A thick black L-shaped frame surrounds the text. The top-left corner is a horizontal bar extending to the right, then a vertical bar extending downwards. The bottom-right corner is a horizontal bar extending to the left, then a vertical bar extending upwards.

COLONIC DIVERTICULAR DISEASE

Dr Jessica Wing
Charlotte Maxeke Johannesburg Academic Hospital
Wits Donald Gordon Medical Centre

Outline of the presentation

- Definition and terminology
- Epidemiology
- Pathology
- Pathogenesis
- SUDD
- Diverticulitis and complications
- Diverticular bleed
- SCAD
- Take home messages



Definition and terminology

- Anatomic change in the colon characterized by outpouchings of mucosa & submucosa through the muscularis
- Diverticulosis: presence of diverticula, regardless of symptoms
- Diverticular disease: clinically relevant & symptomatic diverticulosis
 1. *Symptomatic uncomplicated diverticular disease (SUDD)*
 2. *Acute, chronic or recurrent diverticulitis*
 3. *Segmental colitis associated with diverticulosis (SCAD)*
 4. *Diverticular haemorrhage*

Epidemiology

- Prevalence of diverticulosis is age-dependent
 - USA: prevalence of diverticulosis increases from fewer than 20 % percent at age 40 to 60 % by age 60
- Western countries: 90% of have left-sided predominant diverticulosis
- African Americans more likely to have diverticula in the proximal colon
- Asia: 75%-90% of patients have right-sided diverticulosis
- South Africa: Diverticulosis in black South Africans is predominantly found in the descending colon

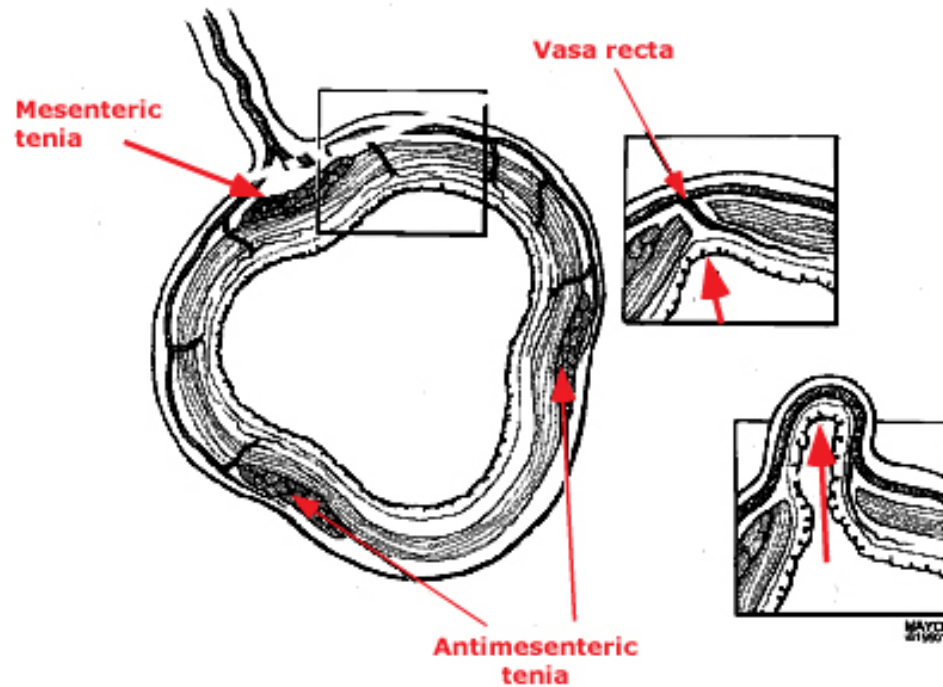
Epidemiology

- Prevalence of diverticulosis has increased in the West + in countries that have adopted a Western lifestyle
- Africa: Systematic review of 30 studies noted a 3x increase in the prevalence of colonic diverticulosis from 2012-2022 in, most common in males >50 years and the left colon was affected more commonly
- Risk factors
- Male
 1. Caucasian
 2. Smoking
 3. Increased body mass index
 4. Low fibre diet and constipation were not shown to increase risk
 5. Sedentary lifestyle, alcohol as well as red meat consumption also did not increase risk of diverticulosis on colonoscopy.

Pathology

- True: contain all layers of the bowel wall (Meckel diverticulum)
- Pseudo: herniations of mucosa & submucosa through the muscular layer of the colon
- Originate in 4 distinct rows which correspond with the penetration of the vasa recta and have a fixed position in relationship to the taenia coli
- Usual size is +/- 3-10 mm in size but giant diverticula can range from 4 cm - 25 cm

Location of colonic diverticula within the bowel wall



- Diverticula develop at 4 well-defined points around the circumference of the colon:
- These vessels enter the wall on each side of the mesenteric taenia and on the mesenteric border of the 2 antimesenteric taeniae.

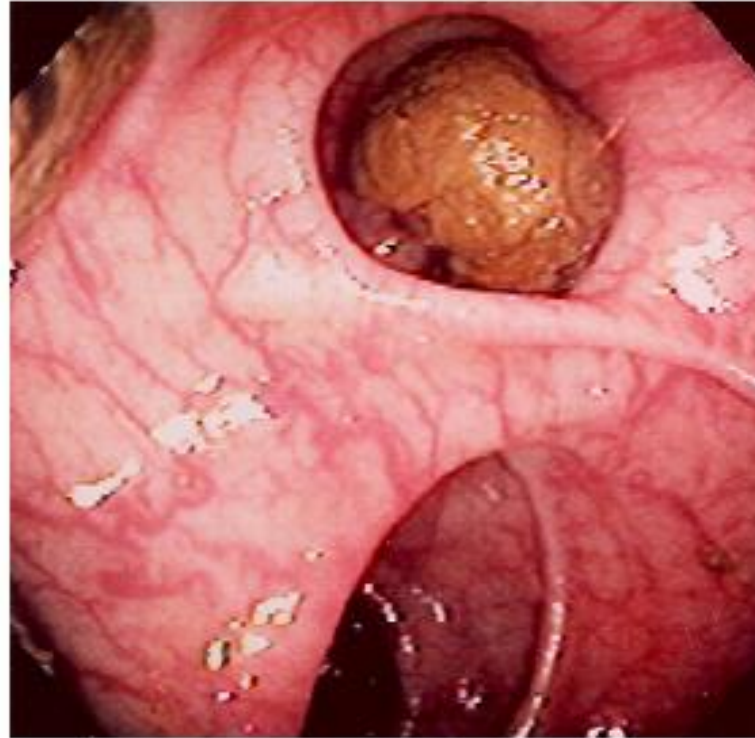
Reproduced from: Pemberton JH, Armstrong DN, Dietzen CD. In: *Textbook of Gastroenterology*, 2nd ed, Yamada T (Ed), 1995. By permission of Mayo Foundation 1997.

UpToDate®

Pathogenesis

1. Heritable factors
2. Colonic wall structure
3. Motility
4. Environmental factors

Diverticulum with nonobstructing fecalith

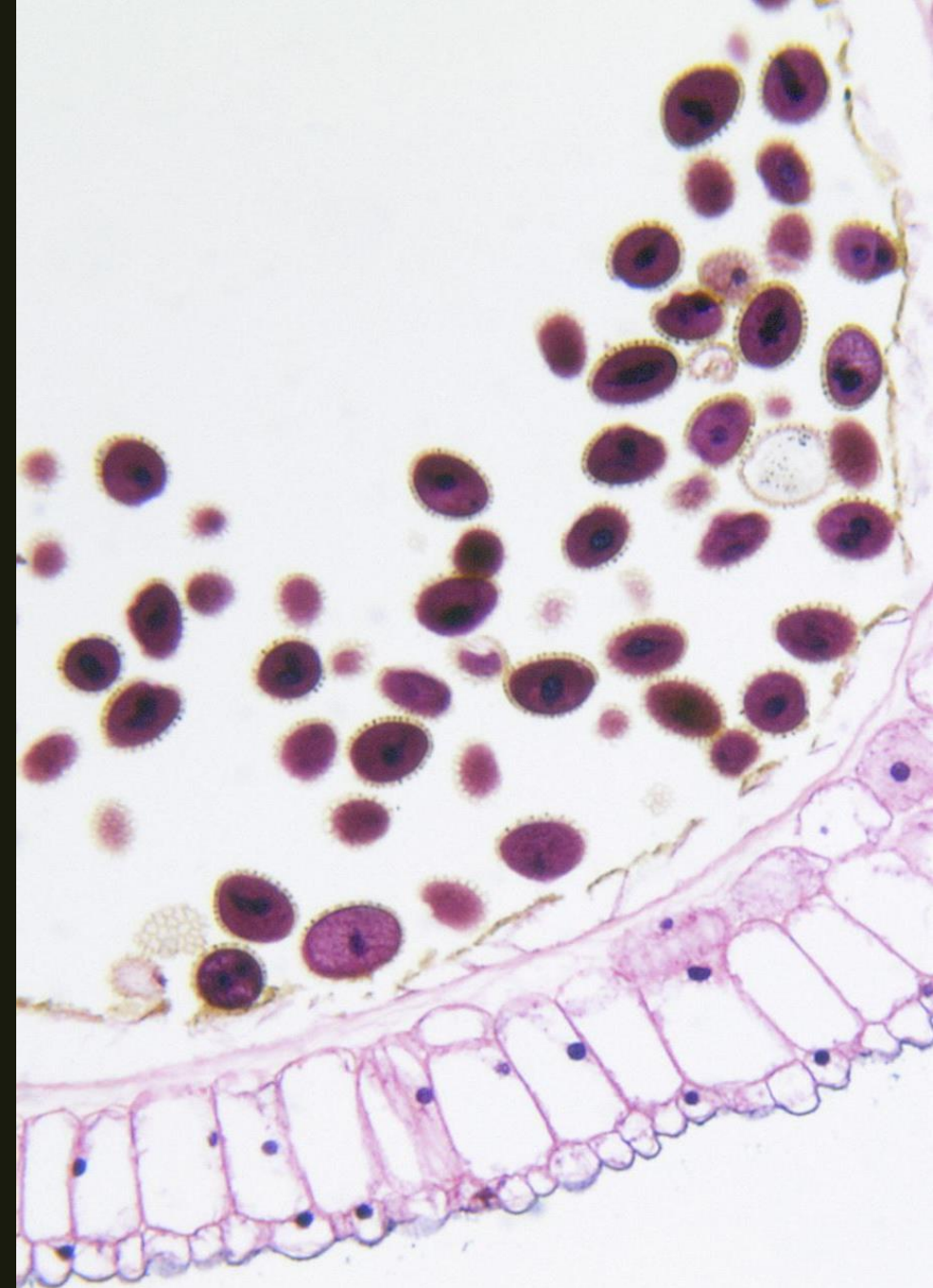


A nonobstructing fecalith is seen within a large diverticulum.

UpToDate®

Colonic wall structure

- Longitudinal and circular muscles layers are both significantly thickened
- Myochosis: “heaped up muscle”. Appearing like an accordion
- Increase in elastin deposition
- Shortening of the taenia and bunching-up of the circular muscle layer
- Increase in type 3 collagen synthesis and upregulation inhibition of metalloproteinases (age related changes in collagen composition)
- Higher rate of diverticulosis in connective tissue diseases



Motility factors

- Manometry sigmoid colon:
 - *Higher resting, postprandial and neostigmine- stimulated luminal pressures*
 - *Abnormal direction (retropropagation) of contractile waves in diverticular segments*
- “Theory of segmentation”: contraction of the colon at haustral folds occurs in segments rather than as a continuous tube resulting in excessively higher luminal pressures in each segment
- Decrease in the number of the interstitial cells of Cajal
- Increased tonicity: increase in excitatory cholinergic neurons and a decrease in non-cholinergic, non-adrenergic inhibitory neurons.

Environmental factors: dietary fiber

- Historically diverticulosis was labeled “ a deficiency disease of fiber”
- Slower transit times >>> increased luminal pressures & diverticular herniation
- Association between dietary fiber and diverticulosis is unclear
- AGA (context of a history of acute diverticulitis):
 - *“very low quality of evidence” but there is an unconditional recommendation for its use as there is an unlikely risk to patients and there is potential benefit.*

BOX 121.1 Factors Postulated to be Associated with Increased Risk of Diverticulosis or its Complications

Alcohol

Aspirin and other NSAIDs

Diets high in red meat (“Western dietary pattern”)

Dietary fiber[‡]

Ethnicity*

Gender[†]

Genetics

Increasing age

Obesity

Physical inactivity

Residence in Western countries (e.g., USA, Western Europe, Australia)

Smoking

Vitamin D deficiency

ENVIRONMENTAL
FACTORS BEYOND
DIETARY FIBER

Heritable factors

■ Sex

- *Episodes of diverticulitis : Women > Men*
- *Diverticular bleeding: Women=Men*
- *Diverticulosis: Women=Men*

■ Genetics

- *Danish study : diverticulosis and its complications strongly aggregate in families;*
- *Swedish twin studies reported estimated a heritable component of 40%*
- *T-cell receptor gene TNFSF15 has been implicated in diverticulitis that required surgery.*

Heritable factors

- Ethnicity
- Epidemiological studies:
- African Americans:
 - Highest prevalence of diverticular bleeds
 - Surgery for diverticulitis more common
- Caucasians
 - Highest prevalence for diverticulitis

SUMMARY OF THE CLINICAL SPECTRUM OF DIVERTICULAR DISEASE

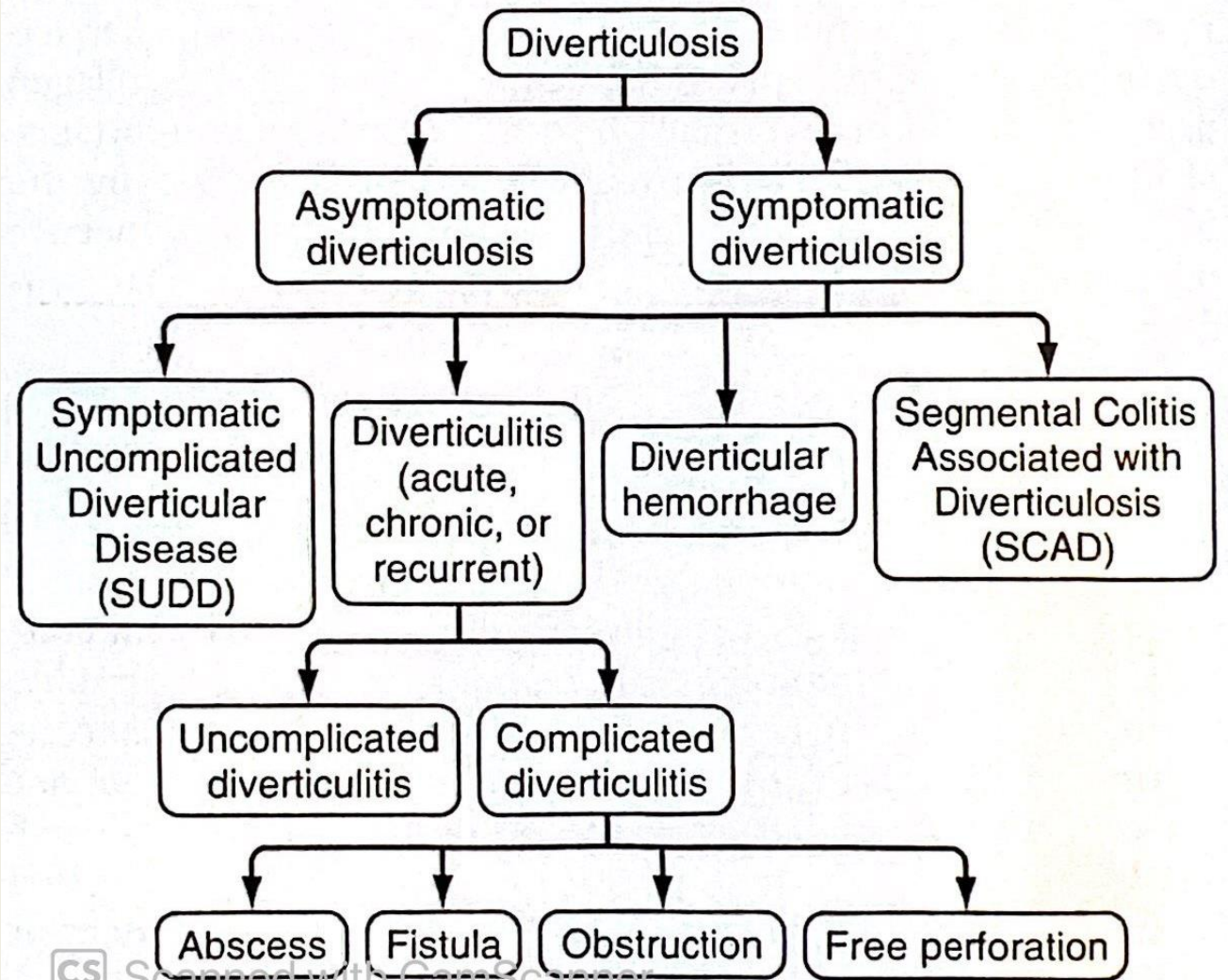


Fig. 121.3 Overview of diverticulosis and its clinical presentations.

Symptomatic uncomplicated diverticular disease (SUDD)

- Non-specific abdominal complaints in a patient with diverticulosis without complications
- True prevalence unknown difficulty distinguishing this entity from IBS
- Benign course, very low incidence of complications
- Prospective study (n=119):
 - *97%: few or no symptoms*
 - *1.7%: episodes of acute diverticulitis*
 - *0.8%: surgery for chronic symptoms*

Pathophysiology

? Late consequence of IBS
? Shared pathophysiology with IBS\

1. Visceral hypersensitivity
2. Chronic inflammation
3. Colonic motility
4. Altered intestinal microbiota

Clinical features

- LLQ abdominal pain
- Relieved by defecation or passage of flatus
- Bloating, diarrhoea, constipation, passage of mucus
- Overlap with IBS

SUDD



Investigations

1. Colonoscopy
2. CT abdomen or CT Colonography
3. Barium enema
4. Normal lab results
5. Higher fecal calprotectin than controls and IBS patients (small case-controlled study)

Treatment

1. ?Soluble fiber (psyllium)
2. ?5-ASA
3. ?Rifaximin
4. ?Probiotics
5. Anti-cholinergics and anti-spasmodics
6. Surgery, no clear role

A word on colonoscopy

- Does colonoscopy increase risk of perforation in diverticular disease ?
 - Burst pressures for diverticula far exceed the standard insufflation pressures used in colonoscopy
 - Relatively safe to perform a colonoscopy to evaluate symptoms in a patient with diverticulosis.

- Challenging: luminal narrowing, spasm, myochosis and fixation as well as confusion between diverticular openings and the lumen
 1. Paediatric colonoscope
 2. Sigmoid flotation maneuver
 3. Water-assisted colonoscopy
 4. Cautious with air insufflation and force when advancing

Diverticulitis

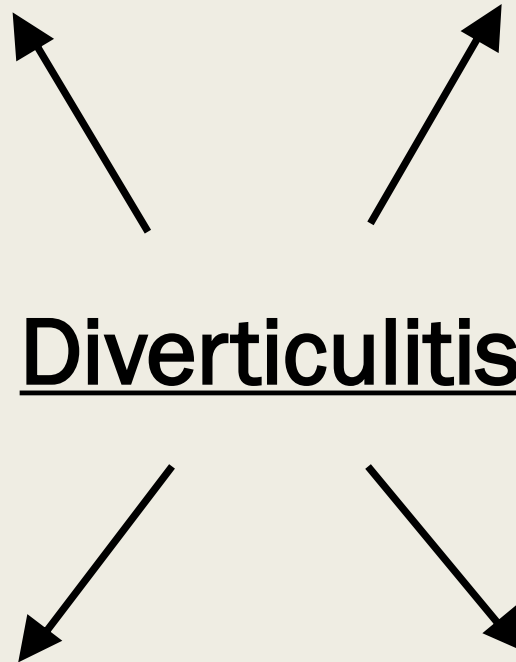
- Inflammation and/or infection of a diverticulum
- 1-4% over a 7-year follow up
- USA NIS data:
 - *Prevalence increased then plateaued in 2008*
 - *Severity of disease decreased*
 - *Surgery declined from 25 % to 15%*
- Acute, chronic, recurrent and smouldering
- Absence or presence of obstruction, abscess and fistula formation and free perforation delineate uncomplicated vs complicated diverticulitis
- Smouldering diverticulitis is diverticular inflammation that persists for weeks to months.

Pathophysiology

- Obstruction with inspissated stool with mucosal abrasion
- Micro-perforation
- Low grade inflammation
- Decreased venous outflow, increase normal bacterial flora
- Localized ischaemia and altered mucosal defense mechanisms (CD2 pathway)
- ?CMV re-activation

Investigations

- CT abdomen
- Barium enema (water soluble)
- Plain abdominal X-ray films
- ?Ultrasound
- CRP>50
- Leukocytosis with left shift
- Colonoscopy should be avoided, limited sigmoidoscopy



Clinical features

- Episodic/ constant LLQ abdominal pain
- Diarrhoea, constipation
- Anorexia, vomiting, nausea
- “Sympathetic cystitis”
- Fever
- Peritoneal signs may be present
- Shock is rare (perforation/peritonitis)
- Palpable tender mass on abdominal and rectal examination

• Treatment

- 70%-100% success with non-operative treatment whether inpatient vs outpatient management
- Bowel rest & liquid diet
- ? Antibiotics with anaerobic and gram-negative bacilli cover
- Interventional radiology
- Surgery

Indications for hospital admissions in uncomplicated diverticulitis

- One or more of the following:
 1. Temperature >38 or $<36^{\circ}\text{C}$, Pulse >90 bpm , respiration rate >20 , WCC $>12,000/\text{mL}$ or $<4000/\text{mL}$, CRP >15 mg/dL.
 2. Severe abdominal pain with failure to control abdominal pain in the emergency department to <5 on a Vas.
 3. Age >70
 4. Significant comorbidities
 5. Immunosuppression
 6. Intolerance of oral intake secondary to bowel obstruction or ileus
 7. Unreliability for return visits/lack of support system
 8. Failed outpatient treatment

Inpatient management

- General measures:
- Analgesia (parenteral)
- Complete bowel rest : nil per os until a clear liquid diet can be tolerated
- IVI fluids until tolerating oral liquids
- IVI antibiotics (anaerobic and gram-negative bacilli cover)

Inpatient care continued:

- Uncomplicated diverticulitis:
 - Short hospital admission (+/- 2-3 days)
 - Diet can be advanced and IVI antibiotics stopped once inflammation settles
- If antibiotics started, oral antibiotics must be given to complete a 10 - 14 day course
- All criteria below must be met before they can be discharged:
 1. Normalization of vital signs
 2. Resolution of severe abdominal pain
 3. Resolution of significant leukocytosis
 4. Tolerance of oral diet
 5. Resumption of bowel movements
- Fail to improve after 2-3 days of IVI antibiotics > repeat imaging to identify new complications
- Surgical evaluation is indicated at any point if the patient's condition deteriorates

Antibiotic choices in diverticulitis

Risk	Antibiotic classes	
Low risk community acquired	Metronidazole + c Cephalosporin/fluoroquinolone	
High risk community acquired	Carbapenem/Tazocin/ Cephalosporin +Metronidazole	
Hospital acquired	Carbapenem/Tazocin/ Cephalosporin + Metronidazole+ vancomycin/ampicillin	

Empiric antibiotic regimens for low-risk community-acquired intra-abdominal infections in adults

	Dose
Single-agent regimen	
Piperacillin-tazobactam*	3.375 g IV every 6 hours
Combination regimen with metronidazole*	
One of the following:	
Cefazolin	1 to 2 g IV every 8 hours
or	
Cefuroxime	1.5 g IV every 8 hours
or	
Ceftriaxone	2 g IV once daily
or	
Cefotaxime	2 g IV every 8 hours
or	
Ciprofloxacin	400 mg IV every 12 hours or 500 mg PO every 12 hours
or	
Levofloxacin	750 mg IV or PO once daily
Plus:	
Metronidazole¶	500 mg IV or PO every 8 hours

- *If Tazocin or one of the other combination regimens cannot be used, then ertapenem is an alternative
- "Low-risk":
- Mild to moderate severity of infection
- No significant medical co-morbidities
- No travel to an area with high-resistance organism
- Not colonized by resistant organisms

Empiric antibiotic regimens for high-risk community-acquired intra-abdominal infections in adults

	Dose
Single-agent regimen	
Imipenem-cilastatin	500 mg IV every 6 hours
Meropenem	1 g IV every 8 hours
Doripenem	500 mg IV every 8 hours
Piperacillin-tazobactam	4.5 g IV every 6 hours
Combination regimen with metronidazole	
ONE of the following:	
Cefepime	2 g IV every 8 hours
OR	
Ceftazidime	2 g IV every 8 hours
PLUS:	
Metronidazole	500 mg IV or orally every 8 hours

- *If a Carbapenem or a Beta-lactam cannot be used, then Vancomycin, Aztreonam and Metronidazole can be used

Empiric antibiotic regimens for health care-associated intra-abdominal infections in adults

	Dose
Single-agent regimen	
Imipenem-cilastatin	500 mg IV every 6 hours
Meropenem	1 g IV every 8 hours
Doripenem	500 mg IV every 8 hours
Piperacillin-tazobactam	4.5 g IV every 6 hours
Combination regimen	
ONE of the following:	
Cefepime	2 g IV every 8 hours
OR	
Ceftazidime	2 g IV every 8 hours
PLUS:	
Metronidazole	500 mg IV or orally every 8 hours
PLUS ONE of the following (in some cases*):	
Ampicillin	2 g IV every 4 hours
OR	
Vancomycin	15 to 20 mg/kg IV every 8 to 12 hours

- Empiric antifungal coverage is appropriate for patients at risk for infection with *Candida* spp.:
 - Upper GIT perforations,
 - Recurrent bowel perforations
 - Surgically treated pancreatitis
 - Heavy colonization
 - Yeast identified on Gram stain of samples from infected peritoneal fluid or tissue)

Obstruction

1. Luminal narrowing from peri-colic inflammation, compression from an abscess
2. SBO can occur
3. Complete obstruction is unusual, unless from stricturing (recurrent episodes of diverticulitis)
4. Endoscopic dilatation/ SEMs
5. Bowel rest, NGT suction, antibiotics if not improving then for surgery

Free perforation

1. Faecal peritonitis caused by free perforation
2. Uncommon 4/100 000 cases
3. Mortality 12-26%
4. Plain x-rays showing free air, clinical diagnosis or CT
5. Surgical emergency (usually 2-staged)

Complications

Abscess formation

1. 15% of patients with diverticulitis
2. Tender mass, persistent leukocytosis, fever despite adequate trial of abx
3. CT abdomen
4. Hinchey classification
5. <3-4cm: can resolve with anti-biotics alone
6. CT-guided percutaneous/ trans-rectal/transvaginal drainage
7. Elective open or laparoscopic surgery

Fistula

- Abscess ruptures into an adjacent organ
- 5% of patients with diverticulitis but present in 20% who require surgery
- Colovesicular: most common type (65%) males>females
- Faecaluria, pneumaturia, UTIs
- Cystoscopy, cystography or barium enema
- Colovaginal: 2nd most common (25%)
- Single-staged surgery with repair of fistula and primary anastomosis (8% mortality)

Outpatient management for uncomplicated diverticulosis

- Outpatient management has success rates of 94% - 97%
- Analgesia: NSAIDS should be stopped as soon as the acute episode has resolved chronic use has been associated with diverticular complications
- Bowel rest and liquid diet for 1 week
- AGA :“**Selective antibiotic use**”: immunocompromised, co-morbidities, severity of inflammatory response
- DIABOLO and AVOD (n=1100): antibiotics did not accelerate recovery and did not prevent complications or recurrence in acute uncomplicated diverticulitis
- DINAMO trial: use of/ without amoxicillin-clavulanic acid resulted in similarly low rates of unscheduled return visits

Oral antibiotics for acute colonic diverticulitis in adults

Amoxicillin-clavulanate 875/125 mg every 8 hours

Ciprofloxacin (500 mg every 12 hours) **plus** metronidazole (500 mg every 8 hours)

Levofloxacin (750 mg once daily) **plus** metronidazole (500 mg every 8 hours)

Trimethoprim-sulfamethoxazole (1 double-strength tablet every 12 hours) **plus** metronidazole (500 mg every 8 hours)

Outpatient care

- Reassessment within 1 week of their initial presentation then weekly assessment until all symptoms resolve
- **Patients who improve:**
 - Repeat imaging studies are not necessary
 - Monitored for any recurrence of symptoms and undergo colonoscopy in 6-8 weeks if they have not done so within the previous year
- **Patients who do not improve:**
 - Admission for inpatient treatment and repeat a CT of the abdomen.
 - New complication
 - Consider smouldering diverticulitis
 - Another diagnosis

Smouldering diverticulitis

- Subacute but protracted symptoms: LLQ abdominal pain, alteration in bowel habits, and/or rectal bleeding (often after cessation of antibiotics)
- Chronic, may last for longer than six months
- Differentiate from recurrent diverticulitis and other conditions such as IBS
- Key feature of **colonic inflammation**: repeat CT scan, lower endoscopy, faecal calprotectin
- Patients should be referred for surgical evaluation
- A systematic review: “elective surgery reduced recurrence in patients with prior complicated, smouldering, or frequently recurrent diverticulitis”

Recurrent Diverticulitis

- 6% - 42 % of patients have 1 or more recurrent episode(s) after non-operative management of acute diverticulitis
- Recurrent diverticulitis is usually **not** more severe than the initial episode
- No evidence for surgery for recurrent episodes of uncomplicated diverticulitis (historically after 2 episodes)
- Important that the distal level of resection extend up to the rectum
 - Colosigmoid anastomosis (distal resection did not extend to the rectum) results in 4x as many recurrences as those with a colorectal anastomosis

Rationale for elective colonoscopy after an episode of diverticulitis

- Exclude a concomitant colonic cancer
- 2 meta-analyses: CRC was detected by colonoscopy in 8.3 -10.8 %of patients with complicated diverticulitis but only in 0.5 -0.7 % of those with uncomplicated diverticulitis
- American experts are in favour of routine colonoscopy but European experts are against colonoscopy for patients with uncomplicated diverticulitis
- ASCRS guidelines (2020): colonoscopy after all complicated diverticulitis and after uncomplicated diverticulitis with imaging abnormalities or atypical courses
- Our setting: based on resources, patient co-morbidities and clinical course

Role of elective surgery

- 2-Staged: Colonic resection and colostomy
- Ongoing dialogue regarding resection and primary anastomosis
- High risk of developing serious complications or dying from recurrent diverticulitis:
 - Complicated diverticulitis (fistula, obstruction, free perforation)
 - Evidence for a healed diverticular abscess is less clear. Decision based on symptoms and quality of life
 - Immunosuppressed
- Not offered to immunocompetent patients with a history of uncomplicated diverticulitis, **regardless of the number of past episodes**

Other outpatient measures

- Healthy lifestyle, can recommend a high-fiber diet
- Do not counsel on avoiding nuts, seeds and corn
- Stop NSAID as well as aspirin use (unless for cardiovascular reasons) as there is an association with diverticulitis and diverticular bleeding
- Mesalamine:
 - Cochrane systematic review and meta-analysis of 7 randomized trials, found no evidence of an effect when comparing mesalamine with control for prevention of recurrent diverticulitis
- Poor evidence for rifaximin use

Special populations in diverticulitis: Young (<40 years of age)

- Relatively uncommon (10% of all patients with diverticulitis)
- Often missed or misdiagnosed as IBD
- Also common in the sigmoid colon, more predominant in males
- Youth is an independent risk factor for a poor outcome when acute diverticulitis is managed non-operatively
 - Initial attacks are more severe
 - Complication and recurrence rates are higher
- Prompted rationale for elective segmental, colonic resection after 1 attack
- Large series: higher rates of surgery in young patients was primarily due to prevent poor outcomes rather than higher complication rates itself
- ASCRS: “we do not offer elective surgery to patients who have a history of diverticulitis simply because they are young”

Special populations in diverticulitis: Immunosuppressed patients

- Manifests subtly and can be challenging to make a timely diagnosis
- Not more common but confers more severe consequences than immunocompetent patient:
 1. Higher rate of free perforation (43% vs. 14%)
 2. Need for surgery (58% vs. 33%)
 3. Post-operative mortality (39% vs. 2%)
- Solid organ transplant recipients have a very high mortality risk (25%- 100%)
- Many authorities advocate for elective resection after the initial episode of acute diverticulitis

Special populations in diverticulitis: Right-sided disease

- Predominant in Asia (36%-78%) compared to 1.5% in the West
- Clinically indistinguishable from acute appendicitis
- Older, Asian descent, less frequent nausea and vomiting, lack of progression of symptoms such as in appendicitis
- Radiologically differentiating between acute appendicitis and right-sided diverticulosis is also challenging and the diagnosis is often made on laparotomy
- Less likely to develop complications than left-sided disease and medical management is usually sufficient
- Treatment is the same for left-sided disease

SCAD: AN INTRODUCTION

- Initially thought to be a rare form of Crohn's disease in a segment of colon which contains diverticula
- Distinct and rare but poorly understood manifestation of diverticular disease in a very small subset of patients (prevalence 0.3% to 1.3%)
- Characterized by chronic mucosal inflammation of colonic segments which contain diverticula
- 58.7% are male patients
- Mean age of 63.6 years
- Mimics the clinical presentation of IBD
- Primarily affect the sigmoid colon
- SCAD does not confer a higher risk of diverticulitis nor CRC

SCAD: PATHOGENESIS

- Unclear
- Hypotheses:
 - Prolapsed mucosa causes chronic mucosal inflammation by being exposed to shear stress
 - Changes in bacterial flora and bacterial enzyme activity from faecal stasis in diverticulosis
 - Changes in permeability to intraluminal antigens, or altered microcirculation leading to focal mucosal ischemia

Investigations

- CT abdomen: colonic wall thickening in the segment of colon with pre-existing diverticular and peri-colic fat stranding
- WCC usually normal
- Faecal calprotectin and lactoferrin may be raised
- Endoscopy: Type A,B,C,D

Clinical features

- LLQ cramping pain
- Chronic diarrhoea
- Rectal bleeding
- May mimic IBD

Histology

- Cryptitis, crypt abscesses, chronic lymphocytic infiltration and granulomas

DDX:

1. Acute diverticulitis
2. Ischaemic colitis
3. Drug-related colitis

SCAD

DDX:

4. IBD
5. Solitary rectal ulcer syndrome
6. Infectious colitis
7. Radiation colitis

Course

- Poorly understood
- Benign and self-limiting clinical course
- Endoscopically overtime: an evolving picture like ulcerative proctosigmoiditis, or Crohn's colitis is seen
- Prompts early endoscopic re-evaluation in a patient with presumed SCAD who has ongoing or progressive symptoms

Treatment

- Not well defined as based on case reports
- Ciprofloxacin and Metronidazole for 10-14 days
- Mesalamine 800 mg po tds for 7-10 days then if poor response in 2-4 weeks, increase dose to 1.6g po tds
- Prednisone at 40 mg od x1 week then wean over 6/52
- ? Immune therapy and biologics
- Surgery for steroid refractory or dependent disease

SCAD

- Endoscopically:

- Interdiverticular mucosal erythema, friability & erosions are noted in varying degrees
- Inflammation does not extend into the diverticular orifices
- Inflammation is only found only within the segments of colon that contain diverticula
- Inflammation usually limited to the interdiverticular mucosa of the sigmoid
- The remaining colon and rectum is neither endoscopically or histologically involved



SCAD: Endoscopic classification

- **Type A** (crescentic fold pattern):
 - Reddish round lesions at the top of the colonic folds
- **Type B** (mild- moderate ulcerative colitis-like pattern):
 - Loss of the submucosal vascular pattern, oedema of the mucosa, hyperaemia, and diffuse erosions
- **Type C** (Crohn's colitis-like pattern):
 - Isolated aphthous ulcers
- **Type D** (severe ulcerative colitis-like pattern):
 - loss of submucosa vascular pattern, intense hyperaemia, diffuse ulcerations, and reduced calibre of colonic lumen



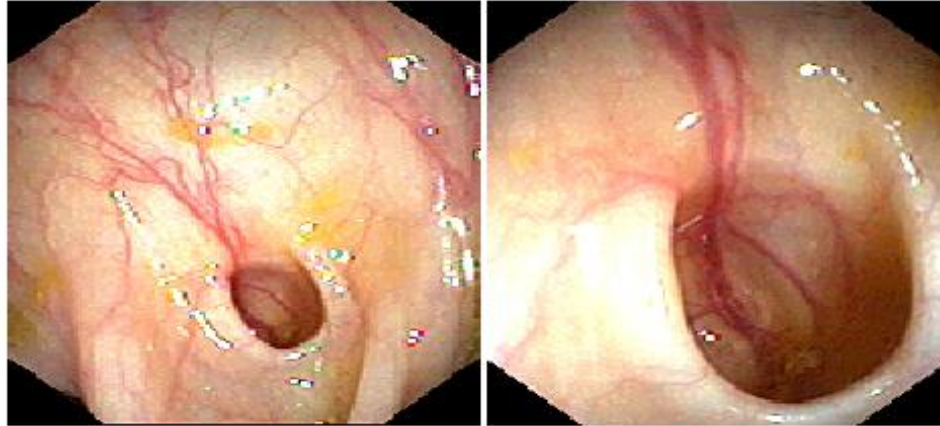
Diverticular Haemorrhage

- Most common cause of a significant LGIB in adults (33%-66%)
- Bleeding is estimated to occur in 10% -15% of patients with diverticulosis and of those 3%-5% will have severe haemorrhage
- Culprit diverticulum is not usually identified, it is often a presumptive diagnosis in the context of diverticulosis with no other source identified
- Pancolonic diverticulosis has a higher haemorrhage rate than segmental disease
- Diverticular haemorrhage tends to arise from the right colon > left colon

Diverticular Haemorrhage: Pathophysiology

- Not well understood.
- Intimal thickening and medial thinning of the vasa recta causing weak vessels
- As the diverticulum herniates the vasa recta are stretched over its apex with a thin layer of colonic mucosa separating it from the lumen
- Increased exposure and weakening of the vessels predispose to rupture
- NSAID use (incl aspirin) associated with increased diverticular bleeding in multiple studies

Blood vessel within a colonic diverticulum



Endoscopy showing a blood vessel within a diverticulum. The blood vessel is separated from the bowel lumen only by mucosa. Over time, the vessel wall is exposed to injury along its luminal aspect, possibly leading to segmental weakness which predisposes to rupture into the lumen.

Courtesy of James B McGee, MD.

UpToDate®

Diverticular Haemorrhage: Clinical features

- Abrupt, painless and self-limiting haematochezia
- Volume of blood is moderate to large as the bleeding vessel is an arteriole
- Patients pass red or maroon clots
- Malena unusual
- Spontaneous cessation of bleeding occurs in 70% to 80% of patients
- 30-day rebleeding rates are as high as 53%
- Emergency surgery rates are also high at 35%

Diverticular Haemorrhage: Diagnosis

- Classic clinical symptoms and signs have a high pre-test probability in an older person
- Consider other sources of LGIB: colitis, malignancy , haemorrhoids, angioectatic lesions
- Assess haemodynamic stability initially, if stable :
- Expedite colonoscopy (within 12 to 48 hours of presentation)
 - *Stigmata of a recent bleed (adherent clot or visible vessel within a diverticulum)*
 - *Active bleeding*
 - *Identification of a source is only evident in 10%-20% of colonoscopic examinations*
 - *Epinephrine injection*
 - *Heater probe coagulation or bipolar coagulation*
 - *Endoclips*
 - *Fibrin selant*
 - *Band ligation*

Diverticular Haemorrhage: Diagnosis

- If an endoscopic source was not identified and bleeding continues:
- **Nuclear scintigraphy (tagged red cell scan):**
 - Can detect bleeding rates as low as 0.1mL/min, inexpensive, non-invasive
 - Identifies site and not source of bleeding
 - No therapeutic potential
 - Studies have showed lack of improvement in terms of mortality, transfusion requirements and need for surgery
 - “Gateway to angiography”: minimizes a negative angiogram and helps select a specific artery to inject contrast into

Diverticular Haemorrhage: Diagnosis

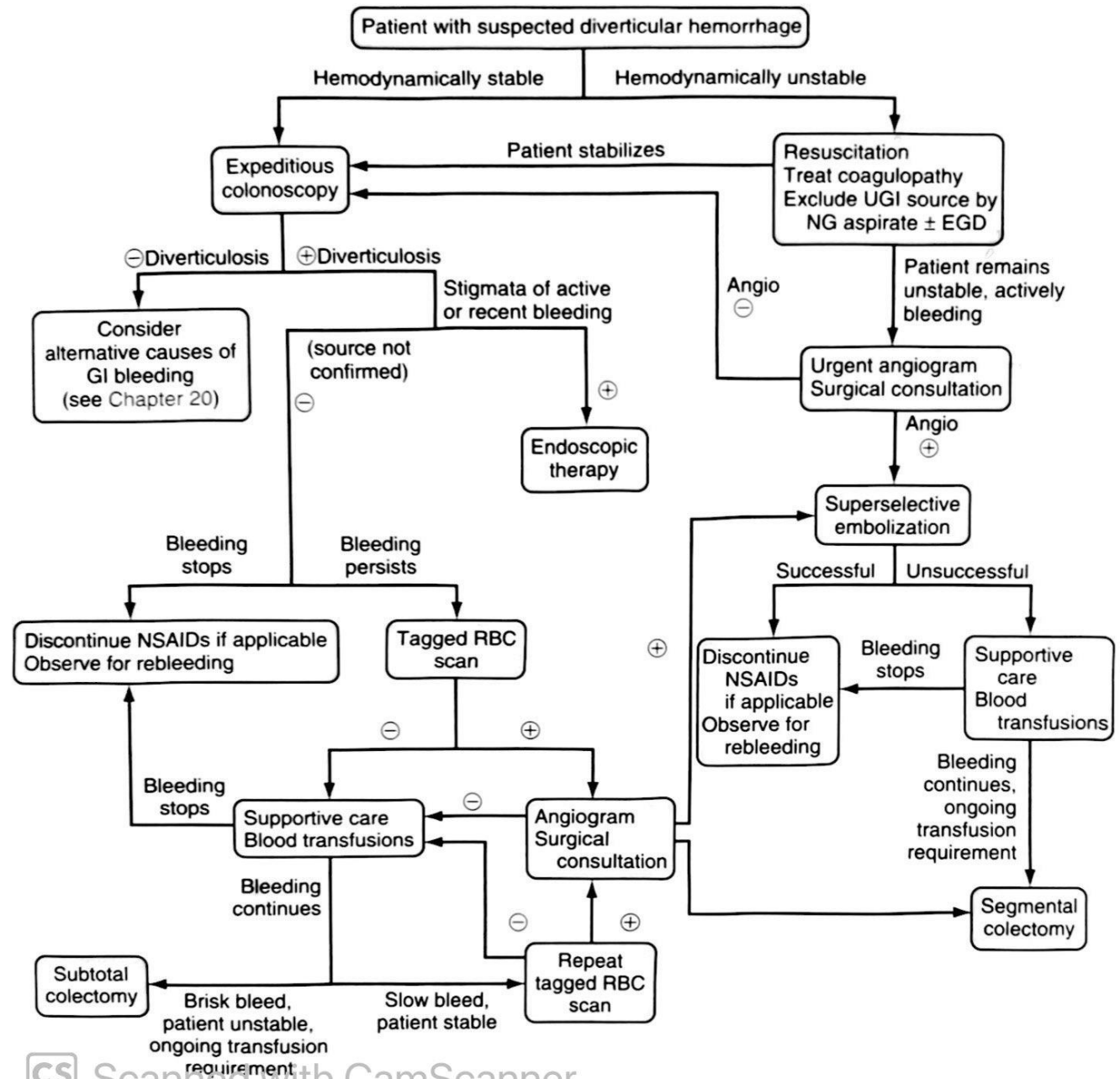
■ Angiography

1. Not as sensitive as nuclear scintigraphy
2. Detects bleeding at rates of 0.5mLs/min
3. Direct super-selective embolization or embolization of the distal arterial branches
4. Becoming the non-surgical treatment of choice when endoscopic control is not possible
5. 67%-100% achieve lasting haemostasis
6. Colonic ischaemic rates are <20%



Diverticular Haemorrhage: Surgery

- Avoided unless endoscopic or angiographic modalities are unavailable or fail
- Infrequently needed as the majority of diverticular bleeds resolve spontaneously
- Indications
 1. Persistent haemorrhage which is refractory or not amenable to therapy
 2. Massive transfusion requirements
 3. Haemodynamic instability refractory to resuscitation
- Partial or segmental colectomy preferred if the bleeding site is identified
- Sub-total colectomy may be needed in patients with life-threatening and ongoing bleeding with no clear identification site



CS Scanned with CamScanner
Fig. 121.7 Algorithm for the management of patients with suspected diverticular hemorrhage. Angio, angio-gram; RBC, red blood cell.

References

- Bhuket T, Stollman N. Diverticular disease of the colon. Ch 121. In: Sleisenger and Fordtran's Gastrointestinal and Liver Disease 11th edition, ed. By R Chung, D Rubin, C Wilcox. Philadelphia: Elsevier, 2012, pp 1993-2007.
- Strate LL, Liu YL, Syngal S, Aldoori WH, Giovannucci EL. Diet, corn, and popcorn consumption and the incidence of diverticular disease. *JAMA*. 2008;300(8):907.
- Peery AF, Barrett PR, Park D, Rogers AJ, Galanko JA, Martin CF, Sandler RS. A high-fiber diet does not protect against asymptomatic diverticulosis. *Gastroenterology*. 2012 Feb;142(2):266-72.e1. Epub 2011 Nov 4.
- Peery AF, Keku TO, Martin CF, Eluri S, Runge T, Galanko JA, Sandler RS. Distribution and Characteristics of Colonic Diverticula in a United States Screening Population. *Clin Gastroenterol Hepatol*. 2016;14(7):980. Epub 2016 Feb 9.
- Peery AF, Keku TO, Galanko JA, Sandler RS. Sex and Race Disparities in Diverticulosis Prevalence. *Clin Gastroenterol Hepatol*. 2020;18(9):1980. Epub 2019 Oct 18.
- Falangone F, Esposito G, Angeletti S, Pillozzi E, Corleto VD, Di Giulio E, Annibale B, Carabotti M. Prevalence of Segmental Colitis Associated with Colonic Diverticulosis in a Prospective Cohort of Patients Who Underwent Colonoscopy in a Tertiary Center. *J Clin Med*. 2022;11(3) Epub 2022 Jan 20.
- Vulsteke F, De Hertogh G, Vermeire S. Therapeutic outcome of diverticular associated colitis - a retrospective single centre experience. *Acta Gastroenterol Belg*. 2021;84(2):275.
- Tursi A, Elisei W, Brandimarte G, Giorgetti GM, Lecca PG, Di Cesare L, Inchigolo CD, Aiello F. The endoscopic spectrum of segmental colitis associated with diverticulosis. *Colorectal Dis*. 2010 May;12(5):464-70. Epub 2009 Jun 25.
- Naidoo, V.G: Diverticular disease of the colon. CME. 2009 May;(27): 224-226

Take home messages

- Diverticulosis is considered common and costly complication associated GIT disorders in the West
- Prevalence is increasing with urbanization and adoption of Western lifestyle measures in other nations
- Pathogenesis is poorly understood with a large spectrum of manifestations
- May present with life-threatening complications for which a gastroenterologist needs to know how to treat timeously and effectively
- No strong nor clear evidence for definitive medical treatment, especially with regards to antibiotic therapy and uncomplicated diverticulitis and adoption of a high fiber diet

