

### Interessenerklärungen – Tabellarische Zusammenfassung

- 1 Berater- bzw. Gutachtertätigkeit oder bezahlte Mitarbeit in einem wissenschaftlichen Beirat eines Unternehmens der Gesundheitswirtschaft (z. B. Arzneimittelindustrie, Medizinproduktindustrie), eines kommerziell orientierten Auftragsinstituts oder einer Versicherung
- 2 Mitarbeit in einem Wissenschaftlichen Beirat (advisory board)
- 3 Honorare für Vortrags- und Schulungstätigkeiten im Auftrag eines Unternehmens der Gesundheitswirtschaft, eines kommerziell orientierten Auftragsinstituts oder einer Versicherung
- 4 Bezahlte Autoren-/oder Co-Autorenschaft im Auftrag eines Unternehmens der Gesundheitswirtschaft, eines kommerziell orientierten Auftragsinstituts oder einer Versicherung
- 5 Forschungsvorhaben/Durchführung klinischer Studien: finanzielle Zuwendungen (Drittmittel) für Forschungsvorhaben oder direkte Finanzierung von Mitarbeitern der Einrichtung vonseiten eines Unternehmens der Gesundheitswirtschaft, eines kommerziell orientierten Auftragsinstituts oder einer Versicherung
- 6 Eigentümerinteressen (Patent, Urheberrecht, Aktienbesitz): Besitz von Geschäftsanteilen, Aktien, Fonds mit Beteiligung von Unternehmen der Gesundheitswirtschaft
- 7 Indirekte Interessen: Mitglied von in Zusammenhang mit der Leitlinienentwicklung relevanten Fachgesellschaften/Berufsverbänden, Mandatsträger im Rahmen der Leitlinienentwicklung

## Stand August 2021

	Berater-/ Gutachtertätig-keit	Mitarbeit in einem Wissenschaftlichen Beirat (advisory board)	Bezahlte Vortrags- /oder Schulungs- tätigkeit	Bezahlte Autoren-/oder Co- Autorenschaft	Forschungs- vorhaben/Durchführ ung klinischer Studien	Eigentümer- interessen (Patent, Urheberrecht, Aktienbesitz)	Indirekte Interessen	Bewertung
Aigner, Felix	Keine	Keine	Takeda Olympus Deutschland	Keine	Keine	Keine	Mitglied: Deutsche Gesellschaft für Koloproktologie – Nachwuchsbeauftragter (kooptiertes Vorstandsmitglied) Mitglied: CACP/DGAV – Vorsitzender AG Funktionalität in der kolorektalen Chirurgie Schwerpunkt: Koloproktologie, gastrointestinale Onkologie, Transplantationschirurgie	Gering
Allescher, Hans- Dieter	Bayer	Bayer	Keine	Keine	Keine	Keine	Federführung: Organisationskursen (TaTME, kolorektale Chirurgie) in Zusammenarbeit mit dem BDC, DGK, DGAV, mit Themenbezug zur Leitlinie Persönlich: – Mitglied: DGVS, DGEBV, DGIM, DKG, BDI, AGA Schwerpunkt: – Federführung: Endupdate Persönlich: –	Gering
Böhm, Stephan	Keine	Keine	Falk Foundation Vifor	Keine	Keine	Keine	Mitglied: – Schwerpunkt: –	Gering























Reinshagen, Max	Keine	Abbvie, Janssen, Takeda, MSD, Amgen, Boehringer	Keine	Keine	Keine	Keine	Mitglied: DGVS, AGA Schwerpunkt: Chronisch-entzündliche Darmerkrankungen Federführung: – Persönlich: –	Gering
Reißfelder, Christoph	Keine	Keine	Keine	Keine	Keine	Medtronic Olympus Falk	Mitglied: – Schwerpunkt: kolorektale Chirurgie Leberchirurgie Federführung: DGAV "Fit für den Facharzt" Federführung: OP-Kurs laparoskopische Leberchirurgie Persönlich: –	Gering
Ritz, Jörg-Peter	Keine	Keine	Keine	Keine	Keine	DGAV/DGCH/DKG/DC CV	Mitglied: DGAV, DGCH, BDC, DKG, DCCV, Schwerpunkt: Divertikulitis, CED, Onkologie, ERAS Federführung: – Persönlich: –	Keine
Rubin, Diana	Keine	Keine	Keine	Keine	Keine	Novo Nordisk	Mitglied: DGEM, Schatzmeisterin, Vorstandstätigkeit DDG, Ausschussleiterin (Ernährung) Schwerpunkt: Nutrigenetik	Gering

	Federführung: z. B. Ernährungsmedizin Persönlich: –									
Sander, Cornelia	Mitglied: Kompetenznetz Darmerkrankungen (seit 12/2015 im Vorstand) Schwerpunkt: – Federführung: – Persönlich: –	Keine	Keine	Keine	Keine	Keine	Keine	Keine	Keine	Keine
Schiedeck, Thomas	Mitglied: Deutsche Gesellschaft für Chirurgie, Schatzmeister Mitglied: Deutsche Gesellschaft für Koloproktologie, Vorstand Mitglied: Deutsche Gesellschaft für Allgemein- und Viszeralchirurgie, Vorstand, aktuell Vize-Präsident Mitglied: European Society of Coloproctology Trustee Schwerpunkt: Kolorektales Karzinom, Laparoskopie, Koloproktologie Federführung: – Persönlich: –	Keine	Keine	Keine	Keine	Keine	Keine	Keine	Keine	Keine
Schreyer, Andreas	Mitglied: Schwerpunkt: –	Aktienbesitz Siemens Healthineers	Keine	Keine	Keine	Bayer	Takeda	Keine		Gering











**Schlüsselfragen (inklusive Hinweisen und Evidenzprüfung)****AG 1 Anatomie, Pathologie, Pathogenese, Risikofaktoren, Komorbidität****AG 2 Klinisches Erscheinungsbild (Definitionen), natürlicher Verlauf, Komplikationen, Epidemiologie****AG 3 Diagnostik und Stadieneinteilung sowie Divertikelblutung (Diagnostik und Therapie)****AG 4 Konservative Behandlung, Medikamente, Ernährung, Lifestyle****AG 5 Indikationsstellung zur chirurgischen Therapie****AG 6 Operative Verfahrenswahl**

**AG 1: Anatomie, Pathologie, Pathogenese, Risikofaktoren, Komorbidität, Medikation**

Evidenzprüfung: Es sollte zumindest eine Evidenzprüfung der mit „e“ gekennzeichneten Schlüsselthemen erfolgen (insbesondere die Faktoren, die eine therapeutische Konsequenz haben könnten). Eine Ausdehnung der Evidenzprüfung kann auf Eigeninitiative und Einschätzung der AG-Leitenden erfolgen.

## Anatomie Divertikulose

## Pathogenese

- Divertikulose
- Divertikelkrankheit
- Divertikulitis
- Divertikelblutung

## Genetische Faktoren

## Einfluss der Motilität

## Einfluss der Innervation – Gut-Brain-Axis

## Bindegewebe

## Mikrobiom

## Risikofaktoren (Medikamente, Lifestyle) „e“

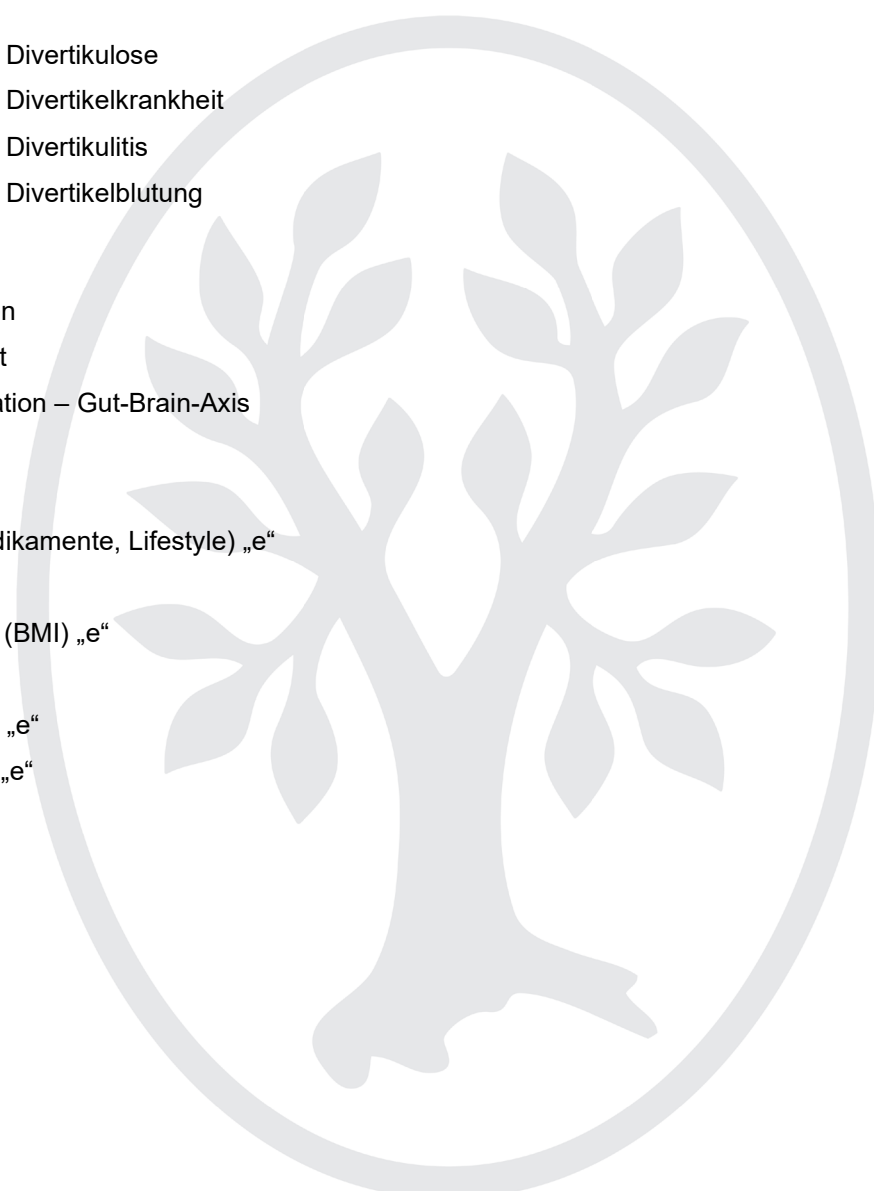
## Alter „e“

## Ernährung/Gewicht (BMI) „e“

## viszerales Fett

## körperliche Aktivität „e“

## Immunsuppression „e“



**AG 2: Klinisches Erscheinungsbild (Definitionen), natürlicher Verlauf, Komplikationen, Epidemiologie**

Evidenzprüfung: Es sollte zumindest eine Evidenzprüfung der mit „e“ gekennzeichneten Schlüsselthemen erfolgen (insbesondere die Faktoren, die eine therapeutische oder diagnostische Konsequenz haben könnten). Eine Ausdehnung der Evidenzprüfung kann auf Eigeninitiative und Einschätzung der AG-Leiter erfolgen.

- Definition
1. Divertikulose
  2. Divertikelkrankheit, SUDD
  3. Divertikulitis

Epidemiologie der Divertikulose, Divertikelkrankheit, Divertikulitis

Epidemiologie der rechtsseitigen Divertikulose

Klinisches Erscheinungsbild

Spontanverlauf/Langzeitverlauf „e“

Sterblichkeit „e“

- Komorbidität „e“
- SCAD
  - CED
  - Neoplasien

**AG 3: Diagnostik und Stadieneinteilung sowie Divertikelblutung (Diagnostik und Therapie)**

Evidenzprüfung: Die Evidenzprüfung sollte für alle Schlüsselfragen erfolgen.

**Diagnostik und Stadieneinteilung:**

Sensitivität, Spezifität, ggf. pos./neg. prädiktiver Wert, technische Bedingungen und Zeitpunkt der diagnostischen Verfahren.

- Anamnese
- Klinische Untersuchung
- Labor (insbesondere CRP!, fäkales Calprotectin, Procalcitonin)
- Sonografie
- CT/MRT
- Koloskopie/Sigmoidoskopie (inklusive zu welchem Zeitpunkt)

Diagnostischer Algorithmus

- Divertikulose – Divertikelkrankheit (SUDD)
- Divertikulitis (unkompliziert, kompliziert)
- Divertikelblutung

Wertung der in der Leitlinie entwickelten Klassifikation (CDD) / Wertung anderer Klassifikationen (im Vergleich zur CDD)

**Divertikelblutung (Diagnostik und Therapie):**

Was ist die Primärdiagnostik bei V.a. eine Divertikelblutung?

Zu welchem Zeitpunkt ist eine Koloskopie bei V.a. Divertikelblutung durchzuführen (Notfallendoskopie, aufgeschobene Dringlichkeit)?

Ist eine Darmreinigung vor einer Koloskopie wegen des V.a. eine Divertikelblutung notwendig?

Wann besteht die Indikation zur Durchführung einer Angiografie bzw. eines Angio-CT bei V.a. Divertikelblutung?

Stellenwert der Blood-Pool-Szintigrafie bei V.a. Divertikelblutung.

Indikation und Technik der endoskopischen Blutstillung bei Divertikelblutung. Welche Evidenz besteht für welches Verfahren?

Indikation und Technik zur angiografischen Embolisation bei Divertikelblutung. Welche Evidenz besteht für welches Verfahren?

Indikation zur operativen Therapie bei Divertikelblutung. Zeitpunkt der Operation mit Dringlichkeitsstufe.

Operative Verfahrenswahl bei Divertikelblutung mit bzw. ohne vorherige endoskopische Blutungslokalisierung.



**AG 4: Konservative Behandlung, Medikamente, Ernährung, Lifestyle**

Evidenzprüfung: Die Evidenzprüfung sollte für alle Schlüsselfragen erfolgen.

Darstellung und Empfehlung folgender konservativer Behandlungen (Prävention und aktive Erkrankung):

- Antibiotika
- Mesalazin
- Probiotika
- Ernährung/Diät/ Lifestyle/Nahrungskarenz

Bei folgenden Krankheitstypen:

- Divertikulose
- Divertikelkrankheit (SUDD)
- akute und rezidivierende Divertikulitis (unkompliziert, kompliziert)





**AG 5 Indikationsstellung zur chirurgischen Therapie**

## Divertikelkrankheit/Divertikulitis

1. Voraussetzung der ambulanten Behandlung
2. Indikationen für eine stationäre Behandlung
3. Konservatives versus operatives Prozedere

**3.1 Typ 1 nach CDD (unkomplizierte Divertikulitis)**

Behandlungskonzept

Gibt es eine OP-Indikation beim Typ 1 in Abhängigkeit vom Vorerkrankungsprofil?

**3.2 Typ II nach CDD (komplizierte Divertikulitis)**

## 3.2.1 Typ IIa nach CDD

Gibt es eine Indikation zur operativen Therapie nach initial erfolgreicher konservativer Behandlung? Wenn ja: OP-Zeitpunkt

## 3.2.2 Typ IIb

Indikation zur interventionellen Drainage?

Indikation zur elektiven Sigmaresektion nach primär nicht operativer Therapie? Wenn ja: OP-Zeitpunkt?

## 3.2.3 Typ IIc

OP-Indikation, OP-Zeitpunkt

**3.3 Typ III**

## 3.3.1 Typ IIIa

Gibt es eine Indikation zur elektiven Sigmaresektion bei Vorliegen einer SUDD?

## 3.3.2 Typ IIIb

Indikation zur elektiven Sigmaresektion bei chron.-rez. Divertikulitis ohne Komplikationen. (Quote Beschwerdefreiheit, Lebensqualität, Rezidive, Langzeitergebnisse, Prognosefaktoren für ein gutes operatives Ergebnis)

## 3.3.3 Typ IIIc

Indikation zur elektiven Sigmaresektion bei chron.-rez. Divertikulitis mit Komplikationen (Fistel, Stenose)

**AG 6 Operative Verfahrenswahl**

1. Operativer Zugang/Operationsverfahren Therapie
- 1.1. Verfahrenswahl bei der **elektiven Sigmaresektion**
  - 1.1.1. Laparoskopische versus offene Resektion
    - 1.1.1.1. Total laparoskopische/laparoskopisch-assistierte versus Hand-Port- Verfahren?
    - 1.1.1.2. Stellenwert von Single-Port, NOS- und NOTES-Techniken?
- 2.2. Verfahrenswahl bei der **frei perforierten Sigmadivertikulitis (Typ IIc)**
  - 2.2.1. Sigmaresektion mit Kontinuitätswiederherstellung mit/ohne Deviationsstoma versus Diskontinuitätswiederherstellung nach Hartmann
  - 2.2.2. Stellenwert der alleinigen laparoskopischen Lavage ohne Resektion
  - 2.2.3. Stellenwert des Damage-control-Konzeptes
3. Resektionsausmaß der Sigmaresektion

Wo soll der orale Absetzungsrand lokalisiert sein? Wo soll der aborale Absetzungsrand lokalisiert sein?

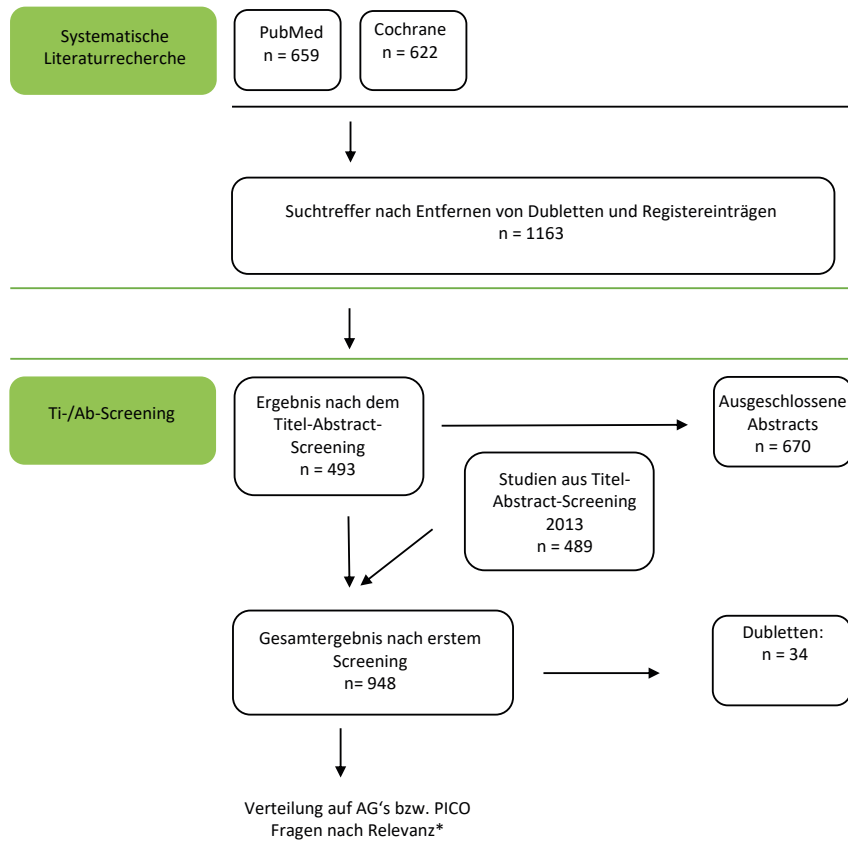
Ist die Resektion sämtlicher divertikeltragender Darmabschnitte erforderlich?
4. Technische Aspekte der Sigmaresektion

Stapler- vs. Handanastomose?

Zentrales oder peripheres Absetzen der Gefäße

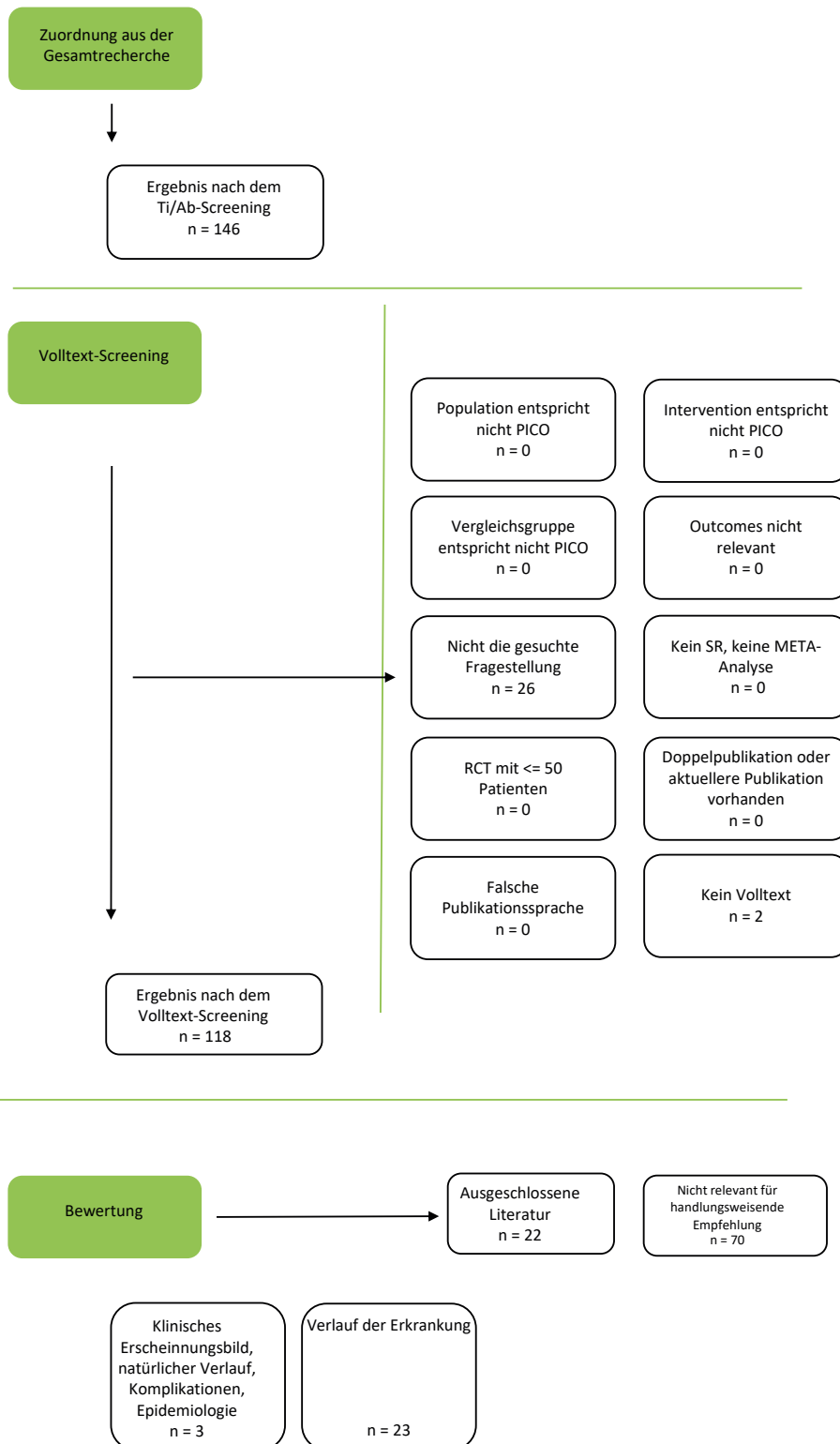
  - Vorgehen an der Arteria mesenterica inferior
  - Vorgehen an der Vena mesenterica inferior
5. Wie ist das Management von Komplikationen?
  - Anastomoseninsuffizienz

## Gesamtrecherche

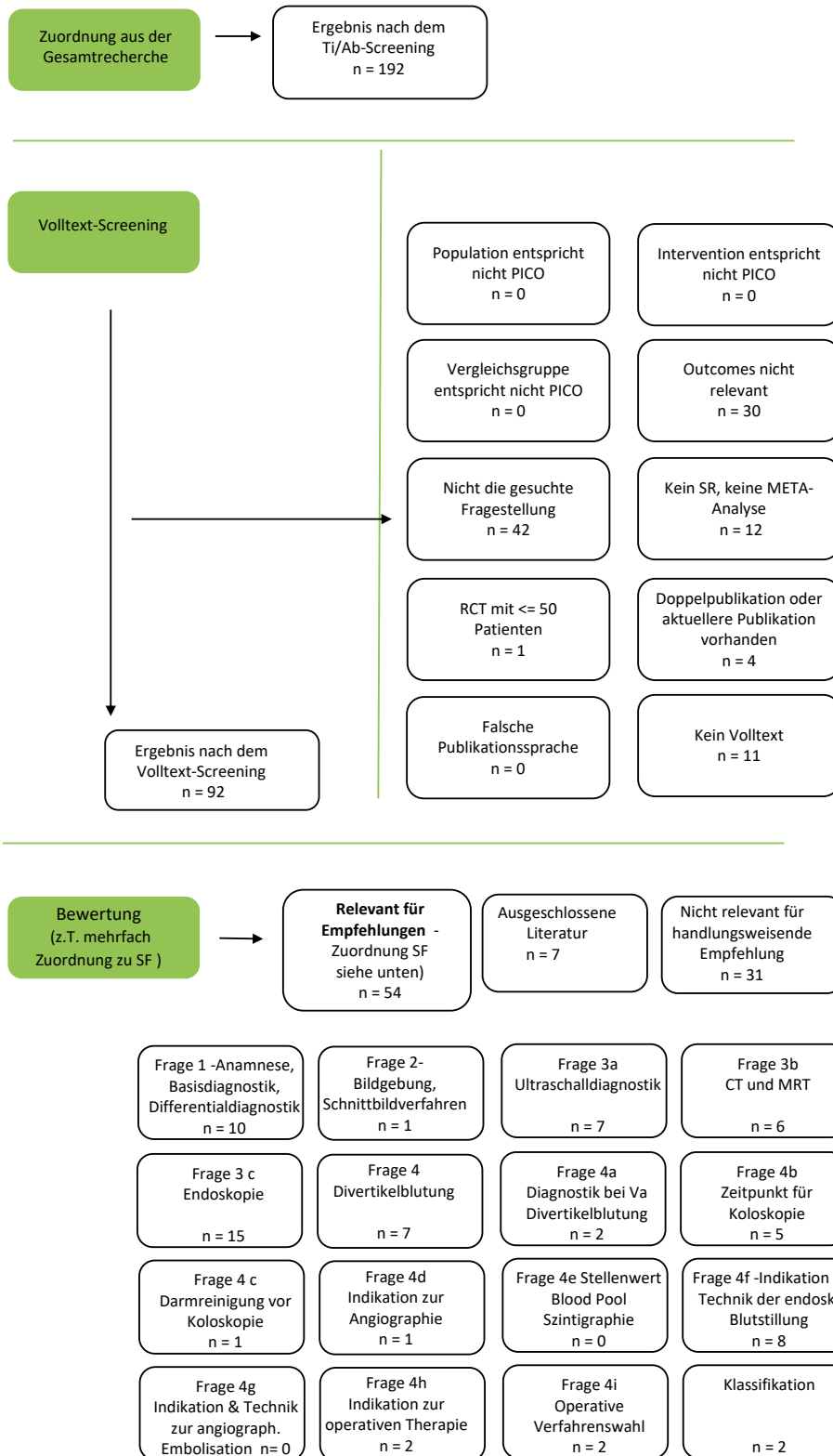


\*Doppelte Zuteilung möglich

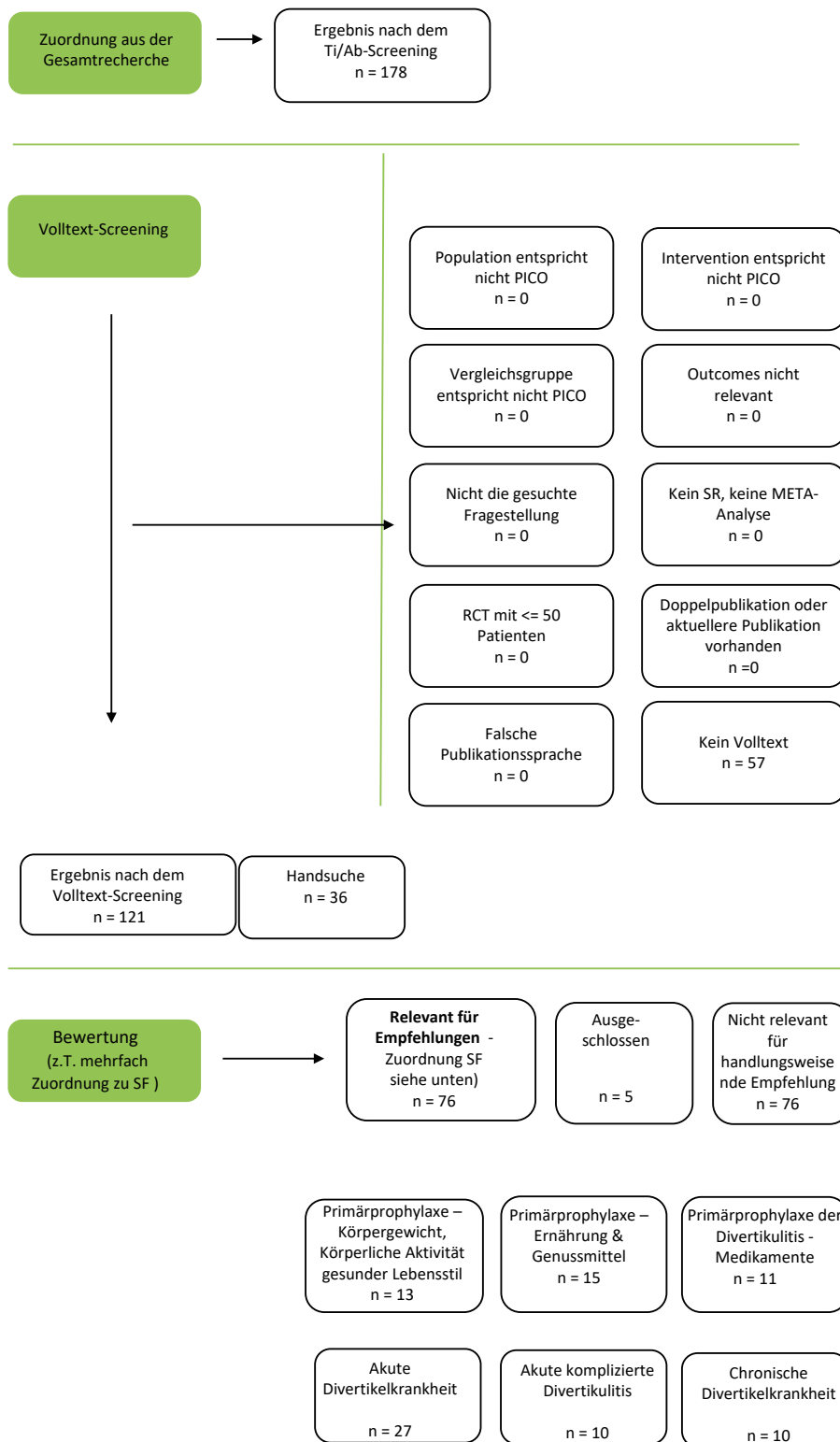
## Arbeitsgruppe 2



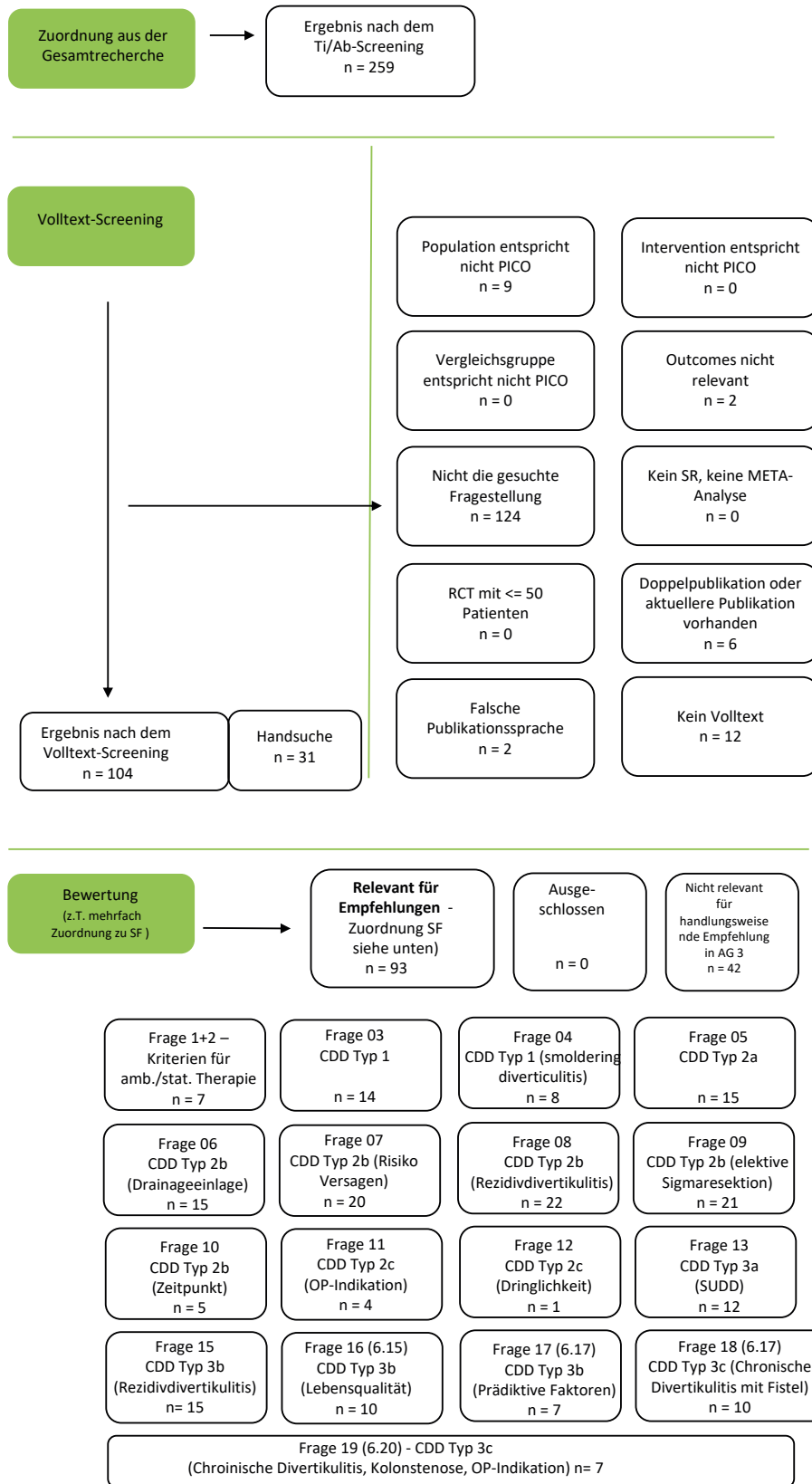
### Arbeitsgruppe 3



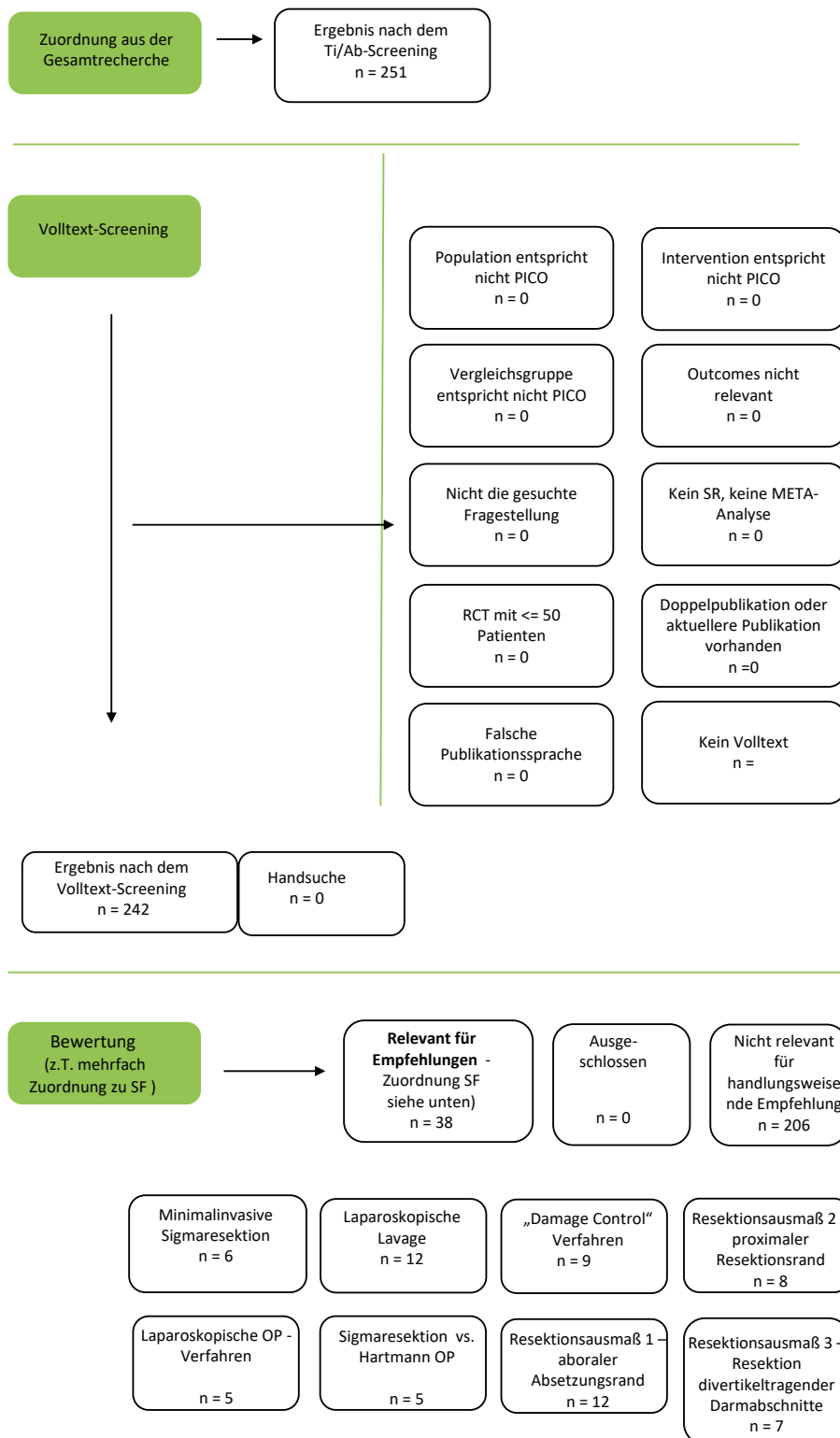
## Arbeitsgruppe 04



### Arbeitsgruppe 5



## Arbeitsgruppe 06





## Schlüsselfrage:

**AG 02**  
**Klinisches Erscheinungsbild (Definitionen), natürlicher Verlauf, Komplikationen, Epidemiologie**

**Inhalt: 2 Literaturstellen**

Literaturstelle	Evidenzlevel	Studientyp
Al-Khamis, A. 2016	3	Retrospektive Kohortenstudie
Biondo, S. 2012	1	systematic review

**OXFORD (2011) Appraisal Sheet: Systematic Reviews: 1 Bewertung(en)**

Biondo, S. et al. Current status of the treatment of acute colonic diverticulitis: a systematic review. Colorectal Dis. 14. e1-e11. 2012			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: systematic review</p> <p>Databases: PUBMED, MEDLINE, EMBASE and Google scholar</p> <p>Search period: all publications to March 2011</p> <p>Inclusion Criteria: all studies dealing with treatment of acute colonic diverticulitis</p> <p>Exclusion Criteria:</p>	<p>Intervention:</p> <p>Comparison:</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results:</p> <p>Author's Conclusion: 1 An abdominal CT is the most effective tool for diagnosis and staging of AD, and can also be used for percutaneous drainage of abscesses.            2 In patients without significant comorbidities and an uncomplicated diverticulitis, outpatient treatment can be performed.            3 Conservative treatment can be used for patients with uncomplicated AD, small abscesses or percutaneously drained abscesses.            4 The recommendation of elective surgery after a favourable response to medical treatment should be made on an individual basis. Elective laparoscopic surgery in diverticulitis is appropriate but is technically complex and requires experience in laparoscopic surgery.            5 The PSS scoring system is a specific system for peritonitis of colonic origin that helps to predict mortality and is useful in the decision making process.            6 In cases of perforated diverticulitis, after a careful selection of patients, the technique of choice should be resection with primary anastomosis. However, at present, laparoscopic lavage is being considered as a potentially safe alternative in cases of purulent peritonitis.</p>	
<b>Methodical Notes</b>			
<b>Funding Sources:</b>			
<b>COI:</b>			

Study Quality: most retrospective studies and cohorts

Heterogeneity:

Publication Bias:

Notes:

**NEWCASTLE - OTTAWA Checklist: Cohort: 1 Bewertung(en)**

Al-Khamis, A. et al. Sigmoid Colectomy for Acute Diverticulitis in Immunosuppressed vs Immunocompetent Patients: Outcomes From the ACS-NSQIP Database. *Dis Colon Rectum*. 59. 101-9. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: Retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 26987  Recruiting Phase: <u>2005-2012</u>  Inclusion criteria: Patienten, bei denen eine Kolektomie aufgrund einer akuten Divertikulitis durchgeführt wurde  Exclusion criteria:	Interventions: Immunsuppression vs. Immunkompetenz; Notfallsetting vs. Elektives Setting  Comparison:
Notes:	Author's conclusion: Notfallkolektomie für Divertikulitis ist bei immunsupprimierten im Vergleich zu immunkompetenten PatientInnen mit einer höheren Mortalität assoziiert. Elektive Kolektomie ist hingegen mit einer vergleichbaren Mortalität zwischen den Gruppen assoziiert. Im elektiven Setting zeigte sich zudem bei immunsupprimierten im Vergleich zu immunkompetenten Patienten ein erhöhtes Risiko für Morbidität und Wunddehiszenz.		
Outcome Measures/results	Primary Mortalität, Morbidität, Organraum-Infektionen, infektiöse Komplikationen und Wunddehiszenz  Secondary	Results: Sowohl in der Gruppe der immunsupprimierten als auch in der immunkompetenten PatientInnen war die Mortalität und Morbidität im Notfallsetting deutlich erhöht (immunsupprimiert 16% und 45%, immunkompetent 4% und 28%) im Vergleich zum elektiven Setting (immunsupprimiert 2% und 25%, immunkompetent 0,4% und 12%) (p<0,001).  In der multivariaten Regression für das Notfall-Setting zeigte sich bei den immunsupprimierten PatientInnen eine signifikant erhöhte Mortalität (OR, 1,79; 95% CI, 1,17–2,75) und erhöhte Morbidität (nicht signifikant).  In der multivariaten Regression für das elektive Setting war die Mortalität der immunsupprimierten und immunkompetenten PatientInnen gleich. Jedoch war die Morbidität (OR, 1.46; 95% CI, 1.17–1.83) und Wunddehiszenz (OR, 2.69; 95% CI, 1.63–4.42) signifikant erhöht bei immunsupprimierten im Vergleich immunkompetenten PatientInnen.	

## Schlüsselfrage:

AG 02 - Verlauf der Erkrankung

**Inhalt: 23 Literaturstellen**

Literaturstelle	Evidenzlevel	Studientyp
Al-Khamis, A. 2016	3	Retrospektive Kohortenstudie
Ambrosetti, P. 2005	3	Prospektive Kohortenstudie
Aune, D. 2017	1	Systematisches Review und Meta-Analyse (Kohortenstudien)
Aune, D. 2017	1	Systematisches Review und Meta-Analyse (Kohortenstudien)
Bargellini, T. 2013	4	Prospektive Kohortenstudie
Biondo, S. 2016	3	Kohortenstudie
Bolster, L. T. 2003	5	Explorative Studie (Preliminary Study)
Chautems, R. C. 2002	4	Prospektive Kohortenstudie
Del Rio, P. 2014	4	Prospektive Kohortenstudie
Farmakis, N. 1994	3	Prospektive Kohortenstudie
Granlund, J. 2011	3	Fall-Kontroll-Studie
Hall, J. F. 2011	4	retrospektive Kohorte 2011
Hjern, F. 2008	3	retrospektive Kohorte, teils Fragebogen basierte Langzeitobservation
Holmer, C. 2011	4	prospektive Studie 2011
Kieff, B. J. 2004	3	Assoziationsstudie bei Koloskopie , Frage nach gemeinsamem Auftreten von Polypen und Divertikeln
Lam, T. J. 2010	4	retrospektive Krankenhausdatenanalyse
Moreno, A. M. 2007	4	retrospektive Datenbankanlyse. Eingangskriterium Divertikulitis und Krankenhausaufenthalt. Nachbeobachtung über das nationale Register
Parks, T. G. 1969	4	retrospektive Datenbankanlyse, Nachbeobachtung über Pat. Kontakt
Salem, T. A. 2007	3	retrospektive Datenanalyse mit Nachbeobachtung über 5 Jahre.
Sarin, S. 1994	4	retrospektive Datenbankanlyse, Nachbeobachtung mittels Brief oder Tel.
Schneider, L. V. 2017	3	retrospektive Case-Control Studie
Thaler, K. 2003	4	retrospektive Datenanalyse
Tursi, A. 2012	3	retrospektive Datenanalyse, prospektive Nachbeobachtung

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 2 Bewertung(en)

Aune, D. et al. Body mass index and physical activity and the risk of diverticular disease: a systematic review and meta-analysis of prospective studies. *Eur J Nutr.* 56. 2423-2438. 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Systematisches Review und Meta-Analyse (Kohortenstudien)</p> <p>Databases: Pubmed, Embase</p> <p>Search period: bis zum 07.02.2017</p> <p>Inclusion Criteria: Prospektive Studien, die den Zusammenhang zwischen dem BMI oder anderen übergewichtsassoziierten Messungen, körperlicher Bewegung und dem Risiko, an Divertikulitis zu erkranken, untersuchen</p> <p>Angabe von adjustierten relativen Risikoschätzungen (Hazard Ratio, Risk Ratio, Odds Ratio) und dazugehörigen 95%-Konfidenzintervallen</p> <p>Für Dosis-Wirkungs-Analyse: Exposition quantifiziert in mindestens drei Kategorien; Verfügbarkeit absolute Zahl an Fällen und Personjahren</p> <p>Exclusion Criteria:</p>	<p>Population: Erwachsene Personen</p> <p>Intervention: BMI /andere übergewichtsassoziierte Parameter und körperliche Aktivität</p> <p>Comparison:</p>	<p>Primary: Diverticular Disease, Diverticulitis, diverticular disease complications</p> <p>Secondary:</p> <p>Results: Das zusammengefasste RR der Diverticular Disease für einen 5-Unit BMI lag bei 1,28 (95% KI: 1,18 – 1,40, I<sup>2</sup> = 77%, n = 6), für Divertikulitis bei 1,31 (95% KI: 1,09 – 1,56, I<sup>2</sup>=74%, n=2), für Divertikulitis assoziierte Krankheitskomplikationen bei 1,20 (95% KI: 1,04 – 1,40, I<sup>2</sup>= 56%, n=3). Es bestanden keine Hinweise auf einen nichtlinearen Zusammenhang zwischen dem BMI und dem Risiko für Divertikelerkrankungen (pnonlinearity=0,22). Zudem stieg das Risiko sogar innerhalb des normalen Gewichtsbereiches an. Im Vergleich zu einem BMI von 20 lag das zusammengefasste RR für einen BMI von 22.5, 25.0, 27.5, 30.0, 32.5, 35.0, 37.5 und 40.0 bei 1.15 (1.07–1.23), 1.31 (1.17–1.47), 1.50 (1.31–1.71), 1.71 (1.52–1.94), 1.96 (1.77–2.18), 2.26 (2.00–2.54), 2.60 (2.11–3.21), und 3.01 (2.06–4.39).</p> <p>Das zusammengefasste RR lag bei 0.76 (95% KI: 0.63–0.93, I<sup>2</sup>=54%, n=5) für hohe vs. niedrige körperliche Aktivität und bei 0.74 (95% CI: 0.57–0.97, I<sup>2</sup>=39.5%, pheterogeneity=0.20, n = 2) für hohe vs. niedrige körperliche Aktivität.</p> <p>Author's Conclusion: Die Ergebnisse legen nahe, dass selbst ein moderater Anstieg des BMI das Risiko für Divertikulitis sowie für Divertikulitis assoziierte Komplikationen erhöhen kann und dass ein höheres Maß an körperlicher Aktivität das Risiko dafür verringern kann.</p>	<p>Aune et al., 2017, Eur J Nutr</p>

## Methodical Notes

Funding Sources: Die Studie wurde von dem Liaison Committee, Central Norway Regional Health Authority (RHA), der Norwegian University of Science and Technology (NTNU), und dem Imperial College National Institute of Health Research (NIHR) Biomedical Research Centre (BRC) gefördert. Die Förderer hatten keinen Einfluss auf Studiendesign, Datensammlung, Datenanalyse und -interpretation, den Schreibprozess sowie die Entscheidung bezüglich der Veröffentlichung.

COI: Kein bestehender Interessenskonflikt

Study Quality:

Heterogeneity: z.T. hohe bis mittlere Heterogenität

RR Diverticular Disease für einen 5-Unit-BMI: I2 = 77%  
 RR Divertikulitis für einen 5-Unit-BMI: I2=74%  
 RR Divertikulitis assoziierte Komplikationen für einen 5-Unit-BMI: I2= 56%

RR niedrige vs. hohe körperliche Aktivität: I2=54%  
 RR hohe vs. niedrige körperliche Aktivität: I2=39.5%

Publication Bias: AutorInnen beschreiben, dass sie eine Analyse auf einen möglichen Publikationsbias durchgeführt haben. Ergebnisse dieser Analyse sind jedoch nicht einsehbar.

**Notes:**

Nur Kohortenstudien berücksichtigt

Aune, D. et al. Tobacco smoking and the risk of diverticular disease - a systematic review and meta-analysis of prospective studies. *Colorectal Dis.* 19. 621-633. 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Systematisches Review und Meta-Analyse (Kohortenstudien)</p> <p>Databases: Pubmed, Embase</p> <p>Search period: 19.02.2016</p> <p>Inclusion Criteria: Prospektive Studien, welche den Zusammenhang zwischen dem Rauchen von Tabak und dem Risiko einer Divertikulitis bzw. damit verbundenen Komplikationen (wie z.B. Abszesse und/oder Perforationen) untersuchen</p> <p>Adjustierte Schätzungen des RR mit 95% KI</p> <p>Verwendung eines quantitativen Maßes für das Rauchen von Tabak, um Dosis-Wirkungs-Analysen durchzuführen</p> <p>Exclusion Criteria:</p>	<p>Population: Raucher (current, former, ever) und Nicht-Raucher</p> <p>Intervention: Rauchen von Tabak</p> <p>Comparison: Kein Rauchen von Tabak</p>	<p>Primary: Risiko für Divertikulitis oder damit verbundene Komplikationen</p> <p>Secondary:</p> <p>Results:            Das RR für die Inzidenz von Divertikulitis lag für Current-Smoker bei 1,36 (95% KI 1.15 – 1.61, I2 = 84%, n=4), bei 1,17 (95% KI 1.05 – 1.31, I2 = 49%, n = 4) für Former-Smoker und bei 1,29 (95% KI 1.16 – 1.44, I2 = 62%, n = 5) für Ever-Smoker. Das gesamte RR lag bei 1,11 (95% KI 0,99 – 1,25, I2 = 82%, n=4) für zehn Zigaretten am Tag. Obwohl es einige Hinweise auf eine Nichtlinearität gab, bestand eine dosisabhängige positive Assoziation mit steigender Anzahl an gerauchten Zigaretten pro Tag. Zudem gab es Evidenz dafür, dass Rauchen auch das Risiko für Divertikulitis assoziierte Komplikationen erhöhte, jedoch war die Anzahl der Studien hierfür klein.</p> <p>Author's Conclusion: Die Meta-Analyse bietet Evidenz darüber, dass Tabak-Rauchen mit einer erhöhten Inzidenz von Divertikulitis und damit verbundenen Komplikationen assoziiert ist.</p>	<p>Aune et al., 2017, Colorectal Disease</p>

**Methodical Notes**

Funding Sources: Die Studie wurde von dem Liaison Committee, Central Norway Regional Health Authority (RHA), der Norwegian University of Science and Technology (NTNU), und dem Imperial College National Institute of Health Research (NIHR) Biomedical Research Centre (BRC) gefördert. Die Förderer hatten keinen Einfluss auf Studiendesign, Datensammlung, Datenanalyse und -interpretation, den Schreibprozess sowie die Entscheidung bezüglich der Veröffentlichung.

COI: Kein bestehender Interessenskonflikt

**Study Quality:**

Heterogeneity: Teilweise hohe Heterogenität:

RR-Divertikulitis Current Smoker: I2 = 84%

RR Divertikulitis Former-Smoker: I2 = 49%

RR Divertikulitis Ever-Smoker: I2 = 62%

RR Divertikulitis Insgesamt: I2: 82%

Publication Bias: Publikations Bias liegt nicht vor

**Notes:**

Nur prospektive Kohortenstudien eingeschlossen

**NEWCASTLE - OTTAWA Checklist: Case Control: 1 Bewertung(en)**

Ambrosetti, P. et al. Long-term outcome of mesocolic and pelvic diverticular abscesses of the left colon: a prospective study of 73 cases. *Dis Colon Rectum*. **48**. 787-91. 2005

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3	Funding sources: k.A.	Total no. patients: Insgesamt aufgenommen: 465, Patienten mit mesokolischen- und Beckenabszessen: 76	Interventions: /
Study type: Prospektive Kohortenstudie	Conflict of Interests: k.A. Randomization: / Blinding: / Dropout rates: 4% Loss to Follow-Up	Patient characteristics: Oktober 1986 bis Oktober 1997 Inclusion criteria: Aufnahme in Studie, sofern bei einer oder beiden radiologischen Untersuchungen eine akute Divertikulitis diagnostiziert wurde oder wenn die Diagnose chirurgisch gestellt und im Anschluss histologisch bestätigt wurde Exclusion criteria:	Comparison: /
Notes:	kleine Fallzahl der Langzeitverlauf Author's conclusion: In Anbetracht des schlechten Outcomes eines Beckenabszesses in Verbindung mit einer akuten linksseitigen Dickdarm-Divertikulitis scheint eine perkutane Drainage gefolgt von einer sekundären Kolektomie gerechtfertigt. Mesokolische Abszesse an sich stellen keine absolute Indikation für eine Kolektomie dar.		
Outcome Measures/results	Primary Das Langzeitergebnis von mesokolischen und pelvinen divertikulären Abszessen des linken Dickdarms Secondary	Results: Von den 45 Patienten mit einem mesokolischen Abszess benötigten 7 (15%) eine Operation während dem ersten Krankenhausaufenthalt im Vergleich zu 11 (39%) der 28 Patienten mit Beckenabszess (p=0,04). Nach Ende der Follow-Up Zeit benötigten 22 (58%) der 38 Patienten mit einem mesokolischen Abszess, die während ihres ersten Krankenhausaufenthaltes konservativ behandelt wurden keine chirurgische Behandlung im Vergleich zu den 8 (47%) der 17 Patienten mit Beckenabszess. Zusammenfassend erhielten 51% der Patienten mit einem mesokolischen Abszess eine chirurgische Behandlung im Vergleich zu 71% der Patienten mit einem Beckenabszess (p= 0,09).	

**NEWCASTLE - OTTAWA Checklist: Cohort: 20 Bewertung(en)**

Al-Khamis, A. et al. Sigmoid Colectomy for Acute Diverticulitis in Immunosuppressed vs Immunocompetent Patients: Outcomes From the ACS-NSQIP Database. *Dis Colon Rectum*. **59**. 101-9. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level:	Funding sources:	Total no. patients: 26987	Interventions:

3	Study type: Retrospektive Kohortenstudie	Conflict of Interests: Randomization: Blinding: Dropout rates:	of Recruiting Phase: <u>2005-2012</u>  Inclusion criteria: Patienten, bei denen eine Kolektomie aufgrund einer akuten Divertikulitis durchgeführt wurde  Exclusion criteria:	Immunsuppression vs. Immunkompetenz; Notfallsetting vs. Elektives Setting  Comparison:
Notes:	Author's conclusion: Notfallkolektomie für Divertikulitis ist bei immunsupprimierten im Vergleich zu immunkompetenten PatientInnen mit einer höheren Mortalität assoziiert. Elektive Kolektomie ist hingegen mit einer vergleichbaren Mortalität zwischen den Gruppen assoziiert. Im elektiven Setting zeigte sich zudem bei immunsupprimierten im Vergleich zu immunkompetenten Patienten ein erhöhtes Risiko für Morbidität und Wunddehiszenz.			
Outcome Measures/results	Primary Mortalität, Morbidität, Organraum-Infektionen, infektiöse Komplikationen und Wunddehiszenz  Secondary	Results: Sowohl in der Gruppe der immunsupprimierten als auch in der immunkompetenten PatientInnen war die Mortalität und Morbidität im Notfallsetting deutlich erhöht (immunsupprimiert 16% und 45%, immunkompetent 4% und 28%) im Vergleich zum elektiven Setting (immunsupprimiert 2% und 25%, immunkompetent 0,4% und 12%) ( $p < 0,001$ ).  In der multivariaten Regression für das Notfall-Setting zeigte sich bei den immunsupprimierten PatientInnen eine signifikant erhöhte Mortalität (OR, 1,79; 95% CI, 1,17–2,75) und erhöhte Morbidität (nicht signifikant).  In der multivariaten Regression für das elektive Setting war die Mortalität der immunsupprimierten und immunkompetenten PatientInnen gleich. Jedoch war die Morbidität (OR, 1,46; 95% CI, 1,17–1,83) und Wunddehiszenz (OR, 2,69; 95% CI, 1,63–4,42) signifikant erhöht bei immunsupprimierten im Vergleich immunkompetenten PatientInnen.		

Bargellini, T. et al. Long-term results of treatment of acute diverticulitis: still lessons to be learned?. *Updates Surg.* 65. 125-30. 2013

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: Propektive Kohortenstudie	Funding sources:  Conflict of Interests: Keine bestehenden Interessenskonflikte  Randomization:  Blinding:  Dropout rates:	Total no. patients: 202  Recruiting Phase: <u>2003-2007</u>  Inclusion criteria:  Exclusion criteria:	Interventions: Gruppe A: Antibiotikatherapie oder Drainage ohne weiteres operatives Vorgehen Gruppe B: OP nach 30-90 Tagen Gruppe C: Akut Chirurgie  Comparison:
Notes:	Author's conclusion: Diverticulitis Disease beeinflusste die Darmfunktion und die Lebensqualität der PatientInnen im Langzeit-Follow-Up unabhängig von der Art der Therapie. Die Ergebnisse zeigen, dass es keine langfristigen Vorteile für die Kolonresektion gibt, die nur bei PatientInnen mit komplizierter DD berücksichtigt werden sollte.		
Outcome Measures/results	Primary Indikation von Operationen, Ergebnis der Behandlungsmodalitäten, Lebensqualität  Secondary	Results: Es zeigten sich keine Unterschiede zwischen den drei Gruppen	

Biondo, S. et al. Outcomes of colonic diverticulitis according to the reason of immunosuppression. Am J Surg. 212. 384-90. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Kohortenstudie	Funding sources: Keine Conflict of Interests: Keine Randomization: Blinding: Dropout rates:	Total no. patients: 192 Recruiting Phase: <u>1994-2013</u> Inclusion criteria: IMS PatientInnen mit linksseitiger Dickdarm-Divertikulitis Exclusion criteria: PatientInnen mit Divertikulitis des rechten Kolons, divertikulären Blutungen, Eintritt der Divertikulitis vor dem Studienzeitraum, Todesfälle, die nicht mit der akuten Divertikulitis zusammenhängen	Interventions: Gruppe 1: Kortikosteroide Gruppe2: Transplantation Gruppe 3: Malignom Gruppe 4: Nierenversagen Gruppe 5: andere Immunsuppressiva Comparison:
Notes:	Author's conclusion: Die Rate der Notfalloperationen bei IMS-Patienten in der ersten Episode einer akuten Dickdarm-Divertikulitis ist hoch. Wahloperationen bei IMS-PatientInnen sollten entsprechend indiziert werden nach Persistenz von Symptomen oder frühen Rezidiven.		
Outcome Measures/results	Primary Rate der Notoperationen, Ergebnisse in Bezug auf die postoperative Mortalität, und Rezidivrate nach nichtoperativem Management Secondary	Results: Notfall-Operationen wurden am häufigsten in Gruppe I durchgeführt. Männl. Geschlecht und Schweregrad der Divertikulitis assoziiert Mit Notfallchirurgie; Insgesamt lag die postoperative Mortalität bei 31,6% und die Rezidivrate nach erfolgreicher nichtoperativer Behandlung lag bei 27,8%. Es zeigten sich keine Unterschiede zwischen den Gruppen.	

Bolster, L. T. et al. Diverticular disease has an impact on quality of life -- results of a preliminary study. Colorectal Dis. 5. 320-3. 2003

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 5 Study type: Explorative Studie (Preliminary Study)	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 100 Recruiting Phase: Inclusion criteria: Exclusion criteria:	Interventions: Patienten mit DD Comparison: Gesunde Kontrollen
Notes:	Author's conclusion: Diese vorläufige Studie legt nahe, dass DD sich auf die Lebensqualität einer Person auswirkt. Die AutorInnen empfehlen, dass weitere Forschung der Entwicklung eines (Lebensqualitäts-)Bewertungssystems spezifisch für PatientInnen mit DD benötigt wird. Die Entwicklung eines Werkzeuges, welches den subjektiven Gesundheitsstatus (QoL) dieser Krankheitsgruppe präzise messen kann, bietet den Ausgangspunkt für einen systematischen Ansatz für die Bereitstellung von Behandlung, Management und Betreuung von PatientInnen mit DD		
Outcome Measures/results	Primary Darmsymptome, systemische Symptome, emotionale Symptome und	Results: In der Patientengruppe fielen die Werte deutlich unter die optimalen QoL-Werte in jeder der einzelnen Subskalen insbesondere in den Bereichen der Darmsymptome (43.8 vs. 65.4 für Kontrollen) und emotionale Funktion (55,1 vs. 75,9 für Kontrollen). Zudem wiesen PatientInnen mit DD statistisch signifikant niedrigere QoL-Werte als Kontrollen auf. Dieser	



	soziale Funktion Secondary	Unterschied war konsistent in allen vier untersuchten Bereichen (p < 0,003 in allen Kategorien)
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Chautems, R. C. et al. Long-term follow-up after first acute episode of sigmoid diverticulitis: is surgery mandatory?: a prospective study of 118 patients. *Dis Colon Rectum*. 45. 962-6. 2002

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Prospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 118 Recruiting Phase: <u>1986-1991</u> Inclusion criteria: Alle PatientInnen die sich zum ersten Mal in der Notfallambulanz mit einer Anamnese und klinischen Befunden einer Sigmadivertikulitis vorstellten, wurden einem abdominalen CT und einem wasserlöslichen Kontrasteinlauf unterzogen. PatientInnen wurden als PatientInnen mit Divertikulitis betrachtet, wenn einer oder beide diagnostische Tests negativ ausfielen. Exclusion criteria: PatientInnen wurden ausgeschlossen, wenn beide Untersuchungen negativ ausfielen.	Interventions: Comparison:
Notes:	Author's conclusion: Die AutorInnen schlagen vor, nach einer ersten akuten Episode der Divertikulitis, welche nicht operativ behandelt wurde, jungen PatientInnen (≤50 Jahre) mit einem schweren Verlauf der Divertikulitis, eine elektive Kolektomie anzubieten.		
Outcome Measures/results	Primary Langzeitergebnisse von PatientInnen, die nach einer ersten akuten Episode von Sigmadivertikulitis nicht operativ behandelt wurden Secondary	Results: Insgesamt traten bei 80 PatientInnen keine Komplikationen und bei 38 PatientInnen Fernkomplikationen auf. Hierbei war die Inzidenz von Fernkomplikationen bei jüngeren PatientInnen mit schwerer Divertikulitis am höchsten (54% nach 5 Jahren). Die niedrigste Inzidenz ließ sich bei älteren PatientInnen mit leichter Erkrankung verzeichnen (19% nach 5 Jahren). Junges Alter und schwere Divertikulitis waren getrennt voneinander betrachtet beide statistisch signifikante Faktoren für ein schlechtes Outcome (p=0,007 und p=0,003). Daher sind Risikofaktoren für eine Rückfall ein Alter unter 50 Jahren sowie ein schwerer Verlauf der Divertikulitis	

Del Rio, P. et al. Diverticular disease and colon cancer: a real association between the two diseases?. *Ann Ital Chir*. 85. 389-96. 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Prospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 165 Recruiting Phase: Mai 2011 - Dezember 2012 Inclusion criteria: PatientInnen die zwischen Mai 2011 und Dezember 2012 eine linke Kolonresektion in der Abteilung für Chirurgia generale e trapianti d'Organo im Krankenhaus von Parma erhielten Exclusion criteria:	Interventions: Gruppe 1: Hemikolek. Links wegen KolonCa n=120 Gruppe 2: Hemikolek. Links wegen Divertikulitis n=29 Gruppe 3: Hemikolek. Links Kombi n=16 (Grund für Hemi Ca) Comparison:
Notes:			

	<p><b>Author's conclusion:</b> Die AutorInnen fanden in ihrer Studie und dem Vergleich mit der bestehenden Literatur eine Synthese mehrerer klinischer Beweise für einen Zusammenhang zwischen den beiden Erkrankungen. Das Vorhandensein einer Divertikulitis würde zu einer Frühdiagnose des Kolon-Adenokarzinoms führen. Es besteht jedoch noch die Notwendigkeit, die mögliche ätiopathogenetische Korrelation zwischen den beiden klinischen Entitäten im zeitlichen Verlauf zu analysieren, die tatsächlich noch als zufällige Assoziation betrachtet wird.</p>	
<b>Outcome Measures/results</b>	<p><b>Primary</b> Zusammenhang zwischen KolonCa und Divertikulitis</p> <p><b>Secondary</b></p>	<p><b>Results:</b> Das Durchschnittsalter der PatientInnen, die aufgrund eines Kolon-Adenokarzinom operiert wurden, betrug 69,91 Jahre. Das Durchschnittsalter PatientInnen mit OP aufgrund eines Kolon-Adenokarzinoms und gleichzeitig vorliegender Divertikulitis war im Vergleich zu PatientInnen die nur aufgrund einer Divertikulitis in Behandlung waren statistisch höher (<math>73.8 \pm 6.89</math> VS <math>60.9 \pm 13.5</math>, <math>p = 0.004</math>). □ DD &lt; Kombi &lt; Ca</p> <p>Es wurde ein höherer Grad an Divertikelentzündung bei PatientInnen gefunden, die wegen Divertikulitis allein behandelt wurden im Vergleich zu PatientInnen, die aufgrund des Kolon-Adenokarzinom in Verbindung mit Divertikulitis behandelt wurden.</p> <p>Zudem zeigte kein/e Patient/in mit Kolon-Adenokarzinom in Verbindung mit einer Divertikulitis Lebermetastasen, während bei PatientInnen bei denen nur ein Kolon-Adenokarzinom vorlag, eine Peritonealkarzinose in 2,6% der Fällen sowie Lebermetastasen, immer synchron, in 11,5% der Fällen festgestellt wurden. Die Lymphknoten-Positivität hingegen wies eine Prävalenz von 33,5% bei PatientInnen mit Kolon-Adenokarzinom und bei PatientInnen mit assoziierter Divertikulitis von 7% auf.</p>

Farmakis, N. et al. The 5-year natural history of complicated diverticular disease. Br J Surg. 81. 733-5. 1994

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p> <p>Study type: Prospektive Kohortenstudie</p>	<p>Funding sources:</p> <p>Conflict of Interests:</p> <p>Randomization:</p> <p>Blinding:</p> <p>Dropout rates:</p>	<p>Total no. patients: 165 (120 ausgewertet)</p> <p>Recruiting Phase: 1985 - 1988</p> <p>Inclusion criteria: PatientInnen mit komplizierter Divertikulitis, welche die Index-Aufnahme überlebten</p> <p>Exclusion criteria:</p>	<p>Interventions:</p> <p>Comparison:</p>
<b>Notes:</b>	<p><b>Author's conclusion:</b> Die Daten sprechen für eine Sigmoid Kolektomie für die meisten PatientInnen, die sich im Krankenhaus mit einer komplizierten Divertikulitis vorstellen. Hierdurch kann der späteren Entwicklung von potentiellen Komplikationen vorgebeugt werden.</p>		
<b>Outcome Measures/results</b>	<p><b>Primary</b> Natürlicher Verlauf der komplizierten Divertikulitis</p> <p><b>Secondary</b></p>	<p><b>Results:</b> Von 120 PatientInnen verstarben zehn an einer rezidivierenden komplizierten Divertikulitis. 29 weitere PatientInnen verstarben anderen Erkrankungen und 81 PatientInnen überlebten.</p> <p>40 der 110 PatientInnen (Ausschluss von den PatientInnen, die an einer rezidivierenden komplizierten Divertikulitis verstarben) sind immer noch symptomatisch oder waren es bis zu dem Zeitpunkt ihres Todes.</p> <p>39 PatientInnen entwickelten eine schwere Komplikation nach der Indexaufnahme. Von diesen PatientInnen wiesen 14 die Komplikation bereits zu Anfang auf.</p> <p>Von den 77 PatientInnen die zu Beginn eine Sigmoidresektion erhielten entwickelten nur zwei PatientInnen rezidivierende Komplikationen im Vergleich zu 37 von 43 PatientInnen, die eine konservative Behandlung erhielten.</p> <p>Von den zehn PatientInnen, die an einer rezidivierenden komplizierten</p>	

	Divertikulitis verstarben, erhielten neun PatientInnen keine Sigmoidkolektomie bei oder nach der Aufnahme.
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Granlund, J. et al. Diverticular disease and the risk of colon cancer - a population-based case-control study. *Aliment Pharmacol Ther.* **34.** 675-81. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Fall-Kontroll-Studie	Funding sources: Die Studie wurde teilweise finanziert durch den Bezirksrat Stockholm und das Karolinska Institut bedingt durch das regionale Abkommen zur medizinischen Ausbildung und klinischen Forschung (ALF) Conflict of Interests: Keine Randomization: Blinding: Die Diagnose Diverticulose oder Diverticulitis wurde von einer unabhängigen und verblindeten Person gestellt Dropout rates:	Total no. patients: 41037 Recruiting Phase: <u>1992 - 2006</u> Inclusion criteria: PatientInnen mit Darmkrebs (ICD-7 codes 1530–1533 and 1538–1539) ohne Vorgeschichte mit anderen Krebsarten und gematchte Kontrollen ohne Krebs Exclusion criteria:	Interventions: Comparison:
Notes:	case control, Registerstudie  Author's conclusion: Divertikulitis erhöht langfristig nicht das Risiko für das Auftreten von Darmkrebs und eine Vorgeschichte der Divertikulitis wirkt sich nicht auf die Mortalität von Darmkrebs aus.  Das erhöhte Risiko innerhalb der ersten 12 Monate nach einer Divertikulitis Diagnose an Darmkrebs zu erkranken ist höchstwahrscheinlich auf eine Überwachung und Missklassifikation zurückzuführen. Keine erhöhte Kolonkarzinomrate mit Divertikulitis assoziiert.  Die Untersuchung des Darmes sollte nach einer primären Episode der Divertikulitis empfohlen werden.		
Outcome Measures/results	Primary Inzidenz von Darmkrebs Secondary	Results: Innerhalb von sechs Monaten nach einer Aufnahme aufgrund von Divertikulitis lag das OR für das Vorliegen einer Darmkrebs Diagnose bei 31,49 (19,00 – 52,21). Nach 12 Monaten zeigte sich kein erhöhtes Risiko. Die Zahl der Entlassungen für die Divertikulitis hatte keinen Einfluss auf das Risiko.  Es zeigte sich kein Unterschied in der Mortalität von Darmkrebs zwischen PatientInnen mit und ohne Divertikulitis	

Hall, J. F. et al. Long-term follow-up after an initial episode of diverticulitis: what are the predictors of recurrence?. *Dis Colon Rectum.* **54.** 283-8. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospektive Kohorte 2011	Funding sources: nicht aufgezählt Conflict of Interests: keine Randomization: Blinding: Dropout rates:	Total no. patients: n=954 Recruiting Phase: <u>2002-2008</u> Inclusion criteria: alle Patienten, bei denen eine Divertikulitis diagnostiziert wurde - aus elektronischen Verzeichnis unter Verwendung d. Standard Diagnose ( International Classification of Disease, 9th Revision) CT Abdomen-Hüfte	Interventions: intravenöse oder orale Therapie mit Antibiotika Comparison:

		Exclusion criteria: Patienten, die anschließend aufgrund des ersten Anfalls eine Kolektomie erhielten (n=81) oder Patienten, bei denen der Anfall zwischen 2002 und 2008 nicht ihr erster war (n=201) Patienten mit bekannter Vorerkrankung: Krebs, IBD, ischämische Colitis
Notes:	retrospektive Serie  Author's conclusion: Risiko für das Wiederauftreten einer Divertikulitis: Familiäre Vorgeschichte, langes Kolonsegment befallen, retroperitoneale Abszesse sind mit mehr Rückfall assoziiert	
Outcome Measures/results	Primary CT Prädiktoren (n=20) für Schwere d. Divertikulitis: ausgewählt durch verblindete prospektive Reevaluierung (zB. Länge d. Kolonsegments, Lokalisation des Abszesses, extraluminale Gas, anatomische Lokalisation der Erkrankung usw.) klinische Prädiktoren (n=43) retrospektive Chart Überprüfung  Secondary	Results: Durchschnittsalter 61 Jahre, Durchschnitts-Follow up: 43 Monate Manifestation am häufigsten am Colon sigmoideum (72%), gefolgt vom absteigendem Kolon (33%), rechtes Kolon (5%) und Colon transversum (3%) Rezidive nach 5 Jahren: 36% Komplikationen (Fisteln, Abszesse, Perforationen) dabei 3,9% familiäre Vorbelastung (HR 2.2, 95% CI 1.4 –3.2), retroperitoneale Abszesse(HR 4.5, 95% CI 1.1–18.4), und Länge des betroffenen Kolon 5 cm (HR 1.7, 95% CI 1.3–2.3) waren mit Rezidiven assoziiert betroffenes rechtes Kolon (HR 0.27, 95% CI 0.09 – 0.86) war mit Freiheit von Rezidiven assoziiert

## Hjern, F. et al. Outcome of younger patients with acute diverticulitis. Br J Surg. 95. 758-64. 2008

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: retrospektive Kohorte, teils Fragebogen basierte Langzeitobservation	Funding sources: keine Angaben  Conflict of Interests: keine Angaben  Randomization: -  Blinding: -  Dropout rates: n= 5 starben während ersten Krankenhausaufenthalts, n=5 starben während des Follow-ups alle Tode standen nicht im Zusammenhang mit der Diverticulitis	Total no. patients: n=234  Recruiting Phase: Kanuar 2000 bis Juni 2002  Inclusion criteria: K572 & K573 Patienten mit akuter Divertikulitis bestätigt durch CT ODER Pathologie  Exclusion criteria: Patienten mit vorberichtlicher Divertikulitis	Interventions: n= 58 jünger als 50 Jahre  Comparison: n= 176 über 50 Jahre alt
Notes:	Retro, Gruppenvergleich, geringe Fallzahl  Author's conclusion: Kein Einfluss des Alters auf den Verlauf oder Schweregrad der Erstmanifestation der Divertikulitis		
Outcome Measures/results	Primary Alter bei erster Divertikulitis, Geschlecht, Komorbiditäten, Operationsgeschichte, Temperatur bei Aufnahme, WBC, CRP, Länge des Krankenhausaufenthaltes und Behandlung (medikamentös, Operation), CT Bilder  Secondary Rezidiv definiert als erneuter Krankenhausaufnahme mit Zeichen einer akuten Divertikulitis nach vollkommener Beschwerdefreiheit nach über einem Monat nach Entlassung des Patienten	Results: Es konnten keine Unterschiede bezüglich Fieber und WBC zwischen den unter und über 50jährigen Patienten festgestellt werden Die Rate an schweren Verläufen war niedriger unter den jungen Patienten(2 versus 11.9 per cent; P = 0.025). Operation während erstem Krankenhausaufenthalt seltener unter jungen Patienten(2 versus 6.8 per cent; P = 0.271	

von n=448 Patienten wurde die Diagnose bei n=131 nicht bestätigt, n=83 hatten vorher eine Diverticulitis und wurden ausgeschlossen, das Durchschnittsalter betrug 59 Jahre, geringere Rate schwerer Inflammation, geringeres CRP Level, kürzerer Krankenhausaufenthalt in Patientengruppe 50 und jünger alle Patienten die starben wiesen Hinchey stage 4 dieses (fäkale Peritonitis) auf

Holmer, C. et al. Long-term outcome after conservative and surgical treatment of acute sigmoid diverticulitis. *Langenbecks Arch Surg.* **396.** 825-32. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: prospektive Studie 2011	Funding sources: keine Angaben  Conflict of Interests: keine  Randomization: -  Blinding: -  Dropout rates: n=210 rekrutiert, n=153 inkludiert, Rest konnte zum Großteil wegen geänderter Kontaktdaten nicht zum Followup erreicht werden; 9 Patienten lehnte es ab an der Studie teilzunehmen	Total no. patients: n=153  Recruiting Phase: Januar 2004 bis Juni 2007  Inclusion criteria: erste akute SD, CT Kontrastmittel iv/rektal innerhalb 12 h nach Aufnahme Hansen-Stock classification  Exclusion criteria: frei perforierte SD, diffuse Peritonitis, chronische SD mit Stenzen und Fisteln, Allergie gegen das Kontrastmittel, Kolorektalkarzinom, IBD, infektiöse Colitis	Interventions: konservative Therapie bei Patienten mit SD Anzeichen ohne Perforation oder diffuse Peritonitis: intravenöse Therapie mit 1g Sulbactam und 2g Ampicillin; bei Penicillin Unverträglichkeit: Ciprofloxacin und Metronidazol  Comparison: operative Therapie Indikation: weitere Ausbreitung während Antibiotika Therapie, lokale Peritonitis, erste Manifestation bei Immunsuppremierten, chronische Schmerzen wegen diverticular disease, rekurrierte Blutungen Divertikel, überdeckte perforierende SD
Notes:	Langes follow up - Daten aber telefonisch erhoben  Author's conclusion: Die operative Versorgung einer akuten sigmoiden Divertikulitis ist effektiver um einem Rückfall vorzubeugen im Verhältnis zur konservativen Therapie		
Outcome Measures/results	Primary Fragebogen  Secondary	Results: n=210 Patienten eingeschlossen, n=153 zum Follow-up erreicht, 45,8% präsentierten sich mit Erstmanifestation, 54,2% hatten eine SD Vorgeschichte median Follow-up 32 Monate n=13 (32,5%) der konservativ behandelten Patienten und n=113 (3,5%) der operierten Patienten erlitten ein Rezidiv Behandlungsgruppen unterschieden sich nicht nach Alter, Geschlecht, Entzündungsparameter, jedoch hatten konservativ behandelte Patienten signifikant höhere Komorbiditäten (p=0,038) und seltener schwere Verläufe (p=0,022)	

Kieff, B. J. et al. Is diverticulosis associated with colorectal neoplasia? A cross-sectional colonoscopic study. *Am J Gastroenterol.* **99.** 2007-11. 2004

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: Assoziationsstudie bei Koloskopie , Frage nach	Funding sources: Förderung durch das National Institute of Diabetes and Digestive and Kidney Diseases	Total no. patients: n=502  Recruiting Phase: <u>1.10.2001-30.09.2002</u>  Inclusion criteria: alle Patienten, die von ihrem Hausarzt zu einer Darmspiegelung	Interventions: Zusammenhang zwischen distaler Divertikulitis und Risiko für kolorektale Neoplasien Fragebogen über

<p>gemeinsamem Auftreten von Polypen und Divertikeln</p>	<p>(K24 DK02756)                  Conflict of Interests: keine Angabe                  Randomization:                  Blinding: ja, durchführende Person der Endoskopie war sich der Studie und wer daran teilnimmt nicht bewusst                  Dropout rates:</p>	<p>überwiesen wurden und auf die die die Exklusionskriterien nicht zutreffen                  Exclusion criteria: vorangegangene Polypektomie, Kolonresektion, IBD, Unfähigkeit Zustimmung zu geben, Schwangerschaft</p>	<p>Risikofaktoren für kolorektales Karzinom                  Comparison:</p>
<p><b>Notes:</b>                  Author's conclusion: ausgedehnte distale Divertikulose war nicht mit einem höheren Risiko für fortgeschrittene proximale Neoplasie assoziiert</p>			
<p>Outcome Measures/results</p>	<p>Primary Dokumentation Größe, Umfang und Lokalisation der Divertikulitis und Kolonpolypen                  Secondary Fragebogen Risikofaktoren: Größe, Gewicht, NSAID Einnahme, Alkoholkonsum, Taback, kilorektales Karzinom in Familiengeschichte, Sport, Diät und Verzehr von rotem Fleisch, Frauen: Hormontherapie</p>	<p>Results: 67% der Patienten waren Männer mit einem Durchschnittsalter von 58,6 Jahren                  23% wiesen eine extensive distale Diverticulosis( EDD) auf 36% hatten ≥1 Adenom, 14% eine Neoplasie. Der Vergleich von EDD vs. wenige oder keine Divertikel zeigte keine Unterschiede im Risiko einer Neoplasie(neoplasia or advanced neoplasia, either distally (26.7% vs 25.4%; 12.9% vs 8.8%, respectively) or proximally (25% vs 18.4%; 6.0% vs 4.9%)). Bei Frauen wiesen Patientinnen mit wenigen oder keinen distalen Divertikeln ein geringeres Risiko für Neoplasien auf als Frauen mit EDD. Frauen mit EDD: neoplasia and advanced neoplasia, both distally (34.6% vs 16.3%; p = 0.03, and 23.1% vs 5.7%; p = 0.003) and proximally (30.8% vs 14.9%; p = 0.049, and 11.5% vs 4.3%, p = 0.13).                  Adjustment for age did not affect results for advanced distal neoplasia (OR = 3.92; CI: 1.18–13); however, adjustment for the presence of a distal neoplasm eliminated the increased risk of proximal neoplasia associated with EDD (OR = 1.31; CI: 0.43–4.02).                  Assoziation von ausgedehnter Divertikulose und distale Neoplasie bei Männern kein Unterschied#                  (Bei Frauen mit extensiver distaler Divertikulose höhere Wahrscheinlichkeit für distal/proximale Neoplasie --&gt; nicht signifikant)</p>	

Lam, T. J. et al. There is no increased risk for colorectal cancer and adenomas in patients with diverticulitis: a retrospective longitudinal study. *Colorectal Dis.* **12**. 1122-6. 2010

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 4                  Study type: retrospektive Krankenhausdatenanalyse</p>	<p>Funding sources: keine Angaben                  Conflict of Interests: keine Angaben                  Randomization: -                  Blinding: -                  Dropout rates: -</p>	<p>Total no. patients: n=288                  Recruiting Phase: <u>1990-2000</u> follow-up bis 2008                  Inclusion criteria: Patienten mit Divertikulitis bestätigt durch CT ODER OP                  Exclusion criteria: Patienten mit OP kein Follow-up, da Resektion in betroffenem Gebiet die Entwicklung eines Karzinoms verhindert</p>	<p>Interventions:                  Comparison:</p>
<p><b>Notes:</b>                  Author's conclusion: Vergleich mit allgemeiner Prävalenz von Polypen und KolonCa. Keine Assoziation zw. Divertikulitis und Kolon CA</p>			

Outcome Measures/results	Primary KolonCA, Polypen  Secondary	Results: n=288 Patienten eingeschlossen, 167 (58%) weiblich, Durchschnittsalter: 66 Jahre, CRC wurde in 5 Patienten detektiert (1,7%) mittleres Alter 77 Jahre, Adeome bei 18 Patienten (6,3%) Durchschnittsalter 62 Jahre. Das lebenslängliche Risiko CRC und Adenome zu entwickeln wird auf 4% und 20% geschätzt Durchschnittsalter bei Ende des Followup: 71 Jahre n=182 Operation, n=106 konservative Therapie KolonCA bei 1,7% mit Durchschnittsalter von 77 Jahren detektiert Kolonadenome: 6,3% Durchschnittsalter 62 Jahre
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Moreno, A. M. et al. Long-term outcome in 445 patients after diagnosis of diverticular disease. *Colorectal Dis.* 9. 464-8. 2007

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospektive Datenbankanalyse. Eingangskriterium Divertikulitis und Krankenhausaufenthalt. Nachbeobachtung über das nationale Register	Funding sources: keine  Conflict of Interests: keine Angabe  Randomization: -  Blinding: -  Dropout rates: keine	Total no. patients: n=445  Recruiting Phase: <u>1989-1995</u> Followup bei allen Patienten Mai 2002  Inclusion criteria: Patienten bei Erstmanifestation von Divertikulitis oder Divertikulose, klinische Daten aus Patientenakte übernommen  Exclusion criteria:	Interventions: Langzeit Outcome nach Erstdiagnose von Divertikulitis (DD)  Comparison:
Notes:	retrospektive, kein Register  Author's conclusion: keine Assoziation für einen prospektiven Marker gefunden. Keine Assoziation für Geschlecht, Alter, Lebensstil für die Entwicklung von komplizierter Divertikulitis mit wiederkehrenden Stat Aufenthalt und OP		
Outcome Measures/results	Primary  Secondary	Results: Verhältnis Frauen zu Männern 30/70, Median Alter 75 Jahre, Männer waren jünger als Frauen (p<0,01); 73% erhielten konservative Therapie, zum Follow-up 35,3% hatten einen Rückfall von DD erlitten; von ihnen wurden 15,9% operiert; 3,6% der Patienten starben assoziiert mit DD Mögliche high-risk Gruppen für Rezidiv: Männer über 70, mediane Verfolgungsdauer: 6,5 Jahre 157 (35,3%) Patienten erlitten Rezidive; von den 325 zunächst konservativ therapierten Patienten, benötigten 25 anschließend eine Operation Es konnte kein Zusammenhang zwischen der Schwere bei Erstmanifestation, Lebensstil und der Frequenz von Rezidiven festgestellt werden Am Ende des Follow-ups waren 282 Patienten verstorben, nur 3,6% der Tode stand im Zusammenhang mit DD	

Parks, T. G. Natural history of diverticular disease of the colon. A review of 521 cases. *Br Med J.* 4. 639-42. 1969

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospektive Datenbankanalyse, Nachbeobachtung über Pat. Kontakt	Funding sources:  Conflict of Interests:  Randomization: -  Blinding: -	Total no. patients: n=521  Recruiting Phase: <u>1951-1965</u>  Inclusion criteria: Patienten mit Diagnose Divertikular disease aufgr. von klinischen Anzeichen in Kombination mit radiologischen	Interventions:  Comparison:

	Dropout rates: 2 Patienten (0,4%) konnten zum Follow-up nicht erreicht werden	Anzeichen oder Befund intraOP oder Autopsie Exclusion criteria: Patienten mit isolierten caecalen Divertikeln und Patienten bei denen Diagnose nicht abgesichert
Notes:	keine Kontrollgruppe unklare Datenqualität weitere Bemerkung: reine Deskription, keine Statistik Author's conclusion:	
Outcome Measures/results	Primary Secondary	Results: 154 Patienten gestorben, Informationen durch andere Krankenhäuser, Hausärzte und Verwandte? n=521 davon n=204 Männer und n=317 Frauen, Durchschnittsalter: 61,8 Jahre bei Männern/ 65,9 Jahre bei Frauen Bei der Vorstellung im Krankenhaus zeigten die Hälfte der Patienten die Symptome kürzer als einen Monat, bei diesen Patienten war die Morbidität und Mortalität am höchsten Progression der Krankheit fand vor allem in Segmenten, die primär betroffen waren statt, Ausbreitung auf andere Regionen des Kolons traten selten auf Die Prognose für Patienten wo das totale Kolon betroffen war, war ähnlich wie für Patienten mit einer lokalen Erkrankung. Die Morbidität und Mortalität eines Rezidive war höher, als in der initialen akuten Phase.

Salem, T. A. et al. Prospective, five-year follow-up study of patients with symptomatic uncomplicated diverticular disease. *Dis Colon Rectum*. 50. 1460-4. 2007

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospektive Datenanalyse mit Nachbeobachtung über 5 Jahre.	Funding sources: keine Angaben Conflict of Interests: keine Angaben Randomization: Blinding: Dropout rates: 19 starben ohne Zusammenhang zur DD, 19 nahmen nicht an follow up teil	Total no. patients: n=163 Recruiting Phase: August 1999 bis April 2001 Inclusion criteria: Eingangskriterium unkomplizierte Divertikulitis unkompliziert: Schmerz der li. Fossa iliaca, Veränderung der Stuhlgewohnheiten ohne Beweis für Entzündung: Fieber, erhöhte Entzündungsparameter Exclusion criteria: komplizierte DD: Striktur, Fistel, Abszess, Massen, signifikante Blutung, Perforation	Interventions: telefonischer Fragebogen Comparison: -
Notes:	Prospektives follow up weitere Anmerkung: KEINE Vergleichsgruppe!!! Author's conclusion: keine Komplikationen im 5-Jahres follow up,		
Outcome Measures/results	Primary Entwicklung von Komplikationen in Zusammenhang mit DD: akute Divertikulitis, Phlegmonen, Abszesse, Perforation, Fisteln, Strukturen oder Blutungen Komplikationen, die OP nach sich zogen Operationen, die in Zusammenhang mit Divertikulitis während des Follow-up standen (median 5.5 Jahre) aktuelles Befinden, Symptome und Effekte ihrer täglichen Aktivitäten	Results: n=163 Patienten identifiziert, n=106 weiblich, mediates Alter 74, Diagnose wurde gesichert durch: Koloskopie (n=106), flexible sigmoidoscopy (n=57), und barium enema (n=31). Divertikulitis war bei n=61 Patienten mit anderen Pathologien assoziiert: Polypen Kolon (n=24), Hämorrhoiden n=22, kolorektales Karzinom n=3, verschiedene n=12 Patienten mit kolorektal Karzinom zeigten es linksseitig und wurden aus Follow-up da DD höchstwahrscheinlich nicht primäre Pathologie war ausgeschlossen, ebenso 11 v. 24 d. Patienten mit Polypen und 11 v. 22 Patienten mit Hämorrhoiden während follow up erhielt ein Patient eine Resektion aufgrund eines Rezidivs, 2 weitere wurden mit akuter	



Todesursache Secondary	Divertikulitis vorstellig und wurden konservativ behandelt verblieben ohne weitere Auffälligkeiten während verbleibenden Beobachtungszeitraum Keine anderen Komplikationen Konten im Zusammenhang mit DD festgestellt werden, nur 2% der Patienten mit DD entwickelten Probleme zusammenhängend mit dieser Erkrankung
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Sarin, S. et al. Long-term outcome of patients presenting with acute complications of diverticular disease. *Ann R Coll Surg Engl.* **76.** 117-20. 1994

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospektive Datenbankanalyse, Nachbeobachtung mittels Brief oder Tel.	Funding sources: keine Angaben Conflict of Interests: keine Angaben Randomization: - Blinding: Dropout rates: 11 Patienten nahmen nicht am Follow up teil	Total no. patients: n=164 Recruiting Phase: <u>1980-1987</u> Inclusion criteria: Aufnahmegrund Divertikulitis, konservative Behandlung, bei Komplikation OP Bei Peritonitis OP akute Divertikulitis, Peritonitis, Obstruktion, Blutungen Exclusion criteria:	Interventions: Follow up (median: 48 Monate) von n=164 Patienten mit akuten Komplikationen von Diverticular Disease Comparison:
Notes:	single center, retrospective, Author's conclusion: im follow up keine veränderte Wiederaufnahmerate oder Komplikationsrate bei Pat. konservativ behandelt oder primär operativ behandelt		
Outcome Measures/results	Primary Secondary	Results: n=164 Patienten Männer/Frauen 69/95, Median Alter: 68 Jahre mit akuten Komplikationen von DD, Follow-up: 48 Monate konservativ medikamentöse Behandlung bei 85% v. 86 Patienten erfolgreich, Mortalität 1,3% und Rezidiv 2% alle 37 Patienten, die mit Blutungen vorgestellt wurden sprachen auf konservative Therapie ohne Todesfälle oder Wiederaufnahme Patienten mit Kolon Resektion (n=52): Mortalität 12%, jedoch keine weitere Aufnahme wg. Komplikationen bezogen auf DD	

Schneider, L. V. et al. Right colonic diverticulitis in Caucasians: presentation and outcomes versus left-sided disease. *Abdom Radiol (NY).* **42.** 810-817. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospektive Case-Control Studie	Funding sources: Keine Gelder erhalten Conflict of Interests: keiner vorhanden Randomization: Blinding: Befundung durch Radiologen: Patienten Daten verblindet Dropout rates:	Total no. patients: n=100 Recruiting Phase: Juli 2005 bis Februar 2013 Inclusion criteria: Finale Diagnose Divertikulitis durch Gastroenterologen und Radiologen Exclusion criteria:	Interventions: Vergleich Outcome der rechtsseitigen Divertikulitis (n=30) Comparison: mit Linksseitendivertikulitis (n=70) bei Kaukasiern
Notes:	case control study Author's conclusion: Bei Kaukasiern tritt die Rechtsseitenkolitis häufiger in jüngeren und dünneren Patienten aus und zeigt ein geringeres Risiko von Komplikationen, als die		

	Linksseitige fokale Infalmmation ist häufiger bei Rechtsseitenkolitis zu beobachten	
Outcome Measures/results	Primary CT Befunde, 2 Radiologen verblindet gegen Patientendaten Outcome Secondary	Results: Rechtsseitenkolitis ist assoziiert mit jüngerem Alter (48 vs 63 Jahren) Rechtsseitenkolitis ist assoziiert mit geringerem Gewicht (<20 BMI vs >30BMI) Rechtsseitenkolitis häufiger fokale Entzündung , nicht zirkumferente Wandverdickung , weniger Komplikationen

Thaler, K. et al. Determinants of recurrence after sigmoid resection for uncomplicated diverticulitis. Dis Colon Rectum. 46. 385-8. 2003

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospektive Datenanalyse	Funding sources: z.T. Eleanor Naylor Dana Charitable Trust Fund  Conflict of Interests: keine Angaben  Randomization:  Blinding:  Dropout rates:	Total no. patients: n=236  Recruiting Phase: 1992 bis 2000  Inclusion criteria: Eingangskriterium: Sigmaresektion bei unkomplizierter Divertikulitis erneutes Auftreten innerhalb von 6 Wochen, multivariate Analyse der Risikofaktoren  Exclusion criteria:	Interventions:  Comparison:
Notes:	retrospektiv, kleine Fallzahl  Author's conclusion: keine Ergebnisse in der multivariaten Analyse. Autoren mutmaßen zu wenig Patienten mit Rückfall		
Outcome Measures/results	Primary erneutes Auftreten: Schmerzen im linken unteren Quadrant, Fieber, Leukozytose mit konsistenten CT oder Kontrast enema innerhalb von 6 Wochen Patientendaten: Demographie, Dauer der preoperative Beschwerden, vorherige Krankenhausaufenthalte und abdominal OP, postoperative Komplikationen, OP Technik, Länge Inflammation und Anastomosen des proximalen Resektionsrandes-Pathologie  Secondary	Results: Durchschnittsalter 60 Jahre, Follow-up 67 Monate, mediane Dauer der preoperative Symptome: 18 Monate, alle außer einem Patienten, hatten mind. 1 Krankenhausaufenthalt vor OP, n=140 (59%) laparoscopische OP; n=96 (41%) offene OP, 30 Tage Komplikationsrate: 23%; 30 Tage Mortaliätsrate: 0,4% Reoperationsrate: 2,1% Probenlänge: 17,9 cm Inflammation bei 30 Patienten; 12% entwickelten Rezidiv nach durchschnittlich 78 Monaten Patienten mit kolosigmoiden Anastomosen wiesen 4x höheres Risiko für Rezidiv auf vs. Patienten mit Kolorektalen Anastomosen	

Tursi, A. et al. Segmental colitis associated with diverticulosis: a 5-year follow-up. Int J Colorectal Dis. 27. 179-85. 2012

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: retrospektive Datenanalyse, prospektive Nachbeobachtung	Funding sources: keine Angaben  Conflict of Interests: keine Angaben  Randomization: -  Blinding: Histologische und Immunohisto durch 2 Experten, welche verblindet gegenüber dem Befund aus Endoskopie  Dropout rates: 2 Patienten nicht im Follow-up	Total no. patients: n=27  Recruiting Phase:  Inclusion criteria: Patienten mit SCAD, welche im April 2010 ein 5 jähriges Follow up erreicht haben nach 2, 6 und 12 Monaten nach Diagnose von SCAD Endoskopie Biopsieentnahme n=6 pro Patient sigmoid und	Interventions: Patienten mit SCAD A und C: Mesalazin 2,4g/d über 4 Wochen dann Mesalazin 1,6 g/d um Remission aufrecht zu erhalten  Comparison: Patienten SCAD B und D Beclomethason Dipropionat (BDP) 10mg/d

		Rektum Exclusion criteria:	über 4 Wochen und Probiotika VSL#3 über 15 Tage danach BDP 5mg/d für 4 Wochen + VSL#3 für weitere 15 d um Remission aufrecht zu erhalten: Mesalazin 1,6 g/d und VSL#3 alle 15 d/Monat
Notes:	<p>reine Deskription des Auftretens in Klassifikation und verschiedener Behandlung</p> <p>Segemntal Colitis associated with diverticulitis (SCAD). Zu Grund eliegt ine eigene Klassifikation der SCAD Typ a bis D, die nicht weiter beschrieben wird (Literaturangabe)</p> <p>Author's conclusion: SCAD B und D Patienten konnten die Remission nicht aufrecht erhalten und benötigen häufig eine immunosuppressive Therapie SCAD A und C zeigen einen benigneren Verlauf, trotzdem garantiert auch unter diesen Patienten eine Langzeit Therapie eine längere Remission</p>		
Outcome Measures/results	<p>Primary Befund Endoskopie Histologie</p> <p>Secondary</p>	<p>Results: n=5 (83%) TypA Patienten unter Behandlung, n=2 (50%) TypA Patienten ohne Therapie, alle Typ C (100%) und n=5 (62,5%) und keine TypD 0% waren unter ständiger Remission alle TypD Patienten benötigten weitere Steroide um Remission zu erhalten, 2 Patienten benötigten Azathioprin um Remission aufrecht zu erhalten</p>	

## Schlüsselfrage:

AG 3 Frage 4i  
Operative Verfahrenswahl bei der Divertikelblutung mit bzw. ohne vorherige Blutungslokalisierung

## Inhalt: 2 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Plummer, J. M. 2009	4	retrospective case series
Renzulli, P. 2002	3	retrospective single-center cohort study

## NEWCASTLE - OTTAWA Checklist: Cohort: 2 Bewertung(en)

Plummer, J. M. et al. Emergency subtotal colectomy for lower gastrointestinal haemorrhage: over-utilised or underestimated?. Int J Clin Pract. 63. 865-8. 2009			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospective case series	Funding sources: disclosed Conflict of Interests: disclosed Randomization: Blinding: not applicable Dropout rates:	Total no. patients: 58 (80% diverticular disease) Recruiting Phase: 1998-2005 Inclusion criteria: emergency cases with lower GI-bleeding, who were operated and histopathology reports were stored.. However, no clear description of severity or detailed time-relations are supplied Exclusion criteria: unclear, not mentioned	Interventions: colonic resection (55/58 subtotal) Comparison: none
Notes:	Author's conclusion: While emergency STC is an effective and definitive method of treating unlocalised massive LGIB, its associated morbidity and mortality may limit its usefulness.		
Outcome Measures/results	Primary outcome (efficacy and risk) of emergency colectomy for lower GI-Bleeding Secondary	Results: The major causes of bleeding were diverticular disease only (68%), angiodysplasia only (12%) and both diseases (12%). Overall mortality was 17%, with the main contributor being sepsis resulting from anastomotic leak. Non-fatal complications occurred in 20%, resulting in a mean postoperative length of stay of 13 days. All patients were doing well on their first follow-up visit with a mean number of four stools per day after 1 month.	

Renzulli, P. et al. Subtotal colectomy with primary ileorectostomy is effective for unlocalized, diverticular hemorrhage. Langenbecks Arch Surg. 387. 67-71. 2002			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospective single-center cohort study	Funding sources: not stated Conflict of Interests: not stated Randomization: not applicable Blinding: no	Total no. patients: 42 Recruiting Phase: Nov 1993-Dec 2000 Inclusion criteria: Severe diverticular hemorrhage, defined by continuous bleeding despite blood transfusions $\geq 1500$ ml, blood transfusions $\geq 2000$ ml/day, continued bleeding $\geq 3$ days or recurrent bleeding within 1 week after first episode. All patients underwent urgent colonoscopy Exclusion criteria:	Interventions: emergency laparotomy with segmental or subtotal colectomy Comparison: Segmental vs subtotal colectomy for diverticular hemorrhage

	Dropout rates:	
<b>Notes:</b>	<p><b>Author's conclusion:</b> Subtotal colectomy with primary ileorectostomy for unlocalized colonic diverticular bleeding is a safe and effective surgical procedure providing complete bleeding control and preserving continence.</p>	
<b>Outcome Measures/results</b>	<p><b>Primary outcome-parameters</b></p> <p><b>Secondary rebleeding</b></p>	<p><b>Results:</b> Preoperative localization of the bleeding site was possible in six patients (14%), by colonoscopy in two and by angiography in four. Ten patients underwent segmental colectomy with primary anastomosis (5 “directed”, 5 “blind”) and 32 subtotal colectomy with primary ileorectostomy (1 “directed”, 31 “blind”). Subtotal colectomy is the more extensive surgical procedure (longer resected bowel, greater blood loss), and although it was performed in older patients, there were no significant differences between segmental and subtotal colectomy with respect to operation time, morbidity, mortality, hospital stay, number of bowel movements, continence scores, rebleeding rate, or patient satisfaction.</p>



## Schlüsselfrage:

AG 3 Frage 1  
Anamnese, Basisdiagnostik, Differentialdiagnose(n)

## Inhalt: 10 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Annibale, B. 2012	5	
Boostrom, S. Y. 2012	3	Single center retrospective cohort study
Garcea, G. 2006	4	retrospective case study
Ghorai, S. 2003	4	Retrospective case study
Gray, D. W. 1988	1	Prospective cohort trial with consecutive patients
Jeger, V. 2017	2	prospective diagnostic cohort study
Jurowich, C. F. 2011	3	Consecutive cohort study
Lameris, W. 2010	3	Prospective cohort study
Tursi, A. 2009	4	prospective 5-arm case-control study
Tursi, A. 2014	3	prospective cohort study

## NEWCASTLE - OTTAWA Checklist: Case Control: 2 Bewertung(en)

Ghorai, S. et al. Endoscopic findings of diverticular inflammation in colonoscopy patients without clinical acute diverticulitis: prevalence and endoscopic spectrum. Am J Gastroenterol. <u>98</u> . 802-6. 2003			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Retrospective case study	Funding sources: not stated Conflict of Interests: not stated Randomization: not applicable Blinding: no Dropout rates: 4/21	Total no. patients: 2566 screened Patient characteristics: no data Inclusion criteria: endoscopic appearance of inflammation around diverticula Exclusion criteria:	Interventions: Comparison:
Notes:	This publication shows 0.8%-prevalence of diverticulitis signs at endoscopy in patients without clinical suspicion of diverticulitis. Hence, the CDD-criteria of diverticulitis are not fulfilled in these patients, underlining the necessity for a strict definition of diverticulitis. Author's conclusion: Endoscopy may identify signs resembling diverticulitis in 0,8% of patients undergoing routine endoscopy for other purposes than diverticulitis. Many patients with this finding will be asymptomatic at the time of colonoscopy.		
Outcome Measures/results	Primary Outcome of patients with endoscopic features of diverticulitis Secondary	Results: 21 of 2566 consecutive colonoscopies not performed for diverticulitis showed endoscopic features of diverticulitis (0.8%). Retrospectively in one/21 patient diverticulitis was a possible explanation (treated with antibiotics). 17 were followed up by telephone interview. 6/17 had symptoms of a clinical episode of some kind of diverticulitis before endoscopy, in one the diagnosis of diverticulitis had been made.	

Tursi, A. et al. Faecal calprotectin in colonic diverticular disease: a case-control study. Int J Colorectal Dis. 24. 49-55. 2009

Evidence level	Methodical Notes	Patient characteristics	Interventions
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<b>Evidence level:</b> 4	<b>Funding sources:</b> no data	<b>Total no. patients:</b> 80, maybe 92, -who knows ??  <b>Patient characteristics:</b> unclear	<b>Interventions:</b> Fecal calprotectin concentration
<b>Study type:</b> prospective 5-arm case-control study	<b>Conflict of Interests:</b> no data  <b>Randomization:</b> not stated  <b>Blinding:</b> no  <b>Dropout rates:</b> unclear	<b>Inclusion criteria:</b> consecutive patients with some kind of diverticular disease, classified as asymptomatic diverticulosis, symptomatic diverticular disease or uncomplicated diverticulitis, patients with IBS (Rome criteria) and controls.  <b>Exclusion criteria:</b> Patients with potential known sources of a positive calprotectin test: i.e. colonic polyps, CRC, NSAIDs, COXibes, IBD, family history of CRC or bowel resection.	<b>Comparison:</b> Number of positive tests in the 5 groups
<b>Notes:</b>	Author's conclusion: FC may be useful to detect colonic inflammation in DD and in distinguishing symptomatic DD from IBS, as well as in assessing response to therapy in DD.		
<b>Outcome Measures/results</b>	<b>Primary</b> Fecal calprotection as an index of diverticular inflammation  <b>Secondary</b> Response of fecal calprotectin to antiinflammatory therapy	<b>Results:</b> FC was not increased in healthy controls and IBS patients. No difference was found between asymptomatic diverticulosis, healthy controls, and IBS patients (p=n.s.). We found higher FC values in acute uncomplicated diverticulitis (p<0.0005) and in symptomatic uncomplicated DD (p<0.005) than in healthy controls and in IBS patients. FC values correlated with inflammatory infiltrate (p<0.0005). FC decreased after treatment to normal values both in acute uncomplicated diverticulitis (p<0.0005) and in symptomatic uncomplicated DD (p<0.005) after treatment.	

**NEWCASTLE - OTTAWA Checklist: Cohort: 8 Bewertung(en)**

<b>Annibale, B. et al. Clinical features of symptomatic uncomplicated diverticular disease: a multicenter Italian survey. Int J Colorectal Dis. 27. 1151-9. 2012</b>			
<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
<b>Evidence level:</b> 5	<b>Funding sources:</b>  <b>Conflict of Interests:</b>  <b>Randomization:</b>  <b>Blinding:</b>  <b>Dropout rates:</b>	<b>Total no. patients:</b>  <b>Recruiting Phase:</b>  <b>Inclusion criteria:</b>  <b>Exclusion criteria:</b>	<b>Interventions:</b>  <b>Comparison:</b>
<b>Notes:</b>	The value of this publication is on the description of SUDD-patients being more male in young-age groups and preeminantly female with advanced age. Furthermore it shows that SUDD is predominantly (but not uniquely) a recurrent condition although relations with antecedent diverticulitis remains unclear by the design of patient acquisition  Author's conclusion:		
<b>Outcome Measures/results</b>	<b>Primary</b>  <b>Secondary</b>	<b>Results:</b>	

<b>Boostrum, S. Y. et al. Uncomplicated diverticulitis, more complicated than we thought. J Gastrointest Surg. 16. 1744-9. 2012</b>			
<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
<b>Evidence level:</b> 3	<b>Funding sources:</b> no indication  <b>Conflict of Interests:</b> no indication	<b>Total no. patients:</b> 907, after excluding the non-compatible 684 patients remained  <b>Recruiting Phase:</b> Jan 2005 - Dec 2009	<b>Interventions:</b>  <b>Comparison:</b> Outcome of operation (sigmoid resection) in uncomplicated acute resolving diverticulitis vs uncomplicated chronic smoldering diverticulitis vs uncomplicated atypical diverticulitis (today named SUDD)

	<p>Randomization: not applicable</p> <p>Blinding: not applicable</p> <p>Dropout rates: no indication</p>	<p>Inclusion criteria: Patients operated for uncomplicated diverticular disease</p> <p>Exclusion criteria: Patients showing complications of diverticular disease</p>	
Notes:	<p>The study shows, that sigmoid resection for uncomplicated diverticular disease bears a significant risk for complications, i.e. morbidity, irrespective whether or not resection is for acute resolving diverticulitis, chronic or smoldering or atypical diverticulitis (today: Sudd / IBS).</p> <p>Author's conclusion: The authors consider sigmoid resection in uncomplicated diverticular disease a safe procedure. Therefore and in view of the frequent findings of complications in presumed uncomplicated cases they refer also to surgery as a valuable solution for patients with smoldering or atypical disease</p>		
Outcome Measures/results	<p>Primary Outcome of sigmoid resection for uncomplicated diverticular disease</p> <p>Secondary</p>	<p>Results: While mortality was low, morbidity was 33-48 % over all 3 subgroups. Moreover, in the acute resolving cases of "uncomplicated" diverticulitis 67/564 had an abscess at pathology, 2/564 an undetected carcinoma. In the chronic/smoldering diverticulitis-patients 7/66 indeed had an abscess at pathology, 2/66 tubular adenoma. Among the atypical (Sudd) patients, 17/54 showed inflammation at surgery, 2/54 an abscess while an abscess was found at pathology in 9/54 patients.</p>	

Garcea, G. et al. Diagnosis and management of colovesical fistulae; six-year experience of 90 consecutive cases. *Colorectal Dis.* 8. 347-52. 2006

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 4</p> <p>Study type: retrospective case study</p>	<p>Funding sources: not indicated</p> <p>Conflict of Interests: not indicated</p> <p>Randomization: not applicable</p> <p>Blinding: no</p> <p>Dropout rates: no</p>	<p>Total no. patients: 90 (72 included)</p> <p>Recruiting Phase: 6 years</p> <p>Inclusion criteria: 90 patients with colovesical fistula</p> <p>Exclusion criteria: 18 patients who were not operated (too high risk oder even dead before therapy)</p>	<p>Interventions: diagnostic set of studies for identifying the source of the fistulas</p> <p>Comparison: pros of the different methods</p>
Notes:	<p>Author's conclusion: The authors see a role of barium enema, colonic endoscopy and CT in the preoperative diagnostic workup of patients with colovesical fistulas</p>		
Outcome Measures/results	<p>Primary Accuracy of the diagnostic measures</p> <p>Secondary</p>	<p>Results: Endoscopy was the best method to clarify the colonic origin of the fistula but did not visualize the fistula itself. Cystoscopy however identified less than 50 % (46.7%) of the fistulas and not at all contribute to their colonic etiology. US was useless in this investigation except for the detection of an abscess while CT identified fistulas in 10 % and diverticula in 9 % only.</p>	

Gray, D. W. et al. The closed eyes sign: an aid to diagnosing non-specific abdominal pain. *Bmj.* 297. 837. 1988

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 1</p> <p>Study type: Prospective cohort trial with consecutive patients</p>	<p>Funding sources: apparently not relevant</p> <p>Conflict of Interests: not stated / apparently irrelevant</p> <p>Randomization: not applicable</p> <p>Blinding: likely with respect to the further workup of the investigated patients, not</p>	<p>Total no. patients: 158</p> <p>Recruiting Phase: 6 months</p> <p>Inclusion criteria: consecutive patients with abdominal pain admitted to the emergency entrance of a surgery department at Oxford University Hospital</p>	<p>Interventions: Clinical management without using the investigated sign</p> <p>Comparison: Closed eye sign vs final</p>



	definitely stated (.the findings were not used... does not mean they were disclosed)  Dropout rates: not indicated, apparently none	Exclusion criteria: not stated	outcome as pain of organic or functional origin
Notes:	Innovative prospective study based on a clinical impressin in other patients. Well applicable for the differential diagnosis of functional pain vs organic pain, mainly appendicitis. Unfortunately the study does not directly address diverticulitis and the "variety of organic illnesses" in between apendicitis and functional pain is not further differentiated; the median age of 61y in this group suggests, that diverticulitis was among them.  Author's conclusion: The apparently inexpensive test is a helpful puzzle-stone but not the cornerstone of a secure diagnosis.		
Outcome Measures/results	Primary PPV of the closed eye sign-Test  Secondary NPV of the closed eye sign-Test	Results: PPV 79 %, PNV 65%	

Jeger, V. et al. Is there a role for procalcitonin in differentiating uncomplicated and complicated diverticulitis in order to reduce antibiotic therapy? A prospective diagnostic cohort study. *Swiss Med Wkly.* 147. w14555. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: prospective diagnostic cohort study	Funding sources: denied  Conflict of Interests: denied  Randomization: Complicated vs uncomplicated diagnosed at CT  Blinding: as far as possible  Dropout rates:	Total no. patients: 115  Recruiting Phase: Sept 2015 - Dec 2016  Inclusion criteria: Acute diverticulitis with a positive CT  Exclusion criteria: Immunosuppression, IBD	Interventions:  Comparison: Complicated ( $\geq$ Hinchey 1b) vs uncomplicated (Hinchey 0-1a) Diverticulitis
Notes:	Author's conclusion: Procalcitonin was able to differentiate with a high sensitivity and specificity between complicated and uncomplicated cases of diverticulitis when combined with abdominal CT scans.		
Outcome Measures/results	Primary Validity of procalcitonin as a biomarker for complicated diverticulitis  Secondary	Results: Complicated cases had significantly higer PCT-values than uncomplicated cases. In the ROC analysis reached a sensitivity of 81% and specificity of 91%, if the highest values (measurements at day 1 and 2) were used. Values at admission only showed lower sensitivity and specificity.	

Jurowich, C. F. et al. How complicated is complicated diverticulitis?--phlegmonous diverticulitis revisited. *Int J Colorectal Dis.* 26. 1609-17. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: Consecutive cohort study	Funding sources: not indicated  Conflict of Interests: not given  Randomization: not relevant  Blinding: not relevant  Dropout rates:	Total no. patients: 318  Recruiting Phase: Jan 2004 - Dec 2006  Inclusion criteria: CT-proven diverticulitis  Exclusion criteria: 11 patients where diverticulitis was found at operation but no CT had been performed due to preoperative suspicion of other causes for the patients complaints	Interventions:  Comparison: CT-staging vs operative findings with emphasis on Type IIa (HS)(phlegmonous diverticulitis without preoperatively detected abscess)
Notes:			

	<p>Author's conclusion: Patients with phlegmonous diverticulitis (type IIA) represent the most challenging group among patients with acute diverticulitis as they are frequently understaged and conceal cases with covered perforations (type IIB). This may support the view to subsume phlegmonous diverticulitis (type IIA) under complicated diverticulitis.</p>	
Outcome Measures/results	<p>Primary Validity of staging</p> <p>Secondary</p>	<p>Results: Of 112 patients considered Ila at CT, 83 underwent surgery (the others denied operation). Postoperatively 30/83 were found to be Ila (26.8%), 44 (39.3%) were understaged, 9 (10.9%) overstaged.</p>

Lameris, W. et al. A clinical decision rule to establish the diagnosis of acute diverticulitis at the emergency department. *Dis Colon Rectum*. **53**. 896-904. 2010

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p> <p>Study type: Prospective cohort study</p>	<p>Funding sources: This study was supported by the Dutch Organization for Health Research and Development, Health Care Efficiency Research programme (grant number 945-04-308).</p> <p>Conflict of Interests: not stated</p> <p>Randomization: not applicable</p> <p>Blinding: no</p> <p>Dropout rates:</p>	<p>Total no. patients: 126</p> <p>Recruiting Phase: not stated / lacking Prospective data collection</p> <p>Inclusion criteria: 1021 patients at 6 emergency units from the Netherlands, 112 (11%) of them with the clinical diagnosis of diverticulitis</p> <p>Exclusion criteria: hemprhagic shock, pregnancy, patients &lt; 18 years</p>	<p>Interventions:</p> <p>Comparison: Clinical pattern in patients with finally assured diverticulitis (n=80) compared to those with other final diagnoses (n=46)</p>
Notes:	<p>Author's conclusion: In a quarter of patients with suspected diverticulitis, the diagnosis can be made clinically based on a combination of direct tenderness only in the left lower quadrant, the absence of vomiting, and an elevated C-reactive protein. In patients without these features, imaging is required to reach adequate diagnostic accuracy.</p>		
Outcome Measures/results	<p>Primary</p> <p>Secondary</p>	<p>Results: In total, 112 of the 1021 patients (11%) had a final diagnosis of diverticulitis. Of the 126 patients with clinically suspected diverticulitis, 80 had a final diagnosis of diverticulitis. In 32 patients with diverticulitis as their final diagnosis, another clinical diagnosis was made. A decision rule was based on the 3 strongest clinical features: direct tenderness only in the left lower quadrant, the absence of vomiting, and a C-reactive protein 50 mg/L. Of the 126 clinically suspected patients, 30 patients had all 3 features (24%), of whom 29 had a final diagnosis of acute diverticulitis (97%; 95% CI: 83%–99%). Of the 96 patients without all 3 features, 45 (47%) did not have diverticulitis.</p>	

Tursi, A. et al. Increased faecal calprotectin predicts recurrence of colonic diverticulitis. *Int J Colorectal Dis*. **29**. 931-5. 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p> <p>Study type: prospective cohort study</p>	<p>Funding sources: not stated</p> <p>Conflict of Interests: not stated</p> <p>Randomization: no</p>	<p>Total no. patients: 48 of 54</p> <p>Recruiting Phase: Jan 2011 - Sept 2012</p> <p>Inclusion criteria: Diagnosis of uncomplicated Diverticulitis (clinical, radiological), responsive to antibiotic plus antiinflammatory therapy</p>	<p>Interventions: Measurement of fecal calprotectin at 2 months interval</p> <p>Comparison: FC concentrations in patients with vs without recurrence of diverticulitis (all additionally under 5-ASA-medication 2.4 g/d)</p>

	Blinding: Dropout rates:	Exclusion criteria: 6 patients lost for follow up	
Notes:	Author's conclusion: In the present prospective study, increased FC was found to be predictive of diverticulitis recurrence		
Outcome Measures/results	Primary Value of FC as an index ("predictor") of recurrent diverticulitis  Secondary	Results: The mean follow-up was 20 months (range 12–24 months). Forty-eight patients were available for the final evaluation, and six patients were lost to follow-up. During follow-up, increased FC was detected in 17 (35.4 %) patients and diverticulitis recurred in eight patients (16.7 %). Diverticulitis recurred in eight (16.7 %) patients: seven (87.5 %) patients showed increased FC during the followup, and only one (12.5 %) patient with recurrent diverticulitis did not show increased FC. Diverticulitis recurrence was strictly related to the presence of abnormal FC test during follow-up.	



## Schlüsselfrage:

AG 3 Frage 2  
Bildgebung / Schnittbildverfahren

## Inhalt: 1 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Lameris, W. 2010	3	Prospective cohort study

## NEWCASTLE - OTTAWA Checklist: Cohort: 1 Bewertung(en)

Lameris, W. et al. A clinical decision rule to establish the diagnosis of acute diverticulitis at the emergency department. <i>Dis Colon Rectum</i> . 53. 896-904. 2010			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: Prospective cohort study	Funding sources: This study was supported by the Dutch Organization for Health Research and Development, Health Care Efficiency Research programme (grant number 945-04-308).  Conflict of Interests: not stated  Randomization: not applicable  Blinding: no  Dropout rates:	Total no. patients: 126  Recruiting Phase: not stated / lacking Prospective data collection  Inclusion criteria: 1021 patients at 6 emergency units from the Netherlands, 112 (11%) of them with the clinical diagnosis of diverticulitis  Exclusion criteria: hemprrhagic shock, pregnancy, patients < 18 years	Interventions:  Comparison: Clinical pattern in patients with finally assured diverticulitis (n=80) compared to those with other final diagnoses (n=46)
Notes:	Author's conclusion: In a quarter of patients with suspected diverticulitis, the diagnosis can be made clinically based on a combination of direct tenderness only in the left lower quadrant, the absence of vomiting, and an elevated C-reactive protein. In patients without these features, imaging is required to reach adequate diagnostic accuracy.		
Outcome Measures/results	Primary  Secondary	Results: In total, 112 of the 1021 patients (11%) had a final diagnosis of diverticulitis. Of the 126 patients with clinically suspected diverticulitis, 80 had a final diagnosis of diverticulitis. In 32 patients with diverticulitis as their final diagnosis, another clinical diagnosis was made. A decision rule was based on the 3 strongest clinical features: direct tenderness only in the left lower quadrant, the absence of vomiting, and a C-reactive protein 50 mg/L. Of the 126 clinically suspected patients, 30 patients had all 3 features (24%), of whom 29 had a final diagnosis of acute diverticulitis (97%; 95% CI: 83%–99%). Of the 96 patients without all 3 features, 45 (47%) did not have diverticulitis.	

## Schlüsselfrage:

AG 3 Frage 3a  
Ultraschalldiagnostik

## Inhalt: 7 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Elsing, C. 2012	4	Prospective case series
Farag Soliman, M. 2004	2	Prospective single-center comparison of CT vs US
Jurowich, C. F. 2011	3	Consecutive cohort study
Lameris, W. 2010	3	Prospective cohort study
Schwerk, W. B. 1992	1	prospective cohort study
van Randen, A. 2011	3	head-to-head comparison
Zielke, A. 1997	4	prospective case-series

## NEWCASTLE - OTTAWA Checklist: Case Control: 1 Bewertung(en)

Evidence level	Methodical Notes	Patient characteristics	Interventions
Elsing, C. et al. Value of lipopolysaccharide binding protein, interleukin-6 and C-reactive protein as biomarkers of severity in acute diverticulitis: a prospective study. Clin Lab. <u>58</u> . 145-51. 2012			
Evidence level: 4 Study type: Prospective case series	Funding sources: Björn Steiger Foundation. Conflict of Interests: denied Randomization: no Blinding: no Dropout rates: none	Total no. patients: 38 Patient characteristics: Aug 2006 - Nov 2008 Inclusion criteria: Acute diverticulitis Exclusion criteria:	Interventions: Comparison: perforated vs non-perforated diverticulitis Biomarkers LBP and IL-6 in comparison to CRP and WBC
Notes:	Case series with longitudinal follow up Author's conclusion: LBP may be of additional value in the management of diverticulitis		
Outcome Measures/results	Primary Biomarkers LBP and IL-6 as indicators of severity Secondary	Results: CRP, LBP and IL-6 at patient entry to hospital reacted to acute diverticulitis but did not reflect perforation. ROC showed superiority of LBP as a predictor of sigmoid stenosis.	

## NEWCASTLE - OTTAWA Checklist: Cohort: 6 Bewertung(en)

Evidence level	Methodical Notes	Patient characteristics	Interventions
Farag Soliman, M. et al. [Primary diagnostics of acute diverticulitis of the sigmoid]. Ultraschall Med. <u>25</u> . 342-7. 2004			
Evidence level: 2 Study type: Prospective single-center comparison of CT vs US	Funding sources: not mentioned Conflict of Interests: not mentioned Randomization: not applicable	Total no. patients: 63, 43 of them with diverticulitis Recruiting Phase: 16 months Inclusion criteria: Patients referred to a surgical unit with clinical symptoms of diverticulitis (in Germany, in contrast to	Interventions: not applicable. Comparison: Spiral-CT with rectal contrast and i.v. contrast versus Ultrasonography including tissue harmonic imaging and dual probe

	<p>Blinding: with respect to the results of the respective corresponding method: yes, and evaluation by a third party.</p> <p>Dropout rates: Not mentioned. The published number was completely investigated.</p>	<p>e.g. Norway, clinical symptoms include laboratory measures which are available throughout)</p> <p>Exclusion criteria: Patients with perforation and free air at abdominal X-ray or generalized peritonitis (who were operated immediately)</p>	(routine and high frequency) application
Notes:	<p>State of art comparison at a hospital setting with adequate equipment <u>and</u> experience. To my knowledge the most valid methodological comparison until now (2019)</p> <p>Author's conclusion: The best comparison of CT and US for the diagnosis of diverticulitis. Both methods are equivalent with a very high (97%) sensitivity and specificity. The study convinces also by a short period of recruitment, the blinded character among the investigators who conducted the different investigations and evaluation by a third party. Moreover, CT has been performed at an advanced level and appropriate expertise in either method is given by the investigators group.</p>		
Outcome Measures/results	<p>Primary Superiority of one of the two measures</p> <p>Secondary</p>	Results: Both CT and US had excellent (97%) and equivalent Sensitivity and Specificity.	

Jurowich, C. F. et al. How complicated is complicated diverticulitis?--phlegmonous diverticulitis revisited. *Int J Colorectal Dis.* **26.** 1609-17. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p> <p>Study type: Consecutive cohort study</p>	<p>Funding sources: not indicated</p> <p>Conflict of Interests: not given</p> <p>Randomization: not relevant</p> <p>Blinding: not relevant</p> <p>Dropout rates:</p>	<p>Total no. patients: 318</p> <p>Recruiting Phase: Jan 2004 - Dec 2006</p> <p>Inclusion criteria: CT-proven diverticulitis</p> <p>Exclusion criteria: 11 patients where diverticulitis was found at operation but no CT had been performed due to preoperative suspicion of other causes for the patients complaints</p>	<p>Interventions:</p> <p>Comparison: CT-staging vs operative findings with emphasis on Type IIa (HS)(phlegmonous diverticulitis without preoperatively detected abscess)</p>
Notes:	<p>Author's conclusion: Patients with phlegmonous diverticulitis (type IIA) represent the most challenging group among patients with acute diverticulitis as they are frequently understaged and conceal cases with covered perforations (type IIB). This may support the view to subsume phlegmonous diverticulitis (type IIA) under complicated diverticulitis.</p>		
Outcome Measures/results	<p>Primary Validity of staging</p> <p>Secondary</p>	Results: Of 112 patients considered IIa at CT, 83 underwent surgery (the others denied operation). Postoperatively 30/83 were found to be IIa (26.8%), 44 (39.3%) were understaged, 9 (10.9%) overstaged.	

Lameris, W. et al. A clinical decision rule to establish the diagnosis of acute diverticulitis at the emergency department. *Dis Colon Rectum.* **53.** 896-904. 2010

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p>	<p>Funding sources: This study was supported by the Dutch Organization</p>	<p>Total no. patients: 126</p> <p>Recruiting Phase: not stated / lacking</p>	Interventions:

Study type: Prospective cohort study	for Health Research and Development, Health Care Efficiency Research programme (grant number 945-04-308).  Conflict of Interests: not stated  Randomization: not applicable  Blinding: no  Dropout rates:	Prospective data collection  Inclusion criteria: 1021 patients at 6 emergency units from the Netherlands, 112 (11%) of them with the clinical diagnosis of diverticulitis  Exclusion criteria: hemorrhagic shock, pregnancy, patients < 18 years	Comparison: Clinical pattern in patients with finally assured diverticulitis (n=80) compared to those with other final diagnoses (n=46)
Notes:	Author's conclusion: In a quarter of patients with suspected diverticulitis, the diagnosis can be made clinically based on a combination of direct tenderness only in the left lower quadrant, the absence of vomiting, and an elevated C-reactive protein. In patients without these features, imaging is required to reach adequate diagnostic accuracy.		
Outcome Measures/results	Primary  Secondary	Results: In total, 112 of the 1021 patients (11%) had a final diagnosis of diverticulitis. Of the 126 patients with clinically suspected diverticulitis, 80 had a final diagnosis of diverticulitis. In 32 patients with diverticulitis as their final diagnosis, another clinical diagnosis was made. A decision rule was based on the 3 strongest clinical features: direct tenderness only in the left lower quadrant, the absence of vomiting, and a C-reactive protein 50 mg/L. Of the 126 clinically suspected patients, 30 patients had all 3 features (24%), of whom 29 had a final diagnosis of acute diverticulitis (97%; 95% CI: 83%–99%). Of the 96 patients without all 3 features, 45 (47%) did not have diverticulitis.	

Schwerk, W. B. et al. Sonography in acute colonic diverticulitis. A prospective study. *Dis Colon Rectum*. 35. 1077-84. 1992

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 1  Study type: prospective cohort study	Funding sources: not indicated  Conflict of Interests: not indicated  Randomization: not applicable  Blinding: yes, with respect to the forerunning categorization  Dropout rates: overall not mentioned, none for the reported patients	Total no. patients: 130, among them 52 with proven diverticulitis  Recruiting Phase: 2 years  Inclusion criteria: Patients referred to a surgical unit at a university hospital (serving as a municipal hospital) for diverticulitis or the differential diagnosis of diverticulitis  Exclusion criteria: not mentioned	Interventions: not applicable  Comparison: Clinical judging of a senior surgeon without US vs ads-on-impact of US by a single experienced investigator
Notes:	This is a very relevant study with a practical approach. The senior surgeon had to define a diagnosis of which the sonographer was unaware, allowing to define a true change of diagnosis / therapeutic impact.  Author's conclusion: This was a game-changing study at its time. Not only showing the high value and validity of US but also the relevance of US for clinical routine at a "visceral unit" in the interplay of surgery and gastroenterology. While the study designs appears somehow strange at first glance it is fully representative.		
Outcome Measures/results	Primary Validity of US for the diagnosis of diverticulitis and diverticular abscess  Secondary	Results: Accuracy of US was 97.7 %, Sensitivity 98.1%, Specificity 97.5%. PPV 96.2%, NPV 98.5% Abscesses were correctly seen at US in 12/13 cases (92%) and drained in 7 cases, while six required surgery.	

	Description of US pattern and parameters for diverticulitis	
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van Randen, A. et al. A comparison of the accuracy of ultrasound and computed tomography in common diagnoses causing acute abdominal pain. *Eur Radiol.* 21. 1535-45. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: head-to-head comparison	Funding sources: The Dutch Organization for Health Research and Development, Health Care Efficiency Research Programme, funded the study  Conflict of Interests: not stated but notably this is a radiological study  Randomization: no  Blinding: attempted, but not convincing between 5 p.m. and 11 p.m. (with a single radiologist performing CT and US)  Dropout rates:	Total no. patients: 118 with diverticulitis among 1021 patients with adminal pain studied by CT and US  Recruiting Phase: March 2005 - No 2006  Inclusion criteria: patients with CT and US investigated for abdominal pain, diverticulitis serving as a subgroup. Final diagnosis was made after 6 months and was unequivocal in 76% but required a panel discussion in 24%.  Exclusion criteria: 80 patients (7.3%) with incomplete record forms	Interventions: CT and US  Comparison: Diagnostic validity for different etiologies of abdominal pain
Notes:	Author's conclusion: CT sensitivity is higher than that of ultrasound in detecting appendicitis and diverticulitis in unselected patients presenting with acute abdominal pain, but positive predictive values are comparable		
Outcome Measures/results	Primary head-to-head comparison of US and CT in e.g. diverticulitis  Secondary Factors hampring either method	Results: Sensitivity was -overall- higher for detecting diverticulitis, with CT (81 vs 61%) than with US while the ppv was not different. Moreover, if only adequately trained investigators ( $\geq 500$ investigations) used US, sensitivity was 100%	

Zielke, A. et al. Prospective evaluation of ultrasonography in acute colonic diverticulitis. *Br J Surg.* 84. 385-8. 1997

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: prospective case-series	Funding sources: not stated  Conflict of Interests: not stated  Randomization: no  Blinding: no  Dropout rates:	Total no. patients: 143 with suspected diverticulitis  Recruiting Phase: ..4 years  Inclusion criteria: 187 unselected patients with abdominal symptoms possibly advocating diverticulitis, 143 after excluding patients with acute surgery  Exclusion criteria: Urgent operation for peritonitis	Interventions:  Comparison: Diagnostic validity of US and comparison with clinical judging at discharge or operation
Notes:	Author's conclusion: Ultrasonography is a useful and valid modality for imaging ACD and its differential diagnoses in the hands of sonographically trained surgeons. It is especially helpful when the clinical findings are equivocal.		
Outcome Measures/results	Primary Validity of US in the hand of a trained, but not specialized	Results: Of 74 patients with proven ACD (prevalence 52 per cent) the diagnosis was made by ultrasonography in 62, with an accuracy of 88 per cent, sensitivity 84 per cent and specificity 93 per cent. Ultrasonography gave a false-negative result in 12 patients (negative predictive value (NPV) 84 per cent) and there were five false-positive findings (positive predictive value (PPV) 93 per cent). The final diagnosis in the latter five	



surgeon Secondary	patients was colitis (two patients), caecal carcinoma (one), colonic ileus due to perforated sigmoid carcinoma (one) and suppurative pyosalpingitis with involvement of the sigmoid colon (one). The accuracy of clinical evaluation on admission was 71 per cent (sensitivity 82 per cent, specificity 55 per cent, PPV 72 per cent, NPV 68 per cent); however, in only 53 per cent of patients was the diagnosis considered clinically unequivocal.
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## Schlüsselfrage:

AG 3 Frage 3b  
CT und MRT

## Inhalt: 6 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Farag Soliman, M. 2004	2	Prospective single-center comparison of CT vs US
Jurowich, C. F. 2011	3	Consecutive cohort study
Lameris, W. 2010	3	Prospective cohort study
Sharma, P. V. 2014	1	Systematic review and meta-analysis
Tan, J. P. 2016	3	Systematic literature review
van Randen, A. 2011	3	head-to-head comparison

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 2 Bewertung(en)

Sharma, P. V. et al. Systematic review and meta-analysis of the role of routine colonic evaluation after radiologically confirmed acute diverticulitis. *Ann Surg.* **259**: 263-72. 2014

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Systematic review and meta-analysis</p> <p>Databases: PubMed, Medline, EMBASE, BIREME, CINAHL, Cochrane Library</p> <p>Search period: unclear, earliest study included was from 1997, latest from 2012.</p> <p>Inclusion Criteria: studies with direct colonoscopic or sigmoideoscopic or contrast enema evaluation in relation to acute diverticulitis (evaluated by CT)</p> <p>Exclusion Criteria: diverticulitis diagnosis on clinical signs only</p>	<p>Population: 11 studies formeta-analysis</p> <p>Intervention:</p> <p>Comparison: yield of CRC and adenomas in diverticulitis patients compared to</p>	<p>Primary: yield of colorectal cancers and colorectal polyps by colonic imaging in patients with uncomplicated vs complicated acute diverticulitis</p> <p>Secondary:</p> <p>Results: Eleven studies from 7 countries were included in the analysis. Out of a pooled population of 1970 patients, cancer was found in 22. The pooled proportional estimate of malignancy was 1.6% (95% confidence interval [CI], 0.9%–2.8%). Of the 1497 patients with uncomplicated diverticulitis, cancer was found in 5 (proportional estimate of risk 0.7%; CI, 0.3%–1.4%). Of the 79 patients with complicated disease, cancer was found in 6 (proportion estimate of risk 10.8%; CI, 5.2%–21.0%).</p> <p>Author's Conclusion: The risk of malignancy after a radiologically proven episode of acute uncomplicated diverticulitis is low. In the absence of other indications, routine colonoscopy may not be necessary. Patients with complicated diverticulitis still have a significant risk of colorectal cancer at subsequent colonic evaluation.</p>	

## Methodical Notes

Funding Sources: no conflicts

COI: disclosed

**Study Quality:**

Heterogeneity: evaluated and stated as low

Publication Bias:

Notes:

11 studies from 7 countries

Tan, J. P. et al. Predictors of acute diverticulitis severity: A systematic review. *Int J Surg.* **26.** 43-52. 2016

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 3</p> <p>Study type: Systematic literature review</p> <p>Databases: Medline, PubMed, EMBASE, Cochrane library</p> <p>Search period: 1980 - May 2015</p> <p>Inclusion Criteria: Full papers on severe diverticulitis in english language</p> <p>Exclusion Criteria: non english papers, Abstracts, conference notes</p>	<p>Population: 387 records, finally 21 applicable</p> <p>Intervention:</p> <p>Comparison:</p>	<p>Primary: Factors (patient characteristics, medication, biochemical markers and imaging) that indicate a severe form of diverticulitis (i.e. rather indicators than "predictors")</p> <p>Secondary:</p> <p>Results: Predictors for severe diverticulitis included first episode of diverticulitis, co-morbidities (Charlson score &gt; 3), non-steroidal anti-inflammatory drug use, steroid use, a high CRP on admission and severe disease on radiological imaging. Age and gender were not associated with disease severity.</p> <p>Author's Conclusion: number of predictors exist for identifying severe diverticulitis, and CT remains the gold standard for diagnosing complicated disease. Patients who present with identified risk factors for severe disease warrant early imaging, closer in-patient observation and a lower threshold for early surgical intervention. Patients without these factors may be suitable for outpatient-based treatment.</p>	

**Methodical Notes**

Funding Sources: none

COI: none

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

**NEWCASTLE - OTTAWA Checklist: Cohort: 4 Bewertung(en)**Farag Soliman, M. et al. [Primary diagnostics of acute diverticulitis of the sigmoid]. *Ultraschall Med.* **25.** 342-7. 2004

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 2</p> <p>Study type: Prospective single-center comparison of CT vs US</p>	<p>Funding sources: not mentioned</p> <p>Conflict of Interests: not mentioned</p> <p>Randomization: not applicable</p> <p>Blinding: with respect to the results of the respective corresponding method: yes, and evaluation by a third party.</p> <p>Dropout rates: Not mentioned. The</p>	<p>Total no. patients: 63, 43 of them with diverticulitis</p> <p>Recruiting Phase: 16 months</p> <p>Inclusion criteria: Patients referred to a surgical unit with clinical symptoms of diverticulitis (in Germany, in contrast to e.g. Norway, clinical symptoms include laboratory measues which are available throughout)</p> <p>Exclusion criteria: Patients with perforation and free air at abdominal X-ray or generalized peritonitis (who were operated immediately)</p>	<p>Interventions: not applicable.</p> <p>Comparison: Spiral-CT with rectal contrast and i.v. contrast versus Ultrasonography including tissue harmonic imaging and dual probe (routine and high frequency) application</p>

	published number was completely investigated.	
Notes:	<p>State of art comparison at a hospital setting with adequate equipment <b>and</b> experience. To my knowledge the most valid methodological comparison until now (2019)</p> <p>Author's conclusion: The best comparison of CT and US for the diagnosis of diverticulitis. Both methods are equivalent with a very high (97%) sensitivity and specificity. The study convinces also by a short period of recruitment, the blinded character among the investigators who conducted the different investigations and evaluation by a third party. Moreover, CT has been performed at an advanced level and appropriate expertise in either method is given by the investigators group.</p>	
Outcome Measures/results	<p>Primary Superiority of one of the two measures</p> <p>Secondary</p>	Results: Both CT and US had excellent (97%) and equivalent Sensitivity and Specificity.

Jurowich, C. F. et al. How complicated is complicated diverticulitis?--phlegmonous diverticulitis revisited. *Int J Colorectal Dis.* **26.** 1609-17. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p> <p>Study type: Consecutive cohort study</p>	<p>Funding sources: not indicated</p> <p>Conflict of Interests: not given</p> <p>Randomization: not relevant</p> <p>Blinding: not relevant</p> <p>Dropout rates:</p>	<p>Total no. patients: 318</p> <p>Recruiting Phase: Jan 2004 - Dec 2006</p> <p>Inclusion criteria: CT-proven diverticulitis</p> <p>Exclusion criteria: 11 patients where diverticulitis was found at operation but no CT had been performed due to preoperative suspicion of other causes for the patients complaints</p>	<p>Interventions:</p> <p>Comparison: CT-staging vs operative findings with emphasis on Type IIa (HS)(phlegmonous diverticulitis without preoperatively detected abscess)</p>
Notes:	<p>Author's conclusion: Patients with phlegmonous diverticulitis (type IIA) represent the most challenging group among patients with acute diverticulitis as they are frequently understaged and conceal cases with covered perforations (type IIB). This may support the view to subsume phlegmonous diverticulitis (type IIA) under complicated diverticulitis.</p>		
Outcome Measures/results	<p>Primary Validity of staging</p> <p>Secondary</p>	Results: Of 112 patients considered IIa at CT, 83 underwent surgery (the others denied operation). Postoperatively 30/83 were found to be IIa (26.8%), 44 (39.3%) were understaged, 9 (10.9%) overstaged.	

Lameris, W. et al. A clinical decision rule to establish the diagnosis of acute diverticulitis at the emergency department. *Dis Colon Rectum.* **53.** 896-904. 2010

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p> <p>Study type: Prospective cohort study</p>	<p>Funding sources: This study was supported by the Dutch Organization for Health Research and Development, Health Care Efficiency Research programme (grant number 945-04-308).</p> <p>Conflict of Interests: not stated</p> <p>Randomization: not</p>	<p>Total no. patients: 126</p> <p>Recruiting Phase: not stated / lacking Prospective data collection</p> <p>Inclusion criteria: 1021 patients at 6 emergency units from the Netherlands, 112 (11%) of them with the clinical diagnosis of diverticulitis</p> <p>Exclusion criteria: hemprhagic shock, pregnancy, patients &lt; 18 years</p>	<p>Interventions:</p> <p>Comparison: Clinical pattern in patients with finally assured diverticulitis (n=80) compared to those with other final diagnoses (n=46)</p>

	applicable Blinding: no Dropout rates:	
Notes:	Author's conclusion: In a quarter of patients with suspected diverticulitis, the diagnosis can be made clinically based on a combination of direct tenderness only in the left lower quadrant, the absence of vomiting, and an elevated C-reactive protein. In patients without these features, imaging is required to reach adequate diagnostic accuracy.	
Outcome Measures/results	Primary Secondary	Results: In total, 112 of the 1021 patients (11%) had a final diagnosis of diverticulitis. Of the 126 patients with clinically suspected diverticulitis, 80 had a final diagnosis of diverticulitis. In 32 patients with diverticulitis as their final diagnosis, another clinical diagnosis was made. A decision rule was based on the 3 strongest clinical features: direct tenderness only in the left lower quadrant, the absence of vomiting, and a C-reactive protein 50 mg/L. Of the 126 clinically suspected patients, 30 patients had all 3 features (24%), of whom 29 had a final diagnosis of acute diverticulitis (97%; 95% CI: 83%–99%). Of the 96 patients without all 3 features, 45 (47%) did not have diverticulitis.

van Randen, A. et al. A comparison of the accuracy of ultrasound and computed tomography in common diagnoses causing acute abdominal pain. *Eur Radiol.* 21. 1535-45. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: head-to-head comparison	Funding sources: The Dutch Organization for Health Research and Development, Health Care Efficiency Research Programme, funded the study  Conflict of Interests: not stated but notably this is a radiological study  Randomization: no  Blinding: attempted, but not convincing between 5 p.m. and 11 p.m. (with a single radiologist performing CT and US)  Dropout rates:	Total no. patients: 118 with diverticulitis among 1021 patients with abdominal pain studied by CT and US  Recruiting Phase: March 2005 - No 2006  Inclusion criteria: patients with CT and US investigated for abdominal pain, diverticulitis serving as a subgroup. Final diagnosis was made after 6 months and was unequivocal in 76% but required a panel discussion in 24%.  Exclusion criteria: 80 patients (7.3%) with incomplete record forms	Interventions: CT and US  Comparison: Diagnostic validity for different etiologies of abdominal pain
Notes:	Author's conclusion: CT sensitivity is higher than that of ultrasound in detecting appendicitis and diverticulitis in unselected patients presenting with acute abdominal pain, but positive predictive values are comparable		
Outcome Measures/results	Primary head-to-head comparison of US and CT in e.g. diverticulitis  Secondary Factors hampering either method	Results: Sensitivity was -overall- higher for detecting diverticulitis, with CT (81 vs 61%) than with US while the ppv was not different. Moreover, if only adequately trained investigators (≥500 investigations) used US, sensitivity was 100%	

## Schlüsselfrage:

AG 3 Frage 3c  
Endoskopie

## Inhalt: 15 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Choi, Y. H. 2014	4	retrospective case-control analysis
Daniels, L. 2014	2	Systematic review
Daniels, L. 2015	2	Retrospective comparison of data from two prospective multicenter cohort studies.
Ghorai, S. 2003	4	Retrospective case study
Lahat, A. 2007	2	Randomized prospective comparative study
Lahat, A. 2008	4	Prospective cohort study
Lam, T. J. 2010	4	Retrospective cohort study with epidemiological controls (from different sources)
Lecleire, S. 2014	2	retrospective randomized controlled study
Mann, N. S. 2012	4	Case report with literature review; Qualitative Meta-Analysis
Sai, V. F. 2012	1	systematic review
Schmilovitz-Weiss, H. 2012	3	retrospective
Sharma, P. V. 2014	1	Systematic review and meta-analysis
Tursi, A. 2016	4	retrospective multicenter case-series
Tursi, A. 2010	4	Prospective observational study
Westwood, D. A. 2011	3	retrospective longitudinal single center observation study

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 4 Bewertung(en)

Daniels, L. et al. Routine colonoscopy after left-sided acute uncomplicated diverticulitis: a systematic review. *Gastrointest Endosc.* 79. 378-89; quiz 498-498 e5. 2014

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: Systematic review</p> <p>Databases: Medline, Embase, CINAHL, Cochrane</p> <p>Search period: JAn 1966 - July 2013</p> <p>Inclusion Criteria: Studies on the detection of advanced adenomas or colorectal cancer in patients with antecedent uncomplicated diverticulitis (all with CT-imaging)with endoscopy</p>	<p>Population: 8 Studies with a total of 1796 patients</p> <p>Intervention:</p> <p>Comparison: Prevalence and yield of advanced adenomas and CRC in the diverticulitis patients was compared to published epidemiological data</p>	<p>Primary: Prevalence of advanced lesions</p> <p>Secondary:</p> <p>Results: 363/1796 patients (20.2%) had at least 1 polyp (with 3 studies not mentioning hyperplastic polyps and none referring to serrated adenomas), 236/1695 patients (14 %) had adenomas (one study not mentioning adenomas). 33/915 patients had advanced adenomas (3 studies not reporting on this), 29/1796 patients (1.6%) had CRC. In the studies reporting on both , advanced adenomas and CRC, prevalence was 4.9% (45/915)</p> <p>Author's Conclusion: Routine colonoscopy is not held necessary after uncomplicated diverticulitis, while "a more refined" approach is suggested, speculating on patients with complicated diverticulitis or suspicious CT-findings or a protracted clinical course.</p>	adequate

at follow-up			
Exclusion Criteria: Antecedent endoscopy, complicated diverticulitis, patients receiving operation for diverticulitis, duplicate and irrelevant studies, incomplete documentation			

<p><b>Methodical Notes</b></p> <p>Funding Sources: none indicated</p> <p>COI: disclosed</p> <p>Study Quality:</p> <p>Heterogeneity: yes</p> <p>Publication Bias: discussed, overall probably not large</p> <p>Notes:</p>
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Mann, N. S. et al. Segmental colitis associated with diverticulosis: systematic evaluation of 486 cases with meta-analysis. *Hepatogastroenterology*. 59. 2119-21. 2012

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 4</p> <p>Study type: Case report with literature review; Qualitative Meta-Analysis</p> <p>Databases: PubMed</p> <p>Search period: Literature up to Publication</p> <p>Inclusion Criteria: Cross-criteria of Segmental colitis and diverticulosis</p> <p>Exclusion Criteria: no language or time restrictions</p>	<p>Population: Published data on patients with segmental colitis and diverticulosis</p> <p>Intervention: none</p> <p>Comparison: Clinical pattern in SCAD vs acute diverticulitis and IBD</p>	<p>Primary: Symptoms of SCAD</p> <p>Secondary: calculated prevalence of SCAD</p> <p>Results: SCAD shows rectal bleeding, diarrhea and abdominal pain. It is diagnosed at endoscopy by sparing the diverticular ostia as a mucosal spotting rounded hyperemia and occurs in 0.3-1.3% of the investigated patients with diverticulosis, amounting to about 1 calculated case/400 colonoscopies.</p> <p>Literature is discussed showing that TNF-alpha-expression ist observed in the SCAD-cases.</p> <p>Author's Conclusion: SCAD can be distinguished from acute diverticulitis by clinical, endoscopic and histological features. Most have a benign course.</p>	

<p><b>Methodical Notes</b></p> <p>Funding Sources: not stated</p> <p>COI: not stated</p> <p>Study Quality: in fact, ths is acase report with adequate lietrature search pushed-up as "Meta-analysis"</p> <p>Heterogeneity:</p> <p>Publication Bias: It is not clear, whether or not the cases used from the literature all present the same kind of underlying disease</p> <p>Notes: Description of a single case mingled with the discussion of 486 cases of similar differential diagnoses (plural, not singular)in the literature</p>
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Sai, V. F. et al. Colonoscopy after CT diagnosis of diverticulitis to exclude colon cancer: a systematic literature review. *Radiology*. 263. 383-90. 2012

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: systematic review</p> <p>Databases: PubMed, EMBASE, BIREME, Cochrane Library</p> <p>Search period: Dec 2010-June 2011 with no search limits for publication dates or language</p> <p>Inclusion Criteria: Studies considering patients with diverticulitis at CT and surgery, barium enema or colonoscopy within 24 weeks thereafter</p> <p>Exclusion Criteria:</p>	<p>Population: 771 Patients in 10 Publications</p> <p>Intervention:</p> <p>Comparison: found carcinomas after diverticulitis as compared to a calculated estimated prevalence among US-Adults <math>\geq 55</math> years of age</p>	<p>Primary: percentage of patients with colon cancer after the initial diagnosis of diverticulitis</p> <p>Secondary:</p> <p>Results: Fourteen patients were found to have colon cancer, for a prevalence of 2.1% (95% confidence interval: 1.2%, 3.2%). This compares to a calculated estimated prevalence of 0.68% among U.S. adults older than 55 years.</p> <p>Author's Conclusion: There are limited data to support the recommendation to perform colonoscopy after a diagnosis of acute diverticulitis.</p>	

#### Methodical Notes

Funding Sources: NIH grant

COI: disclosed

Study Quality: formally sophisticated but hampered by a paucity of data. Low medical merit. If 14/771 patients were found with CRC, this is a number of 1 in 55 colonoscopies. If that does not merit a diagnostic procedure against carcinoma (nonwithstanding adenomas and prevention of carcinomas), - what else deserves medical diagnosis?

Heterogeneity:

Publication Bias: excluded

Notes:

Sharma, P. V. et al. Systematic review and meta-analysis of the role of routine colonic evaluation after radiologically confirmed acute diverticulitis. *Ann Surg*. 259. 263-72. 2014

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Systematic review and meta-analysis</p> <p>Databases: PubMed, Medline, EMBASE, BIREME, CINAHL, Cochrane Library</p> <p>Search period: unclear, earliest study included was from 1997, latest from 2012.</p> <p>Inclusion Criteria: studies with direct colonoscopic or sigmoidoscopic or contrast enema evaluation in relation to acute diverticulitis (evaluated by CT)</p> <p>Exclusion Criteria: diverticulitis diagnosis on clinical signs only</p>	<p>Population: 11 studies for meta-analysis</p> <p>Intervention:</p> <p>Comparison: yield of CRC and adenomas in diverticulitis patients compared to</p>	<p>Primary: yield of colorectal cancers and colorectal polyps by colonic imaging in patients with uncomplicated vs complicated acute diverticulitis</p> <p>Secondary:</p> <p>Results: Eleven studies from 7 countries were included in the analysis. Out of a pooled population of 1970 patients, cancer was found in 22. The pooled proportional estimate of malignancy was 1.6% (95% confidence interval [CI], 0.9%–2.8%). Of the 1497 patients with uncomplicated diverticulitis, cancer was found in 5 (proportional estimate of risk 0.7%; CI, 0.3%–1.4%). Of the 79 patients with complicated disease, cancer was found in 6 (proportion estimate of risk 10.8%; CI, 5.2%–21.0%).</p> <p>Author's Conclusion: The risk of malignancy after a radiologically proven episode of</p>	



acute uncomplicated diverticulitis is low. In the absence of other indications, routine colonoscopy may not be necessary. Patients with complicated diverticulitis still have a significant risk of colorectal cancer at subsequent colonic evaluation.

**Methodical Notes**

Funding Sources: no conflicts

COI: disclosed

Study Quality:

Heterogeneity: evaluated and stated as low

Publication Bias:

Notes:

11 studies from 7 countries

**NEWCASTLE - OTTAWA Checklist: Case Control: 2 Bewertung(en)**

Choi, Y. H. et al. Do we need colonoscopy following acute diverticulitis detected on computed tomography to exclude colorectal malignancy?. *Dig Dis Sci.* **59.** 2236-42. 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospective case-control analysis	Funding sources: not indicated Conflict of Interests: not indicated Randomization: age- and sex-matched Blinding: no Dropout rates: not indicated	Total no. patients: 447 Patient characteristics: Jan 2001- March 2013 Inclusion criteria: Patients with colonoscopy within 1 year after diverticulitis (all with CT) vs matched patients undergoing screening colonoscopy Exclusion criteria:	Interventions: Colonoscopy Comparison: presence of neoplastic findings
Notes:	Subanalysis within a cohort study Author's conclusion: Routine colonoscopy after diverticulitis is warranted/appropriate in patients > 50 years		
Outcome Measures/results	Primary prevalence of neoplastic findings Secondary	Results: Both, advanced neoplasia and colon cancer occurred significantly more frequently in the post-diverticulitis-group Memo: mostly right-sided diverticulitis-patients (asia) Further analysis shows, that most neoplasias occurred in patients > 50 years.	

Ghorai, S. et al. Endoscopic findings of diverticular inflammation in colonoscopy patients without clinical acute diverticulitis: prevalence and endoscopic spectrum. *Am J Gastroenterol.* **98.** 802-6. 2003

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Retrospective case study	Funding sources: not stated Conflict of Interests: not stated Randomization: not applicable	Total no. patients: 2566 screened Patient characteristics: no data Inclusion criteria: endoscopic appearance of inflammation around diverticula Exclusion criteria:	Interventions: Comparison:

	Blinding: no Dropout rates: 4/21	
Notes:	This publication shows 0.8%-prevalence of diverticulitis signs at endoscopy in patients without clinical suspicion of diverticulitis. Hence, the CDD-criteria of diverticulitis are not fulfilled in these patients, underlining the necessity for a strict definition of diverticulitis.  Author's conclusion: Endoscopy may identify signs resembling diverticulitis in 0,8% of patients undergoing routine endoscopy for other purposes than diverticulitis. Many patients with this finding will be asymptomatic at the time of colonoscopy.	
Outcome Measures/results	Primary Outcome of patients with endoscopic features of diverticulitis  Secondary	Results: 21 of 2566 consecutive colonoscopies not performed for diverticulitis showed endoscopic features of diverticulitis (0.8%). Retrospectively in one/21 patient diverticulitis was a possible explanation (treated with antibiotics). 17 were followed up by telephone interview. 6/17 had symptoms of a clinical episode of some kind of diverticulitis before endoscopy, in one the diagnosis of diverticulitis had been made.

## NEWCASTLE - OTTAWA Checklist: Cohort: 9 Bewertung(en)

Daniels, L. et al. Yield of colonoscopy after recent CT-proven uncomplicated acute diverticulitis: a comparative cohort study. *Surg Endosc.* **29.** 2605-13. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: Retrospective comparison of data from two prospective multicenter cohort studies.	Funding sources: indicated, official sources  Conflict of Interests: disclosed  Randomization: not applicable  Blinding: not applicable  Dropout rates: not relevant	Total no. patients: 401 plus 1426 (1827)  Recruiting Phase: <u>2009-2013</u>  Inclusion criteria: Screening for CRC-invited patients (COCOS-trial) Post-diverticulitis-patients (uncomplicated) of the DIABOLO-trial, who underwent colonoscopy within 6 months after diverticulitis  Exclusion criteria:	Interventions:  Comparison:
Notes:	Author's conclusion: Routine colonoscopy after uncomplicated diverticulitis can be omitted.		
Outcome Measures/results	Primary Yield of advanced colonic neoplasias (CRC, AA)  Secondary	Results: Of 570 patients with diverticulitis, 102 did not undergo colonoscopy, 401 finally fulfilled the criteria for study Of 6000 invited screening individuals, 1426 appeared for colonoscopy. Polyps (including serrated polyps, adenomas, polyps > 10 mm and HG-dysplastic polyps) were significantly more frequent in the screening cohort than in the diverticulitis cohort. The rate of CRC was twice as high in the diverticulitis cohort, which was not significant (0.205)	

Lahat, A. et al. The feasibility and risk of early colonoscopy in acute diverticulitis: a prospective controlled study. *Endoscopy.* **39.** 521-4. 2007

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: Randomized prospective comparative study	Funding sources: no  Conflict of Interests: not stated  Randomization: yes  Blinding: no	Total no. patients: 81 out of 154  Recruiting Phase: Jan 2004 - June 2006  Inclusion criteria: Acute diverticulitis, Hinchey 1a at CT  Exclusion criteria: Free fluid at CT, Perforation of any type, suspicion of malignancy, patients with a colonoscopy within 1 year prior to the index diverticulosis	Interventions: Colonoscopy  Comparison: Randomized trial for early (inhouse) colonoscopy after diverticulitis vs delayed colonoscopy 6 weeks after discharge

	Dropout rates:	
Notes:	Author's conclusion: Early colonoscopy in acute diverticulitis is feasible and safe in the absence of pericolic air on CT, and has greater compliance. However, no added value is apparent compared with the CT scan currently used.	
Outcome Measures/results	Primary Risk of early vs delayed colonoscopy Secondary change of policy by early colonoscopy	Results: Three and 10 did not present for the examination, in the early and late group respectively. The cecum could not be reached in eight and three patients from the early and late groups, respectively. The colonoscopy revealed polyps in five patients, two in the early group and three in the late group. No malignancy was detected. There were no complications in either group

Lahat, A. et al. Role of colonoscopy in patients with persistent acute diverticulitis. *World J Gastroenterol.* **14.** 2763-6. 2008

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Prospective cohort study	Funding sources: not stated Conflict of Interests: not stated Randomization: not applicable Blinding: no Dropout rates:	Total no. patients: 23 of 224 Recruiting Phase: July 2000 - Dec 2006 Inclusion criteria: Patients with acute diverticulitis (clinics, CT) received early (in-hospital) colonoscopy. 23 of them with continuing symptoms of diverticulitis or recurrence of symptoms within 2 months after discharge. Exclusion criteria: Patients refusing colonoscopy, patients with a colonoscopy within 1 year prior to diverticulitis, patients who require surgery and patients lost for follow-up	Interventions: In hospital colonoscopy Comparison: Colonoscopy-derived change of clinical pathway
Notes:	Author's conclusion: Early colonoscopy detected other significant pathology, which accounted for the clinical presentation in 17% of patients with persistent acute diverticulitis. Therefore, we believe an early colonoscopy should be considered in all patients with a persistent clinical course.		
Outcome Measures/results	Primary Secondary	Results: Twenty three patients (10.3%) fulfilled the criteria for a persistent course of acute diverticulitis. Of them, four patients (17.4%) clearly benefited from an early colonoscopy; these patients' clinical course is described. None of the patients with a regular non-persistent course demonstrated any benefit from colonoscopy.	

Lam, T. J. et al. There is no increased risk for colorectal cancer and adenomas in patients with diverticulitis: a retrospective longitudinal study. *Colorectal Dis.* **12.** 1122-6. 2010

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Retrospective cohort study with epidemiological controls (from different sources)	Funding sources: not stated Conflict of Interests: not stated Randomization: no Blinding: no Dropout rates:	Total no. patients: 106 from 288 Recruiting Phase: 1990-2000 Inclusion criteria: Patients with diverticulitis admitted to hospital Exclusion criteria:	Interventions: Comparison: CRC and adenomas in the diverticulitis patients (Mean follow up 12 years) compared to statistical data retrieved from the literature (of different populations)

		182 patients with sigmoid resection
Notes:	<p>Author's conclusion: This study showed a lower prevalence of CRC and colonic adenomas in patients with diverticulitis compared with the lifetime risk which means that diverticulitis is not a risk factor for development of CRC and adenomas. Long-term colonic screening after a negative colonoscopy for diverticulitis (generally performed several weeks after recovery) does not seem to be justified.</p>	
Outcome Measures/results	<p>Primary Incidence of CRC and adenomas as a consequence of diverticulitis</p> <p>Secondary</p>	<p>Results: CRC was detected in five patients (1.7%) (95% CI 0.8–3.5) with a mean age of 77 years; colonic adenomas were found in 18 patients (6.3%) (95% CI 4.3–9.0) with a mean age of 62 years. The lifetime risks of developing CRC and adenomas were presumed to be 4% and 20% respectively. Expected rates for CRC and adenomas in our patients were calculated as 17 (95% CI 4.0–8.6) and 69 patients (95% CI 20.1–28.3) respectively.</p>

Lecleire, S. et al. Diagnostic impact of routine colonoscopy following acute diverticulitis: A multicenter study in 808 patients and controls. *United European Gastroenterol J.* **2**, 301-6, 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 2</p> <p>Study type: retrospective randomized controlled study</p>	<p>Funding sources: disclosed</p> <p>Conflict of Interests: disclosed</p> <p>Randomization: matched</p> <p>Blinding: not applicable</p> <p>Dropout rates: adequate ITT-analysis</p>	<p>Total no. patients: 808</p> <p>Recruiting Phase: Jan 2005 - Dec 2011</p> <p>Inclusion criteria: Diverticulitis patients with colonoscopy within 6 months after the diverticulitis episode Matched controls</p> <p>Exclusion criteria: hematochezia, change of bowel habits, history of CRC neoplasia, colonoscopy within 2 years prior to diverticulitis</p> <p>Controls: patients with alarm symptoms (pain, hematochezia, IBD, evidence for genetic cancer mutations / Lynch syndrome or family history of CRC ≤50 years</p>	<p>Interventions:</p> <p>Comparison: Test arm vs Controls. Number of Polyps, Adenomas, Advanced adenomas (size, dysplasia), cancer</p>
Notes:	<p>Well controlled reasonable study, also showing that perforation occurred at 2/404 colonoscopies in the diverticulitis group vs 0/404 in the control group.</p> <p>Author's conclusion: Diagnosis rates for adenomas and for colorectal cancer during a colonoscopy scheduled after acute diverticulitis were similar than those of control patients undergoing a screening colonoscopy, while the detection rate of advanced adenomas was lower. We suggest that colonoscopy should be indicated only in selected patients, i.e. those presenting with reasonable doubt on initial CT-scan, those with alarm symptoms, and those with identified risk factors for colorectal cancer</p>		
Outcome Measures/results	<p>Primary Diagnostic rates of significant CR-lesions detected</p> <p>Secondary Incompleteness / side effects of colonoscopy</p>	<p>Results: Colorectal adenoma, advanced adenoma and cancer detection rates in acute diverticulitis patients were 12.1%, 2.7% and 0.25%, respectively; versus 14.6% (p=0.35), 6.7% (p=0.01) and 0.25% respectively, in control patients. The authors observed two perforations in 404 patients (0.5%) vs 0/404 in the controls, which proves n.s. simply due to the number of patients studied, but is apparently higher than the perforation rate of 0.01% currently observed in the medical literature</p>	

Schmilovitz-Weiss, H. et al. Does a colonoscopy after acute diverticulitis affect its management?: a single center experience. *J Clin Gastroenterol.* **46**, 317-20, 2012

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level:	Funding	Total no. patients: 200 from 220	Interventions: early colonoscopy (4-6

3	sources: disclosed	Recruiting Phase: June 2002 - Sept 2009	weeks after diverticulitis)
Study type: retrospective	Conflict of interests: disclosed	Inclusion criteria: Patients with (clinically diagnosed) acute diverticulitis, an indefinite number of them with CT (and those with 3 mm instead of the usual 4 mm wall thickness as one parameter)	Comparison: Colonic malignancy and adenomas in the early investigated group compared to the outcome in the later and only in part (17%) with colonoscopy investigated arm.
	Randomization: unclear	Exclusion criteria: questionable CT (15) and hematochezia (5)	
	Blinding: no		
	Dropout rates:		
Notes:	It does not become clear, how the group with early colonoscopy and that without were created, moreover in the group without early colonoscopy only 17/100 received a colonoscopy. This design does not allow a true estimation of the contribution of colonoscopy to the patients healthcare.  Author's conclusion: Colonoscopy does not affect the management of patients with acute diverticulitis nor alter the outcome.		
Outcome Measures/results	Primary yield of early colonoscopy	Results: No significant differences in survival (4 ±1.9 vs. 4.2 ±2.1 years) with or without early colonoscopy. No colonic malignancy was detected. In 32% at least 1 polyp was found	
	Secondary Survival		

Tursi, A. et al. Prognostic Role of the Endoscopic Classification "DICA". J Clin Gastroenterol. 50 Suppl 1. S16-9. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4	Funding sources: not disclosed	Total no. patients: 1651	Interventions: colonoscopy
Study type: retrospective multicenter case-series	Conflict of Interests: disclosed	Recruiting Phase: 2014	Comparison: Occurrence of diverticulitis in relation to the DICA-classification (median follow up 24 months, 9-138)
	Randomization: no	Inclusion criteria: Patients with diverticulosis or diverticular disease undergoing their first colonoscopy	
	Blinding: no	Exclusion criteria: incomplete documentation	
	Dropout rates:		
Notes:	Poor quality due to a combination of related and unrelated endoscopic findings resulting in a self fulfilling hypothesis: where inflammation is present, inflammation will be more likely...  Author's conclusion: DICA classification seems to be a valid parameter to predict the risk of diverticulitis occurrence/recurrence in patients suffering from diverticular disease of the colon.		
Outcome Measures/results	Primary Incidence of acute diverticulitis	Results: Acute diverticulitis (AD) occurred/recurred in 263 (15.9%) patients, and surgery was necessary in 57 (21.7%) cases. DICA was the only factor significantly associated with the occurrence/recurrence of diverticulitis and surgery either at univariate ( $w^2=405.029$ ; $P<0.0001$ ) or multivariate analysis (hazard ratio=4.319; 95% CI, 3.639-5.126; $P<0.0001$ ). Only in DICA 2 patients scheduled therapy was effective for prevention of AD occurrence/recurrence with a hazard ratio (95% CI) of 0.598 (0.391-0.914) ( $P=0.006$ , log-rank test). Mesalazine-based therapies reduced the risk of AD occurrence/recurrence and need of surgery with a hazard ratio (95% CI) of 0.2103 (0.122-0.364) and 0.459 (0.258-0.818), respectively.	
	Secondary Effect of mesalazin or rifamixin during follow up		

Tursi, A. et al. The endoscopic spectrum of segmental colitis associated with diverticulosis. Colorectal Dis. 12. 464-70. 2010

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4	Funding sources: not stated	Total no. patients: 92 SCAP-patients among 807 with diverticulosis among 6230 colonoscopies	Interventions: colonoscopy and histology
Study type: Prospective	Conflict of Interests: not stated	Recruiting Phase: Jan 2004 - Oct 2007	Comparison: Different patterns of interdiverticular inflammation were

observational study	Randomization: no Blinding: no Dropout rates: no	Inclusion criteria: Patients with diverticulosis and colonoscopic features of interdiverticular inflammation  Exclusion criteria:	compared with symptoms and histology
Notes:	Author's conclusion: Endoscopic patterns of SCAD may range from mild to severe inflammation. The histopathological findings but not clinical features showed a statistically significant association with the degree of endoscopic severity.		
Outcome Measures/results	Primary Description of potential SCAD-cases and their endoscopic pattern  Secondary Correlation of endoscopy/histology and symptoms	Results: SCAD was diagnosed in 92 (1.48%) patients, with four endoscopic patterns: pattern A, 'crescentic fold disease' (52.20%); pattern B, 'Mild-to moderate ulcerative colitis-like' pattern (30.40%); pattern C, 'Crohn's disease colitis-like' pattern (10.90%); pattern D, 'Severe ulcerative colitis-like' pattern (6.50%). Most patients with patterns A (58.33%, $P < 0.018$ ) and B (89.29%, $P < 0.00001$ ) showed histological alterations resembling moderate ulcerative colitis (UC). In pattern C, larger histological variability was found ( $P < 0.01$ ). All patients showing pattern D showed the typical histological alteration changes of severe UC ( $P < 0.0001$ ). In pattern A (60.42%, $P = n.s.$ ) and pattern B (46.43%, $P = n.s.$ ), diarrhoea was the most common symptom whilst abdominal pain was the most frequent in pattern C (50%, $P = n.s.$ ) and pattern D (83.33%, $P = n.s.$ ) patients.	

## Westwood, D. A. et al. Routine colonoscopy following acute uncomplicated diverticulitis. Br J Surg. 98. 1630-4. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospective longitudinal single center observation study	Funding sources: not stated  Conflict of Interests: not stated  Randomization: no  Blinding: no  Dropout rates:	Total no. patients: 292  Recruiting Phase: Jan 2004 - Dec 2008  Inclusion criteria: Patients with uncomplicated diverticulitis (CT) with (205) or without (87) colonic investigation by colonoscopy or virtual CT-colonoscopy  Exclusion criteria: Complicated diverticulitis	Interventions: Colonoscopy or virtual CT-colonoscopy  Comparison: neoplastic lesions in the group with luminal colon imaging as compared to expected data and CRC in the non-luminal imaging group as compared to a CRC-registry
Notes:	Author's conclusion: The yield of advanced colonic neoplasia in this cohort was equivalent to, or less than that detected on screening asymptomatic average-risk individuals. In the absence of other indications, subsequent evaluation of the colon may not be required to confirm the diagnosis of diverticulitis		
Outcome Measures/results	Primary Number and type of neoplastic lesions detected  Secondary	Results: Colorectal polyps were present in 50 patients (24.4 per cent). Twenty patients (9.8 per cent) had hyperplastic polyps and 19 (9.3 per cent) had adenomas. Eleven patients (5.4 per cent) had advanced colonic neoplasia, including one (0.5 per cent) with a colorectal cancer. One patient had inflammatory bowel disease (IBD). The patients with colorectal cancer and IBD had clinical indicators that independently warranted colonoscopy. None of the 87 patients who did not undergo colonic evaluation had a diagnosis of colorectal cancer registered with the New Zealand Cancer Registry	

## Schlüsselfrage:

AG 3 Frage 4a  
Welche Diagnostik sollte bei V.a. Divertikelblutung / unterer GI-Blutung primär eingesetzt werden?

## Inhalt: 2 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Kolb, J. M. 2018	2	Randomized prospective drug-trial
Mizuki, A. 2016	4	Retrospective case series

## NEWCASTLE - OTTAWA Checklist: Cohort: 2 Bewertung(en)

Kolb, J. M. et al. Locations and Mucosal Lesions Responsible for Major Gastrointestinal Bleeding in Patients on Warfarin or Dabigatran. <i>Dig Dis Sci.</i> 63. 1878-1889. 2018			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2 Study type: Randomized prospective drug-trial	Funding sources: Digestive Disease Research Foundation, Boehringer Ingelheim (providing data and manpower and financing the Re-Ly-study) Conflict of Interests: Compliance with ethical standards stated Randomization: yes Blinding: D150 vs D110, warfarin-cohort open Dropout rates:	Total no. patients: 546 with GI-bleeding from 18113 Recruiting Phase: 2 years (median) Inclusion criteria: Safety data from the Re-Ly study. 546 cases with major GI bleeding (fall of Hb $\geq$ 20% or 2 units transfusion and/or symptomatic bleeding into a critical organ) Exclusion criteria: incomplete data or non GI-attributable bleeding (as judged ex post by 2 gastroenterologists)	Interventions: none Comparison: Dabigatran 150 mg BID vs dabigatran 110 mg BID (both blinded) vs warfarin (open) according to INR
Notes:	This paper does not state the period over which the patients were followed. Referring to Ref 4 (which is wrongly quoted!) it should be 2.0 years (Median) Author's conclusion: In a chronic NVAf population, D150 but not D110 is associated with increased major and life-threatening GI bleeding in comparison with warfarin. At both dabigatran doses, increased bleeding from the colorectum, in particular from angiodysplasia, is seen.		
Outcome Measures/results	Primary Incidence and source and relevance of bleeding in the 3 cohorts Secondary Dose-finding	Results: Colonic bleeding was twice as frequent with dabigatran (irrespective of the dose) compared to warfarin (0.4%/year vs 0.18%/year), but focussing on diverticular bleeding the findings were fully equivalent with either regimen. Major GIB events (total n = 546) and life-threatening GIB events (n = 258) were more common with D150 versus warfarin (RR 1.57 [1.28–1.92] and RR 1.62 [1.20–2.18], respectively) and similar for D110 compared to warfarin (RR 1.11 [0.89–1.38] and RR 1.16 [0.84–1.61], respectively). Fatal bleeding was similarly rare across treatment groups. Lower	

Mizuki, A. et al. Long-Term Clinical Course after Conservative and Endoscopic Treatment of Colonic Diverticular Bleeding. *Digestion.* 94. 186-191. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4	Funding sources:	Total no. patients: 88	Interventions: endoscopic injection or clipping vs no endoscopic intervention

<b>Study type:</b> <b>Retrospective case series</b>	<b>disclosed</b>  <b>Conflict of Interests:</b> disclosed  <b>Randomization:</b> no  <b>Blinding:</b> no  <b>Dropout rates:</b>	<b>Recruiting Phase:</b> Sept 2000-Dec 2010  <b>Inclusion criteria:</b> 123 patients with definite colonic diverticular bleeding, 88 of them responding to a questionnaire  <b>Exclusion criteria:</b> no response to the questionnaire	<b>at colonoscopy</b>  <b>Comparison:</b> Rebleeding after colonoscopic intervention vs rebleeding after conservative management
<b>Notes:</b>	<b>Author's conclusion:</b> Patients with endoscopic therapy of diverticular hemorrhage require attention considering rebleeding.		
<b>Outcome Measures/results</b>	<b>Primary Rebleeding rate (Median 42.7 months)</b>  <b>Secondary potential risk factors for rebleeding</b>	<b>Results:</b> Twenty-four (38.7%) of 62 conservatively treated patients and 16 (61.5%) of 26 endoscopically treated patients experienced recurrence of CDB during the follow-up period. Kaplan–Meier’s analysis showed that the rate of recurrence was significantly higher ( $p < 0.05$ ) in cases with endoscopic treatment than in those with conservative treatment (mean time to recurrence = 55.3 months (95% CI 30.8–79.9) vs. 99.9 months (95%CI 80.7–119.1)). The Cox proportional hazards model did not identify any significant variables	





## Schlüsselfrage:

AG 3 Frage 4b  
Welcher Zeitpunkt empfiehlt sich für die Koloskopie bei V.a. Divertikelblutung?

## Inhalt: 5 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Chen, C. Y. 2009	3	Retrospective cohort analysis
Green, B. T. 2005	2	RCT
Jensen, D. M. 2000	2	Dual prospective cohort study
Smoot, R. L. 2003	4	retrospective case series
Strate, L. L. 2003	3	single-center retrospective case series

## NEWCASTLE - OTTAWA Checklist: Cohort: 5 Bewertung(en)

Chen, C. Y. et al. Colonic diverticular bleeding with comorbid diseases may need elective colectomy. J Gastrointest Surg. 13. 516-20. 2009

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Retrospective cohort analysis	Funding sources: not indicated Conflict of Interests: not indicated Randomization: not appropriate Blinding: not appropriate Dropout rates: not indicated	Total no. patients: 250 with lower GI-bleeding admitted to a surgical unit, 73 of them with diverticular bleeding Recruiting Phase: 1997-2005 Inclusion criteria: Patients with diverticular bleeding submitted to a Division of GI-surgery Exclusion criteria: non-diverticular sources of bleeding	Interventions: conservative vs urgent operation Comparison: outcomes and risk factors in the conservative vs operation group
Notes:	Author's conclusion: In view of the high burden of urgent operation the authors speculate on elective surgery for diverticular bleeding in patients with high-risk comorbidity.		
Outcome Measures/results	Primary outcome Secondary risk factors indicating the need for urgent surgery	Results: 10/73 patients required urgent surgery, in 6/10 cases subtotal colectomy, 2/10 died. In the conservative treated group (63) 1 patient died. Transfusion needs were higher in the operated group as were risk factors (diabetes, "gout" -which was referred to NSAID-use- or coagulopathies and chronic severe diseases.	

Green, B. T. et al. Urgent colonoscopy for evaluation and management of acute lower gastrointestinal hemorrhage: a randomized controlled trial. Am J Gastroenterol. 100. 2395-402. 2005

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2 Study type: RCT	Funding sources: Sources stated (non-commercial) Conflict of Interests: not	Total no. patients: 112, 100 included (calculated measure 116) Recruiting Phase: July 1993 - June 1995	Interventions: Urgent colonoscopy

	<p>stated</p> <p>Randomization: prospective      yes,</p> <p>Blinding: partially / as possible in clinical practice</p> <p>Dropout rates: rational dropout rate, no ITT-analysis</p>	<p>(ten years prior to publication)</p> <p>Inclusion criteria: Patients with significant hematochezia.</p> <p>(1) the last bloody bowel movement was within 24 h of presentation;</p> <p>(2) there was clinical or laboratory evidence of significant blood loss, manifested by any one of the following: (a) &gt;3 bloody bowel movements in &lt;8 h; (b) admission to the intensive care unit; (c) decrease of more than 5% hematocrit points in &lt;12 h; (d) transfusion of &gt;3 units of packed red blood cells; (e) hemodynamic instability in previous 6 h defined by: angina, syncope, presyncope, orthostatic vital signs, mean arterial blood pressure &lt;80 mmHg, or resting pulse &gt;11</p> <p>Exclusion criteria: (1) age &lt;18 yr; (2) known or suspected inflammatory bowel disease; (3) abdominal surgery within previous 10 days; (4) endoscopic polypectomy within the previous 10 days; (5) known or suspected ischemic bowel, perforation, or peritonitis; (6) refractory angina or suspected myocardial infarction; (7) hemodynamic instability refractory to resuscitation; (8) coagulopathy refractory to correction; (9) acquired immune deficiency syndrome or neutropenia; (10) documented pregnancy; (11) inability to provide informed consent</p>	<p>Comparison: Urgent colonoscopy vs standard care</p>
Notes:	<p>Randomized trial comparing standard care with urgent colonoscopy. The calculated number of patients was not fulfilled in both arms. Nevertheless most results rely on differences that are not considered statistically significant which results in a skewed impression. Fokussing on rebleeding as the main outcome is in addition a strange parameter for an evaluation of urgent colonoscopy, i.e. in an emergency setting</p> <p>Author's conclusion: Although urgent colonoscopy identified a definite source of LGIB more often than a standard care algorithm based on angiography and expectant colonoscopy, the approaches are not significantly different with regard to important outcomes. Thus, decisions concerning care for patients with acute LGIB should be based on individual experience and local expertise</p>		
Outcome Measures/results	<p>Primary Rebleeding</p> <p>Secondary Hemostasis by intervention; mortality, hospital stay, ICU stay, transfusion requirements, early rebleeding, surgery, late rebleeding</p>	<p>Results: Colonoscopy identified almost twice as much of the bleeding sources (21 vs 11) as the standard procedure. In addition, most secondary parameters tended towards a better score: mortality 2% versus 4%, hospital stay 5.8 versus 6.6 days, ICU stay 1.8 versus 2.4 days, transfusion requirements 4.2 versus 5 units, early rebleeding 22% versus 30%, while surgery 14% versus 12%, or late rebleeding 16% versus 14% (mean follow-up of 62 and 58 months)differed. Hemostasis was successful in any case (17/17 at urgent colonoscopy, 8/10 with vasopressin at angiography)</p>	

Jensen, D. M. et al. Urgent colonoscopy for the diagnosis and treatment of severe diverticular hemorrhage. *N Engl J Med.* 342. 78-82. 2000

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: Dual prospective cohort study	<p>Funding sources: NIH</p> <p>Conflict of Interests: not stated</p> <p>Randomization: not applicable</p>	<p>Total no. patients: 121 (73 and 48)</p> <p>Recruiting Phase: June 1986-June 1992 and June 1994 - Dec 1998</p>	<p>Interventions: Urgent colonoscopy. In the first 73 patients surgery was performed if bleeding continued or recurred. In the later 48 patients colonoscopy was combined with epinephrine injection of heater probe-coagulation in case of a proven source of bleeding.</p>

	Blinding: Dropout rates:	Inclusion criteria: Severe lower GI-Bleeding/hematochezia and diverticulosis  Exclusion criteria:	Comparison: Outcome of proven diverticular hemorrhage after medical/surgical intervention (phase 1) compared to medical/colonoscopic intervention (phase 2)
Notes:	Author's conclusion: Among patients with severe hematochezia and diverticulosis, at least one fifth have definite diverticular hemorrhage. Colonoscopic treatment of such patients with epinephrine injections, bipolar coagulation, or both may prevent recurrent bleeding and decrease the need for surgery.		
Outcome Measures/results	Primary Outcome (hemicolectomy, additional / severe bleeding, complications, time to discharge after colonoscopy)  Secondary late bleeding	Results: This study shows with the use of urgent colonoscopy, that diverticular bleeding is the second most common cause of lower GI-bleeding. In diverticular hemorrhage active bleeding, a nonbleeding visible vessel or an adherent clot define diverticular bleeding, whereas incidental diverticulosis means a defined source of bleeding apart from diverticulosis and presumptive diverticular hemorrhage means diverticulosis as the only potential visible source of lower GI-bleeding.  In the 27 patients with proven diverticular bleeding, diagnostic colonoscopy followed by surgery where needed was significantly inferior to colonoscopy with active intervention, regardless of the parameter investigated.  Of great importance is the finding that none of the patients receiving endoscopic intervention had any type of rebleeding at any time 8 up to 30 months (median))	

Smoot, R. L. et al. Is early colonoscopy after admission for acute diverticular bleeding needed?. Am J Gastroenterol. 98. 1996-9. 2003

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospective case series	Funding sources: Institutional grant  Conflict of Interests: not mentioned  Randomization: no  Blinding: no  Dropout rates:	Total no. patients: 78  Recruiting Phase: 1998 - 2000  Inclusion criteria: hematochezia attributed to colonic diverticular bleeding (definite and presumptive)  Exclusion criteria:	Interventions: Colonoscopy  Comparison: Outcome in relation to timing of colonoscopy (3 groups): ≤ 12 hours, 12-24 hours or ≥ 24 hours after admission
Notes:	Author's conclusion: No significant association is apparent between the timing of colonoscopy after admission and encountering active bleeding or nonbleeding stigmata. Based on these observations, urgent colonoscopy for these patients does not seem advantageous.		
Outcome Measures/results	Primary Detection of stigmata for active bleeding in relation to colonoscopy-timing  Secondary	Results: Twelve patients (15%) had active bleeding or stigmata. Colonoscopies were performed a mean of 18.11 h after admission. The association between a definitive diagnosis of acute diverticular bleeding and the timing of colonoscopy was not significant (p 0.46).	

Strate, L. L. et al. Timing of colonoscopy: impact on length of hospital stay in patients with acute lower intestinal bleeding. Am J Gastroenterol. 98. 317-22. 2003

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: single-center retrospective case series	Funding sources: NIH  Conflict of Interests: not stated  Randomization: no  Blinding: no  Dropout rates:	Total no. patients: 144  Recruiting Phase: Aug 1996 - June 1999  Inclusion criteria: lower GI-bleeding and potential sources as an ICD-9-framework for retrospective identification of patients  Exclusion criteria: upper GI-bleeding, small bowel bleeding, bleeding ≥ 3	Interventions: Colonoscopy at different time intervals after admission  Comparison: Groups receiving colonoscopy at ≤ 12 hours, 12-24 hours, 24-48 hours or ≥ 48 hours

		days before admission or low-grade bleeding
<b>Notes:</b>	<p>Diverticular hemorrhage accounts for only 30% in this series and was for sure (definite) in only 2%. Thus, the study is a description of practice in lower GI-bleeding</p> <p><b>Author's conclusion:</b> Time to colonoscopy is an independent predictor of hospital LOS. In a wide spectrum of patients with LIB, this reduction in hospital LOS seems to be primarily related to improved diagnostic yield rather than therapeutic interventions. (</p>	
<b>Outcome Measures/results</b>	<p>Primary length of hospital stay (LOS)</p> <p>Secondary Relation of time to colonoscopy and other binary variables (multiple regression-approach)</p>	<p><b>Results:</b> After controlling for the other independent correlates, earlier colonoscopy was significantly associated with a shorter hospital LOS (hazards ratio 2.02, 95% CI 1.5–2.6, p 0.0001). The absence of visible blood or active bleeding at the time of colonoscopy was also independently related to a shorter hospital LOS (hazards ratio 1.5, 95% CI 1.1–2.0, p 0.01).</p>



## Schlüsselfrage:

AG 3 Frage 4c  
Ist eine Darmreinigung vor einer Koloskopie bei V.a. Divertikelblutung notwendig?

## Inhalt: 1 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Jensen, D. M. 2000	2	Dual prospective cohort study

## NEWCASTLE - OTTAWA Checklist: Cohort: 1 Bewertung(en)

Jensen, D. M. et al. Urgent colonoscopy for the diagnosis and treatment of severe diverticular hemorrhage. N Engl J Med. 342. 78-82. 2000			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2 Study type: Dual prospective cohort study	Funding sources: NIH Conflict of Interests: not stated Randomization: not applicable Blinding: Dropout rates:	Total no. patients: 121 (73 and 48) Recruiting Phase: June 1986-June 1992 and June 1994 - Dec 1998 Inclusion criteria: Severe lower GI-Bleeding/hematochezia and diverticulosis Exclusion criteria:	Interventions: Urgent colonoscopy. In the first 73 patients surgery was performed if bleeding continued or recurred. In the later 48 patients colonoscopy was combined with epinephrine injection of heater probe-coagulation in case of a proven source of bleeding. Comparison: Outcome of proven diverticular hemorrhage after medical/surgical intervention (phase 1) compared to medical/colonoscopic intervention (phase 2)
Notes:	Author's conclusion: Among patients with severe hematochezia and diverticulosis, at least one fifth have definite diverticular hemorrhage. Colonoscopic treatment of such patients with epinephrine injections, bipolar coagulation, or both may prevent recurrent bleeding and decrease the need for surgery.		
Outcome Measures/results	Primary Outcome (hemicolectomy, additional / severe bleeding, complications, time to discharge after colonoscopy) Secondary late bleeding	Results: This study shows with the use of urgent colonoscopy, that diverticular bleeding is the second most common cause of lower GI-bleeding. In diverticular hemorrhage active bleeding, a nonbleeding visible vessel or an adherent clot define diverticular bleeding, whereas incidental diverticulosis means a defined source of bleeding apart from diverticulosis and presumptive diverticular hemorrhage means diverticulosis as the only potential visible source of lower GI-bleeding. In the 27 patients with proven diverticular bleeding, diagnostic colonoscopy followed by surgery where needed was significant inferior to colonoscopy with active intervention, regardless of the parameter investigated. Of great importance is the finding that none of the patients receiving endoscopic intervention had any type of rebleeding at any time 8 up to 30 months (median)	

## Schlüsselfrage:

AG 3 Frage 4d  
Wann besteht die Indikation zur Durchführung einer Angiographie / eines Angio-CT bei V.a. Divertikelblutung?

## Inhalt: 1 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Wu, L. M. 2010	2	Meta-Analyse

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 1 Bewertung(en)

Wu, L. M. et al. Usefulness of CT angiography in diagnosing acute gastrointestinal bleeding: a meta-analysis. *World J Gastroenterol.* 16. 3957-63. 2010

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: Meta-Analyse</p> <p>Databases: MEDLINE, EMBASE, Cancerlit, Cochrane Library database, Scencedirect, Springerlink und Scopus</p> <p>Search period: 1995-2009</p> <p>Inclusion Criteria:</p> <p>Exclusion Criteria:</p>	<p>Population: 198 Patienten aus 9 Studien</p> <p>Intervention: CT Angiografie</p> <p>Comparison: DSA, Operation, Endoskopie, NUK, Kapsel</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results: gepoolte Sensitivität und Spezifität der CTA für GI-Blutungen 89% und 85%, AUC 0,9297</p> <p>Author's Conclusion: für die Detektive von GI-Blutungen ist die CTA akkurat, kosteneffizient und veranschaulicht präzise die Blutungslokalisierung</p>	

## Methodical Notes

## Funding Sources:

## COI:

## Study Quality:

## Heterogeneity:

## Publication Bias:

## Notes:

## Schlüsselfrage:

AG 3 Frage 4f  
Indikation und Technik der endoskopischen Blutstillung bei der Divertikelblutung.

## Inhalt: 8 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Farrell, J. J. 2005	2	Review of literatre
Green, B. T. 2005	2	RCT
Ishii, N. 2012	3	Retrospective dual center investigation
Kaltenbach, T. 2012	3	Dual center prospective cohort study
Mizuki, A. 2016	4	Retrospective case series
Nagata, N. 2018	2	prospective non-randomized single-center cohort study
Okamoto, N. 2019	3	multicenter cohort study with two periods of endoscopic intervention
Setoyama, T. 2011	4	retrospective comparative case series with heterogeneous approach

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 1 Bewertung(en)

Farrell, J. J. et al. Review article: the management of lower gastrointestinal bleeding. *Aliment Pharmacol Ther.* **21**, 1281-98. 2005

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: Review of literatre</p> <p>Databases: Medline</p> <p>Search period: 1966-Dec 2004</p> <p>Inclusion Criteria: Gastroinetsinal hemorrhage, bleeding and colonoscopy</p> <p>Exclusion Criteria:</p>	<p>Intervention:</p> <p>Comparison:</p>	<p>Primary: Evaluation of a superior practical approach to LGB</p> <p>Secondary: Predictors of outcome</p> <p>Results: There is limited high-quality research in the area of lower gastrointestinal bleeding. Current endoscopic, radiologic, and surgical practices appear to reflect local expertise and availability of services.</p> <p>Early intervention, particularly for massive diverticular haemorrhage, may improve the diagnostic and therapeutic outcome and prevent the need for surgical intervention (grade B evidence- Early colonoscopic evaluation may reduce the duration of hospitalization and lower overall costs per patient (grade B evidence).</p> <p>Angiography has a specificity of 100% but a sensitivity of only 30–47% (grade B evidence).Angiography should be reserved for the patient who has massive bleeding that precludes colonoscopy, has persistent or recurrent bleeding, or has undergone a colonoscopy that has failed to identify the bleeding source.</p> <p>Author's Conclusion: Mortality rates for lower gastrointestinal bleeding are less than 5% (Grade B Evidence).Treatment decisions are still often based on local expertise and preference.</p>	

## Methodical Notes

Funding Sources: Career developing award by the ASGE

COI: not declared

Study Quality: not applicable

Heterogeneity: described

Publication Bias: not evident

Notes:

**NEWCASTLE - OTTAWA Checklist: Cohort: 7 Bewertung(en)**

Green, B. T. et al. Urgent colonoscopy for evaluation and management of acute lower gastrointestinal hemorrhage: a randomized controlled trial. *Am J Gastroenterol.* **100.** 2395-402. 2005

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2 Study type: RCT	Funding sources: Sources stated (non-commercial) Conflict of Interests: not stated Randomization: yes, prospective Blinding: partially / as possible in clinical practice Dropout rates: rational dropout rate, no ITT-analysis	Total no. patients: 112, 100 included (calculated measure 116) Recruiting Phase: July 1993 - June 1995 (ten years prior to publication) Inclusion criteria: Patients with significant hematochezia. (1) the last bloody bowel movement was within 24 h of presentation; (2) there was clinical or laboratory evidence of significant blood loss, manifested by any one of the following: (a) >3 bloody bowel movements in <8 h; (b) admission to the intensive care unit; (c) decrease of more than 5% hematocrit points in <12 h; (d) transfusion of >3 units of packed red blood cells; (e) hemodynamic instability in previous 6 h defined by: angina, syncope, presyncope, orthostatic vital signs, mean arterial blood pressure <80 mmHg, or resting pulse >11 Exclusion criteria: (1) age <18 yr; (2) known or suspected inflammatory bowel disease; (3) abdominal surgery within previous 10 days; (4) endoscopic polypectomy within the previous 10 days; (5) known or suspected ischemic bowel, perforation, or peritonitis; (6) refractory angina or suspected myocardial infarction; (7) hemodynamic instability refractory to resuscitation; (8) coagulopathy refractory to correction; (9) acquired immune deficiency syndrome or neutropenia; (10) documented pregnancy; (11) inability to provide informed consent	Interventions: Urgent colonoscopy Comparison: Urgent colonoscopy vs standard care
Notes:	Randomized trial comparing standard care with urgent colonoscopy. The calculated number of patients was not fulfilled in both arms. Nevertheless most results rely on differences that are not considered statistically significant which results in a skewed impression. Fokussing on rebleeding as the main outcome is in addition a strange parameter for an evaluation of urgent colonoscopy, i.e. in an emergency setting  Author's conclusion: Although urgent colonoscopy identified a definite source of LGIB more often than a standard care algorithm based on angiography and expectant colonoscopy, the approaches are not significantly different with regard to important outcomes. Thus, decisions concerning care for patients with acute LGIB should be based on individual experience and local expertise		
Outcome Measures/results	Primary Rebleeding Secondary Hemostasis by intervention; mortality, hospital stay, ICU stay, transfusion requirements,	Results: Colonoscopy identified almost twice as much of the bleeding sources (21 vs 11) as the standard procedure. In addition, most secondary parameters tended towards a better score: mortality 2% versus 4%, hospital stay 5.8 versus 6.6 days, ICU stay 1.8 versus 2.4 days, transfusion requirements 4.2 versus 5 units, early rebleeding 22% versus 30%, while surgery 14% versus 12%, or late rebleeding 16% versus 14% (mean follow-up of 62 and 58	



early rebleeding, surgery, late rebleeding	months)differed. Hemostasis was successful in any case (17/17 at urgent colonoscopy, 8/10 with vasopressin at angiography)
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Ishii, N. et al. Location in the ascending colon is a predictor of refractory colonic diverticular hemorrhage after endoscopic clipping. *Gastrointest Endosc.* **76**. 1175-81. 2012

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Retrospective dual center investigation	Funding sources: not stated Conflict of Interests: disclosed Randomization: Blinding: Dropout rates:	Total no. patients: 98 Recruiting Phase: Jan 2004 - Feb 2010 Inclusion criteria: Lower GI-bleeding with stigmata of recent diverticular bleeding Exclusion criteria: Non-diverticular sources of bleeding, patients receiving other forms of therapy than endoscopic clipping	Interventions: endoscopic clipping Comparison: Rebleeding / early (< 30 days) bleeding control depending on the site of bleeding and the modus of intervention
Notes:	Author's conclusion: Location in the ascending colon is a predictor of refractory diverticular hemorrhage after endoscopic clipping. Indirect placement of clips is ineffective in the right colon.		
Outcome Measures/results	Primary Comorbidities, location of bleeding, modus of clipping Secondary	Results: 87/98 patients were controlled by endoscopic clipping (30 days observation period). 6 of 22 needed reclipping within this time, but 11 patients required other forms of hemostasis. Right-sided diverticula were significantly worse controllable by clipping and a tendency towards a failure of unselective clipping was observed in the right colon (only).	

Kaltenbach, T. et al. Colonoscopy with clipping is useful in the diagnosis and treatment of diverticular bleeding. *Clin Gastroenterol Hepatol.* **10**. 131-7. 2012

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Dual center prospective cohort study	Funding sources: no data Conflict of Interests: no data Randomization: not applicable Blinding: not applicable Dropout rates:	Total no. patients: 64 patients with diverticular bleeding among 250 with severe lower GI-Bleeding Recruiting Phase: Nov 2003 - Nov 2008 Inclusion criteria: Patients with proven and presumptive diverticular hemorrhage Exclusion criteria: Other sources of bleeding	Interventions: Clipping of the visible (presumed) site of hemorrhage Comparison:
Notes:	Author's conclusion: Colonoscopy can be a safe first-line diagnostic and therapeutic approach for patients with severe LGIB. Endoscopic clipping provides hemostasis of active diverticular bleeding. Recurrent bleeding occurs in about 21% of patients who were treated with clips, at approximately 4 years; most bleeding is self-limited or can be retreated by endoscopic clipping.		
Outcome Measures/results	Primary Efficacy of hemostasis with colonoscopic clipping Secondary early (< 30 day) rebleeding rates, blood transfusions, length of hospital stay, complications), late recurrent bleeding rate	Results: Twenty-four of the 64 patients (38%) had diverticular stigmata of recent hemorrhage; and 21 of these patients (88%) were treated successfully using endoscopic clips, without complication or early rebleeding. During 35 18 months of follow-up, late recurrent diverticular bleeding occurred in 22% of the patients (14/64) after a mean time period of 22 months; 5 of the patients (21%) with stigmata of recent hemorrhage who received clip treatment had rebleeding at	

	43 months. Rebleeding was self-limited in 8 patients (57%), was clipped in 4 (29%), or was embolized in 2 (14%).
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**Mizuki, A. et al. Long-Term Clinical Course after Conservative and Endoscopic Treatment of Colonic Diverticular Bleeding. *Digestion*. 94. 186-191. 2016**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Retrospective case series	Funding sources: disclosed Conflict of Interests: disclosed Randomization: no Blinding: no Dropout rates:	Total no. patients: 88 Recruiting Phase: Sept 2000-Dec 2010 Inclusion criteria: 123 patients with definite colonic diverticular bleeding, 88 of them responding to a questionnaire Exclusion criteria: no response to the questionnaire	Interventions: endoscopic injection or clipping vs no endoscopic intervention at colonoscopy Comparison: Rebleeding after colonoscopic intervention vs rebleeding after conservative management
Notes:	Author's conclusion: Patients with endoscopic therapy of diverticular hemorrhage require attention considering rebleeding.		
Outcome Measures/results	Primary Rebleeding rate (Median 42.7 months) Secondary potential risk factors for rebleeding	Results: Twenty-four (38.7%) of 62 conservatively treated patients and 16 (61.5%) of 26 endoscopically treated patients experienced recurrence of CDB during the follow-up period. Kaplan–Meier's analysis showed that the rate of recurrence was significantly higher ( $p < 0.05$ ) in cases with endoscopic treatment than in those with conservative treatment (mean time to recurrence = 55.3 months (95% CI 30.8–79.9) vs. 99.9 months (95%CI 80.7–119.1)). The Cox proportional hazards model did not identify any significant variables	

**Nagata, N. et al. Long-term recurrent bleeding risk after endoscopic therapy for definitive colonic diverticular bleeding: band ligation versus clipping. *Gastrointest Endosc*. 88. 841-853 e4. 2018**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2 Study type: prospective non-randomized single-center cohort study	Funding sources: disclosed Conflict of Interests: disclosed Randomization: at the discretion of the colonoscopist Blinding: no Dropout rates:	Total no. patients: 108 among 1105 presenting with lower GI-bleeding at an emergency service Recruiting Phase: Sept 2010 - Aug 2017 Inclusion criteria: acute lower GI-bleeding from diverticula diagnosed at colonoscopy, japanese hospital inpatients, $\geq 18$ years of age, Exclusion criteria: Lower GI-bleeding from other causes, barium impaction therapy for diverticular bleeding	Interventions: endoscopic ligation vs endoscopic clipping Comparison: Rebleeding after endoscopic ligation vs endoscopic clipping
Notes:	Author's conclusion: Band ligation for definitive CDB has better outcomes than clipping during long-term follow-up after endoscopic therapy, probably because of complete elimination of the diverticulum. CDB can recur at the same diverticulum in the short term but at a different diverticulum in the long term.		
Outcome Measures/results	Primary Recurrent bleeding after endoscopic therapy Secondary Achievement of initial hemostasis, transfusions, length of hospital stay, endoscopic therapy-related side effects. In patients with recurrent bleeding	Results: The probability of 1-year recurrent bleeding was 11.5% in the ligation group versus 37.0% in the clipping group ( $P Z .018$ ). No patients required surgery or experienced perforation.	

within 7 days, the recurrent bleeding site was the same diverticulum, and ulceration was found in the ligation group on repeat colonoscopy. In patients with recurrent bleeding after 2 months, repeat colonoscopy identified that the recurrent bleeding site was different, and scar formation was seen in the ligation group. The left side of the colon was an independent predictor for recurrent bleeding in the ligation group but not in the clipping group.

Okamoto, N. et al. Lower Rebleeding Rate after Endoscopic Band Ligation than Endoscopic Clipping of the Same Colonic Diverticular Hemorrhagic Lesion: A Historical Multicenter Trial in Saga, Japan. *Intern Med.* 58: 633-638. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: multicenter cohort study with two periods of endoscopic intervention	Funding sources: not indicated  Conflict of Interests: disclosed  Randomization: no, historical control of equal size  Blinding: no  Dropout rates:	Total no. patients: 135  Recruiting Phase: Jan 2010-Dec 2012 and Jan 2013 - Aug 2016  Inclusion criteria: definite colonic diverticular hemorrhage (with endoscopic stigmata)  Exclusion criteria: not detectable	Interventions: Either endoscopic band ligation (second time period) or endoscopic clipping (first time period)  Comparison: EBL vs EC, i.e. period I with period II
Notes:	Two periods compared, but striking results  Author's conclusion: The low rebleeding rate in the EBL group was attributed to the low degree of rebleeding from the same diverticulum, indicating that EBL was superior to EC in preventing rebleeding of an initially treated diverticulum.		
Outcome Measures/results	Primary Rebleeding (not exactly defined)  Secondary multivariate analysis of risk factors for rebleeding and attribution of the rebleeding source to the case-defining bleeding site (or another)	Results: The rebleeding rate was lower in the EBL group (7 of 67, 10%) than in the EC group (21 of 68, 31%; p<0.01). This difference was mainly due to the lower rebleeding rate from the same hemorrhagic diverticulum initially treated by hemostasis (EBL: 4 of 67, 6%; EC: 15 of 68, 22%; p<0.01). The time span until rebleeding in the EBL group was 1 week. A multivariate analysis indicated that bleeding from the diverticula on the right side of the colon was a high-risk factor for rebleeding from the diverticula (odds ratio, 4.48; 95% confidence interval, 1.22-16.46; p=0.02).	

Setoyama, T. et al. Endoscopic band ligation (EBL) is superior to endoscopic clipping for the treatment of colonic diverticular hemorrhage. *Surg Endosc.* 25: 3574-8. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospective comparative case series with heterogeneous approach	Funding sources: disclosed  Conflict of Interests: disclosed  Randomization: no  Blinding: no	Total no. patients: 66  Recruiting Phase: Jan 2004 - Oct 2010  Inclusion criteria: Patients with definite signs of diverticular hemorrhage at colonoscopy  Exclusion criteria: Other or unproven origin of hemorrhage at colonoscopy	Interventions: Endoclip vs band ligation at colonoscopy  Comparison: Success rate, complications and early rebleeding (30 days)

	Dropout rates:	
Notes:	<p><b>Author's conclusion:</b> EBL should be considered safe, effective, and superior to endoclips for the treatment of colonic diverticular hemorrhage. The EBL procedure should be attempted as the initial therapy especially for the right-sided disease.</p>	
Outcome Measures/results	<p><b>Primary Control of bleeding</b></p> <p><b>Secondary Early rebleeding rate</b></p>	<p><b>Results:</b> Early rebleeding was observed in one patient (6%), for whom eversion of a bleeding diverticulum in the sigmoid colon could not be obtained and early loss of the O-band occurred. However, the patient could be retreated with EBL. On the other hand, complete eversion could be obtained for all 10 patients with right-sided diverticula, and no early rebleeding occurred. Endoclips were used to treat 48 patients. Although the initial success rate for hemostasis was 100% without any complications, the rate of early rebleeding was 33% (16 patients), which was significantly higher than the rate for the EBL-treated group (<math>P = 0.018</math>).</p>



## Schlüsselfrage:

AG 3 Frage 4h  
Indikation zur operativen Therapie bei Divertikelblutung. Zeitpunkt / Dringlichkeit der Operation

## Inhalt: 2 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Plummer, J. M. 2009	4	retrospective case series
Renzulli, P. 2002	3	retrospective single-center cohort study

## NEWCASTLE - OTTAWA Checklist: Cohort: 2 Bewertung(en)

Plummer, J. M. et al. Emergency subtotal colectomy for lower gastrointestinal haemorrhage: over-utilised or underestimated?. Int J Clin Pract. 63. 865-8. 2009			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospective case series	Funding sources: disclosed  Conflict of Interests: disclosed  Randomization:  Blinding: not applicable  Dropout rates:	Total no. patients: 58 (80% diverticular disease)  Recruiting Phase: 1998-2005  Inclusion criteria: emergency cases with lower GI-bleeding, who were operated and histopathology reports were stored.. However, no clear description of severity or detailed time-relations are supplied  Exclusion criteria: unclear, not mentioned	Interventions: colonic resection (55/58 subtotal)  Comparison: none
Notes:	Author's conclusion: While emergency STC is an effective and definitive method of treating unlocalised massive LGIB, its associated morbidity and mortality may limit its usefulness.		
Outcome Measures/results	Primary outcome (efficacy and risk) of emergency colectomy for lower GI-Bleeding  Secondary	Results: The major causes of bleeding were diverticular disease only (68%), angiodysplasia only (12%) and both diseases (12%). Overall mortality was 17%, with the main contributor being sepsis resulting from anastomotic leak. Non-fatal complications occurred in 20%, resulting in a mean postoperative length of stay of 13 days. All patients were doing well on their first follow-up visit with a mean number of four stools per day after 1 month.	

Renzulli, P. et al. Subtotal colectomy with primary ileorectostomy is effective for unlocalized, diverticular hemorrhage. Langenbecks Arch Surg. 387. 67-71. 2002			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: retrospective single-center cohort study	Funding sources: not stated  Conflict of Interests: not stated  Randomization: not applicable  Blinding: no	Total no. patients: 42  Recruiting Phase: Nov 1993-Dec 2000  Inclusion criteria: Severe diverticular hemorrhage, defined by continuous bleeding despite blood transfusions $\geq 1500$ ml, blood transfusions $\geq 2000$ ml/day, continued bleeding $\geq 3$ days or recurrent bleeding within 1 week after first episode. All patients underwent urgent colonoscopy  Exclusion criteria:	Interventions: emergency laparotomy with segmental or subtotal colectomy  Comparison: Segmental vs subtotal colectomy for diverticular hemorrhage

	Dropout rates:	
<b>Notes:</b>	<p><b>Author's conclusion:</b> Subtotal colectomy with primary ileorectostomy for unlocalized colonic diverticular bleeding is a safe and effective surgical procedure providing complete bleeding control and preserving continence.</p>	
<b>Outcome Measures/results</b>	<p><b>Primary outcome-parameters</b></p> <p><b>Secondary rebleeding</b></p>	<p><b>Results:</b> Preoperative localization of the bleeding site was possible in six patients (14%), by colonoscopy in two and by angiography in four. Ten patients underwent segmental colectomy with primary anastomosis (5 "directed", 5 "blind") and 32 subtotal colectomy with primary ileorectostomy (1 "directed", 31 "blind"). Subtotal colectomy is the more extensive surgical procedure (longer resected bowel, greater blood loss), and although it was performed in older patients, there were no significant differences between segmental and subtotal colectomy with respect to operation time, morbidity, mortality, hospital stay, number of bowel movements, continence scores, rebleeding rate, or patient satisfaction.</p>



## Schlüsselfrage:

AG 3 Frage 4i  
Operative Verfahrenswahl bei der Divertikelblutung mit bzw. ohne vorherige Blutungslokalisierung

## Inhalt: 2 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Plummer, J. M. 2009	4	retrospective case series
Renzulli, P. 2002	3	retrospective single-center cohort study

## NEWCASTLE - OTTAWA Checklist: Cohort: 2 Bewertung(en)

Plummer, J. M. et al. Emergency subtotal colectomy for lower gastrointestinal haemorrhage: over-utilised or underestimated?. Int J Clin Pract. 63. 865-8. 2009			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospective case series	Funding sources: disclosed Conflict of Interests: disclosed Randomization: Blinding: not applicable Dropout rates:	Total no. patients: 58 (80% diverticular disease) Recruiting Phase: 1998-2005 Inclusion criteria: emergency cases with lower GI-bleeding, who were operated and histopathology reports were stored.. However, no clear description of severity or detailed time-relations are supplied Exclusion criteria: unclear, not mentioned	Interventions: colonic resection (55/58 subtotal) Comparison: none
Notes:	Author's conclusion: While emergency STC is an effective and definitive method of treating unlocalised massive LGIB, its associated morbidity and mortality may limit its usefulness.		
Outcome Measures/results	Primary outcome (efficacy and risk) of emergency colectomy for lower GI-Bleeding Secondary	Results: The major causes of bleeding were diverticular disease only (68%), angiodysplasia only (12%) and both diseases (12%). Overall mortality was 17%, with the main contributor being sepsis resulting from anastomotic leak. Non-fatal complications occurred in 20%, resulting in a mean postoperative length of stay of 13 days. All patients were doing well on their first follow-up visit with a mean number of four stools per day after 1 month.	

Renzulli, P. et al. Subtotal colectomy with primary ileorectostomy is effective for unlocalized, diverticular hemorrhage. Langenbecks Arch Surg. 387. 67-71. 2002			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospective single-center cohort study	Funding sources: not stated Conflict of Interests: not stated Randomization: not applicable Blinding: no	Total no. patients: 42 Recruiting Phase: Nov 1993-Dec 2000 Inclusion criteria: Severe diverticular hemorrhage, defined by continuous bleeding despite blood transfusions $\geq 1500$ ml, blood transfusions $\geq 2000$ ml/day, continued bleeding $\geq 3$ days or recurrent bleeding within 1 week after first episode. All patients underwent urgent colonoscopy Exclusion criteria:	Interventions: emergency laparotomy with segmental or subtotal colectomy Comparison: Segmental vs subtotal colectomy for diverticular hemorrhage

	Dropout rates:	
<b>Notes:</b>	<p><b>Author's conclusion:</b> Subtotal colectomy with primary ileorectostomy for unlocalized colonic diverticular bleeding is a safe and effective surgical procedure providing complete bleeding control and preserving continence.</p>	
<b>Outcome Measures/results</b>	<p><b>Primary outcome-parameters</b></p> <p><b>Secondary rebleeding</b></p>	<p><b>Results:</b> Preoperative localization of the bleeding site was possible in six patients (14%), by colonoscopy in two and by angiography in four. Ten patients underwent segmental colectomy with primary anastomosis (5 "directed", 5 "blind") and 32 subtotal colectomy with primary ileorectostomy (1 "directed", 31 "blind"). Subtotal colectomy is the more extensive surgical procedure (longer resected bowel, greater blood loss), and although it was performed in older patients, there were no significant differences between segmental and subtotal colectomy with respect to operation time, morbidity, mortality, hospital stay, number of bowel movements, continence scores, rebleeding rate, or patient satisfaction.</p>





## Schlüsselfrage:

AG 3 Frage 4  
Divertikelblutung

## Inhalt: 7 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Cirocchi, R. 2015	1	Systematic review
Nagata, N. 2015	2	single-center 2-arm, parallel group, open-label randomized controlled study
Niikura, R. 2015	3	retrospective cohort study
Poncet, G. 2010	3	In fact retrospective although data collection is claimed as prospective
Suzuki, K. 2012	2	Matched multicenter case control study, retrospective
Taki, M. 2017	2	Single-center age- and sex-matched case-control study
Yamada, A. 2008	3	retrospective controlled (2:1) cohort study

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 1 Bewertung(en)

Cirocchi, R. et al. New Trends in Acute Management of Colonic Diverticular Bleeding: A Systematic Review. *Medicine (Baltimore)*. 94. e1710. 2015

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Systematic review</p> <p>Databases: PubMed, EMBASE, Cochrane, Scopus, Publish or Perish.</p> <p>Search period: Jan 2005 - Aug 2014</p> <p>Inclusion Criteria: Diverticular hemorrhage management as headings, trails and case series including case reports</p> <p>Exclusion Criteria: double publication of data content</p>	<p>Population: 14 Studies</p> <p>Intervention:</p> <p>Comparison:</p>	<p>Primary: Diagnosis of diverticular bleeding Incidence of self-limitation Management of non-self-limiting bleeding</p> <p>Secondary: Risk factors for diverticular bleeding</p> <p>Results: No RCTs exist on this topic. &gt; 80% of diverticular bleeds are self limiting Colonoscopy is the method of choice in use, but direct evidence of bleeding is frequently not obtained because concise standards are not approached Subsequently, active intervention shows a wide range (7.6 - 100%) as does intervention with embolization (3.3 - 100%). Almost 25% of patients undergo urgent surgery, which includes high morbidity (and mortality)</p> <p>Author's Conclusion: Spontaneous stop of diverticular bleeding occurs in &gt; 80%. More recent publications favour endoscopic and/or angiographic interventions so that urgent surgery can be restricted to non-responding cases.</p>	adequate

## Methodical Notes

Funding Sources: not indicated

COI: excluded

Study Quality: state of art

Heterogeneity: massive / showing international reality

Publication Bias: not detected

Notes:

Study shows lack of RCTs and extreme diversity of therapeutic approaches. Therefore the study-goal to ascertain the best therapeutic approach turns to a description of trends

**NEWCASTLE - OTTAWA Checklist: Cohort: 6 Bewertung(en)**

Nagata, N. et al. High-dose barium impaction therapy for the recurrence of colonic diverticular bleeding: a randomized controlled trial. *Ann Surg.* 261. 269-75. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: single-center 2-arm, parallel group, open-label randomized controlled study	Funding sources: Governmental  Conflict of Interests: disclosed  Randomization: yes  Blinding: no  Dropout rates:	Total no. patients: 54  Recruiting Phase: Dec 2009 - Dec 2011  Inclusion criteria: Diverticular hemorrhage, self-limiting, patients 20-90 years, Japanese nationality.  Exclusion criteria: cessation of bleeding within 4 days of hospitalization, shock/ICU, contrast allergy, intestinal obstruction, barium enema within 6 months before hemorrhage, immobility, pregnancy, history of colonic resection, IBD, CRC, advanced cancer of other origin.	Interventions: barium enema for therapy  Comparison: barium enema vs control arm
Notes:	Author's conclusion: High-dose barium impaction therapy was effective in the longterm prevention of recurrent bleeding, and reduced the frequency of rehospitalization and need for blood transfusion and colonoscopic examination.		
Outcome Measures/results	Primary Rebleeding at fixed intervals  Secondary number of hospitalizations, transfusions, colonoscopies, length of hospital stay, any type of complications	Results: The probability of rebleeding at 30-day, 180-day, 1-year, and 2-year follow-up in all patients was 3.7%, 14.8%, 28.4%, and 32.7%, respectively. By group, probability at 1 year was 42.5% in the conservative group and 14.8% in the barium group (log-rank test, $P = 0.04$ ). After adjustment for a history of hypertension, the hazard ratio of rebleeding in the barium group was 0.34 (95% confidence interval, 0.12–0.98). No complications or laboratory abnormalities due to barium therapy were observed. Compared with the conservative group, the barium group had significantly ( $P < 0.05$ ) fewer hospitalizations per patient (1.7 vs 1.2), units of blood transfused (1.9 vs 0.7), colonoscopies (1.4 times vs 1.1 times), and hospital stay days (15 days vs 11 days) during the follow-up period. No patients died and none required angiographic or surgical procedures in either group.	

Niikura, R. et al. Predictors for identification of stigmata of recent hemorrhage on colonic diverticula in lower gastrointestinal bleeding. *J Clin Gastroenterol.* 49. e24-30. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: retrospective cohort study	Funding sources: Governmental grant, not interfering  Conflict of Interests: disclosed  Randomization: not applicable  Blinding: no  Dropout rates:	Total no. patients: 215 with diverticular hemorrhage, 396 overall  Recruiting Phase: <u>2004-2012</u>  Inclusion criteria: Inpatients with lower GI bleeding  Exclusion criteria:	Interventions: Colonoscopy  Comparison:
Notes:	Author's conclusion: Factors of urgent colonoscopy, expert colonoscopist, use of a cap, and use of water-jet scope are useful for identifying SRH diverticula.		
Outcome Measures/results	Primary factors predicting identification of stigmata of recent hemorrhage in diverticular disease  Secondary blood transfusions, hospital stay, need for radiological or surgical intervention, rebleeding during follow up	Results: Urgent colonoscopy (OR, 8.4; 95% CI, 2.3-30; $P < 0.01$ ), expert colonoscopist (OR, 3.0; 95% CI, 1.2-7.3; $P = 0.02$ ), use of a cap (OR, 3.4; 95% CI, 1.4-8.0; $P = 0.01$ ), and use of water-jet scope (OR, 5.8; 95% CI, 2.3-15; $P < 0.01$ ) were found to	

	be independent predictive factors for SRH. The accuracy of these factors in combination was 0.90 (95% CI, 0.85-0.96) as measured by area under the receiver operating characteristic curve (ROC-AUC). SRH identification rate was higher in the urgent (22%) than in the 24 to 48 hours (2.9%, P<0.01) and >48 hours groups (1.0%, P<0.01), showing a tendency to decrease with time (P<0.01 for trend).
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Poncet, G. et al. Natural history of acute colonic diverticular bleeding: a prospective study in 133 consecutive patients. *Aliment Pharmacol Ther.* 32. 466-71. 2010

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: In fact retrospective although data collection is claimed as prospective	Funding sources: Declared. None  Conflict of Interests: not indicated  Randomization: not applicable  Blinding: not applicable  Dropout rates:	Total no. patients: 133  Recruiting Phase: Jan 1997 - Aug 2005  Inclusion criteria: Patients with colonic diverticular bleeding (133 with definite or presumptive stigmata of diverticular bleeding among 1145 patients with lower GI-Bleeding, all of them with colonoscopy)  Exclusion criteria: Other causes of lower GI-bleeding	Interventions: Diagnostic colonoscopy. In 10 patients endoscopic (3) or radiologic (4) interventions (with surgery thereafter in 4/7) or direct surgery (3) were required  Comparison: Outcome of the natural history compared to literature data
Notes:	Author's conclusion: The low estimated rebleeding rate and the fact that rebleeding can be treated conservatively in most cases suggest that an aggressive approach with intervention is not justified.		
Outcome Measures/results	Primary Spontaneous cessation of bleeding  Secondary Necessity of intervention, rebleeding	Results: Bleeding stopped spontaneously in 123 patients (92.4%). A more interventional approach was necessary in 10 patients. Thirty-day mortality rate for first bleeding was 2.25%. Out of the 123 patients managed conservatively and submitted to an average follow-up of 47.5 months, 17 (13.8%) presented at least one recurrent diverticular bleeding. Spontaneous haemostasis was obtained in all recurrent cases except one, who died. The estimated bleeding recurrence rate was 3.8% at 1 year, 6.9% at 5 years and 9.8% at 10 years.	

Suzuki, K. et al. Risk factors for colonic diverticular hemorrhage: Japanese multicenter study. *Digestion.* 85. 261-5. 2012

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: Matched multicenter control study, retrospective	Funding sources: disclosed  Conflict of Interests: disclosed  Randomization: yes (matched controls)  Blinding: no  Dropout rates:	Total no. patients: 206  Recruiting Phase: April 2002 - August 2009  Inclusion criteria: Patients assigned diverticular hemorrhage vs a nonbleeding matched diverticulosis group  Exclusion criteria: Patients with a colonic resection and those, not receiving "urgent" colonoscopy which means here within 3days	Interventions: Diagnostic colonoscopy and, where appropriate, therapeutic colonoscopy  Comparison: Analysis of potential risk factors for diverticular hemorrhage
Notes:	Case control study		

	Author's conclusion: Only the diverticular location (bilateral) was found to be an independent risk factor for diverticular hemorrhage.	
Outcome Measures/results	Primary Risk factor analysis  Secondary	Results: The body weight (p = 0.0065), body mass index (p = 0.006), prevalence of hypertension (p = 0.0242), prevalence of ischemic heart disease (p = 0.0015), and frequency of use of low-dose aspirin (p = 0.042) were significantly different between the two groups. The percentage of patients with bilateral diverticula, that is, diverticula on both the right and left hemicolon, was significantly higher in the diverticular hemorrhage group (p = 0.0011). Multiple regression analysis identified only the diverticular location as being significantly associated with the risk of diverticular hemorrhage (p = 0.0021).

Taki, M. et al. Analysis of risk factors for colonic diverticular bleeding and recurrence. *Medicine (Baltimore)*. 96. e8090. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: Single-center age- and sex-matched case-control study	Funding sources: disclosed  Conflict of Interests: disclosed  Randomization: matched controls 1:2  Blinding: not applicable  Dropout rates:	Total no. patients: 302  Recruiting Phase: Jan 2009 - Dec 2016  Inclusion criteria: Colonic diverticular hemorrhage with colonoscopy  Exclusion criteria: 2 patients with withdrawal time ≤ 6 min	Interventions:  Comparison: Univariate analysis of the risk factor profile for initial episode of hemorrhage
Notes:	Author's conclusion: Extensive distribution of diverticulosis and use of nonselective NSAIDs, LDA, and anticoagulants are regarded as risk factors for the onset of colonic diverticular bleeding. In addition, a prior history of colonic diverticular bleeding is related to the recurrence		
Outcome Measures/results	Primary Risk factors for diverticular hemorrhage  Secondary Risk factors for recurrent diverticular hemorrhage	Results: Bilateral colonic diverticulosis, nonselective nonsteroidal anti-inflammatory drugs (NSAIDs), low-dose aspirin (LDA), and anticoagulants were significant risk factors for the onset of colonic diverticular bleeding on multivariate analysis. In contrast, the use of selective cyclooxygenase-2 (COX-2) inhibitor was not a risk factor for the onset. The incidence of bleeding in direct oral anticoagulant and warfarin users was not different between the 2 groups. The cumulative recurrence rate at 1 year was 15%. Recurrence rate was significantly higher in patients with a prior history of colonic diverticular bleeding than those without. Steroid use was associated with recurrence.	

Yamada, A. et al. Assessment of the risk factors for colonic diverticular hemorrhage. *Dis Colon Rectum*. 51. 116-20. 2008

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: retrospective controlled (2:1) cohort study	Funding sources: not stated  Conflict of Interests: not stated  Randomization: not applicable  Blinding: no  Dropout rates:	Total no. patients: 44 diverticular hemorrhage among 1783 patients with diverticula among 9499 colonoscopies. 88 matched controls from cancer screening colonoscopies (with nonbleeding diverticula)  Recruiting Phase: Sept 1995 - Dec 2005  Inclusion criteria: Diverticular hemorrhage, colonoscopy within 4 days after admission  Exclusion criteria:	Interventions:  Comparison: Patients characteristics in the bleeding diverticula-group vs the nonbleeders
Notes:	large and careful study		

	<b>Author's conclusion: Hypertension, nonsteroidal antiinflammatory drugs, and anticoagulants, including aspirin, are independent risk factors for colonic diverticular hemorrhage.</b>	
<b>Outcome Measures/results</b>	<p><b>Primary characteristics associated with diverticular hemorrhage</b></p> <p><b>Patient with</b></p> <p><b>Secondary</b></p>	<p><b>Results: the proportion of bilateral diverticulosis was larger among patients with hemorrhage (43 vs. 22 percent). In the case-control study, nonsteroidal anti-inflammatory drugs (odds ratio, 15.6; 95 percent confidence interval, 1.1–214; P=0.04), hypertension (odds ratio, 6.6; 95 percent confidence interval, 2.1–20.5; P=0.0011), and aspirin and/or other anticoagulant (odds ratio, 3; 95 percent confidence interval, 1.04–8.6; P=0.042) were shown to be significant risk factors by multivariate analysis.</b></p>



## Schlüsselfrage:

AG 04\_Akute Divertikelkrankheit

## Inhalt: 27 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Bolkenstein, H. E. 2018	3	Retrospektive Kohortenstudie
Bolkenstein, H. E. 2017	1	Systematic review
Bolkenstein, H. E. 2018	1	retrospective cross-sectional study
Carabotti, M. 2018	3	Non-systematic review on new developments
Carabotti, M. 2017	1	Systematisches review
Chabok, A. 2012	2	Randomisierte Studie zum Gebrauch von AB bei unkomplizierter Divertikulitis
Dahl, C. 2018	2	systematic review
Emile, S. H. 2018	1	Systematic review and metaanalysis
Friend, Kerri 2011	3	Non-systematic review
Iannone, A. 2018	1	systematic review
Isacson, D. 2019	3	Langzeitbeobachtung der AVOD Studie über 11 Jahre mit 89% Recruitment!
Kechagias, A. 2018	3	Nicht randomisierte follow up Kohorte
Käser, S. A. 2010	3	retrospective, comparative cohort
Lahner, E. 2016	2	Systematic review on the effect of Probiotics in the Treatment of Diverticular Disease.
Lorimer, J. W. 2007	4	retrospective, comparative cohort
Mann, N. S. 2012	5	review and systematic description of case reports
Nespoli, L. 2015	4	single centre retrospective cohort study
Ojetti, V. 2018	1	systematic review A meta-analysis was originally planned to provide a numerical estimate of the overall effect of the probiotics treatment with respect to baseline or with respect to controls, taking into account the regression or the absence of abdominal symptoms. Due to the heterogeneity of the retrieved studies, and the little database of total patients, meta-analysis was not considered applicable. So, the efficacy of the probiotics in different phases of Diverticular Disease was described in a qualitative and not quantitative manner.
Petruzzello, C. 2019	1	double-blind, placebo RCT
Picchio, M. 2018	1	Systematic Review with Meta-Analysis of Randomized, Placebo-Controlled Trials
Stephen, A. M. 2017	5	Aufwändige allgemeine Übersichtsarbeit über Ballaststoffe bei der Divertikelkrankheit

Stollman, N. 2013	1	r, db, pl
Strate, L. L. 2015	1	Systematisches review bzgl. 11 definierten Fragen zur Divertikerkrankheit
Tursi, A. 2007	5	Pilot studie, randomisiert
Unlu, C. 2012	2	systematic review
van Dijk, S. T. 2018	1	Systematic review and metaanalysis
van Dijk, S. T. 2018	2	open RCT

**OXFORD (2011) Appraisal Sheet: Systematic Reviews: 14 Bewertung(en)**

Bolkenstein, H. E. et al. Risk factors for complicated diverticulitis: systematic review and meta-analysis. *Int J Colorectal Dis.* **32**. 1375-1383. 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Systematic review</p> <p>Databases: This systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines and was executed in May 2016 [7]. The databases PubMed, Embase, and Cochrane library were searched using synonyms for domain (diverticulitis), determinant (risk factors), and outcome (complicated diverticulitis). The used search terms are listed in appendix 1. These search results were filtered for doubles, and the remaining articles were screened for title and abstract. All studies that did not report on the domain (diverticulitis) and outcome (complicated diverticulitis) were excluded. All non-English publications and studies performed before 1990 were also excluded. The remaining articles were read for full text. Only studies comparing patients with uncomplicated to complicated diverticulitis were included in this review. Case-reports, expert-opinions, reviews, and studies on right-sided diverticulitis were excluded. The references of all selected studies were hand-searched for other relevant studies. Ambiguities were resolved by consultation with the senior authors</p> <p>Search period:</p> <p>Inclusion Criteria: Data regarding study characteristics and all relevant risk factors were extracted. A risk factor for complicated diverticulitis encompassed all patient characteristics (medical history, age, gender, body mass index, race), clinical signs (pain, nausea, vomiting, rectal bleeding, diarrhea, constipation), physical signs (guarding, palpable mass, signs of bowel obstruction), vital signs (body temperature, heart rate, blood pressure, respiratory rate), and laboratory parameters (C-reactive protein (CRP) white blood cell (WBC) count, sodium). Uncomplicated diverticulitis was defined as Hinchey Ia diverticulitis or mild diverticulitis according to the Ambrosetti classification. Complicated diverticulitis was defined as Hinchey Ib or severe diverticulitis according to the Ambrosetti criteria (see appendix 2 and 3)</p> <p>Exclusion Criteria:</p>	<p>Intervention:</p> <p>Comparison:</p>	<p>Primary: Purpose The aim of this systematic review is to identify risk factors that can predict complicated diverticulitis. Uncomplicated diverticulitis is a self-limiting and mild disease, but 10% of patients with diverticulitis develop complications requiring further treatment. It is important to estimate the risk of developing complicated diverticulitis at an early stage to set the right treatment at initial presentation.</p> <p>Secondary:</p> <p>Results:</p> <p>Author's Conclusion: Although high-level evidence is lacking, this study demonstrates that CRP level, WBC count, clinical signs (generalized abdominal pain, constipation, vomiting), steroid use, number of episodes, and comorbidity are risk factors for complicated diverticulitis. Individually, these risk factors have little value for truly estimating the risk of developing complicated diverticulitis. Combining them in a prognostic model as proposed by the authors might be the next step to aid the physician in predicting the course of diverticulitis and setting the right treatment at initial presentation</p>	<p>21 references</p>
<b>Methodical Notes</b>			

Funding Sources: n.a.

COI: n-a-

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Carabotti, M. et al. Treatment of diverticular disease: an update on latest evidence and clinical implications. *Drugs Context.* 7. 212526. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 3</p> <p>Study type: Non-systematic review on new developments</p> <p>Databases:</p> <p>Search period:</p> <p>Inclusion Criteria: Recent trials on treatment of diverticular disease</p> <p>Exclusion Criteria:</p>	<p>Intervention:</p> <p>Comparison:</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results:</p> <p>Author's Conclusion:</p>	68 references

#### Methodical Notes

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

This is a non-systematic review on latest developments in treatment of diverticular disease

Carabotti, M. et al. Role of Fiber in Symptomatic Uncomplicated Diverticular Disease: A Systematic Review. *Nutrients.* 9. . 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Systematisches review</p> <p>Databases:</p> <p>Search period: Clinical studies published up to 7 October 2016</p> <p>Inclusion Criteria:</p> <p>Exclusion Criteria:</p>	<p>Population: adults (&gt;18 years) with SUDD</p> <p>Intervention: the efficacy of fiber treatment</p> <p>Comparison:</p>	<p>Primary: (i) on reduction or remission of abdominal symptoms; and/or (ii) on prevention of acute diverticulitis.</p> <p>Secondary:</p> <p>Results: Single studies suggest that fibers, both dietary and supplemental, could be beneficial in SUDD, even if the quality is very low, with just one study yielding an optimal score. The presence of substantial methodological limitations, the heterogeneity of the therapeutic regimens employed, and the lack of ad hoc designed studies, did not permit a summary of the outcome measure. Thus, the benefit of dietary or supplemental fiber in SUDD patients still needs to be established.</p> <p>Author's Conclusion:</p>	

#### Methodical Notes

Funding Sources:

COI:

Study Quality:



Heterogeneity:

Publication Bias:

Notes:

Dahl, C. et al. Evidence for Dietary Fibre Modification in the Recovery and Prevention of Reoccurrence of Acute, Uncomplicated Diverticulitis: A Systematic Literature Review. *Nutrients*. 10. . 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2  Study type: systematic review Databases: Medline (PubMed), Embase, Web of Science and CINAHL  Search period:  Inclusion Criteria: until march 2017  Exclusion Criteria:	Intervention:  Comparison:	Primary:  Secondary:  Results: 8 Studien werden eingeschlossen, sehr gutes systematisches review kommt zu dem Ergebniss, dass die Studien eine eingeschränkte Qualität haben mit schwacher Evidenz. Eine liberale Diät ist demnach statthaft  Author's Conclusion:	

Methodical Notes

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Emile, S. H. et al. Management of acute uncomplicated diverticulitis without antibiotics: a systematic review, meta-analysis, and meta-regression of predictors of treatment failure. *Tech Coloproctol*. 22. 499-509. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1  Study type: Systematic review and metaanalysis Databases: databases including PubMed/Medline, Scopus, Embase, and Cochrane Central Register of Controlled Trials. PubMed function "related articles" was used to search further articles.  Search period: The search process involved articles published in the period from January 1946 until September 2017.  Inclusion Criteria: All English-language publications that assessed the efficacy and safety of conservative treatment of AUD without using antibiotics were considered eligible to be included to the review. The	Population: Patients with acute uncomplicated diverticulitis  Intervention: Antibiotics  Comparison: Antibiotics vs non-antibiotics	Primary: The primary outcome of the review was the rates of failure and complications of conservative treatment of AUD with-out antibiotics.  Secondary: Secondary outcomes included recurrence of diverticulitis, readmission rate, need for surgery whether during admission or after discharge, and LoS  Results: Treatment failure was observed in 5.1% of patients not-given-antibiotic treatment versus 3.4% of those given antibiotic treatment. Recurrent diverticulitis occurred in 9.3% of patients in the non-antibiotic group versus 12.1% of patients in the antibiotic group. On meta-analysis of the studies, there were no significant differences between non-antibiotic and antibiotic treatment groups regarding rates of treatment failure (OR = 1.5, p = 0.06), recurrence of diverticulitis (OR = 0.81, p = 0.2), complications (OR = 0.56, p = 0.25), readmission rates (OR = 0.97, p = 0.91), need for surgery (OR = 0.59, p = 0.28), and mortality (OR = 0.64, p = 0.47). The only variable that was significantly associated with treatment failure in the non-antibiotic treatment group was associated comorbidities (standard error (SE) = - 0.07, 95% CI - 0.117 - 0.032; p < 0.001).  Author's Conclusion: Conservative treatment of AUD without antibiotics is feasible, safe, and effective. Meta-analysis of all studies included revealed that the addition of broad-spectrum antibiotics to the treatment regimen did not serve to decrease treatment failure, recurrence, complications, hospital readmissions, and need for surgery in a significant manner	33 references

type of eligible studies included cohort non-controlled studies, case-controlled studies, and randomized controlled trials (RCTs).

**Exclusion Criteria:** We excluded irrelevant articles, editorials, letters, case reports, reviews, and meta-analyses. Articles that did not report the primary outcomes of the review (treatment failure and complication rates) clearly were also excluded.

compared to non-antibiotic treatment. However, subgroup analysis of only randomized trials revealed that conservative treatment without antibiotics had significantly higher odds for failure than antibiotic treatment, which calls for further randomized trials to reach firmer conclusions on the efficacy and safety of non-antibiotic treatment of AUD. Finally, according to meta-regression analysis of predictors for treatment failure, antibiotics may need to be used selectively in patients with associated comorbidities who are at risk of failing observational non-antibiotic treatment.

**Methodical Notes**

**Funding Sources:** n.a.

**COI:** none

**Study Quality:** Very high quality

**Heterogeneity:** The heterogeneity between the studies was explored in relation to differences in patients' age, sex, associated comorbidities, body temperature on admission, leucocyte count on admission, and previous episodes of diverticulitis.

**Publication Bias:** The methodological quality of each study was assessed by two independent reviewers (S.E & H.E). If any discrepancy in interpretation was noted, a third reviewer (M.S) was consulted.

Publication bias across the studies was assessed using a funnel plot of the standard error of the failure rate of non-antibiotic treatment of AUD against the failure rates in the studies reviewed

**Notes:**  
IA

Friend, Kerri et al. Is Outpatient Oral Antibiotic Therapy Safe and Effective for the Treatment of Acute Uncomplicated Diverticulitis?. *Annals of Emergency Medicine*. 57. 600-602. 2011

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p><b>Evidence level:</b> 3</p> <p><b>Study type:</b> Non-systematic review</p> <p><b>Databases:</b> A PubMed search was performed, using the key words "uncomplicated diverticulitis" and "treatment," limited to English-language articles. This search yielded 124 research articles. Bibliographic references found in these articles were examined for relevance to this topic. Only original published research articles specifically addressing the outpatient treatment of uncomplicated diverticulitis were included. We identified 4 original research articles that addressed our question.</p> <p><b>Search period:</b></p> <p><b>Inclusion Criteria:</b></p> <p><b>Exclusion Criteria:</b></p>	<p><b>Intervention:</b></p> <p><b>Comparison:</b></p>	<p><b>Primary:</b></p> <p><b>Secondary:</b></p> <p><b>Results:</b></p> <p><b>Author's Conclusion:</b> According to the available evidence, outpatient treatment of acute uncomplicated diverticulitis may be a feasible treatment strategy for certain patients: those who are able to tolerate oral intake, have no significant comorbidities, are able to obtain antibiotics, have adequate pain control, and have access to adequate follow-up and social support. In addition, the studies above used CT or ultrasonographic imaging, showing presence of inflamed diverticula, colonic wall thickening, or pericolicitis with lack of significant abscess, to help stratify patients. If outpatient therapy is initiated, the studies advise that close follow-up is needed. Although these studies do not provide clear guidelines for admission versus outpatient treatment, they do suggest that most uncomplicated acute diverticulitis can be successfully treated with outpatient therapy.</p>	<p>8 references</p>

**Methodical Notes**

**Funding Sources:** none

**COI:** n.a.

**Study Quality:** n.a.

Heterogeneity: n.a.

Publication Bias: n.a.

Notes:

Non-systematic review

Iannone, A. et al. Mesalazine for People with Diverticular Disease: A Systematic Review of Randomized Controlled Trials. *Can J Gastroenterol Hepatol.* 2018. 5437135. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
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<p>Evidence level: 1</p> <p>Study type: systematic review</p> <p>Databases: randomized controlled trials of mesalazine in diverticular disease was performed in MEDLINE (1946 to July 2018), EMBASE (1996 to July 2018), the Cochrane Central Register of Controlled Trials (CENTRAL,</p> <p>Search period: <u>1946-2018</u></p> <p>Inclusion Criteria: We included any randomized controlled trials which compared mesalazine, at any dose, mode, and duration of administration with any intervention for the treatment of people with diverticular disease. Diverticular disease was defined as the presence of any colonic diverticula-related symptoms [3]</p> <p>Exclusion Criteria: We excluded trials not involving any arm treated with mesalazine alone or comparing this treatment only with combination therapy including mesalazine.</p>	<p>Population: global; II patients with diverticular disease</p> <p>Intervention: oral mesalazine</p> <p>Comparison: various</p>	<p>Primary: We evaluated the number of participants achieving diverticular disease remission, developing diverticular disease recurrence, and experiencing acute diverticulitis in symptomatic uncomplicated diverticular disease.</p> <p>Secondary: none</p> <p>Results: We identified 13 randomized trials (n=3028 participants). There was a higher likelihood of disease remission with mesalazine than controls in acute uncomplicated diverticulitis (1 trial, 81 participants, RR=2.67, 95%CI=1.05-6.79), but not in symptomatic uncomplicated diverticular disease (1 trial, 123 participants, RR=1.04, 95%CI=0.81-1.34). There was a lower likelihood of disease recurrence with mesalazine than controls in symptomatic uncomplicated diverticular disease (2 trials, 216 participants, RR=0.52, 95%CI=0.28-0.97), but not in acute uncomplicated diverticulitis (7 trials, 2196 participants, RR=0.90, 95%CI=0.61-1.33). There was no difference in the likelihood of developing acute diverticulitis in symptomatic uncomplicated diverticular disease between the two groups (3 trials, 484 participants, RR=0.26, 95%CI=0.06-1.20). There was a higher global symptoms score reduction with mesalazine than controls in symptomatic uncomplicated diverticular disease (2 trials, 326 participants, SMD=-1.01, 95%CI=-1.51,-0.52) and acute uncomplicated diverticulitis (2 trials, 153 participants, SMD=-0.56, 95%CI=-0.88,-0.24).</p> <p>Author's Conclusion: Mesalazine may reduce recurrences in symptomatic uncomplicated diverticular disease. There is uncertainty on the effect of mesalazine in achieving diverticular disease remission. Mesalazine may not prevent acute diverticulitis in symptomatic uncomplicated diverticular disease</p>	<p>41 references</p>
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#### Methodical Notes

Funding Sources: none

COI: none

Study Quality: The review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement [

Heterogeneity: We formally estimated heterogeneity of intervention effects among studies with the Chi<sup>2</sup> (Cochran Q) and the I<sup>2</sup> statistics.

Publication Bias: We assessed the study level risk of bias with the Cochrane risk of bias tool, including the domains of random sequence generation, allocation concealment, blinding of participants or investigators, blinding of outcome assessment, completeness of outcome data, selective reporting, and other threats to validity

Notes:

Lahner, E. et al. Probiotics in the Treatment of Diverticular Disease. A Systematic Review. J Gastrointestin Liver Dis. 25. 79-86. 2016

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: Systematic review on the effect of Probiotics in the Treatment of Diverticular Disease.</p> <p>Databases: The search was conducted according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines [28]. The electronic databases PubMed MEDLINE (U.S. National Library of Medicine, Bethesda, MD), EMBASE Elsevier, and Cochrane Central Register of Controlled Trials were systematically searched</p> <p>Search period: up to 2015</p> <p>Inclusion Criteria:</p> <p>Exclusion Criteria:</p>	<p>Intervention:</p> <p>Comparison:</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results: 11 studies (2 double-blind randomized placebo-controlled, 5 open randomized, 4 non-randomized open studies) were eligible. However, Meta-analysis on the efficacy of probiotics in diverticular disease could not be performed due to the poor quality of retrieved studies.</p> <p>Author's Conclusion: This systematic review showed that high-quality data on the efficacy of probiotics in diverticular disease are scant: the available data do not permit conclusions</p>	

## Methodical Notes

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Ojetti, V. et al. The Use of Probiotics in Different Phases of Diverticular Disease. Rev Recent Clin Trials. 13. 89-96. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: systematic review</p> <p>A meta-analysis was originally planned to provide a numerical estimate of the overall effect of the probiotics treatment with respect to baseline or with respect to controls, taking into account the regression or the absence of abdominal symptoms. Due to the heterogeneity of the retrieved studies, and the little database of total patients, meta-analysis was not considered applicable. So, the efficacy of the probiotics in different phases of Diverticular Disease was described in a qualitative and not quantitative manner.</p> <p>Databases: PubMed Medline, EMBASE Elsevier, ResearchGate and Cochrane Central Register of Controlled Trial</p> <p>Search period:</p> <p>Inclusion Criteria:</p> <p>Exclusion Criteria:</p>	<p>Population: A total of 254 papers were firstly analyzed. Based on the inclusion and exclusion criteria, only 13 papers were finally included in our systematic review</p> <p>Intervention:</p> <p>Comparison:</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results:</p> <p>Author's Conclusion: In conclusion, despite the importance of the results obtained so far, the role of probiotics in different phases of DD is still to be fully understood.</p>	

## Methodical Notes

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Picchio, M. et al. Mesalazine to treat symptomatic uncomplicated diverticular disease and to prevent acute diverticulitis occurrence. A systematic review with meta-analysis of randomized, placebo-controlled trials. *J Gastrointestin Liver Dis.* **27.** 291-297. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Systematic Review with Meta-Analysis of Randomized, Placebo-Controlled Trials</p> <p>Databases: The RCTs were identified by searching MEDLINE, and the Cochrane Central Register of Controlled Trials from 1966 to November 2017. A computer-assisted search was conducted using the following combination of medical subject heading terms (MESH and not MESH terms):</p> <p>Search period:</p> <p>Inclusion Criteria: Two double-blind, placebo-controlled randomised trials have been published as full papers. Two further double-blind, placebo-controlled randomised trials have been published as abstracts. The characteristics of the studies are reported</p> <p>Exclusion Criteria: as described</p>	<p>Population: We assessed the effectiveness of mesalazine in improving symptoms (namely abdominal pain, primary outcome) and in preventing diverticulitis occurrence (secondary outcome) in patients with SUDD.</p> <p>Intervention: Mesalazine</p> <p>Comparison: multiple</p>	<p>Primary: The selected primary outcome was the percentage of patients with symptom relief at maximal follow-up.</p> <p>Secondary: The secondary outcome was diverticulitis occurrence at maximal follow-up</p> <p>Results: Four RCTs enrolled 379 patients, 197 treated with mesalazine and 182 with placebo. Two studies provided data on symptom relief according to definition: it was achieved in 97/121 (80%) patients in the mesalazine group and in 81/129 (62.7%) patients in the placebo group (OR 0.43; 95% CI 0.24-0.75; p=0.003 in favour of the mesalazine group). Two studies provided information regarding occurrence of diverticulitis during follow-up. It occurred in 23/119 (19.3%) patients in the mesalazine group and in 34/102 (33.3%) patients in the placebo group (OR 0.35; 95% CI 0.17-0.70; p=0.003 in favour of the mesalazine group).</p> <p>Author's Conclusion: Treatment with mesalazine seems to be effective in achieving symptom relief and in the primary prevention of diverticulitis in patients with SUDD</p>	35 references

## Methodical Notes

Funding Sources: n.a.

COI: none

Study Quality: ver good

Heterogeneity: n.a.

Publication Bias: as described

Notes:

Stephen, A. M. et al. Dietary fibre in Europe: current state of knowledge on definitions, sources, recommendations, intakes and relationships to health. *Nutr Res Rev.* **30.** 149-190. 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 5</p> <p>Study type: Aufwändige allgemeine Übersichtsarbeit über Ballaststoffe bei der Divertikelkrankheit</p>	Intervention:	<p>Primary:</p> <p>Secondary:</p>	

<b>Databases:</b>	<b>Comparison:</b>	<b>Results:</b>	
<b>Search period:</b>		<b>Author's Conclusion:</b>	
<b>Inclusion Criteria:</b>			
<b>Exclusion Criteria:</b>			

**Methodical Notes****Funding Sources:**

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Strate, L. L. et al. American Gastroenterological Association Institute Technical Review on the Management of Acute Diverticulitis. *Gastroenterology*. 149. 1950-1976 e12. 2015

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
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<b>Evidence level: 1</b>  <b>Study type:</b> Systematisches review bzgl. 11 definierten Fragen zur Divertikekrankheit <b>Databases:</b> medline und embase + cochrane  <b>Search period:</b> bis August 2014  <b>Inclusion Criteria:</b>  <b>Exclusion Criteria:</b>	<b>Intervention:</b>  <b>Comparison:</b>	<b>Primary:</b>  <b>Secondary:</b>  <b>Results:</b>  <b>Author's Conclusion:</b>	
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**Methodical Notes****Funding Sources:**

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Unlu, C. et al. A systematic review of high-fibre dietary therapy in diverticular disease. *Int J Colorectal Dis.* 27. 419-27. 2012

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
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<b>Evidence level: 2</b>  <b>Study type:</b> systematic review <b>Databases:</b> A Medline search was performed to identify guidelines issued by professional organisations on the conservative treatment of diverticulitis and recommendations on the use of high-fibre diet. A Google search was used to identify guidelines not published in Medline indexed journals  <b>Search period:</b> <u>1999-2010</u>	<b>Population:</b> Patients from 3 RCT  <b>Intervention:</b> high fibre versus low fibre  <b>Comparison:</b> direct	<b>Primary:</b> superiority  <b>Secondary:</b> n.a.  <b>Results:</b> Conclusion High-quality evidence for a high-fibre diet in the treatment of diverticular disease is lacking, and most recommendations are based on inconsistent level 2 and mostly level 3 evidence. Nevertheless, high-fibre diet is still recommended in several guidelines.  <b>Author's Conclusion:</b> Conclusion High-quality evidence for a high-fibre diet in the treatment of diverticular disease is	see PDF
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**Inclusion Criteria:** Clinical studies were eligible for inclusion if they assessed the treatment of diverticular disease or the prevention of recurrent diverticulitis with a high-fibre diet.

**Exclusion Criteria:** The following exclusion criteria were used for study selection: studies without comparison of the patient group with a control group.

lacking, and most recommendations are based on inconsistent level 2 and mostly level 3 evidence. Nevertheless, high-fibre diet is still recommended in several guidelines.

#### Methodical Notes

**Funding Sources:** not shown

**COI:** none declared

**Study Quality:** moderate quality

**Heterogeneity:** high

**Publication Bias:** not declared

**Notes:**

van Dijk, S. T. et al. A systematic review and meta-analysis of outpatient treatment for acute diverticulitis. *Int J Colorectal Dis.* **33.** 505-512. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p><b>Evidence level:</b> 1</p> <p><b>Study type:</b> Systematic review and metaanalysis</p> <p><b>Databases:</b> Two investigators, SD and KB, independently searched PubMed and EMBASE databases with the following searchterms: diverticulitis, diverticular, ambulatory care, outpatients, ambulatory, outpatient and home (Online Resource2). No language or date limits were applied. The last search was performed in November 2017. Reference lists of obtained articles were reviewed for omitted studies.</p> <p><b>Search period:</b></p> <p><b>Inclusion Criteria:</b></p> <p><b>Exclusion Criteria:</b> These studies predominantly excluded patients with comorbidity or immunosuppression, inability to tolerate oral intake, or lack of an adequate social network</p>	<p><b>Intervention:</b> multiple</p> <p><b>Comparison:</b></p>	<p><b>Primary:</b> multiple</p> <p><b>Secondary:</b></p> <p><b>Results:</b> The pooled incidence rate of readmission for outpatient treatment was 7% (95%CI 6–9%, I<sup>2</sup>48%). Only 0.2% (2/1288) of patients underwent emergency surgery, and 0.2% (2/1082) of patients underwent percutaneous abscess drainage. Only two studies compared readmission rates outpatients that had similar characteristics as a control group of inpatients; 4.5% (3/66) and 6.3% (2/32) readmissions in outpatient groups versus 6.1% (4/66) and 0.0% (0/44) readmissions in inpatient groups (p=0.619 and p= 0.174, respectively). Average healthcare cost savings for outpatient compared with inpatient treatment ranged between 42 and 82%</p> <p><b>Author's Conclusion:</b> Outpatient treatment of uncomplicated diverticulitis resulted in low readmission rates and very low rates of complications. Furthermore, healthcare cost savings were substantial. Therefore, outpatient treatment of uncomplicated diverticulitis seems to be a safe option for most patients.</p>	<p>43 references</p>

#### Methodical Notes

**Funding Sources:** This study is funded by the Association for Quality Funds Medical Specialists (SKMS)

**COI:** none

**Study Quality:** very good

**Heterogeneity:**

**Publication Bias:**

**Notes:**

*OXFORD (2011) Appraisal Sheet: RCT: 6 Bewertung(en)*

Chabok, A. et al. Randomized clinical trial of antibiotics in acute uncomplicated diverticulitis. Br J Surg. 99. 532-9. 2012

Population	Intervention Comparison	Outcomes/Results
Evidence level: 2 Study type: Randomisierte Studie zum Gebrauch von AB bei unkomplizierter Divertikulitis Number of Patient: 623 Recruiting Phase: Inclusion Criteria: Exclusion Criteria:	Intervention: Comparison:	Primary: Secondary: Results: Author's Conclusion:

#### Methodical Notes

##### Funding Sources:

COI:

Randomization:

Blinding:

Dropout Rate/ITT-Analysis:

Notes:

Isacson, D. et al. Long-term follow-up of the AVOD randomized trial of antibiotic avoidance in uncomplicated diverticulitis. Br J Surg. 106. 1542-1548. 2019

Population	Intervention Comparison	Outcomes/Results
Evidence level: 3 Study type: Langzeitbeobachtung der AVOD Studie über 11 Jahre mit 89% Recruitment! Number of Patient: 556 Recruiting Phase: Inclusion Criteria: Exclusion Criteria:	Intervention: Comparison:	Primary: Secondary: Results: Author's Conclusion:

#### Methodical Notes

##### Funding Sources:

COI:

Randomization:

Blinding:

Dropout Rate/ITT-Analysis:

Notes:

Petruzzello, C. et al. Supplementation with Lactobacillus reuteri ATCC PTA 4659 in patients affected by acute uncomplicated diverticulitis: a randomized double-blind placebo controlled trial. Int J Colorectal Dis. . . 2019

Population	Intervention - Comparison	Outcomes/Results
Evidence level: 1 Study type: double-blind, placebo RCT Number of Patient: 88 (34M/54F mean	Intervention: Group A (n= 44, 26F) received standard antibiotic therapy, consisting of ciprofloxacin 400 mg twice a day and metronidazole 500 mg	Primary: Abdominal pain VAS evaluation Secondary: Grade of inflammation, C-RP evaluation



<p>age 61.9 ± 13.9) patients</p> <p>Recruiting Phase: October 2017–May 2018</p> <p>Inclusion Criteria: with a diagnosis of acute uncomplicated diverticulitis (Hinchey = 0) (CT proven)</p> <p>Exclusion Criteria: &lt;18 years–Prior colonic surgery–Pregnancy or breastfeeding–Concomitant or recent (7–10 days) participation in another clinical trial–Concomitant or recent (7–15 days) intake of probiotics or antibiotics–Major concurrent diseases (hepatological, renal, tumor)–Inflammatory bowel disease (Crohn's disease, ulcerative colitis) or other organic gastrointestinal disease–Allergies to contrast agents or antibiotics–Mental illness or inability to adhere to protocols</p>	<p>three times a day for 7 days, with supplementation of the probiotic <i>L. reuteri</i> 4659 twice a day for 10 days. Group B (n= 44, 28F) received the same standard antibiotic therapy as group A and a matching placebo for the same periods</p> <p>Comparison:</p>	<p>Hours of hospitalization</p> <p>Results: Between days 1 and 3, the group A pain decreased by 4.5 points; group B decreased by 2.36 points (p&lt; 0.0001). Between days 1 and 5, the group A decreased by 6.6 points; group B by 4.4 points (p&lt; 0.0001). Between days 1 and 7, the group A decreased by 7.6 points; group B decreased by 5.6 points (p&lt; 0.0001). Between days 1 and 10, the group A decreased by 8.1 points; group B decreased by 6.7 points (p&lt;0.0001). For C-RP value, the mean decrease between admission and after 72 h was 45.3 mg/L for group A and 27.49 mg/L for group B (p&lt;0.0001)</p> <p>Author's Conclusion: Our RCT showed that supplementation of the standard AUD therapy with <i>L. reuteri</i> strain 4659 significantly reduced abdominal pain and inflammatory markers compared with the placebo group. It also resulted in a shorter period of hospitalization, and thus has economic benefits</p>
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## Methodical Notes

Funding Sources: n.a.

COI: n.a.

Randomization: Yes

Blinding: Yes

Dropout Rate/ITT-Analysis: Yes

Notes:

Stollman, N. et al. A randomized controlled study of mesalamine after acute diverticulitis: results of the DIVA trial. *J Clin Gastroenterol.* 47, 621-9. 2013

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 1</p> <p>Study type: r, db, pl</p> <p>Number of Patient: 117</p> <p>Recruiting Phase: December 2007 and March 2010</p> <p>Inclusion Criteria: Men and women 35 to 85 years of age, with a clinical diagnosis of acute diverticulitis (first, second, or third attack) confirmed by CT scan, were eligible to participate in the study. Patients were required to have a global symptom score (GSS) of at least 12 at baseline, including an abdominal pain assessment score &gt;2.</p> <p>Exclusion Criteria: Patients with diverticulitis complications (abscess, fistula); irritable bowel syndrome as determined by investigator, and those fulfilling ROME criteria before their attack of diverticulitis; active or recent peptic ulcer; history of major abdominal or recent GI surgery; conditions causing malabsorption, chronic abdominal pain, GI motility disorder, or short bowel</p>	<p>Intervention: The study was a 52-week, randomized, multicenter, double-blind, placebo-controlled, proof-of-concept study to evaluate the efficacy and safety of a 12-week treatment with mesalamine (2.4 g/d), administered with or without dietary supplementation with <i>B. infantis</i> 35624, in patients with acute diverticulitis. The 12-week treatment phase was followed by a 9-month nontreatment observation period</p> <p>Comparison:</p>	<p>Primary: GSS at 12 weeks after an attack of acute diverticulitis</p> <p>Secondary:</p> <p>Results: GSS decreased in all groups during treatment without a statistically significant difference between mesalamine and placebo, however; scores were consistently lower for mesalamine at all time points. The rate of complete response (GSS=0) was significantly higher with mesalamine than placebo at weeks 6 and 52 (P&lt;0.05), and was particularly high for rectosigmoid symptoms at weeks 6, 12, 26, and 52. Recurrence of diverticulitis was low and comparable across groups. Probiotic in combination with mesalamine did not provide additional efficacy.</p> <p>Author's Conclusion: In the first US randomized placebo-controlled trial of anti-inflammatory treatment after a documented case of diverticulitis, mesalamine demonstrated a consistent trend in reducing symptoms. Addition of probiotic did not increase mesalamine efficacy.</p>

syndrome; or stool examination positive for Clostridium difficile, bacterial pathogens, or ova and parasites, were not eligible to participate in the study. Other exclusion criteria included major medical or psychiatric diseases; drug or alcohol abuse; recent history of endometriosis or dysmenorrhea; consumption within 4 weeks of study entry of any product containing mesalamine or probiotic (excluding yogurt), or of any product metabolized to mesalamine; allergy to any component of the mesalamine tablet or to Bifidobacterium infantis 35624 (B. infantis 35624); recent participation in another clinical trial; or recent therapy with corticosteroids by any route, topical rectal medication, narcotics, antibiotics (except for those treating the current diverticulitis attack and topical antibiotics), antidiarrheals, or antispasmodics.

**Methodical Notes**

**Funding Sources:** The study was funded by and writing support provided by Warner Chilcott.

**COI:** study grant support, consulting fees, and speaking honoraria from Warner Chilcott. **S.M.:** employee of Procter and Gamble. **F.S.:** study grant support from GlaxoSmithKline and Alimentary Health Ltd., and supported, in part by Science Foundation, Ireland. **E.Q.:** study grant support and speaking honoraria from Procter and Gamble; non-executive director of Alimentary Health Ltd

**Randomization:** Patients were randomized into 1 of 3 treatment groups (placebo, mesalamine, or combined mesalamine/probiotic) in a 1:1:1 ratio

**Blinding:**

**Dropout Rate/ITT-Analysis:** Of 177 patients screened, 60 were excluded (55 who did not meet the admission criteria, 5 who did not wish to participate). The ITT population included 117 patients (placebo, 41; mesalamine, 40; mesalamine+probiotic, 36). Twenty-nine patients (24.8%) dropped out during the treatment phase. Eighty-eight patients (75.2%) completed the 12-week treatment period and continued into the nontreatment follow-up period (PE population), and 73 (62.4%) completed the entire 52-week study.

**Notes:**

Tursi, A. et al. Balsalazide and/or high-potency probiotic mixture (VSL#3) in maintaining remission after attack of acute, uncomplicated diverticulitis of the colon. *Int J Colorectal Dis.* **22.** 1103-8. 2007

Population	Intervention - Comparison	Outcomes/Results
Evidence level: 5	Intervention:	Primary:
Study type: Pilot studie, randomisert	Comparison:	Secondary:
Number of Patient: 30		Results:
Recruiting Phase:		Author's Conclusion:
Inclusion Criteria:		
Exclusion Criteria:		

**Methodical Notes**

**Funding Sources:**

COI:

Randomization:

Blinding:

Dropout Rate/ITT-Analysis:

Notes:

van Dijk, S. T. et al. Long-Term Effects of Omitting Antibiotics in Uncomplicated Acute Diverticulitis. *Am J Gastroenterol.* **113.** 1045-1052. 2018

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 2</p> <p>Study type: open RCT</p> <p>Number of Patient: 528</p> <p>Recruiting Phase: 2010–2012.</p> <p>Inclusion Criteria: CT-proven, first episode, left-sided and uncomplicated acute diverticulitis</p> <p>Uncomplicated acute diverticulitis was defined as modified Hinchey stages 1a and 1b and Ambrosetti's "mild" diverticulitis stage</p> <p>Exclusion Criteria:</p>	<p>Intervention: Trial</p> <p>Antibiotics vs no antibiotics; follow up purely observational</p> <p>Comparison:</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results: Complete case analyses showed no difference in rates of recurrent diverticulitis (15.4% in the observational group versus 14.9% in the antibiotic group; <math>p=0.885</math>), complicated diverticulitis (4.8% versus 3.3%; <math>p=0.403</math>) and sigmoid resection (9.0% versus 5.0%; <math>p=0.085</math>). Young patients (&lt;50 years) and patients with a pain score at presentation of 8 or higher on a visual analogue pain scale were at risk for complicated or recurrent diverticulitis. In this multivariable analysis, treatment type (with or without antibiotics) was not an independent predictor for complicated or recurrent diverticulitis</p> <p>Author's Conclusion: Omitting antibiotics in the treatment of uncomplicated acute diverticulitis did not result in more complicated diverticulitis, recurrent diverticulitis or sigmoid resections at long-term follow up. As the DIABOLO trial was not powered for these secondary outcome measures, some uncertainty remains whether (small) non-significant differences could be true associations</p>

**Methodical Notes**

Funding Sources: The DIABOLO trial was funded by the Netherlands Organization for Health Research and Development (ZonMw; 171002303), and Digestive Diseases Foundation (Maag Lever Darm Stichting, MLDS WO08-54)

COI: none

Randomization: yes

Blinding: no

Dropout Rate/ITT-Analysis:

Notes:

open Extension of the DIABOLO trial

**NEWCASTLE - OTTAWA Checklist: Case Control: 1 Bewertung(en)**

Mann, N. S. et al. Segmental colitis associated with diverticulosis: systematic evaluation of 486 cases with meta-analysis. *Hepatogastroenterology.* **59.** 2119-21. 2012

Evidence level	Methodical Notes	Patient	Interventions
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characteristics			
Evidence level: 5 Study type: review and systematic description of case reports	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: Patient characteristics: Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

**NEWCASTLE - OTTAWA Checklist: Cohort: 6 Bewertung(en)**

**Bolkenstein, H. E. et al. Treatment of acute uncomplicated diverticulitis without antibiotics: risk factors for treatment failure. Int J Colorectal Dis. 33. 863-869. 2018**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 751 Recruiting Phase: <u>2005-2017</u> Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Notes:	retrospektive Kohortenstudie mit 751 Probanden Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

**Bolkenstein, H. E. et al. Development and validation of a diagnostic prediction model distinguishing complicated from uncomplicated diverticulitis. Scand J Gastroenterol. 53. 1291-1297. 2018**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 1 Study type: retrospective cross-sectional study	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 943 Recruiting Phase: Inclusion criteria: patients who presented at the emergency department with CT-proven diverticulitis. Exclusion criteria:	Interventions: to develop a diagnostic model Comparison:
Notes:	Author's conclusion: This proposed prediction model can safely rule out complicated diverticulitis. Clinical practitioners could cautiously use this model to aid them in the decision whether or not to subject patients to further secondary care diagnostics or treatment		
Outcome Measures/results	Primary Secondary	Results: Age, vomiting, generalized abdominal pain, change in bowel habit, abdominal guarding, C-reactive protein and leucocytosis were univariably related to CD. The final validated diagnostic model included abdominal guarding, C-reactive protein	

and leucocytosis (AUC 0.79 (95% CI 0.73–0.84)). At a CD risk threshold of 7.5% this model had a negative predictive value of 96%.

**Kechagias, A. et al. Index C-reactive protein predicts increased severity in acute sigmoid diverticulitis. Ther Clin Risk Manag. 14. 1847-1853. 2018**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Nicht randomiserte follow up Kohorte	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 99 Recruiting Phase: Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

**Käser, S. A. et al. Diagnostic Value of Inflammation Markers in Predicting Perforation in Acute Sigmoid Diverticulitis. World Journal of Surgery. 34. 2717-2722. 2010**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospective, comparative cohort	Funding sources: n.a. Conflict of Interests: none Randomization: no Blinding: no Dropout rates: yes	Total no. patients: 247 Recruiting Phase: 1 January 2001 to 31 December 2008. Inclusion criteria: Patients with acute sigmoid diverticulitis confirmed by computed tomography Exclusion criteria: Patients not having computed tomography scan were excluded. Patients with incomplete laboratory findings were excluded	Interventions: The presence of a perforation was defined by extraintestinal air, extraintestinal feces, abscess formation, omentovesical fistula. Patients with confined pericolic inflammation, thickening of the bowel wall, and/or stenosis of the bowel lumen alone were classified as non-perforated Comparison: Perforation vs Non-Perforation
Notes:	Author's conclusion: A CRP below 50 mg/l suggests a perforation to be unlikely in acute sigmoid diverticulitis, whereas a CRP higher than 200 mg/l is a strong indicator of perforation		
Outcome Measures/results	Primary The latest values of C-reactive protein (CRP), white blood cell count (WBC), and serum bilirubin, as well as the activity of the alkaline	Results: In the Wilcoxon rank sum test CRP and WBC correlate significantly (p<0.05) with perforation in acute sigmoid diverticulitis, whereas the logistic regression model shows only CRP to correlate significantly (p=0.001) with perforation. The sensitivities/specificities for perforation are 98%/5% for elevated CRP ([5 mg/l), 86%/27% for a CRP higher than 50 mg/l, 44%/81% for a CRP higher than 150 mg/l, 28%/93% for	

phosphatase (AP) measured during the 48 h period before the CT scan, were assessed.	a CRP higher than 200 mg/l, 88%/44% for elevated WBC ([109109/l), 35%/90% for hyperbilirubinemia ([20 μmol/l), and 35%/91% for elevated AP ([110 U/l).
Secondary	

Lorimer, J. W. et al. Comorbidity is a major determinant of severity in acute diverticulitis. *Am J Surg.* **193.** 681-5. 2007

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospective, comparative cohort	Funding sources: n.a. Conflict of Interests: n.a. Randomization: none Blinding: none Dropout rates: n.a.	Total no. patients: 281 consecutive admissions Recruiting Phase: from 1991 to 1997 Inclusion criteria: For inclusion in the "uncomplicated" group, the minimum criteria accepted involved clinical diagnosis of acute diverticulitis, proven diverticulosis on barium enema, lower abdominal pain with tenderness, and white blood cell count of greater than 10.0 or temperature greater than 37.7°C. The "complicated" group comprised patients in whom acute diverticulitis was associated with local or remote abscess formation, severe sepsis with positive blood cultures, purulent or fecal peritonitis, colon fistulas, or complete large bowel obstruction; all patients who underwent urgent operation or percutaneous drainage were included in this group. Exclusion criteria: none	Interventions: Clinical follow up, surgery or not, Comparison: Uncomplicated vs complicated course of the disease according to Komorbidität
Notes:	Author's conclusion: There are significant differences between patients presenting with simple and complicated diverticulitis, and the amount of associated comorbidity (as measured by Charlson score) appears to be a major one.		
Outcome Measures/results	Primary Charlson index was used to assess states of preexisting health (comorbidity). Secondary	Results: we were impressed by the absence of mortality with scores of 0 and the high proportion of complicated diverticulitis seen in those with scores of 3 or more Nonsteroidal anti-inflammatory drug exposure and Charlson score 3 or greater maintained their significance	

Nespoli, L. et al. Effect of oral mesalamine on inflammatory response in acute uncomplicated diverticulitis. *World J Gastroenterol.* **21.** 8366-72. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: single centre retrospective cohort study	Funding sources: n.a. Conflict of Interests: n.a. Randomization: no Blinding: no Dropout rates: no	Total no. patients: 50 Recruiting Phase: January 2012 and May 2014 Inclusion criteria: We conducted a single centre retrospective cohort study on patients admitted to our surgical department with a computed tomography -confirmed diagnosis of acute uncomplicated diverticulitis Exclusion criteria: none	Interventions: all patients were prescribed broad-spectrum intravenous antibiotics and fluid support The decision to add mesalamine to the standard therapy was taken independently by the attending physician, Comparison: 3.2 g/d of mesalamine for the duration of their in-hospital stay in addition to the usual standard therapy.
Notes:	Author's conclusion: Despite its limitations, this study suggests that mesalamine may allow for a faster recovery and for a reduction of inflammatory response in acute uncomplicated diverticulitis.		

<b>Outcome Measures/results</b>	<b>Primary endpoints</b> The primary endpoints of the study included mean daily levels of serum CRP and their variation during the first three days of in-patient treatment. Variation was defined as the difference between CRP mean values for each day of treatment and baseline.  <b>Secondary</b>	<b>Results:</b> Patients characteristics and inflammatory Retrospective Cohort StudyEffect of oral mesalamine on inflammatory response in acute uncomplicated diverticulitisLuca Nespoli, Giulia Lo Bianco, Fabio Uggeri, Fabrizio Romano, Angelo Nespoli, Davide Paolo Bernasconi, Luca Gianotti Nespoli L et al. Mesalamine in acute diverticulitis8367July 21, 2015 Volume 21 Issue 27 WJG www.wjgnet.comparameters were similar at baseline in the two groups. The evaluation of CRP levels over time showed, in treated patients, a distinct trend towards a faster decrease compared to controls. This difference app-roached statistical significance on day 2 (mean CRP 6.0 +/- 4.2 mg/dL and 10.0 +/- 6.7 mg/dL respectively in study group vs controls, P = 0.055). ΔCRP evaluation evidenced a significantly greater increment of this inflammatory marker in the control group on day 1 (P= 0.03).
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## Schlüsselfrage:

AG 04\_Akute komplizierte Divertikulitis

## Inhalt: 8 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Biondo, S. 2014	1	Multizentrische prospektive randomisierte Studie
Cirocchi, R. 2019	1	systematic review
Daniels, L. 2017	2	Randomisierte Studie
Jaccard, C. 1998	2	multicenter, prospective, controlled, randomised
Malangoni, Mark A. 2006	1	A prospective, double-blind, randomized, phase III comparative trial
Scarpa, C. R. 2015	3	cohort study
van Dijk, S. T. 2017	3	retrospective comparative Cohort study
Wacha, Hannes 2006	1	This was a randomized double-blind trial conducted in 32 surgical clinics in nine countries.

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 1 Bewertung(en)

Cirocchi, R. et al. Is the outpatient management of acute diverticulitis safe and effective? A systematic review and meta-analysis. <i>Tech Coloproctol.</i> <b>23.</b> 87-100. 2019			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1  Study type: systematic review Databases: literature search was performed on PubMed, Scopus, Embase, Central and Web of Science .  Search period: up to September 2018  Inclusion	Intervention:  Comparison:	Primary:  Secondary:  Results: his systematic review included 21 studies including 1781 patients who had outpatient management of AD including 11 prospective, 9 retrospective and only 1 randomized trial. The meta-analysis showed that outpatient management is safe, and the overall failure rate in an outpatient setting was 4.3% (95% CI 2.6%-6.3%). Localization of diverticulitis is not a selection criterion for an outpatient strategy (p 0.512). The other subgroup analyses did not report any factors that influence the rate of failure: previous episodes of acute diverticulitis (p = 0.163), comorbidities (p = 0.187), pericolic air (p = 0.653), intra-abdominal abscess (p = 0.326), treatment according to a registered protocol (p = 0.078), type of follow-up (p = 0.700), type of antibiotic treatment (p = 0.647) or diabetes (p = 0.610). In patients who failed outpatient treatment, the majority had prolonged antibiotic therapy and only few had percutaneous drainage for an abscess (0.13%) or surgical intervention for perforation (0.06%). These results should be interpreted with some caution because of the low quality of available data.	



<b>Criteria:</b> Studies including patients who had outpatient management of uncomplicated acute diverticulitis were considered  <b>Exclusion Criteria:</b>	<b>Author's Conclusion:</b> The outpatient management of AD can reduce the rate of emergency hospitalizations. This setting is already part of the common clinical practice of many emergency departments, in which a standardized protocol is followed. The data reported suggest that this management is safe if associated with an accurate selection of patients (40%); but no subgroup analysis demonstrated significant differences between groups (such as comorbidities, previous episode, diabetes). The main limitations of the findings of the present review concern their applicability in common clinical practice as it was impossible to identify strict criteria of failure.	
<b>Methodical Notes</b>		
<b>Funding Sources:</b>  <b>COI:</b>  <b>Study Quality:</b>  <b>Heterogeneity:</b>  <b>Publication Bias:</b>  <b>Notes:</b>		

**OXFORD (2011) Appraisal Sheet: RCT: 5 Bewertung(en)**

<b>Biondo, S. et al. Outpatient versus hospitalization management for uncomplicated diverticulitis: a prospective, multicenter randomized clinical trial (DIVER Trial). Ann Surg. 259. 38-44. 2014</b>		
<b>Population</b>	<b>Intervention Comparison</b>	<b>Outcomes/Results</b>
<b>Evidence level: 1</b>  <b>Study type:</b> Multizentrische prospektive randomisierte Studie  <b>Number of Patient:</b> 132 (66 vs. 66)  <b>Recruiting Phase:</b> 2009-2011  <b>Inclusion Criteria:</b> CT graphisch bestätigte akute unkomplizierte Divertikulitis Alter >18 Jahre Toleranz einer oralen Einfuhr gutes Ansprechen auf die primäre parenterale Antibiotika- und analgetische Therapie in der Notaufnahme unterschrieben Einverständniserklärung	<b>Intervention:</b> Entlassung in die ambulante Behandlung nach initialer parenteraler Analgetika und Antibiotikagabe, ambulante Fortführung einer oralen Antibiotikatherapie  <b>Comparison:</b> Stationäre Aufnahme, parenterale Flüssigkeitsgabe und Antibiotikatherapie für mindestens 48 Stunden, Umstellung auf orale Antibiotikagabe bei Nahrungstoleranz	<b>Primary:</b> Versagen der konservativen Therapie, definiert als persistierende, ansteigende oder rezidivierende abdominelle Schmerzen, Fieber, entzündliche Darmobstruktion mit der Notwendigkeit einer Abszessdrainage, Notfalloperation, stationären Wiederaufnahme oder Mortalität innerhalb von 60 Tagen nach Entlassung.  <b>Secondary:</b> Patient Reported Outcome Measures: Quality of life (SF-12) Kostenanalyse  <b>Results:</b> Kein Unterschied bzgl. primärem Studienendpunkt; 4,5% vs. 6,1% (P=0.619). Keine Unterschiede in der Lebensqualität. Dreifach erhöhte Kosten bei stationärer Therapie.  <b>Author's Conclusion:</b> Die ambulante Behandlung einer akuten unkomplizierten Divertikulitis ist sicher und effektiv, soweit keine relevanten Komorbiditäten, eine Immunsuppression, kognitive, psychiatrische, oder soziale Einschränkungen oder eine Unverträglichkeit der oralen Einfuhr bestehen.

<p><b>Exclusion Criteria:</b>          Akute komplizierte Divertikulitis          fehlendes Ansprechen auf die initiale Analgetika- und Antibiotikatherapie          Antibiotikaeinnahme aufgrund einer Divertikulitis innerhalb des letzten Monats vor der Index Aufnahme          Übelkeit und Erbrechen          Immunsuppression          Komorbidität          V.a. Malignom          kognitive, psychiatrische oder soziale Einschränkungen</p>	
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#### Methodical Notes

**Funding Sources:** Instituto Carlos III from the Ministry of Health, Government of Spain

**COI:** keine

**Randomization:** 1:1, nach Zentrum stratifiziert, mittels versiegelter Umschläge

**Blinding:** nein

**Dropout Rate/ITT-Analysis:** 9/132

**Notes:**

5 Zentren, Spanien

Daniels, L. et al. Randomized clinical trial of observational versus antibiotic treatment for a first episode of CT-proven uncomplicated acute diverticulitis. *Br J Surg.* **104.** 52-61. 2017

Population	Intervention - Comparison	Outcomes/Results
<p><b>Evidence level:</b> 2</p> <p><b>Study type:</b> Randomisierte Studie</p> <p><b>Number of Patient:</b> 528</p> <p><b>Recruitment Phase:</b> From 1 June 2010 to 14 October 2012, 8</p> <p><b>Inclusion Criteria:</b> patients with uncomplicated acute diverticulitis</p> <p><b>Exclusion Criteria:</b></p>	<p><b>Intervention:</b> Participants were assigned randomly to either an observational or antibiotic treatment strategy. amoxicillin-clavulanic acid was chosen as broad-spectrum antibiotic treatment (10-day course, with intravenous administration of 1200 mg four times daily for at least 48 h, after which the route could be switched, if tolerated, to oral administration of 625 mg three times daily.</p> <p><b>Comparison:</b> Patients allocated to observational treatment could be treated directly in an outpatient setting when the following criteria were met: toleration of a normal diet, temperature less than 38°C, pain score measured on a visual analogue scale (VAS) below 4 (with paracetamol at the most), capable of self-support at same level as</p>	<p><b>Primary:</b> time to recovery</p> <p><b>Secondary:</b> days spent outside hospital in the 6-month period, readmission rate, occurrence of complicated diverticulitis (abscess, perforation, obstruction/stricture, diverticular bleeding or fistula), ongoing diverticulitis and acute diverticulitis recurrence, need for sigmoid resection.</p> <p><b>Results:</b> Median time to recovery was 14 (i.q.r. 6–35) days for the observational and 12 (7–30) days for the antibiotic treatment strategy, with a hazard ratio for recovery of 0.91 (lower limit of 1-sided 95 % CI 0.78; P = 0.151). No significant differences between the observation and antibiotic treatment groups were found for secondary endpoints: complicated diverticulitis (3.8 versus 2.6 per cent respectively; P = 0.377), ongoing diverticulitis (7.3 versus 4.1 per cent; P = 0.183), recurrent diverticulitis (3.4 versus 3.0 per cent; P = 0.494), sigmoid resection (3.8 versus 2.3 per cent; P = 0.323), readmission (17.6 versus 12.0 per cent; P = 0.148), adverse events (48.5 versus 54.5 per cent; P = 0.221) and mortality (1.1 versus 0.4 per cent; P = 0.432). Hospital stay was significantly shorter in the observation group (2 versus 3 days; P = 0.006). Per-protocol analyses were concordant with the intention-to-treat analyses.</p>

	before illness, and patient acceptance.	<b>Author's Conclusion:</b> Observational treatment without antibiotics did not prolong recovery and can be considered appropriate in patients with uncomplicated diverticulitis.
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**Methodical Notes****Funding Sources:**

COI:

Randomization:

Blinding:

Dropout Rate/ITT-Analysis:

Notes:

Jaccard, C. et al. Prospective Randomized Comparison of Imipenem-Cilastatin and Piperacillin-Tazobactam in Nosocomial Pneumonia or Peritonitis. *Antimicrobial Agents and Chemotherapy*. **42**, 2966-2972. 1998

Population	Intervention Comparison	Outcomes/Results
<p>Evidence level: 2</p> <p>Study type: multicenter, prospective, controlled, randomised</p> <p>Number of Patient: 371</p> <p>Recruitment Phase: December 1993 to May 1996</p> <p>Inclusion Criteria: Acute peritonitis. Acute peritonitis was assessed intraoperatively, and microbiological documentation was attempted in all cases. The only exception was sigmoid diverticulitis, which was defined as muscle guarding and rebound tenderness in the left iliac fossa or left flank with leukocytosis (WBC count, &gt;1010/liter) or leukopenia (WBC count, &lt;43109/liter) and fever &gt;38°C. In cases where a computerized axial tomography scan was diagnostic, peritonism in left lower quadrant was sufficient for inclusion</p> <p>Exclusion Criteria: Exclusion criteria included pregnancy or lactating state, expected survival of less than 48 h, known allergy to <math>\beta</math>-lactam antibiotics or <math>\beta</math>-lactamase inhibitors, human immunodeficiency virus infection, concomitant infection other than intra-abdominal or nosocomial pneumonia,</p>	<p>Intervention: Patients were openly assigned to one of the following two regimens: piperacillin-tazobactam at 4.5 g three times a day or imipenem-cilastatin at 500 mg four times a day. The dosage of each regimen was adjusted to renal function</p> <p>Comparison:</p>	<p>Primary: Peritonitis. Patients with peritonitis were considered to have been clinically cured if the initial course of therapy and the initial intervention resolved the intra-abdominal infectious process. Any further antibiotic treatment or surgery for peritonitis within 7 days after the end of treatment was considered a failure of the original treatment (42)</p> <p>Secondary:</p> <p>Results: In the treatment of peritonitis (Table 3), piperacillin-tazobactam was clinically successful in 72 of 76 patients (95%) and imipenem-cilastatin was clinically successful in 77 of 83 (93%) (RR 51.02; P 50.75). There were no significant differences in mean duration of treatment or death due to infection</p> <p>Author's Conclusion: piperacillin-tazobactam monotherapy is at least as effective and safe as imipenem-cilastatin in the treatment of nosocomial pneumonia and peritonitis</p>

**Methodical Notes**

**Funding Sources:** This study was supported by a grant from Wyeth-Lederle Switzerland and MSD-Chibret Switzerland

COI: n.a.

Randomization: yes

Blinding: no

Dropout Rate/ITT-Analysis: yes

Notes:

Malangoni, Mark A. et al. Randomized Controlled Trial of Moxifloxacin Compared With Piperacillin/Tazobactam and Amoxicillin/Clavulanate for the Treatment of Complicated Intra-abdominal Infections. *Annals of Surgery*. 244. 204-211. 2006

Population	Intervention Comparison	Outcomes/Results
<p>Evidence level: 1</p> <p>Study type: A prospective, double-blind, randomized, phase III comparative trial</p> <p>Number of Patient: Of 656 intent-to-treat patients,</p> <p>Recruiting Phase: Between October 23, 2000 and April 22, 2003,</p> <p>Inclusion Criteria: Complicated intrabdominal infection</p> <p>Exclusion Criteria: Patients with any of the following diagnoses were excluded from the study: preexisting ascites with spontaneous bacterial peritonitis; pancreatic origin of infection; perforated peptic ulcer or traumatic upper gastrointestinal tract perforation of 24 hours duration; traumatic perforation of the small or large bowel of 12 hours duration; transmural necrosis of the intestine due to acute embolic, thrombotic, or obstructive occlusions; acute cholecystitis with infection confined to the gallbladder; nonperforated appendicitis (unless there was evidence of an abscess or peritonitis); perinephric infections; gynecologic infections; indwelling peritoneal catheter; planned multiple laparotomies; conditions requiring antibiotic irrigations of the abdominal cavity or incision; and patients requiring "open abdomen" or marsupialization (defined as planned repacking or planned debridement) techniques for management. Additionally, patients who were pregnant or nursing and patients with any of the following medical conditions were excluded from the study: immunologic compromise, including those receiving chronic immunosuppressant therapy (15 mg/day systemic prednisone or equivalent) or HIV seropositive with a CD4 count &lt;200 cells/L; neutropenia (&lt;1000 cells/L); renal insufficiency (serum creatinine &gt;2.5 mg/dL) or the need for hemodialysis or peritoneal dialysis; severe hepatic insufficiency (Child-Pugh class C); known QTc prolongation or receiving medications known to increase the QTc interval; uncorrected hypokalemia; known hypersensitivity to study drugs or multivitamin infusion; preexisting hypervitaminosis; history of phenylketonuria; history of fluoroquinolone-associated tendinopathy; or infection requiring treatment with an</p> <p><i>Annals of Surgery</i> • Volume 244, Number 2, August 2006 Moxifloxacin in Complicated Intra-abdominal Infections © 2006 Lippincott</p>	<p>Intervention: moxifloxacin, 400 mg IV every 24 hours, followed by moxifloxacin, 400 mg PO every 24 hours (Bayer HealthCare, Pharmaceuticals, West Haven, CT), or piperacillin-tazobactam, 3.0/0.375 g IV every 6 hours, followed by amoxicillin-clavulanate, 800/114 mg PO every 12 hours (comparator agents were supplied by Bayer HealthCare, Pharmaceuticals or sourced from study site pharmacies if approved by sponsors). The duration of combined IV/PO treatment was 5 to 14 days. The decision to switch from IV to PO administration was made by the investigator, who was blinded to treatment group, and was based on the patient's clinical status and ability to tolerate oral therapy</p> <p>Comparison:</p>	<p>Primary: Clinical response at the test-of-cure visit (the primary efficacy variable) was defined as cure (disappearance of acute signs and symptoms related to the infection, or sufficient improvement such that additional antimicrobial therapy was not required), failure (insufficient resolution of the signs and symptoms of acute infection requiring additional or alternative antimicrobial therapy or additional operation or percutaneous intervention or an outcome of failure at a previous visit), or indeterminate (assessment not possible for any reason). For the clinical efficacy population, indeterminate outcomes at the during treatment and end of therapy visits were to be treated as failures. For the intent-to-treat population, indeterminate outcomes were treated as failures at all visits.</p> <p>Secondary:</p> <p>Results: Clinical cure rates at the test-of-cure visit (the primary efficacy variable) in the efficacy-valid population were similar in the 2 groups (80% for moxifloxacin and 78% for comparator; 95% confidence interval, 7.4%, 9.3%, Table 3). Similarly, there were no significant differences in clinical cure rates between the 2 groups at the end-of-therapy or during-therapy visits. No patient had an outcome of "indeterminate" at the test-of-cure visit among those in the efficacy-valid population. There were no differences in clinical cure rates by infection site</p>

<p>Williams &amp; Wilkins205 anti-infective agent other than the study drugs. Patients who received prior antibiotic therapy were excluded unless therapy failed and they had a subsequent positive culture</p>		<p>Author's Conclusion: Once daily IV/PO moxifloxacin monotherapy was at least as effective as standard IV piperacillin-tazobactam/PO amoxi-cillin-clavulanate dosed multiple times daily for the treatment of cIAIs.</p>
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#### Methodical Notes

Funding Sources: n.a.

COI: n.a.

Randomization: yes

Blinding: yes

Dropout Rate/ITT-Analysis: yes

Notes:

Wacha, Hannes et al. Comparison of Sequential Intravenous/Oral Ciprofloxacin Plus Metronidazole with Intravenous Ceftriaxone Plus Metronidazole for Treatment of Complicated Intra-abdominal Infections. *Surgical Infections*. 7. 341-354. 2006

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 1</p> <p>Study type: This was a randomized double-blind trial conducted in 32 surgical clinics in nine countries.</p> <p>Number of Patient: The intention-to-treat (ITT) population consisted of the 523 patients</p> <p>Recruitment Phase:</p> <p>Inclusion Criteria: Patients were eligible for inclusion if they were 18 years of age or older and had proved or suspected complicated intra-abdominal infection.</p> <p>Exclusion Criteria: Patients were excluded from the trial for the following reasons: Acute Physiology and Chronic Health Evaluation (APACHE) II score 30 or an expected survival time of less than 48 h; renal insufficiency manifested either by a need for renal replacement therapy or by a serum creatinine concentration of 3.0 mg/dL; allergy to CIP or other fluoroquinolone, MTR, or CEF, including anaphylaxis in response to any beta-lactam drug; pregnancy or lactation; diffuse necrotizing pancreatitis; an indwelling peritoneal catheter; ascites with primary bacterial peritonitis; perinephric infections; infections of the female genital tract; perforation of the upper gastrointestinal tract of less than 24 h duration; perforation of the lower gastrointestinal tract less than 12 h duration; and suspected appendicitis with a temperature 38.0°C clinical symptoms for 24 h.</p>	<p>Intervention: Patients were randomized in a 1:1 ratio using a computer-generated code: 266 patients to the CIPMTR group and 265 patients to the CEFMTR group. Randomization and blinding were the responsibility of the study site pharmacist, who alone had access to the code</p> <p>Comparison:</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results: Of the patients valid for efficacy, 78% of the ciprofloxacin plus metronidazole group and 81% of the ceftriaxone plus metronidazole group were eligible for a switch to oral therapy. The clinical success rates were 98.9% and 96.9%, respectively, which were statistically equivalent. The clinical success rates for all patients, including those on continuous IV therapy, were 90.6% and 87.9%. Source control was achieved in more than 90% of the patients. The bacteriological eradication rates were similar in the two groups. Bacterial complications (e.g., surgical site infections, abscesses) were encountered more often in the ceftriaxone plus metronidazole group.</p> <p>Author's Conclusion: Sequential ciprofloxacin plus metronidazole IV-to-oral therapy was statistically equivalent to ceftriaxone plus metronidazole. The switch to oral therapy with ciprofloxacin plus metronidazole was as effective and safe as continued IV therapy in patients able to tolerate enteral feeding</p>

#### Methodical Notes

Funding Sources: n.a.  
 COI: n.a.  
 Randomization: yes  
 Blinding: yes  
 Dropout Rate/ITT-Analysis: yes  
 Notes:

**NEWCASTLE - OTTAWA Checklist: Cohort: 2 Bewertung(en)**

Scarpa, C. R. et al. Short-term Intravenous Antibiotic Treatment in Uncomplicated Diverticulitis Does Not Increase the Risk of Recurrence Compared to Long-term Treatment. *Ann Coloproctol.* **31.** 52-6. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: cohort study	Funding sources: na Conflict of Interests: no conflict of interests Randomization: na Blinding: na Dropout rates: 256 out of 282	Total no. patients: 256 Recruiting Phase: <u>2007-2012</u> Inclusion criteria: first episode of uncomplicated diverticulitis (Hinchey Ia), Exclusion criteria: na	Interventions: short-course IV antibiotic arm (ceftriaxone and metronidazole) for up to 5 days (followed by 5 days of oral antibiotics); Comparison: the other received a long-course IV arm between days 5 and 10.
Notes:	Author's conclusion: Treatment of diverticulitis with a short IV antibiotic treatment is possible and does not modify the recurrence rate in patients with uncomplicated diverticulitis.		
Outcome Measures/results	Primary primary outcome was the recurrence-free survival time. Secondary na	Results: The recurrence-free survivals were very similar between the two groups, which was supported by a log rank test (P = 0.772).	

van Dijk, S. T. et al. Predictive factors on CT imaging for progression of uncomplicated into complicated acute diverticulitis. *Int J Colorectal Dis.* **32.** 1693-1698. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospective comparative Cohort study	Funding sources: The DIABOLO trial was funded by the Netherlands Organisation for Health Research and Development (ZonMw; 171002303), and Digestive Diseases Foundation (MaagLever Darm Stichting, MLDS WO08-54). No additional funding was received for this study Conflict of Interests: none	Total no. patients: Of the 528 patients with uncomplicated diverticulitis in the DIABOLO trial, 16 patients progressed into complicated di-verticulitis within 90 days after randomization Recruiting Phase: Inclusion criteria: Four	Interventions: Unclear, the patients were allocated to two treatment arms of DIABOLO Comparison:

	<p>Randomization: no</p> <p>Blinding: no</p> <p>Dropout rates:</p>	<p>patients developed an abscess larger than 5 cm, six patients developed perforation, and six patients developed bowel obstruction demanding surgical intervention</p> <p>Exclusion criteria:</p>
Notes:	<p>Post hoc Analyse of DIABOLO-Study</p> <p>Author's conclusion: Fluid collections and to a lesser extent the length of the inflamed colon segment may serve as predictive factors on initial CT for a complicated disease course in patients with uncomplicated acute colonic diverticulitis. These findings may aid in the selection of patients not suitable for outpatient treatment and treatment without antibiotics.</p>	
Outcome Measures/results	<p>Primary multiple CT-findings</p> <p>Secondary</p>	<p>Results: In the group with a complicated course of initially uncomplicated diverticulitis, more patients with fluid collections (25 vs. 0%; <math>p=0.009</math>) and a longer inflamed colon segment (<math>86 \pm 26</math> mm vs. <math>65 \pm 21</math> mm; <math>p=0.007</math>) were observed compared to an uncomplicated course of disease. Pericolicestral air was no predictive factor.</p>



## Schlüsselfrage:

AG 04\_Chronische Divertikelkrankheit

## Inhalt: 15 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Bianchi, M. 2011	1	Systematic review and metaanalysis
Carabotti, M. 2018	3	Non-systematic review on new developments
Di Mario, F. 2019	3	Retrospective multicenter comparative cohort study
Iannone, A. 2018	1	systematic review
Kruis, W. 2017	2	Two phase 3, randomised, placebo-controlled, double-blind multicentre trials
Lanas, A. 2013	3	multicentre, randomized, open controlled study the study was interrupted since the recruitment rate was largely below the minimum anticipated, and the trial was switched from evidence-gathering to proof-of-concept
Leahy, A. L. 1985	5	Retrospektive Kohortenstudie
Maconi, G. 2011	1	systematic review
Ojetti, V. 2018	1	systematic review A meta-analysis was originally planned to provide a numerical estimate of the overall effect of the probiotics treatment with respect to baseline or with respect to controls, taking into account the regression or the absence of abdominal symptoms. Due to the heterogeneity of the retrieved studies, and the little database of total patients, meta-analysis was not considered applicable. So, the efficacy of the probiotics in different phases of Diverticular Disease was described in a qualitative and not quantitative manner.
Papi, C. 1995	2	double-blind placebo-controlled trial
Parente, F. 2013	2	multicentre, randomised, double-blind, placebo-controlled pilot study
Picchio, M. 2018	1	Systematic Review with Meta-Analysis of Randomized, Placebo-Controlled Trials
Raskin, J. B. 2014	2	Randomisierte geblindete Multicenterstudien
Stollman, N. 2013	1	r, db, pl
Tursi, A. 2013	1	A multicentre, double-blind, placebo-controlled study

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 6 Bewertung(en)

Bianchi, M. et al. Meta-analysis: long-term therapy with rifaximin in the management of uncomplicated diverticular disease. <i>Aliment Pharmacol Ther.</i> 33. 902-10. 2011			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: Systematic review and metaanalysis Databases: The RCTs were	Intervention: To evaluate the long-term efficacy administration of rifaximin plus fibresupplementation vs. fibre supplementation	Primary: Secondary: Results: Four prospective randomised trials	49 references



<p>identified by searching MEDLINE, and the Cochrane Central Register of Controlled Trials from 1966 to September 2010. A computer-assisted search was conducted using the following combination of medical subject heading terms (MESH and not MESH terms)</p> <p>Search period:</p> <p>Inclusion Criteria: SUDD</p> <p>Predefined inclusion criteria were: (1) prospective RCTs of treatment with poorly absorbed antibiotics vs. no treatment in symptomatic colonic diverticular disease; (2) well-defined outcome</p> <p>Exclusion Criteria:</p>	<p>alone, on symptoms and complications, in patient with symptomatic uncomplicated diverticular disease.</p> <p>Comparison:</p>	<p>including 1660 patients were selected. The pooled RD for symptom relief was 29.0% (rifaximin vs. control; 95% CI 24.5–33.6%; P &lt; 0.0001; NNT = 3). The pooled RD for complication rates was 1.7% in favour of rifaximin (95% CI 3.2 to 0.1%; P = 0.03; NNT = 59). When considering only acute diverticulitis, the pooled RD in the treatment group was 2% (95% CI 3.4 to 0.6%; P = 0.0057; NNT = 50)</p> <p>Author's Conclusion: In symptomatic uncomplicated diverticular disease, treatment with rifaximin plus fibre supplementation is effective in obtaining symptom relief and preventing complications at 1 year</p>
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<p><b>Methodical Notes</b></p> <p>Funding Sources: n.a.</p> <p>COI: n.a.</p> <p>Study Quality:</p> <p>Heterogeneity:</p> <p>Publication Bias: We did not find any evidence of publication bias.</p> <p>Notes:</p>
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Carabotti, M. et al. Treatment of diverticular disease: an update on latest evidence and clinical implications. *Drugs Context.* 7. 212526. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 3</p> <p>Study type: Non-systematic review on new developments</p> <p>Databases:</p> <p>Search period:</p> <p>Inclusion Criteria: Recent trials on treatment of diverticular disease</p> <p>Exclusion Criteria:</p>	<p>Intervention:</p> <p>Comparison:</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results:</p> <p>Author's Conclusion:</p>	<p>68 references</p>

<p><b>Methodical Notes</b></p> <p>Funding Sources:</p> <p>COI:</p> <p>Study Quality:</p> <p>Heterogeneity:</p> <p>Publication Bias:</p> <p>Notes: This is a non-systematic review on latest developments in treatment of diverticular disease</p>
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Iannone, A. et al. Mesalazine for People with Diverticular Disease: A Systematic Review of Randomized Controlled Trials. *Can J Gastroenterol Hepatol.* 2018. 5437135. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References

<p><b>Evidence level:</b> 1</p> <p><b>Study type:</b> systematic review</p> <p><b>Databases:</b> randomized controlled trials of mesalazine in diverticular disease was performed in MEDLINE (1946 to July 2018), EMBASE (1996 to July 2018), the Cochrane Central Register of Controlled Trials (CENTRAL,</p> <p><b>Search period:</b> <u>1946-2018</u></p> <p><b>Inclusion Criteria:</b> We included any randomized controlled trials which compared mesalazine, at any dose, mode, and duration of administration with any intervention for the treatment of people with diverticular disease. Diverticular disease was defined as the presence of any colonic diverticula-related symptoms [3]</p> <p><b>Exclusion Criteria:</b> We excluded trials not involving any arm treated with mesalazine alone or comparing this treatment only with a combination therapy including mesalazine.</p>	<p><b>Population:</b> global; II patients with diverticular disease</p> <p><b>Intervention:</b> oral mesalazine</p> <p><b>Comparison:</b> various</p>	<p><b>Primary:</b> We evaluated the number of participants achieving diverticular disease remission, developing diverticular disease recurrence, and experiencing acute diverticulitis in symptomatic uncomplicated diverticular disease.</p> <p><b>Secondary:</b> none</p> <p><b>Results:</b> We identified 13 randomized trials (n=3028 participants). There was a higher likelihood of disease remission with mesalazine than controls in acute uncomplicated diverticulitis (1 trial, 81 participants, RR=2.67, 95%CI=1.05-6.79), but not in symptomatic uncomplicated diverticular disease (1 trial, 123 participants, RR=1.04, 95%CI=0.81-1.34). There was a lower likelihood of disease recurrence with mesalazine than controls in symptomatic uncomplicated diverticular disease (2 trials, 216 participants, RR=0.52, 95%CI=0.28-0.97), but not in acute uncomplicated diverticulitis (7 trials, 2196 participants, RR=0.90, 95%CI=0.61-1.33). There was no difference in the likelihood of developing acute diverticulitis in symptomatic uncomplicated diverticular disease between the two groups (3 trials, 484 participants, RR=0.26, 95%CI=0.06-1.20). There was a higher global symptoms score reduction with mesalazine than controls in symptomatic uncomplicated diverticular disease (2 trials, 326 participants, SMD=-1.01, 95%CI=-1.51,-0.52) and acute uncomplicated diverticulitis (2 trials, 153 participants, SMD=-0.56, 95%CI=-0.88,-0.24).</p> <p><b>Author's Conclusion:</b> Mesalazine may reduce recurrences in symptomatic uncomplicated diverticular disease. There is uncertainty on the effect of mesalazine in achieving diverticular disease remission. Mesalazine may not prevent acute diverticulitis in symptomatic uncomplicated diverticular disease</p>	<p>41 references</p>
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**Methodical Notes**

**Funding Sources:** none

**COI:** none

**Study Quality:** The review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement [ ]

**Heterogeneity:** We formally estimated heterogeneity of intervention effects among studies with the Chi2 (Cochran Q) and the I2 statistics.

**Publication Bias:** We assessed the study level risk of bias with the Cochrane risk of bias tool, including the domains of random sequence generation, allocation concealment, blinding of participants or investigators, blinding of outcome assessment, completeness of outcome data, selective reporting, and other threats to validity

**Notes:**

Maconi, G. et al. Treatment of diverticular disease of the colon and prevention of acute diverticulitis: a systematic review. *Dis Colon Rectum*. 54. 1326-38. 2011

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p><b>Evidence level:</b> 1</p> <p><b>Study type:</b> systematic review</p> <p><b>Databases:</b> To select the studies included in this review, we made a search of MEDLINE and Embase, The search strategy covered issues related to DD or diverticulosis of the colon and</p>	<p><b>Intervention:</b> The studies selected were prospective clinical trials on uncomplicated</p>	<p><b>Primary:</b> The main outcomes measured were improvement in symptoms, complete remission of symptoms, and</p>	<p>68 references</p>

treatment with dietary fiber, rifaximin, antibiotics, mesalazine, pro-biotics, or antispasmodics to improve symptoms, maintain remission of symptoms, and prevent acute diverticulitis.

Search period: 1966 to February 2010.

**Inclusion Criteria:** colonic disease with an additional search using key words: ((diverticulosis OR diverticular OR diverticula OR diverticulitis) AND (colon OR colonic OR sigmoid)) OR "diverticulosis, colonic" (MeSH) to assess all articles on colonic diverticulosis and DD of the colon. Combine with text words (Mesalamine OR mesalazine OR 5-ASA OR sulfasalazine OR balsalazide) OR "sul-fasalazine" (MeSH) OR "mesalamine" (MeSH). Combine with text words (Rifaximin OR Rifamycins OR Tetracycline OR Quinolones OR Nitroimidazole OR beta-lactams OR cephalosporins OR anti-biotic\*) OR "Rifamycins" (MeSH) OR "Tetracycline" (MeSH) OR "Quinolones" (MeSH) OR "Nitroimidazole" (MeSH) OR "beta-lactams" (MeSH) OR "cephalosporins" (MeSH). Combine with text words: (probiotic\* OR prebiotic\* OR lactobacilli OR bifidobacteria OR Escherichia OR VSL) OR "Probiotics" (MeSH). Combine with text words ("dietary fiber" OR "dietary fibers" OR "bulking agent" OR "bulking agents" OR bran OR psyllium OR roughage\* OR vegetables OR husk OR ispaghula OR sterculia) OR "Dietary fiber" (MeSH). Combine with text words: (antispasmodic\* OR bromide OR "peppermint oil" OR "mentha piperita" OR antispasmodic OR mebeverine OR trimebutine) OR "mebeverine" (Substance Name) OR "Trimebutine" (MeSH) OR "Parasympatholytics" (MeSH) OR "Butylscopolamin Bromide" (MeSH) OR "Menthapiperita" (MeSH). The following filter was used: NOT (Animal (MeSH)) NOT (Human (MeSH)) AND Animal (MeSH). In addition, manual searches of reference lists from potentially relevant articles and reviews were made to identify additional studies that may have been missed by using the computer-assisted search strategy. This review included the following: 1) studies dealing with: a) symptomatic patients with DD of the colon without previous attacks of acute diverticulitis or no mention of this condition in their clinical history, or with one or more attacks of acute diverticulitis in the past year, and b) asymptomatic (previously symptomatic) patients, enrolled after a course of medical therapy with antibiotics, probiotics, or mesalazine for a recent (3 mo) attack of acute diverticulitis or recurrent symptomatic DD of the colon. 2) Prospective open or randomized trials on uncomplicated DD of the colon, published as full articles, without specific language restriction or length of follow-up, with one or more of the following outcome measures: a) improvement in symptoms (percentage of subjects with reduction of symptoms), b) complete remission of symptoms at the end of follow-up (percentage of asymptomatic patients), and c) prevention of acute diverticulitis during DISEASES OF THE COLON & RECTUM VOLUME 54: 10 (2011) 1327 the follow-up (percentage of patients experiencing acute diverticulitis).

**Exclusion Criteria:** All titles and/or abstracts identified by the electronic searches were independently scrutinized by 2 researchers. The reviewers checked whether inclusion and exclusion criteria were met and, in the event of uncertainty, the full text of articles was retrieved and reviewed, and eventual disagreement was resolved by consensus.

diverticular disease of the colon.

Comparison:

prevention of acutediverticulitis.

Secondary:

**Results:** Only one long-term double-blind placebo-controlled study was identified. This reported a significant improvement in symptoms and greater prevalence of symptom-free patients at 1 year with fiber plus rifaximin in comparison with fiber alone. The efficacy of treatment in preventing acute diverticulitis was evaluated in 11 randomized trials. Four trials compared rifaximin plus fiber vs fiber alone and failed to show a significant difference between treatments. However, cumulative data from these trials revealed a significant benefit following rifaximin and fiber (1-year rate of acute diverticulitis: 11/970 (1.1%) vs 20/690 (2.9%); P.012), but with a number needed to treat of 57, to prevent an attack of acute diverticulitis.

**Author's Conclusion:** The treatment for diverticular disease relies mainly on data from uncontrolled studies. Treatment showed some evidence of improvement in symptoms, but its role in the prevention of acute diverticulitis remains to be defined.

#### Methodical Notes

Funding Sources: n.a.

COI: none

Study Quality: very good

**Heterogeneity:** Heterogeneity of the study design, patients' characteristics, regimens and combination of studied treatment, and outcome reporting precluded the pooling of results and limited interpretation

Publication Bias: no

Notes:

Ojetti, V. et al. The Use of Probiotics in Different Phases of Diverticular Disease. Rev Recent Clin Trials. 13. 89-96. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: systematic review</p> <p>A meta-analysis was originally planned to provide a numerical estimate of the overall effect of the probiotics treatment with respect to baseline or with respect to controls, taking into account the regression or the absence of abdominal symptoms. Due to the heterogeneity of the retrieved studies, and the little database of total patients, meta-analysis was not considered applicable. So, the efficacy of the probiotics in different phases of Diverticular Disease was described in a qualitative and not quantitative manner.</p> <p>Databases: PubMed Medline, EMBASE Elsevier, ResearchGate and Cochrane Central Register of Controlled Trial</p> <p>Search period:</p> <p>Inclusion Criteria:</p> <p>Exclusion Criteria:</p>	<p>Population: A total of 254 papers were firstly analyzed. Based on the inclusion and exclusion criteria, only 13 papers were finally included in our systematic review</p> <p>Intervention:</p> <p>Comparison:</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results:</p> <p>Author's Conclusion: In conclusion, despite the importance of the results obtained so far, the role of probiotics in different phases of DD is still to be fully understood.</p>	
<b>Methodical Notes</b>			
<p>Funding Sources:</p> <p>COI:</p> <p>Study Quality:</p> <p>Heterogeneity:</p> <p>Publication Bias:</p> <p>Notes:</p>			

Picchio, M. et al. Mesalazine to treat symptomatic uncomplicated diverticular disease and to prevent acute diverticulitis occurrence. A systematic review with meta-analysis of randomized, placebo-controlled trials. J Gastrointest Liver Dis. 27. 291-297. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Systematic Review with Meta-Analysis of Randomized, Placebo-Controlled Trials</p> <p>Databases: The RCTs were identified by searching MEDLINE, and the Cochrane Central Register of Controlled Trials from 1966 to November 2017. A computer-assisted search was conducted using the following combination of medical subject heading terms (MESH and not MESH terms):</p> <p>Search period:</p> <p>Inclusion Criteria: Two double-blind, placebo-controlled randomised trials have been published as full papers. Two further double-blind, placebo-controlled randomised trials have been published</p>	<p>Population: We assessed the effectiveness of mesalazine in improving symptoms (namely abdominal pain, primary outcome) and in preventing diverticulitis occurrence (secondary outcome) in patients with SUDD.</p> <p>Intervention: Mesalazine</p> <p>Comparison: multiple</p>	<p>Primary: The selected primary outcome was the percentage of patients with symptom relief at maximal follow-up.</p> <p>Secondary: The secondary outcome was diverticulitis occurrence at maximal follow-up</p> <p>Results: Four RCTs enrolled 379 patients, 197 treated with mesalazine and 182 with placebo. Two studies provided data on symptom relief according to definition: it was achieved in 97/121 (80%) patients in the mesalazine group and in 81/129 (62.7%) patients in the placebo group (OR 0.43; 95% CI 0.24-0.75; p=0.003 in favour of the mesalazine group). Two studies provided information regarding occurrence of diverticulitis during follow-up. It occurred in 23/119 (19.3%) patients in the mesalazine group and in 34/102 (33.3%) patients in the placebo group (OR 0.35; 95% CI 0.17-0.70; p=0.003 in favour of the mesalazine group).</p> <p>Author's Conclusion: Treatment with mesalazine seems to be effective in achieving symptom relief and in the primary prevention of diverticulitis in patients with SUDD</p>	35 references

as abstracts. The characteristics of the studies are reported

Exclusion Criteria: as described

**Methodical Notes**

Funding Sources: n.a.

COI: none

Study Quality: ver good

Heterogeneity: n.a.

Publication Bias: as described

Notes:

**OXFORD (2011) Appraisal Sheet: RCT: 7 Bewertung(en)**

Kruis, W. et al. Randomised clinical trial: mesalazine versus placebo in the prevention of diverticulitis recurrence. *Aliment Pharmacol Ther.* **46.** 282-291. 2017

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 2</p> <p>Study type: Two phase 3, randomised, placebo-controlled, double-blind multicentre trials</p> <p>Number of Patient: PP: 270 (SAG 37) + 218(SAG 51)</p> <p>Recruiting Phase: The SAG-37 study was performed from 2008 to 2011 at 57 centres in 11 countries; SAG-51 was undertaken from 2010 to 2013 at 74 centres in nine countries.</p> <p>Inclusion Criteria: Patients were eligible for the study if (1) they were between 30 and 80 years old (SAG-51) or 40-80 years old (SAG-37), (2) they had a prior diagnosis of left-sided uncomplicated acute diverticulitis confirmed by ultrasonography or computed tomography (CT) with at least one diverticulum in the left colon</p> <p>Exclusion Criteria:</p>	<p>Intervention: SAG-37, patients were randomly assigned in a 1:1 ratio to receive mesalazine 3.0 g once daily (Salofalk granules) or placebo over a period of 48 weeks. In SAG-51, patients were randomised to mesalazine 1.5 g once daily (Salofalk granules, arm A), mesalazine 3.0 g once daily (Salofalk granules, armB) or placebo (arm C) for 96 weeks.</p> <p>Comparison:</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results: Mesalazine did not increase the proportion of recurrence-free patients over 48 or 96 weeks compared to placebo</p> <p>Author's Conclusion: Mesalazine was not superior to placebo in preventing recurrence of diverticulitis</p>

**Methodical Notes**

Funding Sources:

COI:

Randomization:

Blinding:

Dropout Rate/ITT-Analysis:

Notes:

Lanas, A. et al. One year intermittent rifaximin plus fibre supplementation vs. fibre supplementation alone to prevent diverticulitis recurrence: a proof-of-concept study. *Dig Liver Dis.* **45.** 104-9. 2013

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 3</p> <p>Study type: multicentre, randomized, open controlled study</p>	<p>Intervention: All patients enrolled by the attending physician received 3.5g b.d. of plantago ovata husk formulated as effervescent granulate</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results: Recurrences occurred in 17/88</p>

<p>the study was interrupted since the recruitment rate was largely below the minimum anticipated, and the trial was switched from evidence-gathering to proof-of-concept</p> <p>Number of Patient: ITT: 165 PP 142 (planned: 228+228)</p> <p>Recruiting Phase: Between July 2007 and December 2008</p> <p>Inclusion Criteria:</p> <p>Exclusion Criteria:</p>	<p>with or without one week per month of the non-absorbable antibiotic rifaximin(400mgb.d.) for 12 months</p> <p>Comparison:</p>	<p>patients among controls (19.3%,95%CI:12.7–29.4%) and in 8/77 among treated patients(10.4%,95%CI:5.5–19.7%).</p> <p>Author's Conclusion: In summary,this study yields a positive proof-of-concept of the efficacy of 1-year intermittent rifaximin to prevent recurrence of diverticulitis, with appropriate safety profile.</p>
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**Methodical Notes****Funding Sources:**

COI:

Randomization:

Blinding:

Dropout Rate/ITT-Analysis:

Notes:

Papi, C. et al. Efficacy of rifaximin in the treatment of symptomatic diverticular disease of the colon. A multicentre double-blind placebo-controlled trial. *Aliment Pharmacol Ther.* **9**, 33-9. 1995

Population	Intervention - Comparison	Outcomes/Results
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<p>Evidence level: 2</p> <p>Study type: double-blind placebo-controlled trial</p> <p>Number of Patient: 168</p> <p>Recruiting Phase:</p> <p>Inclusion Criteria: na</p> <p>Exclusion Criteria: na</p>	<p>Intervention: fibre supplementation (glucomannan 2 g/day) plus rifaximin 400 mg b.d. for 7 days every month (84 patients),</p> <p>Comparison: glucomannan 2 g/day plus placebo two tablets b.d. for 7 days every month (84 patients)</p>	<p>Primary: symptom-free or mildly symptomatic diverticular disease at 3 and 12 months</p> <p>Secondary: bloating and abdominal pain or discomfort</p> <p>Results: After 12 months, 68.9% of the patients treated with rifaximin were symptom-free or mildly symptomatic, compared to 39.5% in the placebo group (P = 0.001). Symptoms such as bloating and abdominal pain or discomfort were primarily affected by antibiotic treatment when compared with placebo (P &lt; 0.001).</p> <p>Author's Conclusion: Rifaximin appears to be of some advantage in obtaining symptomatic relief in diverticular disease of the colon when compared with fibre supplementation alone.</p>
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**Methodical Notes**

Funding Sources: na

COI: na

Randomization: na

Blinding: double-blind

Dropout Rate/ITT-Analysis: na

Notes:

Parente, F. et al. Intermittent treatment with mesalazine in the prevention of diverticulitis recurrence: a randomised multicentre pilot double-blind placebo-controlled study of 24-month duration. *Int J Colorectal Dis.* **28**, 1423-31. 2013

Population	Intervention - Comparison	Outcomes/Results
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<p><b>Evidence level:</b> 2</p> <p><b>Study type:</b> multicentre, randomised, double-blind, placebo-controlled pilot study</p> <p><b>Number of Patient:</b> 96</p> <p><b>Recruiting Phase:</b></p> <p><b>Inclusion Criteria:</b> age between 18 and 85 years, endoscopic and/or radiologic evidence of diverticular disease of the left colon (already known before the uncomplicated diverticulitis episode or confirmed within the subsequent months), documented (see above) episode of uncomplicated diverticulitis during the last months (maximum 12 months), recruitment which was considered possible only after the complete clinical remission of diverticulitis flare and presence of symptoms attributable to diverticular disease of the colon such as upper and/or lower abdominal pain/discomfort, bloating, tenesmus, diarrhoea, abdominal tenderness, nausea, emesis, fever, dysuria and bleeding.</p> <p><b>Exclusion Criteria:</b> complicated diverticulitis (fistulas, stenosis, abscesses)</p>	<p><b>Intervention:</b> mesalazine 800 mg twice daily for 10 days every month or</p> <p><b>Comparison:</b> placebo for 24 months.</p>	<p><b>Primary:</b> diverticulitis recurrence at intention to treat analysis</p> <p><b>Secondary:</b> Clinical evaluations were performed using the Therapy Impact Questionnaire (TIQ) for physical condition and quality of life at admission and at 3-month intervals. Treatment tolerability and routine biochemistry parameters as well as the use of additional drugs were also evaluated.</p> <p><b>Results:</b> Ninety-two patients (mean age, 61.5) completed the study, 45 of whom received mesalazine, and 47, placebo. Diverticulitis relapse incidence in mesalazine-treated group was 5/45 (11 %) at the 12th month and 6/45 (13 %) at the 24th month; in the placebo-treated group, the correspondent rates were 13 % (6/47) and 28 % (13/47), respectively.</p> <p><b>Author's Conclusion:</b> Diverticulitis recurrence occurred in as many as 28 % of patients under placebo within 24 months from the initial episode. Intermittent prophylaxis with mesalazine did not significantly reduce the risk of relapse but induced a significant improvement of patients' physical conditions and significantly lowered the additional consumption of other gastrointestinal drugs.</p>
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and/or bleeding), previous colonic surgery, ascertained hypersensitivity to the salicylates, any severe pathology that could interfere with the treatment or the clinical or instrumental test of the trial, clinically significant renal or hepatic impairment, oesophageal, gastric or duodenal ulcer within 30 days prior to randomisation, patients with active malignancy of any type or history of a malignancy (patients with history of malignancies that had been surgically removed and who had no evidence of recurrence for at least 5 years before study enrolment were also acceptable), treatment with any investigational drug within 30 days before enrolment, treatment with lactulose or with any compound that lowering the colonic pH could prevent the release of the active moiety from the tablets, recent history or suspicion of alcohol abuse or drug addiction, patients who became unable to conform to protocol, women with ascertained pregnancy and a questionable ability to cooperate.

**Methodical Notes**



**Funding Sources:** This study was funded in full by SOFAR S.p.A., Trezzano Rosa, Milan, Italy (identification number DIV-01/04) and registered in ClinicalTrials.gov (<http://clinicaltrials.gov/ct2/show/NCT01120340>).

**COI:** na

**Randomization:** 1:1 randomization

**Blinding:** double-blind

**Dropout Rate/ITT-Analysis:** 96/92

**Notes:**

Raskin, J. B. et al. Mesalamine did not prevent recurrent diverticulitis in phase 3 controlled trials. *Gastroenterology*. 147. 793-802. 2014

Population	Intervention - Comparison	Outcomes/Results
<p><b>Evidence level:</b> 2</p> <p><b>Study type:</b> Randomisierte geblindete Multicenterstudien</p> <p><b>Number of Patient:</b> 590 und 592</p> <p><b>Recruiting Phase:</b></p> <p><b>Inclusion Criteria:</b> adult patients with 1 episodes of acute diverticulitis in the previous 24 months that resolved without surgery</p> <p><b>Exclusion Criteria:</b></p>	<p><b>Intervention:</b> Patients received mesalamine (1.2 g, 2.4 g, or 4.8 g) or placebo once daily for 104 weeks</p> <p><b>Comparison:</b> placebo</p>	<p><b>Primary:</b></p> <p><b>Secondary:</b></p> <p><b>Results:</b> Mesalamine did not reduce the rate of diverticulitis recurrence</p> <p><b>Author's Conclusion:</b> Mesalamine was not superior to placebo in preventing recurrent diverticulitis. Mesalamine is not recommended for this indication</p>

#### Methodical Notes

**Funding Sources:**

**COI:**

**Randomization:**

**Blinding:**

**Dropout Rate/ITT-Analysis:**

**Notes:**

Stollman, N. et al. A randomized controlled study of mesalamine after acute diverticulitis: results of the DIVA trial. *J Clin Gastroenterol*. 47. 621-9. 2013

Population	Intervention - Comparison	Outcomes/Results
<p><b>Evidence level:</b> 1</p> <p><b>Study type:</b> r, db, pl</p> <p><b>Number of Patient:</b> 117</p> <p><b>Recruiting Phase:</b> December 2007 and March 2010</p> <p><b>Inclusion Criteria:</b> Men and women 35 to 85 years of age, with a clinical diagnosis of acute diverticulitis (first, second, or third attack) confirmed by CT scan, were eligible to participate in the study.</p> <p><b>Patients were required to have a global symptom score (GSS) of at least 12 at baseline, including an abdominal pain assessment score &gt;2.</b></p>	<p><b>Intervention:</b> The study was a 52-week, randomized, multicenter, double-blind, placebo-controlled, proof-of-concept study to evaluate the efficacy and safety of a 12-week treatment with mesalamine (2.4 g/d), administered with or without dietary supplementation with B. infantis 35624, in patients with acute diverticulitis. The 12-week treatment phase was followed by a 9-month nontreatment observation period</p> <p><b>Comparison:</b></p>	<p><b>Primary:</b> GSS at 12 weeks after an attack of acute diverticulitis</p> <p><b>Secondary:</b></p> <p><b>Results:</b> GSS decreased in all groups during treatment without a statistically significant difference between mesalamine and placebo, however; scores were consistently lower for mesalamine at all time points. The rate of complete response (GSS=0) was significantly higher with mesalamine than placebo at weeks 6 and 52 (P&lt;0.05), and was particularly high for rectosigmoid symptoms at weeks 6, 12, 26, and 52. Recurrence of diverticulitis was low and comparable across groups. Probiotic in combination with</p>

**Exclusion Criteria:** Patients with diverticulitis complications (abscess, fistula); irritable bowel syndrome as determined by investigator, and those fulfilling ROME criteria before their attack of diverticulitis; active or recent peptic ulcer; history of major abdominal or recent GI surgery; conditions causing malabsorption, chronic abdominal pain, GI motility disorder, or short bowel syndrome; or stool examination positive for *Clostridium difficile*, bacterial pathogens, or ova and parasites, were not eligible to participate in the study. Other exclusion criteria included major medical or psychiatric diseases; drug or alcohol abuse; recent history of endometriosis or dysmenorrhea; consumption within 4 weeks of study entry of any product containing mesalamine or probiotic (excluding yogurt), or of any product metabolized to mesalamine; allergy to any component of the mesalamine tablet or to *Bifidobacterium infantis* 35624 (*B. infantis* 35624); recent participation in another clinical trial; or recent therapy with corticosteroids by any route, topical rectal medication, narcotics, antibiotics (except for those treating the current diverticulitis attack and topical antibiotics), antidiarrheals, or antispasmodics.

mesalamine did not provide additional efficacy.

**Author's Conclusion:** In the first US randomized placebo-controlled trial of anti-inflammatory treatment after a documented case of diverticulitis, mesalamine demonstrated a consistent trend in reducing symptoms. Addition of probiotic did not increase mesalamine efficacy.

#### Methodical Notes

**Funding Sources:** The study was funded by and writing support provided by Warner Chilcott.

**COI:** study grant support, consulting fees, and speaking honoraria from Warner Chilcott. S.M.: employee of Procter and Gamble.  
**F.S.:** study grant support from GlaxoSmithKline and Alimentary Health Ltd., and supported, in part by Science Foundation, Ireland.  
**E.Q.:** study grant support and speaking honoraria from Procter and Gamble; non-executive director of Alimentary Health Ltd

**Randomization:** Patients were randomized into 1 of 3 treatment groups (placebo, mesalamine, or combined mesalamine/probiotic) in a 1:1:1 ratio

**Blinding:**

**Dropout Rate/ITT-Analysis:** Of 177 patients screened, 60 were excluded (55 who did not meet the admission criteria, 5 who did not wish to participate). The ITT population included 117 patients (placebo, 41; mesalamine, 40; mesalamine+probiotic, 36). Twenty-nine patients (24.8%) dropped out during the treatment phase. Eighty-eight patients (75.2%) completed the 12-week treatment period and continued into the nontreatment follow-up period (PE population), and 73 (62.4%) completed the entire 52-week study.

**Notes:**

Tursi, A. et al. Randomised clinical trial: mesalazine and/or probiotics in maintaining remission of symptomatic uncomplicated diverticular disease - a double-blind, randomised, placebo-controlled study. *Alimentary Pharmacology & Therapeutics*. 38. 741-751. 2013

Population

Intervention - Comparison Outcomes/Results

Evidence level: 1

**Study type:** A multicentre, double-blind, placebo-controlled study

**Number of Patient:** Two hundred and ten patients were randomly enrolled in a double-blind fashion in four groups:

**Recruiting Phase:** From January 2009 to December 2010

**Inclusion Criteria:** Subjects were required to meet all the following inclusion criteria to be eligible for participation:

- (i) males and females aged >18 years;
- (ii) diverticulosis showed by colonoscopy no more than 6 months prior to study entry;
- (iii) symptomatic episode of uncomplicated diverticular disease no more than 4 weeks prior to study entry;
- (iv) patients who have given their free and informed consent.

A negative pregnancy test at the screening visit, agreement to use a valid contraceptive method for the duration of the study, patients not requiring hospitalisation, and patients willing and able to provide written informed consent were also considered inclusion criteria.

**Exclusion Criteria:** Subjects who met any of the following exclusion criteria were not enrolled in this study:

- (i) acute diverticulitis (both complicated and uncomplicated);
- (ii) diverticular colitis;
- (iii) active or recent peptic ulcer;
- (iv) chronic renal insufficiency;
- (v) allergy to salicylates;
- (vi) patients with intended or ascertained pregnancy, lactation;
- (vii) women of child-bearing age not using contraceptives (viii) lactulose-lactitol use in the 2 weeks before the enrolment and during the study;
- (ix) presence of diverticulitis complications (fistulas, abscesses and/or stenoses);
- (x) use of probiotic preparations either prescribed or over the counter within 2 weeks prior to study entry;
- (xi) inability to give a valid informed consent or to properly follow the protocol;
- (xii) patients with active malignancy of any type, or history of a malignancy (patients with a history of other malignancies that have been surgically removed and who have no evidence of recurrence for at least 5 years before study enrolment were also acceptable);
- (xiii) recent history or suspicion of alcohol abuse or drug addiction;
- (xiv) any severe pathology that can interfere with the treatment or the clinical or instrumental tests of the trial;

**Intervention:** Eligible patients were randomly assigned to one of the following treatment groups:

- (i) Group M. Active Pentacol 800, 2 tablets/day for 10 days/month plus Enterolactis Plus placebo, 1 sachet/day for 10 days/month;
- (ii) Group L. Active Enterolactis Plus, 1 sachet/day for 10 days/month plus Pentacol 800 placebo, 2 tablets/day for 10 days/month;
- (iii) Group LM. Active Pentacol 800, 2 tablets/day plus Active Enterolactis Plus, 1 sachet/day for 10 days/month;
- (iv) Group P. Pentacol 800 placebo, 2 tablets/day and Enterolactis Plus placebo, 1 sachet/day for 10 days/month.

Pentacol 800 comprises tablets containing 800 mg of mesalazine, administered at a dose of 1600 mg/day for 10 days/month; the placebo was tablets identical to those containing active mesalazine. Enterolactis Plus comprises sachets, each containing 24 billion viable lyophilised bacteria containing *L. casei* subsp. DG, administered as a single sachet per day for 10 days/month; the placebo was sachets identical to those containing active Lactobacilli. In group LM, mesalazine and probiotics were administered simultaneously for 10 days/month. To simplify the assumption of the drugs, we suggested to take the treatment at the beginning of every month (taking together mesalazine and probiotics). Pentacol 800 and Enterolactis Plus, as well as the placebos, were supplied by the manufacturing company (Sofar S.p.A., Trezzano Rosa (MI), Italy) for the entire duration of the trial. The supply of the experimental drugs was the only involvement of Sofar S.p.A. in this study.

**Comparison:** mesalazine and/or probiotics in maintaining remission of symptomatic uncomplicated

**Primary:** The primary endpoint was the proportion of patients maintaining remission after a previous episode of SUDD.

Maintenance of remission was defined as the absence of recurring abdominal pain scored  $\geq 5$  for at least 24 consecutive hours and recorded at any time during the follow-up. If recurrence occurred, the patient was excluded from the study. Computerised tomography was performed in case of suspected acute diverticulitis symptoms (e.g. abdominal pain associated with fever).

**Secondary:** Secondary endpoints included:

- (i) influence of the extent of diverticulosis on maintaining remission;
- (ii) influence of the severity of diverticulosis on maintaining remission;
- (iii) influence of the type of the drugs used to obtain the remission on maintaining remission;
- (iv) influence of comorbidities with the relative Charlson's score<sup>11, 12</sup> on maintaining remission;
- (v) influence of acetyl salicylic acid intake on maintaining remission;
- (vi) influence of concomitant diseases on maintaining remission;
- (vii) influence of concomitant drugs on maintaining remission;
- (viii) the prevention of acute diverticulitis of the colon occurrence.

**Results:** Recurrence of SUDD occurred in no (0%) patient in group LM, in 7 (13.7%) patients in group M, in 8 (14.5%) patients in group L and in 23 (46.0%) patients in group P (LM group vs. M group,  $P = 0.015$ ; LM group vs. L group,  $P = 0.011$ ; LM group vs. P group,  $P = 0.000$ ; M group vs. P group,  $P = 0.000$ ; L group vs. P group,  $P = 0.000$ ). Acute diverticulitis occurred in six group P cases and in one group L case ( $P = 0.003$ ).

**Author's Conclusion:** Both cyclic mesalazine and Lactobacillus casei subsp. DG treatments, particularly when given in combination, appear to be better than placebo for maintaining remission of symptomatic uncomplicated diverticular disease.

(xv) use of nonsteroidal anti-inflammatory drugs for 1 week before and throughout the study period (only paracetamol was permitted). Significant hepatic, renal, endocrine, respiratory, neurological or cardiovascular diseases, as determined by the investigator, were also considered exclusion criteria. Other exclusion criteria were as follows: history of severe adverse reactions or known hypersensitivity to maltose and/or silicon dioxide; patients requiring hospitalisation; use of any investigational drug and/or participation in any clinical trial within 3 months prior to entering this study; inability to give valid written informed consent or to properly follow the protocol.

diverticular disease

#### Methodical Notes

**Funding Sources:** Pentacol 800 and Enterolactis Plus, as well as the placebos, were supplied by the manufacturing company (Sofar S.p.A., Trezzano Rosa (MI), Italy) for the entire duration of the trial. The supply of the experimental drugs was the only involvement of Sofar S.p.A. in this study.

**COI:** none

**Randomization:** Each centre enrolled patients according to the randomisation list. Eligible patients were randomly assigned to receive active drugs or placebo using one computer-generated randomisation list.

Randomisation was carried out in a double-blind manner in blocks of four subjects using 1:1:1:1 allocation to the four groups.

**Blinding:** Each centre enrolled patients according to the randomisation list. Eligible patients were randomly assigned to receive active drugs or placebo using one computer-generated randomisation list.

Randomisation was carried out in a double-blind manner in blocks of four subjects using 1:1:1:1 allocation to the four groups.

**Dropout Rate/ITT-Analysis:** not shown

**Notes:**

#### NEWCASTLE - OTTAWA Checklist: Cohort: 2 Bewertung(en)

Di Mario, F. et al. Long-term efficacy of rifaximin to manage the symptomatic uncomplicated diverticular disease of the colon. *J Investig Med.* **67.** 767-770. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3	Funding sources: none	Total no. patients: 346 / 470	Interventions:
Study type: Retrospective multicenter comparative cohort study	Conflict of Interests: none  Randomization: no  Blinding: no  Dropout rates: n.a.	Recruiting Phase:  Inclusion criteria: assessing the outcome of Sudd in all eligible patients with Sudd who had an 8-year follow-up until December 31,2017.	Comparison: Group A: patients who have undergone scheduled treatment with rifaximin 800mg/d for 7d/mo. Group B: patients treated with short-term course (no more than 2weeks) of symptomatic therapy (fiber, spasmolytics, mesalazine or other anti-inflammatory drugs, antibiotics, probiotics) only when necessary (namely only when symptoms occurred).

		Exclusion criteria: are listed
Notes:	Author's conclusion: Rifaximin is effective to relieve symptoms and reduce the risk of disease-related complications in patients with Sudd.	
Outcome Measures/results	<p><b>Primary</b> The primary endpoint of the study was to assess the symptomatic score trend from entry (T0) to the end of follow-up (T8), in both groups and between the 2 groups.</p> <p><b>Secondary</b> Secondary endpoints were the comparison of acute diverticulitis occurrence between the 2 groups during follow-up, the rate of surgery occurrence between the 2 groups, the rate of disease-related between the 2 groups</p>	<p><b>Results:</b> Two symptoms (left lower abdominal pain and bloating) were assessed by a visual analog scale (VAS), graded from 0=nosymptom to 10=themost severe symptom. Daily bowel movements were also reported. Median (IQR) VAS score for pain was 6 (5–7) in group A and 6 (6–7) in group B at baseline (p=0.109); at 8-year follow-up it was 3 (3–4) and 6 (5–7), respectively (p&lt;0.000). Both bloating and daily bowel movements were significantly reduced in group A. Acute diverticulitis occurred in 9 (2.6%) patients in group A and in 21 (4.5%) patients in group B (p=0.155). Surgery occurred in 4 (1.2%) patients in group A and 9 (1.9%) in group B (p=0.432). Disease-related mortality occurred in no patient in group A and 2 (0.4%) patients in group B (p=0.239).</p>

Leahy, A. L. et al. High fibre diet in symptomatic diverticular disease of the colon. Ann R Coll Surg Engl. **67**. 173-4. 1985

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 5</p> <p>Study type: Retrospektive Kohortenstudie</p>	<p>Funding sources:</p> <p>Conflict of Interests:</p> <p>Randomization:</p> <p>Blinding:</p> <p>Dropout rates:</p>	<p>Total no. patients: 72</p> <p>Recruiting Phase:</p> <p>Inclusion criteria:</p> <p>Exclusion criteria:</p>	<p>Interventions:</p> <p>Comparison:</p>
Notes:	<p>Retrospektive Kohortenstudie über eine langen Zeitraum mit nur 72 Patienten</p> <p>Author's conclusion:</p>		
Outcome Measures/results	<p>Primary</p> <p>Secondary</p>	Results:	

## Schlüsselfrage:

AG 04\_Primärprophylaxe der Divertikulose und der Divertikelkrankheit - Körpergewicht, Körperliche Aktivität, gesunder Lebensstil

## Inhalt: 12 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Adler, J. T. 2016	4	Kohortenstudie, Aufnahmen mit Divertikelkrankheit und Jahreszeitenabhängigkeiten
Aune, D. 2017	1	Systematisches Review und Meta-Analyse (Kohortenstudien)
Berrigan, D. 2016	5	Es handelt sich um einen Kommentar / unsystematisches review
Harris, T. B. 2017	5	Unsystematisches review / kürzere Übersicht
Jamal Talabani, A. 2016	2	Prospektive Kohortenstudie (North Trondelag Health Study)
Jarbrink-Sehgal, M. E. 2018	3	Große Kohortenstudie von 43,772 Männern (Schwedische Militärangehörige)
Liu, P. H. 2017	2	prospektive Kohorte von 907 Fällen und 757791 Patientenjahren
Ma, W. 2018	2	Große prospektive Kohortenstudie
Maguire, L. H. 2013	3	Kohortenstudie Patienten mit Divertikelkrankheit und Vit D spiegeln
Maguire, L. H. 2015	3	Kohortenstudie Divertikelkrankheit in Korrelation zur UV bestrahlung
Ricciardi, R. 2011	4	Kohortenstudie
Williams, P. T. 2009	4	Kohortenstudie

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 3 Bewertung(en)

Evidence level/Study Types	level/Study	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Systematisches Review und Meta-Analyse (Kohortenstudien)</p> <p>Databases: Pubmed, Embase</p> <p>Search period: bis zum 07.02.2017</p> <p>Inclusion Criteria: Prospektive Studien, die</p>		<p>Population: Erwachsene Personen</p> <p>Intervention: BMI /andere übergewichtsassoziierte Parameter und körperliche Aktivität</p> <p>Comparison:</p>	<p>Primary: Diverticular Disease, Diverticulitis, diverticular complications</p> <p>Secondary:</p> <p>Results: Das zusammengefasste RR der Diverticular Disease für einen 5-Unit BMI lag bei 1,28 (95% KI: 1,18 – 1,40, I2 = 77%, n = 6), für Divertikulitis bei 1,31 (95% KI: 1,09 – 1,56, I2=74%, n=2), für Divertikulitis assoziierte Krankheitskomplikationen bei 1,20 (95% KI: 1,04 – 1,40, I2= 56%, n=3). Es</p>	<p>Aune et al., 2017, Eur J Nutr</p>

<p>den Zusammenhang zwischen dem BMI oder anderen übergewichtsassozierten Messungen, körperlicher Bewegung und dem Risiko, an Divertikulitis zu erkranken, untersuchen</p> <p>Angabe von adjustierten relativen Risikoschätzungen (Hazard Ratio, Risk Ratio, Odds Ratio) und dazugehörigen 95%-Konfidenzintervallen</p> <p>Für Dosis-Wirkungs-Analyse: Exposition quantifiziert in mindestens drei Kategorien; Verfügbarkeit absolute Zahl an Fällen und Personenjahren</p> <p>Exclusion Criteria:</p>		<p>bestanden keine Hinweise auf einen nichtlinearen Zusammenhang zwischen dem BMI und dem Risiko für Divertikelerkrankungen (pnonlinearity=0,22). Zudem stieg das Risiko sogar innerhalb des normalen Gewichtsbereiches an. Im Vergleich zu einem BMI von 20 lag das zusammengefasste RR für einen BMI von 22.5, 25.0, 27.5, 30.0, 32.5, 35.0, 37.5 und 40.0 bei 1.15 (1.07–1.23), 1.31 (1.17–1.47), 1.50 (1.31–1.71), 1.71 (1.52–1.94), 1.96 (1.77–2.18), 2.26 (2.00–2.54), 2.60 (2.11–3.21), und 3.01 (2.06–4.39).</p> <p>Das zusammengefasste RR lag bei 0.76 (95% KI: 0.63–0.93, I<sup>2</sup>=54%, n=5) für hohe vs. niedrige körperliche Aktivität und bei 0.74 (95% CI: 0.57–0.97, I<sup>2</sup>=39.5%, pheterogeneity=0.20, n = 2) für hohe vs. niedrige körperliche Aktivität.</p> <p>Author's Conclusion: Die Ergebnisse legen nahe, dass selbst ein moderater Anstieg des BMI das Risiko für Divertikulitis sowie für Divertikulitis assoziierte Komplikationen erhöhen kann und dass ein höheres Maß an körperlicher Aktivität das Risiko dafür verringern kann.</p>	
<b>Methodical Notes</b>			
<p>Funding Sources: Die Studie wurde von dem Liaison Committee, Central Norway Regional Health Authority (RHA), der Norwegian University of Science and Technology (NTNU), und dem Imperial College National Institute of Health Research (NIHR) Biomedical Research Centre (BRC) gefördert. Die Förderer hatten keinen Einfluss auf Studiendesign, Datensammlung, Datenanalyse und -interpretation, den Schreibprozess sowie die Entscheidung bezüglich der Veröffentlichung.</p> <p>COI: Kein bestehender Interessenskonflikt</p> <p>Study Quality:</p> <p>Heterogeneity: z.T. hohe bis mittlere Heterogenität</p> <p>RR Diverticular Disease für einen 5-Unit-BMI: I<sup>2</sup> = 77%</p> <p>RR Divertikulitis für einen 5-Unit-BMI: I<sup>2</sup>=74%</p> <p>RR Divertikulitis assoziierte Komplikationen für einen 5-Unit-BMI: I<sup>2</sup>= 56%</p> <p>RR niedrige vs. hohe körperliche Aktivität: I<sup>2</sup>=54%</p> <p>RR hohe vs. niedrige körperliche Aktivität: I<sup>2</sup>=39.5%</p> <p>Publication Bias: AutorInnen beschreiben, dass sie eine Analyse auf einen möglichen Publikationsbias durchgeführt haben. Ergebnisse dieser Analyse sind jedoch nicht einsehbar.</p> <p>Notes: Nur Kohortenstudien berücksichtigt</p>			
<p>Berrigan, D. et al. BMI and mortality: the limits of epidemiological evidence. <i>Lancet</i>. <a href="#">388. 734-6. 2016</a></p>			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature

References			
<p><b>Evidence level: 5</b></p> <p><b>Study type:</b> Es handelt sich um einen Kommentar / unsystematisches review</p> <p><b>Databases:</b></p> <p><b>Search period:</b></p> <p><b>Inclusion Criteria:</b></p> <p><b>Exclusion Criteria:</b></p>	<p><b>Intervention:</b></p> <p><b>Comparison:</b></p>	<p><b>Primary:</b></p> <p><b>Secondary:</b></p> <p><b>Results:</b></p> <p><b>Author's Conclusion:</b></p>	
<b>Methodical Notes</b>			
<p><b>Funding Sources:</b></p> <p><b>COI:</b></p> <p><b>Study Quality:</b></p> <p><b>Heterogeneity:</b></p> <p><b>Publication Bias:</b></p> <p><b>Notes:</b></p>			

<p><b>Harris, T. B. Weight and Body Mass Index in Old Age: Do They Still Matter?. J Am Geriatr Soc. 65. 1898-1899. 2017</b></p>			
<b>Evidence level/Study Types</b>	<b>P - I - C</b>	<b>Outcomes/Results</b>	<b>Literature References</b>
<p><b>Evidence level: 5</b></p> <p><b>Study type:</b> Unsystematisches review / kürzere Übersicht</p> <p><b>Databases:</b></p> <p><b>Search period:</b></p> <p><b>Inclusion Criteria:</b></p> <p><b>Exclusion Criteria:</b></p>	<p><b>Intervention:</b></p> <p><b>Comparison:</b></p>	<p><b>Primary:</b></p> <p><b>Secondary:</b></p> <p><b>Results:</b></p> <p><b>Author's Conclusion:</b></p>	
<b>Methodical Notes</b>			
<p><b>Funding Sources:</b></p> <p><b>COI:</b></p> <p><b>Study Quality:</b></p> <p><b>Heterogeneity:</b></p> <p><b>Publication Bias:</b></p> <p><b>Notes:</b></p> <p>Unsystematisches review</p>			

**NEWCASTLE - OTTAWA Checklist: Cohort: 9 Bewertung(en)**

<p><b>Adler, J. T. et al. Seasonal Variation in Diverticulitis: Evidence From Both Hemispheres. Dis Colon</b></p>
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Rectum. <u>59. 870-7. 2016</u>			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 18,672 Recruiting Phase: All of the inpatient admissions between 2008 and 2013 to participating hospitals. Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Study type: Aufnahmen mit Divertikelkrankheit und Jahreszeitenabhängigkeiten	Kohortenstudie, mit und		
Notes:	Author's conclusion: These data suggest a shared seasonal risk factor among geographically distinct populations for diverticulitis.		
Outcome Measures/results	Primary Seasonal trends in diverticulitis admissions among international patient populations. Secondary	Results: Seasonal trends were present in all 3 countries. A summer peak was observed in both hemispheres using multiple statistical testing methods. Logistic regression analyses identified summer months as significantly associated with diverticulitis admission in all 3 countries.	

Jamal Talabani, A. et al. Risk factors of admission for acute colonic diverticulitis in a population-based cohort study: The North Trondelag Health Study, Norway. World J Gastroenterol. 22. 10663-10672. 2016			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 42570 Recruiting Phase: 95-97, follow up bis 2012 611492 Patientenjahre Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Study type: Prospektive Kohortenstudie (North Trondelag Health Study)			
Notes:	große prospektive Kohortenstudie Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results: In a multivariable analysis, increasing age and increasing Body Mass Index were associated with increased risk of admission for acute colonic diverticulitis in both gender. In females, cigarette smoking likewise increased the risk of admission. In males, breathlessness, a HUNT variable associated with Chronic Obstructive Pulmonary Disease, increased the risk of admission. On the other hand, physical activity, constipation and type of bread eaten showed no association with admission for acute colonic diverticulitis	

Jarbrink-Sehgal, M. E. et al. Lifestyle Factors in Late Adolescence Associate With Later Development of Diverticular Disease Requiring Hospitalization. Clin Gastroenterol Hepatol. 16. 1474-1480 e1. 2018			
Evidence level	Methodical Notes	Patient characteristics	Interventions

<b>Evidence level: 3</b>	<b>Funding sources:</b>	<b>Total no. patients: 43772</b>	<b>Interventions:</b> Lifestyle factors (BMI, Cardiovascular fitness, use of recreational drugs, smoking, alcohol consumption, risky alcohol use
<b>Study type:</b> Große Kohortenstudie von 43,772 Männern (Schwedische Militärangehörige)	<b>Conflict of Interests:</b>	<b>Recruiting Phase:</b> population-based study conducted during 1969-1970 of all enlisted Swedish male conscripts	<b>Comparison:</b>
	<b>Randomization:</b>	<b>Inclusion criteria:</b> Swedish men, age 18-20,	
	<b>Blinding:</b>	<b>Exclusion criteria:</b>	
	<b>Dropout rates:</b>		
<b>Notes:</b>	<p><b>Author's conclusion:</b> In a retrospective analysis of data from 43,772 men in Sweden, we associated being overweight or obese, a smoker, a high-risk user of alcohol, and/or having a low level of cardiovascular fitness in late adolescence with an increased risk of developing diverticular disease requiring hospitalization later in life. Improving lifestyle factors among adolescents might reduce the economic burden of diverticular disease decades later.</p>		
<b>Outcome Measures/results</b>	<b>Primary Risk of diverticular disease</b>	<b>Results:</b> Overweight and obese men had a 2-fold increased risk of diverticular disease compared to normal-weight men (hazard ratio=2.00; P<.001 a high level of cardiovascular fitness was associated with reduced risk diverticular disease requiring hospitalization smoking but not use recreational drugs an increased hospitalization. risky alcohol consumption per se increase in>	
	<b>Secondary</b>		

Liu, P. H. et al. Adherence to a Healthy Lifestyle is Associated With a Lower Risk of Diverticulitis among Men. *Am J Gastroenterol.* **112.** 1868-1876. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level: 2</b>	<b>Funding sources:</b>	<b>Total no. patients: 907</b>	<b>Interventions:</b>
<b>Study type:</b> prospektive Kohorte von 907 Fällen und 757791 Patientenjahren	<b>Conflict of Interests:</b>	<b>Recruiting Phase:</b>	<b>Comparison:</b>
	<b>Randomization:</b>	<b>Inclusion criteria:</b>	
	<b>Blinding:</b>	<b>Exclusion criteria:</b>	
	<b>Dropout rates:</b>		
<b>Notes:</b>	<p>prospektive Kohorte von 907 Fällen und 757791 Patientenjahren, gut gemacht mit detaillierter plausibler Analyse und relevanten Daten</p> <p><b>Author's conclusion:</b> Adherence to a low-risk lifestyle is associated with reduced incidence of diverticulitis</p>		
<b>Outcome Measures/results</b>	<b>Primary</b>	<b>Results:</b> High intake of red meat, low intake of dietary fiber, low vigorous physical activity, high BMI, and smoking were independently associated with increased risks of diverticulitis (all p<0.05)	
	<b>Secondary</b>		

Ma, W. et al. Association Between Obesity and Weight Change and Risk of Diverticulitis in Women. *Gastroenterology.* **155.** 58-66 e4. 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions

<b>Evidence level: 2</b>	<b>Funding sources:</b>	<b>Total no. patients: 46,079 Frauen der Nurses' Health Study</b>	<b>Interventions:</b>
<b>Study type: Große prospektive Kohortenstudie</b>	<b>Conflict of Interests:</b>	<b>Recruiting Phase: 2008 6 Jahr follow up, 248,001 Patientenjahre</b>	<b>Comparison:</b>
	<b>Randomization:</b>	<b>Inclusion criteria: 61–89 years old and free of diverticulitis, diverticular bleeding, cancers, or inflammatory bowel disease at baseline (in 2008)</b>	
	<b>Blinding:</b>	<b>Exclusion criteria:</b>	
	<b>Dropout rates:</b>		
<b>Notes:</b>	große sehr gut gemachte prospektive Kohortenstudie		
	Author's conclusion: an association between obesity and risk of diverticulitis among women.		
<b>Outcome Measures/results</b>	<b>Primary</b>	<b>Results: After adjustment for other risk factors, women with a BMI <math>\geq</math> 35.0 kg/m<sup>2</sup> had a hazard ratio (HR) for diverticulitis of 1.42 (95% CI, 1.08–1.85) compared to women with a BMI &lt; 22.5 kg/m<sup>2</sup></b>	
	<b>Secondary</b>		

Maguire, L. H. et al. Higher serum levels of vitamin D are associated with a reduced risk of diverticulitis. Clin Gastroenterol Hepatol. 11. 1631-5. 2013

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level: 3</b>	<b>Funding sources:</b>	<b>Total no. patients: 9116 und 922</b>	<b>Interventions: first measured 25(OH)D level in relation to risk of diverticulitis.</b>
<b>Study type: Kohortenstudie Patienten mit Divertikelkrankheit und Vit D spiegeln</b>	<b>Conflict of Interests:</b>	<b>Recruiting Phase: 1993 through 2012</b>	<b>Comparison:</b>
	<b>Randomization:</b>	<b>Inclusion criteria:</b>	
	<b>Blinding:</b>	<b>Exclusion criteria:</b>	
	<b>Dropout rates:</b>		
<b>Notes:</b>	Author's conclusion: In summary, we show that higher pre-diagnostic serum 25(OH)D levels are associated with a lower risk of requiring hospitalization for diverticulitis. Taken together with prior studies showing an inverse association of 25(OH)D and risk of CRC and IBD, these results highlight the potential importance of vitamin D in the maintenance of colonic health. Additional studies in cohorts with more detailed information on potential confounders of this association are warranted.		
<b>Outcome Measures/results</b>	<b>Primary</b>	<b>Results: Patients with uncomplicated diverticulosis had significantly higher mean prediagnostic serum levels of 25(OH)D (29.1 ng/mL) than patients with diverticulitis that required hospitalization (25.3 ng/mL; P&lt;.0001 compared to patients in the lowest quintile of multivariate-adjusted rr for diverticulitis hospitalization was ci p trend="&lt;.0001)" among highest with uncomplicated diverticulosis mean level significantly lower acute without other sequelae ng n="594)," abscess requiring emergent laparotomy and recurrent&gt;</b>	
	<b>Secondary</b>		

Maguire, L. H. et al. Association of geographic and seasonal variation with diverticulitis admissions. JAMA Surg. 150. 74-7. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions

<b>Evidence level:</b> 3	<b>Funding sources:</b>	<b>Total no. patients:</b> 226 522	<b>Interventions:</b> UV exposure
<b>Study type:</b> Kohortenstudie	<b>Conflict of Interests:</b>	<b>Recruiting Phase:</b> January 2001 through December 2005	<b>Comparison:</b>
<b>Divertikelkrankheit in Korrelation zur UV bestrahlung</b>	<b>Randomization:</b>	<b>Inclusion criteria:</b> nonelective admissions with a code for diverticulitis.	
	<b>Blinding:</b>	<b>Exclusion criteria:</b>	
	<b>Dropout rates:</b>		
<b>Notes:</b>	<b>Author's conclusion:</b> Low UV light exposure is associated with an increased rate of diverticulitis admissions and greater seasonal variation. Because UV exposure largely determines vitamin D status, these findings support a role for vitamin D in the pathogenesis of diverticulitis.		
<b>Outcome Measures/results</b>	<b>Primary incidence of diverticulitis</b>	<b>Results:</b> Compared with high-UV areas, low-UV areas had a higher rate of diverticulitis (751.8 vs 668.1 per 100 000 admissions; $P < .001$ ), diverticular abscess (12.0% vs 9.7%; $P < .001$ ), and colectomy (13.5% vs 11.5%; $P < .001$ ). We also observed significant seasonal variation, with a lower rate of diverticulitis in the winter (645 per 100 000) compared with the summer (748 per 100 000) ( $P < .001$ ). The summer increase was more evident in areas with the greatest UV fluctuation vs areas with the least UV fluctuation (120 vs 70 per 100 000; $P = .01$ ).	
	<b>Secondary</b>		

**Ricciardi, R. et al. Cyclical increase in diverticulitis during the summer months. Arch Surg. 146. 319-23. 2011**

<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
<b>Evidence level:</b> 4	<b>Funding sources:</b>	<b>Total no. patients:</b> 37412 stationär aufgenommene Patienten (Zählung der Anzahl aller aufgenommener Patienten Jahreszeitenabhängig)	<b>Interventions:</b>
<b>Study type:</b> Kohortenstudie	<b>Conflict of Interests:</b>	<b>Recruiting Phase:</b> <u>1997-2005</u>	<b>Comparison:</b>
	<b>Randomization:</b>	<b>Inclusion criteria:</b>	
	<b>Blinding:</b>	<b>Exclusion criteria:</b>	
	<b>Dropout rates:</b>		
<b>Notes:</b>	<b>Author's conclusion:</b>		
<b>Outcome Measures/results</b>	<b>Primary</b>	<b>Results:</b>	
	<b>Secondary</b>		

**Williams, P. T. Incident diverticular disease is inversely related to vigorous physical activity. Med Sci Sports Exerc. 41. 1042-7. 2009**

<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
<b>Evidence level:</b> 4	<b>Funding sources:</b>	<b>Total no. patients:</b> 9072 Männer und 1664 Frauen der National Runners' Health Study >50Jahre	<b>Interventions:</b>
	<b>Conflict of</b>	<b>Recruiting Phase:</b>	

<b>Study type:</b> Kohortenstudie	<b>Interests:</b>  <b>Randomization:</b>  <b>Blinding:</b>  <b>Dropout rates:</b>	<b>Inclusion criteria:</b>  <b>Exclusion criteria:</b>	<b>Comparison:</b>
<b>Notes:</b>	<b>Author's conclusion:</b>		
<b>Outcome Measures/results</b>	<b>Primary</b>  <b>Secondary</b>	<b>Results:</b>	



## Schlüsselfrage:

AG 04- Primärprophylaxe der Divertikulose und der Divertikelkrankheit - Ernährung und Genussmittel

## Inhalt: 14 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Aldoori, W. H. 1995	2	Prospektive Kohortenstudie
Aldoori, W. H. 1994	2	Kohortenstudie, prospektiv
Aune, D. 2017	1	Systematisches Review und Meta-Analyse von prospektiven Kohortenstudien
Aune, D. 2020	1	Metaanalyse
Cao, Y. 2018	2	Prospektive Kohorte, 46461 Männer, 651970 Patientenjahre
Crowe, F. L. 2011	3	Kohortenstudie
Crowe, F. L. 2014	2	Sehr große prospektive Kohortenstudie sehr guter Qualität
Diamant, M. J. 2016	4	Kohortenstudie
Humes, D. J. 2016	2	Kohortenstudie
Liu, P. H. 2017	2	prospektive Kohorte von 907 Fällen und 757791 Patientenjahren
Ma, W. 2019	3	prospektive Kohortenstudie
Mahmood, M. W. 2019	3	Große Kohortenstudie guter Qualität
Tonnesen, H. 1999	4	Kohortenstudie
Tseng, Y. J. 2020	4	Kohortenstudie aus Krankenkassendaten

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 2 Bewertung(en)

Aune, D. et al. Tobacco smoking and the risk of diverticular disease - a systematic review and meta-analysis of prospective studies. <i>Colorectal Dis.</i> 19. 621-633. 2017			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: Systematisches Review und Meta-Analyse von prospektiven Kohortenstudien Databases: Pubmed, Embase Search period:	Population: Raucher (current, former, ever) und Nicht-Raucher Intervention: Rauchen von Tabak Comparison:	Primary: Risiko für Divertikulitis oder damit verbundene Komplikationen Secondary: Results: Das RR für die Inzidenz von Divertikulitis lag für Current-Smoker bei 1,36 (95% KI 1.15 – 1.61, I2 = 84%, n=4), bei 1,17 (95% KI 1.05 – 1.31, I2 = 49%, n = 4) für Former-Smoker und bei 1,29 (95% KI 1.16 – 1.44, I2 = 62%, n = 5) für Ever-Smoker. Das gesamte RR lag bei 1,11 (95% KI 0,99 – 1,25, I2 = 82%, n=4) für zehn Zigaretten am Tag. Obwohl es einige Hinweise auf	Aune et al., 2017, Colorectal Disease

<p>19.02.2016</p> <p><b>Inclusion Criteria:</b>                  Prospektive Studien, welche den Zusammenhang zwischen dem Rauchen von Tabak und dem Risiko einer Divertikulitis bzw. damit verbundenen Komplikationen (wie z.B. Abszesse und/oder Perforationen) untersuchen</p> <p><b>Adjustierte Schätzungen des RR mit 95% KI</b></p> <p><b>Verwendung eines quantitativen Maßes für das Rauchen von Tabak, um Dosis-Wirkungs-Analysen durchzuführen</b></p> <p><b>Exclusion Criteria:</b></p>	<p>Kein Rauchen von Tabak</p>	<p>eine Nichtlinearität gab, bestand eine dosisabhängige positive Assoziation mit steigender Anzahl an gerauchten Zigaretten pro Tag. Zudem gab es Evidenz dafür, dass Rauchen auch das Risiko für Divertikulitis assoziierte Komplikationen erhöhte, jedoch war die Anzahl der Studien hierfür klein.</p> <p><b>Author's Conclusion:</b> Die Meta-Analyse bietet Evidenz darüber, dass Tabak-Rauchen mit einer erhöhten Inzidenz von Divertikulitis und damit verbundenen Komplikationen assoziiert ist.</p>
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<p><b>Methodical Notes</b></p> <p><b>Funding Sources:</b> Die Studie wurde von dem Liaison Committee, Central Norway Regional Health Authority (RHA), der Norwegian University of Science and Technology (NTNU), und dem Imperial College National Institute of Health Research (NIHR) Biomedical Research Centre (BRC) gefördert. Die Förderer hatten keinen Einfluss auf Studiendesign, Datensammlung, Datenanalyse und -interpretation, den Schreibprozess sowie die Entscheidung bezüglich der Veröffentlichung.</p> <p><b>COI:</b> Kein bestehender Interessenskonflikt</p> <p><b>Study Quality:</b></p> <p><b>Heterogeneity:</b> Teilweise hohe Heterogenität:</p> <p>RR-Divertikulitis Current Smoker: I<sup>2</sup> = 84%                  RR Divertikulitis Former-Smoker: I<sup>2</sup> = 49%                  RR Divertikulitis Ever-Smoker: I<sup>2</sup> = 62%                  RR Divertikulitis Insgesamt: I<sup>2</sup>: 82%</p> <p><b>Publication Bias:</b> Publikations Bias liegt nicht vor</p> <p><b>Notes:</b>                  Nur prospektive Kohortenstudien eingeschlossen</p>
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<p>Aune, D. et al. Dietary fibre intake and the risk of diverticular disease: a systematic review and meta-analysis of prospective studies. <i>Eur J Nutr.</i> 59. 421-432. 2020</p>			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type:	Population: Five prospective cohort studies with 19,282 cases	Primary: Secondary:	

<b>Metaanalyse Databases:</b> Pubmed und Embase <b>Search period:</b> up to August 9th 2018 <b>Inclusion Criteria:</b> <b>Exclusion Criteria:</b>	<b>and 865,829 participants were included</b> <b>Intervention:</b> <b>Comparison:</b>	<b>Results:</b> <b>Author's Conclusion:</b> These results suggest that a high fibre intake may reduce the risk of diverticular disease and individuals consuming 30 g of fibre per day have a 41% reduction in risk compared to persons with a low fibre intake. Further studies are needed on fibre types and risk of diverticular disease and diverticulitis	
<b>Methodical Notes</b>			
<b>Funding Sources:</b> <b>COI:</b> <b>Study Quality:</b> <b>Heterogeneity:</b> <b>Publication Bias:</b> <b>Notes:</b>			

**NEWCASTLE - OTTAWA Checklist: Cohort: 12 Bewertung(en)**

<b>Aldoori, W. H. et al. A prospective study of alcohol, smoking, caffeine, and the risk of symptomatic diverticular disease in men. Ann Epidemiol. 5. 221-8. 1995</b>			
<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
<b>Evidence level:</b> 2  <b>Study type:</b> Prospektive Kohortenstudie	<b>Funding sources:</b> <b>Conflict of Interests:</b> <b>Randomization:</b> <b>Blinding:</b> <b>Dropout rates:</b>	<b>Total no. patients:</b> 47678, davon entwickeln im follow up 382 eine Divertikelkrankheit <b>Recruiting Phase:</b> 1988 to 1992 <b>Inclusion criteria:</b> <b>Exclusion criteria:</b>	<b>Interventions:</b>  <b>Comparison:</b>
<b>Notes:</b>	<b>Prospektive Kohortenstudie</b>  <b>Author's conclusion:</b> These results suggest that smoking, caffeine, and alcohol intake are not associated with any substantially increased risk of symptomatic diverticular disease.		
<b>Outcome Measures/results</b>	<b>Primary</b>  <b>Secondary</b>	<b>Results:</b> After adjustments for age, physical activity, and energy-adjusted intake of dietary fiber and total fat, alcohol intake (comparing those who drink > 30 g of alcohol/d to nondrinkers) was only weakly and nonsignificantly associated with risk of symptomatic diver&&r disease (relative risk (RR) = 1.36; 95 percent confidence interval (CI), 0.94 to 1.97; P for trend = 0.37)	

**Aldoori, W. H. et al. A prospective study of diet and the risk of symptomatic diverticular disease in**



men. Am J Clin Nutr. 60. 757-64. 1994

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: Kohortenstudie, prospektiv	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 47888, davon 385 mit neuer symptomatischer Divertikelkrankheit  Recruiting Phase: <u>1986 - 1990</u> + 2 Jahre follow-up  Inclusion criteria: The Health Professionals Follow up Study is a prospective study of heart disease and cancer among 1529 US male health professionals residing in 50 US states and aged 40-75y in 1986. The study population consists of 29683 dentists, 3745 optometrists, 2218 osteopathic physicians, 4185 pharmacists, 1600 podiatrists, and 10098 veterinarians.  Exclusion criteria:	Interventions:  Comparison:
Notes:	Sehr gut gemachte prospektive Kohortenstudie mit 4 jähriger Beobachtung von 47888 Probanden von denen 385 Probanden eine symptomatische Divertikulose entwickelten  Author's conclusion:		
Outcome Measures/results	Primary  Secondary	Results: For men on a high-total-fat, low-fiber diet, the RR was 2.35(95%CI 1.38, 3.98) compared with those on a low-total-fat, high-fiber diet, and for men on a high-red-meat, low-fiber diet the RR was 3.32(95%CI 1.46, 7.53) compared with those on a low-red-meat, high-fiber diet.	

Cao, Y. et al. Meat intake and risk of diverticulitis among men. Gut. 67. 466-472. 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: Prospektive Kohorte, 46461 Männer, 651970 Patientenjahre	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 44461  Recruiting Phase:  Inclusion criteria:  Exclusion criteria:	Interventions:  Comparison:
Notes:	Sehr gut gemachte hochrangig publizierte prospektive Kohortenstudie mit 46461 Männern, 651970 Patientenjahre mit klarem und plausiblen Ergebnis  Author's conclusion: Red meat intake, particularly unprocessed red meat, was associated with an increased risk of diverticulitis. The findings provide practical dietary guidance for patients at risk of diverticulitis		
Outcome Measures/results	Primary  Secondary	Results: Compared to men in the lowest quintile (Q1) of total red meat consumption, men in the highest quintile (Q5) had a multivariable RR of 1.58 (95% CI: 1.19, 2.11; P for trend=0.01)	

Crowe, F. L. et al. Diet and risk of diverticular disease in Oxford cohort of European Prospective Investigation into Cancer and Nutrition (EPIC): prospective study of British vegetarians and non-vegetarians. BMJ. 343. d4131. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
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<b>Evidence level:</b> 3	<b>Funding sources:</b>  <b>Conflict of Interests:</b>  <b>Randomization:</b>  <b>Blinding:</b>  <b>Dropout rates:</b>	<b>Total no. patients:</b> 47033  <b>Recruiting Phase:</b> 1993 and 1999  <b>Inclusion criteria:</b> Men and women aged 20 and older completed the baseline questionnaire.  <b>Exclusion criteria:</b>	<b>Interventions:</b> Participants were categorised into one of four diet groups based on their response to questions asking whether they ate any meat, fish, eggs, and dairy products. Participants were categorised as - those who eat meat ("meat eaters"), - those who do not eat meat but eat fish ("no meat but some fish"), - those who do not eat meat or fish but eat dairy products and/or eggs ("vegetarians"), and - those who do not eat meat, fish, eggs, or dairy products ("vegans").  <b>Comparison:</b>
<b>Notes:</b>	große Kohortenstudie  <b>Author's conclusion:</b> Consuming a vegetarian diet and a high intake of dietary fibre were both associated with a lower risk of admission to hospital or death from diverticular disease.		
<b>Outcome Measures/results</b>	<b>Primary</b> The main outcome was diverticular disease (ICD-9 562 and ICD-10 K57, which includes diverticulitis, diverticulosis, and diverticulum of the large or small intestine) defined as the earliest such diagnosis from HES or SMR data or listing as a cause of death on the death certificate.  <b>Secondary</b>	<b>Results:</b> After a mean follow-up time of 11.6 years, there were 812 cases of diverticular disease (806 admissions to hospital and six deaths). After adjustment for confounding variables, vegetarians had a 31% lower risk (relative risk 0.69, 95% confidence interval 0.55 to 0.86) of diverticular disease compared with meat eaters. There was also an inverse association with dietary fibre intake; participants in the highest fifth ( $\geq 25.5$ g/day for women and $\geq 26.1$ g/day for men) had a 41% lower risk (0.59, 0.46 to 0.78; $P < 0.001$ trend) compared with those in the lowest fifth ( $< 14$ g/day for both women and men). After mutual adjustment, both a vegetarian diet and a higher intake of fibre were significantly associated with a lower risk of diverticular disease.	

Crowe, F. L. et al. Source of dietary fibre and diverticular disease incidence: a prospective study of UK women. *Gut*. 63. 1450-6. 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level:</b> 2  <b>Study type:</b> Sehr große prospektive Kohortenstudie sehr guter Qualität	<b>Funding sources:</b>  <b>Conflict of Interests:</b>  <b>Randomization:</b>  <b>Blinding:</b>  <b>Dropout rates:</b>	<b>Total no. patients:</b> 690 075 women, Dietary fibre intake was assessed using a validated 40-item food questionnaire and remeasured 1 year later in 4265 randomly-selected women  <b>Recruiting Phase:</b> Between 1996 and 2001  <b>Inclusion criteria:</b>  <b>Exclusion criteria:</b>	<b>Interventions:</b>  <b>Comparison:</b>
<b>Notes:</b>	Sehr große prospektive Kohortenstudie sehr guter Qualität  <b>Author's conclusion:</b> A higher intake of dietary fibre is associated with a reduced risk of diverticular disease		
<b>Outcome Measures/results</b>	<b>Primary</b>	<b>Results:</b> The relative risk (95% CI) for diverticular disease per 5 g/day fibre intake was 0.86(0.84 to 0.88)	

Secondary			
<b>Diamant, M. J. et al. Smoking Is Associated with an Increased Risk for Surgery in Diverticulitis: A Case Control Study. PLoS One. 11. e0153871. 2016</b>			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 176 Recruiting Phase: Inclusion criteria: Exclusion criteria:	Interventions: Smoking status at admission to hospital, defined as current, former (no use in the past 30 days) or never smoker. Comparison:
Notes:	Kleinere Kohortenstudie aus Entlassungsdatenbank Author's conclusion: Smoking is associated with the need for surgical management of diverticulitis.		
Outcome Measures/results	Primary Partial colectomy for the treatment of diverticulitis Secondary	Results: Among the 149 patients with diverticulitis and smoking status recorded in their chart, 53 (35.6%) underwent partial colectomy and 1.3% of patients died. Among diverticulitis patients, 26.8% were current smokers, 31.5% were ex-smokers, and 41.6% never smoked. Compared to non-smokers, current smokers (adjusted OR 9.02, 95% CI: 2.47–32.97) and former smokers (adjusted OR 5.41, 95% CI: 1.54–18.96) had an increased odds of requiring surgery after adjusting for covariates including age.	

<b>Humes, D. J. et al. Smoking and the Risk of Hospitalization for Symptomatic Diverticular Disease: A Population-Based Cohort Study from Sweden. Dis Colon Rectum. 59. 110-4. 2016</b>			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2 Study type: Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 232,685 men and 14,592 women, during follow-up, 3891 men and 318 women had a diagnosis of later symptomatic diverticular disease Recruiting Phase: Swedish Construction Workers Cohort 1971–1993 Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Notes:	Große gut gemachte prospektive Kohortenstudie mit klarem plausiblen Ergebnis Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results: heavy smokers (≥15 cigarettes a day) had a 1.6-fold increased risk of developing symptomatic diverticular disease compared with nonsmokers	

**Liu, P. H. et al. Adherence to a Healthy Lifestyle is Associated With a Lower Risk of Diverticulitis among Men. Am J Gastroenterol. 112. 1868-1876. 2017**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: prospektive Kohorte von 907 Fällen und 757791 Patientenjahren	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 907  Recruiting Phase:  Inclusion criteria:  Exclusion criteria:	Interventions:  Comparison:
Notes:	prospektive Kohorte von 907 Fällen und 757791 Patientenjahren, gut gemacht mit detaillierter plausibler Analyse und relevanten Daten  Author's conclusion: Adherence to a low-risk lifestyle is associated with reduced incidence of diverticulitis		
Outcome Measures/results	Primary  Secondary	Results: High intake of red meat, low intake of dietary fiber, low vigorous physical activity, high BMI, and smoking were independently associated with increased risks of diverticulitis (all $p < 0.05$ )	

Ma, W. et al. Intake of Dietary Fiber, Fruits, and Vegetables and Risk of Diverticulitis. *Am J Gastroenterol.* 114. 1531-1538. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: prospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 51529  Recruiting Phase:  Inclusion criteria: NHS is a cohort of 121,700 US female registered nurses aged 30–55 years at enrollment in 1976. Participants have been mailed questionnaires every 2 years since inception, querying demographics, lifestyle factors, medical history, and disease outcomes, with a follow-up rate greater than 90% of available person-time.  Exclusion criteria: We excluded participants who reported a diagnosis of diverticulitis, non melanoma cancers, or inflammatory bowel disease before baseline in 1990, those who had incomplete information for dietary data, and those who reported implausible total energy intake (<500 or >3,500 kcal/d).	Interventions: Dietary intake data were assessed through administration of a validated 131-item semi-quantitative food frequency questionnaire (FFQ) every 4 years.  Comparison:
Notes:	prospektive Kohortenstudie  Author's conclusion: Higher intake of dietary fiber and fiber from different food sources, except for vegetable fiber, are associated with a lower risk of diverticulitis in women. A greater intake of whole fruit is also associated with reduced risk.		
Outcome Measures/results	Primary Our primary endpoint was diverticulitis requiring antibiotic therapy or hospitalization.	Results: We documented 4,343 incident cases of diverticulitis, encompassing 1,106,402 person-years of follow-up. Compared with participants in the lowest quintile, the multivariable hazard ratio of diverticulitis in the highest quintile of total fiber intake was 0.86 (95% confidence interval: 0.78–0.95; P-trend = 0.002). Fiber from fruits and cereals, but not vegetables, was associated with a decreased risk of diverticulitis. Furthermore, intake of total whole fruit intake and specific fruits such as apples/pears and prunes were associated with	

	Secondary	reduced risk of diverticulitis with a multivariable hazard ratio for diverticulitis of 0.95 (0.92–0.98; P-trend < 0.001) for every serving increase of total whole fruit intake per day.
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Mahmood, M. W. et al. High intake of dietary fibre from fruit and vegetables reduces the risk of hospitalisation for diverticular disease. *Eur J Nutr.* 58. 2393-2400. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Große Kohortenstudie guter Qualität	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 56030 + 48850 (Swedish Mammography Cohort (SMC), and the Cohort of Swedish Men (COSM)) Recruiting Phase: Inclusion criteria: Exclusion criteria:	Interventions: Fibre consumption was assessed with a food frequency questionnaire. Participants in the two cohorts indicated their average consumption of 96 foods and beverages over the previous year. Participants could choose from eight predefined frequency categories ranging from never to three or more times per day. Comparison:
Notes:	Große Kohortenstudie guter Qualität Author's conclusion: A high intake of fruits and vegetables may reduce the risk of hospitalisation due to DD. Intake of cereals did not influence the risk.		
Outcome Measures/results	Primary Patients in the cohorts, who had symptomatic diverticular disease (DD) and at least one admission in hospital during the study period from September 15, 1997 to December 31, 2005 for women and from January 1, 1998 to December 31, 2005 for men, were compared with healthy controls in the cohort. Only incident cases were included and patients were censored after diagnosis. Outcome variables were defined in accordance with the WHO International Classifications of Diseases (ICD-10): diverticular disease was defined by a primary diagnosis of K572-9. Secondary	Results: Women with intake of fruit and vegetable fibres in the highest quartile (median 12.6 g/day) had a 30% decreased risk of hospitalisation compared to those with the lowest intake (4.1 g/day). Men within the highest quartile (10.3 g/day) had a 32% decreased risk compared to those with a low intake (2.9 g/day). High intake of fibres from cereals did not affect the risk.	

Tonnesen, H. et al. Association between alcoholism and diverticulitis. *Br J Surg.* 86. 1067-8. 1999

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Kohortenstudie	Funding sources: Conflict of Interests: Randomization:	Total no. patients: Danish National Inpatients Registry a cohort of 21094 men and 7723 women Recruiting Phase: discharged from a Danish hospital between 1977 and 1993 Inclusion criteria: Exclusion criteria:	Interventions: Comparison:

	Blinding:	
	Dropout rates:	
Notes:	Author's conclusion:	
Outcome Measures/results	Primary Secondary	Results:

Tseng, Y. J. et al. Possible increased risk of colonic diverticular disease from alcohol intoxication or abuse. *Medicine (Baltimore)*. 99. e18840. 2020

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Kohortenstudie aus Krankenkassendaten	Funding sources: Conflict of Interests: Randomization: The cohorts were frequency matched 1:4 according to age and sex. Blinding: Dropout rates:	Total no. patients: 51866 mit Alkoholintox Recruiting Phase: January 1, 2000 to December 31, 2008. Inclusion criteria: Exclusion criteria: We excluded patients with a history of CDD (ICD-9-CM 562.1) before the index date.	Interventions: alcohol intoxication cohort consisted of patients newly diagnosed with alcohol intoxication Comparison: comparison cohort comprised randomly selected patients without a history of alcohol intoxication
Notes:	Kohortenstudie aus Krankenkassendaten Author's conclusion: There was a significant relationship between alcohol intoxication or abuse and CDD		
Outcome Measures/results	Primary Secondary	Results: The overall incidence of CDD (per 10,000 person-years) for the alcohol intoxication and control cohorts was 16.4 and 3.46, respectively. Compared with patients in the control cohort (95% confidence interval [CI] = 2.76–3.74), those with alcohol intoxication exhibited a 3.21-fold risk of CDD; the risk was particularly higher in male patients (adjusted hazard ratio [aHR]=3.19, 95% CI=2.72– 3.74) and in those aged <45 years (aHR=4.95, 95% CI=3.91–6.27). The alcohol intoxication still had higher risk of CDD than nonalcohol intoxication, regardless of subjects without comorbidity (aHR=3.38, 95% CI=2.77–4.11) or with (aHR=2.85, 95% CI= 2.25–3.61).	

## Schlüsselfrage:

AG 04\_Primärprophylaxe der Divertikulose und der Divertikelkrankheit - Medikamente

## Inhalt: 11 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Aldoori, W. H. 1998	3	Große gut gemachte Kohortenstudie mit männlicher Kohorte
Broersen, L. H. A. 2017	3	Kohortenstudie
Chang, S. S. 2015	3	case control
Hjern, F. 2015	3	Kohortenstudie
Humes, D. J. 2011	4	Case control studie über Einfluss verschiedener Medikamente
Jovani, M. 2019	3	Kohortenstudie
Kvasnovsky, C. L. 2014	1	Es handelt sich um ein systematisches review und Metaanalyse
Lanas, A. 2018	5	Persönliches Review - non-systematisch!
Morris, C. R. 2003	3	case control study
Reichert, M. C. 2018	4	Kohortenstudie
Schembri, J. 2017	5	non-systematic Review (experts)

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 3 Bewertung(en)

Kvasnovsky, C. L. et al. Increased diverticular complications with nonsteroidal anti-inflammatory drugs and other medications: a systematic review and meta-analysis. *Colorectal Dis.* 16. O189-96. 2014

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
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<p>Evidence level: 1</p> <p>Study type: Es handelt sich um ein systematisches review und Metaanalyse</p> <p>Databases: PubMed, Cochrane Reviews, Embase and Google Scholar</p> <p>Search period: bis 2013</p> <p>Inclusion Criteria:</p> <p>Exclusion Criteria:</p>	<p>Intervention: variety of drugs</p> <p>Comparison:</p>	<p>Primary: risk factors for complications of colonic diverticula, perforation and bleeding</p> <p>Secondary:</p> <p>Results: Individual studies demonstrated the odds of perforation and abscess formation with nonsteroidal anti-inflammatory drugs (NSAIDs) (1.46–10.30), aspirin (0.66–2.40), steroids (2.17–31.90) and opioids (1.80–4.51) and the odds of bleeding with NSAIDs (2.01–12.60), paracetamol (0–3.75), aspirin (1.14–3.70) and steroids (0.57–5.40). Pooled data showed significantly increased odds of perforation and abscess formation with NSAIDs (OR = 2.49), steroids (OR = 9.08) and opioids (OR = 2.52). They also showed increased odds of diverticular bleeding from NSAIDs (OR = 2.69), aspirin (OR = 3.24) and calcium-channel blockers (OR = 2.50). Most studies did not describe the duration or dosage of medication used and did not systematically describe the severity of diverticular complications.</p> <p>Author's Conclusion:</p>	
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## Methodical Notes

## Funding Sources:

## COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Lanas, A. et al. Progress and challenges in the management of diverticular disease: which treatment?. Therap Adv Gastroenterol. 11. 1756284818789055. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 5	Intervention:	Primary:	168 references
Study type: Persönliches Review - non-systematisch!	Comparison:	Secondary:	
Databases:		Results:	
Search period:		Author's Conclusion:	
Inclusion Criteria:			
Exclusion Criteria:			

**Methodical Notes**

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Sehr sorgfältiges, eminenz-basiertes Review

Schembri, J. et al. Segmental colitis associated with diverticulosis: is it the coexistence of colonic diverticulosis and inflammatory bowel disease?. Ann Gastroenterol. 30. 257-261. 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 5	Intervention:	Primary:	33 references
Study type: non-systematic Review (experts)	Comparison:	Secondary:	
Databases: Individual collection		Results:	
Search period:		Author's Conclusion: The rarity of SCAD in everyday practice and in the literature probably stems from the fact that milder forms go undiagnosed, whereas more severe forms can be misdiagnosed as IBD or diverticulitis. Increased awareness about the condition and better liaison between the endoscopist and pathologist would help in making an accurate diagnosis more frequently. Even though cases of SCAD misdiagnosed as IBD will probably respond to conventional IBD treatment, it is still important to make the distinction between the two, since the natural history and prognosis of the two conditions vary significantly. Very often, no long-term medications are required in SCAD.	
Inclusion Criteria: Alle details of SCAD			
Exclusion Criteria:			

**Methodical Notes**

Funding Sources:

COI:

Study Quality:



Heterogeneity:

Publication Bias:

Notes:

**NEWCASTLE - OTTAWA Checklist: Case Control: 3 Bewertung(en)**

Chang, S. S. et al. Long-term use of steroids protects from the development of symptomatic diverticulitis requiring hospitalization in the Asian population. PLoS One. 10. e0124598. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: case control	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 690 Fälle, 2760 Kontrollgruppe Patient characteristics: Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

Humes, D. J. et al. Concurrent drug use and the risk of perforated colonic diverticular disease: a population-based case-control study. Gut. 60. 219-24. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Case control studie über Einfluss verschiedener Medikamente	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 899 Patient characteristics: Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

Morris, C. R. et al. Anti-inflammatory drugs, analgesics and the risk of perforated colonic diverticular disease. Br J Surg. 90. 1267-72. 2003

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: case control study	Funding sources: Conflict of Interests: Randomization: Blinding:	Total no. patients: Patient characteristics: Inclusion criteria:	Interventions: non-steroidal anti-inflammatory drugs (NSAIDs), opioid analgesics and corticosteroids Comparison:

	Dropout rates:	Exclusion criteria:	
Notes:	Author's conclusion: Opioid analgesics, NSAIDs and corticosteroids are all positively associated with perforated colonic diverticular disease. The consistency of these associations, together with plausible biological mechanisms, suggests that these drugs may have a causative role in this condition.		
Outcome Measures/results	Primary risk for perforated diverticular disease Secondary	Results: Opioid analgesics, NSAIDs and corticosteroids were all positively associated with perforated colonic diverticular disease. The odds ratio for opioid analgesics was 1.8 (95 % CI 1.1 to 3.0) in the analysis with ophthalmology controls and 3.1 (95 % CI 1.8 to 5.5) in that with dermatology controls. Respective odds ratios for NSAIDs were 4.0 (95 % CI 2.1 to 7.6) and 3.7 (95 % CI 2.0 to 6.8), and those for corticosteroids were 5.7 (95 % CI 2.2 to 14.4) and 7.8 (95 % CI 2.6 to 23.3).	

## NEWCASTLE - OTTAWA Checklist: Cohort: 5 Bewertung(en)

Aldoori, W. H. et al. Use of acetaminophen and nonsteroidal anti-inflammatory drugs: a prospective study and the risk of symptomatic diverticular disease in men. Arch Fam Med. 7. 255-60. 1998			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Große gut gemachte Kohortenstudie mit männlicher Kohorte	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 35 615 Recruiting Phase: Inclusion criteria: Male health professionals residing in 50 US states. Exclusion criteria:	Interventions: regular use of nonsteroidal antiinflammatory drugs (NSAIDs) and acetaminophen Comparison:
Notes:	Author's conclusion: These results suggest that regular and consistent use of NSAIDs in general and acetaminophen is associated with symptoms of severe diverticular disease, particularly bleeding. Further research is needed to investigate the potentially deleterious effect of NSAIDs and other medications on the lower gastrointestinal tract.		
Outcome Measures/results	Primary risk of symptomatic diverticular disease Secondary	Results: regular and consistent use of NSAIDs and acetaminophen was positively associated with the overall risk of symptomatic diverticular disease (for users vs nonusers, RR for NSAIDs = 2.24, 95% CI, 1.28-3.91; RR for acetaminophen = 1.81, 95% CI, 0.79-4.11). Most of this positive association was attributable to cases associated with bleeding, particularly for acetaminophen (for users vs nonusers, RR for NSAIDs = 4.64, 95% CI, 0.99-21.74; RR for acetaminophen = 13.63, 95% CI, 3.53-52.60).	

Broersen, L. H. A. et al. Corticosteroid use and mortality risk in patients with perforated colonic diverticular disease: a population-based cohort study. BMJ Open Gastroenterol. 4. e000136. 2017			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 4640 Recruiting Phase: Inclusion criteria: adult patients (≥18 years), with and without use of corticosteroids, hospitalised with incident perforated diverticular disease between 2005 and 2013 in Denmark. Exclusion criteria:	Interventions: Corticosteroid use was categorized as follows: - non-users - current users - recent users Comparison:
Notes:	gut gemachte Kohortenstudie Author's conclusion: Corticosteroid use was associated with clearly increased mortality risk after perforated diverticular disease. Thus, use of corticosteroids should be regarded as an important clinical prognostic factor for mortality in patients with this condition.		

<b>Outcome Measures/results</b>	<p>Primary Identification of perforated and non-perforated diverticular disease was based on International Classification of Diseases (ICD) codes</p> <p>Secondary</p>	<p>Results: Mortality risk in non-users was 4.4% after 7 days and 15.6% after 1 year. This risk was doubled for corticosteroid users who filled their last prescription during the 90 days before admission, with mortality risks ranging from 14.2% after 7 days to 47.6% after 1 year. 1-year mortality risk was even higher for corticosteroid users with a first filled prescription <math>\leq 90</math> days before admission: 52.5%.</p>
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Hjern, F. et al. Cohort study of corticosteroid use and risk of hospital admission for diverticular disease. *Br J Surg.* 102. 119-24. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p> <p>Study type: Kohortenstudie</p>	<p>Funding sources:</p> <p>Conflict of Interests:</p> <p>Randomization:</p> <p>Blinding:</p> <p>Dropout rates:</p>	<p>Total no. patients: 36 586</p> <p>Recruiting Phase: 1987 and 1990.</p> <p>Inclusion criteria:</p> <p>Exclusion criteria:</p>	<p>Interventions: intake of corticosteroids, indometacin or aspirin</p> <p>Comparison:</p>
<b>Notes:</b>			
Author's conclusion:			
<b>Outcome Measures/results</b>	<p>Primary relative risk of diverticular disease</p> <p>Secondary</p>	<p>Results: women who reported oral corticosteroid intake had a 37 per cent (RR 1.37, 95 % c.i. 1.06 to 1.78; <math>P = 0.012</math>) increased risk of diverticular disease compared with those who reported no intake at all. Use of inhaled corticosteroids was associated with an even more pronounced increase in risk of 71 % (RR 1.71, 1.36 to 2.14; <math>P &lt; 0.001</math>). There was a significant dose-response relationship, with the risk increasing with longer duration of inhaled corticosteroids (<math>P</math> for trend <math>&lt; 0.001</math>). Use of indometacin (2.5 per cent of women) or aspirin (44.2 per cent) did not influence the risk.</p>	

Jovani, M. et al. Menopausal Hormone Therapy and Risk of Diverticulitis. *Am J Gastroenterol.* 114. 315-321. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p> <p>Study type: Kohortenstudie</p>	<p>Funding sources:</p> <p>Conflict of Interests:</p> <p>Randomization:</p> <p>Blinding:</p> <p>Dropout rates:</p>	<p>Total no. patients: 65367</p> <p>Recruiting Phase:</p> <p>Inclusion criteria: female registered nurses, aged 30–55 years at enrollment in 1976</p> <p>Exclusion criteria:</p>	<p>Interventions: Menopausal hormone therapy</p> <p>Comparison:</p>
<b>Notes:</b>			
Gut gemachte Kohortenstudie mit 65,367 postmenopausalen Frauen			
Author's conclusion: Menopausal hormone therapy was associated with an increased risk of diverticulitis. Further studies are needed to understand the potential mechanisms that may underlie this association.			
<b>Outcome Measures/results</b>	<p>Primary Risk of incident divertikulitis</p> <p>Secondary</p>	<p>Results: increased risk of diverticulitis among both current (HR 1.28; 95% CI 1.18–1.39) and past (HR 1.35; 95% CI 1.25–1.45) MHT users compared to never users. The increased risk was observed among participants using estrogen only (HR 1.30; 95% CI 1.20–1.41) and those using combined estrogen and progesterone (HR 1.31; 95% CI 1.21–1.42) compared to nonusers. The risk did not increase with longer duration of use (<math>P</math>-trend 5 0.76).</p>	

Reichert, M. C. et al. Selective association of nonaspirin NSAIDs with risk of diverticulitis. *Int J Colorectal Dis.* **33**, 423-430. 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 194  Recruiting Phase: 2012 and 2016  Inclusion criteria: Patients referred for colonoscopy (indications were colon cancer screening (61.3%), rectal bleeding including positive hemocult and anemia workup (19.1%), as well as abdominal complaints (19.6%)).  Exclusion criteria:	Interventions: intake of nonsteroidal anti-inflammatory drugs (NSAIDs) and in particular nonaspirin NSAIDs  Comparison:
Notes:	Kleine Kohortenstudie  Author's conclusion: Our study demonstrates, in line with previous reports, that intake of NSAIDs is associated with diverticulitis. We show in particular that nonaspirin NSAIDs might be selectively associated with diverticulitis. These results point to divergent role of aspirin and nonaspirin NSAIDs in the development of diverticulitis		
Outcome Measures/results	Primary progression of diverticulosis to diverticulitis  Secondary	Results: Patients with diverticulitis were significantly ( $p < 0.001$ ) younger as compared to individuals with plain diverticulosis (median age 64 versus 71 years, respectively). The intake of NSAIDs significantly ( $p = 0.002$ ) increased the risk of prior diverticulitis (OR 3.2, 95% CI 1.5–6.9).	



## Schlüsselfrage:

**AG 05 - Frage 01 Kriterien für eine ambulante/stationäre Versorgung**  
**Gibt es Kriterien für eine ambulante/stationäre Versorgung einer Divertikulitis?**

## Inhalt: 7 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Balasubramanian, I. 2017	1	Systematischer Review
Biondo, S. 2014	1	Multizentrische prospektive randomisierte Studie
Isacson, D. 2015	2	Prospektive Kohortenstudie
Joliat, G. R. 2017	4	Retrospektive Kohortestudie
Juszczuk, Karolina 2019	1	cohort
Sanchez-Velazquez, P. 2016	2	Systematischer Review
van Dijk, S. T. 2018	1	Meta-Analyse

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 3 Bewertung(en)

Balasubramanian, I. et al. Out-Patient Management of Mild or Uncomplicated Diverticulitis: A Systematic Review. *Dig Surg.* 34. 151-160. 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Systematischer Review</p> <p>Databases: Medline, Embase, Scopus, Cochrane library</p> <p>Search period: 1945-2015</p> <p>Inclusion Criteria: Akute unkomplizierte Divertikulitis</p> <p>Exclusion Criteria: Komplizierte Divertikulitis, Sonografie als Schnittbildgebung, Rechtsseiten-Divertikulitis</p>	<p>Population: Akute unkomplizierte Divertikulitis</p> <p>Intervention: ambulante Therapie (definiert als stationärer Aufenthalt &lt;24 Stunden)</p> <p>Comparison: stationäre Therapie</p>	<p>Primary: Versagen der primären Therapie und Notwendigkeit einer parenteralen Antibiotikatherapie.</p> <p>Secondary: Rezidivbeschwerden oder Symptome im Follow-Up, Behandlungskosten</p> <p>Results: 11 Studien eingeschlossen (1 RCT, 7 prospektive Kohortenstudien, 2 retrospektive Kohortenstudien) mit insgesamt 772 Patienten. Alle ambulant behandelten Patienten erhielten eine Antibiotikatherapie über 4 - 10 Tage (meist Amoxicillin oder Ciprofloxacin). Versagen der ambulanten konservativen Therapie bei 6,2% (33/533) vs. 4,6% (11/239) bei stationärer Behandlung. Sekundärer Studienendpunkt Rezidivbeschwerden bei 6/10 Studien berichtet. Rekurrente Symptome bei 13% nach ambulanter Behandlung vs. 12,1% nach stationärer Behandlung. Sekundärer Studienendpunkt Behandlungskosten bei 5/10 Studien berichtet. Kosteneinsparung pro ambulantem Patient <u>690 - 1.868 Euro</u>.</p> <p>Author's Conclusion: Ambulante Behandlung einer unkomplizierten ist angemessen.</p>	

## Methodical Notes

Funding Sources: keine

COI: keine

Study Quality: Nur eine positiv randomisierte kontrollierte Studie, ansonsten Kohortenstudien. Alle Patienten antibiotisch behandelt.

**Heterogeneity:** Starke Heterogenität, insbesondere der Patientenselektion und der Antibiotikatherapie.

**Publication Bias:**

**Notes:**

Definition einer unkomplizierten Divertikulitis in allen Studien mittels CT. Kriterien für ambulant nicht klar definiert z.B. Ausschluß von Comorbiditäten, Alter

Sanchez-Velazquez, P. et al. Outpatient treatment of uncomplicated diverticulitis: a systematic review. Eur J Gastroenterol Hepatol. 28. 622-7. 2016

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: Systematischer Review</p> <p>Databases: MEDLINE (access through Pubmed), EMBASE, and Central Register of Controlled Trials.</p> <p>Search period: bis 2015</p> <p>Inclusion Criteria: Ambulante Behandlung bei akuter unkomplizierter Divertikulitis</p> <p>Exclusion Criteria: Ambulante Behandlung nicht als Studienendpunkt</p>	<p>Population: Akute unkomplizierte Divertikulitis</p> <p>Intervention: Ambulante Behandlung</p> <p>Comparison: Keine</p>	<p>Primary: Erfolgsrate der ambulanten Behandlung</p> <p>Secondary: Symptombdauer</p> <p>Results: 11 Studien eingeschlossen (1 RCT, 8 prospektive Kohortenstudien, 2 retrospektive Kohortenstudien). Erfolgsrate der ambulanten Therapie 91,5-100%. Stationäre Wiederaufnahmerate &lt; 8%.</p> <p>Author's Conclusion: Ambulante Therapie der akuten unkomplizierten Divertikulitis ist sicher effektiv und ökonomisch effizient.</p>	

#### Methodical Notes

**Funding Sources:** kein

**COI:** kein

**Study Quality:** Nur eine positiv randomisierte kontrollierte Studie, ansonsten Kohortenstudien. Alle Patienten antibiotisch behandelt.

Einschluss einer Studie bei der die Diagnose der Divertikulitis sonografisch basiert war.

**Heterogeneity:** Wird nicht diskutiert.

**Publication Bias:**

**Notes:**

Keine Diskussion der Heterogenität.

Fokussierung auf die Gruppe der ambulant behandelten Patienten ohne Vergleich zu den stationär behandelten Patienten

van Dijk, S. T. et al. A systematic review and meta-analysis of outpatient treatment for acute diverticulitis. Int J Colorectal Dis. 33. 505-512. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Meta-Analyse</p> <p>Databases: PubMed, EMBASE</p> <p>Search period: bis November 2017</p> <p>Inclusion Criteria: Akute unkomplizierte Divertikulitis</p>	<p>Population: Akute unkomplizierte Divertikulitis</p> <p>Intervention: Ambulante Therapie</p> <p>Comparison: Stationärer Therapie</p>	<p>Primary: Stationäre Wiederaufnahmerate</p> <p>Secondary: Notwendigkeit einer perkutanen Drainage oder Notfalloperation Kosten</p> <p>Results: Die gepoolte Wiederaufnahmerate bei ambulanter Behandlung betrug 7% (95% Konfidenzintervall 6-9%). Nur 0,2% der Patienten benötigten eine Notfalloperation, 0,2 Prozenten eine perkutane Abszessdrainage. Die durchschnittlichen Kosteneinsparungen für ambulant behandelte Patienten im Vergleich zu stationär behandelten Patienten betragen 42 - 82%.</p> <p>Author's Conclusion: Die ambulante Therapie der unkomplizierten Divertikulitis führt zu einer niedrigen Wiederaufnahmerate sowie einer sehr geringen Komplikationsrate. Die Kosteneinsparungen sind substanzial. Daher scheint die ambulante Therapie eine sichere Option für die meisten Patienten.</p>	

Exclusion Criteria: Studien mit mehr als 20% rechtsseitigen Divertikulitis.			
<b>Methodical Notes</b>			
Funding Sources: Association for Quality Funds Medical Specialists (SKMS)			
COI: kein			
Study Quality: Nur eine positiv randomisierte kontrollierte Studie, ansonsten Kohortenstudien. Nur 3 Studien ohne Antibiotikatherapie.			
Heterogeneity: Starke Heterogenität, insbesondere der Patientenselektion und der Antibiotikatherapie.			
Publication Bias: kein			
Notes: Definition einer unkomplizierten Divertikulitis mittels CT oder Sonografie.			

**OXFORD (2011) Appraisal Sheet: RCT: 1 Bewertung(en)**

Biondo, S. et al. Outpatient versus hospitalization management for uncomplicated diverticulitis: a prospective, multicenter randomized clinical trial (DIVER Trial). Ann Surg. <u>259</u> , 38-44. 2014		
<b>Population</b>	<b>Intervention - Comparison</b>	<b>Outcomes/Results</b>
Evidence level: 1  Study type: Multizentrische prospektive randomisierte Studie  Number of Patient: 132 (66 vs. 66)  Recruiting Phase: 2009-2011  Inclusion Criteria: CT graphisch bestätigte akute unkomplizierte Divertikulitis Alter >18 Jahre Toleranz einer oralen Einfuhr gutes Ansprechen auf die primäre parenterale Antibiotika- und analgetische Therapie in der Notaufnahme unterschrieben Einverständniserklärung  Exclusion Criteria: Akute komplizierte Divertikulitis fehlendes Ansprechen auf die initiale Analgetika und Antibiotikatherapie Antibiotikaeinnahme aufgrund einer Divertikulitis innerhalb des letzten Monats vor der Index Aufnahme Übelkeit und Erbrechen Immunsuppression Komorbidität V.a. Malignom kognitive,	Intervention: Entlassung in die ambulante Behandlung nach initialer parenteraler Analgetika und Antibiotikagabe, ambulante Fortführung einer oralen Antibiotikatherapie  Comparison: Stationäre Aufnahme, parenterale Flüssigkeitsgabe und Antibiotikatherapie für mindestens 48 Stunden, Umstellung auf orale Antibiotikagabe bei Nahrungstoleranz	Primary: Versagen der konservativen Therapie, definiert als persistierende, ansteigende oder rezidivierende abdominelle Schmerzen, Fieber, entzündliche Darmobstruktion mit der Notwendigkeit einer Abszessdrainage, Notfalloperation, stationären Wiederaufnahme oder Mortalität innerhalb von 60 Tagen nach Entlassung.  Secondary: Patient Reported Outcome Measures: Quality of life (SF-12) Kostenanalyse  Results: Kein Unterschied bzgl. primärem Studienendpunkt; 4,5% vs. 6,1% (P=0.619). Keine Unterschiede in der Lebensqualität. Dreifach erhöhte Kosten bei stationärer Therapie.  Author's Conclusion: Die ambulante Behandlung einer akuten unkomplizierten Divertikulitis ist sicher und effektiv, soweit keine relevanten Komorbiditäten, eine Immunsuppression, kognitive, psychiatrische, oder soziale Einschränkungen oder eine Unverträglichkeit der oralen Einfuhr bestehen.

psychiatrische soziale Einschränkungen	oder	
<b>Methodical Notes</b>		
Funding Sources: Instituto Carlos III from the Ministry of Health, Government of Spain		
COI: keine		
Randomization: 1:1, nach Zentrum stratifiziert, mittels versiegelter Umschläge		
Blinding: nein		
Dropout Rate/ITT-Analysis: 9/132		
Notes: 5 Zentren, Spanien		

**NEWCASTLE - OTTAWA Checklist: Cohort: 3 Bewertung(en)**

Isacson, D. et al. Outpatient, non-antibiotic management in acute uncomplicated diverticulitis: a prospective study. <i>Int J Colorectal Dis.</i> <b>30.</b> 1229-34. 2015			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: Prospektive Kohortenstudie	Funding sources: Uppsala- Örebro Regional Research Fund, Sweden  Conflict of Interests: keine  Randomization: keine  Blinding: keine  Dropout rates: 5/155	Total no. patients: 155  Recruiting Phase: <u>2012 - 2013</u>  Inclusion criteria: Alter > 18 Jahre Unterbauchschmerzen innerhalb der letzten 3 Tage, erhöhte Infektionsparameter im Serum (CRP oder Leukozytose), CT graphischer Nachweis einer akuten unkomplizierten linksseitigen Divertikulitis  Exclusion criteria: CT graphisch Zeichen einer komplizierten Divertikulitis weitere Pathologien in der Computertomografie hohes Fieber, verschlechterter Allgemeinzustand, Peritonismus, Sepsis bereits vorhandene antibiotische Therapie Dehydratation, Übelkeit, Erbrechen Notwendigkeit einer Opioid- basierten Analgetikatherapie immunsupprimiert Patienten Schwangere Demenz Sprachbarriere unzureichende häusliche Versorgung	Interventions: Ambulante Beobachtung ohne Antibiotikatherapie  Comparison: Keine
Notes:	Author's conclusion: Ambulante Therapie einer akuten unkomplizierten Divertikulitis mit Verzicht auf eine Antibiotikatherapie sicher und effektiv.		
Outcome Measures/results	Primary Therapieversagen mit Notwendigkeit einer stationären Aufnahme innerhalb eines Monats  Secondary Patient reported outcome measures" (PROMs): Schmerzskala VAS, Temperatur Stuhlgewohnheiten, Analgetikaeinnahme	Results: Therapieversagen bei 2.6 %, 4/155 (1x perkutanen Drainage, 3 mal Antibiotikatherapie, keine Notfalloperation). Rascher Rückgang der Beschwerden und Beendigung der Analgetikatherapie bei >90% innerhalb der ersten Woche. Rezidiv Beschwerden/Divertikulitis bei 3,3%, 5/155 innerhalb der ersten 3 Monate	

Joliat, G. R. et al. Antibiotic treatment for uncomplicated and mild complicated diverticulitis: outpatient treatment for everyone. <i>Int J Colorectal Dis.</i> <b>32.</b> 1313-1319. 2017			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level:	Funding sources: kein	Total no. patients: 540	Interventions: Ambulante



4	<p><b>Study type:</b> Retrospektive Kohortestudie</p> <p><b>Conflict of Interests:</b> keine</p> <p><b>Randomization:</b> keine</p> <p><b>Blinding:</b> keine</p> <p><b>Dropout rates:</b> 47% bei fehlender Antwort auf Fragebogen, 33/540 Patienten verstorben.</p>	<p><b>Recruiting Phase:</b> 2006-2012</p> <p><b>Inclusion criteria:</b> CT graphisch gesicherte akute unkomplizierte/mild-komplizierte Divertikulitis (Abszess &lt;4 cm)</p> <p><b>Exclusion criteria:</b> Indikation zur perkutanen Abszessdrainage oder Operation</p>	<p><b>Behandlung mit oraler Antibiotikatherapie für 10 Tage</b></p> <p><b>Comparison:</b> Stationäre Behandlung mit parenterale Flüssigkeitszufuhr und Antibiotikagabe</p>
<b>Notes:</b>	<p><b>Author's conclusion:</b> Ambulante Behandlung bei unkomplizierter/mild komplizierter Divertikulitis ist möglich und sicher.</p>		
<b>Outcome Measures/results</b>	<p><b>Primary</b> Versagen der konservativen Therapie, definiert als stationäre Wiederaufnahme für die Interventionsgruppe bzw. perkutane Drainage oder Notfalloperation für die Kontrollgruppe.</p> <p><b>Secondary</b></p>	<p><b>Results:</b> Therapieversagen bei ambulanter Behandlung 10% versus 32% bei stationärer Behandlung (P &lt; 0,001). Notfalloperation im Verlauf bei 3% nach ambulanter Behandlung sowie 8% nach stationärer Behandlung (p = 0.70). Elektive Operation nach ambulanter Behandlung bei 13% versus 18% nach stationärer Behandlung (p = 0.38).</p>	

Juszczyk, Karolina et al. Reduction in hospital admissions with an early computed tomography scan: results of an outpatient management protocol for uncomplicated acute diverticulitis. ANZ journal of surgery. 89. 1085-1090. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p><b>Evidence level:</b> 1</p> <p><b>Study type:</b> cohort</p>	<p><b>Funding sources:</b></p> <p><b>Conflict of Interests:</b> non</p> <p><b>Randomization:</b></p> <p><b>Blinding:</b></p> <p><b>Dropout rates:</b></p>	<p><b>Total no. patients:</b> 552</p> <p><b>Recruiting Phase:</b> 4-year period: 2 years prior (May 2013–April 2015; pre-protocol) and 2 years after implementation of the protocol (May 2015–April 2017; post-protocol)</p> <p><b>Inclusion criteria:</b></p> <p><b>Exclusion criteria:</b> if the CT scan shows complicated acute diverticulitis (Hinchey I or higher)<sup>8</sup> or a suspicion of malignancy, if they are pregnant, are breastfeeding, are immunosuppressed or if they have been treated with oral antibiotics prior to presenting to the ED and have shown no sign of improvement. Also ineligible for outpatient management are those with severe co-morbidities, such as exacerbation of a heart or lung condition, or cognitive impairment, limiting the chance of successful outpatient management of UAD.</p>	<p><b>Interventions:</b></p> <p><b>Comparison:</b></p>
<b>Notes:</b>	<p><b>Author's conclusion:</b> The results of our current study show that an early CT scan in the ED in case of suspected UAD can reduce the admission rates by more than 50%, and significantly reduce the total number of hospital days without resulting in an increase in representations. UAD can safely and effectively be treated in an outpatient setting leading to a reduction in the burden on the health system</p>		
<b>Outcome Measures/results</b>	<p><b>Primary</b></p> <p><b>Secondary</b></p>	<p><b>Results:</b></p>	

## Schlüsselfrage:

## AG 05 - Frage 03 CDD Typ 1

Gibt es besondere Patientengruppen bei denen nach einer akuten unkomplizierten Divertikulitis eine elektive Resektion indiziert ist?

## Inhalt: 13 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Al-Khamis, A. 2016	2	Retrospektive Analyse großer Datenbank
Biondo, S. 2012	2	
Chabok, A. 2017	3	retrospektive Kohortenstudie
Hupfeld, L. 2017	2	syst. rev.
Hwang, S. S. 2010	2	Systematischer Review
Katz, L. H. 2013	2	Meta-Analyse
Klarenbeek, B. R. 2010	4	retrospektive unizentrische Kohortenstudie
Lee, J. T. 2017	4	retrospektive Kohortenstudie
Oor, J. E. 2014	2	Meta-Analyse
Samdani, T. 2014	3	retrospektive Kohortenstudie
Sugrue, J. 2018	3	retrospektive Kohortenstudie
Turner, G. A. 2020	3	retrospektive Kohortenstudie
van Dijk, S. T. 2020	2	Meta-Analyse

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 5 Bewertung(en)

Hupfeld, L. et al. Risk factors for recurrence after acute colonic diverticulitis: a systematic review. <i>Int J Colorectal Dis.</i> 32. 611-622. 2017			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2 Study type: syst. rev. Databases: Search period: Inclusion Criteria: Exclusion Criteria:	Intervention: Comparison:	Primary: risk of recurrence Secondary: Results: higher risk of recurrence after abscess Author's Conclusion: In conclusion, the risk of experiencing a recurrent episode of acute diverticulitis increased significantly after a primary episode with abscess formation. Further predisposing factors for recurrence were young age at debut and previous recurrences. Recurrence risk was highest within the first year after	

	remission and recurrence risk increased gradually with more recurrent episodes.	
<b>Methodical Notes</b>		
<b>Funding Sources:</b>		
COI:		
<b>Study Quality:</b>		
Heterogeneity:		
<b>Publication Bias:</b>		
<b>Notes:</b> 35 studies included, mostly retrospective studies, small patient numbers per study		

<b>Hwang, S. S. et al. Diverticulitis in transplant patients and patients on chronic corticosteroid therapy: a systematic review. Dis Colon Rectum. 53. 1699-707. 2010</b>				
<b>Evidence level/Study Types</b>	<b>P - I - C</b>	<b>Outcomes/Results</b>	<b>Literature References</b>	
Evidence level: 2  Study type: Systematischer Review Databases: PubMed Web of Knowledge  Search period: <u>1970-2009</u>  Inclusion Criteria: Transplantation, corticosteroid, HIV, AIDS, chemotherapy  Exclusion Criteria:	Intervention:  Comparison:	Primary: Divertikulitis assoziierte Mortalität  Secondary:  Results: Mortalität 23% nach operativer Therapie und 56% nach konservativer Therapie.  Author's Conclusion: Patienten mit Immunsuppression haben ein erhöhtes Risiko einer Divertikulitis und im Falle einer Divertikulitis eine erhöhte Mortalität.		
<b>Methodical Notes</b>				
<b>Funding Sources:</b> keine				
COI: keine				
<b>Study Quality:</b> keine randomisierten Studien				
Heterogeneity: nicht berichtet				
<b>Publication Bias:</b>				
<b>Notes:</b>				

<b>Katz, L. H. et al. Diverticulitis in the young is not more aggressive than in the elderly, but it tends to recur more often: systematic review and meta-analysis. J Gastroenterol Hepatol. 28. 1274-81. 2013</b>				
<b>Evidence level/Study Types</b>	<b>P - I - C</b>	<b>Outcomes/Results</b>	<b>Literature References</b>	
Evidence level: 2  Study type:	Population: 4,982 Patienten aus 12 Studien	Primary: Dringliche/ Notfalloperation  Secondary: Rezidivrate		

<b>Meta-Analyse</b> <b>Databases:</b> NEDLINE, EMBASE  <b>Search period:</b> <u>1980-2011</u>  <b>Inclusion</b> <b>Criteria:</b> Studien mit Altersbezug  <b>Exclusion</b> <b>Criteria:</b>	<b>Intervention:</b> jüngere Patienten  <b>Comparison:</b> ältere Patienten	<b>Results:</b> Kein erhöhtes Risiko einer dringlichen Operation bei Jüngeren (RR 0.69, 95% CI 0.46–1.06). Erhöhtes Rezidivrisiko bei Jüngeren (RR 1.70, 95% CI 1.31–2.21).  <b>Author's Conclusion:</b> Das Alter sollte bei der Therapieempfehlung berücksichtigt werden.
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**Methodical Notes**

**Funding Sources:** große Heterogenität, relativ geringe Fallzahl

**COI:** keine

**Study Quality:** Primärdaten retrospektiv

**Heterogeneity:** gering

**Publication Bias:**

**Notes:**

Oor, J. E. et al. A systematic review of complicated diverticulitis in post-transplant patients. *J Gastrointest Surg.* 18. 2038-46. 2014

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<b>Evidence level:</b> 2  <b>Study type:</b> Meta-Analyse <b>Databases:</b> MEDLINE, EMBASE  <b>Search period:</b> <u>1966-2014</u>  <b>Inclusion Criteria:</b> Organtransplantierte Patienten  <b>Exclusion Criteria:</b>	<b>Population:</b> Organtransplantierte Patienten  <b>Intervention:</b>  <b>Comparison:</b>	<b>Primary:</b> Komplizierte Divertikulitis  <b>Secondary:</b>  <b>Results:</b> Gepoolte Inzidenz der Divertikulitis 1.7 % (95 % CI 1.0 to 2.7 %) bei Patienten nach Organtransplantation. Anteil der Patienten mit komplizierter Divertikulitis 40.1 % (95 % CI 32.2 to 49.7 %).  <b>Author's Conclusion:</b> Patienten nach einer Organtransplantation weisen häufiger eine komplizierte Divertikulitis auf als die Durchschnittsbevölkerung.	

**Methodical Notes**

**Funding Sources:**

**COI:**

**Study Quality:**

**Heterogeneity:**

**Publication Bias:**

**Notes:**

van Dijk, S. T. et al. A systematic review and meta-analysis of disease severity and risk of recurrence in young versus elderly patients with left-sided acute diverticulitis. *Eur J Gastroenterol Hepatol.* **32**, 547-554. 2020

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: Meta-Analyse</p> <p>Databases: MEDLINE, EMBASE</p> <p>Search period: bis 2018</p> <p>Inclusion Criteria: Beurteilung der Divertikulitis mittels CT</p> <p>Exclusion Criteria:</p>	<p>Population: 23 Studien</p> <p>Intervention: jüngere Patienten (unter 40 - 50 Jahre)</p> <p>Comparison: ältere Patienten</p>	<p>Primary: Anteil Komplizierte Divertikulitis</p> <p>Secondary: Notfalloperation Rezidivrate</p> <p>Results: Kein erhöhtes Risiko bei Jüngeren für komplizierte Divertikulitis [risk ratio (RR) 1.19; 95% confidence interval 0.94–1.50] oder Notfalloperation [RR of 0.93 (95% confidence interval 0.70–1.24)]. Erhöhtes Rezidivrisiko bei Jüngeren [RR of 1.47 (95% confidence interval 1.20–1.80)].</p> <p>Author's Conclusion: Kein schwerere Verlauf der Divertikulitis bei Jüngeren. Daher keine Anpassung der Therapie indiziert.</p>	

#### Methodical Notes

#### Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

#### NEWCASTLE - OTTAWA Checklist: Cohort: 8 Bewertung(en)

Al-Khamis, A. et al. Sigmoid Colectomy for Acute Diverticulitis in Immunosuppressed vs Immunocompetent Patients: Outcomes From the ACS-NSQIP Database. *Dis Colon Rectum.* **59**, 101-9. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 2</p> <p>Study type: Retrospektive Analyse großer Datenbank</p>	<p>Funding sources: keine</p> <p>Conflict of Interests: keine</p> <p>Randomization: keine</p> <p>Blinding:</p> <p>Dropout rates:</p>	<p>Total no. patients: 26,987</p> <p>Recruiting Phase: <u>2005-2012</u> (Analysezeitraum)</p> <p>Inclusion criteria: elektive oder Notfall-Sigmaresektion bei akuter Divertikulitis</p> <p>Exclusion criteria: Divertikelblutung</p>	<p>Interventions: Immunsupprimierte Patienten (Kortikoide innerhalb von 30 Tagen präoperativ)</p> <p>Comparison: Nicht immunsupprimierte Patienten</p>

<b>Notes:</b>	Author's conclusion: Deutlich erhöhtes Mortalitätsrisiko bei Notfalloperation unter Immunsuppression. Erhöhte Morbidität, insbesondere Wundheilungsstörungen bei elektiver Resektion	
<b>Outcome Measures/results</b>	<p><b>Primary postoperative Mortalität</b></p> <p><b>Secondary postoperative Komplikationen, Morbidität</b></p>	<p><b>Results:</b> Deutlich erhöhte Mortalität von 16.6% vs. 4.1% (P&lt;0,001) und Morbidität (schwere Komplikationen) von 45% vs. 28% (P&lt;0,001) nach Notfalloperation. In der Multivariaten Analyse betrug die Odds Ratio für postoperative Mortalität bei Immunsuppression 1,8 (95% Konfidenzintervall 1,17-2,75).</p> <p>Die Unterschiede nach elektiver Sigmaresektion waren deutlich geringer, jedoch weiterhin signifikant höher. Mortalität von 2.0% vs. 0.4%(P&lt;0,001) und Morbidität von 25% vs. 12% (P&lt;0,001). In der multivariaten Analyse war die Mortalität unter Immunsuppression nicht signifikant erhöht, jedoch die Morbidität (Odds Ratio 1,46, 95% Konfidenzintervall 1,17-1,83).</p>

Biondo, S. et al. Recurrence and virulence of colonic diverticulitis in immunocompromised patients. *Am J Surg.* 204. 172-9. 2012

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p><b>Evidence level:</b> 2</p> <p><b>Study type:</b></p>	<p><b>Funding sources:</b></p> <p><b>Conflict of Interests:</b></p> <p><b>Randomization:</b></p> <p><b>Blinding:</b></p> <p><b>Dropout rates:</b></p>	<p><b>Total no. patients:</b></p> <p><b>Recruiting Phase:</b></p> <p><b>Inclusion criteria:</b></p> <p><b>Exclusion criteria:</b></p>	<p><b>Interventions:</b></p> <p><b>Comparison:</b></p>
<b>Notes:</b>	<p>Single center Studie für die 931 Patienten (166 immunsupprimiert, 765 nicht immunsupprimiert) beim initialen Divertikulitisschub entweder chirurgisch oder medizinisch behandelt wurden. Im Verlauf von 2 bis max. 16 Jahren wurde die Rezidivhäufigkeit beobachtet. Spezifika über Art, Intensität und Dauer der Immunsuppression finden sich leider nicht.</p> <p>Die Rezidivrate war in beiden Gruppen mit 21.5 bzw. 20.5% nicht wesentlich unterschiedlich.</p> <p>Immunsupprimierte Patienten weisen eine aggressivere 1. Divertikulitisepisode auf mit vermehrter Notwendigkeit zu operieren und höherer Mortalität. Nach einer erfolgreichen medikamentösen Therapie müssen die immunsupprimierten Patienten nicht hinsichtlich einer elektiven Sigmaresektion beraten werden, die Rezidivhäufigkeit und die Wahrscheinlichkeit für eine Notfall-OP unterscheiden sich nicht zwischen Immunsupprimierten und nicht Immunsupprimierten.</p> <p><b>Author's conclusion:</b></p>		
<b>Outcome Measures/results</b>	<p><b>Primary</b></p> <p><b>Secondary</b></p>	<b>Results:</b>	

Chabok, A. et al. Low risk of complications in patients with first-time acute uncomplicated diverticulitis. *Int J Colorectal Dis.* 32. 1699-1702. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p><b>Evidence level:</b> 3</p> <p><b>Study type:</b> retrospektive Kohortenstudie</p>	<p><b>Funding sources:</b> County of Västmanland Sweden</p> <p><b>Conflict of Interests:</b> keine</p> <p><b>Randomization:</b> keine</p>	<p><b>Total no. patients:</b> 809, davor 642 mit 1. Schub</p> <p><b>Recruiting Phase:</b> 2010-2014</p> <p><b>Inclusion criteria:</b> akute unkomplizierte Divertikulitis</p> <p><b>Exclusion criteria:</b></p>	<p><b>Interventions:</b></p> <p><b>Comparison:</b></p>

	Blinding:	
	Dropout rates:	
Notes:	Author's conclusion: Nur sehr geringe Komplikationsrisiken nach dem 1. Schub einer unkomplizierten Divertikulitis.	
Outcome Measures/results	Primary Komplikationen innerhalb von einem Monat definiert als Abszess, Perforation, Ileus oder Fistel  Secondary 1-Jahres Rezidivrate Sigmaresektionsrate	Results: Nur 1,7% der Patienten entwickelten frühzeitig Komplikationen. Die 1-Jahres Rezidivrate betrug 5,6% und nur 1,4% wurde im Verlauf operiert. Patienten mit Immunsuppression hatten ein erhöhtes Risiko für Komplikationen (Odds Ratio 4,71, 95% Konfidenzintervall 1,21 - 18,28).

Klarenbeek, B. R. et al. Indications for elective sigmoid resection in diverticular disease. *Ann Surg.* 251. 670-4. 2010

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospektive unizentrische Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 291  Recruiting Phase: <u>1990-2000</u>  Inclusion criteria: stationäre Aufnahme bei Divertikulitis  Exclusion criteria:	Interventions: akute oder elektive Operation  Comparison: konservative Therapie
Notes:	Author's conclusion: Die Indikation für eine elektive Operation kann bei bestimmten Risikofaktoren indiziert sein.		
Outcome Measures/results	Primary Perforationsrisiko  Secondary	Results: Patienten mit Immunsuppression, chronischer Niereninsuffizienz oder Kollagenosen hatten ein erhöhtes Perforationsrisiko bei Rezidivdivertikulitis (36% vs. 7%).	

Lee, J. T. et al. Elective Colectomy for Diverticulitis in Transplant Patients: Is It Worth the Risk?. *J Gastrointest Surg.* 21. 1486-1490. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospektive Kohortenstudie	Funding sources: keine  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 30  Recruiting Phase: <u>2000-2015</u>  Inclusion criteria: Organtransplantierte Patienten  Exclusion criteria:	Interventions: Operation nach 1. Schub  Comparison: Operation bei chronischer Divertikulitis
Notes:			

	Author's conclusion: Keine Indikation zur elektiven Operation nach einem 1. Schub.	
Outcome Measures/results	Primary Komplikationsrate	Results: Kein Unterschied bei der postoperativen Komplikationsrate (54 vs. 59%, p = 0.94).
	Secondary	

Samdani, T. et al. Colonic diverticulitis in chemotherapy patients: should operative indications change? A retrospective cohort study. *Int J Surg*. 12. 1489-94. 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 131 (39 unter Chemotherapie) Recruiting Phase: <u>1988-2004</u> Inclusion criteria: stationäre Therapie bei 1. Schub einer akuten Divertikulitis Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion: Keine Indikation zur elektiven Sigmaresektion nach akuter Divertikulitis unter Chemotherapie.		
Outcome Measures/results	Primary Komplizierte Divertikulitis Secondary Rezidivhäufigkeit postoperative Komplikationen	Results: Patienten unter Chemotherapie zeigten kein erhöhtes Risiko einer komplizierten Divertikulitis beim Initialen Schub (13.2% vs. 4.4%, p =0.12) und keine erhöhte Rezidivhäufigkeit (20.5% vs 18.5%). Postoperative Komplikationen traten bei Chemotherapiepatienten deutlich häufiger auf (100% vs 9.1% p < 0.01).	

Sugrue, J. et al. Acute diverticulitis in renal transplant patients: should we treat them differently?. *Surgery*. 163. 857-865. 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 154,davon 20 nach Nierentransplantation Recruiting Phase: <u>2002-2015</u> Inclusion criteria: stationäre Aufnahme bei akuter Divertikulitis Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion: Keine Indikation zur elektiven Sigmaresektion aufgrund einer Nierentransplantation.		
Outcome Measures/results	Primary Krankheitsbezogene Komplikationen Secondary Organversagen	Results: Operative Therapie Hauptrisikofaktor für Komplikationen bei Nierentransplantierten.	



Turner, G. A. et al. Influence of obesity on the risk of recurrent acute diverticulitis. ANZ J Surg. . . 2020

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level: 3</b>  <b>Study type: retrospektive Kohortenstudie</b>	<b>Funding sources:</b>  <b>Conflict of Interests:</b>  <b>Randomization:</b>  <b>Blinding:</b>  <b>Dropout rates:</b>	<b>Total no. patients: 1,299</b>  <b>Recruiting Phase: <u>1998-2010</u></b>  <b>Inclusion criteria: stationäre Aufnahme bei akuter Divertikulitis</b>  <b>Exclusion criteria:</b>	<b>Interventions:</b>  <b>Comparison:</b>
<b>Notes:</b>	<b>Author's conclusion: Kein erhöhtes Rezidivrisiko bei BMI &gt;30.</b>		
<b>Outcome Measures/results</b>	<b>Primary Rezidivdivertikulitis</b>  <b>Secondary</b>	<b>Results:</b>	



## Schlüsselfrage:

AG 05 - Frage 04 CDD Typ 1  
Besteht bei anhaltenden Beschwerden nach einer akuten Divertikulitis („smoldering diverticulitis“) die Indikation zur Resektion?

## Inhalt: 8 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Andeweg, C. S. 2016	3	Systematic review and meta analysis
Bolkenstein, H. E. 2019	2	RCT
Bolkenstein, H. E. 2019	2	RCT
Boostrom, S. Y. 2012	3	Single center retrospective cohort study
Horgan, A. F. 2001	3	retrospektiv
Mari, G. M. 2020	3	Kohortenstudie
Rink, Andreas D. 2019	3	prospektive Kohortenstudie
van de Wall, Bryan J. M. 2017	1	open-label, multicentre, randomised controlled trial

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 1 Bewertung(en)

Andeweg, C. S. et al. Patient-reported Outcomes After Conservative or Surgical Management of Recurrent and Chronic Complaints of Diverticulitis: Systematic Review and Meta-analysis. Clin Gastroenterol Hepatol. 14. 183-90. 2016

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 3 Study type: Systematic review and meta analysis Databases: Search period: <u>1990-2014</u> Inclusion Criteria: uncomplicated diverticular disease, conservative or operative treatment Exclusion Criteria:	Population: 1858 pat. Diverticular disease, conservative and surgical treatment Intervention: Comparison:	Primary: QoL, PRO Secondary: Results: Author's Conclusion: better outcome and fewer symptoms after lap surgery	

## Methodical Notes

## Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

## Notes:

pro.: große Patientenzahl  
con: einhomogenes Pat. gut  
keine Aussage zum Resektionsausmaß

## OXFORD (2011) Appraisal Sheet: RCT: 3 Bewertung(en)

Bolkenstein, H. E. et al. Long-term Outcome of Surgery Versus Conservative Management for Recurrent and Ongoing Complaints After an Episode of Diverticulitis: 5-year Follow-up Results of a Multicenter Randomized Controlled Trial (DIRECT-Trial). *Ann Surg.* **269**. 612-620. 2019

Population - Intervention  
Comparison Outcomes/Results

Evidence level: 2	Intervention: Conservative vs. operation	Primary: Quality of life Secondary:
Study type: RCT	Comparison:	Results: At 5-year follow-up, mean GIQLI score was significantly higher in the operative group [118.2 (SD 21.0)] than the conservative group [108.5 (SD 20.0)] with a mean difference of 9.7 (95% confidence interval 1.7–17.7).
Number of Patient: 109 patients were randomized		Author's Conclusion: Consistent with the short-term results of the DIRECT trial, elective sigmoidectomy resulted in a significantly increased QoL at 5-year follow-up compared with conservative management in patients with recurring diverticulitis and/or ongoing complaints. Surgeons should counsel these patients for elective sigmoidectomy weighing superior QoL, less pain, and lower risk of new recurrences against the complication risk of surgery.
Recruiting Phase: From January 2010 to June 2014		
Inclusion Criteria:		
Exclusion Criteria:		

## Methodical Notes

## Funding Sources:

COI: no

Randomization: yes

Blinding: no

Dropout Rate/ITT-Analysis:

Notes:

Bolkenstein, H. E. et al. Cost-effectiveness analysis of a multicentre randomized clinical trial comparing surgery with conservative management for recurrent and ongoing diverticulitis (DIRECT trial). *Br J Surg.* **106**. 448-457. 2019

Population - Intervention  
Comparison Outcomes/Results

Evidence level: 2	Intervention: operation vs. conservative therapy	Primary: Cost effectiveness Secondary:
Study type: RCT	Comparison:	Results: At 1- and 5-year follow-up an incremental effect (QALY difference between groups) of 0.06 and 0.43 respectively was found, and an incremental cost (cost difference between groups) of €957 and €2674 respectively, where surgery was more expensive than conservative treatment. This resulted in an ICER of €123 365 per additional QALY at 1-year follow-up, and €275 at 5 years. At a threshold of €20 000 per QALY, operative treatment has 0 per cent probability of being cost-effective at 1-year follow-up, but a 95 per cent probability at 5 years.
Number of Patient:		Author's Conclusion: At 5-year follow-up, elective sigmoid resection in patients with recurring diverticulitis or persistent complaints was found to be cost-effective.
Recruiting Phase:		
Inclusion Criteria:		
Exclusion Criteria:		

## Methodical Notes

**Funding Sources:**

COI:

Randomization:

Blinding:

Dropout Rate/ITT-Analysis:

Notes:

van de Wall, Bryan J. M. et al. Surgery versus conservative management for recurrent and ongoing left-sided diverticulitis (DIRECT trial): an open-label, multicentre, randomised controlled trial. *The Lancet Gastroenterology & Hepatology*. 2. 13-22. 2017

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 1</p> <p>Study type: open-label, multicentre, randomised controlled trial</p> <p>Number of Patient: 109</p> <p>Recruiting Phase:</p> <p>Inclusion Criteria: Patients aged 18–75 years presenting with either recurrent (three or more presentations with clinical signs of acute diverticulitis within 2 years) or persistent abdominal complaints (ongoing lower left abdominal pain or persistent change in bowel habits for ≥3 months) after an episode of left-sided diverticulitis, confirmed by CT, ultrasound, or endoscopy, were included.</p> <p>Exclusion Criteria: Patients were excluded if they had previous elective or emergency surgery for acute sigmoid diverticulitis, an absolute operation indication, suspicion of a colorectal malignancy, with a preoperative or postoperative risk greater than III (on the American Society of Anesthesiologists classification), or were unable to complete questionnaire or follow-up.</p>	<p>Intervention: Between July 1, 2010, and April 1, 2014, we randomly assigned 109 patients to receive surgical treatment (resection; n=53) or conservative management (n=56)</p> <p>Comparison:</p>	<p>Primary: Our primary endpoint was health-related quality of life, measured by the Gastrointestinal Quality of Life Index (GIQLI) at 6 months after inclusion or surgery, depending on randomisation group.</p> <p>Secondary: Secondary endpoints included additional quality-of-life assessments using the EuroQol five dimensions questionnaire (EQ-5D), Visual Analogue Score for pain (VAS-pain), and the 36-item Short Form health survey (SF-36)</p> <p>Results: The GIQLI score at 6 months' follow-up was significantly higher in patients randomly assigned to receive surgical treatment (mean 114.4 [SD 22.3]) than conservative management (100.4 [22.7]; mean difference 14.2, 95% CI 7.2–21.1, p&lt;0.0001). 43 (38%) of 109 patients had a severe adverse event in the first 6 months after treatment (18 [34%] of 53 patients in the surgical treatment group vs 23 [40%] of 57 patients in the conservative treatment group). Seven (15%) patients who received surgical treatment developed anastomotic leakage. Of the 56 patients assigned to be treated conservatively, 13 (23%) ultimately underwent elective resection due to ongoing abdominal complaints, with no anastomotic leakage. We recorded no patient deaths.</p> <p>Author's Conclusion: Elective sigmoidectomy, despite its inherent risk of complications, results in better quality of life than conservative management in patients with recurrent and persisting abdominal complaints after an episode of diverticulitis.</p>

**Methodical Notes**

**Funding Sources:** The funder of the study reviewed the study protocol but had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

COI: none

**Randomization:** Patients were randomly assigned (3:3) by an independent data manager using a stratified (by type of complaints [ongoing or recurrent] and by centre) digital en-block randomisation system to receive conservative or surgical

management. The block size was six. As the trial is open label, treatment allocation was not masked to patients, physicians, or researchers at any timepoint.

**Blinding:**

**Dropout Rate/ITT-Analysis:** We analysed data according to the intention-to-treat principle. We analysed the difference in quality-of-life outcomes between the two treatment groups using a mixed model with repeated measures over time and included all available data from patients for the first 6 months after randomisation. The variance-covariance matrix was modelled as unstructured. The fixed effects were time after randomisation (categorical), treatment group, a group × time interaction, and baseline GIQLI score. We tested the difference in GIQLI scores at 6 months after randomisation using a linear contrast from this model. If at least 75% of the items were filled in, we calculated a score based on the mean of the completed items.

**Notes:**

**NEWCASTLE - OTTAWA Checklist: Cohort: 4 Bewertung(en)**

**Bostrom, S. Y. et al. Uncomplicated diverticulitis, more complicated than we thought. J Gastrointest Surg. 16. 1744-9. 2012**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Single center retrospective cohort study	Funding sources: no indication Conflict of Interests: no indication Randomization: not applicable Blinding: not applicable Dropout rates: no indication	Total no. patients: 907, after excluding the non-compatible 684 patients remained Recruiting Phase: Jan 2005 - Dec 2009 Inclusion criteria: Patients operated for uncomplicated diverticular disease Exclusion criteria: Patients showing complications of diverticular disease	Interventions: Comparison: Outcome of operation (sigmoid resection) in uncomplicated acute resolving diverticulitis vs uncomplicated chronic smoldering diverticulitis vs uncomplicated atypical diverticulitis (today named SUDD)
Notes:	The study shows, that sigmoid resection for uncomplicated diverticular disease bears a significant risk for complications, i.e. morbidity, irrespective whether or not resection is for acute resolving diverticulitis, chronic or smoldering or atypical diverticulitis (today: SUDD / IBS). Author's conclusion: The authors consider sigmoid resection in uncomplicated diverticular disease a safe procedure. Therefore and in view of the frequent findings of complications in presumed uncomplicated cases they refer also to surgery as a valuable solution for patients with smoldering or atypical disease		
Outcome Measures/results	Primary Outcome of sigmoid resection for uncomplicated diverticular disease Secondary	Results: While mortality was low, morbidity was 33-48 % over all 3 subgroups. Moreover, in the acute resolving cases of "uncomplicated" diverticulitis 67/564 had an abscess at pathology, 2/564 an undetected carcinoma. In the chronic/smoldering diverticulitis-patients 7/66 indeed had an abscess at pathology, 2/66 tubular adenoma. Among the atypical (SUDD) patients, 17/54 showed inflammation at surgery, 2/54 an abscess while an abscess was found at pathology in 9/54 patients.	

**Horgan, A. F. et al. Atypical diverticular disease: surgical results. Dis Colon Rectum. 44. 1315-8. 2001**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospektiv	Funding sources: Conflict of Interests: no	Total no. patients: 930 Recruiting Phase: 1988 - 1997	Interventions:

	Randomization: no Blinding: no Dropout rates: no	Inclusion criteria: Exclusion criteria:	Comparison:
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

Mari, G. M. et al. Symptomatic Uncomplicated Diverticular Disease and Incidence of Unexpected Abscess during Sigmoidectomy: A Multicenter Prospective Observational Study. *Dig Surg.* **37.** 199-204. 2020

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 158 Recruiting Phase: <u>2016-2018</u> Inclusion criteria: elektive Sigmaresektion bei symptomatischer unkomplizierter Divertikulitis Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion: Patienten mit smoldering diverticulitis weisen häufiger einen Abszess als Ursache der Beschwerden auf.		
Outcome Measures/results	Primary Indidenz perikolischer oder intramuraler Abszesse in der Histologie Secondary	Results: Unerwarteter Nachweis von Abszessen bei 47,5% der Patienten Häufigerer Nachweis eines Abszesses bei Smoldering diverticulitis Odds Ratio 6,9 (95% KI 2,1-22,4).	

Rink, Andreas D. et al. Smoldering-Divertikulitis – doch eine Form der chronisch-rezidivierenden Divertikulitis mit guter Operationsindikation?. *Z Gastroenterol.* **57.** 1200-1208. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: prospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 393, davon 44 mit smoldering diverticulitis Recruiting Phase: <u>2009-2014</u> Inclusion criteria: elektive Sigmaresektion Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion: Die Untersuchung zeigt, dass bei dem klinischen Bild der engmaschig-rezidivierenden (Smoldering-) Divertikulitis eine Operation zur Verbesserung der Lebensqualität sinnvoll sein kann.		
Outcome Measures/results	Primary Gastrointestinaler Lebensqualitätsindex (GLQI) Secondary Postoperative Morbidität	Results: Es zeigte sich eine vergleichbare Morbidität der Operation bei kürzeren Operationszeiten in der SmD-Gruppe (159 (65–301) vs. 174 (100–443) Minuten, p = 0,031). Sechs Monate postoperativ fand sich für die SmD-Patienten eine signifikante Verbesserung der Lebensqualität (GLQI 115 (72–143) im Vergleich zur präoperativen Situation (GLQI 98 (56–139), p = 0,018), während sich für die Kontrollgruppe nur ein nicht signifikanter Anstieg der präoperativ weniger reduzierten	

Lebensqualität zeigte. Fast 80 % der Patienten waren mit dem Ergebnis zufrieden.



## Schlüsselfrage:

AG 05 - Frage 05 CDD Typ 2a  
Welche Abszessgröße ist zur Unterscheidung zwischen Mikro- und Makroabszess sinnvoll (bisher 1 cm)?

## Inhalt: 11 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Ambrosetti, P. 2005	3	prospective cohort
Ambrosetti, P. 1992	4	prospective cohort
Bahadursingh, A. M. 2003	5	
Biondo, S. 2012	1	systematic review
Boermeester, M. A. 2016	2	systematic review
Bottger, T. C. 2007	1	retrospective cohort
Buchwald, P. 2017	4	retrospective cohort
Gregersen, R. 2016	3	Retrospektive Kohortenstudie (Register-basiert)
Gregersen, R. 2016	3	systematic review
Lamb, M. N. 2014	2	syst. rev.
Siewert, B. 2006	4	

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 4 Bewertung(en)

Biondo, S. et al. Current status of the treatment of acute colonic diverticulitis: a systematic review. Colorectal Dis. 14. e1-e11. 2012			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1  Study type: systematic review Databases: PUBMED, MEDLINE, EMBASE and Google scholar  Search period: all publications to March 2011  Inclusion Criteria: all studies dealing with treatment of acute colonic diverticulitis	Intervention:  Comparison:	Primary:  Secondary:  Results:  Author's Conclusion: 1 An abdominal CT is the most effective tool for diagnosis and staging of AD, and can also be used for percutaneous drainage of abscesses. 2 In patients without significant comorbidities and an uncomplicated diverticulitis, outpatient treatment can be performed. 3 Conservative treatment can be used for patients with uncomplicated AD, small abscesses or percutaneously drained abscesses. 4 The recommendation of elective surgery after a favourable response to medical treatment should be made on an individual basis. Elective laparoscopic	



<b>Exclusion Criteria:</b>		<p>surgery in diverticulitis is appropriate but is technically complex and requires experience in laparoscopic surgery.</p> <p>5 The PSS scoring system is a specific system for peritonitis of colonic origin that helps to predict mortality and is useful in the decision making process.</p> <p>6 In cases of perforated diverticulitis, after a careful selection of patients, the technique of choice should be resection with primary anastomosis. However, at present, laparoscopic lavage is being considered as a potentially safe alternative in cases of purulent peritonitis.</p>	
<b>Methodical Notes</b>			
<b>Funding Sources:</b>			
<b>COI:</b>			
<b>Study Quality:</b> most retrospective studies and cohorts			
<b>Heterogeneity:</b>			
<b>Publication Bias:</b>			
<b>Notes:</b>			
<p><b>Boermeester, M. A. et al. Contemporary Review of Risk-Stratified Management in Acute Uncomplicated and Complicated Diverticulitis. World J Surg. 40. 2537-45. 2016</b></p>			
<b>Evidence level/Study Types</b>	<b>P - I - C</b>	<b>Outcomes/Results</b>	<b>Literature References</b>
<p><b>Evidence level:</b> 2</p> <p><b>Study type:</b> systematic review</p> <p><b>Databases:</b></p> <p><b>Search period:</b></p> <p><b>Inclusion Criteria:</b> treatment of acute colonic diverticulitis</p> <p><b>Exclusion Criteria:</b></p>	<p><b>Intervention:</b></p> <p><b>Comparison:</b></p>	<p><b>Primary:</b></p> <p><b>Secondary:</b></p> <p><b>Results:</b></p> <p><b>Author's Conclusion:</b> A shift in management has occurred towards conservative management in acute uncomplicated disease. Those with uncomplicated acute diverticulitis may be treated without antibiotics. For complicated diverticulitis with purulent peritonitis, the use of peritoneal lavage appears to be non-superior to resection.</p>	
<b>Methodical Notes</b>			
<b>Funding Sources:</b>			
<b>COI:</b>			
<b>Study Quality:</b> mostly retrospective series, small patient cohorts			
<b>Heterogeneity:</b>			
<b>Publication Bias:</b>			
<b>Notes:</b>			

Gregersen, R. et al. Treatment of patients with acute colonic diverticulitis complicated by abscess formation: A systematic review. *Int J Surg*. 35. 201-208. 2016

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p><b>Evidence level:</b> 3</p> <p><b>Study type:</b> systematic review</p> <p><b>Databases:</b> PubMed, EMBASE and the Cochrane Library</p> <p><b>Search period:</b> until february 2016</p> <p><b>Inclusion Criteria:</b> Patients with diverticulitis and peri- or paracolic, retroperitoneal, intra-abdominal, or pelvic abscesses</p> <p><b>Exclusion Criteria:</b> atients with diverticulitis complicated by generalized purulent or feculent peritonitis and patients only treated electively were excluded. Only publications in English were included.</p>	<p><b>Population:</b> see inclusion</p> <p><b>Intervention:</b> ntibiotics, percutaneous abscess drainage, non-operative treatment, and acute surgery</p> <p><b>Comparison:</b> Patients receiving other or no intervention</p>	<p><b>Primary:</b> Need for acute surgery, short-term mortality, readmission within 30 days, persistent symptoms, presence of residual abscess, recurrence, procedure-related complications and morbidity, permanent stoma, additional abscess drainage or drain adjustment, and risk factors associated with the outcomes of interest</p> <p><b>Secondary:</b> none</p> <p><b>Results:</b> Observational studies were the only available evidence. Treatment generally failed for 20% of patients, regardless of non-operative treatment choice. Abscesses with diameters less than 3 cm were sufficiently treated with antibiotics alone, possibly as outpatient treatment. Of patients treated non-operatively, 25% experienced a recurrent episode during long-term follow-up. When comparing PAD to antibiotic treatment, it appeared that PAD lead to recurrence less often (15.9% vs. 22.2%). Patients undergoing acute surgery had increased risk of death (12.1% vs. 1.1%) compared to patients treated non-operatively. Of patients undergoing PAD, 2.5% experienced procedure-related complications and 15.5% needed adjustment or replacement of the drain</p> <p><b>Author's Conclusion:</b> Diverticular abscesses with diameters less than 3 cm might be sufficiently treated with antibiotics, while the best treatment for larger abscesses remains uncertain. Acute surgery should be reserved for critically ill patients failing non-operative treatment</p>	68 references

#### Methodical Notes

**Funding Sources:** none

**COI:** none

**Study Quality:** high

**Heterogeneity:** n.a.

**Publication Bias:** n.a.

**Notes:**

only observational studies

Lamb, M. N. et al. Elective resection versus observation after nonoperative management of

complicated diverticulitis with abscess: a systematic review and meta-analysis. Dis Colon Rectum. 57. 1430-40. 2014

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: syst. rev.</p> <p>Databases:</p> <p>Search period: 1986 - 2014</p> <p>Inclusion Criteria: complicated diverticulitis</p> <p>Exclusion Criteria:</p>	<p>Population: Patients who were successfully managed nonoperatively and determine the role of elective surgical resection.</p> <p>Intervention: operation versus observation</p> <p>Comparison:</p>	<p>Primary: need for surgery and recurrent attacks without surgery.</p> <p>Secondary:</p> <p>Results: Percutaneous drainage was successful in 49% patients (diameter, &gt;3cm) and antibiotic therapy in 14% patients. Urgent surgery during the index hospitalization was performed in 30% of patients, elective resection in 36%, and no surgery in 35%. Recurrence rates were high, with 39% in patients awaiting elective resection and 18% in the nonsurgery group, with an overall recurrence rate of 28%. Of the whole cohort, only 28% had no surgery and no recurrence during follow-up.</p> <p>Author's Conclusion: The evidence from the literature is weak but still suggests that complicated diverticulitis with abscess formation is associated with a high probability of resective surgery, whereas conservative management may result in chronic or recurrent diverticular symptoms.</p>	

#### Methodical Notes

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

only small retrospective studies with limited follow-up

#### NEWCASTLE - OTTAWA Checklist: Case Control: 1 Bewertung(en)

Ambrosetti, P. et al. Long-term outcome of mesocolic and pelvic diverticular abscesses of the left colon: a prospective study of 73 cases. Dis Colon Rectum. 48. 787-91. 2005

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p> <p>Study type: prospective cohort</p>	<p>Funding sources:</p> <p>Conflict of Interests:</p> <p>Randomization:</p> <p>Blinding:</p>	<p>Total no. patients: 73</p> <p>Patient characteristics: <u>1986-1997</u></p> <p>Inclusion criteria: CT-graphischer Nachweis einer komplizierten akuten Divertikulitis mit Abszessbildung</p> <p>Exclusion criteria: Fehlendes Follow-Up</p>	<p>Interventions: keine</p> <p>Comparison: keine</p>

	Dropout rates:	
Notes:	kleine Fallzahl der Langzeitverläufe	
	Author's conclusion:	
Outcome Measures/results	Primary Art der weiteren Behandlung Secondary	Results: 30 of 73 patients with abscess do not need any operation more emergency operations with pelvic abscesses

**NEWCASTLE - OTTAWA Checklist: Cohort: 6 Bewertung(en)**

Ambrosetti, P. et al. Incidence, outcome, and proposed management of isolated abscesses complicating acute left-sided colonic diverticulitis. A prospective study of 140 patients. *Dis Colon Rectum*. 35. 1072-6. 1992

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: prospective cohort	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 140 Recruiting Phase: Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Notes:	patients with primary operation excluded, indication for operation not explained, short follow-up, old data		
	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

Bahadursingh, A. M. et al. Spectrum of disease and outcome of complicated diverticular disease. *Am J Surg*. 186. 696-701. 2003

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 5 Study type:	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: Recruiting Phase: Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Notes:	retrospective cohort, unclear indication for operation diagnoses not standardized old data <u>1992-2001</u>		
	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

**Bottger, T. C. et al. [Laparoscopic resection with primary anastomosis in Hinchey stages I and II without previous abscess drainage]. Chirurg. 78. 454, 456-60. 2007**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 1 Study type: retrospective cohort	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 72 Recruiting Phase: n.a. Inclusion criteria: Hinchey Stage I and II Exclusion criteria:	Interventions: resection with and without prior drainage of abscesses Comparison:
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results: no benefit of drainage	

**Buchwald, P. et al. Hinchey I and II diverticular abscesses: long-term outcome of conservative treatment. ANZ J Surg. 87. 1011-1014. 2017**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospective cohort	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 115 Recruiting Phase: <u>1998-2009</u> Inclusion criteria: all abscesses Exclusion criteria: postop. abscesses	Interventions: antibiotics, drainage, operation Comparison:
Notes:	115 patients with abscesses (Hinchey I and II) indication for operation not clear Author's conclusion: Recurrence after diverticular abscess is higher after initial conservative Treatment (antibiotics +/- percutaneous drainage) compared with surgery		
Outcome Measures/results	Primary Recurrence rate Secondary abscess size	Results: Recurrence rates: antibiotics alone 30%, percutaneous Drainage + antibiotics 27%, surgery 5% Abscess size: antibiotics alone 3.1 +/- 1.8 cm, percutaneous Drainage + antibiotics 5.6 +/- 2.4 cm, surgery 4.6 +/- 1.6 cm	

**Gregersen, R. et al. Short-term mortality, readmission, and recurrence in treatment of acute diverticulitis with abscess formation: a nationwide register-based cohort study. Int J Colorectal Dis. 31. 983-990. 2016**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3	Funding sources:	Total no. patients: 3.148	Interventions:

<b>Study type:</b> Retrospektive Kohortenstudie (Register-basiert)	<b>Conflict of Interests:</b> <b>Randomization:</b> <b>Blinding:</b> <b>Dropout rates:</b>	<b>Recruiting Phase:</b> <u>2000-2012</u> <b>Inclusion criteria:</b> Komplizierte akute Divertikulitis mit Abszess <b>Exclusion criteria:</b> Follow-Up <30 Tage	<b>Comparison:</b>
<b>Notes:</b>	Populationsregister, Multivariate Analyse; Endpunkte unscharf <b>Author's conclusion:</b> Akute komplizierte Divertikulitis ist eine lebensbedrohliche Erkrankung mit hoher Letalität im kurzen Intervall.		
<b>Outcome Measures/results</b>	<b>Primary Mortalität</b> 30-Tages <b>Secondary Rezidivrisiko und stationäre Wiederaufnahme</b> 30-Tages und	<b>Results:</b> 30-Tages Mortalität 8,7% (nach Antibiotiktherapie 10,1%, perkutane Drainage 3,5%, Operation 5,5%) 30-Tages Rezidivrisiko 5,9% (nach Antibiotiktherapie 5,9%, perkutane Drainage 10,4%, Operation 2,2%) 30-Tages stationäre Wiederaufnahme 23,8% (nach Antibiotiktherapie 21,8%, perkutane Drainage 32,5%, Operation 26,6%)	

Siewert, B. et al. Impact of CT-guided drainage in the treatment of diverticular abscesses: size matters. AJR Am J Roentgenol. 186. 680-6. 2006

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level:</b> 4 <b>Study type:</b>	<b>Funding sources:</b> <b>Conflict of Interests:</b> <b>Randomization:</b> <b>Blinding:</b> <b>Dropout rates:</b>	<b>Total no. patients:</b> <b>Recruiting Phase:</b> <b>Inclusion criteria:</b> <b>Exclusion criteria:</b>	<b>Interventions:</b>  <b>Comparison:</b>
<b>Notes:</b>	old data, retrospective, small sample n=30 <b>Author's conclusion:</b>		
<b>Outcome Measures/results</b>	<b>Primary</b> <b>Secondary</b>	<b>Results:</b>	

## Schlüsselfrage:

## AG 05 - Frage 06 CDD Typ 2b

Unter welchen Umständen ist eine perkutane Drainageeinlage bei akuter komplizierter Divertikulitis mit Makroabszess indiziert?

## Inhalt: 14 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Ambrosetti, P. 2005	3	prospective cohort
Brandt, D. 2006	3	case control study
Colas, P. A. 2017	4	Multizentrische retrospektive Kohortenstudie
Dharmarajan, S. 2011	4	retrospektive Kohortenstudie
Durmishi, Y. 2006	5	Retrospektive Kohorte
Elagili, F. 2015	4	Retrospective cohort study
Felder, S. I. 2013	4	Retrospektive Kohorte
Gregersen, R. 2016	3	Retrospektive Kohortenstudie (Register-basiert)
Kumar, R. R. 2006	5	Retrospective chart review of 114 patients with int ra-abdominal abscesse
Lambrichts, D. P. V. 2019	4	retrospektive multizentrische Kohortenstudie
Siewert, B. 2006	4	retrospektive Kohortenstudie
Singh, B. 2008	5	retrospektive Fallserie
Subhas, G. 2014	5	retrospektive Kohortenstudie
van de Wall, B. J. M. 2012	3	retrospektive Kohortenstudie

## NEWCASTLE - OTTAWA Checklist: Case Control: 3 Bewertung(en)

Ambrosetti, P. et al. Long-term outcome of mesocolic and pelvic diverticular abscesses of the left colon: a prospective study of 73 cases. Dis Colon Rectum. 48. 787-91. 2005			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3	Funding sources:	Total no. patients: 73	Interventions: keine
Study type: prospective cohort	Conflict of Interests:	Patient characteristics: 1986-1997	Comparison: keine
	Randomization:	Inclusion criteria: CT-graphischer Nachweis einer komplizierten akuten Divertikulitis mit Abszessbildung	
	Blinding:	Exclusion criteria: Fehlendes Follow-Up	
	Dropout rates:		

<b>Notes:</b>	Kleine Fallzahl der Langzeitverläufe	
	Author's conclusion:	
<b>Outcome Measures/results</b>	Primary Art der weiteren Behandlung Secondary	Results: 30 of 73 patients with abscess do not need any operation more emergency operations with pelvic abscesses

Brandt, D. et al. Percutaneous CT scan-guided drainage vs. antibiotherapy alone for Hinchey II diverticulitis: a case-control study. *Dis Colon Rectum*. 49. 1533-8. 2006

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: case control study	Funding sources: Conflict of Interests: μ Randomization: Blinding: Dropout rates:	Total no. patients: n=66 Patient characteristics: <u>1993-2005</u> Inclusion criteria: Hinchey II diverticulitis Exclusion criteria:	Interventions: percutaneous abscess Drainage + antibiotic therapy  Comparison: antibiotic therapy alone
<b>Notes:</b>	Author's conclusion: antibiotic therapy alone seems to be a safe alternative, whenever percutaneous drainage is technically difficult or hazardous		
<b>Outcome Measures/results</b>	Primary Treatment failure (consecutive emergency surgery OR worsening sepsis OR abscess recurrence within 4 weeks) Secondary abscess size mortality emergency surgery	Results: Treatment failure: 32.2% vs. 18.7% (p=0.26) Abscess size: 6(3-18)cm vs. 4(3-10)cm (p=0.002) Mortality: 8.8% vs. 3.1% (p=0.61) Emergency surgery: 29.4% vs. 15.6% (p=0.24)	

Kumar, R. R. et al. Factors affecting the successful management of intra-abdominal abscesses with antibiotics and the need for percutaneous drainage. *Dis Colon Rectum*. 49. 183-9. 2006

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 5 Study type: Retrospective chart review of 114 patients with int ra-abdominal abscesse	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 114 patients, 30 of them with diverticulitis Patient characteristics: Inclusion criteria: Exclusion criteria:	Interventions:  Comparison:
<b>Notes:</b>	Author's conclusion:		



<b>Outcome Measures/results</b>	<b>Primary</b> <b>Secondary</b>	<b>Results:</b> The majority of the patients with intra-abdominal abscesses improved with anti-biotic therapy alone. Those patients with an abscess diameter >6.5 cm and temperature at admission >101.2-F have higher likelihood of failing conservative therapy with antibiotics alone and requiring percutaneous drainage.
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**NEWCASTLE - OTTAWA Checklist: Cohort: 11 Bewertung(en)**

<b>Colas, P. A. et al. Failure of Conservative Treatment of Acute Diverticulitis with Extradigestive Air. World J Surg. 41. 1890-1895. 2017</b>			
<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
<b>Evidence level: 4</b> <b>Study type:</b> Multizentrische retrospektive Kohortenstudie	<b>Funding sources:</b> keine <b>Conflict of Interests:</b> keine <b>Randomization:</b> keine <b>Blinding:</b> keine <b>Dropout rates:</b> keine	<b>Total no. patients:</b> 91 <b>Recruiting Phase:</b> <u>2009-2015</u> <b>Inclusion criteria:</b> Komplizierte akute Divertikulitis CT-graphischer Nachweis von freier Luft <b>Exclusion criteria:</b> Hinchey II, III, IV kein CT verfügbar	<b>Interventions:</b>  <b>Comparison:</b>
<b>Notes:</b>	<b>Author's conclusion:</b> Konservative Therapieversuch möglich, aber vorsichtige Patientenselektion empfohlen.		
<b>Outcome Measures/results</b>	<b>Primary</b> Effektivität einer nicht-operativen Primärtherapie <b>Secondary</b> Risikofaktoren für Therapieversagen	<b>Results:</b> Therapieversagen bei 29/91 (31,9%) der Patienten mit Notwendigkeit einer dringlichen Operation. Prädiktive Faktoren für das Versagen der nicht-operativen Therapie waren Luftperlen >5 mm (Odds ratio 5,2) und freie abdominelle Flüssigkeit im Becken (Odds ratio 4,1). Die Patienten die wegen des Versagens der konservativen Therapie operiert werden mussten hat mehrheitlich schwere postoperative Komplikationen, unabhängig vom Operationsverfahren.	

<b>Dharmarajan, S. et al. The efficacy of nonoperative management of acute complicated diverticulitis. Dis Colon Rectum. 54. 663-71. 2011</b>			
<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
<b>Evidence level: 4</b> <b>Study type:</b> retrospektive Kohortenstudie	<b>Funding sources:</b> keine <b>Conflict of Interests:</b> keine <b>Randomization:</b> keine <b>Blinding:</b> keine <b>Dropout rates:</b> keine	<b>Total no. patients:</b> 136 <b>Recruiting Phase:</b> <u>1995-2008</u> <b>Inclusion criteria:</b> Komplizierte akute Divertikulitis mit Abszess oder freier Luft im CT.  <b>Exclusion criteria:</b> Rezidiv-Divertikulitis nach vorausgegangenem	<b>Interventions:</b> Konservative Therapie inklusive Antibiotikatherapie und gegebenenfalls perkutaner Drainage  <b>Comparison:</b> Keine

		Operation grundsätzliche Ablehnung einer operativen Therapie durch den Patient nicht-gegebene Operabilität aufgrund des Allgemeinzustands des Patienten	
Notes:	Author's conclusion: Nicht-operative konservative Primärtherapie der komplizierten Divertikulitis ist effektiv.		
Outcome Measures/results	Primary Erfolgsrate der nicht operativen Primärtherapie zur Vermeidung einer Operation im Rahmen der Index-Hospitalisation  Secondary keine	Results: Nur bei 5 Patienten (3,7%) war bei Aufnahme eine primär chirurgische Therapie erforderlich, bei 7 (5%) kam es zum Versagen der nicht operativen Primärtherapie sodass eine notfallmäßige Operation erforderlich war. Die primäre Erfolgsrate der nicht operativen Therapie betrug somit 93%.	

Durmishi, Y. et al. Results from percutaneous drainage of Hinchey stage II diverticulitis guided by computed tomography scan. *Surg Endosc.* **20.** 1129-33. 2006

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 5  Study type: Retrospektive Kohorte	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 34  Recruiting Phase: <u>1991-2004</u>  Inclusion criteria: Komplizierte akute Divertikulitis mit perkutaner Drainageeinlage bei Abszess  Exclusion criteria:	Interventions: keine  Comparison: keine
Notes:	old data, small cohort, indication for drainage not clear  Author's conclusion: Ein nicht-operatives Management mit CT Drainage ist bei ca. 2/3 der Patienten erfolgreich, sodass auf eine dringliche/Notfalloperation verzichtet werden kann.		
Outcome Measures/results	Primary Versagen der konservativen Therapie mit der Notwendigkeit einer dringlichen Operation  Secondary keine	Results: Die eingelegten Drainagen wurden durchschnittlich 8 Tage (1 bis 18 Tage) belassen. Die primär nicht operative Therapie war bei 23 (67%) der Patienten erfolgreich. Bei den restlichen Patienten kam es zu einem Therapieversagen (Sepsis, Rezidiv Abszess oder Fistelbildung) sodass eine Hartmann Operation im Mittel nach 14 Tagen (1 bis 65 Tage) durchgeführt werden musste. Die postoperative Mortalität betrug 33%.	

Elagili, F. et al. Antibiotics alone instead of percutaneous drainage as initial treatment of large diverticular abscess. *Tech Coloproctol.* **19.** 97-103. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type:	Funding sources: n.a.  Conflict of	Total no. patients: 146  Recruiting Phase: 1994 to 2012	Interventions: per-cutaneous drainage or antibiotics alone

Retrospective cohort study	Interests: none Randomization: none Blinding: none Dropout rates: n.a.	Inclusion criteria: All patients with an abscess of at least 3 cm in diameter associated with sigmoid diverticulitis were identified from an institutional review board-approved diverticular database and retrospectively reviewed  Exclusion criteria: No abscess < 3cm	followed by surgery  Comparison: see above
Notes:	Author's conclusion: Our study shows that systemic antibiotics alone (ABX) could be more frequently used as the initial treatment of diverticular abscess. Future studies will need to assess in which specific circumstances ABX is preferable to percutaneous drainage (PCD) and when it can be expected to be the definitive treatment of diverticular abscess		
Outcome Measures/results	Primary Many primary and secondary outcome measures  Secondary see above	Results: Selected: Failure of initial treatment required urgent surgery in 8 patients with persistent symptoms during treatment with antibiotics alone (25 %) and in 21 patients (18 %) after initial percutaneous drainage (p=0.21).	

Felder, S. I. et al. Can the need for colectomy after computed tomography-guided percutaneous drainage for diverticular abscess be predicted?. Am Surg. 79. 1013-6. 2013

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: Retrospektive Kohorte	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 40  Recruiting Phase: <u>2000-2011</u>  Inclusion criteria: Akute komplizierte Divertikulitis mit der Notwendigkeit der Anlage einer perkutanen Drainage  Exclusion criteria: Technisches Versagen der Anlage einer perkutanen Drainage	Interventions:  Comparison:
Notes:	Author's conclusion: Ein erheblicher Teil der Patienten benötigt trotz perkutaner Drainage eine nicht-elektive Operation sodass die Patienten engmaschig chirurgisch überwacht werden sollten.		
Outcome Measures/results	Primary Rate an Therapieversagen mit konsekutiver chirurgische Therapie sowie Anteil der Patientin mit einer elektiven Operation nach erfolgreicher primär konservativer Therapie  Secondary Risikofaktoren für ein Versagen der nicht operativen Primärtherapie	Results: Abszessdurchmesser 5,6+/-2 cm (85% größer 4 cm) Versagen der konservativen Primärtherapie bei 13 von 40 (33%) mit der Notwendigkeit einer dringlichen Operation. Primär erfolgreiche konservative Therapie und im Verlauf elektive Operation bei 20 von 40 Patienten (50%). Primär erfolgreiche konservative Therapie ohne elektive Operation bei 7 von 40 (18%), hierbei keine Rezidiv Divertikulitis mit einem medianen Follow-up von 47 Monaten (3-84 Monate). Unabhängige Risikofaktoren für ein Versagen der nicht operativen Primärtherapie: Kreatinin größer 1,5 mg/dl und Immunsuppression	

Gregersen, R. et al. Short-term mortality, readmission, and recurrence in treatment of acute diverticulitis with abscess formation: a nationwide register-based cohort study. *Int J Colorectal Dis.* 31. 983-990. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: Retrospektive Kohortenstudie (Register-basiert)	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 3.148  Recruiting Phase: <u>2000-2012</u>  Inclusion criteria: Komplizierte akute Divertikulitis mit Abszess  Exclusion criteria: Follow-Up <30 Tage	Interventions:  Comparison:
Notes:	Populationsregister, Multivariate Analyse; Endpunkte unscharf  Author's conclusion: Akute komplizierte Divertikulitis ist eine lebensbedrohliche Erkrankung mit hoher Letalität im kurzen Intervall.		
Outcome Measures/results	Primary 30-Tages Mortalität  Secondary 30-Tages Rezidivrisiko und stationäre Wiederaufnahme	Results: 30-Tages Mortalität 8,7% (nach Antibiotiktherapie 10,1%, perkutane Drainage 3,5%, Operation 5,5%) 30-Tages Rezidivrisiko 5,9% (nach Antibiotiktherapie 5,9%, perkutane Drainage 10,4%, Operation 2,2%) 30-Tages stationäre Wiederaufnahme 23,8% (nach Antibiotiktherapie 21,8%, perkutane Drainage 32,5%, Operation 26,6%)	

Lambrichts, D. P. V. et al. Multicentre study of non-surgical management of diverticulitis with abscess formation. *Br J Surg.* 106. 458-466. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospektive multizentrische Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 447  Recruiting Phase: <u>2008-2015</u>  Inclusion criteria: CT-graphisch nachgewiesene komplizierte akute Divertikulitis mit Abszess  Exclusion criteria: perforierte Divertikulitis	Interventions:  Comparison:
Notes:	Author's conclusion: Kein Einfluss einer perkutanen Drainage auf den kurzfristigen Verlauf.		
Outcome Measures/results	Primary  Secondary	Results: Abszessgröße 4,2 cm (Mittelwert, IQR 2,7 cm - 6,1 cm). Versagen der konservativen Therapie 26,8%. Kurzfristige Notfalloperation 8,9% Langfristige Rezidivrate 27,3%, elektive Operation 27,7%. Kein Unterschied des Therapieansprechens durch perkutane Drainage. Hauptrisikofaktor für Therapieversagen Abszessgröße >3cm (Odds ratio 2,05) und für Notfalloperation Abszessgröße >5 cm (Odds ratio 2,96).	

Siewert, B. et al. Impact of CT-guided drainage in the treatment of diverticular abscesses: size matters. *AJR Am J Roentgenol.* 186. 680-6. 2006

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 30 Recruiting Phase: <u>2001-2002</u> Inclusion criteria: CT-graphischer Nachweis einer komplizierten akuten Divertikulitis mit Abszess Exclusion criteria: keine klinischen Kriterien einer Divertikulitis	Interventions: Comparison:
Notes:	old data, retrospective, small sample n=30 Author's conclusion: Insgesamt alle Patienten primär konservativ therapiert.		
Outcome Measures/results	Primary weitere Therapie in Abhängigkeit zur Abszessgröße Secondary	Results: 22 Abszesse <3cm (median 1.5 (0.9–2.8) cm), 8 Abszesse ≥3cm (median 4.9 (3.4–6.7) cm) 4/8 Patienten mit großem Abszess mit perkutaner Drainage therapiert Operation bei 5/8 Patienten nach erfolgreicher nicht-operativer Primärtherapie.	

Singh, B. et al. The long-term results of percutaneous drainage of diverticular abscess. *Ann R Coll Surg Engl.* 90. 297-301. 2008

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 5 Study type: retrospektive Fallserie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 16 Recruiting Phase: <u>1999-2007</u> Inclusion criteria: Komplizierte akute Divertikulitis mit Abszess und perkutaner Drainage Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion: Perkutane Drainage kann die Primärtherapie unterstützen.		
Outcome Measures/results	Primary Überleben Secondary	Results: Abszessdurchmesser 8.5 ± 0.9 cm Fistelentstehung 38% 8/16 elektive Operation 8/16 konservativ aufgrund von Komorbidität 1-Jahres Letalität insgesamt 20%	

Subhas, G. et al. Percutaneous drainage of a diverticular abscess should be limited to two attempts for a resilient diverticular abscess. *Am Surg.* 80. 635-9. 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 5 Study type: retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization:	Total no. patients: 117 Recruiting Phase: <u>2008-2011</u> Inclusion criteria: Komplizierte akute Divertikulitis mit Abszess	Interventions: Comparison:

	<b>Blinding:</b> <b>Dropout rates:</b>	<b>Exclusion criteria:</b>	
<b>Notes:</b>	<b>Author's conclusion: Max. 2 Versuche einer perkutanen Drainageanlage.</b>		
<b>Outcome Measures/results</b>	<b>Primary</b> Rate an Hartmann Resektionen im Rahmen des 1. stationären Aufenthalts <b>Secondary</b>	<b>Results: Abszessgröße 0,7-19cm, Indikation zur perkutanen Drainage ab 2cm geprüft</b> Rate an Hartmann Resektionen mit zunehmender Anzahl perkutaner Drainagen pro Patient zunehmend. 44/117 erfolgreich initial ohne Operation behandelt	

van de Wall, B. J. M. et al. Does the Presence of Abscesses in Diverticular Disease Prelude Surgery?. Journal of Gastrointestinal Surgery. 17. 540-547. 2012

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level: 3</b> <b>Study type:</b> retrospektive Kohortenstudie	<b>Funding sources:</b> <b>Conflict of Interests:</b> <b>Randomization:</b> <b>Blinding:</b> <b>Dropout rates:</b>	<b>Total no. patients: 59/722 Pat. mit Abszess</b> <b>Recruiting Phase: 2005-2011</b> <b>Inclusion criteria: CT-graphisch nachgewiesene komplizierte akute Divertikulitis mit Abszess</b> <b>Exclusion criteria: Freie Perforation</b>	<b>Interventions:</b>  <b>Comparison:</b>
<b>Notes:</b>	<b>Author's conclusion: Rezidive und Operationen überwiegend kurzfristig nach Indexdivertikulitis</b>		
<b>Outcome Measures/results</b>	<b>Primary</b> Wiederaufnahmerate, Komplikationen, Operationen <b>Secondary</b>	<b>Results: Abszessgröße &lt;2cm 43,8%, 2-5cm 55,9%, &gt;5cm 23,7%</b> 54/59 (91,5%) erfolgreich konservativ therapiert perkutane Drainage 7/59 (11%) Stationäre Wiederaufnahme 18/54 Pat. (33%) Operative Therapie 22/54 Pat. (40,7%) Rezidive überwiegend im 1 Jahr	

## Schlüsselfrage:

AG 05 - Frage 07 CDD Typ 2b  
Wie hoch ist das Risiko eines Versagens einer primär konservativer Therapie?

## Inhalt: 20 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Aquina, C. T. 2019	3	Register-basierte retrospektive Kohortenstudie
Colas, P. A. 2017	4	Multizentrische retrospektive Kohortenstudie
Dharmarajan, S. 2011	4	retrospektive Kohortenstudie
Elagili, F. 2015	4	Retrospective cohort study
Felder, S. I. 2013	4	Retrospektive Kohorte
Fung, A. K. Y. 2015	4	Retrospektive Kohortenstudie
Gaertner, Wolfgang B. 2013	4	Retrospektive Kohortenstudie
Garfinkle, Richard 2016	4	Retrospektive Kohortenstudie
Gregersen, R. 2016	3	Retrospektive Kohortenstudie (Register-basiert)
Jalouta, Tarek 2017	4	retrospektive Kohortenstudie
Kumar, R. R. 2006	5	Retrospective chart review of 114 patients with intra-abdominal abscesses
Lamb, M. N. 2014	2	syst. rev.
Lambrichts, D. P. V. 2019	4	retrospektive multizentrische Kohortenstudie
Lee, H. 2020	2	Systematischer Review
Mozer, A. B. 2017	3	Register-basierte retrospektive Kohortenstudie
Rose, J. 2015	3	Register-basierte retrospektive Kohortenstudie
Subhas, G. 2014	5	retrospektive Kohortenstudie
Titos-Garcia, A. 2017	4	retrospektive Kohortenstudie
van de Wall, B. J. M. 2012	3	retrospektive Kohortenstudie
You, K. 2018	2	unizentrische prospektiv randomisierte Studie

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 2 Bewertung(en)

Lamb, M. N. et al. Elective resection versus observation after nonoperative management of complicated diverticulitis with abscess: a systematic review and meta-analysis. <i>Dis Colon Rectum</i> . 57. 1430-40. 2014			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2  Study type: syst. rev. Databases:  Search period:  Inclusion Criteria:	Intervention: operation versus observation  Comparison:	Primary:  Secondary:  Results: Percutaneous drainage was successful in 49% patients (diameter, >3 cm) and antibiotic therapy in 14% patients. urgent surgery during the index hospitalization was performed in 30% of patients, elective resection in 36%, and no surgery in 35%. Recurrence rates were high, with 39% in patients awaiting elective resection and 18% in the nonsurgery group, with an overall recurrence rate of 28%. of the whole cohort, only 28% had no surgery and no recurrence during follow-up.	43

complicated diverticulitis	Author's Conclusion: The evidence from the literature is weak but still suggests that complicated diverticulitis with abscess formation is associated with a high probability of resective surgery, whereas conservative management may result in chronic or recurrent diverticular symptoms.
Exclusion Criteria:	
<b>Methodical Notes</b>	
Funding Sources:	
COI:	
Study Quality:	
Heterogeneity: high I2 92%	
Publication Bias: no analysis	
Notes: only small retrospective studies with limited follow-up	

Lee, H. et al. Systematic review of failure of nonoperative management in complicated sigmoid diverticulitis with abscess. *Langenbecks Arch Surg.* . . 2020

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2 Study type: Systematischer Review Databases: Medline Search period: Inclusion Criteria: komplizierte Divertikulitis mit Abszess Exclusion Criteria:	Population: 24 Studien mit 12.601 Patienten Intervention: Comparison:	Primary: Rezidivrate Secondary: Komplizierte Rezidive Versagen der konservativen Therapie Results: Die gepoolte Rezidivrate lag bei 25,5%. Bei Rezidiven lag in 60,9% ein kompliziertes Rezidiv vor. Ein Versagen der konservativen Therapie trat bei 44,4% der Patienten ein. Patienten mit perkutaner Abszessdrainage bei distanten Abszessen wiesen ein erhöhtes Risiko für ein Therapieversagen auf (51% vs. 18%; p = 0.0001). Author's Conclusion: Der Anteil von Patienten mit Versagen der konservativen Therapie ist hoch. Ein Viertel der Patienten erleidet ein Rezidiv.	

**Methodical Notes**

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

**OXFORD (2011) Appraisal Sheet: RCT: 1 Bewertung(en)**

You, K. et al. Randomized clinical trial of elective resection versus observation in diverticulitis with extraluminal air or abscess initially managed conservatively. *Br J Surg.* **105.** 971-979. 2018

Population	Intervention Comparison	Outcomes/Results
Evidence level: 2 Study type: unizentrische prospektiv randomisierte Studie	Intervention: elektive Operation (lap. Sigmaresektion)	Primary: 24-Monate Rezidivdivertikulitisrate Secondary: Versagen der nicht-operativen Therapie Mortalität Morbidity



<p>Number of Patient: 107 (OP Arm n=26, Beobachtungsarm n=81)</p> <p>Recruiting Phase: <u>2011-2014</u></p> <p>Inclusion Criteria: Komplizierte akute Divertikulitis mit extraluminärer Luft oder Abszess</p> <p>Exclusion Criteria: Versagen der nicht-operativen Therapie Kolonkarzinom</p>	<p>Comparison: Beobachtung</p>	<p>Stomarate</p> <p>Results: Redizivdivertikulitis (8% versus 32%; P=0.019) nach 3 Jahren. Alle Rezidive nach Beobachtung erneut kompliziert, aber alle erneut nicht-operativ behandelt.</p> <p>Author's Conclusion: Elektive Operation nicht erforderlich</p>
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**Methodical Notes**

Funding Sources: Merck, Medtronic.

COI: kein

Randomization: 1:3

Blinding: kein

Dropout Rate/ITT-Analysis: 0

Notes:

**NEWCASTLE - OTTAWA Checklist: Case Control: 1 Bewertung(en)**

Kumar, R. R. et al. Factors affecting the successful management of intra-abdominal abscesses with antibiotics and the need for percutaneous drainage. *Dis Colon Rectum*. 49. 183-9. 2006

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 5</p> <p>Study type: Retrospective chart review of 114 patients with intra-abdominal abscesses</p>	<p>Funding sources:</p> <p>Conflict of Interests:</p> <p>Randomization:</p> <p>Blinding:</p> <p>Dropout rates:</p>	<p>Total no. patients: 114 patients, 30 of them with diverticulitis</p> <p>Patient characteristics:</p> <p>Inclusion criteria:</p> <p>Exclusion criteria:</p>	<p>Interventions:</p> <p>Comparison:</p>
Notes:	Author's conclusion:		
Outcome Measures/results	<p>Primary</p> <p>Secondary</p>	<p>Results: The majority of the patients with intra-abdominal abscesses improved with antibiotic therapy alone. Those patients with an abscess diameter &gt;6.5 cm and temperature at admission &gt;101.2-F have higher likelihood of failing conservative therapy with antibiotics alone and requiring percutaneous drainage.</p>	

**NEWCASTLE - OTTAWA Checklist: Cohort: 16 Bewertung(en)**

Aquina, C. T. et al. Population-based study of outcomes following an initial acute diverticular abscess. *Br J Surg*. 106. 467-476. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p> <p>Study type: Registerbasierte retrospektive Kohortenstudie</p>	<p>Funding sources: keine</p> <p>Conflict of Interests: keine</p> <p>Randomization: keine</p>	<p>Total no. patients: 10.342</p> <p>Recruiting Phase: <u>2002-2010</u></p> <p>Inclusion criteria: stationäre Behandlung wegen einer komplizierten akuten Divertikulitis mit Abszess</p>	<p>Interventions: elektive Operation innerhalb von 6 Monaten</p> <p>Comparison: konservative Therapie für mindestens 6 Monate</p>

	Blinding: keine Dropout rates:	Exclusion criteria: < 2 Jahre Follow-UP	
Notes:	Author's conclusion: Niedrige Rezidivrate für diejenigen Patienten, die kein Rezidiv im 1. Jahr aufweisen. Verzicht auf elektive Operation sicher und sinnvoll.		
Outcome Measures/results	Primary Stomarate Divertikulitis-bezogene Krankenhaustage in 5 Jahren Divertikulitis-bezogene Kosten in 5 Jahren Secondary	Results: Perkutane Drainageeinlage bei 21,8% aller Pat. Versagen der nicht-operativen Therapie und dringliche Operation bei 31,6% aller Pat. (mit 4,7% Mortalität). Elektive Operation innerhalb von 6 Monaten bei 16,1% der verbliebenen Patienten. 5-Jahres-Rezidivrisiko der konservativ therapierten Gruppe 24,8% (davon 57% im ersten Jahr), von dieser Gruppe wurden 18,6% im Verlauf operiert. Im Gruppenvergleich signifikant geringere Stomarate, Divertikulitis-bezogene Krankenhaustage in 5 Jahren, und Divertikulitis-bezogene Kosten in 5 Jahren bei der konservativ therapierten Gruppe. Divertikulitis-bezogene Mortalität 1,9% in der konservativen Gruppe.	

Colas, P. A. et al. Failure of Conservative Treatment of Acute Diverticulitis with Extradigestive Air. World J Surg. 41. 1890-1895. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Multizentrische retrospektive Kohortenstudie	Funding sources: keine Conflict of Interests: keine Randomization: keine Blinding: keine Dropout rates: keine	Total no. patients: 91 Recruiting Phase: 2009-2015 Inclusion criteria: Komplizierte akute Divertikulitis CT-graphischer Nachweis von freier Luft Exclusion criteria: Hinchey II, III, IV kein CT verfügbar	Interventions: Comparison:
Notes:	Author's conclusion: Konservative Therapieversuch möglich, aber vorsichtige Patientenselektion empfohlen.		
Outcome Measures/results	Primary Effektivität einer nicht-operativen Primärtherapie Secondary Risikofaktoren für Therapieversagen	Results: Therapieversagen bei 29/91 (31,9%) der Patienten mit Notwendigkeit einer dringlichen Operation. Prädiktive Faktoren für das Versagen der nicht-operativen Therapie waren Luftperlen >5 mm (Odds ratio 5,2) und freie abdominelle Flüssigkeit im Becken (Odds ratio 4,1). Die Patienten die wegen des Versagens der konservativen Therapie operiert werden mussten hat mehrheitlich schwere postoperative Komplikationen, unabhängig vom Operationsverfahren.	

Dharmarajan, S. et al. The efficacy of nonoperative management of acute complicated diverticulitis. Dis Colon Rectum. 54. 663-71. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospektive Kohortenstudie	Funding sources: keine Conflict of Interests: keine Randomization: keine Blinding: keine Dropout rates: keine	Total no. patients: 136 Recruiting Phase: 1995-2008 Inclusion criteria: Komplizierte akute Divertikulitis mit Abszess oder freier Luft im CT. Exclusion criteria: Rezidiv-Divertikulitis nach vorausgegangener Operation grundsätzliche Ablehnung einer operativen Therapie durch den Patient nicht-gegebene Operabilität	Interventions: Konservative Therapie inklusive Antibiotikatherapie und gegebenenfalls perkutaner Drainage Comparison: Keine

		aufgrund Allgemeinzustands Patienten	des des
Notes:	Author's conclusion: Nicht-operative konservative Primärtherapie der komplizierten Divertikulitis ist effektiv.		
Outcome Measures/results	Primary Erfolgsrate der nicht operativen Primärtherapie zur Vermeidung einer Operation im Rahmen der Index-Hospitalisation  Secondary keine	Results: Nur bei 5 Patienten (3,7%) war bei Aufnahme eine primär chirurgische Therapie erforderlich, bei 7 (5%) kam es zum Versagen der nicht operativen Primärtherapie sodass eine notfallmäßige Operation erforderlich war. Die primäre Erfolgsrate der nicht operativen Therapie betrug somit 93%.	

Elagili, F. et al. Antibiotics alone instead of percutaneous drainage as initial treatment of large diverticular abscess. *Tech Coloproctol.* **19.** 97-103. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: Retrospective cohort study	Funding sources: n.a.  Conflict of Interests: none  Randomization: none  Blinding: none  Dropout rates: n.a.	Total no. patients: 146  Recruiting Phase: 1994 to 2012  Inclusion criteria: All patients with an abscess of at least 3 cm in diameter associated with sigmoid diverticulitis were identified from an institutional review board-approved diverticular database and retrospectively reviewed  Exclusion criteria: No abscess < 3cm	Interventions: percutaneous drainage or antibiotics alone followed by surgery  Comparison: see above
Notes:	Author's conclusion: Our study shows that systemic antibiotics alone (ABX) could be more frequently used as the initial treatment of diverticular abscess. Future studies will need to assess in which specific circumstances ABX is preferable to percutaneous drainage (PCD) and when it can be expected to be the definitive treatment of diverticular abscess		
Outcome Measures/results	Primary Many primary and secondary outcome measures  Secondary see above	Results: Selected: Failure of initial treatment required urgent surgery in 8 patients with persistent symptoms during treatment with antibiotics alone (25 %) and in 21 patients (18 %) after initial percutaneous drainage (p=0.21).	

Felder, S. I. et al. Can the need for colectomy after computed tomography-guided percutaneous drainage for diverticular abscess be predicted?. *Am Surg.* **79.** 1013-6. 2013

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: Retrospektive Kohorte	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 40  Recruiting Phase: 2000-2011  Inclusion criteria: Akute komplizierte Divertikulitis mit der Notwendigkeit der Anlage einer perkutanen Drainage  Exclusion criteria: Technisches Versagen der Anlage einer perkutanen Drainage	Interventions:  Comparison:
Notes:	Author's conclusion: Ein erheblicher Teil der Patienten benötigt trotz perkutaner Drainage eine nicht-elektive Operation sodass die Patienten engmaschig chirurgisch überwacht werden sollten.		
Outcome Measures/results	Primary Rate an Therapieversagen mit konsekutiver chirurgische Therapie sowie Anteil der Patientin mit einer elektiven	Results: Abszessdurchmesser 5,6+/-2 cm (85% größer 4 cm) Versagen der konservativen Primärtherapie bei 13 von 40	

Operation nach erfolgreicher primär konservativer Therapie	(33%) mit der Notwendigkeit einer dringlichen Operation. Primär erfolgreiche konservative Therapie und im Verlauf elektive Operation bei 20 von 40 Patienten (50%).
Secondary Risikofaktoren für ein Versagen der nicht operativen Primärtherapie	Primär erfolgreiche konservative Therapie ohne elektive Operation bei 7 von 40 (18%), hierbei keine Rezidiv Divertikulitis mit einem medianen Follow-up von 47 Monaten (3-84 Monate). Unabhängige Risikofaktoren für ein Versagen der nicht operativen Primärtherapie: Kreatinin größer 1,5 mg/dl und Immunsuppression

Fung, A. K. Y. et al. Validation of a grading system for complicated diverticulitis in the prediction of need for operative or percutaneous intervention. The Annals of The Royal College of Surgeons of England. 97. 208-214. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 44 Recruiting Phase: <u>2010-2011</u> Inclusion criteria: CT graphisch nachgewiesene komplizierte akute Divertikulitis Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion: Die klinische Beurteilung des Verlaufs einer akuten komplizierten Divertikulitis kann nicht durch ein Grading der primären CT-Bilder ersetzt werden		
Outcome Measures/results	Primary Prognostische Bedeutung des CT Gratings nach Dharmarajan auf das Versagen einer konservativen Therapie Einigkeit einer dringlichen Operation. Secondary	Results: Kein Einfluss des CT Gratings bezüglich der Wahrscheinlichkeit eines Therapieversagens und der Notwendigkeit einer dringlichen Operation.	

Gaertner, Wolfgang B. et al. Percutaneous Drainage of Colonic Diverticular Abscess. Diseases of the Colon & Rectum. 56. 622-626. 2013

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 218 Recruiting Phase: <u>2002-2007</u> Inclusion criteria: CT graphisch nachgewiesene akute komplizierter Divertikulitis mit Abszesses Einlage einer perkutanen Drainage Exclusion criteria: Kein Nachweis eines Abszesses im CT. Abszess Verdacht ohne CT	Interventions: Comparison:
Notes:	Author's conclusion: In ausgewählten Einzelfällen kann ohne zusätzliche Risiken auf eine operative Therapie verzichtet werden.		
Outcome Measures/results	Primary Rezidive, Überleben Komplikationen Kolektomie-freies Secondary	Results: Abszessdurchmesser 4,7 cm (Mittelwert) Versagen der primär operativen Therapie mit Notfalloperation bei 22/218 Patienten (10%). Elektive Operation bei 137/218 Patienten (61%). Restliche Patienten: Follow-up möglich bei 32/59 Patienten. Bei diesen Patienten Rezidivdivertikulitis bei 42% in einem Zeitraum von 7 Jahren. Insgesamt Kolektomie-freies 7-Jahre-Überleben nach erfolgreicher konservativer Primärtherapie 17%.	

Garfinkle, Richard et al. Diverticular Abscess Managed With Long-term Definitive Nonoperative Intent Is Safe. Diseases of the Colon & Rectum. 59. 648-655. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: Retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 135  Recruiting Phase: <u>2000-2013</u>  Inclusion criteria: CT graphisch nachgewiesen akute komplizierter Divertikulitis mit Abszess  Exclusion criteria:	Interventions:  Comparison:
Notes:	Author's conclusion: Nach erfolgreicher initialer konservativer Therapie einer komplizierten Divertikulitis ist bei einem Teil der Patienten ein langfristig nichtoperatives Procedere möglich und sicher.		
Outcome Measures/results	Primary Kolektomie freies Überleben bei erfolgreich konservativ therapierter akuter komplizierter Divertikulitis mit Langzeit nicht-operativer Therapieempfehlung  Secondary	Results: 31/135 Patienten (23%) mussten bei Versagen der primären konservativen Therapie im gleichen Aufenthalt operiert werden. Im Zeitraum von 60 Tagen nach der Erstaufnahme wurden weitere 24/104 Patienten (23%) wegen persistierender Symptome operiert. Insgesamt konnten 73/135 Patienten (54%) langfristig ohne eine Operation behandelt werden. Von diesen entwickelten 22 Patienten (30%) eine Rezidiv-Divertikulitis nach im Median 23 Monaten (9-40 Monate). 9/73 Patienten wurde im Verlauf operiert.	

Gregersen, R. et al. Short-term mortality, readmission, and recurrence in treatment of acute diverticulitis with abscess formation: a nationwide register-based cohort study. *Int J Colorectal Dis.* 31. 983-990. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: Retrospektive Kohortenstudie (Registerbasiert)	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 3.148  Recruiting Phase: <u>2000-2012</u>  Inclusion criteria: Komplizierte akute Divertikulitis mit Abszess  Exclusion criteria: Follow-Up <30 Tage	Interventions:  Comparison:
Notes:	Populationsregister, Multivariate Analyse; Endpunkte unscharf  Author's conclusion: Akute komplizierte Divertikulitis ist eine lebensbedrohliche Erkrankung mit hoher Letalität im kurzen Intervall.		
Outcome Measures/results	Primary 30-Tages Mortalität  Secondary 30-Tages Rezidivrisiko und stationäre Wiederaufnahme	Results: 30-Tages Mortalität 8,7% (nach Antibiotiktherapie 10,1%, perkutane Drainage 3,5%, Operation 5,5%) 30-Tages Rezidivrisiko 5,9% (nach Antibiotiktherapie 5,9%, perkutane Drainage 10,4%, Operation 2,2%) 30-Tages stationäre Wiederaufnahme 23,8% (nach Antibiotiktherapie 21,8%, perkutane Drainage 32,5%, Operation 26,6%)	

Jalouta, Tarek et al. Diverticulitis recurrence after percutaneous abscess drainage. *International Journal of Colorectal Disease.* 32. 1367-1373. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 165  Recruiting Phase: <u>2001-2012</u>  Inclusion criteria: Komplizierte akute Divertikulitis mit Abszess und konsekutiv perkutaner Drainage  Exclusion criteria:	Interventions:  Comparison:
Notes:	Author's conclusion: Ein Teil der Patienten kann auch nach perkutaner Drainage langfristig ohne Operation behandelt werden.		

Outcome Measures/results	Primary Reizivrisiko bei nicht-operativ behandelten Patienten Secondary	Results: 47/165 pat. (28%) primäres Therapieversagen und sekundäre Operation. 37/118 Pat. (31%) elektive Operation im Verlauf von 3 Monaten insgesamt 73/165 (44%) ohne Operation nach 1 Jahr, für die Gruppe betrug das 5-Jahres Rezidivfreie-Überleben 77%. Insgesamt 55% Kolektomie-freies Überleben der primär erfolgreich therapierten Patienten.
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Lambrichts, D. P. V. et al. Multicentre study of non-surgical management of diverticulitis with abscess formation. *Br J Surg.* 106. 458-466. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospektive multizentrische Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 447 Recruiting Phase: <u>2008-2015</u> Inclusion criteria: CT-graphisch nachgewiesene komplizierte akute Divertikulitis mit Abszess Exclusion criteria: perforierte Divertikulitis	Interventions: Comparison:
Notes:	Author's conclusion: Kein Einfluss einer perkutanen Drainage auf den kurzfristigen Verlauf.		
Outcome Measures/results	Primary Secondary	Results: Abszessgröße 4,2 cm (Mittelwert, IQR 2,7 cm - 6,1 cm). Versagen der konservativen Therapie 26,8%. Kurzfristige Notfalloperation 8,9% Langfristige Rezidivrate 27,3%, elektive Operation 27,7%. Kein Unterschied des Therapieansprechens durch perkutane Drainage. Hauptrisikofaktor für Therapieversagen Abszessgröße >3cm (Odds ratio 2,05) und für Notfalloperation Abszessgröße >5 cm (Odds ratio 2,96).	

Mozer, A. B. et al. Post-operative morbidity, but not mortality, is worsened by operative delay in septic diverticulitis. *Int J Colorectal Dis.* 32. 193-199. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Register-basierte retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 2.119 Recruiting Phase: <u>2005-2012</u> Inclusion criteria: Notfalloperation bei Divertikulitis Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion: Bei Therapieversagen der konservativen Therapie einer akuten Divertikulitis sollte die Operation frühzeitig indiziert werden.		
Outcome Measures/results	Primary Einfluss des Operations Zeitpunkts auf postoperative Morbidität und Mortalität Secondary	Results: Verzögerte Operation war assoziiert mit Komorbiditäten. In der Multivariaten Analyse war verzögerte Operation (3-7 Tage nach Aufnahme) mit einer erhöhten postop. Morbidität verbunden (Odds ratio 1,8). Kein statistisch signifikanter Effekt auf die Mortalität.	

Rose, J. et al. Long-term Outcomes After Initial Presentation of Diverticulitis. *Ann Surg.* 262. 1046-53. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Register-basierte retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization:	Total no. patients: 210.268 Recruiting Phase: <u>1995-2009</u> Inclusion criteria: ungeplante stationäre Aufnahme wegen einer akuten	Interventions: Comparison:

	<b>Blinding:</b> <b>Dropout rates:</b>	<b>Divertikulitis</b> <b>Exclusion criteria: Kolonkarzinom</b> <b>Operation &lt; 24 Stunden nach Aufnahme</b>	
<b>Notes:</b>	<b>Author's conclusion: Elektive Operation bei komplizierter Divertikulitis empfohlen.</b>		
<b>Outcome Measures/results</b>	<b>Primary Rezidivdivertikulitis (mit erneuter stationärer Aufnahme)</b> <b>Secondary Mortalität bei Rezidivdivertikulitis</b>	<b>Results: 83,7% ohne Rezidiv über alle Stadien Abszesse erhöhten das Rezidivrisiko (HR 2,02) Mortalität nach elektiver Operation 0,3%, bei Rezidivdivertikulitis 2,52%.</b>	

Subhas, G. et al. Percutaneous drainage of a diverticular abscess should be limited to two attempts for a resilient diverticular abscess. *Am Surg.* **80.** 635-9. 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level: 5</b> <b>Study type: retrospektive Kohortenstudie</b>	<b>Funding sources:</b> <b>Conflict of Interests:</b> <b>Randomization:</b> <b>Blinding:</b> <b>Dropout rates:</b>	<b>Total no. patients: 117</b> <b>Recruiting Phase: 2008-2011</b> <b>Inclusion criteria: Komplizierte akute Divertikulitis mit Abszess</b> <b>Exclusion criteria:</b>	<b>Interventions:</b> <b>Comparison:</b>
<b>Notes:</b>	<b>Author's conclusion: Max. 2 Versuche einer perkutanen Drainageanlage.</b>		
<b>Outcome Measures/results</b>	<b>Primary Rate an Hartmann Resektionen im Rahmen des 1. stationären Aufenthalts</b> <b>Secondary</b>	<b>Results: Abszessgröße 0,7-19cm, Indikation zur perkutanen Drainage ab 2cm geprüft Rate an Hartmann Resektionen mit zunehmender Anzahl perkutaner Drainagen pro Patient zunehmend. 44/117 erfolgreich initial ohne Operation behandelt</b>	

Titos-Garcia, A. et al. Nonoperative management of perforated acute diverticulitis with extraluminal air: results and risk factors of failure. *Int J Colorectal Dis.* **32.** 1503-1507. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level: 4</b> <b>Study type: retrospektive Kohortenstudie</b>	<b>Funding sources:</b> <b>Conflict of Interests:</b> <b>Randomization:</b> <b>Blinding:</b> <b>Dropout rates:</b>	<b>Total no. patients: 77</b> <b>Recruiting Phase: 2010-2015</b> <b>Inclusion criteria: akute komplizierte Divertikulitis mit Nachweis extraluminärer Luft</b> <b>Exclusion criteria:</b>	<b>Interventions:</b> <b>Comparison:</b>
<b>Notes:</b>	<b>Author's conclusion:</b>		
<b>Outcome Measures/results</b>	<b>Primary Faktoren für erfolgreiches nicht-operatives Primärmanagement</b> <b>Secondary Rezidivdivertikulitis nach Entlassung</b>	<b>Results: 64/77 Pat. konservativer Therapieversuch erfolgreiche nicht-operative Therapie bei 54/64 Pat. Univariate Abszessdurchmesser, multivariate distante Luft und ASA Score</b>	

van de Wall, B. J. M. et al. Does the Presence of Abscesses in Diverticular Disease Prelude Surgery?. *Journal of Gastrointestinal Surgery.* **17.** 540-547. 2012

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level: 3</b> <b>Study type: retrospektive Kohortenstudie</b>	<b>Funding sources:</b> <b>Conflict of Interests:</b> <b>Randomization:</b>	<b>Total no. patients: 59/722 Pat. mit Abszess</b> <b>Recruiting Phase: 2005-2011</b> <b>Inclusion criteria: CT-graphisch nachgewiesene</b>	<b>Interventions:</b> <b>Comparison:</b>

	<b>Blinding:</b> <b>Dropout rates:</b>	<b>komplizierte akute Divertikulitis mit Abszess</b> <b>Exclusion criteria: Freie Perforation</b>
<b>Notes:</b>	<b>Author's conclusion: Rezidive und Operationen überwiegend kurzfristig nach Indexdivertikulitis</b>	
<b>Outcome Measures/results</b>	<b>Primary Wiederaufnahmerate, Komplikationen, Operationen</b> <b>Secondary</b>	<b>Results: Abszessgröße &lt;2cm 43,8%, 2-5cm 55,9%, &gt;5cm 23,7%</b> <b>54/59 (91,5%) erfolgreich konservativ therapiert</b> <b>perkutane Drainage 7/59 (11%)</b> <b>Stationäre Wiederaufnahme 18/54 Pat. (33%)</b> <b>Operative Therapie 22/54 Pat. (40,7%)</b> <b>Rezidive überwiegend im 1 Jahr</b>





## Schlüsselfrage:

## AG 05 - Frage 08 CDD Typ 2b

Wie hoch ist das Risiko für eine Rezidivdivertikulitis nach erfolgreicher konservativer Initialtherapie bei Makroabszess?

## Inhalt: 22 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Ambrosetti, P. 2005	3	prospective cohort
Aquina, C. T. 2019	3	Register-basierte retrospektive Kohortenstudie
Buchwald, P. 2017	4	retrospective cohort
Chautems, R. C. 2002	4	Prospektive Kohortenstudie
Devaraj, Bikash 2016	4	Retrospektive Kohortenstudie
Elagili, F. 2014	4	retrospektive Kohortenstudie
Gaertner, Wolfgang B. 2013	4	Retrospektive Kohortenstudie
Garfinkle, Richard 2016	4	Retrospektive Kohortenstudie
Gregersen, R. 2018	3	Register-basierte retrospektive Kohortenstudie
Gregersen, R. 2016	3	systematic review
Ho, V. P. 2015	2	Kohortenstudie
Holmer, C. 2011	4	prospektive Studie 2011
Hupfeld, L. 2017	2	syst. rev.
Jalouta, Tarek 2017	4	retrospektive Kohortenstudie
Lamb, M. N. 2014	2	syst. rev.
Lee, H. 2020	2	Systematischer Review
Li, D. 2014	3	Register-basierte retrospektive Kohortenstudie
Rose, J. 2015	3	Register-basierte retrospektive Kohortenstudie
Sallinen, V. 2015	4	retrospektive Kohortenstudie
Trenti, Loris 2014	3	retrospektive Kohortenstudie
van de Wall, B. J. M. 2012	3	retrospektive Kohortenstudie
You, K. 2018	2	unizentrische prospektiv randomisierte Studie

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 4 Bewertung(en)

Gregersen, R. et al. Treatment of patients with acute colonic diverticulitis complicated by abscess formation: A systematic review. *Int J Surg.* 35. 201-208. 2016

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 3 Study type: systematic review Databases: PubMed, EMBASE and the Cochrane Library	Population: see inclusion Intervention: antibiotics, percutaneous abscess drainage,	Primary: Need for acute surgery, short-term mortality, readmission within 30 days, persistent symptoms, presence of residual abscess, recurrence, procedure-related complications and morbidity, permanent stoma, additional abscess drainage or drain adjustment, and risk factors associated with the outcomes of interest Secondary: none	68 references

<p><b>Search period:</b> until february 2016</p> <p><b>Inclusion Criteria:</b> Patients with diverticulitis and peri- or paracolic, retroperitoneal, intra-abdominal, or pelvic abscesses</p> <p><b>Exclusion Criteria:</b> patients with diverticulitis complicated by generalized purulent or feculent peritonitis and patients only treated electively were excluded. Only publications in English were included.</p>	<p><b>non-operative treatment, and acute surgery</b></p> <p><b>Comparison:</b> Patients receiving other or no intervention</p>	<p><b>Results:</b> Observational studies were the only available evidence. Treatment generally failed for 20% of patients, regardless of non-operative treatment choice. Abscesses with diameters less than 3 cm were sufficiently treated with antibiotics alone, possibly as outpatient treatment. Of patients treated non-operatively, 25% experienced a recurrent episode during long-term follow-up. When comparing PAD to antibiotic treatment, it appeared that PAD lead to recurrence less often (15.9% vs. 22.2%). Patients undergoing acute surgery had increased risk of death (12.1% vs. 1.1%) compared to patients treated non-operatively. Of patients undergoing PAD, 2.5% experienced procedure-related complications and 15.5% needed adjustment or replacement of the drain</p> <p><b>Author's Conclusion:</b> Diverticular abscesses with diameters less than 3 cm might be sufficiently treated with antibiotics, while the best treatment for larger abscesses remains uncertain. Acute surgery should be reserved for critically ill patients failing non-operative treatment</p>
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**Methodical Notes**

**Funding Sources:** none

**COI:** none

**Study Quality:** high

**Heterogeneity:** n.a.

**Publication Bias:** n.a.

**Notes:**  
only observational studies

Hupfeld, L. et al. Risk factors for recurrence after acute colonic diverticulitis: a systematic review. *Int J Colorectal Dis.* 32. 611-622. 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p><b>Evidence level:</b> 2</p> <p><b>Study type:</b> syst. rev.</p> <p><b>Databases:</b></p> <p><b>Search period:</b></p> <p><b>Inclusion Criteria:</b></p> <p><b>Exclusion Criteria:</b></p>	<p><b>Intervention:</b></p> <p><b>Comparison:</b></p>	<p><b>Primary:</b> risk of recurrence</p> <p><b>Secondary:</b></p> <p><b>Results:</b> higher risk of recurrence after abscess</p> <p><b>Author's Conclusion:</b> In conclusion, the risk of experiencing a recurrent episode of acute diverticulitis increased significantly after a primary episode with abscess formation. Further predisposing factors for recurrence were young age at debut and previous recurrences. Recurrence risk was highest within the first year after remission and recurrence risk increased gradually with more recurrent episodes.</p>	

**Methodical Notes**

**Funding Sources:**

**COI:**

**Study Quality:**

**Heterogeneity:**

**Publication Bias:**

**Notes:**  
35 studies included, mostly retrospective studies, small patient numbers per study

Lamb, M. N. et al. Elective resection versus observation after nonoperative management of complicated diverticulitis with abscess: a systematic review and meta-analysis. *Dis Colon Rectum*. 57. 1430-40. 2014

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2 Study type: syst. rev. Databases: Search period: Inclusion Criteria: complicated diverticulitis Exclusion Criteria:	Intervention: operation versus observation Comparison:	Primary: Secondary: Results: Percutaneous drainage was successful in 49% patients (diameter, >3 cm) and antibiotic therapy in 14% patients. urgent surgery during the index hospitalization was performed in 30% of patients, elective resection in 36%, and no surgery in 35%. Recurrence rates were high, with 39% in patients awaiting elective resection and 18% in the nonsurgery group, with an overall recurrence rate of 28%. of the whole cohort, only 28% had no surgery and no recurrence during follow-up. Author's Conclusion: The evidence from the literature is weak but still suggests that complicated diverticulitis with abscess formation is associated with a high probability of resective surgery, whereas conservative management may result in chronic or recurrent diverticular symptoms.	43

#### Methodical Notes

#### Funding Sources:

COI:

Study Quality:

Heterogeneity: high I2 92%

Publication Bias: no analysis

Notes:

only small retrospective studies with limited follow-up

Lee, H. et al. Systematic review of failure of nonoperative management in complicated sigmoid diverticulitis with abscess. *Langenbecks Arch Surg*. . . 2020

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2 Study type: Systematischer Review Databases: Medline Search period: Inclusion Criteria: komplizierte Divertikulitis mit Abszess Exclusion Criteria:	Population: 24 Studien mit 12.601 Patienten Intervention: Comparison:	Primary: Rezidivrate Secondary: Komplizierte Rezidive Versagen der konservativen Therapie Results: Die gepoolte Rezidivrate lag bei 25,5%. Bei Rezidiven lag in 60,9% ein kompliziertes Rezidiv vor. Ein Versagen der konservativen Therapie trat bei 44,4% der Patienten ein. Patienten mit perkutaner Abszessdrainage bei distanten Abszessen wiesen ein erhöhtes Risiko für ein Therapieversagen auf (51% vs. 18%; p = 0.0001). Author's Conclusion: Der Anteil von Patienten mit Versagen der konservativen Therapie ist hoch. Ein Viertel der Patienten erleidet ein Rezidiv.	

#### Methodical Notes

#### Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

**OXFORD (2011) Appraisal Sheet: RCT: 1 Bewertung(en)**

You, K. et al. Randomized clinical trial of elective resection versus observation in diverticulitis with extraluminal air or abscess initially managed conservatively. *Br J Surg.* **105.** 971-979. 2018

Population	Intervention Comparison	Outcomes/Results
<p>Evidence level: 2</p> <p>Study type: unizentrische prospektiv randomisierte Studie</p> <p>Number of Patient: 107 (OP Arm n=26, Beobachtungsarm n=81)</p> <p>Recruiting Phase: <u>2011-2014</u></p> <p>Inclusion Criteria: Komplizierte akute Divertikulitis mit extraluminärer Luft oder Abszess</p> <p>Exclusion Criteria: Versagen der nicht-operativen Therapie Kolonkarzinom</p>	<p>Intervention: elektive Operation (lap. Sigmaresektion)</p> <p>Comparison: Beobachtung</p>	<p>Primary: 24-Monate Rezidivdivertikulitisrate</p> <p>Secondary: Versagen der nicht-operativen Therapie Mortalität Morbidität Stomarate</p> <p>Results: Rezidivdivertikulitis (8% versus 32%; P=0.019) nach 3 Jahren. Alle Rezidive nach Beobachtung erneut kompliziert, aber alle erneut nicht-operativ behandelt.</p> <p>Author's Conclusion: Elektive Operation nicht erforderlich</p>

**Methodical Notes**

Funding Sources: Merck, Medtronic.

COI: kein

Randomization: 1:3

Blinding: kein

Dropout Rate/ITT-Analysis: 0

Notes:

**NEWCASTLE - OTTAWA Checklist: Case Control: 1 Bewertung(en)**

Ambrosetti, P. et al. Long-term outcome of mesocolic and pelvic diverticular abscesses of the left colon: a prospective study of 73 cases. *Dis Colon Rectum.* **48.** 787-91. 2005

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p> <p>Study type: prospective cohort</p>	<p>Funding sources:</p> <p>Conflict of Interests:</p> <p>Randomization:</p> <p>Blinding:</p> <p>Dropout rates:</p>	<p>Total no. patients: 73</p> <p>Patient characteristics: <u>1986-1997</u></p> <p>Inclusion criteria: CT-graphischer Nachweis einer komplizierten akuten Divertikulitis mit Abszessbildung</p> <p>Exclusion criteria: Fehlendes Follow-Up</p>	<p>Interventions: keine</p> <p>Comparison: keine</p>
Notes:	<p>kleine Fallzahl der Langzeitverläufe</p> <p>Author's conclusion:</p>		
Outcome Measures/results	<p>Primary Art der weiteren Behandlung</p> <p>Secondary</p>	<p>Results: 30 of 73 patients with abscess do not need any operation more emergency operations with pelvic abscesses</p>	

**NEWCASTLE - OTTAWA Checklist: Cohort: 16 Bewertung(en)**

**Aquina, C. T. et al. Population-based study of outcomes following an initial acute diverticular abscess. Br J Surg. 106. 467-476. 2019**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Registerbasierte retrospektive Kohortenstudie	Funding sources: keine Conflict of Interests: keine Randomization: keine Blinding: keine Dropout rates:	Total no. patients: 10.342 Recruiting Phase: <u>2002-2010</u> Inclusion criteria: stationäre Behandlung wegen einer komplizierten akuten Divertikulitis mit Abszess Exclusion criteria: < 2 Jahre Follow-UP	Interventions: elektive Operation innerhalb von 6 Monaten Comparison: konservative Therapie für mindestens 6 Monate
Notes:	Author's conclusion: Niedrige Rezidivrate für diejenigen Patienten, die kein Rezidiv im 1. Jahr aufweisen. Verzicht auf elektive Operation sicher und sinnvoll.		
Outcome Measures/results	Primary Stomarate Divertikulitis-bezogene Krankenhaustage in 5 Jahren Divertikulitis-bezogene Kosten in 5 Jahren Secondary	Results: Perkutane Drainageeinlage bei 21,8% aller Pat. Versagen der nicht-operativen Therapie und dringliche Operation bei 31,6% aller Pat. (mit 4,7% Mortalität). Elektive Operation innerhalb von 6 Monaten bei 16,1% der verbliebenen Patienten. 5-Jahres-Rezidivrisiko der konservativ therapierten Gruppe 24,8% (davon 57% im ersten Jahr), von dieser Gruppe wurden 18,6% im Verlauf operiert. Im Gruppenvergleich signifikant geringere Stomarate, Divertikulitis-bezogene Krankenhaustage in 5 Jahren, und Divertikulitis-bezogene Kosten in 5 Jahren bei der konservativ therapierten Gruppe. Divertikulitis-bezogene Mortalität 1,9% in der konservativen Gruppe.	

**Buchwald, P. et al. Hinchey I and II diverticular abscesses: long-term outcome of conservative treatment. ANZ J Surg. 87. 1011-1014. 2017**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospective cohort	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 115 Recruiting Phase: <u>1998-2009</u> Inclusion criteria: all abscesses Exclusion criteria: postop. abscesses	Interventions: antibiotics, drainage, operation Comparison:
Notes:	115 patients with abscesses (Hinchey I and II) indication for operation not clear Author's conclusion: Recurrence after diverticular abscess is higher after initial conservative Treatment (antibiotics +/- percutaneous drainage) compared with surgery		
Outcome Measures/results	Primary Recurrence rate Secondary abscess size	Results: Recurrence rates: antibiotics alone 30%, percutaneous Drainage + antibiotics 27%, surgery 5% Abscess size: antibiotics alone 3.1 +/- 1.8 cm, percutaneous Drainage + antibiotics 5.6 +/- 2.4 cm, surgery 4.6 +/- 1.6 cm	

**Chautems, R. C. et al. Long-term follow-up after first acute episode of sigmoid diverticulitis: is surgery mandatory?: a prospective study of 118 patients. Dis Colon Rectum. 45. 962-6. 2002**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4	Funding sources:	Total no. patients: 118	Interventions:

Study type: Prospektive Kohortenstudie	Conflict of Interests: Randomization: Blinding: Dropout rates:	Recruiting Phase: <u>1986-1991</u>  Inclusion criteria: Alle PatientInnen die sich zum ersten Mal in der Notfallambulanz mit einer Anamnese und klinischen Befunden einer Sigmadivertikulitis vorstellten, wurden einem abdominalen CT und einem wasserlöslichen Kontrasteinlauf unterzogen. PatientInnen wurden als PatientInnen mit Divertikulitis betrachtet, wenn einer oder beide diagnostische Tests negativ ausfielen.  Exclusion criteria: PatientInnen wurden ausgeschlossen, wenn beide Untersuchungen negativ ausfielen.	Comparison:
Notes:	Author's conclusion: Die AutorInnen schlagen vor, nach einer ersten akuten Episode der Divertikulitis, welche nicht operativ behandelt wurde, jungen PatientInnen (≤50 Jahre) mit einem schweren Verlauf der Divertikulitis, eine elektive Kolektomie anzubieten.		
Outcome Measures/results	Primary Langzeitergebnisse von PatientInnen, die nach einer ersten akuten Episode von Sigmadivertikulitis nicht operativ behandelt wurden  Secondary	Results: Insgesamt traten bei 80 PatientInnen keine Komplikationen und bei 38 PatientInnen Fernkomplikationen auf. Hierbei war die Inzidenz von Fernkomplikationen bei jüngeren PatientInnen mit schwerer Divertikulitis am höchsten (54% nach 5 Jahren). Die niedrigste Inzidenz ließ sich bei älteren PatientInnen mit leichter Erkrankung verzeichnen (19% nach 5 Jahren). Junges Alter und schwere Divertikulitis waren getrennt voneinander betrachtet beide statistisch signifikante Faktoren für ein schlechtes Outcome (p=0,007 und p=0,003). Daher sind Risikofaktoren für eine Rückfall ein Alter unter 50 Jahren sowie ein schwerer Verlauf der Divertikulitis	

**Devaraj, Bikash et al. Medically Treated Diverticular Abscess Associated With High Risk of Recurrence and Disease Complications. Diseases of the Colon & Rectum. 59. 208-215. 2016**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: Retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 210  Recruiting Phase: <u>2004-2014</u>  Inclusion criteria: konservativ behandelte komplizierte akute Divertikulitis (Hinchey Ib-II)  Exclusion criteria: keine	Interventions: keine  Comparison:
Notes:	Author's conclusion: Patienten nach komplizierter akuter Divertikulitis mit Abszess sollte eine elektive Operation angeboten werden.		
Outcome Measures/results	Primary Risiko einer Rezidivdivertikulitis nach konservativer Therapie  Secondary	Results: 60% der Patienten entwickelten im Median nach 5,3 Monaten eine Rezidivdivertikulitis, wobei davon 42% ein höheres Hinchey Stadium beim Rezidiv aufwiesen, als beim 1. Schub. Das Rezidivrisiko bei bei denjenigen Patienten, die eine perkutane Drainage erhielten mit 74% noch höher.	

**Elagili, F. et al. Outcomes of percutaneous drainage without surgery for patients with diverticular abscess. Dis Colon Rectum. 57. 331-6. 2014**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 18 (aus 133)  Recruiting Phase: <u>2001-2012</u>  Inclusion criteria: komplizierte akute Divertikulitis mit Abszess >3cm und Abszessdrainage Ablehnung einer elektiven Operation durch Patient  Exclusion criteria:	Interventions:  Comparison:
Notes:			

	Author's conclusion: Langfristiger Verzicht auf eine Operation ist bei einer kleinen Patientengruppe möglich.	
Outcome Measures/results	Primary Secondary	Results: 22/133 (16,5%) Therapieversagen und dringlichen Operation. 111 erfolgreich konservativ behandelt. 18/111 (16,2%) Patienten im Verlauf nicht operiert (Ablehnung n=11, wg. Komorbiditäten n=7). 7/ 15 Patienten entwickelten eine Rezidivdivertikulitis, 3 Patienten wurde im Verlauf operiert.

Gaertner, Wolfgang B. et al. Percutaneous Drainage of Colonic Diverticular Abscess. Diseases of the Colon & Rectum. 56. 622-626. 2013

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: Retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 218  Recruiting Phase: <u>2002-2007</u>  Inclusion criteria: CT graphisch nachgewiesen akute komplizierter Divertikulitis mit Abszesses Einlage einer perkutanen Drainage  Exclusion criteria: Kein Nachweis eines Abszesses im CT. Abszess Verdacht ohne CT	Interventions:  Comparison:
Notes:	Author's conclusion: In ausgewählten Einzelfällen kann ohne zusätzliche Risiken auf eine operative Therapie verzichtet werden.		
Outcome Measures/results	Primary Rezidive, Überleben  Secondary	Komplikationen Kolektomie-freies	Results: Abszessdurchmesser 4,7 cm (Mittelwert) Versagen der primär operativen Therapie mit Notfalloperation bei 22/218 Patienten (10%). Elektive Operation bei 137/218 Patienten (61%). Restliche Patienten: Follow-up möglich bei 32/59 Patienten. Bei diesen Patienten Rezidivdivertikulitis bei 42% in einem Zeitraum von 7 Jahren. Insgesamt Kolektomie-freies 7-Jahre-Überleben nach erfolgreicher konservativer Primärtherapie 17%.

Garfinkle, Richard et al. Diverticular Abscess Managed With Long-term Definitive Nonoperative Intent Is Safe. Diseases of the Colon & Rectum. 59. 648-655. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: Retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 135  Recruiting Phase: <u>2000-2013</u>  Inclusion criteria: CT graphisch nachgewiesen akute komplizierter Divertikulitis mit Abszess  Exclusion criteria:	Interventions:  Comparison:
Notes:	Author's conclusion: Nach erfolgreicher initialer konservativer Therapie einer komplizierten Divertikulitis ist bei einem Teil der Patienten ein langfristig nichtoperatives Procedere möglich und sicher.		
Outcome Measures/results	Primary Kolektomie freies Überleben bei erfolgreich konservativ therapierter akuter komplizierter Divertikulitis mit Langzeit nicht- operativer Therapieempfehlung  Secondary	Komplikationen Kolektomie-freies	Results: 31/135 Patienten (23%) mussten bei Versagen der primären konservativen Therapie im gleichen Aufenthalt operiert werden. Im Zeitraum von 60 Tagen nach der Erstaufnahme wurden weitere 24/104 Patienten (23%) wegen persistierender Symptome operiert. Insgesamt konnten 73/135 Patienten (54%) langfristig ohne eine Operation behandelt werden. Von diesen entwickelten 22 Patienten (30%) eine Rezidiv-Divertikulitis nach im Median 23 Monaten (9-40 Monate). 9/73 Patienten wurde im Verlauf operiert.

Gregersen, R. et al. Long-term mortality and recurrence in patients treated for colonic diverticulitis with abscess

formation: a nationwide register-based cohort study. *Int J Colorectal Dis.* **33.** 431-440. 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: Register-basierte retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 3.148  Recruiting Phase: <u>200-2012</u>  Inclusion criteria: Komplizierte akute Divertikulitis mit Abszess (nach mod. Hinchey Ib-II)  Exclusion criteria: vorausgegangene stationäre Behandlung wegen Divertikulitis freie Perforation	Interventions: perkutane Drainage und Antibiotikatherapie vs. alleinige Antibiotikatherapie beim Initialen Schub  Comparison: Operation im Initialen Schub
Notes:	Author's conclusion: Insgesamt hohe Rezidivrate und hohe Mortalität. Patienten nach Drainageanlage mit deutlich erhöhtem Rezidivrisiko		
Outcome Measures/results	Primary Mortalität  Secondary Rezidivdivertikulitisrate	Langzeit-  Results: 1-Jahr-Überlebensrate 81-83%, 5-Jahres-Überlebensrate 66-67%. Keine Unterschiede im Überleben zwischen den untersuchten Gruppen. Langfristige Rezidivdivertikulitisrate nach Drainage 23,6%, nach antibiotischer Therapie 15,5%, nach Operation 9,1%. >50% der Rezidive im 1. Jahr. Kein signifikanter Unterschied bzgl. der Rezidivbedingten Mortalität.	

Ho, V. P. et al. Identification of diverticulitis patients at high risk for recurrence and poor outcomes. *J Trauma Acute Care Surg.* **78.** 112-9. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: Kohortenstudie	Funding sources:  Conflict of Interests: no  Randomization: no  Blinding: no  Dropout rates: no	Total no. patients: 237.879  Recruiting Phase: <u>1985 - 2006</u>  Inclusion criteria: stationäre Aufnahme wegen akuter Divertikulitis  Exclusion criteria:	Interventions:  Comparison:
Notes:	grosses Patientenkollektiv, langer Zeitraum  Author's conclusion: Individualisiertes Vorgehen zur Indikationsstellung zur elektiven Operation nach Vorhandensein für Risikofaktoren für ein schlechtes Outcome.		
Outcome Measures/results	Primary  Secondary	Results: Rezidivhäufigkeit nach 1. Schub insgesamt 8,7%, nach 2. Schub 23,2%, nach 3. Schub 35,8%, nach 4. Schub 41,1% komplizierte Divertikulitis mit Abszess Haupt-Einflussfaktor auf Rezidive (Odds Ratio 1,67) und schlechtes Outcome (Odds Ratio 3,84)	

Holmer, C. et al. Long-term outcome after conservative and surgical treatment of acute sigmoid diverticulitis. *Langenbecks Arch Surg.* **396.** 825-32. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: prospektive Studie 2011	Funding sources: keine Angaben  Conflict of Interests: keine  Randomization: -	Total no. patients: n=153  Recruiting Phase: Januar 2004 bis Juni 2007  Inclusion criteria: erste akute SD, CT Kontrastmittel	Interventions: konservative Therapie bei Patienten mit SD Anzeichen ohne Perforation oder diffuse Peritonitis: intravenöse Therapie mit 1g Sulbactam und 2g Ampicillin; bei Penicillin Unverträglichkeit: Ciprofloxacin und Metronidazol



	Blinding: - Dropout rates: n=210 rekrutiert, n=153 inkludiert, Rest konnte zum Großteil wegen geänderter Kontaktdaten nicht zum Followup erreicht werden; 9 Patienten lehnte es ab an der Studie teilzunehmen	iv/rektal innerhalb 12 h nach Aufnahme Hansen-Stock classification Exclusion criteria: frei perforierte SD, diffuse Peritonitis, chronische SD mit Stenzen und Fisteln, Allergie gegen das Kontrastmittel, Kolorektalkarzinom, IBD, infektiöse Colitis	Comparison: operative Therapie Indikation: weitere Ausbreitung während Antibiotika Therapie, lokale Peritonitis, erste Manifestation bei Immunsupprimierten, chronische Schmerzen wegen diverticular disease, rekurrenente Blutungen Divertikel, überdeckte perforierende SD
Notes:	Langes follow up - Daten aber telefonisch erhoben Author's conclusion: Die operative Versorgung einer akuten sigmoiden Divertikulitis ist effektiver um einem Rückfall vorzubeugen im Verhältnis zur konservativen Therapie		
Outcome Measures/results	Primary Fragebogen Secondary	Results: n=210 Patienten eingeschlossen, n=153 zum Follow-up erreicht, 45,8% präsentierten sich mit Erstmanifestation, 54,2% hatten eine SD Vorgeschichte median Follow-up 32 Monate n=13 (32,5%) der konservativ behandelten Patienten und n=113 (3,5%) der operierten Patienten erlitten ein Rezidiv Behandlungsgruppen unterschieden sich nicht nach Alter, Geschlecht, Entzündungsparameter, jedoch hatten konservativ behandelte Patienten signifikant höhere Komorbiditäten (p=0,038) und seltener schwere Verläufe (p=0,022)	

Jalouta, Tarek et al. Diverticulitis recurrence after percutaneous abscess drainage. International Journal of Colorectal Disease. 32. 1367-1373. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 165 Recruiting Phase: <u>2001-2012</u> Inclusion criteria: Komplizierte akute Divertikulitis mit Abszess und konsekutiv perkutaner Drainage Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion: Ein Teil der Patienten kann auch nach perkutaner Drainage langfristig ohne Operation behandelt werden.		
Outcome Measures/results	Primary Reizivrisiko bei nicht-operativ behandelten Patienten Secondary	Results: 47/165 pat. (28%) primäres Therapieversagen und sekundäre Operation. 37/118 Pat. (31%) elektive Operation im Verlauf von 3 Monaten insgesamt 73/165 (44%) ohne Operation nach 1 Jahr, für die Gruppe betrug das 5-Jahres Rezidivfreie-Überleben 77%. Insgesamt 55% Kolektomie-freies Überleben der primär erfolgreich therapierten Patienten.	

Li, D. et al. Risk of readmission and emergency surgery following nonoperative management of colonic diverticulitis: a population-based analysis. Ann Surg. 260. 423-30; discussion 430-1. 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Register-basierte retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 18,543 Recruiting Phase: <u>2002-2012</u> Inclusion criteria: erstmalige stationäre Aufnahme wegen einer akuten Divertikulitis Exclusion criteria: ambulante Behandlung Operation < 30 Tage nach stationärer Aufnahme Follow-Up <30 Tage	Interventions: Comparison:
Notes:			

	Author's conclusion: Nichtoperatives Management erfolgreich.	
Outcome Measures/results	Primary Rezidivrisiko Notfalloperation im Verlauf Secondary	Results: Rezidiv mit stationärer Wiederaufnahme bei komplizierter Divertikulitis 12% (am höchsten nach perkutaner Drainage), Notfalloperation bei komplizierter Divertikulitis 4,3% (70% der Operation im 1 Jahr nach Indexhospitalisation).

Rose, J. et al. Long-term Outcomes After Initial Presentation of Diverticulitis. *Ann Surg.* **262.** 1046-53. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Register-basierte retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 210.268 Recruiting Phase: <u>1995-2009</u> Inclusion criteria: ungeplante stationäre Aufnahme wegen einer akuten Divertikulitis Exclusion criteria: Kolonkarzinom Operation < 24 Stunden nach Aufnahme	Interventions: Comparison:
Notes:	Author's conclusion: Elektive Operation bei komplizierter Divertikulitis empfohlen.		
Outcome Measures/results	Primary Rezidivdivertikulitis (mit erneuter stationärer Aufnahme) Secondary Mortalität bei Rezidivdivertikulitis	Results: 83,7% ohne Rezidiv über alle Stadien Abszesse erhöhten das Rezidivrisiko (HR 2,02) Mortalität nach elektiver Operation 0,3%, bei Rezidivdivertikulitis 2,52%.	

Sallinen, V. et al. Assessment of risk for recurrent diverticulitis: a proposal of risk score for complicated recurrence. *Medicine (Baltimore).* **94.** e557. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: rektrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 512 Recruiting Phase: <u>2006-2010</u> Inclusion criteria: CT-graphisch nachgewiesene akute Divertikulitis Exclusion criteria: Fehlendes CT Operation beim 1. stationären Aufenthalt	Interventions: Comparison:
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Risikofaktoren für eine komplizierte Rezidivdivertikulitis Secondary	Results: Risikofaktoren: initialer Abszess (HR 6,2) Steroidmedikation (HR 16,1)	

Trenti, Loris et al. Long-Term Evolution of Acute Colonic Diverticulitis After Successful Medical Treatment. *World Journal of Surgery.* **39.** 266-274. 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 560 Recruiting Phase: <u>1994-2011</u> Inclusion criteria: erfolgreich konservativ therapie akute Divertikulitis (1. Schub) Exclusion criteria: Rezidivdivertikulitis kein CT Operation innerhalb von 2 Monaten nach Index CT	Interventions: Comparison:

<b>Notes:</b>	<b>Author's conclusion:</b> Individuelle Indikationsstellung für elektive Operation nach komplizierter Divertikulitis	
<b>Outcome Measures/results</b>	<b>Primary</b> Rezidivrate  <b>Secondary</b> Risikofaktoren für Rezidive	<b>Results:</b> 125 Pat. mit Abszessen (Durchmesser 37.2 ± 24.3 mm) Rezidiv 22/125 Pat. (17,6%) (12/22 Pat. kompliziertes Rezidiv) Abszess Hauptrisikofaktor für Rezidive (HR 5,3)

van de Wall, B. J. M. et al. Does the Presence of Abscesses in Diverticular Disease Prelude Surgery?. Journal of Gastrointestinal Surgery. 17. 540-547. 2012

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level:</b> 3  <b>Study type:</b> retrospektive Kohortenstudie	<b>Funding sources:</b> <b>Conflict of Interests:</b> <b>Randomization:</b> <b>Blinding:</b> <b>Dropout rates:</b>	<b>Total no. patients:</b> 59/722 Pat. mit Abszess <b>Recruiting Phase:</b> 2005-2011 <b>Inclusion criteria:</b> CT-graphisch nachgewiesene komplizierte akute Divertikulitis mit Abszess <b>Exclusion criteria:</b> Freie Perforation	<b>Interventions:</b>  <b>Comparison:</b>
<b>Notes:</b>	<b>Author's conclusion:</b> Rezidive und Operationen überwiegend kurzfristig nach Indexdivertikulitis		
<b>Outcome Measures/results</b>	<b>Primary</b> Wiederaufnahmerate, Komplikationen, Operationen  <b>Secondary</b>	<b>Results:</b> Abszessgröße <2cm 43,8%, 2-5cm 55,9%, >5cm 23,7% 54/59 (91,5%) erfolgreich konservativ therapiert perkutane Drainage 7/59 (11%) Stationäre Wiederaufnahme 18/54 Pat. (33%) Operative Therapie 22/54 Pat. (40,7%) Rezidive überwiegend im 1 Jahr	



## Schlüsselfrage:

## AG 05 - Frage 09 CDD Typ 2b

Besteht nach erfolgreicher konservativer Initialtherapie einer akuten komplizierten Divertikulitis mit Makroabszess eine Indikation zur elektiven Sigmaresektion?

## Inhalt: 19 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Ambrosetti, P. 2005	3	prospective cohort
Aquina, C. T. 2019	3	Register-basierte retrospektive Kohortenstudie
Brandlhuber, M. 2018	4	Kohortenstudie
Buchwald, P. 2017	4	retrospective cohort
Chautems, R. C. 2002	5	retrospective
Devaraj, Bikash 2016	4	Retrospektive Kohortenstudie
Durmishi, Y. 2006	5	Retrospektive Kohorte
Gaertner, Wolfgang B. 2013	4	Retrospektive Kohortenstudie
Garfinkle, Richard 2016	4	Retrospektive Kohortenstudie
Gregersen, R. 2018	3	Register-basierte retrospektive Kohortenstudie
Ho, V. P. 2015	2	Kohortenstudie
Jalouta, Tarek 2017	4	retrospektive Kohortenstudie
Lamb, M. N. 2014	2	syst. rev.
Li, D. 2014	3	Register-basierte retrospektive Kohortenstudie
Rose, J. 2015	3	Register-basierte retrospektive Kohortenstudie
Trenti, Loris 2014	3	retrospektive Kohortenstudie
van de Wall, B. J. M. 2012	3	retrospektive Kohortenstudie
van de Wall, Bryan J. M. 2017	1	open-label, multicentre, randomised controlled trial
You, K. 2018	2	unizentrische prospektiv randomisierte Studie

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 1 Bewertung(en)

Lamb, M. N. et al. Elective resection versus observation after nonoperative management of complicated diverticulitis with abscess: a systematic review and meta-analysis. *Dis Colon Rectum*. 57. 1430-40. 2014

Evidence level/Study Types P - I - C

Outcomes/Results

Literature References

Evidence Population: Patients who were Primary: need for surgery and recurrent

<p>level: 2</p> <p>Study type: syst. rev.</p> <p>Databases:</p> <p>Search period: <u>1986 - 2014</u></p> <p>Inclusion Criteria: complicated diverticulitis</p> <p>Exclusion Criteria:</p>	<p>successfully managed nonoperatively and determine the role of elective surgical resection.</p> <p>Intervention: operation versus observation</p> <p>Comparison:</p>	<p>attacks without surgery.</p> <p>Secondary:</p> <p>Results: Percutaneous drainage was successful in 49% patients (diameter, &gt;3cm) and antibiotic therapy in 14% patients. Urgent surgery during the index hospitalization was performed in 30% of patients, elective resection in 36%, and no surgery in 35%. Recurrence rates were high, with 39% in patients awaiting elective resection and 18% in the nonsurgery group, with an overall recurrence rate of 28%. Of the whole cohort, only 28% had no surgery and no recurrence during follow-up.</p> <p>Author's Conclusion: The evidence from the literature is weak but still suggests that complicated diverticulitis with abscess formation is associated with a high probability of resective surgery, whereas conservative management may result in chronic or recurrent diverticular symptoms.</p>
<b>Methodical Notes</b>		
<p>Funding Sources:</p> <p>COI:</p> <p>Study Quality:</p> <p>Heterogeneity:</p> <p>Publication Bias:</p> <p>Notes: only small retrospective studies with limited follow-up</p>		

**OXFORD (2011) Appraisal Sheet: RCT: 2 Bewertung(en)**

<p>van de Wall, Bryan J. M. et al. Surgery versus conservative management for recurrent and ongoing left-sided diverticulitis (DIRECT trial): an open-label, multicentre, randomised controlled trial. <i>The Lancet Gastroenterology &amp; Hepatology</i>. 2. 13-22. 2017</p>		
<b>Population</b>	<b>Intervention - Comparison</b>	<b>Outcomes/Results</b>
<p>Evidence level: 1</p> <p>Study type: open-label, multicentre, randomised controlled trial</p> <p>Number of Patient: 109</p> <p>Recruitment Phase:</p> <p>Inclusion Criteria: Patients aged 18–75 years presenting with either recurrent (three or more presentations with clinical signs of acute diverticulitis within 2 years) or persistent abdominal</p>	<p>Intervention: Between July 1, 2010, and April 1, 2014, we randomly assigned 109 patients to receive surgical treatment (resection; n=53) or conservative management (n=56)</p> <p>Comparison:</p>	<p>Primary: Our primary endpoint was health-related quality of life, measured by the Gastrointestinal Quality of Life Index (GIQLI) at 6 months after inclusion or surgery, depending on randomisation group.</p> <p>Secondary: Secondary endpoints included additional quality-of-life assessments using the EuroQol five dimensions questionnaire (EQ-5D), Visual Analogue Score for pain (VAS-pain), and the 36-item Short Form health survey</p>

complaints (ongoing lower left abdominal pain or persistent change in bowel habits for  $\geq 3$  months) after an episode of left-sided diverticulitis, confirmed by CT, ultrasound, or endoscopy, were included.

**Exclusion Criteria:** Patients were excluded if they had previous elective or emergency surgery for acute sigmoid diverticulitis, an absolute operation indication, suspicion of a colorectal malignancy, with a preoperative or postoperative risk greater than III (on the American Society of Anesthesiologists classification), or were unable to complete questionnaire or follow-up.

(SF-36)

**Results:** The GIQLI score at 6 months' follow-up was significantly higher in patients randomly assigned to receive surgical treatment (mean 114.4 [SD 22.3]) than conservative management (100.4 [22.7]; mean difference 14.2, 95% CI 7.2–21.1,  $p < 0.0001$ ). 43 (38%) of 109 patients had a severe adverse event in the first 6 months after treatment (18 [34%] of 53 patients in the surgical treatment group vs 23 [40%] of 57 patients in the conservative treatment group). Seven (15%) patients who received surgical treatment developed anastomotic leakage. Of the 56 patients assigned to be treated conservatively, 13 (23%) ultimately underwent elective resection due to ongoing abdominal complaints, with no anastomotic leakage. We recorded no patient deaths.

**Author's Conclusion:** Elective sigmoidectomy, despite its inherent risk of complications, results in better quality of life than conservative management in patients with recurrent and persisting abdominal complaints after an episode of diverticulitis.

#### Methodical Notes

**Funding Sources:** The funder of the study reviewed the study protocol but had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

**COI:** none

**Randomization:** Patients were randomly assigned (3:3) by an independent data manager using a stratified (by type of complaints [ongoing or recurrent] and by centre) digital en-block randomisation system to receive conservative or surgical management. The block size was six. As the trial is open label, treatment allocation was not masked to patients, physicians, or researchers at any timepoint.

**Blinding:**

**Dropout Rate/ITT-Analysis:** We analysed data according to the intention-to-treat principle. We analysed the difference in quality-of-life outcomes between the two treatment groups using a mixed model with repeated measures over time and included all available data from patients for the first 6 months after randomisation. The variance-covariance matrix was modelled as unstructured. The fixed effects were time after randomisation (categorical), treatment group, a group  $\times$  time interaction, and baseline GIQLI score. We tested the difference in GIQLI scores at 6 months after randomisation using a linear contrast

from this model. If at least 75% of the items were filled in, we calculated a score based on the mean of the completed items.

Notes:

You, K. et al. Randomized clinical trial of elective resection versus observation in diverticulitis with extraluminal air or abscess initially managed conservatively. *Br J Surg.* **105.** 971-979. 2018

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 2</p> <p>Study type: unizentrische prospektiv randomisierte Studie</p> <p>Number of Patient: 107 (OP Arm n=26, Beobachtungsarm n=81)</p> <p>Recruitment Phase: <u>2011-2014</u></p> <p>Inclusion Criteria: Komplizierte akute Divertikulitis mit extraluminärer Luft oder Abszess</p> <p>Exclusion Criteria: Versagen der nicht-operativen Therapie Kolonkarzinom</p>	<p>Intervention: elektive Operation (lap. Sigmaresektion)</p> <p>Comparison: Beobachtung</p>	<p>Primary: 24-Monate Rezidivdivertikulitisrate</p> <p>Secondary: Versagen der nicht-operativen Therapie Mortalität Morbidität Stomarate</p> <p>Results: Redizivdivertikulitis (8% versus 32%; P=0.019) nach 3 Jahren. Alle Rezidive nach Beobachtung erneut kompliziert, aber alle erneut nicht-operativ behandelt.</p> <p>Author's Conclusion: Elektive Operation nicht erforderlich</p>

#### Methodical Notes

Funding Sources: Merck, Medtronic.

COI: kein

Randomization: 1:3

Blinding: kein

Dropout Rate/ITT-Analysis: 0

Notes:

#### NEWCASTLE - OTTAWA Checklist: Case Control: 1 Bewertung(en)

Ambrosetti, P. et al. Long-term outcome of mesocolic and pelvic diverticular abscesses of the left colon: a prospective study of 73 cases. *Dis Colon Rectum.* **48.** 787-91. 2005

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 3</p> <p>Study type: prospective cohort</p>	<p>Funding sources:</p> <p>Conflict of Interests:</p> <p>Randomization:</p>	<p>Total no. patients: 73</p> <p>Patient characteristics: <u>1986-1997</u></p> <p>Inclusion criteria: CT-graphischer Nachweis einer komplizierten akuten Divertikulitis mit Abszessbildung</p>	<p>Interventions: keine</p> <p>Comparison: keine</p>

	Blinding: Dropout rates:	Exclusion criteria: Fehlendes Follow-Up	
Notes:	kleine Fallzahl der Langzeitverläufe Author's conclusion:		
Outcome Measures/results	Primary Art der weiteren Behandlung Secondary	Results: 30 of 73 patients with abscess do not need any operation more emergency operations with pelvic abscesses	

**NEWCASTLE - OTTAWA Checklist: Cohort: 15 Bewertung(en)**

Aquina, C. T. et al. Population-based study of outcomes following an initial acute diverticular abscess. <i>Br J Surg.</i> <b>106.</b> 467-476. 2019			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Register-basierte retrospektive Kohortenstudie	Funding sources: keine Conflict of Interests: keine Randomization: keine Blinding: keine Dropout rates:	Total no. patients: 10.342 Recruiting Phase: <u>2002-2010</u> Inclusion criteria: stationäre Behandlung wegen einer komplizierten akuten Divertikulitis mit Abszess Exclusion criteria: < 2 Jahre Follow-UP	Interventions: elektive Operation innerhalb von 6 Monaten Comparison: konservative Therapie für mindestens 6 Monate
Notes:	Author's conclusion: Niedrige Rezidivrate für diejenigen Patienten, die kein Rezidiv im 1. Jahr aufweisen. Verzicht auf elektive Operation sicher und sinnvoll.		
Outcome Measures/results	Primary Stomarate Divertikulitis-bezogene Krankenhaustage in 5 Jahren Divertikulitis-bezogene Kosten in 5 Jahren Secondary	Results: Perkutane Drainageeinlage bei 21,8% aller Pat. Versagen der nicht-operativen Therapie und dringliche Operation bei 31,6% aller Pat. (mit 4,7% Mortalität). Elektive Operation innerhalb von 6 Monaten bei 16,1% der verbliebenen Patienten. 5-Jahres-Rezidivrisiko der konservativ therapierten Gruppe 24,8% (davon 57% im ersten Jahr), von dieser Gruppe wurden 18,6% im Verlauf operiert. Im Gruppenvergleich signifikant geringere Stomarate, Divertikulitis-bezogene Krankenhaustage in 5 Jahren, und Divertikulitis-bezogene Kosten in 5 Jahren bei der konservativ therapierten Gruppe. Divertikulitis-bezogene Mortalität 1,9% in der konservativen Gruppe.	

Brandlhuber, M. et al. Long-term quality of life after conservative treatment versus surgery for different stages of acute sigmoid diverticulitis. <i>Int J Colorectal Dis.</i> <b>33.</b> 317-326. 2018			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4	Funding sources: Conflict of	Total no. patients: 138 Recruiting Phase: <u>2000-2010</u>	Interventions: elektive Operation



<b>Study type:</b> Kohortenstudie	<b>Interests:</b>  <b>Randomization:</b>  <b>Blinding:</b>  <b>Dropout rates:</b> 53%	<b>Inclusion criteria:</b> erfolgreiche primär konservative Therapie einer akuten Divertikulitis CT bei initialem Schub  <b>Exclusion criteria:</b>	<b>Comparison:</b> langfristig konservative Therapie
<b>Notes:</b>	Author's conclusion: Patienten nach Makroabszess haben nach elektiver Operation eine verbesserte Lebensqualität.		
<b>Outcome Measures/results</b>	<b>Primary</b> Lebensqualität (CGQL, sSF-36, GIQLI)  <b>Secondary</b>	<b>Results:</b> Elektive Operation bei 54/138 Pat. (39%) im Verlauf erfolgt. Patienten mit Abszess (CDD Typ 2b) hatten nach Operation eine bessere Lebensqualität als konservativ behandelte Patienten (GIQLI (89.3±1.4 vs. 69.5±4.5, P <0.01). Bei den übrigen Stadien ergaben sich keine Hinweise auf eine verbesserte Lebensqualität durch eine Operation.	

Buchwald, P. et al. Hinchey I and II diverticular abscesses: long-term outcome of conservative treatment. ANZ J Surg. 87. 1011-1014. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level:</b> 4  <b>Study type:</b> retrospective cohort	<b>Funding sources:</b>  <b>Conflict of Interests:</b>  <b>Randomization:</b>  <b>Blinding:</b>  <b>Dropout rates:</b>	<b>Total no. patients:</b> 115  <b>Recruiting Phase:</b> 1998-2009  <b>Inclusion criteria:</b> all abscesses  <b>Exclusion criteria:</b> postop. abscesses	<b>Interventions:</b> antibiotics, drainage, operation  <b>Comparison:</b>
<b>Notes:</b>	115 patients with abscesses (Hinchey I and II) indication for operation not clear  Author's conclusion: Recurrence after diverticular abscess is higher after initial conservative Treatment (antibiotics +/- percutaneous drainage) compared with surgery		
<b>Outcome Measures/results</b>	<b>Primary</b> Recurrence rate  <b>Secondary</b> abscess size	<b>Results:</b> Recurrence rates: antibiotics alone 30%, percutaneous Drainage + antibiotics 27%, surgery 5% Abscess size: antibiotics alone 3.1 +/- 1.8 cm, percutaneous Drainage + antibiotics 5.6 +/- 2.4 cm, surgery 4.6 +/- 1.6 cm	

Chautems, R. C. et al. Long-term follow-up after first acute episode of sigmoid diverticulitis: is surgery mandatory?: a prospective study of 118 patients. Dis Colon Rectum. 45. 962-6. 2002

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level:</b> 5  <b>Study type:</b> retrospective	<b>Funding sources:</b>  <b>Conflict of Interests:</b>  <b>Randomization:</b>  <b>Blinding:</b>  <b>Dropout rates:</b>	<b>Total no. patients:</b>  <b>Recruiting Phase:</b>  <b>Inclusion criteria:</b> ct  <b>Exclusion criteria:</b>	<b>Interventions:</b>  <b>Comparison:</b>

Notes:	old retrospective data, high drop-out rate	
	Author's conclusion:	
Outcome Measures/results	Primary	Results:
	Secondary	

<b>Devaraj, Bikash et al. Medically Treated Diverticular Abscess Associated With High Risk of Recurrence and Disease Complications. Diseases of the Colon &amp; Rectum. 59. 208-215. 2016</b>			
<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
Evidence level: 4	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 210 Recruiting Phase: <u>2004-2014</u> Inclusion criteria: konservativ behandelte komplizierte akute Divertikulitis (Hinchey Ib-II) Exclusion criteria: keine	Interventions: keine  Comparison:
Study type: Retrospektive Kohortenstudie			
Notes:	Author's conclusion: Patienten nach komplizierter akuter Divertikulitis mit Abszess sollte eine elektive Operation angeboten werden.		
Outcome Measures/results	Primary Risiko einer Rezidivdivertikulitis nach konservativer Therapie Secondary	Results: 60% der Patienten entwickelten im Median nach 5,3 Monaten eine Rezidivdivertikulitis, wobei davon 42% ein höheres Hinchey Stadium beim Rezidiv aufwiesen, als beim 1. Schub. Das Rezidivrisiko bei denjenigen Patienten, die eine perkutane Drainage erhielten mit 74% noch höher.	

<b>Durmishi, Y. et al. Results from percutaneous drainage of Hinchey stage II diverticulitis guided by computed tomography scan. Surg Endosc. 20. 1129-33. 2006</b>			
<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
Evidence level: 5	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 34 Recruiting Phase: <u>1991-2004</u> Inclusion criteria: Komplizierte akute Divertikulitis mit perkutaner Drainageeinlage bei Abszess Exclusion criteria:	Interventions: keine  Comparison: keine
Study type: Retrospektive Kohorte			
Notes:	old data, small cohort, indication for drainage not clear  Author's conclusion: Ein nicht-operatives Management mit CT Drainage ist bei ca. 2/3 der Patienten erfolgreich, sodass auf eine dringliche/Notfalloperation verzichtet werden kann.		
Outcome Measures/results	Primary Versagen der konservativen Therapie mit der Notwendigkeit einer dringlichen Operation Secondary	Results: Die eingelegten Drainagen wurden durchschnittlich 8 Tage (1 bis 18 Tage) belassen. Die primär nicht operative Therapie war bei 23 (67%) der Patienten erfolgreich. Bei den restlichen Patienten kam es zu einem Therapieversagen (Sepsis, Rezidiv Abszess oder Fistelbildung) sodass eine Hartmann Operation im Mittel nach 14 Tagen (1 bis 65 Tage) durchgeführt werden musste. Die postoperative Mortalität betrug 33%.	

Secondary keine

Gaertner, Wolfgang B. et al. Percutaneous Drainage of Colonic Diverticular Abscess. Diseases of the Colon & Rectum. 56. 622-626. 2013

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: Retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 218  Recruiting Phase: <u>2002-2007</u>  Inclusion criteria: CT graphisch nachgewiesen akute komplizierter Divertikulitis mit Abszesses Einlage einer perkutanen Drainage  Exclusion criteria: Kein Nachweis eines Abszesses im CT. Abszess Verdacht ohne CT	Interventions:  Comparison:
Notes:	Author's conclusion: In ausgewählten Einzelfällen kann ohne zusätzliche Risiken auf eine operative Therapie verzichtet werden.		
Outcome Measures/results	Primary Komplikationen Rezidive, Kolektomie-freies Überleben  Secondary	Results: Abszessdurchmesser 4,7 cm (Mittelwert) Versagen der primär operativen Therapie mit Notfalloperation bei 22/218 Patienten (10%). Elektive Operation bei 137/218 Patienten (61%). Restliche Patienten: Follow-up möglich bei 32/59 Patienten. Bei diesen Patienten Rezidivdivertikulitis bei 42% in einem Zeitraum von 7 Jahren. Insgesamt Kolektomie-freies 7-Jahre-Überleben nach erfolgreicher konservativer Primärtherapie 17%.	

Garfinkle, Richard et al. Diverticular Abscess Managed With Long-term Definitive Nonoperative Intent Is Safe. Diseases of the Colon & Rectum. 59. 648-655. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: Retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 135  Recruiting Phase: <u>2000-2013</u>  Inclusion criteria: CT graphisch nachgewiesen akute komplizierter Divertikulitis mit Abszess  Exclusion criteria:	Interventions:  Comparison:
Notes:	Author's conclusion: Nach erfolgreicher initialer konservativer Therapie einer komplizierten Divertikulitis ist bei einem Teil der Patienten ein langfristig nichtoperatives Procedere möglich und sicher.		
Outcome Measures/results	Primary Kolektomie freies Überleben bei erfolgreich konservativ therapiert akuter komplizierter Divertikulitis mit	Results: 31/135 Patienten (23%) mussten bei Versagen der primären konservativen Therapie im gleichen Aufenthalt operiert werden. Im Zeitraum von 60 Tagen nach der Erstaufnahme wurden weitere 24/104 Patienten (23%) wegen persistierender Symptome operiert. Insgesamt konnten 73/135 Patienten (54%) langfristig ohne eine Operation behandelt werden. Von diesen entwickelten 22 Patienten (30%) eine Rezidiv-Divertikulitis nach	

Langzeit nicht-operativer Therapieempfehlung	im Median 23 Monaten (9-40 Monate). 9/73 Patienten wurde im Verlauf operiert.
Secondary	

Gregersen, R. et al. Long-term mortality and recurrence in patients treated for colonic diverticulitis with abscess formation: a nationwide register-based cohort study. *Int J Colorectal Dis.* **33.** 431-440. 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Register-basierte retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 3.148 Recruiting Phase: <u>200-2012</u> Inclusion criteria: Komplizierte akute Divertikulitis mit Abszess (nach mod. Hinchey Ib-II) Exclusion criteria: vorausgegangene stationäre Behandlung wegen Divertikulitis freie Perforation	Interventions: perkutane Drainage und Antibiotikatherapie vs. alleinige Antibiotikatherapie beim Initialen Schub Comparison: Operation im Initialen Schub
Notes:	Author's conclusion: Insgesamt hohe Rezidivrate und hohe Mortalität. Patienten nach Drainageanlage mit deutlich erhöhtem Rezidivrisiko		
Outcome Measures/results	Primary Mortalität Langzeit-Mortalität Secondary Rezidivdivertikulitisrate	Results: 1-Jahr-Überlebensrate 81-83%, 5-Jahres-Überlebensrate 66-67%. Keine Unterschiede im Überleben zwischen den untersuchten Gruppen. Langfristige Rezidivdivertikulitisrate nach Drainage 23,6%, nach antibiotischer Therapie 15,5%, nach Operation 9,1%. >50% der Rezidive im 1. Jahr. Kein signifikanter Unterschied bzgl. der Rezidivbedingten Mortalität.	

Ho, V. P. et al. Identification of diverticulitis patients at high risk for recurrence and poor outcomes. *J Trauma Acute Care Surg.* **78.** 112-9. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2 Study type: Kohortenstudie	Funding sources: Conflict of Interests: no Randomization: no Blinding: no Dropout rates: no	Total no. patients: 237.879 Recruiting Phase: <u>1985 - 2006</u> Inclusion criteria: stationäre Aufnahme wegen akuter Divertikulitis Exclusion criteria:	Interventions: Comparison:
Notes:	grosses Patientenkollektiv, langer Zeitraum		

	<b>Author's conclusion:</b> Individualisiertes Vorgehen zur Indikationsstellung zur elektiven Operation nach Vorhandensein für Risikofaktoren für ein schlechtes Outcome.	
<b>Outcome Measures/results</b>	Primary Secondary	<b>Results:</b> Rezidivhäufigkeit nach 1. Schub insgesamt 8,7%, nach 2. Schub 23,2%, nach 3. Schub 35,8%, nach 4. Schub 41,1% komplizierte Divertikulitis mit Abszess Haupt-Einflussfaktor auf Rezidive (Odds Ratio 1,67) und schlechtes Outcome (Odds Ratio 3,84)

Jalouta, Tarek et al. Diverticulitis recurrence after percutaneous abscess drainage. *International Journal of Colorectal Disease*. 32. 1367-1373. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 165  Recruiting Phase: <u>2001-2012</u>  Inclusion criteria: Komplizierte akute Divertikulitis mit Abszess und konsekutiv perkutaner Drainage  Exclusion criteria:	Interventions:  Comparison:
<b>Notes:</b>	Author's conclusion: Ein Teil der Patienten kann auch nach perkutaner Drainage langfristig ohne Operation behandelt werden.		
<b>Outcome Measures/results</b>	Primary Reizivrisiko bei nicht-operativ behandelten Patienten  Secondary	<b>Results:</b> 47/165 pat. (28%) primäres Therapieversagen und sekundäre Operation. 37/118 Pat. (31%) elektive Operation im Verlauf von 3 Monaten insgesamt 73/165 (44%) ohne Operation nach 1 Jahr, für die Gruppe betrug das 5-Jahres Rezidivfreie-Überleben 77%. Insgesamt 55% Kolektomie-freies Überleben der primär erfolgreich therapierten Patienten.	

Li, D. et al. Risk of readmission and emergency surgery following nonoperative management of colonic diverticulitis: a population-based analysis. *Ann Surg*. 260. 423-30; discussion 430-1. 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: Register-basierte retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 18,543  Recruiting Phase: <u>2002-2012</u>  Inclusion criteria: erstmalige stationäre Aufnahme wegen einer akuten Divertikulitis  Exclusion criteria: ambulante Behandlung Operation < 30 Tage nach stationärer Aufnahme Follow-Up <30 Tage	Interventions:  Comparison:
<b>Notes:</b>	Author's conclusion: Nichtoperatives Management erfolgreich.		
<b>Outcome Measures/results</b>	Primary Rezidivrisiko Notfalloperation im Verlauf	<b>Results:</b> Rezidiv mit stationärer Wiederaufnahme bei komplizierter Divertikulitis 12% (am höchsten nach perkutaner Drainage), Notfalloperation bei komplizierter Divertikulitis 4,3% (70% der Operation im 1 Jahr nach Indexhospitalisation).	

Secondary			
<b>Rose, J. et al. Long-term Outcomes After Initial Presentation of Diverticulitis. Ann Surg. 262. 1046-53. 2015</b>			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: Register-basierte retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 210.268  Recruiting Phase: <u>1995-2009</u>  Inclusion criteria: ungeplante stationäre Aufnahme wegen einer akuten Divertikulitis  Exclusion criteria: Kolonkarzinom Operation < 24 Stunden nach Aufnahme	Interventions:  Comparison:
Notes:	Author's conclusion: Elektive Operation bei komplizierter Divertikulitis empfohlen.		
Outcome Measures/results	Primary Rezidivdivertikulitis (mit erneuter stationärer Aufnahme)  Secondary Mortalität bei Rezidivdivertikulitis	Results: 83,7% ohne Rezidiv über alle Stadien Abszesse erhöhten das Rezidivrisiko (HR 2,02) Mortalität nach elektiver Operation 0,3%, bei Rezidivdivertikulitis 2,52%.	

<b>Trenti, Loris et al. Long-Term Evolution of Acute Colonic Diverticulitis After Successful Medical Treatment. World Journal of Surgery. 39. 266-274. 2014</b>			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 560  Recruiting Phase: <u>1994-2011</u>  Inclusion criteria: erfolgreich konservativ therapie akute Divertikulitis (1. Schub)  Exclusion criteria: Rezidivdivertikulitis kein CT Operation innerhalb von 2 Monaten nach Index CT	Interventions:  Comparison:
Notes:	Author's conclusion: Individuelle Indikationsstellung für elektive Operation nach komplizierter Divertikulitis		
Outcome Measures/results	Primary Rezidivrate  Secondary Risikofaktoren für Rezidive	Results: 125 Pat. mit Abszessen (Durchmesser 37.2 ± 24.3 mm) Rezidiv 22/125 Pat. (17,6%) (12/22 Pat. kompliziertes Rezidiv) Abszess Hauptrisikofaktor für Rezidive (HR 5,3)	

van de Wall, B. J. M. et al. Does the Presence of Abscesses in Diverticular Disease Prelude Surgery?. Journal of Gastrointestinal Surgery. 17. 540-547. 2012

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level: 3</b>  <b>Study type:</b> retrospektive Kohortenstudie	<b>Funding sources:</b>  <b>Conflict of Interests:</b>  <b>Randomization:</b>  <b>Blinding:</b>  <b>Dropout rates:</b>	<b>Total no. patients:</b> 59/722 Pat. mit Abszess  <b>Recruiting Phase:</b> <u>2005-2011</u>  <b>Inclusion criteria:</b> CT-graphisch nachgewiesene komplizierte akute Divertikulitis mit Abszess  <b>Exclusion criteria:</b> Freie Perforation	<b>Interventions:</b>   <b>Comparison:</b>
<b>Notes:</b>	<b>Author's conclusion:</b> Rezidive und Operationen überwiegend kurzfristig nach Indexdivertikulitis		
<b>Outcome Measures/results</b>	<b>Primary</b> Wiederaufnahmerate, Komplikationen, Operationen  <b>Secondary</b>	<b>Results:</b> Abszessgröße <2cm 43,8%, 2-5cm 55,9%, >5cm 23,7% 54/59 (91,5%) erfolgreich konservativ therapiert perkutane Drainage 7/59 (11%) Stationäre Wiederaufnahme 18/54 Pat. (33%) Operative Therapie 22/54 Pat. (40,7%) Rezidive überwiegend im 1 Jahr	



## Schlüsselfrage:

AG 05 - Frage 10 CDD Typ 2b  
Wann ist der geeignete Zeitpunkt für eine elektive Resektion nach akuter komplizierter Divertikulitis?

## Inhalt: 5 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Devaraj, Bikash 2016	4	Retrospektive Kohortenstudie
Gregersen, R. 2018	3	Register-basierte retrospektive Kohortenstudie
Khan, R. M. A. 2017	2	Meta-Analyse
Lamb, M. N. 2014	2	sys. rev.
Li, D. 2014	3	Register-basierte retrospektive Kohortenstudie

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 2 Bewertung(en)

Khan, R. M. A. et al. Early elective versus delayed elective surgery in acute recurrent diverticulitis: A systematic review and meta-analysis. *Int J Surg.* **46.** 92-101. 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2 Study type: Meta-Analyse Databases: MEDLINE, EMBASE, CINAHL, Cochrane Search period: 2017 Inclusion Criteria: RCT oder Kohortenstudie Exclusion Criteria:	Intervention: Frühe elektive Operation nach < 6 Wochen Comparison: Spätere elektive Operation nach > 6 Wochen	Primary: Wundinfektionen (SSI), Anastomoseninsuffizienz, 30-Tages-Mortalität Secondary: Konversion laparoskopisch auf offene Operation, OP Dauer Results: Kein Unterschied bzgl. primärer Endpunkte, allerdings erhöhtes Konversionsrisiko bei früher Operation (Odds Ratio 2,7) und längere Operationsdauer (+12 Minuten) Author's Conclusion: Kein wesentlicher Unterschied der postoperativen Risiken, aber höheren Konserionsrisiko und längere Operation bei frühzeitiger elektiver Resektion	24

## Methodical Notes

Funding Sources: keine

COI: keine

Study Quality: keine randomisierten Studien

Heterogeneity: gering bis mittel

Publication Bias:

Notes:

Lamb, M. N. et al. Elective resection versus observation after nonoperative management of complicated diverticulitis with abscess: a systematic review and meta-analysis. *Dis Colon Rectum.* **57.** 1430-40. 2014

Evidence level/Study	P - I - C	Outcomes/Results	Literature References
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## Types

<p>Evidence level: 2</p> <p>Study type: syst. rev.</p> <p>Databases:</p> <p>Search period: <u>1986 - 2014</u></p> <p>Inclusion Criteria: complicated diverticulitis</p> <p>Exclusion Criteria:</p>	<p>Population: Patients who were successfully managed nonoperatively and determine the role of elective surgical resection.</p> <p>Intervention: operation versus observation</p> <p>Comparison:</p>	<p>Primary: need for surgery and recurrent attacks without surgery.</p> <p>Secondary:</p> <p>Results: Percutaneous drainage was successful in 49% patients (diameter, &gt;3cm) and antibiotic therapy in 14% patients. Urgent surgery during the index hospitalization was performed in 30% of patients, elective resection in 36%, and no surgery in 35%. Recurrence rates were high, with 39% in patients awaiting elective resection and 18% in the nonsurgery group, with an overall recurrence rate of 28%. Of the whole cohort, only 28% had no surgery and no recurrence during follow-up.</p> <p>Author's Conclusion: The evidence from the literature is weak but still suggests that complicated diverticulitis with abscess formation is associated with a high probability of resective surgery, whereas conservative management may result in chronic or recurrent diverticular symptoms.</p>
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## Methodical Notes

## Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

only small retrospective studies with limited follow-up

## NEWCASTLE - OTTAWA Checklist: Cohort: 3 Bewertung(en)

Devaraj, Bikash et al. Medically Treated Diverticular Abscess Associated With High Risk of Recurrence and Disease Complications. *Diseases of the Colon & Rectum*. **59**. 208-215. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 4</p> <p>Study type: Retrospektive Kohortenstudie</p>	<p>Funding sources:</p> <p>Conflict of Interests:</p> <p>Randomization:</p> <p>Blinding:</p> <p>Dropout rates:</p>	<p>Total no. patients: 210</p> <p>Recruiting Phase: <u>2004-2014</u></p> <p>Inclusion criteria: konservativ behandelte komplizierte akute Divertikulitis (Hinchey Ib-II)</p> <p>Exclusion criteria: keine</p>	<p>Interventions: keine</p> <p>Comparison:</p>
Notes:	<p>Author's conclusion: Patienten nach komplizierter akuter Divertikulitis mit Abszess sollte eine elektive Operation angeboten werden.</p>		
Outcome Measures/results	<p>Primary Risiko einer Rezidivdivertikulitis nach konservativer Therapie</p> <p>Secondary</p>	<p>Results: 60% der Patienten entwickelten im Median nach 5,3 Monaten eine Rezidivdivertikulitis, wobei davon 42% ein höheres Hinchey Stadium beim Rezidiv aufwiesen, als beim 1. Schub. Das Rezidivrisiko bei bei denjenigen Patienten, die eine perkutane Drainage erhielten mit 74% noch höher.</p>	

Gregersen, R. et al. Long-term mortality and recurrence in patients treated for colonic diverticulitis with abscess formation: a nationwide register-based cohort study. *Int J Colorectal Dis*. **33**. 431-440. 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions
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Evidence level: 3 Study type: Register-basierte retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 3.148 Recruiting Phase: <u>200-2012</u> Inclusion criteria: Komplizierte akute Divertikulitis mit Abszess (nach mod. Hinchey Ib-II) Exclusion criteria: vorausgegangene stationäre Behandlung wegen Divertikulitis freie Perforation	Interventions: perkutane Drainage und Antibiotikatherapie vs. alleinige Antibiotikatherapie beim Initialen Schub Comparison: Operation im Initialen Schub
Notes:	Author's conclusion: Insgesamt hohe Rezidivrate und hohe Mortalität. Patienten nach Drainageanlage mit deutlich erhöhtem Rezidivrisiko		
Outcome Measures/results	Primary Mortalität Langzeit- Secondary Rezidivdivertikulitisrate	Results: 1-Jahr-Überlebensrate 81-83%, 5-Jahres-Überlebensrate 66-67%. Keine Unterschiede im Überleben zwischen den untersuchten Gruppen. Langfristige Rezidivdivertikulitisrate nach Drainage 23,6%, nach antibiotischer Therapie 15,5%, nach Operation 9,1%. >50% der Rezidive im 1. Jahr. Kein signifikanter Unterschied bzgl. der Rezidivbedingten Mortalität.	

Li, D. et al. Risk of readmission and emergency surgery following nonoperative management of colonic diverticulitis: a population-based analysis. *Ann Surg.* **260.** 423-30; discussion 430-1. 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Register-basierte retrospektive Kohortenstudie	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 18,543 Recruiting Phase: <u>2002-2012</u> Inclusion criteria: erstmalige stationäre Aufnahme wegen einer akuten Divertikulitis Exclusion criteria: ambulante Behandlung Operation < 30 Tage nach stationärer Aufnahme Follow-Up <30 Tage	Interventions: Comparison:
Notes:	Author's conclusion: Nichtoperatives Management erfolgreich.		
Outcome Measures/results	Primary Rezidivrisiko Notfalloperation im Verlauf Secondary	Results: Rezidiv mit stationärer Wiederaufnahme bei komplizierter Divertikulitis 12% (am höchsten nach perkutaner Drainage), Notfalloperation bei komplizierter Divertikulitis 4,3% (70% der Operation im 1 Jahr nach Indexhospitalisation).	

## Schlüsselfrage:

## AG 05 - Frage 11 CDD Typ 2c

Besteht eine generelle Op-Indikation bei freier Perforation? Kann ein primär nicht operatives Verfahren (e.g. interventionelle Drainagenanlage) bei CT-graphisch freier Luft aber ohne klinisch manifeste Peritonitis/ Sepsis indiziert sein?

## Inhalt: 4 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Colas, P. A. 2017	3	multizentrische retrospektive Kohortenstudie
Sallinen, V. J. 2014	3	retrospektive Kohortenstudie
Thorisson, A. 2018	3	retrospektive Kohortenstudie
van Dijk, S. T. 2018	2	Systematischer Review

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 1 Bewertung(en)

van Dijk, S. T. et al. A Systematic Review of Pericolic Extraluminal Air in Left-Sided Acute Colonic Diverticulitis. *Surg Infect (Larchmt)*. 19. 362-368. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2 Study type: Systematischer Review Databases: Medline, Embase Search period: 1980-2017 Inclusion Criteria: Patienten mit extraluminärer Luft Exclusion Criteria:	Population: 251 Patienten aus 8 Studien Intervention: Comparison:	Primary: Erfolg der konservativen Therapie Secondary: Results: Therapieversagen bei 6% (95% CI 3%–12%). Author's Conclusion: Konservativer Therapieversuch bei extraluminärer Luft gerechtfertigt. Antibiotische Therapie erscheint erforderlich.	

## Methodical Notes

## Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

## NEWCASTLE - OTTAWA Checklist: Cohort: 3 Bewertung(en)

Colas, P. A. et al. Failure of Conservative Treatment of Acute Diverticulitis with Extradigestive Air. *World journal of surgery*. 41. 1890-1895. 2017

Evidence level	Methodical Notes	Patient characteristics	Interventions
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Evidence level: 3	Funding sources:	Total no. patients: 91	Interventions:
Study type: multizentrische retrospektive Kohortenstudie	Conflict of Interests: Randomization: Blinding: Dropout rates:	Recruiting Phase: <u>2009-2015</u> Inclusion criteria: perforated diverticulitis without abscess or peritonitis (PDwAP) Exclusion criteria:	Comparison:
Notes:	Author's conclusion: Patienten mit bestimmten radiologischen Zeichen weisen ein erhöhtes Risiko für eine Versagen der konservativen Therapie auf.		
Outcome Measures/results	Primary Versagen der konservativen Therapie  Secondary Risikofaktoren für ein Therapieversagen	Results: Bei 31.9% kam es zu einem Versagen der konservativen Therapie. Risikofaktoren waren Luftperlen >5mm (OR 5.193; p = 0.015) und freie abdominelle Flüssigkeit im Douglas Raum (OR 4.103; p = 0.036).	

Sallinen, V. J. et al. Nonoperative management of perforated diverticulitis with extraluminal air is safe and effective in selected patients. *Dis Colon Rectum*. **57**. 875-81. 2014

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3	Funding sources:	Total no. patients: 132	Interventions:
Study type: retrospektive Kohortenstudie	Conflict of Interests: Randomization: Blinding: Dropout rates:	Recruiting Phase: <u>2006-2010</u> Inclusion criteria: CT-diagnosed acute perforated diverticulitis with extraluminal air and nonoperative treatment Exclusion criteria:	Comparison:
Notes:	Author's conclusion: Nichtoperative Therapie ist bei bestimmten Patienten mit freier Perforation möglich.		
Outcome Measures/results	Primary Versagen der konservativen Therapie  Secondary	Results: 112/132 Patienten wurden erfolgreich konservativ Therapiert. Risikofaktoren für ein Versagen der der konservativen Therapie waren intraperitoneale Luft >1 x 1 cm or 2 cm in einer Dimension 6.5 (1.5–28.0) oder distante retroperitoneale Luft 5.6 (1.3–24.7).	

Thorisson, A. et al. Non-operative management of perforated diverticulitis with extraluminal or free air - a retrospective single center cohort study. *Scand J Gastroenterol*. **53**. 1298-1303. 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3	Funding sources:	Total no. patients: 141	Interventions:
Study type: retrospektive Kohortenstudie	Conflict of Interests: Randomization: Blinding: Dropout rates:	Recruiting Phase: <u>2010-2014</u> Inclusion criteria: extraluminale oder freie Luft Exclusion criteria:	Comparison:
Notes:	Author's conclusion: Nichtoperatives Management erfolgreich bei den meisten Patienten mit extraluminärer Luft.		
Outcome	Primary	Results: 101 von 107 Patienten erfolgreich nicht operativ behandelt. Erhöhtes	

Measures/results	erfolgreiche konservative Therapie Secondary	Risiko des Therapieversagens bei Nachweis eines Abszesses (67% vs. 17%, p=0,013).
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## Schlüsselfrage:

AG 05 - Frage 12 CDD Typ 2c  
Mit welcher Dringlichkeit sollte eine frei perforierte Divertikulitis operiert werden?

## Inhalt: 1 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Mozer, A. B. 2017	3	Register-basierte retrospektive Kohortenstudie

## NEWCASTLE - OTTAWA Checklist: Cohort: 1 Bewertung(en)

Mozer, A. B. et al. Post-operative morbidity, but not mortality, is worsened by operative delay in septic diverticulitis. Int J Colorectal Dis. 32. 193-199. 2017			
Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: Register-basierte retrospektive Kohortenstudie	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 2.119  Recruiting Phase: <u>2005-2012</u>  Inclusion criteria: Notfalloperation bei Divertikulitis  Exclusion criteria:	Interventions:  Comparison:
Notes:	Author's conclusion: Bei Therapieversagen der konservativen Therapie einer akuten Divertikulitis sollte die Operation frühzeitig indiziert werden.		
Outcome Measures/results	Primary Einfluss des Operations Zeitpunkts auf postoperative Morbidität und Mortalität  Secondary	Results: Verzögerte Operation war assoziiert mit Komorbiditäten. In der Multivariaten Analyse war verzögerte Operation (3-7 Tage nach Aufnahme) mit einer erhöhten postop. Morbidität verbunden (Odds ratio 1,8). Kein statistisch signifikanter Effekt auf die Mortalität.	

## Schlüsselfrage:

**AG 05 - Frage 13 CDD Typ 3a**  
 Kann eine symptomatische unkomplizierte Divertikelkrankheit (SUDD) unter bestimmten Umständen auch eine Operationsindikation sein?

## Inhalt: 9 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Andeweg, C. S. 2016	3	Systematic review and meta analysis
Biondo, S. 2012	1	systematic review
Boermeester, M. A. 2016	2	systematic review
Bolkenstein, H. E. 2019	2	RCT
Bolkenstein, H. E. 2019	2	RCT
Comparato, G. 2007	4	Kohortenstudie
Fozard, J. B. 2011	1	syst rev.
Horgan, A. F. 2001	3	retrospektiv
van de Wall, Bryan J. M. 2017	1	open-label, multicentre, randomised controlled trial

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 4 Bewertung(en)

Andeweg, C. S. et al. Patient-reported Outcomes After Conservative or Surgical Management of Recurrent and Chronic Complaints of Diverticulitis: Systematic Review and Meta-analysis. Clin Gastroenterol Hepatol. 14. 183-90. 2016			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 3 Study type: Systematic review and meta analysis Databases: Search period: <u>1990-2014</u> Inclusion Criteria: uncomplicated diverticular disease, conservative or operative treatment	Population: 1858 pat. disease, conservative and surgical treatment Intervention: Comparison:	Primary: QoL, PRO Secondary: Results: Author's Conclusion: better outcome and fewer symptoms after lap surgery	
Methodical Notes			
Funding Sources:			
COI:			

**Study Quality:**

Heterogeneity:

Publication Bias:

**Notes:**

pro.: große Patientenzahl

con: einhomogenes Pat. gut

keine Aussage zum Resektionsausmaß

**Biondo, S. et al. Current status of the treatment of acute colonic diverticulitis: a systematic review. Colorectal Dis. 14. e1-e11. 2012**

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p><b>Evidence level: 1</b></p> <p><b>Study type:</b> systematic review</p> <p><b>Databases:</b> PUBMED, MEDLINE, EMBASE and Google scholar</p> <p><b>Search period:</b> all publications to March 2011</p> <p><b>Inclusion Criteria:</b> all studies dealing with treatment of acute colonic diverticulitis</p> <p><b>Exclusion Criteria:</b></p>	<p><b>Intervention:</b></p> <p><b>Comparison:</b></p>	<p><b>Primary:</b></p> <p><b>Secondary:</b></p> <p><b>Results:</b></p> <p><b>Author's Conclusion:</b> 1 An abdominal CT is the most effective tool for diagnosis and staging of AD, and can also be used for percutaneous drainage of abscesses.            2 In patients without significant comorbidities and an uncomplicated diverticulitis, outpatient treatment can be performed.            3 Conservative treatment can be used for patients with uncomplicated AD, small abscesses or percutaneously drained abscesses.            4 The recommendation of elective surgery after a favourable response to medical treatment should be made on an individual basis. Elective laparoscopic surgery in diverticulitis is appropriate but is technically complex and requires experience in laparoscopic surgery.            5 The PSS scoring system is a specific system for peritonitis of colonic origin that helps to predict mortality and is useful in the decision making process.            6 In cases of perforated diverticulitis, after a careful selection of patients, the technique of choice should be resection with primary anastomosis. However, at present, laparoscopic lavage is being considered as a potentially safe alternative in cases of purulent peritonitis.</p>	

**Methodical Notes****Funding Sources:****COI:****Study Quality:** most retrospective studies and cohorts**Heterogeneity:****Publication Bias:****Notes:**

**Boormeester, M. A. et al. Contemporary Review of Risk-Stratified Management in Acute Uncomplicated and Complicated Diverticulitis. World J Surg. 40. 2537-45. 2016**

Evidence	P - I - C	Outcomes/Results	Literature
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level/Study Types			References
<b>Evidence level: 2</b> <b>Study type: systematic review</b> <b>Databases:</b> <b>Search period:</b> <b>Inclusion Criteria: treatment of acute colonic diverticulitis</b> <b>Exclusion Criteria:</b>	<b>Intervention:</b> <b>Comparison:</b>	<b>Primary:</b> <b>Secondary:</b> <b>Results:</b> <b>Author's Conclusion: A shift in management has occurred towards conservative management in acute uncomplicated disease. Those with uncomplicated acute diverticulitis may be treated without antibiotics. For complicated diverticulitis with purulent peritonitis, the use of peritoneal lavage appears to be non-superior to resection.</b>	
<b>Methodical Notes</b>			
<b>Funding Sources:</b> <b>COI:</b> <b>Study Quality: mostly retrospective series, small patient cohorts</b> <b>Heterogeneity:</b> <b>Publication Bias:</b> <b>Notes:</b>			
<b>Fozard, J. B. et al. ACPGBI position statement on elective resection for diverticulitis. Colorectal Dis. 13 Suppl 3. 1-11. 2011</b>			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<b>Evidence level: 1</b> <b>Study type: syst rev.</b> <b>Databases: only publications in english</b> <b>Search period: -2010</b> <b>Inclusion Criteria:</b> <b>Exclusion Criteria:</b>	<b>Intervention:</b> <b>Comparison:</b>	<b>Primary:</b> <b>Secondary:</b> <b>Results:</b> <b>Author's Conclusion:</b>	
<b>Methodical Notes</b>			
<b>Funding Sources:</b> <b>COI:</b> <b>Study Quality:</b> <b>Heterogeneity:</b> <b>Publication Bias:</b> <b>Notes:</b>			

**OXFORD (2011) Appraisal Sheet: RCT: 3 Bewertung(en)**

**Bolkenstein, H. E. et al. Long-term Outcome of Surgery Versus Conservative Management for Recurrent and Ongoing Complaints After an Episode of Diverticulitis: 5-year Follow-up Results of a Multicenter Randomized Controlled Trial (DIRECT-Trial). Ann Surg. 269. 612-620. 2019**

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 2</p> <p>Study type: RCT</p> <p>Number of Patient: 109 patients were randomized</p> <p>Recruiting Phase: From January 2010 to June 2014</p> <p>Inclusion Criteria:</p> <p>Exclusion Criteria:</p>	<p>Intervention: Conservative vs. operation</p> <p>Comparison:</p>	<p>Primary: Quality of life</p> <p>Secondary:</p> <p>Results: At 5-year follow-up, mean GIQLI score was significantly higher in the operative group [118.2 (SD 21.0)] than the conservative group [108.5 (SD 20.0)] with a mean difference of 9.7 (95% confidence interval 1.7–17.7).</p> <p>Author's Conclusion: Consistent with the short-term results of the DIRECT trial, elective sigmoidectomy resulted in a significantly increased QoL at 5-year follow-up compared with conservative management in patients with recurring diverticulitis and/or ongoing complaints. Surgeons should counsel these patients for elective sigmoidectomy weighing superior QoL, less pain, and lower risk of new recurrences against the complication risk of surgery.</p>

**Methodical Notes****Funding Sources:**

COI: no

Randomization: yes

Blinding: no

Dropout Rate/ITT-Analysis:

Notes:

**Bolkenstein, H. E. et al. Cost-effectiveness analysis of a multicentre randomized clinical trial comparing surgery with conservative management for recurrent and ongoing diverticulitis (DIRECT trial). Br J Surg. 106. 448-457. 2019**

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 2</p> <p>Study type: RCT</p>	<p>Intervention: operation vs. conservative therapy</p>	<p>Primary: Cost effectiveness</p> <p>Secondary:</p> <p>Results: At 1- and 5-year follow-up an incremental effect (QALY difference between groups) of 0.06</p>

Number of Patient:	Comparison:	and 0.43 respectively was found, and an incremental cost (cost difference between groups) of €6957 and €2674 respectively, where surgery was more expensive than conservative treatment. This resulted in an ICER of €123 365 per additional QALY at 1-year follow-up, and €6275 at 5 years. At a threshold of €20 000 per QALY, operative treatment has 0 per cent probability of being cost-effective at 1-year follow-up, but a 95 per cent probability at 5 years.
Recruiting Phase:		
Inclusion Criteria:		Author's Conclusion: At 5-year follow-up, elective sigmoid resection in patients with recurring diverticulitis or persistent complaints was found to be cost-effective.
Exclusion Criteria:		

#### Methodical Notes

##### Funding Sources:

COI:

Randomization:

Blinding:

Dropout Rate/ITT-Analysis:

Notes:

van de Wall, Bryan J. M. et al. Surgery versus conservative management for recurrent and ongoing left-sided diverticulitis (DIRECT trial): an open-label, multicentre, randomised controlled trial. *The Lancet Gastroenterology & Hepatology*. 2. 13-22. 2017

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 1</p> <p>Study type: open-label, multicentre, randomised controlled trial</p> <p>Number of Patient: 109</p> <p>Recruiting Phase:</p> <p>Inclusion Criteria: Patients aged 18–75 years presenting with either recurrent (three or more presentations with clinical signs of acute diverticulitis within 2 years) or persistent abdominal complaints (ongoing lower left abdominal pain or persistent change in bowel habits for ≥3 months) after an episode of left-sided diverticulitis, confirmed by CT, ultrasound, or endoscopy, were included.</p> <p>Exclusion Criteria: Patients were excluded if they had previous elective or emergency surgery for acute sigmoid diverticulitis, an absolute operation indication, suspicion of a colorectal malignancy, with a preoperative or postoperative risk greater than III (on the American Society of Anesthesiologists classification)</p>	<p>Intervention: Between July 1, 2010, and April 1, 2014, we randomly assigned 109 patients to receive surgical treatment (resection; n=53) or conservative management (n=56)</p> <p>Comparison:</p>	<p>Primary: Our primary endpoint was health-related quality of life, measured by the Gastrointestinal Quality of Life Index (GIQLI) at 6 months after inclusion or surgery, depending on randomisation group.</p> <p>Secondary: Secondary endpoints included additional quality-of-life assessments using the EuroQol five dimensions questionnaire (EQ-5D), Visual Analogue Score for pain (VAS-pain), and the 36-item Short Form health survey (SF-36)</p> <p>Results: The GIQLI score at 6 months' follow-up was significantly higher in patients randomly assigned to receive surgical treatment (mean 114.4 [SD 22.3]) than conservative management (100.4 [22.7]; mean difference 14.2, 95% CI 7.2–21.1, p&lt;0.0001). 43 (38%) of 109 patients had a severe adverse event in the first 6 months after treatment (18 [34%] of 53 patients in the surgical treatment group vs 23 [40%] of 57 patients in the conservative treatment group). Seven (15%) patients who received surgical</p>

cation), or were unable to complete questionnaire or follow-up.

treatment developed anastomotic leakage. Of the 56 patients assigned to be treated conservatively, 13 (23%) ultimately underwent elective resection due to ongoing abdominal complaints, with no anastomotic leakage. We recorded no patient deaths.

**Author's Conclusion:** Elective sigmoidectomy, despite its inherent risk of complications, results in better quality of life than conservative management in patients with recurrent and persisting abdominal complaints after an episode of diverticulitis.

#### Methodical Notes

**Funding Sources:** The funder of the study reviewed the study protocol but had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

**COI:** none

**Randomization:** Patients were randomly assigned (3:3) by an independent data manager using a stratified (by type of complaints [ongoing or recurrent] and by centre) digital en-block randomisation system to receive conservative or surgical management. The block size was six. As the trial is open label, treatment allocation was not masked to patients, physicians, or researchers at any timepoint.

**Blinding:**

**Dropout Rate/ITT-Analysis:** We analysed data according to the intention-to-treat principle. We analysed the difference in quality-of-life outcomes between the two treatment groups using a mixed model with repeated measures over time and included all available data from patients for the first 6 months after randomisation. The variance-covariance matrix was modelled as unstructured. The fixed effects were time after randomisation (categorical), treatment group, a group × time interaction, and baseline GIQLI score. We tested the difference in GIQLI scores at 6 months after randomisation using a linear contrast from this model. If at least 75% of the items were filled in, we calculated a score based on the mean of the completed items.

**Notes:**

#### NEWCASTLE - OTTAWA Checklist: Cohort: 2 Bewertung(en)

Comparato, G. et al. Quality of life in uncomplicated symptomatic diverticular disease: is it another good reason for treatment?. *Dig Dis.* 25. 252-9. 2007

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4	Funding sources:	Total no. patients: 58	Interventions:
Study type: Kohortenstudie	Conflict of Interests:	Recruiting Phase: <u>2003 - 2004</u>	Comparison:

	<b>Randomization:</b> no <b>Blinding:</b> no <b>Dropout rates:</b>	<b>Inclusion criteria:</b> <b>Exclusion criteria:</b>	
<b>Notes:</b>	kleine Kohorte, zufällige Medikamentengabe <b>Author's conclusion:</b>		
<b>Outcome Measures/results</b>	<b>Primary</b> <b>Secondary</b>	<b>Results:</b>	

<b>Horgan, A. F. et al. Atypical diverticular disease: surgical results. Dis Colon Rectum. 44. 1315-8. 2001</b>			
<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
<b>Evidence level: 3</b>  <b>Study type: retrospektiv</b>	<b>Funding sources:</b> <b>Conflict of Interests: no</b> <b>Randomization: no</b> <b>Blinding: no</b> <b>Dropout rates: no</b>	<b>Total no. patients: 930</b> <b>Recruiting Phase: 1988 - 1997</b> <b>Inclusion criteria:</b> <b>Exclusion criteria:</b>	<b>Interventions:</b>  <b>Comparison:</b>
<b>Notes:</b>	<b>Author's conclusion:</b>		
<b>Outcome Measures/results</b>	<b>Primary</b> <b>Secondary</b>	<b>Results:</b>	

## Schlüsselfrage:

## AG 05 - Frage 15 CDD Typ 3b

Wie hoch ist das Risiko einer Rezidivdivertikulitis bei Typ 3b? Gibt es Empfehlungen für eine Resektion nach einer bestimmten Anzahl von Entzündungsschüben?

## Inhalt: 12 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Biondo, S. 2012	1	systematic review
Boermeester, M. A. 2016	2	systematic review
Bolkenstein, H. E. 2019	2	RCT
Collins, D. 2008	3	Review
Holmer, C. 2011	4	
Hupfeld, L. 2017	2	syst. rev.
Mueller, M. H. 2005	3	retrospective
Pittet, O. 2009	4	
Ritz, J. P. 2011	3	retrospective
Sallinen, V. 2015	4	
Simianu, V. V. 2016	3	
van de Wall, Bryan J. M. 2017	1	open-label, multicentre, randomised controlled trial

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 5 Bewertung(en)

Biondo, S. et al. Current status of the treatment of acute colonic diverticulitis: a systematic review. Colorectal Dis. 14. e1-e11. 2012			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1  Study type: systematic review Databases: PUBMED, MEDLINE, EMBASE and Google scholar  Search period: all publications to March 2011  Inclusion Criteria: all studies dealing with treatment of acute colonic	Intervention:  Comparison:	Primary:  Secondary:  Results:  Author's Conclusion: 1 An abdominal CT is the most effective tool for diagnosis and staging of AD, and can also be used for percutaneous drainage of abscesses. 2 In patients without significant comorbidities and an uncomplicated diverticulitis, outpatient treatment can be performed. 3 Conservative treatment can be used for patients with uncomplicated AD, small abscesses or percutaneously drained abscesses. 4 The recommendation of elective surgery after a favourable response to medical treatment should be	

<b>diverticulitis</b>		<p>made on an individual basis. Elective laparoscopic surgery in diverticulitis is appropriate but is technically complex and requires experience in laparoscopic surgery.</p> <p>5 The PSS scoring system is a specific system for peritonitis of colonic origin that helps to predict mortality and is useful in the decision making process.</p> <p>6 In cases of perforated diverticulitis, after a careful selection of patients, the technique of choice should be resection with primary anastomosis. However, at present, laparoscopic lavage is being considered as a potentially safe alternative in cases of purulent peritonitis.</p>
<b>Exclusion Criteria:</b>		

**Methodical Notes****Funding Sources:****COI:**

**Study Quality:** most retrospective studies and cohorts

**Heterogeneity:****Publication Bias:****Notes:**

**Boermeester, M. A. et al. Contemporary Review of Risk-Stratified Management in Acute Uncomplicated and Complicated Diverticulitis. World J Surg. 40. 2537-45. 2016**

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p><b>Evidence level:</b> 2</p> <p><b>Study type:</b> systematic review</p> <p><b>Databases:</b></p> <p><b>Search period:</b></p> <p><b>Inclusion Criteria:</b> treatment of acute colonic diverticulitis</p> <p><b>Exclusion Criteria:</b></p>	<p><b>Intervention:</b></p> <p><b>Comparison:</b></p>	<p><b>Primary:</b></p> <p><b>Secondary:</b></p> <p><b>Results:</b></p> <p><b>Author's Conclusion:</b> A shift in management has occurred towards conservative management in acute uncomplicated disease. Those with uncomplicated acute diverticulitis may be treated without antibiotics. For complicated diverticulitis with purulent peritonitis, the use of peritoneal lavage appears to be non-superior to resection.</p>	

**Methodical Notes****Funding Sources:****COI:**

**Study Quality:** mostly retrospective series, small patient cohorts

**Heterogeneity:****Publication Bias:**

Notes:

Collins, D. et al. Elective resection for diverticular disease: an evidence-based review. *World J Surg.* **32.** 2429-33. 2008

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 3 Study type: Review Databases: Search period: <u>1967 - 2007</u> Inclusion Criteria: acute diverticulitis, recurrent diverticulitis, diverticular disease, and elective resection AND diverticulitis in PUBMED and Medline database Exclusion Criteria:	Intervention: Comparison:	Primary: Secondary: Results: Author's Conclusion:	

## Methodical Notes

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Zusammengetragene Daten aus Leitlinien + neuere Literatur mit deren zusätzlicher Bewertung (Zeitraum 2006 - 2008)

keine Meta-Analyse

kein Systematik Review

Hupfeld, L. et al. Risk factors for recurrence after acute colonic diverticulitis: a systematic review. *Int J Colorectal Dis.* **32.** 611-622. 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2 Study type: syst. rev. Databases: Search period: Inclusion Criteria: Exclusion Criteria:	Intervention: Comparison:	Primary: risk of recurrence Secondary: Results: higher risk of recurrence after abscess Author's Conclusion: In conclusion, the risk of experiencing a recurrent episode of acute diverticulitis increased significantly after a primary episode with abscess formation. Further predisposing factors for recurrence were young age at debut and previous recurrences. Recurrence risk was highest within the first year after remission and recurrence risk increased gradually with more recurrent episodes.	

## Methodical Notes



**Funding Sources:**

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

35 studies included, mostly retrospective studies, small patient numbers per study

Sallinen, V. et al. Assessment of risk for recurrent diverticulitis: a proposal of risk score for complicated recurrence. *Medicine (Baltimore)*. 94. e557. 2015

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 4  Study type: Databases:  Search period:  Inclusion Criteria:  Exclusion Criteria:	Intervention:  Comparison:	Primary:  Secondary:  Results:  Author's Conclusion:	

**Methodical Notes**

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

SC retrospective

**OXFORD (2011) Appraisal Sheet: RCT: 2 Bewertung(en)**

Bolkenstein, H. E. et al. Long-term Outcome of Surgery Versus Conservative Management for Recurrent and Ongoing Complaints After an Episode of Diverticulitis: 5-year Follow-up Results of a Multicenter Randomized Controlled Trial (DIRECT-Trial). *Ann Surg*. 269. 612-620. 2019

Population	Intervention - Comparison	Outcomes/Results
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Evidence level: 2  Study type: RCT  Number of Patient: 109 patients	Intervention: Conservative vs. operation  Comparison:	Primary: Quality of life  Secondary:  Results: At 5-year follow-up, mean GIQLI score was significantly higher in the operative group [118.2 (SD 21.0)] than the conservative group [108.5 (SD 20.0)] with a mean difference of 9.7 (95% confidence interval 1.7–17.7).  Author's Conclusion: Consistent with the short-term results of the DIRECT trial, elective sigmoidectomy resulted in a significantly increased QoL at 5-
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were randomized	year follow-up compared with conservative management in patients with recurring diverticulitis and/or ongoing complaints. Surgeons should counsel these patients for elective sigmoidectomy weighing superior QoL, less pain, and lower risk of new recurrences against the complication risk of surgery.
Recruiting Phase: From January 2010 to June 2014	
Inclusion Criteria:	
Exclusion Criteria:	

#### Methodical Notes

##### Funding Sources:

COI: no

Randomization: yes

Blinding: no

Dropout Rate/ITT-Analysis:

Notes:

van de Wall, Bryan J. M. et al. Surgery versus conservative management for recurrent and ongoing left-sided diverticulitis (DIRECT trial): an open-label, multicentre, randomised controlled trial. *The Lancet Gastroenterology & Hepatology*. 2. 13-22. 2017

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 1</p> <p>Study type: open-label, multicentre, randomised controlled trial</p> <p>Number of Patient: 109</p> <p>Recruiting Phase:</p> <p>Inclusion Criteria: Patients aged 18–75 years presenting with either recurrent (three or more presentations with clinical signs of acute diverticulitis within 2 years) or persistent abdominal complaints (ongoing lower left abdominal pain or persistent change in bowel habits for ≥3 months) after an episode of left-sided diverticulitis, confirmed by CT, ultrasound, or endoscopy, were included.</p> <p>Exclusion Criteria: Patients were excluded if they had previous elective or emergency surgery for acute sigmoid diverticulitis, an absolute operation indication, suspicion of a colorectal malignancy, with a</p>	<p>Intervention: Between July 1, 2010, and April 1, 2014, we randomly assigned 109 patients to receive surgical treatment (resection; n=53) or conservative management (n=56)</p> <p>Comparison:</p>	<p>Primary: Our primary endpoint was health-related quality of life, measured by the Gastrointestinal Quality of Life Index (GIQLI) at 6 months after inclusion or surgery, depending on randomisation group.</p> <p>Secondary: Secondary endpoints included additional quality-of-life assessments using the EuroQol five dimensions questionnaire (EQ-5D), Visual Analogue Score for pain (VAS-pain), and the 36-item Short Form health survey (SF-36)</p> <p>Results: The GIQLI score at 6 months' follow-up was significantly higher in patients randomly assigned to receive surgical treatment (mean 114.4 [SD 22.3]) than conservative management (100.4 [22.7]; mean difference 14.2, 95% CI 7.2–21.1, p&lt;0.0001). 43 (38%) of 109 patients had a severe adverse event in the first 6 months after treatment (18 [34%] of 53 patients in the surgical treatment</p>

preoperative or postoperative risk greater than III (on the American Society of Anesthesiologists classification), or were unable to complete questionnaire or follow-up.

group vs 23 [40%] of 57 patients in the conservative treatment group). Seven (15%) patients who received surgical treatment developed anastomotic leakage. Of the 56 patients assigned to be treated conservatively, 13 (23%) ultimately underwent elective resection due to ongoing abdominal complaints, with no anastomotic leakage. We recorded no patient deaths.

**Author's Conclusion:** Elective sigmoidectomy, despite its inherent risk of complications, results in better quality of life than conservative management in patients with recurrent and persisting abdominal complaints after an episode of diverticulitis.

**Methodical Notes**

**Funding Sources:** The funder of the study reviewed the study protocol but had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

**COI:** none

**Randomization:** Patients were randomly assigned (3:3) by an independent data manager using a stratified (by type of complaints [ongoing or recurrent] and by centre) digital en-block randomisation system to receive conservative or surgical management. The block size was six. As the trial is open label, treatment allocation was not masked to patients, physicians, or researchers at any timepoint.

**Blinding:**

**Dropout Rate/ITT-Analysis:** We analysed data according to the intention-to-treat principle. We analysed the difference in quality-of-life outcomes between the two treatment groups using a mixed model with repeated measures over time and included all available data from patients for the first 6 months after randomisation. The variance-covariance matrix was modelled as unstructured. The fixed effects were time after randomisation (categorical), treatment group, a group × time interaction, and baseline GIQLI score. We tested the difference in GIQLI scores at 6 months after randomisation using a linear contrast from this model. If at least 75% of the items were filled in, we calculated a score based on the mean of the completed items.

**Notes:**

**NEWCASTLE - OTTAWA Checklist: Cohort: 5 Bewertung(en)**

Holmer, C. et al. Long-term outcome after conservative and surgical treatment of acute sigmoid diverticulitis. *Langenbecks Arch Surg.* 396. 825-32. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions

Evidence level: 4	Funding sources:	Total no. patients:	Interventions:
Study type:	Conflict of Interests:	Recruiting Phase:	Comparison:
	Randomization:	Inclusion criteria:	
	Blinding:	Exclusion criteria:	
	Dropout rates:		
Notes:	Langes follow up - Daten aber telefonisch erhoben		
	Author's conclusion:		
Outcome Measures/results	Primary	Results:	
	Secondary		

**Mueller, M. H. et al. Long-term outcome of conservative treatment in patients with diverticulitis of the sigmoid colon. Eur J Gastroenterol Hepatol. 17. 649-54. 2005**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3	Funding sources:	Total no. patients: 252	Interventions:
Study type: retrospective	Conflict of Interests: no	Recruiting Phase:	Comparison:
	Randomization: no	Inclusion criteria:	
	Blinding: no	Exclusion criteria:	
	Dropout rates:		
Notes:	Author's conclusion:		
Outcome Measures/results	Primary	Results:	
	Secondary		

**Pittet, O. et al. Recurrent left colonic diverticulitis episodes: more severe than the initial diverticulitis?. World J Surg. 33. 547-52. 2009**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4	Funding sources:	Total no. patients:	Interventions:
Study type:	Conflict of Interests:	Recruiting Phase:	Comparison:
	Randomization:	Inclusion criteria:	
	Blinding:	Exclusion criteria:	
	Dropout rates:		
Notes:	SC retrospektive Kohorte		
	Author's conclusion:		
Outcome Measures/results	Primary	Results:	
	Secondary		

**Ritz, J. P. et al. Outcome of patients with acute sigmoid diverticulitis: multivariate analysis of risk factors for free perforation. Surgery. 149. 606-13. 2011**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospective	Funding sources: Conflict of Interests: no Randomization: no Blinding: no Dropout rates: no	Total no. patients: 934 Recruiting Phase: Inclusion criteria: Exclusion criteria:	Interventions:  Comparison:
Notes:	SC, retrospektive Analyse; aber hohe Datenkonsistenz Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

Simianu, V. V. et al. Number of Diverticulitis Episodes Before Resection and Factors Associated With Earlier Interventions. *JAMA Surg.* 151. 604-10. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type:	Funding sources: Conflict of Interests: Randomization: no Blinding: no Dropout rates:	Total no. patients: 87.000 Recruiting Phase: <u>2014 - 2015</u> Inclusion criteria: Exclusion criteria:	Interventions:  Comparison:
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

## Schlüsselfrage:

## AG 05 - Frage 16 CDD Typ 3b

Verbessert eine Sigmaresektion die Lebensqualität bei einer chronisch rezidivierenden Divertikulitis Typ 3b? Welche Faktoren sprechen für/gegen eine Sigmaresektion bei Typ 3b? Gibt es prädiktive Faktoren für ein gutes postoperatives Ergebnis?

## Inhalt: 8 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Andeweg, C. S. 2016	3	Systematic review and meta analysis
Biondo, S. 2012	1	systematic review
Bolkenstein, H. E. 2019	2	RCT
Bolkenstein, H. E. 2019	2	RCT
Comparato, G. 2007	4	Kohortenstudie
Fozard, J. B. 2011	1	syst rev.
Ritz, J. P. 2011	3	retrospective
van de Wall, Bryan J. M. 2017	1	open-label, multicentre, randomised controlled trial

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 3 Bewertung(en)

Andeweg, C. S. et al. Patient-reported Outcomes After Conservative or Surgical Management of Recurrent and Chronic Complaints of Diverticulitis: Systematic Review and Meta-analysis. Clin Gastroenterol Hepatol. 14. 183-90. 2016

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 3 Study type: Systematic review and meta analysis Databases: Search period: <u>1990-2014</u> Inclusion Criteria: uncomplicated diverticular disease, conservative or operative treatment Exclusion Criteria:	Population: 1858 pat. Diverticular disease, conservative and surgical treatment Intervention: Comparison:	Primary: QoL, PRO Secondary: Results: Author's Conclusion: better outcome and fewer symptoms after lap surgery	

## Methodical Notes

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

pro.: große Patientenzahl

con: einhomogenes Pat. gut

keine Aussage zum Resektionsausmaß

**Biondo, S. et al. Current status of the treatment of acute colonic diverticulitis: a systematic review. Colorectal Dis. 14. e1-e11. 2012**

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: systematic review</p> <p>Databases: PUBMED, MEDLINE, EMBASE and Google scholar</p> <p>Search period: all publications to March 2011</p> <p>Inclusion Criteria: all studies dealing with treatment of acute colonic diverticulitis</p> <p>Exclusion Criteria:</p>	<p>Intervention:</p> <p>Comparison:</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results:</p> <p>Author's Conclusion: 1 An abdominal CT is the most effective tool for diagnosis and staging of AD, and can also be used for percutaneous drainage of abscesses.                      2 In patients without significant comorbidities and an uncomplicated diverticulitis, outpatient treatment can be performed.                      3 Conservative treatment can be used for patients with uncomplicated AD, small abscesses or percutaneously drained abscesses.                      4 The recommendation of elective surgery after a favourable response to medical treatment should be made on an individual basis. Elective laparoscopic surgery in diverticulitis is appropriate but is technically complex and requires experience in laparoscopic surgery.                      5 The PSS scoring system is a specific system for peritonitis of colonic origin that helps to predict mortality and is useful in the decision making process.                      6 In cases of perforated diverticulitis, after a careful selection of patients, the technique of choice should be resection with primary anastomosis. However, at present, laparoscopic lavage is being considered as a potentially safe alternative in cases of purulent peritonitis.</p>	

**Methodical Notes**

Funding Sources:

COI:

Study Quality: most retrospective studies and cohorts

Heterogeneity:

Publication Bias:

Notes:

**Fozard, J. B. et al. ACPGBI position statement on elective resection for diverticulitis. Colorectal Dis. 13 Suppl 3. 1-11. 2011**

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References

Evidence level: 1	Intervention:	Primary:	
Study type: syst rev. Databases: only publications in english	Comparison:	Secondary:	
Search period: -2010		Results:	
Inclusion Criteria:		Author's Conclusion:	
Exclusion Criteria:			
<b>Methodical Notes</b>			
Funding Sources:			
COI:			
Study Quality:			
Heterogeneity:			
Publication Bias:			
Notes:			

**OXFORD (2011) Appraisal Sheet: RCT: 3 Bewertung(en)**

<p><b>Bolkenstein, H. E. et al. Long-term Outcome of Surgery Versus Conservative Management for Recurrent and Ongoing Complaints After an Episode of Diverticulitis: 5-year Follow-up Results of a Multicenter Randomized Controlled Trial (DIRECT-Trial). Ann Surg. 269. 612-620. 2019</b></p>		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 2	Intervention: Conservative vs. operation	Primary: Quality of life
Study type: RCT	Comparison:	Secondary:
Number of Patient: 109 patients were randomized		Results: At 5-year follow-up, mean GIQLI score was significantly higher in the operative group [118.2 (SD 21.0)] than the conservative group [108.5 (SD 20.0)] with a mean difference of 9.7 (95% confidence interval 1.7–17.7).
Recruiting Phase: From January 2010 to June 2014		Author's Conclusion: Consistent with the short-term results of the DIRECT trial, elective sigmoidectomy resulted in a significantly increased QoL at 5-year follow-up compared with conservative management in patients with recurring diverticulitis and/or ongoing complaints. Surgeons should counsel these patients for elective sigmoidectomy weighing superior QoL, less pain, and lower risk of new recurrences against the complication risk of surgery.
Inclusion Criteria:		
Exclusion Criteria:		
<b>Methodical Notes</b>		
Funding Sources:		
COI: no		



Randomization: yes

Blinding: no

Dropout Rate/ITT-Analysis:

Notes:

**Bolkenstein, H. E. et al. Cost-effectiveness analysis of a multicentre randomized clinical trial comparing surgery with conservative management for recurrent and ongoing diverticulitis (DIRECT trial). Br J Surg. 106. 448-457. 2019**

Population	Intervention - Comparison	Outcomes/Results
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Evidence level: 2	Intervention: operation vs. conservative therapy	Primary: Cost effectiveness Secondary:
Study type: RCT	Comparison:	Results: At 1- and 5-year follow-up an incremental effect (QALY difference between groups) of 0.06 and 0.43 respectively was found, and an incremental cost (cost difference between groups) of €6957 and €2674 respectively, where surgery was more expensive than conservative treatment. This resulted in an ICER of €123 365 per additional QALY at 1-year follow-up, and €6275 at 5 years. At a threshold of €20 000 per QALY, operative treatment has 0 per cent probability of being cost-effective at 1-year follow-up, but a 95 per cent probability at 5 years.
Number of Patient:		
Recruiting Phase:		
Inclusion Criteria:		Author's Conclusion: At 5-year follow-up, elective sigmoid resection in patients with recurring diverticulitis or persistent complaints was found to be cost-effective.
Exclusion Criteria:		

#### Methodical Notes

Funding Sources:

COI:

Randomization:

Blinding:

Dropout Rate/ITT-Analysis:

Notes:

**van de Wall, Bryan J. M. et al. Surgery versus conservative management for recurrent and ongoing left-sided diverticulitis (DIRECT trial): an open-label, multicentre, randomised controlled trial. The Lancet Gastroenterology & Hepatology. 2. 13-22. 2017**

Population	Intervention - Comparison	Outcomes/Results
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Evidence level: 1	Intervention: Between July 1, 2010, and April 1, 2014, we randomly assigned 109 patients to receive surgical treatment (resection; n=53) or conservative management (n=56)	Primary: Our primary endpoint was health-related quality of life, measured by the Gastrointestinal Quality of Life Index (GIQLI) at 6 months after inclusion or surgery, depending on randomisation group.
Study type: multicentre, controlled trial	Comparison:	Secondary: Secondary endpoints included additional quality-of-life assessments using the EuroQol fi
Number of Patient: 109		
Recruiting Phase:		
Inclusion Criteria: Patients aged		

18–75 years presenting with either recurrent (three or more presentations with clinical signs of acute diverticulitis within 2 years) or persistent abdominal complaints (ongoing lower left abdominal pain or persistent change in bowel habits for  $\geq 3$  months) after an episode of left-sided diverticulitis, confirmed by CT, ultrasound, or endoscopy, were included.

**Exclusion Criteria:** Patients were excluded if they had previous elective or emergency surgery for acute sigmoid diverticulitis, an absolute operation indication, suspicion of a colorectal malignancy, with a preoperative or postoperative risk greater than III (on the American Society of Anesthesiologists classification), or were unable to complete questionnaire or follow-up.

ve dimensions questionnaire (EQ-5D), Visual Analogue Score for pain (VAS-pain), and the 36-item Short Form health survey (SF-36)

**Results:** The GIQLI score at 6 months' follow-up was significantly higher in patients randomly assigned to receive surgical treatment (mean 114.4 [SD 22.3]) than conservative management (100.4 [22.7]; mean difference 14.2, 95% CI 7.2–21.1,  $p < 0.0001$ ). 43 (38%) of 109 patients had a severe adverse event in the first 6 months after treatment (18 [34%] of 53 patients in the surgical treatment group vs 23 [40%] of 57 patients in the conservative treatment group). Seven (15%) patients who received surgical treatment developed anastomotic leakage. Of the 56 patients assigned to be treated conservatively, 13 (23%) ultimately underwent elective resection due to ongoing abdominal complaints, with no anastomotic leakage. We recorded no patient deaths.

**Author's Conclusion:** Elective sigmoidectomy, despite its inherent risk of complications, results in better quality of life than conservative management in patients with recurrent and persisting abdominal complaints after an episode of diverticulitis.

#### Methodical Notes

**Funding Sources:** The funder of the study reviewed the study protocol but had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

**COI:** none

**Randomization:** Patients were randomly assigned (3:3) by an independent data manager using a stratified (by type of complaints [ongoing or recurrent] and by centre) digital en-block randomisation system to receive conservative or surgical management. The block size was six. As the trial is open label, treatment allocation was not masked to patients, physicians, or researchers at any timepoint.

**Blinding:**

**Dropout Rate/ITT-Analysis:** We analysed data according to the intention-to-treat principle. We analysed the difference in quality-of-life outcomes between the two treatment groups using a mixed model with repeated measures over time and included all available data from patients for the first 6 months after randomisation. The variance-covariance

matrix was modelled as unstructured. The fixed effects were time after randomisation (categorical), treatment group, a group × time interaction, and baseline GIQLI score. We tested the difference in GIQLI scores at 6 months after randomisation using a linear contrast from this model. If at least 75% of the items were filled in, we calculated a score based on the mean of the completed items.

Notes:

#### NEWCASTLE - OTTAWA Checklist: Cohort: 2 Bewertung(en)

Comparato, G. et al. Quality of life in uncomplicated symptomatic diverticular disease: is it another good reason for treatment?. *Dig Dis.* **25.** 252-9. 2007

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Kohortenstudie	Funding sources: Conflict of Interests: Randomization: no Blinding: no Dropout rates:	Total no. patients: 58 Recruiting Phase: <u>2003 - 2004</u> Inclusion criteria: Exclusion criteria:	Interventions:  Comparison:
Notes:	kleine Kohorte, zufällige Medikamentengabe Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

Ritz, J. P. et al. Outcome of patients with acute sigmoid diverticulitis: multivariate analysis of risk factors for free perforation. *Surgery.* **149.** 606-13. 2011

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospective	Funding sources: Conflict of Interests: no Randomization: no Blinding: no Dropout rates: no	Total no. patients: 934 Recruiting Phase: Inclusion criteria: Exclusion criteria:	Interventions:  Comparison:
Notes:	SC, retrospektive Analyse; aber hohe Datenkonsistenz Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

## Schlüsselfrage:

AG 05 - Frage 17 CDD Typ 3b  
Gibt es prädiktive Faktoren für einen komplikativen postoperativen Verlauf?

## Inhalt: 7 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Al-Khamis, A. 2016	3	Retrospektive Analyse großer Datenbank
Bhakta, A. 2016	3	cohort study
Biondo, S. 2012	1	systematic review
Ho, V. P. 2015	2	Kohortenstudie
Hoffmann, H. 2012	3	retrospektive Studie
Khan, R. M. A. 2017	2	Meta-Analyse
Martinolich, J. 2019	4	retrospektiv

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 2 Bewertung(en)

Biondo, S. et al. Current status of the treatment of acute colonic diverticulitis: a systematic review. *Colorectal Dis.* 14. e1-e11. 2012

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
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<p>Evidence level: 1</p> <p>Study type: systematic review Databases: PUBMED, MEDLINE, EMBASE and Google scholar</p> <p>Search period: all publications to March 2011</p> <p>Inclusion Criteria: all studies dealing with treatment of acute colonic diverticulitis</p> <p>Exclusion Criteria:</p>	<p>Intervention:</p> <p>Comparison:</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results:</p> <p>Author's Conclusion: 1 An abdominal CT is the most effective tool for diagnosis and staging of AD, and can also be used for percutaneous drainage of abscesses. 2 In patients without significant comorbidities and an uncomplicated diverticulitis, outpatient treatment can be performed. 3 Conservative treatment can be used for patients with uncomplicated AD, small abscesses or percutaneously drained abscesses. 4 The recommendation of elective surgery after a favourable response to medical treatment should be made on an individual basis. Elective laparoscopic surgery in diverticulitis is appropriate but is technically complex and requires experience in laparoscopic surgery. 5 The PSS scoring system is a specific system for peritonitis of colonic origin that helps to predict mortality and is useful in the decision making process. 6 In cases of perforated diverticulitis, after a careful selection of patients, the technique of choice should be resection with primary anastomosis. However, at present, laparoscopic lavage is being considered as a potentially safe alternative in cases of purulent peritonitis.</p>	
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## Methodical Notes

## Funding Sources:

COI:

Study Quality: most retrospective studies and cohorts

Heterogeneity:

Publication Bias:

Notes:

Khan, R. M. A. et al. Early elective versus delayed elective surgery in acute recurrent diverticulitis: A systematic review and meta-analysis. *Int J Surg.* **46.** 92-101. 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2 Study type: Meta-Analyse Databases: MEDLINE, EMBASE, CINAHL, Cochrane Search period: 2017 Inclusion Criteria: RCT oder Kohortenstudie Exclusion Criteria:	Intervention: Frühe elektive Operation nach < 6 Wochen Comparison: Spätere elektive Operation nach > 6 Wochen	Primary: Wundinfektionen (SSI), Anastomoseninsuffizienz, 30-Tages-Mortalität Secondary: Konversion laparoskopisch auf offene Operation, OP Dauer Results: Kein Unterschied bzgl. primärer Endpunkte, allerdings erhöhtes Konversionsrisiko bei früher Operation (Odds Ratio 2,7) und längere Operationsdauer (+12 Minuten) Author's Conclusion: Kein wesentlicher Unterschied der postoperativen Risiken, aber höheres Konversionsrisiko und längere Operation bei frühzeitiger elektiver Resektion	24

## Methodical Notes

Funding Sources: keine

COI: keine

Study Quality: keine randomisierten Studien

Heterogeneity: gering bis mittel

Publication Bias:

Notes:

## NEWCASTLE - OTTAWA Checklist: Cohort: 5 Bewertung(en)

Al-Khamis, A. et al. Sigmoid Colectomy for Acute Diverticulitis in Immunosuppressed vs Immunocompetent Patients: Outcomes From the ACS-NSQIP Database. *Dis Colon Rectum.* **59.** 101-9. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Retrospektive Analyse großer Datenbank	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 26,987 Recruiting Phase: <u>2005-2012</u> (Analysezeitraum) Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

**Bhakta, A. et al. Laparoscopic sigmoid colectomy for complicated diverticulitis is safe: review of 576 consecutive colectomies. Surg Endosc. 30. 1629-34. 2016**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: cohort study	Funding sources: Conflict of Interests: Randomization: no Blinding: no Dropout rates:	Total no. patients: 139 Recruiting Phase: December 2001 and May 2013 Inclusion criteria: all patients with diverticulitis requiring elective operation were offered laparoscopic sigmoid colectomy as the initial approach Exclusion criteria: no exclusion criteria	Interventions: Our operative technique entailed selective takedown of the splenic flexure, mandatory identification of the left ureter, exteriorization through a 4-cm infraumbilical mid-line incision, intracorporeal end-to-end anastomosis, followed by a pneumatic air leak test. Comparison: simple diverticulitis vs. complicated diverticulitis
Notes:	komplizierte Divertikulitis mit komplikativerem Verlauf als simple Divertikulitis Keine Aussage zum Resektionsausmaß, niedrige Konversionsrate Author's conclusion:		
Outcome Measures/results	Primary Postoperative variables evaluated included time to ROBF, HLOS, morbidity, and mortality. ROBF was defined as the postoperative day when patients were able to tolerate a diet or reported passage of flatus Secondary Post-operative morbidity included superficial surgical site infection (SSI), deep incisional SSI, organ space SSI, anastomotic leak, incisional hernia, Clostridium difficile infection, and ileus.	Results: With regard to anastomotic integrity, the leak rates for overall,SD,andCDwere2.1 %(n = 12),2.3 %(n = 10), and 1.4 %(n = 2), respectively	

**Ho, V. P. et al. Identification of diverticulitis patients at high risk for recurrence and poor outcomes. J Trauma Acute Care Surg. 78. 112-9. 2015**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2 Study type: Kohortenstudie	Funding sources: Conflict of Interests: no Randomization: no Blinding: no Dropout rates: no	Total no. patients: 237.879 Recruiting Phase: 1985 - 2006 Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Notes:	grosses Patientenkollektiv, langer Zeitraum Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

**Hoffmann, H. et al. Surgical treatment of acute recurrent diverticulitis: early elective or late elective surgery. An analysis of 237 patients. World J Surg. 36. 898-907. 2012**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospektive Studie	Funding sources: Conflict of Interests: no	Total no. patients: 237 Recruiting Phase: 2005 - 2009	Interventions: Comparison:

	<b>Randomization: no</b> <b>Blinding: no</b> <b>Dropout rates:</b>	<b>Inclusion criteria:</b> <b>Exclusion criteria:</b>	
<b>Notes:</b>	<b>Author's conclusion:</b>		
<b>Outcome Measures/results</b>	<b>Primary</b> <b>Secondary</b>	<b>Results:</b>	

**Martinolich, J. et al. Laparoscopic Surgery for Diverticular Fistulas: Outcomes of 111 Consecutive Cases at a Single Institution. J Gastrointest Surg. 23. 1015-1021. 2019**

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level: 4</b> <b>Study type: retrospektiv</b>	<b>Funding sources:</b> <b>Conflict of Interests:</b> <b>Randomization: no</b> <b>Blinding: no</b> <b>Dropout rates: no</b>	<b>Total no. patients: 111</b> <b>Recruiting Phase: 11 Jahre</b> <b>Inclusion criteria:</b> <b>Exclusion criteria:</b>	<b>Interventions:</b> <b>Comparison:</b>
<b>Notes:</b>	<b>Author's conclusion:</b>		
<b>Outcome Measures/results</b>	<b>Primary</b> <b>Secondary</b>	<b>Results:</b>	



## Schlüsselfrage:

AG 05 - Frage 18 CDD Typ 3c  
Besteht bei chronischer Divertikulitis mit Ausbildung von Fisteln eine generelle Operationsindikation?

## Inhalt: 7 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Boermeester, M. A. 2016	2	systematic review
Comparato, G. 2007	4	Kohortenstudie
Fozard, J. B. 2011	1	syst rev.
Garcea, G. 2006	4	retrospective case study
Martinolich, J. 2019	4	retrospektiv
Radwan, R. 2013	4	retrospektiv
Solkar, M. H. 2005	4	retrospektiv

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 2 Bewertung(en)

Boermeester, M. A. et al. Contemporary Review of Risk-Stratified Management in Acute Uncomplicated and Complicated Diverticulitis. World J Surg. 40. 2537-45. 2016			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2 Study type: systematic review Databases: Search period: Inclusion Criteria: treatment of acute colonic diverticulitis Exclusion Criteria:	Intervention: Comparison:	Primary: Secondary: Results: Author's Conclusion: A shift in management has occurred towards conservative management in acute uncomplicated disease. Those with uncomplicated acute diverticulitis may be treated without antibiotics. For complicated diverticulitis with purulent peritonitis, the use of peritoneal lavage appears to be non-superior to resection.	
Methodical Notes			
Funding Sources:			



COI:

Study Quality: mostly retrospective series, small patient cohorts

Heterogeneity:

Publication Bias:

Notes:

Fozard, J. B. et al. ACPGBI position statement on elective resection for diverticulitis. *Colorectal Dis.* 13 Suppl 3. 1-11. 2011

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: syst rev. Databases: only publications in english Search period: -2010 Inclusion Criteria: Exclusion Criteria:	Intervention: Comparison:	Primary: Secondary: Results: Author's Conclusion:	

## Methodical Notes

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

**NEWCASTLE - OTTAWA Checklist: Cohort: 5 Bewertung(en)**

Comparato, G. et al. Quality of life in uncomplicated symptomatic diverticular disease: is it another good reason for treatment?. *Dig Dis.* 25. 252-9. 2007

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Kohortenstudie	Funding sources: Conflict of Interests: Randomization: no Blinding: no Dropout rates:	Total no. patients: 58 Recruiting Phase: <u>2003 - 2004</u> Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Notes:	kleine Kohorte, zufällige Medikamentengabe Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

Garcea, G. et al. Diagnosis and management of colovesical fistulae; six-year experience of 90 consecutive cases. *Colorectal Dis.* **8.** 347-52. 2006

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospective case study	Funding sources: not indicated Conflict of Interests: not indicated Randomization: not applicable Blinding: no Dropout rates: no	Total no. patients: 90 (72 included) Recruiting Phase: 6 years Inclusion criteria: 90 patients with colovesical fistula Exclusion criteria: 18 patients who were not operated (too high risk oder even dead before therapy)	Interventions: diagnostic set of studies for identifying the source of the fistulas Comparison: pros of the different methods
Notes:	Author's conclusion: The authors see a role of barium enema, colonic endoscopy and CT in the preoperative diagnostic workup of patients with colovesical fistulas		
Outcome Measures/results	Primary Accuracy of the diagnostic measures Secondary	Results: Endoscopy was the best method to clarify the colonic origin of the fistula but did not visualize the fistula itself. Cystoscopy however identified less than 50 % (46.7%) of the fistulas and not at all contribute to their colonic etiology. US was useless in this investigation except for the detection of an abscess while CT identified fistulas in 10 % and diverticula in 9 % only.	

Martinolich, J. et al. Laparoscopic Surgery for Diverticular Fistulas: Outcomes of 111 Consecutive Cases at a Single Institution. *J Gastrointest Surg.* **23.** 1015-1021. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospektiv	Funding sources: Conflict of Interests: Randomization: no Blinding: no Dropout rates: no	Total no. patients: 111 Recruiting Phase: 11 Jahre Inclusion criteria: Exclusion criteria:	Interventions: Comparison:
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

Radwan, R. et al. How safe is it to manage diverticular colovesical fistulation non-operatively?. *Colorectal Dis.* **15.** 448-50. 2013

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospektiv	Funding sources: Conflict of Interests:	Total no. patients: 62 Recruiting Phase: <u>2005 - 2011</u>	Interventions: Comparison:

	Randomization: no Blinding: no Dropout rates: no	Inclusion criteria: Exclusion criteria:	
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

Solkar, M. H. et al. Colovesical fistula--is a surgical approach always justified?. *Colorectal Dis.* 7, 467-71. 2005

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospektiv	Funding sources: Conflict of Interests: Randomization: no Blinding: no Dropout rates:	Total no. patients: 50 Recruiting Phase: <u>1992 - 2004</u> Inclusion criteria: Kolovesikale Fistel Exclusion criteria:	Interventions: Comparison: OP vs. konservativ
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

## Schlüsselfrage:

**AG 05 - Frage 19 CDD Typ 3c**  
**Besteht bei chronischer Divertikulitis mit Ausbildung einer symptomatischen Kolonstenose eine generelle Operationsindikation?**

**Inhalt: 5 Literaturstellen**

Literaturstelle	Evidenzlevel	Studientyp
Boermeester, M. A. 2016	2	systematic review
Comparato, G. 2007	4	Kohortenstudie
Fozard, J. B. 2011	1	syst rev.
Keränen, I. 2010	4	retrospective
Park, Chan Hyuk 2015	4	retrospective

**OXFORD (2011) Appraisal Sheet: Systematic Reviews: 2 Bewertung(en)**

Boermeester, M. A. et al. Contemporary Review of Risk-Stratified Management in Acute Uncomplicated and Complicated Diverticulitis. <i>World J Surg.</i> <b>40.</b> 2537-45. 2016			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2 Study type: systematic review Databases: Search period: Inclusion Criteria: treatment of acute colonic diverticulitis Exclusion Criteria:	Intervention: Comparison:	Primary: Secondary: Results: Author's Conclusion: A shift in management has occurred towards conservative management in acute uncomplicated disease. Those with uncomplicated acute diverticulitis may be treated without antibiotics. For complicated diverticulitis with purulent peritonitis, the use of peritoneal lavage appears to be non-superior to resection.	
<b>Methodical Notes</b>			
Funding Sources: COI: Study Quality: mostly retrospective series, small patient cohorts			

Heterogeneity:

Publication Bias:

Notes:

Fozard, J. B. et al. ACPGBI position statement on elective resection for diverticulitis. *Colorectal Dis.* 13 Suppl 3. 1-11. 2011

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
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Evidence level: 1

Study type: syst rev.  
Databases: only publications in english

Search period: -2010

Inclusion Criteria:

Exclusion Criteria:

Intervention:

Comparison:

Primary:

Secondary:

Results:

Author's Conclusion:

Methodical Notes

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

**NEWCASTLE - OTTAWA Checklist: Cohort: 3 Bewertung(en)**

Comparato, G. et al. Quality of life in uncomplicated symptomatic diverticular disease: is it another good reason for treatment?. *Dig Dis.* 25. 252-9. 2007

Evidence level	Methodical Notes	Patient characteristics	Interventions
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Evidence level: 4

Study type: Kohortenstudie

Funding sources:

Conflict of Interests:

Randomization: no

Blinding: no

Dropout rates:

Total no. patients: 58

Recruiting Phase: 2003 - 2004

Inclusion criteria:

Exclusion criteria:

Interventions:

Comparison:

Notes:

kleine Kohorte, zufällige Medikamentengabe

Author's conclusion:

Outcome Measures/results

Primary

Secondary

Results:

Keränen, I. et al. Outcome of patients after endoluminal stent placement for benign colorectal obstruction. *Scand J Gastroenterol.* 45. 725-31. 2010

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospective	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 23 Recruiting Phase: <u>1998 - 2008</u> Inclusion criteria: benign colonic stenosis Exclusion criteria:	Interventions: colon Stent Comparison:
Notes:	Case control study Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

Park, Chan Hyuk et al. Clinical efficacy of endoscopic treatment for benign colorectal stricture: balloon dilatation versus stenting. Gut and liver. 9. 73-79. 2015

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospective	Funding sources: Conflict of Interests: none Randomization: none Blinding: none Dropout rates:	Total no. patients: 7 Recruiting Phase: <u>1999 - 2012</u> Inclusion criteria: benign colon stenosis Exclusion criteria:	Interventions: SEMS(self expanding metal stents) , balloon dilatation Comparison: SEMS vs Balloon
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

## Schlüsselfrage:

**AG 06 Operative Verfahrenswahl**  
Ist das „Damage control“ Verfahren mit Sigmaresektion und Blindverschluß der Darmenden sowie abdomineller Vakuumentherapie mit zweizeitiger Anastomosierung nach max. 72h nach Beherrschung des abdominellen Infektes als Alternative geeignet

## Inhalt: 9 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Brillantino, A. 2019	3	cohort study
Cirocchi, R. 2014	4	systematic review
Gasser, E. 2019	3	retrospective analysis
Kafka-Ritsch, R. 2012	2	cohort study, retrospective data
Perathoner, A. 2010	2	prospectively assessed patient data
Sohn, M. A. 2018	1	prospective data, non randomized
Sohn, M. 2016	1	prospectively assessed data, non randomized, control study
Sohn, M. 2018	2	prospectively assessed data, retrospective analysis, non-randomized
Tartaglia, D. 2019	3	cohort study

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 1 Bewertung(en)

Cirocchi, R. et al. Role of damage control surgery in the treatment of Hinchey III and IV sigmoid diverticulitis: a tailored strategy. <i>Medicine (Baltimore)</i> . 93. e184. 2014			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 4 Study type: systematic review Databases: Search period: January 1960 to July 2014 Inclusion Criteria: underwent DCS for complicated diverticulitis Exclusion Criteria: n.a.	Intervention: damage control surgery (by definition of the authors: sigmoid resection and blind loops w/o NPWT or laparoscopic lavage) Comparison:	Primary: Secondary: Results: Author's Conclusion: the review failed to determine specific physiologic parameters (eg, APACHE, POSSUM, ...) that could be used to triage patients to receive DCS versus other treatment	
<b>Methodical Notes</b>			
<b>Funding Sources:</b> COI: Study Quality: Heterogeneity: high			

## Publication Bias:

## Notes:

too heterogenous cohorts included (laparoscopic lavage and real damage control with sigmoid resection)

## NEWCASTLE - OTTAWA Checklist: Cohort: 8 Bewertung(en)

Brillantino, A. et al. Advantages of Damage Control Strategy With Abdominal Negative Pressure and Instillation in Patients With Diffuse Peritonitis From Perforated Diverticular Disease. *Surg Innov.* **26**. 656-661. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: cohort study	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 42 Recruiting Phase: 2016-2018 Inclusion criteria: pts with complicated diverticulitis Exclusion criteria: n.a.	Interventions: damage control strategy (1 step: sigmoid resection and negative pressure wound therapy (NPWT) application for 48h; 2 step: Hartmann procedure or anastomosis Comparison: see above
Notes:	Author's conclusion: DC can reduce permanent stoma rate		
Outcome Measures/results	Primary Morbidity Secondary	Results: 24 patients (80%) received a colorectal anastomosis and 6 patients (20%) underwent a Hartmann's procedure; at discharge 23 patients (76.6%) were free of stoma	

Gasser, E. et al. Damage control surgery for perforated diverticulitis: a two center experience with two different abdominal negative pressure therapy devices. *Acta Chir Belg.* **119**. 370-375. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospective analysis	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 78 Recruiting Phase: January 2009 and December 2014 Inclusion criteria: perforated sigmoid diverticulitis with purulent or faecal peritonitis Exclusion criteria:	Interventions: damage control concept (two-staged) with two different vacuum assisted wound closure systems Comparison:
Notes:	retrospective study Author's conclusion: Despite the good feasibility and the well-known positive effect of abdominal NPT, perforated diverticulitis is still associated with high morbidity. However, the analysis did not show significant differences between the two abdominal NPT devices.		
Outcome Measures/results	Primary not reported Secondary not reported	Results: The mean length of abdominal NPT was 3.6 days in Group A and 2.8 days in Group B. Revisional surgery after closure of the abdomen was necessary due to surgical site infections, fascial dehiscence or anastomotic insufficiency in 25% and 29%, respectively. NPT-associated complications like fistula formation or acute bleeding were not observed. Mortality was 15% (Group A) and 7% (Group B).	

Kafka-Ritsch, R. et al. Damage control surgery with abdominal vacuum and delayed bowel reconstruction in patients with perforated diverticulitis Hinchey III/IV. *J Gastrointest Surg.* **16**. 1915-22. 2012

Evidence level	Methodical Notes	Patient characteristics	Interventions
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Evidence level: 2 Study type: cohort study, retrospective data	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 51 Recruiting Phase: October 2006 and September 2011 Inclusion criteria: Hinchey III and IV perforated diverticulitis Exclusion criteria:	Interventions: Damage control strategy (two staged) Comparison: none
Notes:	retrospective data however all consecutive patients included; two center experience Author's conclusion: low mortality rate and a very low rate of permanent colostomy		
Outcome Measures/results	Primary morbidity and mortality Secondary	Results: Hospital mortality rate was 9.8 %; median (range) ICU stay was 6 (1–42) days; median (range) hospital stay was 24 (9– 71) days, and median (range) duration of vacuum treatment was 3 (2–8) days. 35 (76 %) of patients were discharged with reconstructed colon, and 93 % of patients live without a stoma at follow-up	

Perathoner, A. et al. Damage control with abdominal vacuum therapy (VAC) to manage perforated diverticulitis with advanced generalized peritonitis—a proof of concept. *Int J Colorectal Dis.* **25.** 767-74. 2010

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2 Study type: prospectively assessed patient data	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 27 Recruiting Phase: October 2006 and September 2008 Inclusion criteria: perforated diverticulitis (Hinchey III/IV) Exclusion criteria:	Interventions: A) primary anastomosis and VAC B) Damage control with a) resection of perforated sigmoid colon, b) VAC and delayed completion of either Hartmann or sigmoid resection with two-staged anastomosis C) Hartmann's procedure Comparison:
Notes:	Author's conclusion: Surgical treatment of perforated diverticulitis with advanced generalized peritonitis (Hinchey score III and IV) should be individually tailored according to the clinical presentation of the patient and pre-existing co-morbidities. The decision to perform an anastomosis is postponed to a second-look operation under elective conditions. This strategy allows a high rate of restoration of the intestinal continuity.		
Outcome Measures/results	Primary n.a. Secondary n.a.	Results: Considering an overall mortality rate of 26% (n = 7), the rate of anastomosis in surviving patients was 70%.	

Sohn, M. A. et al. Damage control surgery in perforated diverticulitis: ongoing peritonitis at second surgery predicts a worse outcome. *Int J Colorectal Dis.* **33.** 871-878. 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 1 Study type: prospective data, non randomized	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 74 Recruiting Phase: 5/2011 - 7/2017 Inclusion criteria: perforated diverticular disease complicated by generalized peritonitis Exclusion criteria: < Hinchey III diverticulitis	Interventions: damage control strategy, definite reconstruction (anastomosis or Hartmann's procedure (HP) at second look Comparison: group with ongoing peritonitis vs. no ongoing peritonitis
Notes:	good prospective data, multi centric, ongoing peritonitis at second look as prognostic criteria		

	Author's conclusion: Ongoing peritonitis after DCS is a predictor of a worse outcome in patients with perforated diverticulitis.	
Outcome Measures/results	Primary morbidity and mortality and stoma rate  Secondary	Results: At second surgery, 55% presented with ongoing peritonitis (OP). Patients with OP had higher rate of organ failure (32 vs. 9%, $p = 0.024$ ), higher Mannheim Peritonitis Index (25.2 vs. 18.9; $p = 0.001$ ), and increased operation time (105 vs. 84 min., $p = 0.008$ ) at first surgery. An anastomosis was constructed in all patients with no OP (nOP) at second surgery as opposed to 71% in the OP group ( $p < 0.001$ ). Complication rate (44 vs. 24%, $p = 0.092$ ), mortality (12 vs. 0%, $p = 0.061$ ), overall number of surgeries (3.4 vs. 2.4, $p = 0.017$ ), enterostomy rate (76 vs. 36%, $p = 0.001$ ), and length of hospital stay (25 vs. 18.8 days, $p = 0.03$ ) were all increased in OP group. OP at second surgery occurred significantly more often in patients with Enterococcus infection (81 vs. 44%, $p = 0.005$ ) and with fungal infection (100 vs. 49%, $p = 0.007$ ).

Sohn, M. et al. Damage control strategy for the treatment of perforated diverticulitis with generalized peritonitis. *Tech Coloproctol.* **20.** 577-83. 2016

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 1  Study type: prospectively assessed data, non randomized, control study	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 37  Recruiting Phase: <u>2010 - 2015</u>  Inclusion criteria: perforated diverticular disease of the sigmoid colon with generalized peritonitis  Exclusion criteria: < Hinchey III diverticulitis	Interventions: damage control vs. definitive reconstruction (anastomosis or Hartmann's procedure) at the initial operation  Comparison:
Notes:	comparison between damage control and non-damage control group; non randomized controlled study  Author's conclusion: Damage control strategy in patients with generalized peritonitis due to perforated diverticulitis leads to a significantly reduced stoma rate after the initial hospital stay without an increased risk of postoperative morbidity.		
Outcome Measures/results	Primary morbidity and mortality, stoma rate  Secondary	Results: overall postoperative mortality was 11 % (n = 4), a significantly higher proportion of patients in the control group had a stoma after the initial hospital stay (83 vs. 47 %, $p = 0.038$ )	

Sohn, M. et al. Perforated Diverticulitis with Generalized Peritonitis: Low Stoma Rate Using a "Damage Control Strategy". *World J Surg.* **42.** 3189-3195. 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2  Study type: prospectively assessed data, non-randomized retrospective analysis, non-randomized	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 58  Recruiting Phase: May 2011 - February 2017  Inclusion criteria: Hinchey III/IV diverticulitis  Exclusion criteria: < Hinchey III diverticulitis	Interventions: limited resection of the perforated colon segment with oral and aboral blind closure during the emergency procedure and [2] definitive reconstruction at scheduled second laparotomy (anastomosis ; loop ileostomy or a Hartmann's procedure) after 24–48 h  Comparison:
Notes:	Author's conclusion: The use of the Damage Control strategy leads to a comparatively low stoma rate in patients suffering from perforated diverticulitis with generalized peritonitis.		
Outcome	Primary	Results: Thus, altogether, 29 patients (50%) had stoma at the end of the hospital	

Measures/results	morbidity mortality and stoma rate  Secondary	stay. The postoperative mortality was 9% (n = 5), and median postoperative hospital stay was 18.5 days (3–66). At the end of the follow-up, 44 of 53 surviving patients were stoma free (83%).
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Tartaglia, D. et al. Damage control surgery for perforated diverticulitis with diffuse peritonitis: saves lives and reduces ostomy. *World J Emerg Surg.* 14. 19. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: cohort study	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 34 Recruiting Phase: 2011-2017 Inclusion criteria: patients with perforated diverticulitis Hinchey grade III and IV Exclusion criteria: age >90yrs, presence of poor-prognosis-associated comorbidities or severe limitation of self-sufficiency that a priori favored the choice of an end colostomy	Interventions: damage control with two-staged restoration of bowel continuity and Hartmann's procedure  Comparison: see above
Notes:	no statement about total number of patients treated in the observational period in each center  Author's conclusion: DCS is feasible, related to higher rate of bowel reconstruction		
Outcome Measures/results	Primary mortality and morbidity and intestinal anastomosis rate w/wo temporary stoma  Secondary length of ICU stay, length of total po stay, recurrence of div, late development of incisional hernia	Results: 71% had restoration of bowel continuity, 29% Hartmann's procedure, mortality rate was 12%, at Multivariate analysis male gender and Mannheim Peritonitis Index correlated with Hartmann's procedures	



## Schlüsselfrage:

**A06 Operative Verfahrenswahl**  
Ist die organerhaltende Therapie wie die laparoskopische Lavage eine geeignete Therapie der perforierten Divertikulitis Typ IIc?

## Inhalt: 11 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Binda, G. A. 2018	3	retrospective, multi centric observational study
Biondo, S. 2012	1	systematic review
Boermeester, M. A. 2016	2	systematic review
Cirocchi, R. 2013	2	systematic review and meta-analysis
Cirocchi, R. 2015	2	systematic review and meta-analysis
Galbraith, N. 2017	1	
Gehrman, J. 2016	3	RCT
Kohl, A. 2018	3	RCT
Marshall, J. R. 2017	1	systematic review and meta-analysis
Schultz, J. K. 2017	2	RCT
Shaikh, F. M. 2017	2	systematic review and meta-analysis

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 7 Bewertung(en)

Biondo, S. et al. Current status of the treatment of acute colonic diverticulitis: a systematic review. Colorectal Dis. 14. e1-e11. 2012			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1  Study type: systematic review Databases: PUBMED, MEDLINE, EMBASE and Google scholar  Search period: all publications to March 2011  Inclusion Criteria: all studies dealing with treatment of acute colonic diverticulitis	Intervention:  Comparison:	Primary:  Secondary:  Results:  Author's Conclusion: 1 An abdominal CT is the most effective tool for diagnosis and staging of AD, and can also be used for percutaneous drainage of abscesses. 2 In patients without significant comorbidities and an uncomplicated diverticulitis, outpatient treatment can be performed. 3 Conservative treatment can be used for patients with uncomplicated AD, small abscesses or percutaneously drained abscesses. 4 The recommendation of elective surgery after a favourable response to medical treatment should be made on an individual basis. Elective laparoscopic	

<b>Exclusion Criteria:</b>		<p>surgery in diverticulitis is appropriate but is technically complex and requires experience in laparoscopic surgery.</p> <p>5 The PSS scoring system is a specific system for peritonitis of colonic origin that helps to predict mortality and is useful in the decision making process.</p> <p>6 In cases of perforated diverticulitis, after a careful selection of patients, the technique of choice should be resection with primary anastomosis. However, at present, laparoscopic lavage is being considered as a potentially safe alternative in cases of purulent peritonitis.</p>	
<b>Methodical Notes</b>			
<b>Funding Sources:</b>			
<b>COI:</b>			
<b>Study Quality:</b> most retrospective studies and cohorts			
<b>Heterogeneity:</b>			
<b>Publication Bias:</b>			
<b>Notes:</b>			
<p><b>Boermeester, M. A. et al. Contemporary Review of Risk-Stratified Management in Acute Uncomplicated and Complicated Diverticulitis. World J Surg. 40. 2537-45. 2016</b></p>			
<b>Evidence level/Study Types</b>	<b>P - I - C</b>	<b>Outcomes/Results</b>	<b>Literature References</b>
<p><b>Evidence level:</b> 2</p> <p><b>Study type:</b> systematic review</p> <p><b>Databases:</b></p> <p><b>Search period:</b></p> <p><b>Inclusion Criteria:</b> treatment of acute colonic diverticulitis</p> <p><b>Exclusion Criteria:</b></p>	<p><b>Intervention:</b></p> <p><b>Comparison:</b></p>	<p><b>Primary:</b></p> <p><b>Secondary:</b></p> <p><b>Results:</b></p> <p><b>Author's Conclusion:</b> A shift in management has occurred towards conservative management in acute uncomplicated disease. Those with uncomplicated acute diverticulitis may be treated without antibiotics. For complicated diverticulitis with purulent peritonitis, the use of peritoneal lavage appears to be non-superior to resection.</p>	
<b>Methodical Notes</b>			
<b>Funding Sources:</b>			
<b>COI:</b>			
<b>Study Quality:</b> mostly retrospective series, small patient cohorts			
<b>Heterogeneity:</b>			
<b>Publication Bias:</b>			
<b>Notes:</b>			

Cirocchi, R. et al. Treatment of Hinchey stage III-IV diverticulitis: a systematic review and meta-analysis. *Int J Colorectal Dis.* 28. 447-57. 2013

Evidence Types	level/Study	P - I - C	Outcomes/Results	Literature References
<p><b>Evidence level: 2</b></p> <p><b>Study type:</b> systematic review and meta-analysis</p> <p><b>Databases:</b> Medline, Embase, Cochrane Central Register of Controlled Trials, and the Science Citation Index, GreyNet, SIGLE, National Technological Information Service, and British Library Integrated catalogue</p> <p><b>Search period:</b> eligible studies published between 1990 and 2011 were reviewed.</p> <p><b>Inclusion Criteria:</b> surgical treatments for diverticular peritonitis Hinchey III or IV</p> <p><b>Exclusion Criteria:</b> (1) the studies did not report the outcomes of interest of two or more different surgical treatments, or (2) although comparing the different surgical techniques, we cannot directly or indirectly obtain the outcomes of interest peritonitis caused by cancer or inflammatory bowel disease</p>		<p><b>Intervention:</b></p> <ul style="list-style-type: none"> <li>- Colon resection with primary anastomosis</li> <li>- Colon resection with Hartmann's procedure</li> <li>- Proximal diversion without removal of perforated segment of colon</li> <li>- Closure of perforation site with suture</li> <li>- the vacuumassisted closure (VAC) therapy as complementary therapy with the previous surgical strategies</li> </ul> <p><b>Comparison:</b></p> <ol style="list-style-type: none"> <li>1. Colon resection vs suture of the colon perforation</li> <li>2. Colon resection vs maintained perforated diseased segment of colon and proximal colostomy(obsolete!)</li> <li>3. Primary resection vs proximal colostomy followed by secondary resection</li> <li>4. Primary resection with anastomosis vs Hartmann's procedure</li> <li>5. Primary resection with anastomosis vs laparoscopic peritoneal lavage</li> <li>6. Results of colon resection with primary anastomosis±VAC colon vs Hartman's procedure±VAC vs limited sigmoid resection or closure of perforation site with sutures, and VAC</li> </ol>	<p><b>Primary:</b> overall mortality rate re-interventions for complications postoperative stay</p> <p><b>Secondary:</b></p> <p><b>Results:</b> Primary resection with anastomosis has a significant advantage in the resection anastomosis (RA) group in terms of lower mortality rate compared to Hartmann's procedure (P&lt;0.02). The postoperative stay was also significantly lower in the RA group (P&lt;0.001). Overall surgical morbidity and hospital stay were lower in the laparoscopic peritoneal lavage group with respect to the primary resection and anastomosis group (P&lt;0.001)</p> <p><b>Author's Conclusion:</b> Published literature do not allow today an evidence-based surgical management of patient with Hinchey stage III and IV diverticular disease.</p>	

#### Methodical Notes

#### Funding Sources:

COI:

Study Quality:

Heterogeneity:

**Publication Bias:** the authors conclude that it was a "reflection of the careful selection of patients undergoing resection anastomosis" forming "a group of particularly good prognostic outlook" (selection bias)

Notes:

this review and meta-analysis outlines that according to the literature at that time (2013) the only meaningful comparison is the resection anastomosis vs. Hartmann's procedure

Cirocchi, R. et al. Laparoscopic peritoneal lavage: a definitive treatment for diverticular peritonitis or a "bridge" to elective laparoscopic sigmoidectomy?: a systematic review. *Medicine (Baltimore)*. 94. e334. 2015

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: systematic review and meta-analysis</p> <p>Databases:</p> <p>Search period:</p> <p>Inclusion Criteria: All articles reporting laparoscopic peritoneal lavage in patients with sigmoid diverticulitis were included irrespective of the study design. Comparative studies were included regardless of the surgical approach or the outcomes reported.</p> <p>Exclusion Criteria: Case reports (defined as studies describing the laparoscopic peritoneal lavage in only 1 patient) were excluded. In case of patients overlapping between 2 or more studies, only the most recent study was considered.</p>	<p>Intervention: laparoscopic lavage in uncomplicated and complicated acute diverticulitis</p> <p>Comparison:</p>	<p>Primary: success rate of laparoscopic peritoneal lavage, defined as the rate of patients alive without surgical treatment for recurrent attacks of diverticulitis</p> <p>Secondary: 1. laparotomic or laparoscopic conversion rate (defined as the conversion during the procedure of laparoscopic lavage in any form of surgery, different from the peritoneal lavage, with or without bowel resection); 2. 30 day postoperative mortality; 3. 30 day postoperative surgical reintervention rate; 4. 30 day postoperative percutaneous drainage rate; 5. hospital readmission rate for diverticulitis recurrence; 6. two-stage laparoscopic management rate; 7. rate of visualization of colonic perforation during the laparoscopic peritoneal lavage; 8. surgical strategies used in case of detection of a colonic perforation; 9. rate of visceral adhesiolysis searching for visceral perforation; 10. duration of follow-up.</p> <p>Results: success rate of lap. lavage was 24.3% overall conversion rate for Hinchey stages I-IV was 3.8% (17/444), but in stage IV diverticulitis the incidence of conversion was 45% 30-day postoperative mortality rate was 4.8% (5/103) 30 day postoperative reintervention rate was 4.95% hospital readmission rate after the first hospitalization, during which the patients underwent laparoscopic lavage, was 6.9% (29/419); the most frequent reason for re-hospitalization was recurrent diverticulitis (16 patients, 55.2%) A 2-stage laparoscopic management (laparoscopic peritoneal lavage followed by laparoscopic sigmoid resection) was performed in 35.8% (159/444) of patients</p>	

		<p><b>Author's Conclusion:</b> the laparoscopic approach is more suitable in nonstercoraceous peritonitis forms (Hinchey III), in which the conversion rate (1%), mean hospital stay, and morbidity and mortality rates were low; high conversion rate in Hinchey IV diverticulitis (45%) some evidence to suggest that laparoscopic peritoneal lavage could be an effective option in patients with an Hinchey III peritonitis if used as a bridge to elective colonic resection also as "damage control" alternative</p>
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<p><b>Methodical Notes</b></p> <p><b>Funding Sources:</b></p> <p><b>COI:</b></p> <p><b>Study Quality:</b></p> <p><b>Heterogeneity:</b></p> <p><b>Publication Bias:</b></p> <p><b>Notes:</b></p>
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<p><b>Galbraith, N. et al. Laparoscopic Lavage in the Management of Perforated Diverticulitis: a Contemporary Meta-analysis. J Gastrointest Surg. 21. 1491-1499. 2017</b></p>			
<b>Evidence level/Study Types</b>	<b>P - I - C</b>	<b>Outcomes/Results</b>	<b>Literature References</b>
<p><b>Evidence level:</b> 1</p> <p><b>Study type:</b></p> <p><b>Databases:</b></p> <p><b>Search period:</b></p> <p><b>Inclusion Criteria:</b> Randomized controlled trials, where laparoscopic lavage was used as a major treatment modality for acute diverticulitis associated with peritonitis</p> <p><b>Exclusion Criteria:</b> case reports, non-randomized, observational studies and studies not identifying the primary outcome of interest</p>	<p><b>Population:</b> diverticulitis related infection in patients with Hinchey III diverticulitis without the need for stoma formation</p> <p><b>Intervention:</b> laparoscopic lavage colonic resection</p> <p><b>Comparison:</b> laparoscopic lavage vs. colonic resection</p>	<p><b>Primary:</b> need for unplanned reoperations for all causes and unplanned reoperations specifically for the control of infection (abscess, peritonitis, or continuing abdominal sepsis) within 90 days</p> <p><b>Secondary:</b> length of stay of the index admission and mortality in both laparoscopic lavage and colon resection groups, defined as occurring within 90 days after the index operation</p> <p><b>Results:</b> Pooled RR for total reoperations (n=305) is 2.07 (CI 1.12, 3.84), p= 0.021; 9.5% higher with lavage                      pooled RR for reoperations for infection (n=305) is 5.56 (CI 1.97, 15.69), p= 0.001; 9.3% higher with lavage                      pooled RR for stoma formation (n=288) is 0.18 (CI 0.12, 0.27), p&lt;0.001; 66.8% lower with lavage                      pooled RR for mortality (n=307) is 1.03 (CI 0.45, 2.34), p=0.95; 0.2% higher with lavage</p> <p><b>Author's Conclusion:</b> laparoscopic lavage in the setting of perforated</p>	



	Hinchey III diverticulitis is associated with a lesser need for an intestinal stoma, however, at the cost of an increased need for reoperation to control infection and an increased need for subsequent percutaneous abscess drainage. There is no difference in mortality between laparoscopic lavage and colon resection for Hinchey III diverticulitis <u>patient selection is key</u>
<b>Methodical Notes</b>	
<b>Funding Sources:</b>	
<b>COI:</b>	
<b>Study Quality:</b>	
<b>Heterogeneity:</b>	
<b>Publication Bias:</b>	
<b>Notes:</b> SR that focuses on on comparison with strict inclusion and exclusion criteria and inclusion of only Hinchey III diverticulitis cases	

Marshall, J. R. et al. Laparoscopic Lavage in the Management of Hinchey Grade III Diverticulitis: A Systematic Review. *Ann Surg.* 265. 670-676. 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: systematic review and meta-analysis</p> <p>Databases: MEDLINE from 1946 to present (via OVID), Cochrane Database of Systematic Reviews (via OVID) and Cochrane database of Registered clinical trials (via OVID) and EMBASE (via OVID)</p> <p>Search period: <u>1946-2016</u></p> <p>Inclusion Criteria: all RCTs that compared laparoscopic lavage with primary resection in Hinchey grade III diverticulitis</p> <p>Exclusion Criteria: Studies in which</p>	<p>Population: patients with perforated diverticulitis and purulent peritonitis (Hinchey III)</p> <p>Intervention: lap. lavage colonic resection</p> <p>Comparison:</p>	<p>Primary: rate of early reintervention</p> <p>Secondary: Intensive Care Unit (ICU) admission postoperatively, 30-day mortality, 90-day mortality, and the presence of a stoma at 12 months</p> <p>Results: PRIMARY OUTCOME: 45 re-interventions in the laparoscopic lavage group and 13 in the resection group, giving overall rates of 23.6% and 7.3%, respectively</p> <p>The overall analysis shows that the RR of reintervention was 3.03 [95% confidence interval (CI) 1.16–7.89] for those who underwent laparoscopic lavage</p> <p>SECONDARY OUTCOME: Postoperative ICU admission was higher for the resection group (21.2% compared with 17.3%; n.s.)</p> <p>Mortality at 30 days and 90 days was comparable between both groups (RR 1.34, 95% CI 0.37–4.79; and RR 0.86, 95% CI 0.40–1.84, respectively).</p> <p>10% and 20.5% of patients were living with unreversed stomas in the laparoscopic lavage and resection groups, respectively, at 12 months (RR 1.90, 95% CI 0.76–4.79).</p> <p>Author's Conclusion: It has shown an increased risk of postoperative reintervention within the first 30 days for Hinchey grade III diverticulitis managed with laparoscopic lavage. This did not result in an increased mortality rate at both 30 and 90 days when compared with resection. In addition, there was a trend toward</p>	

laparoscopic lavage was used as part of a 2-step management scheme that resulted in primary resection were not included	reduced stomas at 12 months in those who underwent laparoscopic lavage, although this did not reach statistical significance.
<b>Methodical Notes</b>	
<b>Funding Sources:</b> <b>COI:</b> <b>Study Quality:</b> <b>Heterogeneity:</b> There was evidence of statistical heterogeneity between studies (I <sup>2</sup> ¼ 60%) due to differences in the control procedure and being potentially underpowered <b>Publication Bias:</b> <b>Notes:</b>	

Shaikh, F. M. et al. Laparoscopic peritoneal lavage or surgical resection for acute perforated sigmoid diverticulitis: A systematic review and meta-analysis. *Int J Surg.* **38.** 130-137. 2017

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<b>Evidence level: 2</b>  <b>Study type:</b> systematic review and meta-analysis <b>Databases:</b> PubMed, EMBASE, and the Cochrane Library  <b>Search period:</b> n.a.  <b>Inclusion Criteria:</b> Any randomised controlled trial comparing the use of LPL with SR for APSD addressing one or more of our end points was considered eligible for meta-analysis (Hinchey III)  <b>Exclusion Criteria:</b> studies dealing with patients with faecal peritonitis were excluded from the analysis (Hinchey IV)	<b>Population:</b> patients with acute perforated sigmoid diverticulitis  <b>Intervention:</b> laparoscopic lavage vs surgical resection  <b>Comparison:</b> laparoscopic lavage vs. surgical resection	<b>Primary:</b> perioperative mortality, severe adverse events, postoperative abdominal or pelvic abscess formation, operative time, postoperative hospital stay, re-admission, reoperation and overall mortality at the end of the trials.  <b>Secondary:</b>  <b>Results:</b> no statistically significant difference in the incidence of mortality and morbidity significantly higher rate of postoperative abscess formation in the LPL group as compared to SR group (OR =4.121, 95% CI = 1.890 to 8.986, p =0.0004, and its in the LPL group required significantly more percutaneous interventions than the SR group. (OR = 5.414, 95% CI = 1.618 to 18.118, p = 0.006, regarding reoperation rate no statistically significant difference in the reoperation rates between the two groups were identified significant reduction in operative time with LPL treatment as opposed to SR (WMD =72.105, 95% CI = 88.335 to 55.876, p < 0.0001, no significant difference in readmission rates between the LPL and SR groups  <b>Author's Conclusion:</b> Laparoscopic peritoneal lavage for APSD is a safe and quick procedure with a shorter hospital stay. The rate of on-going abdominal sepsis was significantly higher in patients managed with LPL compared to SR	

The meta-analysis is limited by small numbers and heterogeneity between included trials.

#### Methodical Notes

##### Funding Sources:

COI: none

Study Quality: ITT principle

Heterogeneity: test of heterogeneity was not significant for mortality rate but for severe adverse events

Publication Bias:

Notes:

#### OXFORD (2011) Appraisal Sheet: RCT: 3 Bewertung(en)

Gehrman, J. et al. Health economic analysis of laparoscopic lavage versus Hartmann's procedure for diverticulitis in the randomized DILALA trial. *Br J Surg.* **103.** 1539-47. 2016

##### Population

##### Intervention - Comparison

##### Outcomes/Results

Evidence level: 3

Study type: RCT

Number of Patient:  
group lap lavage 43,  
group Hartmann's  
procedure 40

Recruitment Phase:  
February 2010 to  
February 2014

Inclusion Criteria:  
radiological  
examination showing  
intra-abdominal fluid or  
gas, and the decision to  
perform surgery

Exclusion Criteria: n.a.

Intervention: laparoscopic  
lavage  
Hartmann's procedure

Comparison: laparoscopic  
lavage versus Hartmann's  
procedure for perforated  
diverticulitis with purulent  
peritonitis (Hinchey grade  
III)

Primary: two time intervals were analyzed: one included all costs accumulated during 12 months in the trial (base-case A) and the other included all costs from inclusion in the trial throughout the patient's expected lifetime (base-case B)

Secondary:

Results: In the base-case A analysis, mean(s.d.) costs were €18 025(14 646) for laparoscopic lavage and €27 009(18 445) for Hartmann's procedure; the difference was €-8983 (95 per cent c.i. -16 232 to -1735; P =0.016)

In the base-case B analysis, the costs were €25 703(27 544) and €45 498(38 928) for laparoscopic lavage and Hartmann's procedure respectively, with a difference in mean total cost of €-19 794 (95 per cent c.i. -34 657 to -4931)

Author's Conclusion: they have shown significant cost reduction when using laparoscopic lavage compared with Hartmann's resection as a treatment for perforated diverticulitis with purulent peritonitis.

#### Methodical Notes

##### Funding Sources:

COI:

Randomization: 1:1

Blinding: none

Dropout Rate/ITT-Analysis: ITT analysis arguments

Notes:

underpowered? small patients' cohort

Kohl, A. et al. Two-year results of the randomized clinical trial DILALA comparing laparoscopic lavage with resection as treatment for perforated diverticulitis. *Br J Surg.* 105. 1128-1134. 2018

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 3</p> <p>Study type: RCT</p> <p>Number of Patient: lap. lavage 43; Hartmann's procedure 40</p> <p>Recruiting Phase: February 2010 until February 2014</p> <p>Inclusion Criteria: patients with suspected acute perforated diverticulitis, with imaging showing intra-abdominal free air and/or fluid, and were deemed in need of emergency surgery by the attending surgeon</p> <p>Exclusion Criteria: Patients who were found to have pathology other than diverticulitis at initial laparoscopy were not randomized.</p>	<p>Intervention: lap. lavage vs. Hartmann's procedure</p> <p>Comparison: see above</p>	<p>Primary: proportion of patients with one or more secondary operations from 0 to 24months after index surgery</p> <p>Secondary: number of operations, number of admissions, total duration of hospital stay, all-cause mortality and number of patients with a stoma at 24months</p> <p>Results: proportion of patients who underwent one or more secondary operations within 24months was 18 of 43 in the laparoscopic lavage group versus 27 of 40 in the Hartmann's procedure group, with a risk reduction of 45 per cent for laparoscopic lavage (relative risk 0.55, 95 per cent c.i. 0.36 to 0.84; P =0.012)</p> <p>Patients in the lavage group had fewer secondary operations (mean 0.63 versus 1.08), a reduction of 49 per cent (ratio 0.51, 95 per cent c.i. 0.31 to 0.87; P =0.024)</p> <p>Author's Conclusion: Two-year results showed that both the proportion of patients who had one or more secondary operations and the mean number of operations per patient were significantly lower after initial treatment with laparoscopic lavage compared with Hartmann's procedure for Hinchey grade III perforated diverticulitis.</p>

#### Methodical Notes

#### Funding Sources:

COI:

Randomization: 1:1

Blinding: none

Dropout Rate/ITT-Analysis: ITT defined

#### Notes:

small cohort

Schultz, J. K. et al. One-year results of the SCANDIV randomized clinical trial of laparoscopic lavage versus primary resection for acute perforated diverticulitis. *Br J Surg.* 104. 1382-1392. 2017

Population	Intervention - Comparison	Outcomes/Results
<p>Evidence level: 2</p> <p>Study type: RCT</p> <p>Number of Patient: lap.lavage 101; primary resection 98</p> <p>Recruiting Phase: 5 February 2010 and 28 June 2014</p>	<p>Intervention: lap lavage laparoscopic versus open resection, and Hartmann's procedure versus primary anastomosis with or without</p>	<p>Primary: 1 year was severe complications (Clavien-Dindo grade IIIa or more)</p> <p>Secondary: all postoperative complications, reoperations, functional outcome measures and QoL</p> <p>Results: Within 1 year after surgery, severe complications were observed in 30 of 89 patients (34 per cent) in the lavage group and 22 of 83 (27 per cent) in the resection group (absolute difference 7.2 (95 per</p>

<p><b>Inclusion Criteria:</b> patients aged more than 18 years with a clinical suspicion of perforated diverticulitis in need of urgent surgery were enrolled</p> <p><b>Exclusion Criteria:</b> bowel obstruction and pregnancy</p>	<p>a diverting stoma</p> <p><b>Comparison:</b> see above</p>	<p>cent c.i. -6.5 to 20.4) per cent; P=0.323). Overall 1-year mortality rates were 12 per cent (9 patients) in the lavage group versus 11 per cent (8) in the resection group deep surgical-site infections occurred in 24 patients (32 percent) in the lavage group and nine patients (13 per cent) in the resection group (P=0.006). the rate of superficial surgical-site infections within 1 year was lower in the lavage group than in the resection group (1 versus 17 per cent; P=0.001). The mean Cleveland Global QoL score was comparable between groups (0.73 in lavage group versus 0.75 in resection group; P=0.558).</p> <p><b>Author's Conclusion:</b> For patients with perforated diverticulitis, the present 1-year results of the SCANDIV trial did not show any significant difference in severe complications between laparoscopic lavage and primary resection. Complications and reinterventions after laparoscopic lavage were mainly related to the retained diseased bowel segment bearing the risk of a persisting perforation, recurrence or undiagnosed perforated malignancy</p>
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**Methodical Notes**

**Funding Sources:**

**COI:**

**Randomization:** 1:1, before surgery

**Blinding:** no

**Dropout Rate/ITT-Analysis:** modified ITT

**Notes:**

con: heterogeneity in the resection group (w/o Stoma) open or lap.

**NEWCASTLE - OTTAWA Checklist: Case Control: 1 Bewertung(en)**

Binda, G. A. et al. Multicentre international trial of laparoscopic lavage for Hinchey III acute diverticulitis (LLO Study). Br J Surg. 105. 1835-1843. 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p><b>Evidence level:</b> 3</p> <p><b>Study type:</b> retrospective, multi centric observational study</p>	<p><b>Funding sources:</b></p> <p><b>Conflict of Interests:</b></p> <p><b>Randomization:</b></p> <p><b>Blinding:</b></p> <p><b>Dropout rates:</b></p>	<p><b>Total no. patients:</b> 231</p> <p><b>Patient characteristics:</b> <u>2005-2015</u></p> <p><b>Inclusion criteria:</b> acute diverticulitis Hinchey grade III</p> <p><b>Exclusion criteria:</b> Hinchey stage I, II and IV</p>	<p><b>Interventions:</b> lap. lavage</p> <p><b>Comparison:</b> no</p>

<b>Notes:</b>	<p>con: retrospective analysis, only patients consecutively treated by laparoscopic lavage included, other treatments not described</p> <p>Author's conclusion: Laparoscopic lavage showed a high rate of successful sepsis control in selected patients with perforated Hinchey III acute diverticulitis affected by peritonitis, with low rates of operative mortality, reoperation and stoma formation</p>	
<b>Outcome Measures/results</b>	<p>Primary success of LL defined as patients alive and free from sepsis after the index episode, with no need for further surgery or death within 60 days after discharge</p> <p>Secondary conversion to any form of laparoscopic procedure different from peritoneal lavage (with or without bowel resection); conversion to laparotomy (with or without bowel resection); 30-day postoperative mortality and morbidity; hospital readmission rate for AD within 60 days after discharge; hospital readmission rate for recurrent AD, defined as a further episode of AD after at least 60 days following discharge; and need for surgery for a recurrent episode of AD.</p>	<p>Results: Sepsis control was achieved in 172 patients (74.5 per cent) morbidity rate was 33.0 per cent; the reoperation rate was 13.7 per cent and the 30-day mortality rate 1.9 per cent a recurrent episode of acute diverticulitis was registered in 46 (26.7 per cent), at a mean of 11 (range 2–108) months</p>



## Schlüsselfrage:

## AG 06 Operative Verfahrenswahl

Ist die total laparoskopische Operation, die laparoskopisch-assistierte Operation sowie roboter-assistierte Operation und Hand-Port Verfahren als gleichwertig anzusehen?

## Inhalt: 5 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Cirocchi, R. 2015	2	systematic review
Cirocchi, R. 2012	1	
Cirocchi, R. 2018	3	systematic review and meta-analysis
Cirocchi, R. 2013	2	systematic review and meta-analysis
Cirocchi, R. 2015	2	systematic review and meta-analysis

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 5 Bewertung(en)

Cirocchi, R. et al. Is laparoscopic surgery the best treatment in fistulas complicating diverticular disease of the sigmoid colon? A systematic review. *Int J Surg.* 24. 95-100. 2015

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: systematic review</p> <p>Databases: EMBASE and PubMed</p> <p>Search period: January 1991 and March 2015</p> <p>Inclusion Criteria: Published randomized and non-randomized studies in which at least 10 adult patients (age 18 years) underwent laparoscopic surgical treatment for colonic fistula secondary to sigmoid diverticular disease</p> <p>Exclusion Criteria: if the outcomes of interest were not reported or it was not possible to evaluate them based on the published results</p>	<p>Intervention: Operations involving fully laparoscopic, laparoscopic assisted surgery, or hand-assisted laparoscopy surgery were included</p> <p>Comparison:</p>	<p>Primary: Rate of fistula recurrence</p> <p>Secondary: Rate of reoperation for post-operative complications</p> <p>Rate of Hartmann's procedure or proximal diversion</p> <p>Rate of conversion to laparotomy</p> <p>Results: rate of fistula recurrence was 0.8% (1/121) rate of re-operations 2% in patients with complicated diverticulitis the stoma rate was between 21% and 35% conversion rate to open surgery was relatively high 19.7%</p> <p>Author's Conclusion: The lack of RCTs, the small sample size, the heterogeneity of literature do not allow to draw statistically significant conclusions on the laparoscopic surgery for fistulas despite this approach is considered safe. Laparoscopic approach has led to less postoperative pain, shorter hospital stay, faster recovery and better cosmetic results. Laparoscopic resection and primary anastomosis is a possible approach to sigmoid fistulas but its advantages in terms of lower mortality rate and postoperative stay after colon resection with primary anastomosis should be interpreted with caution.</p>	

## Methodical Notes

Funding Sources: none

COI: none

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Cirocchi, R. et al. Elective sigmoid colectomy for diverticular disease. Laparoscopic vs open surgery: a systematic review. *Colorectal Dis.* 14. 671-83. 2012

Evidence Types	level/Study P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: Databases: The Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE and EMBASE</p> <p>Search period: December 1990–December 2009</p> <p>Inclusion Criteria: direct comparison between elective open surgical resection (OSR) and laparoscopic surgical resection (LSR) in patients with complicated and uncomplicated diverticular disease of the sigmoid colon</p> <p>Exclusion Criteria: Studies including ascending or transverse colon resection, emergency procedures and procedures performed by surgical trainees were excluded</p>	<p>Intervention: laparoscopic vs. open sigmoid resection and anastomosis</p> <p>Comparison:</p>	<p>Primary: Overall, 30-day postoperative mortality and 30-day postoperative morbidity</p> <p>Secondary: major surgical complications (anastomotic leakage, intraabdominal abscess, ureteral injuries, accidental enterotomies, postoperative small bowel obstructions and anastomotic bleeding) and the main minor complications (wound infection and prolonged postoperative ileus)</p> <p>Results: overall morbidity: favors LSR (p=0.01) minor complications: favors LSR (p=0.008) major complications n.s. wound infections: favors LSR (p=0.001) prolonged postoperative ileum: favors LSR (p=0.006)</p> <p>Author's Conclusion: LSR can be safely performed in an elective treatment for diverticular disease. In the only RCT included the high overall morbidity of 42.3% reported in the LSR group is a cause for concern.</p>	

## Methodical Notes

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Cirocchi, R. et al. The role of emergency laparoscopic colectomy for complicated sigmoid diverticulitis: A systematic review and meta-analysis. *Surgeon.* . . 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 3</p> <p>Study type: systematic review and meta-analysis Databases: MEDLINE, SCOPUS and WOS</p> <p>Search period: between January 1990 and February 2018</p> <p>Inclusion Criteria: randomized (RCTs) and nonrandomized controlled trials (non-RCTs) comparing outcomes of emergency/urgent laparoscopic versus open sigmoid resection for complicated diverticulitis</p>	<p>Intervention:</p> <p>Comparison: laparoscopic vs. open sigmoidectomy for diverticulitis</p>	<p>Primary: post-operative mortality and morbidity rates, overall post-operative complications and rate of Hartmann's procedure vs primary anastomosis after laparoscopic vs open sigmoidectomy.</p> <p>Secondary: reoperation rate, operation time and post-operative length of hospital stay</p> <p>Results: In the rate of post-operative mortality there is little benefit in the laparoscopic group (9/181, 4.97%) than in the open group (p=0.53) The laparoscopy improves the rate of overall postoperative complications (laparoscopic group 56/181, 30.93% vs open group 132/255, 51.76%) (RR 0.62, 95% CI 0.49 to 0.80; I<sup>2</sup>= 0%, p =0.0002)</p>	



<b>Exclusion Criteria:</b>	<p>Laparoscopy improves slightly the rate of Hartmann's procedure laparoscopic (28/78, 35.89%) than in open group (70/164, 42.68%)</p> <p><b>Author's Conclusion:</b> significant advantages are associated with a laparoscopic over open approach to emergency sigmoidectomy in acute diverticulitis in terms of postoperative complication rates, although other outcomes are found equivalent.</p>
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**Methodical Notes****Funding Sources:**

COI:

Study Quality:

Heterogeneity:

**Publication Bias:** The limitations of the present study are the inclusion of nonrandomized trials with a high risk of bias and the reported differences in the inclusion criteria between the included studies: two studies included only Hinchey III and IV, whereas the other two included all complications (general and localized peritonitis, intra-abdominal abscess and acute obstruction)

type of surgical treatment was also different: two studies included only Hartmann's procedure, while the other two included sigmoidectomy with Hartmann's procedure or primary anastomosis

**Notes:**  
see bias

Cirocchi, R. et al. Treatment of Hinchey stage III-IV diverticulitis: a systematic review and meta-analysis. *Int J Colorectal Dis.* **28.** 447-57. 2013

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: systematic review and meta-analysis</p> <p>Databases: Medline, Embase, Cochrane Central Register of Controlled Trials, and the Science Citation Index, Greynet, SIGLE, National Technological Information Service, and British Library Integrated catalogue</p> <p>Search period: eligible studies published between 1990 and 2011 were reviewed.</p> <p>Inclusion Criteria: surgical treatments for diverticular peritonitis Hinchey III or IV</p> <p>Exclusion Criteria: (1) the studies did not report the outcomes of interest of two or more different surgical treatments, or (2) although comparing the different surgical techniques, we cannot directly or indirectly obtain the outcomes of interest peritonitis caused by cancer or inflammatory bowel disease</p>	<p><b>Intervention:</b></p> <ul style="list-style-type: none"> <li>- Colon resection with primary anastomosis</li> <li>- Colon resection with Hartmann's procedure</li> <li>- Proximal diversion without removal of perforated segment of colon</li> <li>- Closure of perforation site with suture</li> <li>- the vacuumassisted closure (VAC) therapy as complementary therapy with the previous surgical strategies</li> </ul> <p><b>Comparison:</b></p> <ol style="list-style-type: none"> <li>1. Colon resection vs suture of the colon perforation</li> <li>2. Colon resection vs maintained perforated diseased segment of colon and proximal colostomy(obsolete!)</li> <li>3. Primary resection vs proximal colostomy followed by secondary resection</li> <li>4. Primary resection with anastomosis vs Hartmann's procedure</li> <li>5. Primary resection with anastomosis vs laparoscopic peritoneal lavage</li> <li>6. Results of colon resection with primary anastomosis±VAC colon vs Hartman's procedure±VAC vs limited sigmoid resection or closure of perforation site with sutures, and VAC</li> </ol>	<p><b>Primary:</b> overall mortality rate re-interventions for complications postoperative stay</p> <p><b>Secondary:</b></p> <p><b>Results:</b> Primary resection with anastomosis has a significant advantage in the resection anastomosis (RA) group in terms of lower mortality rate compared to Hartmann's procedure (P&lt;0.02). The postoperative stay was also significantly lower in the RA group (P&lt;0.001). Overall surgical morbidity and hospital stay were lower in the laparoscopic peritoneal lavage group with respect to the primary resection and anastomosis group (P&lt;0.001)</p> <p><b>Author's Conclusion:</b> Published literature do not allow today an evidence-based surgical management of patient with Hinchey stage III and IV diverticular disease.</p>	

**Methodical Notes**

**Funding Sources:**

COI:

Study Quality:

Heterogeneity:

**Publication Bias:** the authors conclude that it was a "reflection of the careful selection of patients undergoing resection anastomosis" forming "a group of particularly good prognostic outlook" (selection bias)

**Notes:**

this review and meta-analysis outlines that according to the literature at that time (2013) the only meaningful comparison is the resection anastomosis vs. Hartmann's procedure

Cirocchi, R. et al. Laparoscopic peritoneal lavage: a definitive treatment for diverticular peritonitis or a "bridge" to elective laparoscopic sigmoidectomy?: a systematic review. *Medicine (Baltimore)*. 94. e334. 2015

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: systematic review and meta-analysis</p> <p>Databases:</p> <p>Search period:</p> <p>Inclusion Criteria: All articles reporting laparoscopic peritoneal lavage in patients with sigmoid diverticulitis were included irrespective of the study design. Comparative studies were included regardless of the surgical approach or the outcomes reported.</p> <p>Exclusion Criteria: Case reports (defined as studies describing the laparoscopic peritoneal lavage in only 1 patient) were excluded. In case of patients overlapping between 2 or more studies, only the most recent study was considered.</p>	<p>Intervention: laparoscopic lavage in uncomplicated and complicated acute diverticulitis</p> <p>Comparison:</p>	<p>Primary: success rate of laparoscopic peritoneal lavage, defined as the rate of patients alive without surgical treatment for recurrent attacks of diverticulitis</p> <p>Secondary: 1. laparotomic or laparoscopic conversion rate (defined as the conversion during the procedure of laparoscopic lavage in any form of surgery, different from the peritoneal lavage, with or without bowel resection); 2. 30 day postoperative mortality; 3. 30 day postoperative surgical reintervention rate; 4. 30 day postoperative percutaneous drainage rate; 5. hospital readmission rate for diverticulitis recurrence; 6. two-stage laparoscopic management rate; 7. rate of visualization of colonic perforation during the laparoscopic peritoneal lavage; 8. surgical strategies used in case of detection of a colonic perforation; 9. rate of visceral adhesiolysis searching for visceral perforation; 10. duration of follow-up.</p> <p>Results: success rate of lap. lavage was 24.3% overall conversion rate for Hinchey stages I-IV was 3.8% (17/444), but in stage IV diverticulitis the incidence of conversion was 45% 30-day postoperative mortality rate was 4.8% (5/103) 30 day postoperative reintervention rate was 4.95% hospital readmission rate after the first hospitalization, during which. the patients underwent laparoscopic lavage, was 6.9% (29/419); the most frequent reason for re-hospitalization was recurrent diverticulitis (16 patients, 55.2%) A 2-stage laparoscopic management (laparoscopic peritoneal lavage followed by laparoscopic sigmoid resection) was performed in 35.8% (159/444) of patients</p> <p>Author's Conclusion: the laparoscopic approach is more suitable in nonstercoraceous peritonitis forms</p>	

	(Hinchey III), in which the conversion rate (1%), mean hospital stay, and morbidity and mortality rates were low; high conversion rate in Hinchey IV diverticulitis (45%) some evidence to suggest that laparoscopic peritoneal lavage could be an effective option in patients with an Hinchey III peritonitis if used as a bridge to elective colonic resection also as "damage control" alternative	
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**Methodical Notes**

Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:



## Schlüsselfrage:

AG 06 Operative Verfahrenswahl  
Ist die minimal-invasive Sigmaresektion ist – wenn technisch möglich - der offenen Operation vorzuziehen?

## Inhalt: 6 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Cirocchi, R. 2018	2	systematic review
Cirocchi, R. 2015	2	systematic review
Cirocchi, R. 2012	1	
Cirocchi, R. 2018	3	systematic review and meta-analysis
Cirocchi, R. 2013	2	systematic review and meta-analysis
Daher, R. 2016	5	review

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 6 Bewertung(en)

Cirocchi, R. et al. Perforated sigmoid diverticulitis: Hartmann's procedure or resection with primary anastomosis-a systematic review and meta-analysis of randomised control trials. *Tech Coloproctol.* **22**. 743-753. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: systematic review</p> <p>Databases: MEDLINE, Embase, SCOPUS and Web of Science for publications</p> <p>Search period: up to March 2018</p> <p>Inclusion Criteria: randomized controlled trials (RCTs) comparing the outcomes of sigmoidectomy with PA versus HP in adults with perforated sigmoid diverticulitis and generalised peritonitis (Hinchey III or IV)</p> <p>Exclusion Criteria: Hinchey I and II, evidence of malignancy, clinical state which prevented patient's participation (septic shock or multi-visceral failure) and the lack of consent</p>	<p>Population: all patients with perforated sigmoid diverticulitis and generalized peritonitis (Hinchey III or IV) undergoing sigmoidectomy with primary anastomosis (PA) or Hartmann's procedure (HP)</p> <p>Intervention: PA vs. HP</p> <p>Comparison: PA vs. HP</p>	<p>Primary: overall and postoperative hospital mortality rate, and permanent stoma rate</p> <p>Secondary: overall and postoperative hospital morbidity rate, hospital duration, unplanned return to theatre rate, anastomotic leakage rate, rate of postoperative intraabdominal abscesses, cost-analysis</p> <p>Results: no statistically significant difference in the rate of postoperative hospital mortality after the index intervention (RR = 0.63, 95% CI 0.23–1.70) as well as no statistically significant difference in the cumulative rate of postoperative hospital mortality after the index intervention and the stoma reversal operation (RR = 0.52, 95% CI 0.20–1.35); no statistically significant difference in the permanent stoma rate (RR = 0.40, 95% CI 0.14–1.16)</p> <p>no statistically significant difference in the rate of postoperative morbidity after the index intervention (RR = 1.05, 95% CI 0.85–1.30)</p> <p>no statistically significant difference in the cumulative rate of postoperative morbidity after the index intervention and the stoma reversal operation combined (RR = 0.96, 95% CI 0.71–1.30)</p> <p>patients in the PA group had a 66% lower risk of a postoperative intra-abdominal abscess than the patients in the HP group (RR = 0.34, 95% CI 0.12–0.96)</p> <p>the pooled rate of cumulative anastomotic leak rate after index intervention including stoma reversal operation was lower in HP group (5/138, 3.6%) than PA group (6/116, 5.2%), however, this difference was not statistically significant</p> <p>Author's Conclusion: PA and HP seem to be equivalent in terms of most outcomes of interest with a lower intra-abdominal abscess rate after the index procedure favouring PA</p>	

**Methodical Notes****Funding Sources:**

COI:

Study Quality:

Heterogeneity:

Publication Bias:

**Notes:**

good: primary end point permanent stoma rate, however, included studies showed heterogeneity in definition of permanent stoma. Therefore, stomas not reversed within 1 year of the index intervention are considered 'permanent' stomas for the purposes of this analysis.

Cirocchi, R. et al. Is laparoscopic surgery the best treatment in fistulas complicating diverticular disease of the sigmoid colon? A systematic review. *Int J Surg.* **24.** 95-100. 2015

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: systematic review</p> <p>Databases: EMBASE and PubMed</p> <p>Search period: January 1991 and March 2015</p> <p>Inclusion Criteria: Published randomized and non-randomized studies in which at least 10 adult patients (age 18 years) underwent laparoscopic surgical treatment for colonic fistula secondary to sigmoid diverticular disease</p> <p>Exclusion Criteria: if the outcomes of interest were not reported or it was not possible to evaluate them based on the published results</p>	<p>Intervention: Operations involving fully laparoscopic, laparoscopic assisted surgery, or hand-assisted laparoscopy surgery were included</p> <p>Comparison:</p>	<p>Primary: Rate of fistula recurrence</p> <p>Secondary: Rate of reoperation for post-operative complications Rate of Hartmann's procedure or proximal diversion Rate of conversion to laparotomy</p> <p>Results: rate of fistula recurrence was 0.8% (1/121) rate of re-operations 2% in patients with complicated diverticulitis the stoma rate was between 21% and 35% conversion rate to open surgery was relatively high 19.7%</p> <p>Author's Conclusion: The lack of RCTs, the small sample size, the heterogeneity of literature do not allow to draw statistically significant conclusions on the laparoscopic surgery for fistulas despite this approach is considered safe. Laparoscopic approach has led to less postoperative pain, shorter hospital stay, faster recovery and better cosmetic results. Laparoscopic resection and primary anastomosis is a possible approach to sigmoid fistulas but its advantages in terms of lower mortality rate and postoperative stay after colon resection with primary anastomosis should be interpreted with caution.</p>	

**Methodical Notes**

Funding Sources: none

COI: none

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Cirocchi, R. et al. Elective sigmoid colectomy for diverticular disease. Laparoscopic vs open surgery: a systematic review. *Colorectal Dis.* **14.** 671-83. 2012

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 1</p> <p>Study type: systematic review</p> <p>Databases: The Cochrane Central Register of Controlled Trials</p>	<p>Intervention: laparoscopic vs. open sigmoid resection and anastomosis</p>	<p>Primary: Overall, 30-day postoperative mortality and 30-day postoperative morbidity</p> <p>Secondary: major surgical complications (anastomotic leakage, intraabdominal abscess, ureteral injuries, accidental enterotomies, postoperative small bowel obstructions and</p>	

<p>(CENTRAL), MEDLINE and EMBASE</p> <p>Search period: December 1990–December 2009</p> <p>Inclusion Criteria: direct comparison between elective open surgical resection (OSR) and laparoscopic surgical resection (LSR) in patients with complicated and uncomplicated diverticular disease of the sigmoid colon</p> <p>Exclusion Criteria: Studies including ascending or transverse colon resection, emergency procedures and procedures performed by surgical trainees were excluded</p>	<p>Comparison:</p>	<p>anastomotic bleeding) and the main minor complications (wound infection and prolonged postoperative ileus)</p> <p>Results: overall morbidity: favors LSR (p=0.01)  minor complications: favors LSR (p=0.008)  major complications n.s.  wound infections: favors LSR (p=0.001)  prolonged postoperative ileum: favors LSR (p=0.006)</p> <p>Author's Conclusion: LSR can be safely performed in an elective treatment for diverticular disease. In the only RCT included the high overall morbidity of 42.3% reported in the LSR group is a cause for concern.</p>
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#### Methodical Notes

#### Funding Sources:

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Cirocchi, R. et al. The role of emergency laparoscopic colectomy for complicated sigmoid diverticulitis: A systematic review and meta-analysis. *Surgeon*. . . 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 3</p> <p>Study type: systematic review and meta-analysis</p> <p>Databases: MEDLINE, SCOPUS and WOS</p> <p>Search period: between January 1990 and February 2018</p> <p>Inclusion Criteria: randomized (RCTs) and nonrandomized controlled trials (non-RCTs) comparing outcomes of emergency/urgent laparoscopic versus open sigmoid resection for complicated diverticulitis</p> <p>Exclusion Criteria:</p>	<p>Intervention:</p> <p>Comparison: laparoscopic vs. open sigmoidectomy for diverticulitis</p>	<p>Primary: post-operative mortality and morbidity rates, overall post-operative complications and rate of Hartmann's procedure vs primary anastomosis after laparoscopic vs open sigmoidectomy.</p> <p>Secondary: reoperation rate, operation time and post-operative length of hospital stay</p> <p>Results: In the rate of post-operative mortality there is little benefit in the laparoscopic group (9/181, 4.97%) than in the open group (p=0.53)  The laparoscopy improves the rate of overall postoperative complications (laparoscopic group 56/181, 30.93% vs open group 132/255, 51.76%) (RR 0.62, 95% CI 0.49 to 0.80; I2= 0%, p =0.0002)  Laparoscopy improves slightly the rate of Hartmann's procedure laparoscopic (28/78, 35.89%) than in open group (70/164, 42.68%)</p> <p>Author's Conclusion: significant advantages are associated with a laparoscopic over open approach to emergency sigmoidectomy in acute diverticulitis in terms of postoperative complication rates, although other outcomes are found equivalent.</p>	

#### Methodical Notes

#### Funding Sources:

COI:

Study Quality:

Heterogeneity:

**Publication Bias:** The limitations of the present study are the inclusion of nonrandomized trials with a high risk of bias and the reported differences in the inclusion criteria between the included studies: two studies included only Hinchey III and IV, whereas the other two included all complications (general and localized peritonitis, intra-abdominal abscess and acute obstruction)

type of surgical treatment was also different: two studies included only Hartmann's procedure, while the other two included sigmoidectomy with Hartmann's procedure or primary anastomosis

Notes:

see bias

Cirocchi, R. et al. Treatment of Hinchey stage III-IV diverticulitis: a systematic review and meta-analysis. *Int J Colorectal Dis.* **28.** 447-57. 2013

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p><b>Evidence level: 2</b></p> <p><b>Study type:</b> systematic review and meta-analysis</p> <p><b>Databases:</b> Medline, Embase, Cochrane Central Register of Controlled Trials, and the Science Citation Index, GreyNet, SIGLE, National Technological Information Service, and British Library Integrated catalogue</p> <p><b>Search period:</b> eligible studies published between 1990 and 2011 were reviewed.</p> <p><b>Inclusion Criteria:</b> surgical treatments for diverticular peritonitis Hinchey III or IV</p> <p><b>Exclusion Criteria:</b> (1) the studies did not report the outcomes of interest of two or more different surgical treatments, or (2) although comparing the different surgical techniques, we cannot directly or indirectly obtain the outcomes of interest peritonitis caused by cancer or inflammatory bowel disease</p>	<p><b>Intervention:</b></p> <ul style="list-style-type: none"> <li>- Colon resection with primary anastomosis</li> <li>- Colon resection with Hartmann's procedure</li> <li>- Proximal diversion without removal of perforated segment of colon</li> <li>- Closure of perforation site with suture</li> <li>- the vacuumassisted closure (VAC) therapy as complementary therapy with the previous surgical strategies</li> </ul> <p><b>Comparison:</b></p> <ol style="list-style-type: none"> <li>1. Colon resection vs suture of the colon perforation</li> <li>2. Colon resection vs maintained perforated diseased segment of colon and proximal colostomy(obsolete!)</li> <li>3. Primary resection vs proximal colostomy followed by secondary resection</li> <li>4. Primary resection with anastomosis vs Hartmann's procedure</li> <li>5. Primary resection with anastomosis vs laparoscopic peritoneal lavage</li> <li>6. Results of colon resection with primary anastomosis±VAC colon vs Hartman's procedure±VAC vs limited sigmoid resection or closure of perforation site with sutures, and VAC</li> </ol>	<p><b>Primary:</b> overall mortality rate re-interventions for complications postoperative stay</p> <p><b>Secondary:</b></p> <p><b>Results:</b> Primary resection with anastomosis has a significant advantage in the resection anastomosis (RA) group in terms of lower mortality rate compared to Hartmann's procedure (P&lt;0.02). The postoperative stay was also significantly lower in the RA group (P&lt;0.001).</p> <p>Overall surgical morbidity and hospital stay were lower in the laparoscopic peritoneal lavage group with respect to the primary resection and anastomosis group (P&lt;0.001)</p> <p><b>Author's Conclusion:</b> Published literature do not allow today an evidence-based surgical management of patient with Hinchey stage III and IV diverticular disease.</p>	

**Methodical Notes**

Funding Sources:

COI:

Study Quality:

Heterogeneity:

**Publication Bias:** the authors conclude that it was a "reflection of the careful selection of patients undergoing resection anastomosis" forming "a group of particularly good prognostic outlook" (selection bias)

Notes:

this review and meta-analysis outlines that according to the literature at that time (2013) the only meaningful comparison is the resection anastomosis vs. Hartmann's procedure

Daher, R. et al. Laparoscopic treatment of complicated colonic diverticular disease: A review. *World J Gastrointest Surg.* **8**: 134-42. 2016

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 5</p> <p>Study type: review</p> <p>Databases: PubMed and Cochrane Library</p> <p>Search period: 1/1995-7/2015</p> <p>Inclusion Criteria: data concerning the laparoscopic approach in both emergent and elective settings of complicated diverticulitis.</p> <p>Exclusion Criteria:</p>	<p>Intervention:</p> <p>Comparison:</p>	<p>Primary:</p> <p>Secondary:</p> <p>Results:</p> <p>Author's Conclusion: laparoscopy is undeniably a promising adjunct in the management of complicated colonic diverticulitis.</p>	
<b>Methodical Notes</b>			
<p>Funding Sources:</p> <p>COI:</p> <p>Study Quality:</p> <p>Heterogeneity:</p> <p>Publication Bias:</p> <p>Notes: only review, no systematic</p>			





## Schlüsselfrage:

**AG 06 Resektionsausmaß**  
**Wo soll der aborale Absetzungsrand lokalisiert sein?**

## Inhalt: 11 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Abraha, I. 2017	1	Systematic metaanalysis of RCT
Agaba, E. A. 2009	1	retrospektive Fallanalyse
Al Natour, R. H. 2018	3	Propensity score matched Analyse zweier Anastomoseverfahren
Albrecht, R. 2011	4	Fallserie, Analyse, Vergleich lap. versus konventionell
Ambrosetti, P. 2005	3	prospective cohort study
Ambrosetti, P. 2008	4	Prospective cohort
Anderson, J. 2007	4	retrospective analysis of prospectively maintained data
Bakker, I. S. 2017	1	RCT
Benn, P. L. 1986	1	retrospective analysis
Bergamaschi, R. 1998	1	Matched pairs
Cirocchi, R. 2013	2	systematic review and meta-analysis

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 2 Bewertung(en)

Abraha, I. et al. Laparoscopic versus open resection for sigmoid diverticulitis. Cochrane Database Syst Rev. 11. CD009277. 2017			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1  Study type: Systematic metaanalysis of RCT Databases:  Search period: 1946-2017  Inclusion Criteria: RCT published or unpublished	Population: 392  Intervention: open versus laparoscopic sigmoid colectomy  Comparison: see 3.6	Primary: mean length of hospital stay  Secondary: 30 day postoperative mortality postoperative complications  Results: no evidence to support or refute the use of laparoscopic surgery to reduce length of hospital stay; operative time was longer with laparoscopy surgery (low-level evidence); evidence insufficient to comment on postoperative pain; Insufficient evidence in favour of one of the interventions for the following outcomes: major complications, postoperative times to liquid and solid diets, and reoperation rate due to anastomotic leak.  Author's Conclusion: Trial authors have presented uncertainty as to whether laparoscopic surgery provides	

Exclusion Criteria: non-RCT	any substantial advantages over open surgery with regard to surgical management of acute diverticular disease.
<b>Methodical Notes</b>	
Funding Sources:	
COI:	
Study Quality:	
Heterogeneity:	
Publication Bias:	
Notes: Exzellent methodology.	

Cirocchi, R. et al. Treatment of Hinchey stage III-IV diverticulitis: a systematic review and meta-analysis. *Int J Colorectal Dis.* 28. 447-57. 2013

Evidence Types	level/Study	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: systematic review and meta-analysis</p> <p>Databases: Medline, Embase, Cochrane Central Register of Controlled Trials, and the Science Citation Index, GreyNet, SIGLE, National Technological Information Service, and British Library Integrated catalogue</p> <p>Search period: eligible studies published between 1990 and 2011 were reviewed.</p> <p>Inclusion Criteria: surgical treatments for diverticular peritonitis Hinchey III or IV</p> <p>Exclusion Criteria: (1) the studies did not report the outcomes of interest of two or more different surgical treatments, or (2) although comparing the different surgical techniques, we cannot directly or indirectly obtain the outcomes of interest peritonitis caused by cancer or inflammatory bowel disease</p>		<p>Intervention:</p> <ul style="list-style-type: none"> <li>- Colon resection with primary anastomosis</li> <li>- Colon resection with Hartmann's procedure</li> <li>- Proximal diversion without removal of perforated segment of colon</li> <li>- Closure of perforation site with suture</li> <li>- the vacuumassisted closure (VAC) therapy as complementary therapy with the previous surgical strategies</li> </ul> <p>Comparison:</p> <ol style="list-style-type: none"> <li>1. Colon resection vs suture of the colon perforation</li> <li>2. Colon resection vs maintained perforated diseased segment of colon and proximal colostomy(obsolete!)</li> <li>3. Primary resection vs proximal colostomy followed by secondary resection</li> <li>4. Primary resection with anastomosis vs Hartmann's procedure</li> <li>5. Primary resection with anastomosis vs laparoscopic peritoneal lavage</li> <li>6. Results of colon resection with primary anastomosis±VAC colon vs Hartman's procedure±VAC vs limited sigmoid resection or</li> </ol>	<p>Primary: overall mortality rate re-interventions for complications postoperative stay</p> <p>Secondary:</p> <p>Results: Primary resection with anastomosis has a significant advantage in the resection anastomosis (RA) group in terms of lower mortality rate compared to Hartmann's procedure (P&lt;0.02). The postoperative stay was also significantly lower in the RA group (P&lt;0.001). Overall surgical morbidity and hospital stay were lower in the laparoscopic peritoneal lavage group with respect to the primary resection and anastomosis group (P&lt;0.001)</p> <p>Author's Conclusion: Published literature do not allow today an evidence-based surgical management of patient with Hinchey stage III and IV diverticular disease.</p>	

	closure of perforation site with sutures, and VAC	
<b>Methodical Notes</b>		
<b>Funding Sources:</b>		
COI:		
Study Quality:		
Heterogeneity:		
Publication Bias: the authors conclude that it was a “reflection of the careful selection of patients undergoing resection anastomosis” forming “a group of particularly good prognostic outlook” (selection bias)		
Notes: this review and meta-analysis outlines that according to the literature at that time (2013) the only meaningful comparison is the resection anastomosis vs. Hartmann's procedure		

**OXFORD (2011) Appraisal Sheet: RCT: 1 Bewertung(en)**

Bakker, I. S. et al. Randomized clinical trial of biodegradable intraluminal sheath to prevent anastomotic leak after stapled colorectal anastomosis. <i>Br J Surg.</i> <b>104.</b> 1010-1019. 2017		
<b>Population</b>	<b>Intervention - Comparison</b>	<b>Outcomes/Results</b>
Evidence level: 1 Study type: RCT Number of Patient: 402, 202 versus 200 control Recruiting Phase: December 2011 and December 2013 Inclusion Criteria: elective surgery with a stapled colorectal anastomosis less than 15 cm from the anal verge Exclusion Criteria:	Intervention: protective sheet Comparison: no sheet	Primary: leak rate within 30d Secondary: Secondary endpoints included the number of dismantled anastomoses, the grade of anastomotic leakage according to the International Study Group of Rectal Cancer <sup>13</sup> , the interval between primary surgery and the occurrence of anastomotic leakage, the number of stomas created, and the total duration of hospital stay including readmissions for adverse events. Results: Anastomotic leakage was diagnosed in 31 patients (7.7 per cent), with a 10.4 per cent leak rate in the C-seal group and 5.0 per cent in the control group (P = 0.060). Male sex showed a trend towards a higher leak rate (P = 0.055). Construction of a defunctioning stoma led to a lower leakage rate, although this was not significant (P = 0.095). Author's Conclusion: C-seal application in stapled colorectal anastomoses does not reduce anastomotic leakage
<b>Methodical Notes</b>		
<b>Funding Sources:</b>		
COI:		
Randomization: Patients were distributed equally to C-seal and control groups by means of an online digital randomization system		
Blinding: This randomized controlled unblinded trial was conducted in 41 hospitals in the Netherlands, Hungary, Germany, France and Spain.		
Dropout Rate/ITT-Analysis:		

**Notes:**

no information about extent of resection, level of anastomosis 15cm (colorectal?)

**NEWCASTLE - OTTAWA Checklist: Case Control: 3 Bewertung(en)**

Agaba, E. A. et al. Laparoscopic Hartmann's procedure: a viable option for treatment of acutely perforated diverticulitis. *Surg Endosc.* **23.** 1483-6. 2009

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 1  Study type: retrospektive Fallanalyse	Funding sources:  Conflict of Interests:  Randomization: keine  Blinding: keine  Dropout rates: kein Dropout bei insgesamt n=7	Total no. patients: 7  Patient characteristics: December 2004 and January 2006  Inclusion criteria: Hinchey III/IV sigmoid diverticulitis  Exclusion criteria: ?	Interventions: 7  Comparison: none
Notes:	nur 7 Fälle, proximale Resektionslinie: oberhalb Entzündung, distale Resektionslinie Rektosigmoid, allerdings zunächst nur Hartmann. Lap Reversal dann in 2-3 Mon  Author's conclusion: Simple Retrospektive Machbarkeitsanalyse, lap Hartmann im Notfall		
Outcome Measures/results	Primary estimated blood loss (EBL), length of the operative procedure, patient outcomes, and demographics were evaluated.  Secondary	Results: 7 pat, mean age of 49.7 y lap Hartmann. Mean EBL was 138 ml, mean operative time was 154 min. no conversion. The average time to return of bowel function: 3.7 d. mean postoperative hospital stay: 6.6 days. There were no complications. Laparoscopic Hartmann's takedown was performed for all the patients approximately 2 to 3 months later. The mean EBL was 107 ml, and the average operative time was 189 min. One patient had intraoperative anastomotic leak, which was successfully repaired and retested.	

Al Natour, R. H. et al. A propensity score matched comparison of intracorporeal and extracorporeal techniques for robotic-assisted sigmoidectomy in an enhanced recovery pathway. *J Robot Surg.* . . 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: Propensity score matched Analyse zweier Anastomoseverfahren	Funding sources:  Conflict of Interests:  Randomization:  Blinding:	Total no. patients: 57 vs 57  Patient characteristics:  Inclusion criteria:  Exclusion criteria:	Interventions:  Comparison:

	Dropout rates:	
Notes:	Author's conclusion:	
Outcome Measures/results	Primary Secondary	Results:

**Ambrosetti, P. et al. Long-term outcome of mesocolic and pelvic diverticular abscesses of the left colon: a prospective study of 73 cases. Dis Colon Rectum. 48. 787-91. 2005**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: prospective cohort study	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates: 4%	Total no. patients: 76 patients Patient characteristics: October 1986 to October 1997 Inclusion criteria: Patients were included in this prospective study if one or both radiologic examinations were diagnostic of acute diverticulitis or if the diagnosis was made surgically and confirmed histologically. Exclusion criteria:	Interventions: CT-guided percutaneous drainage of the abscess Comparison: emergency surgery
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

**NEWCASTLE - OTTAWA Checklist: Cohort: 5 Bewertung(en)**

**Albrecht, R. et al. Sind eine laparoskopische Diskontinuitätsresektion und eine spätere laparoskopische Rekonstruktion bei der komplizierten Sigmadivertikulitis möglich? [Is it possible to perform a laparoscopic assisted Hartmann's procedure and a subsequent laparoscopically . Zentralbl Chir. 136. 61-5. 2011**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Fallserie, Analyse, Vergleich lap. versus konventionell	Funding sources: kein Funding Conflict of Interests: Randomization: keine Blinding: Dropout rates:	Total no. patients: 45 Pat. mit Hartmann: Davon 15patient lap, komplettiert: n = 13cases. Mortalität 0% Hartmann reversal could be performed in 26 patients (58 %). A laparoscopic approach was chosen in 16 patients and could be successfully completed in 14 cases 12 patients were operated with classical Hartmann reversal. The respective mortality rates in both groups were 0 %. Recruiting Phase: <u>2005-2009</u> Inclusion criteria: Retrospektive Analyse: Divertikulitis-OP	Interventions: Comparison:

	Exclusion criteria:	
Notes:	<p>Fallserie: Machbarkeitsanalyse lap. Hartmann inkl. Reverse Distale Absetzung: mittleres Rektumdrittel</p> <p>Hohe Selektionsbias</p> <p>Author's conclusion:</p>	
Outcome Measures/results	<p>Primary</p> <p>Secondary</p>	Results:

Ambrosetti, P. et al. Colorectal anastomotic stenosis after elective laparoscopic sigmoidectomy for diverticular disease: a prospective evaluation of 68 patients. *Dis Colon Rectum*. 51. 1345-9. 2008

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 4</p> <p>Study type: Prospective cohort</p>	<p>Funding sources:</p> <p>Conflict of Interests:</p> <p>Randomization:</p> <p>Blinding:</p> <p>Dropout rates:</p>	<p>Total no. patients: 68 consecutive patients (34 women)</p> <p>Recruiting Phase: November 1998 to June 2007</p> <p>Inclusion criteria: elective laparoscopic sigmoidectomy for diverticular disease (DD) were included in a prospective evaluation that explored the incidence of symptomatic anastomotic stenosis. All patients were electively operated on after one or more episodes of acute diverticulitis that was proven by CT.</p> <p>Exclusion criteria:</p>	<p>Interventions: Lap Sigmoid resection Großer Methoden bias</p> <p>Anastomosis was end-to-end in 58 patients (85 percent), end-to-side in 8 patients (12 percent), and side- to-end manual in 2 patients (3 percent). The diameter of the PCEA was 31 mm in 63 patients (93 percent) and 34 mm in 3 patients (4 percent). Preservation both of the inferior mesenteric and left colic arteries was done in 29 patients (43 percent), preservation of the inferior mesenteric artery (IMA) alone in 26 patients (38 percent), ligation of the IMA distal to the colic artery in 7 patients (10 percent), and ligation of the IMA at its origin in 6 patients (9 percent).</p> <p>Comparison:</p>
Notes:	<p>Anastomosis was performed on the rectum, distal to the reunion of the taenia by the double-stapling procedure using the linear endo-GIA and the circular PCEA</p> <p>Author's conclusion:</p>		
Outcome Measures/results	<p>Primary anastomotic stenosis was considered when after regular rectoscopic follow-up the anastomosis was not opening with a size inferior to 12 mm, thus preventing the passage of a 12 mm</p>	<p>Results: keine signifikanten Unterschiede, aber auch große Diversivität in der Methodik</p>	

sigmoidoscope
Secondary

<b>Anderson, J. et al. A comparison of laparoscopic, hand-assist and open sigmoid resection in the treatment of diverticular disease. Am J Surg. 193. 400-3; discussion 403. 2007</b>			
<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
Evidence level: 4 Study type: retrospective analysis of prospectively maintained data	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates:	Total no. patients: 30/5/14 Recruiting Phase: Inclusion criteria: diverticulitis Exclusion criteria:	Interventions: lap versus handassist versus open Comparison: lap versus handassist versus open
<b>Notes:</b>	distale resectionslinie rectosigmoid, keine Verlaufsinformation kleine Fallzahl, keine Aussage zur Schlüsselfrage bzgl Resektionsausmaß Author's conclusion:		
<b>Outcome Measures/results</b>	Primary Secondary	<b>Results:</b>	

<b>Benn, P. L. et al. Level of anastomosis and recurrent colonic diverticulitis. Am J Surg. 151. 269-71. 1986</b>			
<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
Evidence level: 1 Study type: retrospective analysis	Funding sources: Conflict of Interests: Randomization: Blinding: Dropout rates: follow-up was at least 5 years for 387 (77 percent)	Total no. patients: 501 Recruiting Phase: 1970to 1975 Inclusion criteria: resections for diverticular disease with anastomosis Exclusion criteria:	Interventions: colosigmoidal versus colorectal anastomosis, open resection Comparison:
<b>Notes:</b>	it seemslogical that resecting the entire sigmoid colon before anastomosis would decrease the likelihood of recurrent diverticulitis. We tested this hypothesis by studying a group of patients who had sigmoid resections for diverticulitis from 1970to 1975. The area where the sigmoid colon ends and the rectum begins should be defined by the teniae coli and by changes in serosa. We suggest that, to avoid recurrent diverticular disease,the entire sigmoid colon should be removed and resected distally onto the rectum. Author's conclusion: In the present study, we found a significant difference in the likelihood of recurrent diverticular disease after resection depending on whether the		

	sigmoid colon or the rectum was used for the distal tissue. We suggest that, to avoid recurrent diverticular disease, the entire sigmoid colon should be removed and resected distally onto the rectum. Mobilization of the upper rectum may require additional operative time, and the area of inflammation may spare the distal sigmoid colon at the time of exploration. Generally, however, a posterior rectal mobilization is all that is required to facilitate an anastomosis.	
Outcome Measures/results	Primary Secondary	Results: In the present study, we found a significant difference in the likelihood of recurrent diverticular disease after resection depending on whether the sigmoid colon or the rectum was used for the distal tissue. Sigmoid colon tissue was used about twice as often as rectal tissue for the distal margin. Recurrences were much more frequent in the patients in whom the sigmoid colon was used. In each group, reoperation was necessary in about 3 percent of patients.

**Bergamaschi, R. et al. Anastomosis level and specimen length in surgery for uncomplicated diverticulitis of the sigmoid. Surg Endosc. 12. 1149-51. 1998**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 1  Study type: Matched pairs	Funding sources: no funding  Conflict of Interests: no conflict  Randomization: none  Blinding:  Dropout rates:	Total no. patients: 40 versus 35 diagnosis-matched controls who previously underwent OCR by the same surgeons at the same institution. With regard to the extent of bowel resection, our institution policy (unchanged throughout the 5-year study period) included placement of proximal resection on normal-appearing descending colon while leaving resection of the distal cuff of possibly uninvolved sigmoid and mobilization of the splenic flexure to the surgeon's preference  Recruiting Phase: <u>1992 - 1994</u>  Inclusion criteria: elektive Resektion bei Divertikulitis With regard to the extent of bowel resection, our institution policy (unchanged throughout the 5-year study period) included placement of proximal resection on normal-appearing descending colon while leaving resection of the distal cuff of possibly uninvolved sigmoid and mobilization of the splenic flexure to the surgeon's preference  Exclusion criteria:	Interventions: Anastomosenhöhe laparoskopisch  Comparison: Anastomosenhöhe offene Resektion
Notes:	The recurrence rate was significantly higher in patients with colosigmoid anastomoses (12%) than in patients with colorectal anastomoses (7%). Reoperation was performed in 29% of the patients with recurrent diverticulitis or 3% of the whole series.  Author's conclusion: The recurrence rate was significantly higher in patients with colosigmoid anastomoses (12%) than in patients with colorectal anastomoses (7%). Reoperation was performed in 29% of the patients with recurrent diverticulitis or 3% of the whole series. Inadequate sigmoid resection should prompt diligence to take down the splenic flexure placing the distal anastomotic margin on the rectum to ensure adequate surgery.		
Outcome Measures/results	Primary Verlaufskontrolle, Rezidivrate  Secondary rektoskopische Anastomosenhöhe	Results: Specimen length (18 cm vs. 11 cm, p	



## Schlüsselfrage:

**AG 06 Resektionsausmaß**  
**Wo soll der proximale Resektionsrand lokalisiert sein?**

## Inhalt: 7 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Abraha, I. 2017	1	Systematic metaanalysis of RCT
Agaba, E. A. 2009	1	retrospektive Fallanalyse
Al Natour, R. H. 2018	3	Propensity score matched Analyse zweier Anastomoseverfahren
Anderson, J. 2007	4	retrospective analysis of prospectively maintained data
Benn, P. L. 1986	1	retrospective analysis
Bergamaschi, R. 1998	1	Matched pairs
Cirocchi, R. 2013	2	systematic review and meta-analysis

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 2 Bewertung(en)

Abraha, I. et al. Laparoscopic versus open resection for sigmoid diverticulitis. Cochrane Database Syst Rev. 11. CD009277. 2017			
Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1  Study type: Systematic metaanalysis of RCT Databases:  Search period: 1946-2017  Inclusion Criteria: RCT published or unpublished  Exclusion Criteria: non-RCT	Population: 392  Intervention: open versus laparoscopic sigmoid colectomy  Comparison: see 3.6	Primary: mean length of hospital stay  Secondary: 30 day postoperative mortality postoperative complications  Results: no evidence to support or refute the use of laparoscopic surgery to reduce length of hospital stay; operative time was longer with laparoscopy surgery (low-level evidence); evidence insufficient to comment on postoperative pain; Insufficient evidence in favour of one of the interventions for the following outcomes: major complications, postoperative times to liquid and solid diets, and reoperation rate due to anastomotic leak.  Author's Conclusion: Trial authors have presented uncertainty as to whether laparoscopic surgery provides any substantial advantages over open surgery with regard to surgical management of acute diverticular disease.	
Methodical Notes			
Funding Sources:			

COI:

Study Quality:

Heterogeneity:

Publication Bias:

Notes:

Exzellent methodology.

Cirocchi, R. et al. Treatment of Hinchey stage III-IV diverticulitis: a systematic review and meta-analysis. *Int J Colorectal Dis.* **28.** 447-57. 2013

Evidence Types	level/Study	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: systematic review and meta-analysis</p> <p>Databases: Medline, Embase, Cochrane Central Register of Controlled Trials, and the Science Citation Index, GreyNet, SIGLE, National Technological Information Service, and British Library Integrated catalogue</p> <p>Search period: eligible studies published between 1990 and 2011 were reviewed.</p> <p>Inclusion Criteria: surgical treatments for diverticular peritonitis Hinchey III or IV</p> <p>Exclusion Criteria: (1) the studies did not report the outcomes of interest of two or more different surgical treatments, or (2) although comparing the different surgical techniques, we cannot directly or indirectly obtain the outcomes of interest peritonitis caused by cancer or inflammatory bowel disease</p>		<p>Intervention:</p> <ul style="list-style-type: none"> <li>- Colon resection with primary anastomosis</li> <li>- Colon resection with Hartmann's procedure</li> <li>- Proximal diversion without removal of perforated segment of colon</li> <li>- Closure of perforation site with suture</li> <li>- the vacuumassisted closure (VAC) therapy as complementary therapy with the previous surgical strategies</li> </ul> <p>Comparison:</p> <ol style="list-style-type: none"> <li>1. Colon resection vs suture of the colon perforation</li> <li>2. Colon resection vs maintained perforated diseased segment of colon and proximal colostomy(obsolete!)</li> <li>3. Primary resection vs proximal colostomy followed by secondary resection</li> <li>4. Primary resection with anastomosis vs Hartmann's procedure</li> <li>5. Primary resection with anastomosis vs laparoscopic peritoneal lavage</li> <li>6. Results of colon resection with primary anastomosis±VAC colon vs Hartman's procedure±VAC vs limited sigmoid resection or closure of perforation site with sutures, and VAC</li> </ol>	<p>Primary: overall mortality rate re-interventions for complications postoperative stay</p> <p>Secondary:</p> <p>Results: Primary resection with anastomosis has a significant advantage in the resection anastomosis (RA) group in terms of lower mortality rate compared to Hartmann's procedure (P&lt;0.02). The postoperative stay was also significantly lower in the RA group (P&lt;0.001). Overall surgical morbidity and hospital stay were lower in the laparoscopic peritoneal lavage group with respect to the primary resection and anastomosis group (P&lt;0.001)</p> <p>Author's Conclusion: Published literature do not allow today an evidence-based surgical management of patient with Hinchey stage III and IV diverticular disease.</p>	

Methodical Notes

Funding Sources:

COI:

**Study Quality:**

**Heterogeneity:**

**Publication Bias:** the authors conclude that it was a “reflection of the careful selection of patients undergoing resection anastomosis” forming “a group of particularly good prognostic outlook” (selection bias)

**Notes:**

this review and meta-analysis outlines that according to the literature at that time (2013) the only meaningful comparison is the resection anastomosis vs. Hartmann's procedure

**NEWCASTLE - OTTAWA Checklist: Case Control: 2 Bewertung(en)**

**Agaba, E. A. et al. Laparoscopic Hartmann's procedure: a viable option for treatment of acutely perforated diverticulitis. Surg Endosc. 23. 1483-6. 2009**

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level: 1</b>  <b>Study type: retrospektive Fallanalyse</b>	<b>Funding sources:</b>  <b>Conflict of Interests:</b>  <b>Randomization: keine</b>  <b>Blinding: keine</b>  <b>Dropout rates: kein Dropout bei insgesamt n=7</b>	<b>Total no. patients: 7</b>  <b>Patient characteristics: December 2004 and January 2006</b>  <b>Inclusion criteria: Hinchey III/IV sigmoid diverticulitis</b>  <b>Exclusion criteria: ?</b>	<b>Interventions: 7</b>  <b>Comparison: none</b>
<b>Notes:</b>	nur 7 Fälle, proximale Resektionslinie: oberhalb Entzündung, distale Resektionslinie Rektosigmoid, allerdings zunächst nur Hartmann. Lap Reversal dann in 2-3 Mon  <b>Author's conclusion: Simple Retrospektive Machbarkeitsanalyse, lap Hartmann im Notfall</b>		
<b>Outcome Measures/results</b>	<b>Primary estimated blood loss (EBL), length of the operative procedure, patient outcomes, and demographics were evaluated.</b>  <b>Secondary</b>	<b>Results: 7 pat, mean age of 49.7 y lap Hartmann. Mean EBL was 138 ml, mean operative time was 154 min. no conversion. The average time to return of bowel function: 3.7 d. mean postoperative hospital stay: 6.6 days. There were no complications. Laparoscopic Hartmann's takedown was performed for all the patients approximately 2 to 3 months later. The mean EBL was 107 ml, and the average operative time was 189 min. One patient had intraoperative anastomotic leak, which was successfully repaired and retested.</b>	

**Al Natour, R. H. et al. A propensity score matched comparison of intracorporeal and extracorporeal techniques for robotic-assisted sigmoidectomy in an enhanced recovery pathway. J Robot Surg. . . 2018**

Evidence level	Methodical Notes	Patient characteristics	Interventions
<b>Evidence level: 3</b>	<b>Funding</b>	<b>Total no. patients:</b>	<b>Interventions:</b>

Study type: Propensity score matched Analyse zweier Anastomoseverfahren	sources:	57 vs 57	Comparison:
	Conflict of Interests:	Patient characteristics:	
	Randomization:	Inclusion criteria:	
	Blinding:	Exclusion criteria:	
	Dropout rates:		
Notes:	Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

**NEWCASTLE - OTTAWA Checklist: Cohort: 3 Bewertung(en)**

Anderson, J. et al. A comparison of laparoscopic, hand-assist and open sigmoid resection in the treatment of diverticular disease. Am J Surg. 193. 400-3; discussion 403. 2007

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4  Study type: retrospective analysis of prospectively maintained data	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 30/5/14  Recruiting Phase:  Inclusion criteria: diverticulitis  Exclusion criteria:	Interventions: lap versus handassist versus open  Comparison: lap versus handassist versus open
Notes:	distale resectionslinie rectosigmoid, keine Verlaufsinformation  kleine Fallzahl, keine Aussage zur Schlüsselfrage bzgl Resektionsausmaß  Author's conclusion:		
Outcome Measures/results	Primary Secondary	Results:	

Benn, P. L. et al. Level of anastomosis and recurrent colonic diverticulitis. Am J Surg. 151. 269-71. 1986

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 1  Study type: retrospective analysis	Funding sources:  Conflict of Interests:  Randomization:	Total no. patients: 501  Recruiting Phase: 1970to 1975  Inclusion criteria: resections for diverticular disease with anastomosis	Interventions: colosigmoidal versus colorectal anastomosis, open resection  Comparison:

	<p><b>Blinding:</b></p> <p><b>Dropout rates:</b> follow-up was at least 5 years for 387 (77 percent)</p>	<p><b>Exclusion criteria:</b></p>
<p><b>Notes:</b></p>	<p>it seems logical that resecting the entire sigmoid colon before anastomosis would decrease the likelihood of recurrent diverticulitis. We tested this hypothesis by studying a group of patients who had sigmoid resections for diverticulitis from 1970 to 1975. The area where the sigmoid colon ends and the rectum begins should be defined by the teniae coli and by changes in serosa. We suggest that, to avoid recurrent diverticular disease, the entire sigmoid colon should be removed and resected distally onto the rectum.</p> <p><b>Author's conclusion:</b> In the present study, we found a significant difference in the likelihood of recurrent diverticular disease after resection depending on whether the sigmoid colon or the rectum was used for the distal tissue. We suggest that, to avoid recurrent diverticular disease, the entire sigmoid colon should be removed and resected distally onto the rectum. Mobilization of the upper rectum may require additional operative time, and the area of inflammation may spare the distal sigmoid colon at the time of exploration. Generally, however, a posterior rectal mobilization is all that is required to facilitate an anastomosis.</p>	
<p><b>Outcome Measures/results</b></p>	<p><b>Primary</b></p> <p><b>Secondary</b></p>	<p><b>Results:</b> In the present study, we found a significant difference in the likelihood of recurrent diverticular disease after resection depending on whether the sigmoid colon or the rectum was used for the distal tissue. Sigmoid colon tissue was used about twice as often as rectal tissue for the distal margin. Recurrences were much more frequent in the patients in whom the sigmoid colon was used. In each group, reoperation was necessary in about 3 percent of patients.</p>

<p><b>Bergamaschi, R. et al. Anastomosis level and specimen length in surgery for uncomplicated diverticulitis of the sigmoid. Surg Endosc. 12. 1149-51. 1998</b></p>			
<b>Evidence level</b>	<b>Methodical Notes</b>	<b>Patient characteristics</b>	<b>Interventions</b>
<p><b>Evidence level:</b> 1</p> <p><b>Study type:</b> Matched pairs</p>	<p><b>Funding sources:</b> no funding</p> <p><b>Conflict of Interests:</b> no conflict</p> <p><b>Randomization:</b> none</p> <p><b>Blinding:</b></p> <p><b>Dropout rates:</b></p>	<p><b>Total no. patients:</b> 40 versus 35 diagnosis-matched controls who previously underwent OCR by the same surgeons at the same institution.</p> <p>With regard to the extent of bowel resection, our institution policy (unchanged throughout the 5-year study period) included placement of proximal resection on normal-appearing descending colon while leaving resection of the distal cuff of possibly uninvolved sigmoid and mobilization of the splenic flexure to the surgeon's preference</p> <p><b>Recruiting Phase:</b> 1992 - 1994</p> <p><b>Inclusion criteria:</b> elektive Resektion bei Divertikulitis</p> <p>With regard to the extent of bowel resection, our institution policy (unchanged throughout the 5-year study period) included placement of proximal resection on normal-appearing descending colon while leaving resection of the distal cuff of possibly uninvolved sigmoid and mobilization of the splenic flexure to the surgeon's preference</p> <p><b>Exclusion criteria:</b></p>	<p><b>Interventions:</b> Anastomosenhöhe laparoskopisch</p> <p><b>Comparison:</b> Anastomosenhöhe offene Resektion</p>

<b>Notes:</b>	<p>The recurrence rate was significantly higher in patients with colosigmoid anastomoses (12%) than in patients with colorectal anastomoses (7%). Reoperation was performed in 29% of the patients with recurrent diverticulitis or 3% of the whole series.</p> <p><b>Author's conclusion:</b> The recurrence rate was significantly higher in patients with colosigmoid anastomoses (12%) than in patients with colorectal anastomoses (7%). Reoperation was performed in 29% of the patients with recurrent diverticulitis or 3% of the whole series.</p> <p>Inadequate sigmoid resection should prompt diligence to take down the splenic flexure placing the dis- tal anastomotic margin on the rectum to ensure adequate surgery.</p>	
<b>Outcome Measures/results</b>	<p><b>Primary</b> Verlaufskontrolle, Rezidivrate</p> <p><b>Secondary</b> rektoskopische Anastomosenhöhe</p>	<p><b>Results:</b> Specimen length (18 cm vs. 11 cm, p</p>



## Schlüsselfrage:

**AG 06 Resektionsausmaß**  
Ist die Resektion sämtlicher divertikeltragender Darmabschnitte erforderlich?

## Inhalt: 6 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Agaba, E. A. 2009	1	retrospektive Fallanalyse
Al Natour, R. H. 2018	3	Propensity score matched Analyse zweier Anastomoseverfahren
Benn, P. L. 1986	1	retrospective analysis
Bergamaschi, R. 1998	1	Matched pairs
Bhakta, A. 2016	1	cohort study
Cirocchi, R. 2013	2	systematic review and meta-analysis

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 1 Bewertung(en)

Cirocchi, R. et al. Treatment of Hinchey stage III-IV diverticulitis: a systematic review and meta-analysis. <i>Int J Colorectal Dis.</i> 28. 447-57. 2013				
Evidence Types	level/Study	P - I - C	Outcomes/Results	Literature References
<p><b>Evidence level: 2</b></p> <p><b>Study type:</b> systematic review and meta-analysis</p> <p><b>Databases:</b> Medline, Embase, Cochrane Central Register of Controlled Trials, and the Science Citation Index, GreyNet, SIGLE, National Technological Information Service, and British Library Integrated catalogue</p> <p><b>Search period:</b> eligible studies published between 1990 and 2011 were reviewed.</p> <p><b>Inclusion Criteria:</b> surgical treatments for diverticular peritonitis Hinchey III or IV</p> <p><b>Exclusion Criteria:</b> (1) the studies did not report the outcomes of interest of two or more different surgical treatments, or (2) although comparing</p>		<p><b>Intervention:</b></p> <ul style="list-style-type: none"> <li>- Colon resection with primary anastomosis</li> <li>- Colon resection with Hartmann's procedure</li> <li>- Proximal diversion without removal of perforated segment of colon</li> <li>- Closure of perforation site with suture</li> <li>- the vacuumassisted closure (VAC) therapy as complementary therapy with the previous surgical strategies</li> </ul> <p><b>Comparison:</b></p> <ol style="list-style-type: none"> <li>1. Colon resection vs suture of the colon perforation</li> <li>2. Colon resection vs maintained perforated diseased segment of colon and proximal colostomy(obsolete!)</li> <li>3. Primary resection vs proximal colostomy followed by secondary resection</li> </ol>	<p><b>Primary:</b> overall mortality rate re-interventions for complications postoperative stay</p> <p><b>Secondary:</b></p> <p><b>Results:</b> Primary resection with anastomosis has a significant advantage in the resection anastomosis (RA) group in terms of lower mortality rate compared to Hartmann's procedure (P&lt;0.02). The postoperative stay was also significantly lower in the RA group (P&lt;0.001). Overall surgical morbidity and hospital stay were lower in the laparoscopic peritoneal lavage group with respect to the primary resection and anastomosis group (P&lt;0.001)</p> <p><b>Author's Conclusion:</b> Published literature do not allow today an evidence-based surgical management of patient with</p>	

the different surgical techniques, we cannot directly or indirectly obtain the outcomes of interest peritonitis caused by cancer or inflammatory bowel disease	4. Primary resection with anastomosis vs Hartmann's procedure 5. Primary resection with anastomosis vs laparoscopic peritoneal lavage 6. Results of colon resection with primary anastomosis±VAC colon vs Hartman's procedure±VAC vs limited sigmoid resection or closure of perforation site with sutures, and VAC	Hinchey stage III and IV diverticular disease.
<b>Methodical Notes</b>		
<p><b>Funding Sources:</b></p> <p><b>COI:</b></p> <p><b>Study Quality:</b></p> <p><b>Heterogeneity:</b></p> <p><b>Publication Bias:</b> the authors conclude that it was a "reflection of the careful selection of patients undergoing resection anastomosis" forming "a group of particularly good prognostic outlook" (selection bias)</p> <p><b>Notes:</b> this review and meta-analysis outlines that according to the literature at that time (2013) the only meaningful comparison is the resection anastomosis vs. Hartmann's procedure</p>		

**NEWCASTLE - OTTAWA Checklist: Case Control: 2 Bewertung(en)**

<b>Agaba, E. A. et al. Laparoscopic Hartmann's procedure: a viable option for treatment of acutely perforated diverticulitis. Surg Endosc. 23. 1483-6. 2009</b>			
Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 1</p> <p>Study type: retrospektive Fallanalyse</p>	<p>Funding sources:</p> <p>Conflict of Interests:</p> <p>Randomization: keine</p> <p>Blinding: keine</p> <p>Dropout rates: kein Dropout bei insgesamt n=7</p>	<p>Total no. patients: 7</p> <p>Patient characteristics: December 2004 and January 2006</p> <p>Inclusion criteria: Hinchey III/IV sigmoid diverticulitis</p> <p>Exclusion criteria: ?</p>	<p>Interventions: 7</p> <p>Comparison: none</p>
<b>Notes:</b>	<p>nur 7 Fälle, proximale Resektionslinie: oberhalb Entzündung, distale Resektionslinie Rektosigmoid, allerdings zunächst nur Hartmann. Lap Reversal dann in 2-3 Mon</p> <p>Author's conclusion: Simple Retrospektive Machbarkeitsanalyse, lap Hartmann im Notfall</p>		
<b>Outcome Measures/results</b>	<b>Primary estimated</b>	<b>Results: 7 pat, mean age of 49.7 y lap Hartmann. Mean EBL was 138 ml, mean operative time was 154 min. no conversion. The average time</b>	



	blood loss (EBL), length of the operative procedure, patient outcomes, and demographics were evaluated.	to return of bowel function: 3.7 d. mean postoperative hospital stay: 6.6 days. There were no complications. Laparoscopic Hartmann's takedown was performed for all the patients approximately 2 to 3 months later. The mean EBL was 107 ml, and the average operative time was 189 min. One patient had intraoperative anastomotic leak, which was successfully repaired and retested.
	Secondary	

Al Natour, R. H. et al. A propensity score matched comparison of intracorporeal and extracorporeal techniques for robotic-assisted sigmoidectomy in an enhanced recovery pathway. *J Robot Surg.* . . 2018

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: Propensity score matched Analyse zweier Anastomoseverfahren	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 57 vs 57  Patient characteristics:  Inclusion criteria:  Exclusion criteria:	Interventions:  Comparison:
Notes:	Author's conclusion:		
Outcome Measures/results	Primary  Secondary	Results:	

**NEWCASTLE - OTTAWA Checklist: Cohort: 3 Bewertung(en)**

Benn, P. L. et al. Level of anastomosis and recurrent colonic diverticulitis. *Am J Surg.* **151.** 269-71. 1986

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 1  Study type: retrospective analysis	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates: follow-up was at least 5 years for 387 (77 percent)	Total no. patients: 501  Recruiting Phase: 1970to 1975  Inclusion criteria: resections for diverticular disease with anastomosis  Exclusion criteria:	Interventions: colosigmoidal versus colorectal anastomosis, open resection  Comparison:

Notes:	<p>it seems logical that resecting the entire sigmoid colon before anastomosis would decrease the likelihood of recurrent diverticulitis. We tested this hypothesis by studying a group of patients who had sigmoid resections for diverticulitis from 1970 to 1975. The area where the sigmoid colon ends and the rectum begins should be defined by the teniae coli and by changes in serosa. We suggest that, to avoid recurrent diverticular disease, the entire sigmoid colon should be removed and resected distally onto the rectum.</p> <p>Author's conclusion: In the present study, we found a significant difference in the likelihood of recurrent diverticular disease after resection depending on whether the sigmoid colon or the rectum was used for the distal tissue. We suggest that, to avoid recurrent diverticular disease, the entire sigmoid colon should be removed and resected distally onto the rectum. Mobilization of the upper rectum may require additional operative time, and the area of inflammation may spare the distal sigmoid colon at the time of exploration. Generally, however, a posterior rectal mobilization is all that is required to facilitate an anastomosis.</p>	
Outcome Measures/results	<p>Primary</p> <p>Secondary</p>	<p>Results: In the present study, we found a significant difference in the likelihood of recurrent diverticular disease after resection depending on whether the sigmoid colon or the rectum was used for the distal tissue. Sigmoid colon tissue was used about twice as often as rectal tissue for the distal margin. Recurrences were much more frequent in the patients in whom the sigmoid colon was used. In each group, reoperation was necessary in about 3 percent of patients.</p>

Bergamaschi, R. et al. Anastomosis level and specimen length in surgery for uncomplicated diverticulitis of the sigmoid. *Surg Endosc.* 12. 1149-51. 1998

Evidence level	Methodical Notes	Patient characteristics	Interventions
<p>Evidence level: 1</p> <p>Study type: Matched pairs</p>	<p>Funding sources: no funding</p> <p>Conflict of Interests: no conflict</p> <p>Randomization: none</p> <p>Blinding:</p> <p>Dropout rates:</p>	<p>Total no. patients: 40 versus 35 diagnosis-matched controls who previously underwent OCR by the same surgeons at the same institution.</p> <p>With regard to the extent of bowel resection, our institution policy (unchanged throughout the 5-year study period) included placement of proximal resection on normal-appearing descending colon while leaving resection of the distal cuff of possibly uninvolved sigmoid and mobilization of the splenic flexure to the surgeon's preference</p> <p>Recruiting Phase: <u>1992 - 1994</u></p> <p>Inclusion criteria: elektive Resektion bei Divertikulitis</p> <p>With regard to the extent of bowel resection, our institution policy (unchanged throughout the 5-year study period) included placement of proximal resection on normal-appearing descending colon while leaving resection of the distal cuff of possibly uninvolved sigmoid and mobilization of the splenic flexure to the surgeon's preference</p> <p>Exclusion criteria:</p>	<p>Interventions: Anastomosenhöhe laparoskopisch</p> <p>Comparison: Anastomosenhöhe offene Resektion</p>
Notes:	<p>The recurrence rate was significantly higher in patients with colosigmoid anastomoses (12%) than in patients with colorectal anastomoses (7%). Reoperation was performed in 29% of the patients with recurrent diverticulitis or 3% of the whole series.</p> <p>Author's conclusion: The recurrence rate was significantly higher in patients with colosigmoid anastomoses (12%) than in patients with colorectal anastomoses (7%). Reoperation was performed in 29% of the patients with recurrent diverticulitis or 3% of the whole series.</p>		

	Inadequate sigmoid resection should prompt diligence to take down the splenic flexure placing the distal anastomotic margin on the rectum to ensure adequate surgery.	
Outcome Measures/results	Primary Verlaufskontrolle, Rezidivrate  Secondary rektoskopische Anastomosenhöhe	Results: Specimen length (18 cm vs. 11 cm, p

**Bhakta, A. et al. Laparoscopic sigmoid colectomy for complicated diverticulitis is safe: review of 576 consecutive colectomies. Surg Endosc. 30. 1629-34. 2016**

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 1  Study type: cohort study	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 576  Recruiting Phase: December 2001 and May 2013  Inclusion criteria: all patients with diverticulitis requiring elective operation were offered laparoscopic sigmoid colectomy as the initial approach  Exclusion criteria: no exclusion criteria	Interventions: Our operative technique entailed selective takedown of the splenic flexure, mandatory identification of the left ureter, exteriorization through a 4-cm infraumbilical mid-line incision, intracorporeal end-to-end anastomosis, followed by a pneumatic air leak test.  Comparison: simple diverticulitis vs. complicated diverticulitis
Notes:	komplizierte Divertikulitis mit komplikativerem Verlauf als simple Divertikulitis Keine Aussage zum Resektionsausmaß, niedrige Konversionsrate  Author's conclusion:		
Outcome Measures/results	Primary variables evaluated included time to ROBF, HLOS, morbidity, and mortality. ROBF was defined as the postoperative day when patients were able to tolerate a diet or reported passage of flatus  Secondary Post-operative morbidity included superficial surgical site infection (SSI), deep incisional SSI, organ space SSI, anastomotic leak, incisional hernia, Clostridium difficile infection, and ileus.	Results: With regard to anastomotic integrity, the leak rates for overall, SD, and CD were 2.1 % (n = 12), 2.3 % (n = 10), and 1.4 % (n = 2), respectively	

## Schlüsselfrage:

## AG 06 Operative Verfahrenswahl

Ist die Sigmaresektion mit primärer Kontinuitätswiederherstellung mit Anastomose und Vorschaltung eines Ileostoma einer Hartmann Operation vorzuziehen?

## Inhalt: 5 Literaturstellen

Literaturstelle	Evidenzlevel	Studientyp
Binda, G. A. 2012	3	
Cirocchi, R. 2018	2	systematic review
Cirocchi, R. 2013	2	systematic review and meta-analysis
Constantinides, V. A. 2006	3	systematic review and meta-analysis
Tartaglia, D. 2019	3	cohort study

## OXFORD (2011) Appraisal Sheet: Systematic Reviews: 3 Bewertung(en)

Cirocchi, R. et al. Perforated sigmoid diverticulitis: Hartmann's procedure or resection with primary anastomosis-a systematic review and meta-analysis of randomised control trials. *Tech Coloproctol.* **22.** 743-753. 2018

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: systematic review</p> <p>Databases: MEDLINE, Embase, SCOPUS and Web of Science for publications</p> <p>Search period: up to March 2018</p> <p>Inclusion Criteria: randomized controlled trials (RCTs) comparing the outcomes of sigmoidectomy with PA versus HP in adults with perforated sigmoid diverticulitis and generalised peritonitis (Hinchey III or IV)</p> <p>Exclusion Criteria: Hinchey I and II, evidence of malignancy, clinical state which prevented patient's participation (septic shock or multi-visceral failure) and the lack of consent</p>	<p>Population: all patients with perforated sigmoid diverticulitis and generalized peritonitis (Hinchey III or IV) undergoing sigmoidectomy with primary anastomosis (PA) or Hartmann's procedure (HP)</p> <p>Intervention: PA vs. HP</p> <p>Comparison: PA vs. HP</p>	<p>Primary: overall and postoperative hospital mortality rate, and permanent stoma rate</p> <p>Secondary: overall and postoperative hospital morbidity rate, hospital duration, unplanned return to theatre rate, anastomotic leakage rate, rate of postoperative intraabdominal abscesses, cost-analysis</p> <p>Results: no statistically significant difference in the rate of postoperative hospital mortality after the index intervention (RR = 0.63, 95% CI 0.23–1.70) as well as no statistically significant difference in the cumulative rate of postoperative hospital mortality after the index intervention and the stoma reversal operation (RR = 0.52, 95% CI 0.20–1.35); no statistically significant difference in the permanent stoma rate (RR = 0.40, 95% CI 0.14–1.16)</p> <p>no statistically significant difference in the rate of postoperative morbidity after the index intervention (RR = 1.05, 95% CI 0.85–1.30)</p> <p>no statistically significant difference in the cumulative rate of postoperative morbidity after the index intervention and the stoma reversal operation combined (RR = 0.96, 95% CI 0.71–1.30)</p> <p>patients in the PA group had a 66% lower risk of a postoperative intra-abdominal abscess than the patients in the HP group (RR = 0.34, 95% CI 0.12–0.96)</p> <p>the pooled rate of cumulative anastomotic leak rate after index intervention including stoma reversal operation was lower in HP group (5/138, 3.6%) than PA group (6/116, 5.2%), however, this difference was not statistically significant</p> <p>Author's Conclusion: PA and HP seem to be equivalent in terms of most outcomes of interest with a lower intra-abdominal abscess rate after the index procedure favouring PA</p>	

## Methodical Notes

**Funding Sources:**

COI:

Study Quality:

Heterogeneity:

Publication Bias:

**Notes:**

good: primary end point permanent stoma rate, however, included studies showed heterogeneity in definition of permanent stoma. Therefore, stomas not reversed within 1 year of the index intervention are considered 'permanent' stomas for the purposes of this analysis.

Cirocchi, R. et al. Treatment of Hinchey stage III-IV diverticulitis: a systematic review and meta-analysis. *Int J Colorectal Dis.* **28**, 447-57. 2013

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
<p>Evidence level: 2</p> <p>Study type: systematic review and meta-analysis</p> <p>Databases: Medline, Embase, Cochrane Central Register of Controlled Trials, and the Science Citation Index, GreyNet, SIGLE, National Technological Information Service, and British Library Integrated catalogue</p> <p>Search period: eligible studies published between 1990 and 2011 were reviewed.</p> <p>Inclusion Criteria: surgical treatments for diverticular peritonitis Hinchey III or IV</p> <p>Exclusion Criteria: (1) the studies did not report the outcomes of interest of two or more different surgical treatments, or (2) although comparing the different surgical techniques, we cannot directly or indirectly obtain the outcomes of interest peritonitis caused by cancer or inflammatory bowel disease</p>	<p>Intervention:</p> <ul style="list-style-type: none"> <li>- Colon resection with primary anastomosis</li> <li>- Colon resection with Hartmann's procedure</li> <li>- Proximal diversion without removal of perforated segment of colon</li> <li>- Closure of perforation site with suture</li> <li>- the vacuumassisted closure (VAC) therapy as complementary therapy with the previous surgical strategies</li> </ul> <p>Comparison:</p> <ol style="list-style-type: none"> <li>1. Colon resection vs suture of the colon perforation</li> <li>2. Colon resection vs maintained perforated diseased segment of colon and proximal colostomy(obsolete!)</li> <li>3. Primary resection vs proximal colostomy followed by secondary resection</li> <li>4. Primary resection with anastomosis vs Hartmann's procedure</li> <li>5. Primary resection with anastomosis vs laparoscopic peritoneal lavage</li> <li>6. Results of colon resection with primary anastomosis±VAC colon vs Hartman's procedure±VAC vs limited sigmoid resection or closure of perforation site with sutures, and VAC</li> </ol>	<p>Primary: overall mortality rate re-interventions for complications postoperative stay</p> <p>Secondary:</p> <p>Results: Primary resection with anastomosis has a significant advantage in the resection anastomosis (RA) group in terms of lower mortality rate compared to Hartmann's procedure (P&lt;0.02). The postoperative stay was also significantly lower in the RA group (P&lt;0.001). Overall surgical morbidity and hospital stay were lower in the laparoscopic peritoneal lavage group with respect to the primary resection and anastomosis group (P&lt;0.001)</p> <p>Author's Conclusion: Published literature do not allow today an evidence-based surgical management of patient with Hinchey stage III and IV diverticular disease.</p>	

**Methodical Notes****Funding Sources:**

COI:

Study Quality:

Heterogeneity:

Publication Bias: the authors conclude that it was a "reflection of the careful selection of patients undergoing resection anastomosis" forming "a group of particularly good prognostic outlook" (selection bias)

**Notes:**

this review and meta-analysis outlines that according to the literature at that time (2013) the only meaningful comparison is the resection anastomosis vs. Hartmann's procedure

Constantinides, V. A. et al. Primary resection with anastomosis vs. Hartmann's procedure in nonelective surgery for acute colonic diverticulitis: a systematic review. *Dis Colon Rectum*. 49. 966-81. 2006

Evidence level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 3  Study type: systematic review and meta-analysis Databases:  Search period: between 1984 and 2004  Inclusion Criteria:  Exclusion Criteria:	Population: pst with acute colonic diverticulitis  Intervention: primary resection with anastomosis Hartmann's procedure  Comparison: primary resection with anastomosis vs. Hartmann's procedure	Primary: postoperative mortality  Secondary: surgical and medical morbidity, operative time, and length of postoperative hospitalization.  Results: Overall mortality was significantly reduced with primary resection and anastomosis (4.9 vs. 15.1 percent; odds ratio = 0.41) significantly decreased mortality with primary resection and anastomosis (7.4 vs. 15.6 percent; odds ratio = 0.44). No significant difference in mortality was observed in trials matched for severity of peritonitis Hinchey > 2 (14.1 vs. 14.4 percent; odds ratio = 0.85)  Author's Conclusion: Patients selected for primary resection and anastomosis have a lower mortality than those treated by Hartmann's procedure in the emergency setting and comparable mortality under conditions of generalized peritonitis (Hinchey > 2).	

#### Methodical Notes

#### Funding Sources:

COI:

Study Quality:

Heterogeneity: Sensitivity analysis did not reveal significant heterogeneity between the studies for the primary outcome.

Publication Bias: patient selection bias

Notes:

*OXFORD (2011) Appraisal Sheet: RCT: 1 Bewertung(en)*

Binda, G. A. et al. Primary anastomosis vs nonrestorative resection for perforated diverticulitis with peritonitis: a prematurely terminated randomized controlled trial. *Colorectal Dis*. 14. 1403-10. 2012

Population	Intervention - Comparison	Outcomes/Results
Evidence level: 3  Study type:  Number of Patient:  Recruiting Phase:  Inclusion Criteria:  Exclusion Criteria:	Intervention:  Comparison:	Primary:  Secondary:  Results:  Author's Conclusion:

#### Methodical Notes

#### Funding Sources:

COI:

Randomization:

Blinding:

Dropout Rate/ITT-Analysis:

Notes:

the study was closed prematurely because of logistic reasons (difficulties inherent in researching emergency surgery for a life-threatening condition as well as the multicentre design)

imbalanced study arm numbers: 34 PRA and 56 nonrestorative resections

**NEWCASTLE - OTTAWA Checklist: Cohort: 1 Bewertung(en)**

Tartaglia, D. et al. Damage control surgery for perforated diverticulitis with diffuse peritonitis: saves lives and reduces ostomy. *World J Emerg Surg.* 14. 19. 2019

Evidence level	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3  Study type: cohort study	Funding sources:  Conflict of Interests:  Randomization:  Blinding:  Dropout rates:	Total no. patients: 34  Recruiting Phase: <u>2011-2017</u>  Inclusion criteria: patients with perforated diverticulitis Hinchey grade III and IV  Exclusion criteria: age >90yrs, presence of poor-prognosis-associated comorbidities or severe limitation of self-sufficiency that a priori favored the choice of an end colostomy	Interventions: damage control with two-staged restoration of bowel continuity and Hartmann's procedure  Comparison: see above
Notes:	no statement about total number of patients treated in the observational period in each center  Author's conclusion: DCS is feasible, related to higher rate of bowel reconstruction		
Outcome Measures/results	Primary mortality and morbidity and intestinal anastomosis rate w/wo temporary stoma  Secondary length of ICU stay, length of total po stay, recurrence of div, late development of incisional hernia	Results: 71% had restoration of bowel continuity, 29% Hartmann's procedure, mortality rate was 12%, at Multivariate analysis male gender and Mannheim Peritonitis Index correlated with Hartmann's procedures	

**Versionsnummer: 2.1**

**Erstveröffentlichung: 05/2014**

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