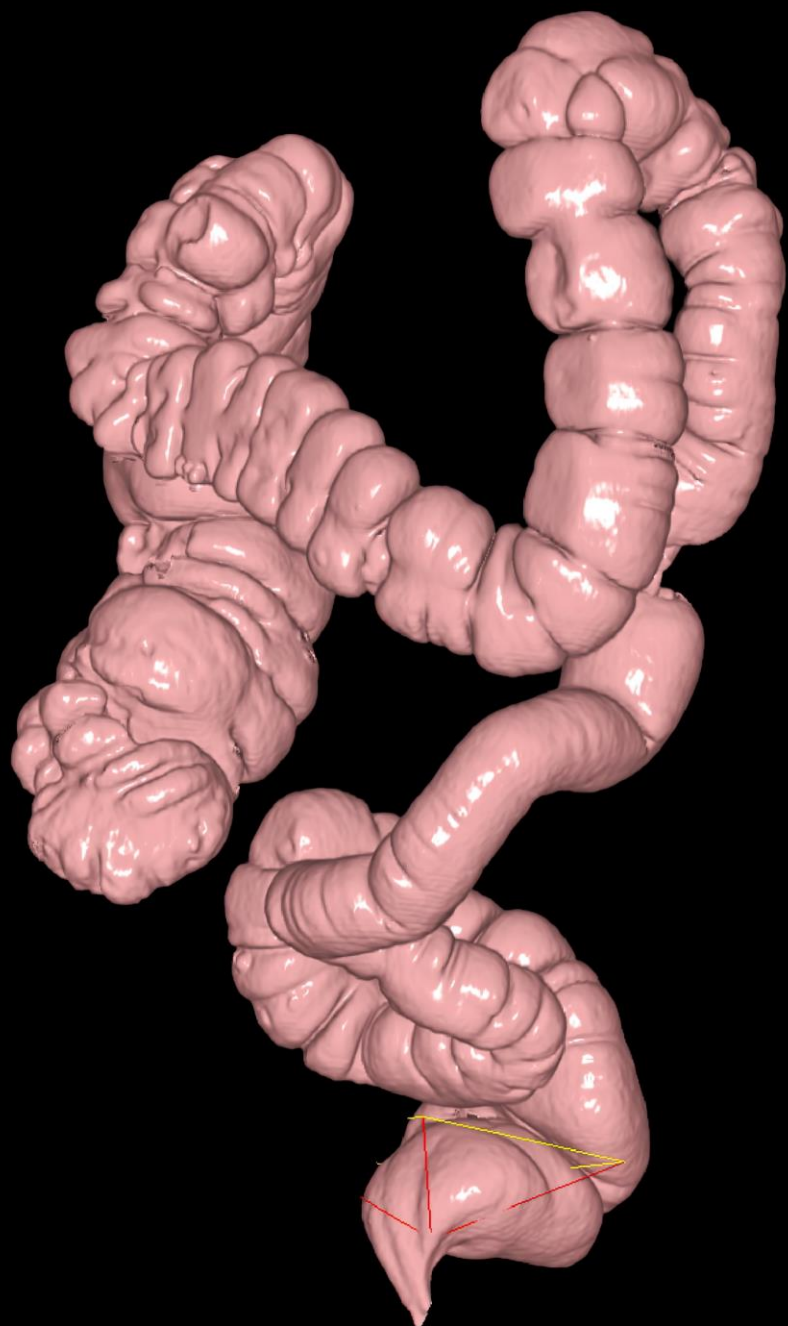
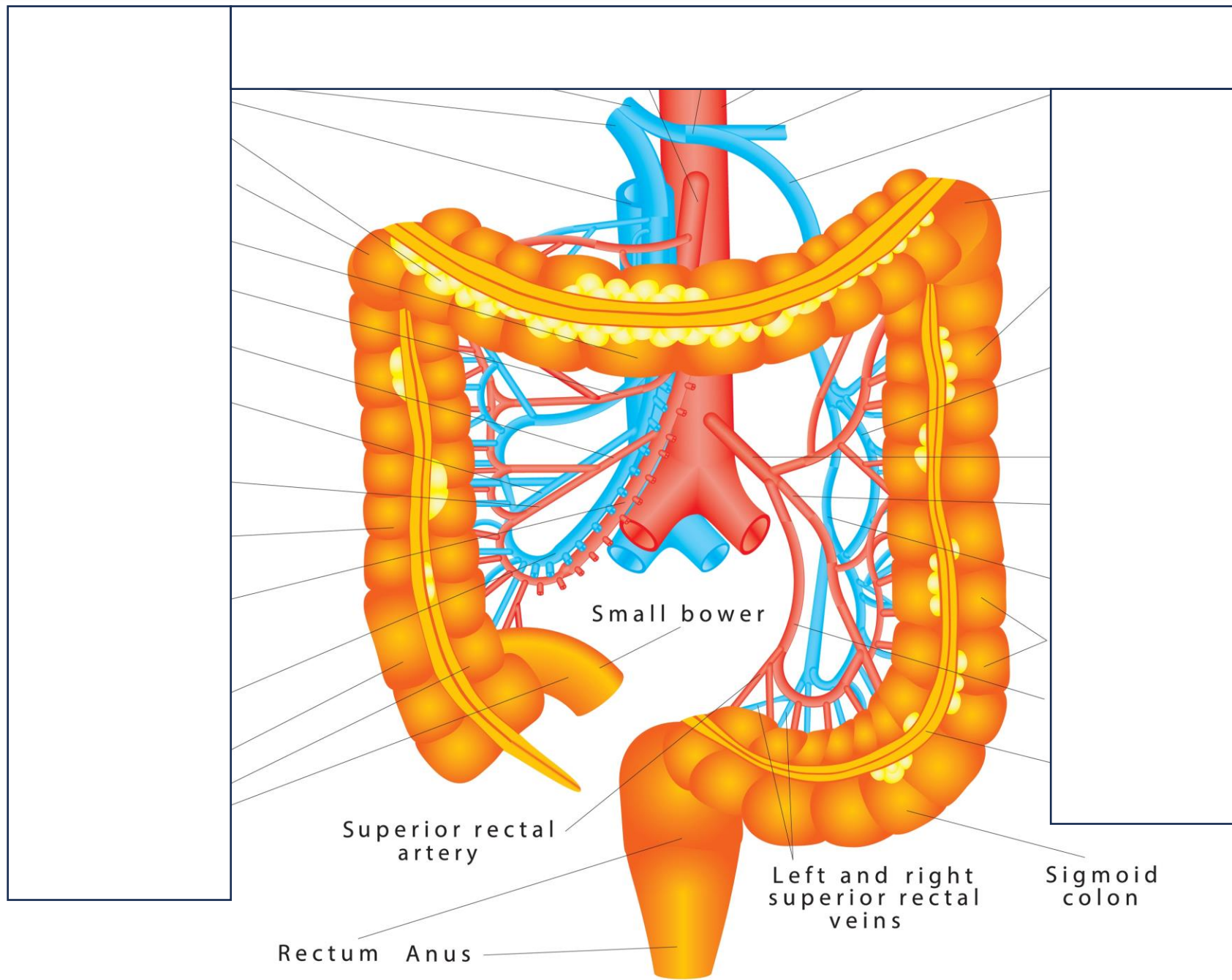
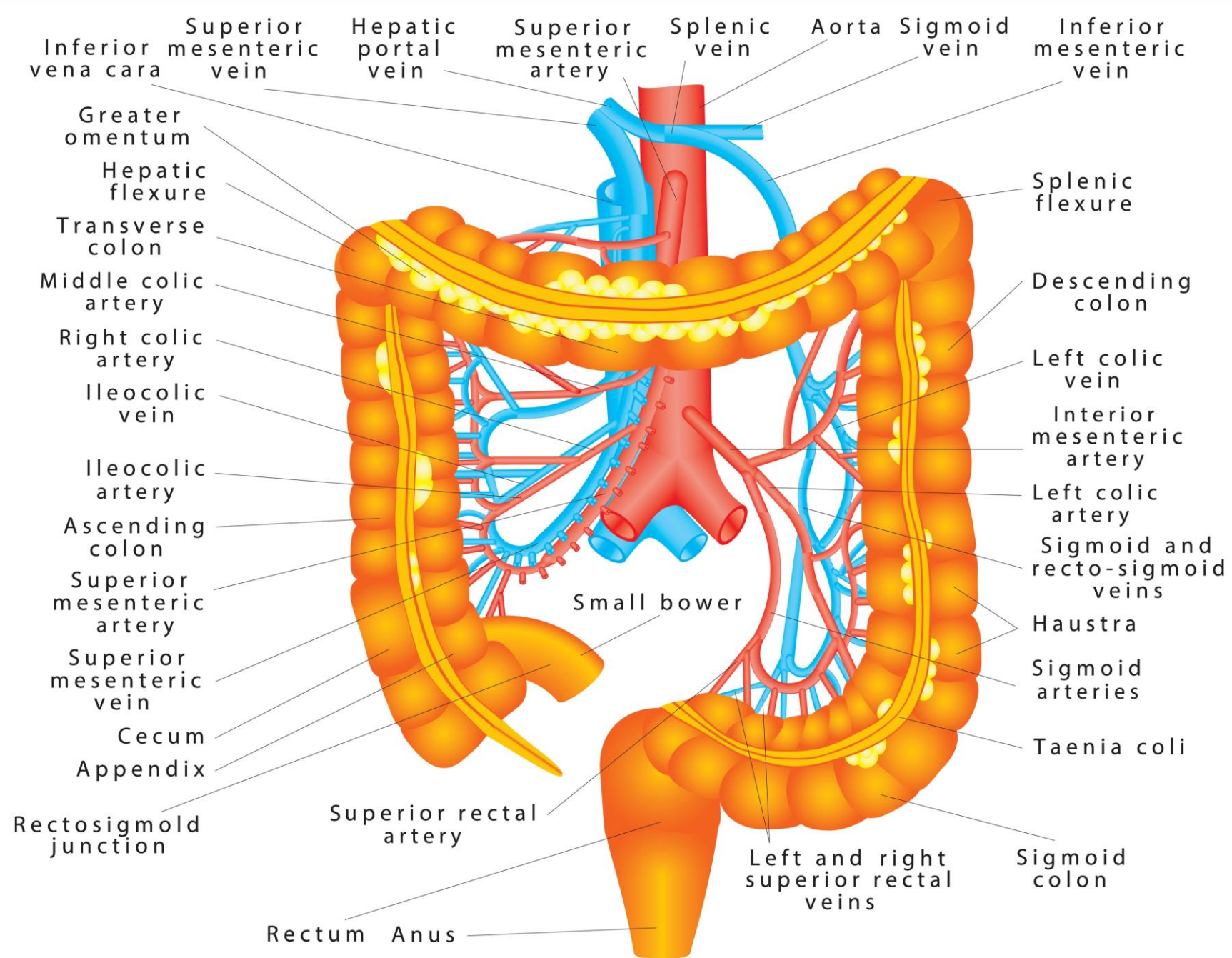


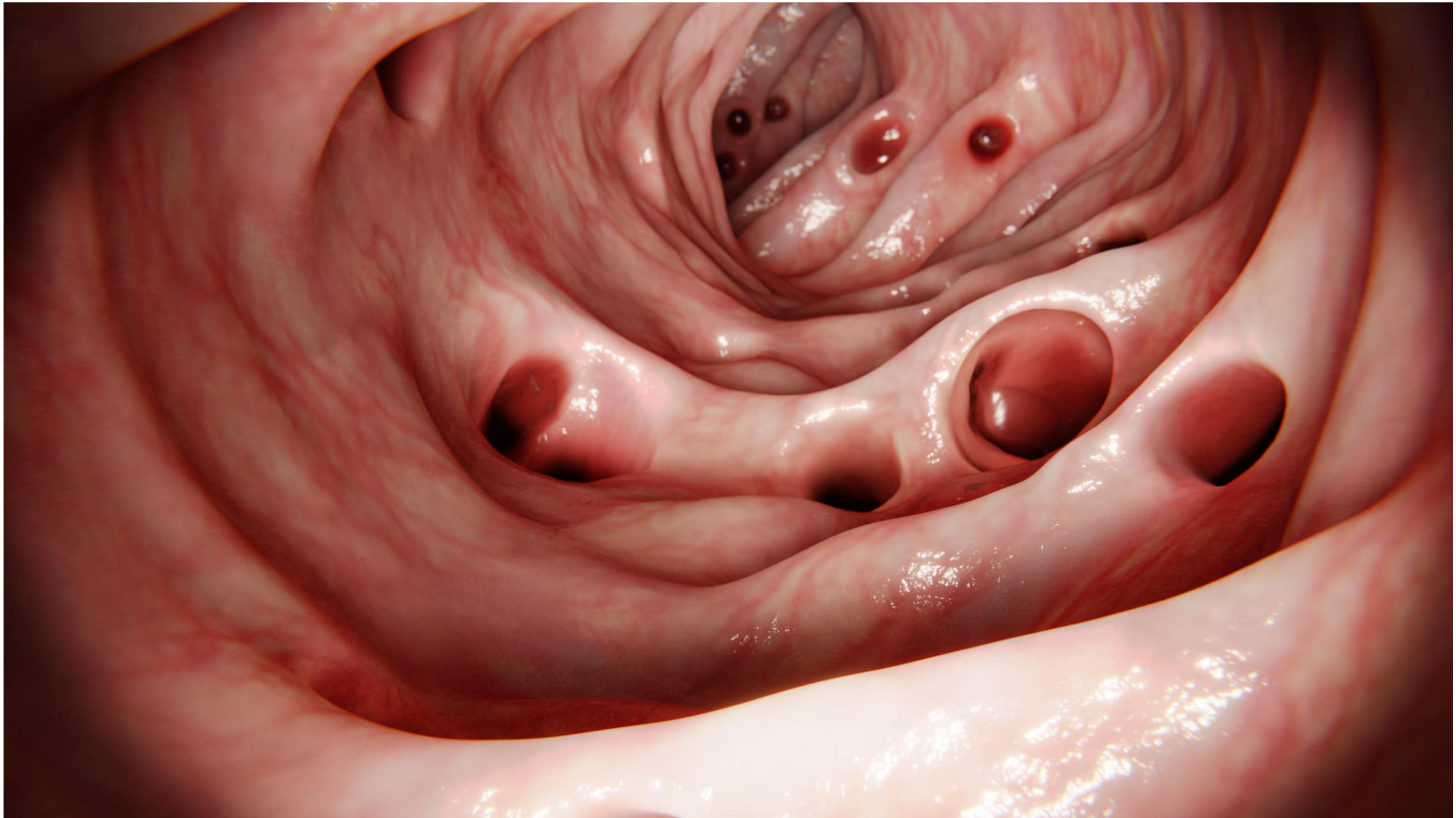




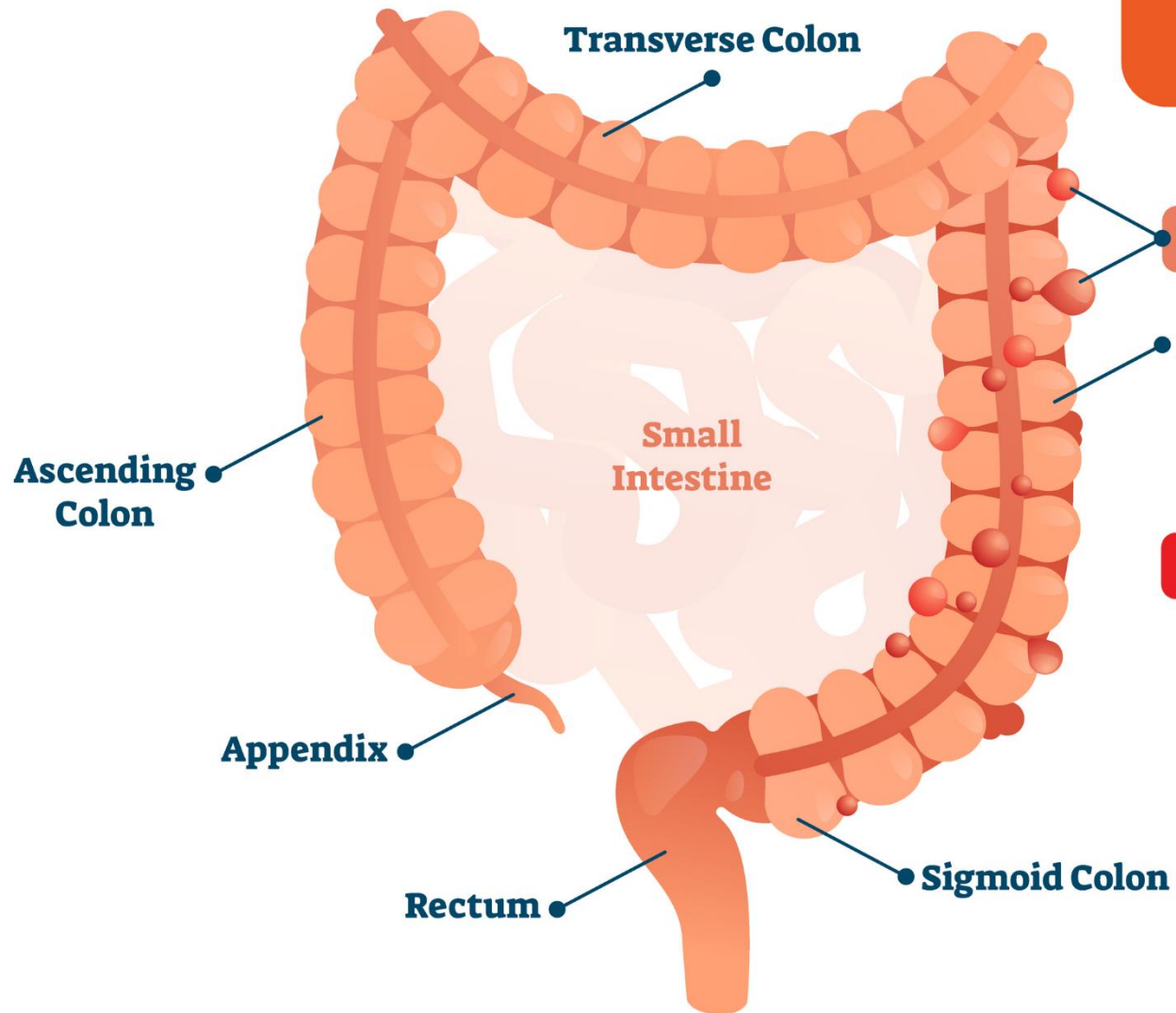
BLOOD SUPPLY TO THE COLON



BLOOD SUPPLY TO THE COLON



DIVERTICULITIS



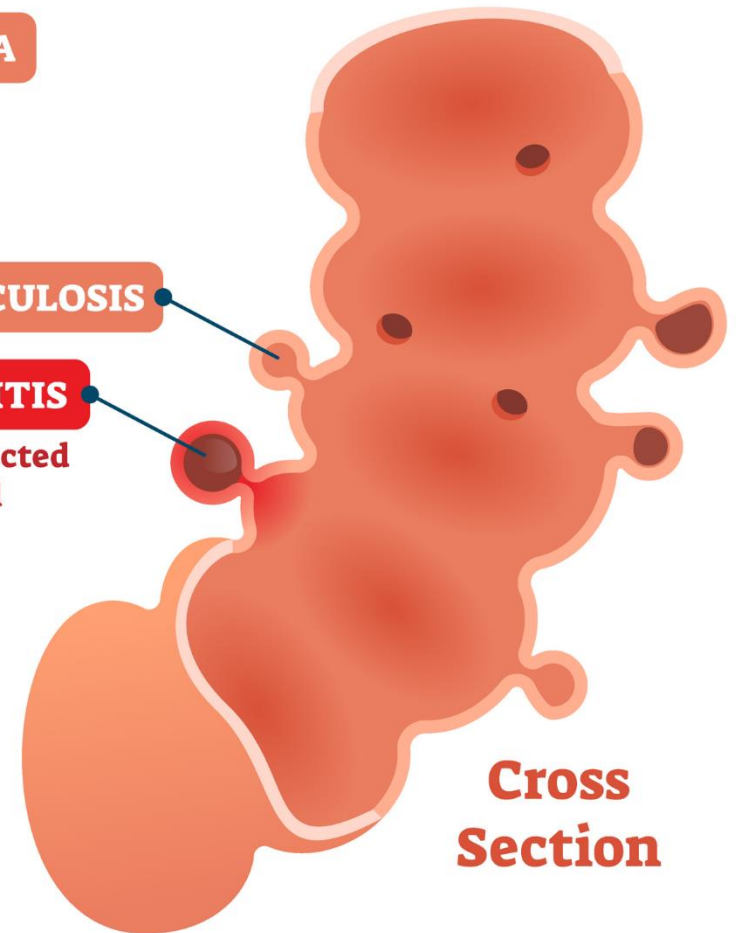
DIVERTICULA

**Descending
Colon**

DIVERTICULOSIS

DIVERTICULITIS

Diverticula Infected
or Inflamed



**Cross
Section**



Definitioner

- Diverticulosis coli
 - Multiple divertikler. Ofte lokaliseret til colon sigmoideum. Udposninger på tarmen. I colon hyppigst pseudodivertikler, som ikke omfatter alle tarmens lag. Det er en herniering af mucosa og submucosa ud gennem muskellagene
- Diverticulitis coli
 - En inflammation i eller omkring colon udgået fra divertikler

Diverticulitis coli - behandling

...den gang

- Anlæggelse af ventrikelsonde, iv.
Væske, og bredspektret
antibiotika
- Ingen tegn til bedring efter 3 til
4 dage - operation
- 5% mortalitet, tidligere 25%

...nu

Stadie inddeling a.m. Hinchey

1. Mesokolisk /perikolisk absces
2. Absces uden for mesokolon (pelvis -, abdominal -, eller retroperitoneal)
3. Purulent peritonitis
4. Fækulent peritonitis

European Society of Coloproctology: guidelines for the management of diverticular disease of the colon

J. K. Schultz* , N. Azhar†† , G. A. Binda§, G. Barbara¶ , S. Biondo** ,
M. A. Boermeester††, A. Chabok‡‡ , E. C. J. Consten§§¶¶¶, S. T. van Dijk††,
A. Johanssen*, W. Kruis***, D. Lambrichts††† , S. Post‡‡‡ , F. Ris§§§§ ,
T. A. Rockall¶¶¶¶, A. Samuelsson*****††††, S. Di Saverio‡‡‡‡§§§§ , D. Tartaglia¶¶¶¶ ,
A. Thorisson*****††††† , D. C. Winter‡‡‡‡‡, W. Bemelman†† and E. Angenete§§§§§§††††† 

Results This guideline contains 38 evidence-based statements on the management of diverticular disease.

Conclusion This international, multidisciplinary guideline provides an up to date summary of the current knowledge of the management of diverticular disease as a guidance for clinicians and patients.

Results This guideline contains 38 evidence based consensus statements on the management of diverticular disease.

†††††Department of Surgery, SSORG – Scandinavian Surgical Outcomes Academy, University of Gothenburg, Gothenburg, Sweden, †††††Cambridge Colorectal Unit, Addenbrooke's Hospital, Cambridge, UK, §§§§§Department of General Surgery, ASST Sette Mare, Italy, ¶¶¶¶¶Emergency Surgery Unit, New Santa Chiara Hospital, University of Pisa, Pisa, Italy, ¶¶¶¶¶Västerås, Västerås, Sweden, †††††Centre for Clinical Research of Uppsala University, Uppsala, Sweden, †††††Vincent's University Hospital, Dublin, Ireland, and §§§§§Department of Surgery, Region Stockholm, Sweden

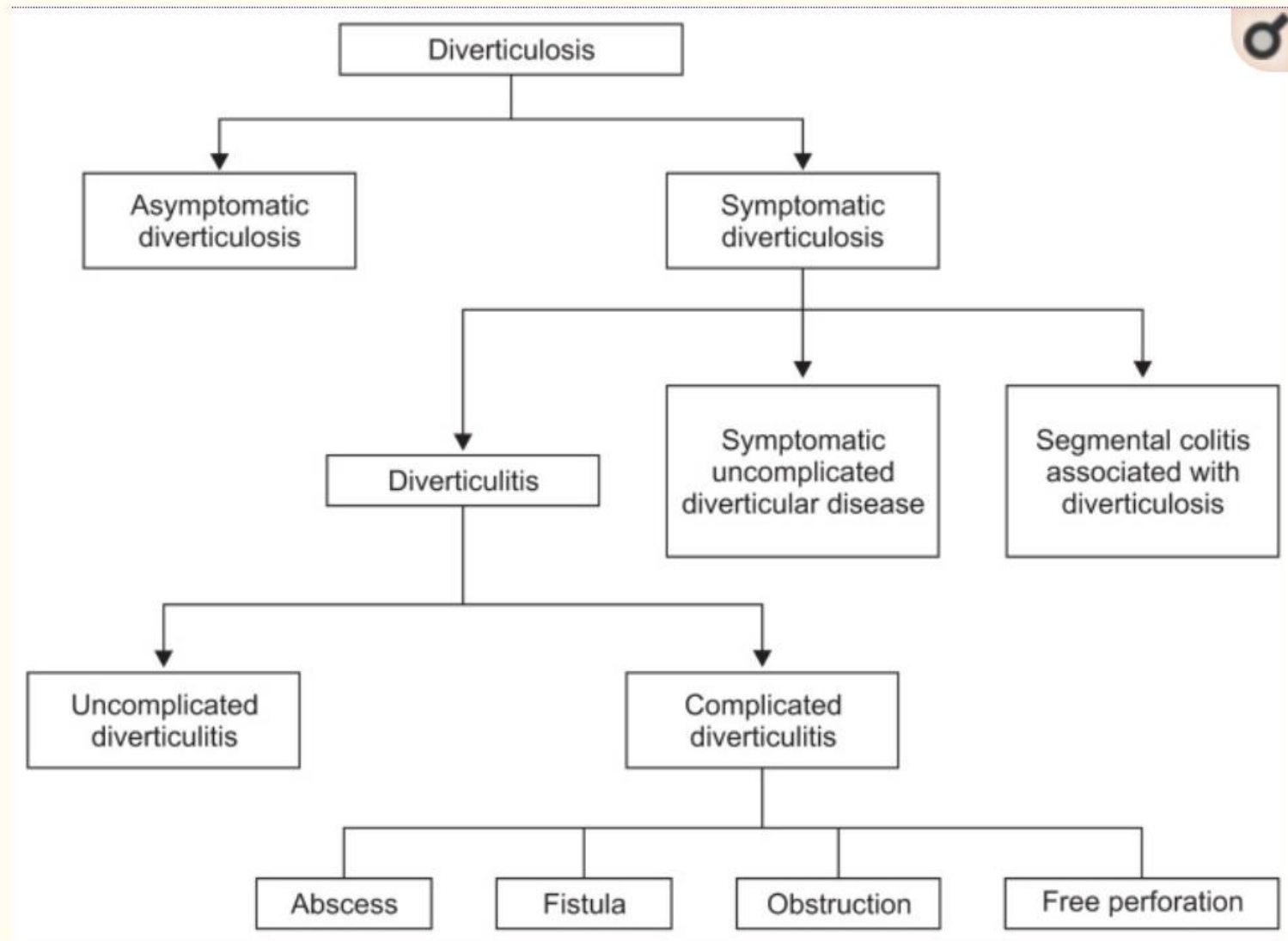


Fig. 1

Classification of diverticular disease.

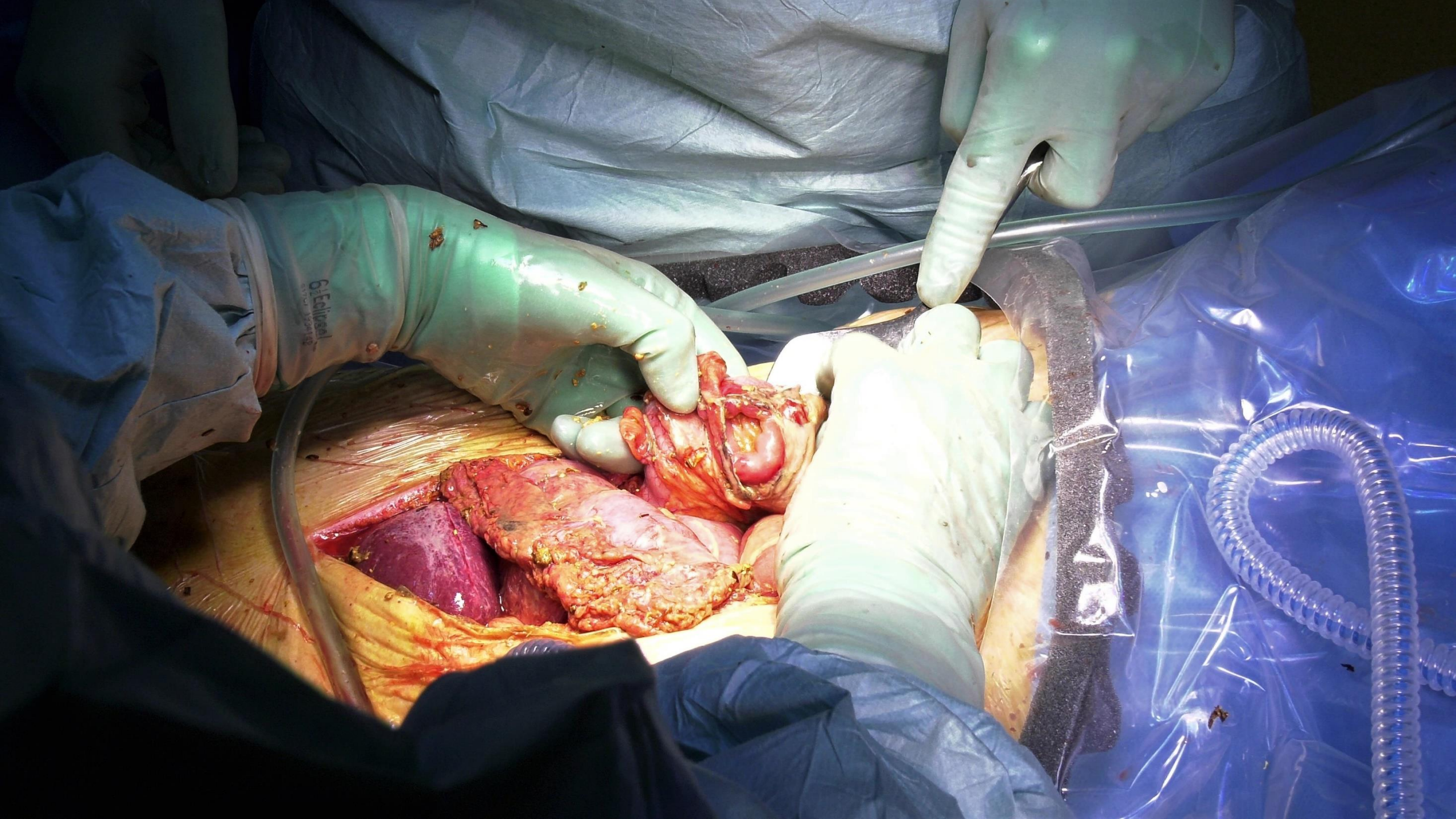
Behandling af diverticulitis coli

Ukompliceret

- Analgetika, kost efter evne, mobilisering, kontrol af infektionsparametre
- Ingen antibiotika medmindre
Antibiotika (efter lokal vejledning) anbefales hos patienter med sepsis, påvirket almentilstand, graviditet eller immunsuppression, men ikke rutinemæssigt til behandling af ukompliceret diverticulitis.

Kompliceret

- Afhængig af peritoneal reaktion og/eller fund på CT med kontrast
- +/- diffus peritoneal
- +/- absces
- +/- fri luft (lidt eller meget)
- Drænage/laparoskopi
- Skylning og dræn/resektion



Elektiv kirurgi

Rutinemæssig operation anbefales ikke

hyppigt recidiverende eller langvarige diverticulitistilfælde kan resektion komme på tale, hvis tilstanden er uacceptabel for patienten, og hvis patienten accepterer de risici, der er ved elektiv resektion.

Kronisk, kompliceret diverticulitis (fistler og/eller stenose):

Det er vigtigt at overveje, om comorbiditet kontraindicerer kirurgisk behandling, da mange af disse tilstande kan behandles konservativt eller med aflastende kolostomi. Hvis en ikke-resektionsstrategi vælges, bør malignitet være udelukket; ellers anbefales resektion.

Ved kompliceret diverticulitis med fistel eller stenose anbefales resektion, hvis patientens tilstand tillader dette.

Symptomgivende strikturer forårsaget af diverticulitis anbefales ikke behandlet med endoskopisk stentning.

Table 2

Treatment of Diverticular Disease

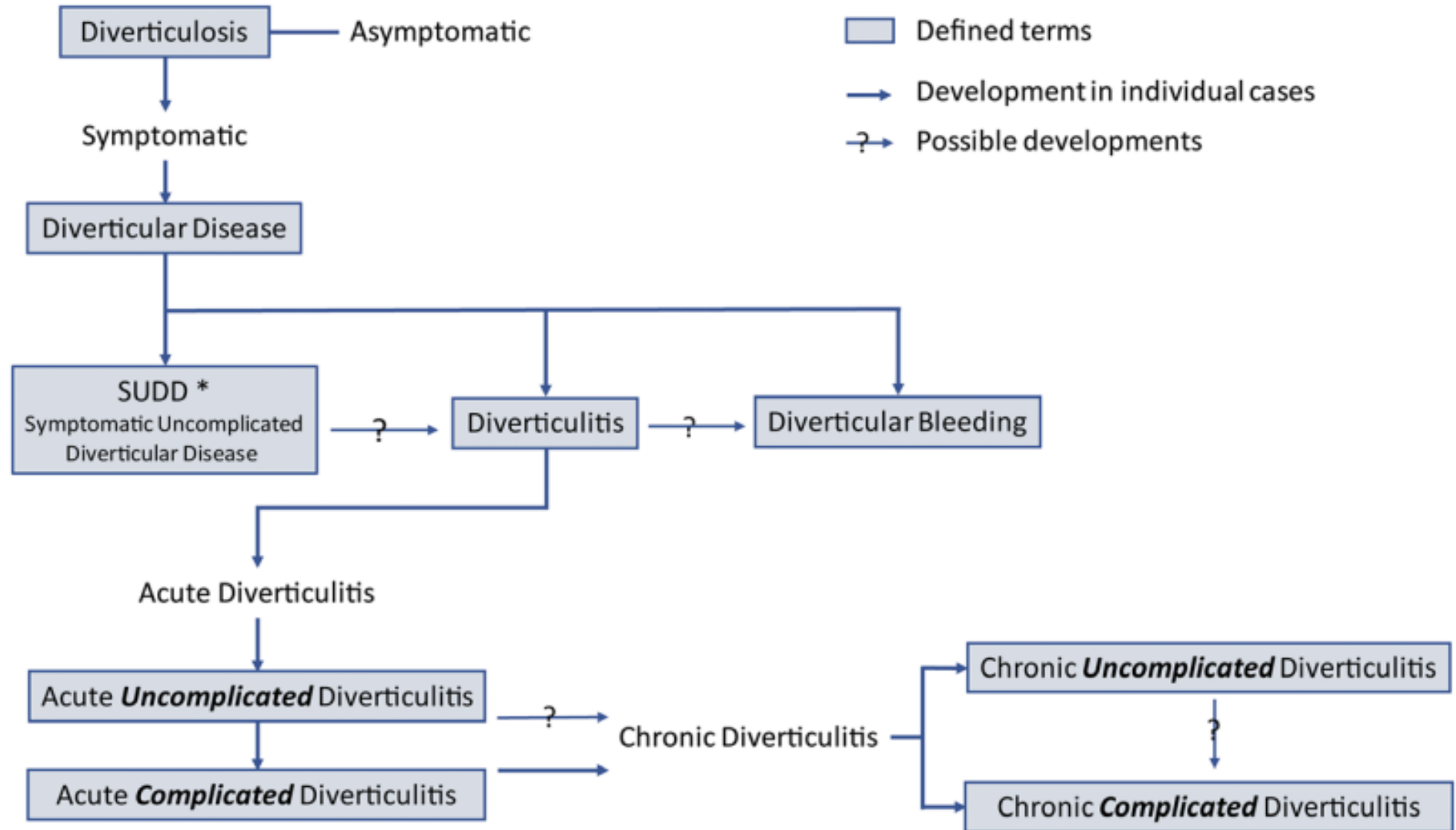
Mesalamine	Does not reduce diverticular recurrence
Rifaximin	Does not reduce diverticular recurrence
Probiotics	Does not reduce diverticular recurrence
Physical activity	Vigorous activity decreases risk of diverticulitis
Elective surgery	Not advised for initial episode of acute diverticulitis

Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence

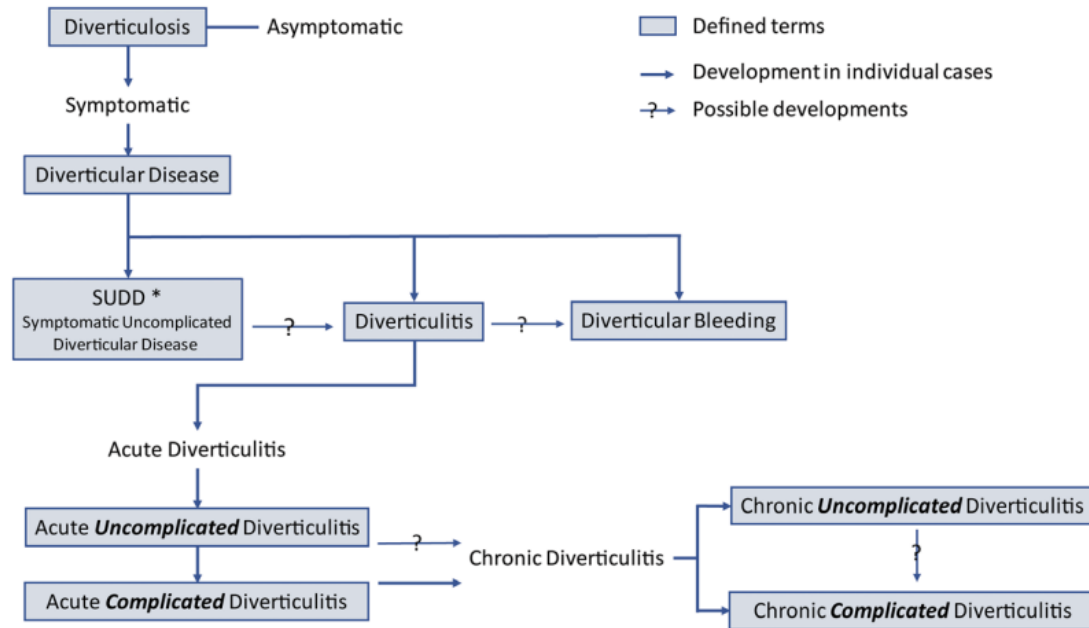
Question	Step 1 (Level 1*)	Step 2 (Level 2*)	Step 3 (Level 3*)	Step 4 (Level 4*)	Step 5 (Level 5)
How common is the problem?	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances**	Local non-random sample**	Case-series**	n/a
Is this diagnostic or monitoring test accurate? (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-consecutive studies, or studies without consistently applied reference standards**	Case-control studies, or "poor or non-independent reference standard**	Mechanism-based reasoning
What will happen if we do not add a therapy? (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohort study or control arm of randomized trial*	Case-series or case-control studies, or poor quality prognostic cohort study**	n/a
Does this intervention help? (Treatment Benefits)	Systematic review of randomized trials or <i>n</i> -of-1 trials	Randomized trial or observational study with dramatic effect	Non-randomized controlled cohort/follow-up study**	Case-series, case-control studies, or historically controlled studies**	Mechanism-based reasoning
What are the COMMON harms? (Treatment Harms)	Systematic review of randomized trials, systematic review of nested case-control studies, <i>n</i> -of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning
What are the RARE harms? (Treatment Harms)	Systematic review of randomized trials or <i>n</i> -of-1 trial	Randomized trial or (exceptionally) observational study with dramatic effect			
Is this (early detection) test worthwhile? (Screening)	Systematic review of randomized trials	Randomized trial	Non-randomized controlled cohort/follow-up study**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning

* Level may be graded down on the basis of study quality, imprecision, indirectness (study PICO does not match questions PICO), because of inconsistency between studies, or because the absolute effect size is very small; Level may be graded up if there is a large or very large effect size.

** As always, a systematic review is generally better than an individual study.



1.1 How is diverticular disease defined and how should it be classified?



Statements

1.1.1 Diverticulosis means an asymptomatic presence of diverticula and is *per se* not a disease.

Agreement 97% (second voting)

1.1.2 Diverticular disease is defined as diverticulosis with related symptoms or complications.

Agreement 100% (consensus meeting)

1.1.3 Clinical and scientific communication on diverticular disease must use accepted definitions.

Agreement 100% (second voting)

1.1.4 It is unclear whether SUDD – as defined by abdominal symptoms without proven inflammation or bleeding – can be considered a disease of its own or whether it represents the coexistence of IBS and diverticulosis.

Evidence level 4. Agreement 100% (consensus meeting)

1.1.5 Diverticulitis should be associated with symptoms and signs of peridiverticular inflammation proven by cross-sectional imaging and laboratory tests. Diagnosis should differentiate between uncomplicated and complicated as well as acute and chronic diverticulitis.

Evidence level 4. Agreement 97% (second voting)

1.1.6 Diverticular bleeding, very probably caused by a mechanical disruption of a vessel, occurs mostly painlessly without preceding diverticulitis. Patients with possible diverticular bleeding often need hospitalization with multidisciplinary treatment options and an urgent or semi-urgent endoscopic evaluation.

Evidence level 4. Agreement 93% (second voting)

1.4 What are the risk factors for diverticulosis, diverticulitis and its complications?

Statements

1.4.1 The development of diverticulosis is multifactorial and risk factors include age, genetic predisposition and obesity. The pathogenesis from diverticulosis to diverticulitis and its complications can be influenced by lifestyle and medications.

Evidence level 2. Agreement 100% (consensus meeting)

1.4.2 Acute complicated diverticulitis is associated with considerable short-term and long-term mortality. The risk of severe complications is highest at the first episode of diverticulitis and decreases with the number of recurrences.

Evidence level 2. Agreement 100% (second voting)

1.2 What is the prevalence of diverticulosis?

10 til 70%

Forekomsten af divertikulose stiger med alderen. Således er prævalensen hos 50-59-årige 33%, stigende for hver aldersgruppe til en prævalens på 71% hos personer > 80 år [1]. Progression til divertikulitis ses hos $\leq 5\%$ med divertikulose [8]. Hos ca. 12% af disse udvikles der kompliceret divertikulitis [9]. Fra 2000 til 2012 steg antallet af indlæggelser for kompliceret divertikulitis med 42,7% i Danmark. I samme periode registreredes en betydelig stigning i antallet af yngre mænd med divertikulitis [10]. Risikoen for recidiverende divertikulitis er ca. 22% de følgende ti år efter første episode, mens 55% får recidiv inden for ti år efter anden episode [11]. Ca. 10% oplever persisterende symptomer efter første divertikulisepisode, hvor symptomerne kan minde om colon irritabile [12]. Risikoen for perforation er størst ved det første divertikulitistilfælde [13]

1.3 What is the incidence of uncomplicated and complicated diverticulitis and what are the annual healthcare costs for diverticulitis in Europe?

1.4 What are the risk factors for diverticulosis, diverticulitis and its complications?

Statements

1.4.1 The development of diverticulosis is multifactorial and risk factors include age, genetic predisposition and obesity. The pathogenesis from diverticulosis to diverticulitis and its complications can be influenced by lifestyle and medications.

Evidence level 2. Agreement 100% (consensus meeting)

1.4.2 Acute complicated diverticulitis is associated with considerable short-term and long-term mortality. The risk of severe complications is highest at the first episode of diverticulitis and decreases with the number of recurrences.

Evidence level 2. Agreement 100% (second voting)

1.5 How should patients be followed-up after an episode of uncomplicated and complicated diverticulitis?

Statement

1.5.1 Endoscopic follow-up: for patients with symptom-free recovery after a single episode of CT verified uncomplicated diverticulitis endoscopic follow-up remains controversial and may not be necessary. All other patients treated without resection for acute diverticulitis should be followed up with an examination of the colon at least 6 weeks after the acute episode, if not done within the last 3 years.

Evidence level 3. Agreement 100% (third voting)

2.1 How can clinical findings be correlated to the severity of the disease?

Statement

2.1.1 There is a poor correlation between clinical findings and severity of the disease.

Evidence level 2. Consensus 100% (consensus meeting)

2.2 When should imaging be obtained on index and successive presentations of disease? (Which cases can be treated in primary care without imaging?)

Statement

2.2.1 Imaging is required to confirm the diagnosis of acute diverticulitis if there is no prior diagnostic information.

Evidence level 2, Strong recommendation. Consensus 100% (consensus meeting)

2.3 What is the most appropriate imaging tool to diagnose acute diverticulitis?

Statement

2.3.1 CT is recommended as the first-line investigation in suspected diverticulitis. Ultrasound and MRI are alternatives.

Evidence level 2, Strong recommendation. Consensus 100% (consensus meeting)

2.4 Which CT classification is appropriate?



Statement

2.4.1 No CT classification is superior to others as a diagnostic tool for acute diverticulitis. Each centre should choose their preferred classification in communication with available radiologists.

*Evidence level 5, Conditional recommendation.
Consensus 100% (third voting)*

3.1 Should uncomplicated diverticulitis be treated with antibiotics?

Statement

3.1.1 Patients with acute uncomplicated diverticulitis do not require antibiotics routinely. Antibiotic treatment should be reserved for immunocompromised patients and patients with sepsis.

Evidence level 1, Strong recommendation. Consensus 100%, consensus meeting

3.2 What is the role of antibiotics in complicated diverticulitis?

Statement

3.2.1 Patients with radiological signs of complicated diverticulitis should normally be treated with antibiotics.

*Evidence level 3, Conditional recommendation.
Consensus 100%, consensus meeting*

3.3 Which group of diverticulitis patients can safely be treated as outpatients?

Statement

3.2.2 For patients with an adequate social network tolerating oral intake, outpatient treatment of uncomplicated diverticulitis seems to be safe in the absence of sepsis, significant comorbidity and immunosuppression.

*Evidence level 2, Conditional recommendation.
Consensus 97%, consensus meeting*

3.4 Which supportive measures should be recommended in the acute stage of diverticulitis?

Statements

3.4.1 There is no evidence to support dietary restrictions. An unrestricted diet (when tolerated) is preferable.

*Evidence level 3, Conditional recommendation.
Consensus 93% (second voting)*

3.4.2. Any evidence regarding bed rest is lacking and, since imposed physical inactivity may impair the patients' general condition, bed rest is not recommended.

*Evidence level 4, Conditional recommendation.
Consensus 100% (second voting)*

3.5 Are medical agents (mesalazine, rifaximin, probiotics) useful to prevent recurrences or persistent symptoms after an episode of acute diverticulitis?

Statement

3.5.1. From the available medical agents, neither mesalazine, rifaximin nor probiotics can be recommended to prevent recurrent diverticulitis or persistent complaints after an episode of acute diverticulitis.

*Evidence level 3, Conditional recommendation.
Consensus 96% (second voting)*

3.6 Should a high-fibre diet be recommended following an episode of acute diverticulitis?

Statement

3.6.1 Although a high-fibre diet may be recommendable for general health purposes, there is little evidence that it can prevent recurrent episodes or persistent symptoms in patients with acute diverticulitis.

*Evidence level 3, Conditional recommendation.
Consensus 93% (second voting)*

3.7 What is the appropriate treatment strategy for patients with a diverticular abscess in the acute setting?

Statement

3.7.1 Although the role of percutaneous drainage of abscesses in acute diverticulitis is not completely clear, it may be considered in patients with an abscess larger than 3 cm. Emergency surgery should be kept as last resort for patients failing other non-surgical treatments.

*Evidence level 3, Conditional recommendation.
Consensus 100% (consensus meeting)*

4.1 What are the indications for abdominal exploration in patients with acute diverticulitis?

Statement

4.1.1 It seems fairly safe to observe immunocompetent haemodynamically stable patients even if there are radiological signs of extraluminal air. Immediate surgery should be considered in haemodynamically unstable or septic patients.

*Evidence level 3, Conditional recommendation.
Consensus 100% (second voting)*

4.2 Which surgical approach is appropriate in patients with faecal peritonitis (overt perforation)?



Statement

4.2.1 The surgical approach in patients with faecal peritonitis should be related to the experience of the surgeon; there is no evidence supporting laparoscopic or open surgery. Resection is the treatment of choice.

Evidence level 4, Strong recommendation. Consensus 97% (second voting)

4.3 Which surgical approach is appropriate in patients with purulent peritonitis?

Statement

4.3.1 Laparoscopic lavage is feasible in selected patients with Hinchey III peritonitis. Alternatively, resection is recommended.

*Evidence level 2, Conditional recommendation.
Consensus 93% (second voting)*

4.4 What is the role of restoration of intestinal continuity with or without proximal faecal diversion in the management of acute diverticulitis?

Statement

4.4.1 Primary anastomosis with or without diverting ileostomy can be performed in haemodynamically stable and immunocompetent patients with Hinchey III or IV diverticulitis.

*Evidence level 2, Conditional recommendation.
Consensus 97% (second voting)*

5.1 When should elective sigmoid colectomy be considered after recovery from uncomplicated acute diverticulitis?

Statements

5.1.1 Elective surgery to prevent complicated disease is not justified, irrespective of the number of previous attacks.

Evidence level 2, Strong recommendation, Consensus: 97% (second voting)

5.1.2 There is no evidence to support resection in symptomatic patients without radiological or endoscopic signs of ongoing inflammation, stenosis or fistula.

Evidence level 3, Strong recommendation. Consensus 97% (second voting)

5.1.3 The goal of elective surgery after one or more episodes of diverticulitis is to improve QoL. The indication should be individualized and based on the frequency of recurrences, duration and severity of symptoms after the attacks and the comorbidity of the patient.

Evidence level 3, Strong recommendation. Consensus 97% (second voting)

5.2 Should elective colectomy typically be offered/considered after recovery from a conservatively managed episode of acute complicated diverticulitis?

Statement

5.2.1 The decision to operate on patients after a conservatively managed episode of acute complicated diverticulitis should follow the same principles as for patients with uncomplicated diverticulitis, resection is not recommended routinely.

*Evidence level 3, Conditional recommendation.
Consensus 100% (second voting)*

5.3 How should surgery of persisting abscesses and fistulas be performed and is there a role for nonsurgical treatment?

Statement

5.3.1 Fistulas or persistent abscesses should normally be treated with laparoscopic or open resection of the diseased bowel with or without anastomosis.

*Evidence level 3, Conditional recommendation.
Consensus 100% (second voting)*

5.4 Which surgical approach is most appropriate in elective surgery for diverticulitis (open/laparoscopic)?

Statement

5.4.1 Elective colon resection for diverticulitis should preferably be performed laparoscopically when feasible.

*Evidence level 3, Conditional recommendation.
Consensus 100% (second voting)*

5.5 Should immunocompromised and young patients be treated differently?

Statement

5.5.1 The decision for elective resection after an acute episode of diverticulitis in immunocompromised and younger patients should follow the same principles as in other patients and is not recommended routinely.

*Evidence level 3, Conditional recommendation.
Consensus 100% (consensus meeting)*

6.1 What is the role of leak tests in surgery for diverticular disease?

Statement

6.1.1. An ALT of the colorectal anastomosis during surgery for sigmoid diverticulitis is recommended.

*Evidence level 2, Conditional recommendation.
Consensus 93% (second voting)*

6.2 Which extent of resection is appropriate in an emergency setting?

Statements

6.2.1 In the emergency setting, the focus is to control sepsis and resect the perforated segment.

Evidence level 4, Conditional recommendation.

Consensus 100% (consensus meeting)

6.2.2 In the case of resection and primary anastomosis, sigmoid resection down to the rectum with colorectal anastomosis should be done, with the proximal margin in as healthy colon as possible.

Evidence level 3, Strong recommendation. Consensus 100% (consensus meeting)

6.3 What is the preferred vascular approach in surgery for diverticular disease?

Statement

6.3.1 In cases where there is no suspicion of cancer, IMA-preserving surgery can be performed to optimize preservation of the vascularization and the autonomic nerves.

Evidence level 2, Strong recommendation. Consensus 97% (second voting)

6.4 What is the role of ureteral stents in elective resection for diverticular disease?

Statement

6.4.1 Ureteral stenting is not recommended as a routine, due to increased costs and operative time, but may be appropriate in selected cases with severe complicated disease.

*Evidence level 3, Conditional recommendation.
Consensus 100% (second voting)*

6.5 Should the splenic flexure routinely be mobilized?

Statement

6.5.1 Partial or full mobilization of the splenic flexure might facilitate the anastomosis being made of soft and compliant descending colon, by being brought down to the pelvic brim and anastomosed with the rectum without tension. It is up to the judgement of the surgeon whether this is necessary.

*Evidence level 3, Conditional recommendation.
Consensus 100% (second voting)*