2018 | Dynamic Practice Guidelines for Emergency General Surgery

Committee on Acute Care Surgery, Canadian Association of General Surgeons

17

DIVERTICULITIS

Dynamic Practice Guidelines for Emergency General Surgery

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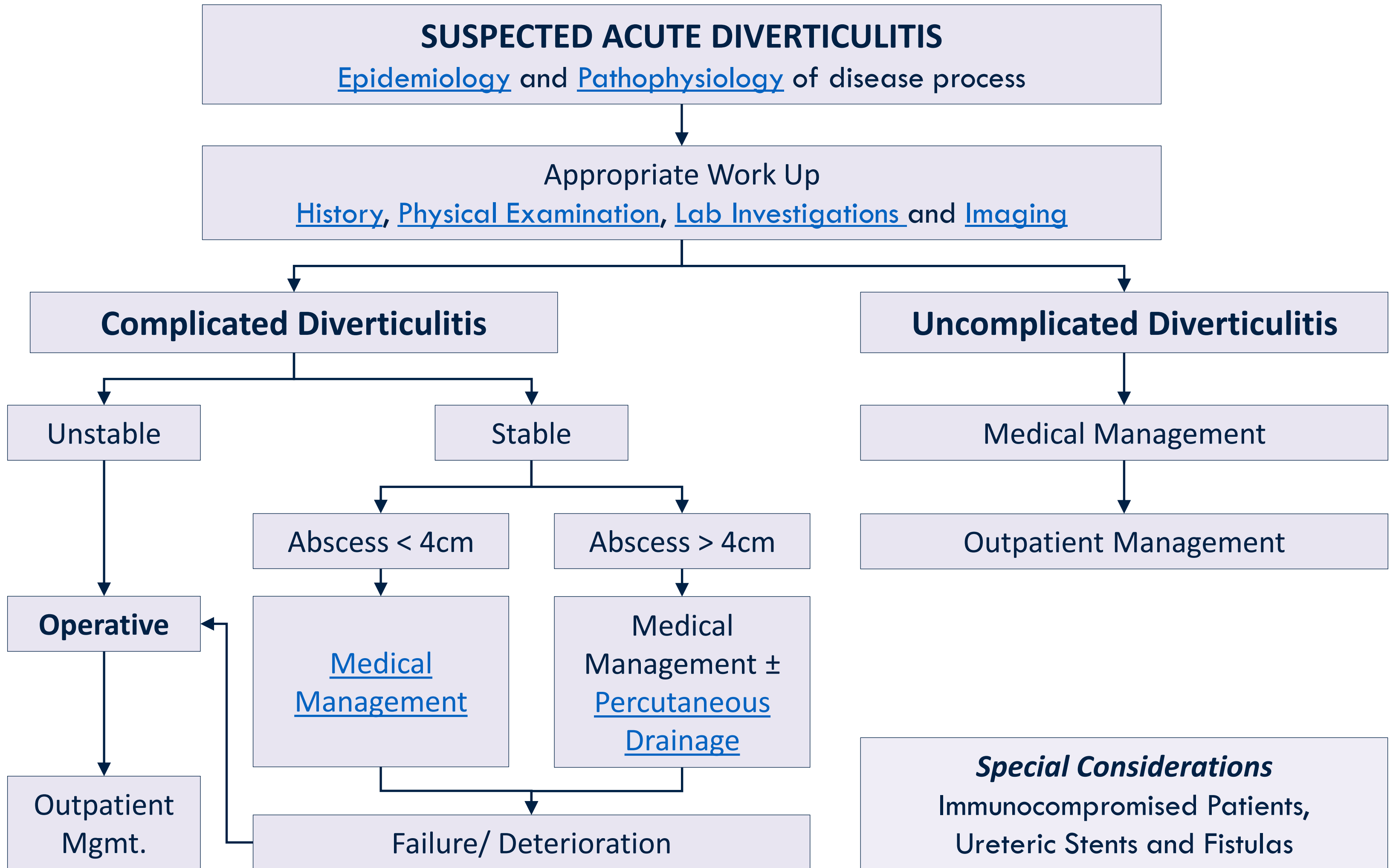
Clinical Practice Guideline

DIVERTICULITIS



DIVERTICULITIS

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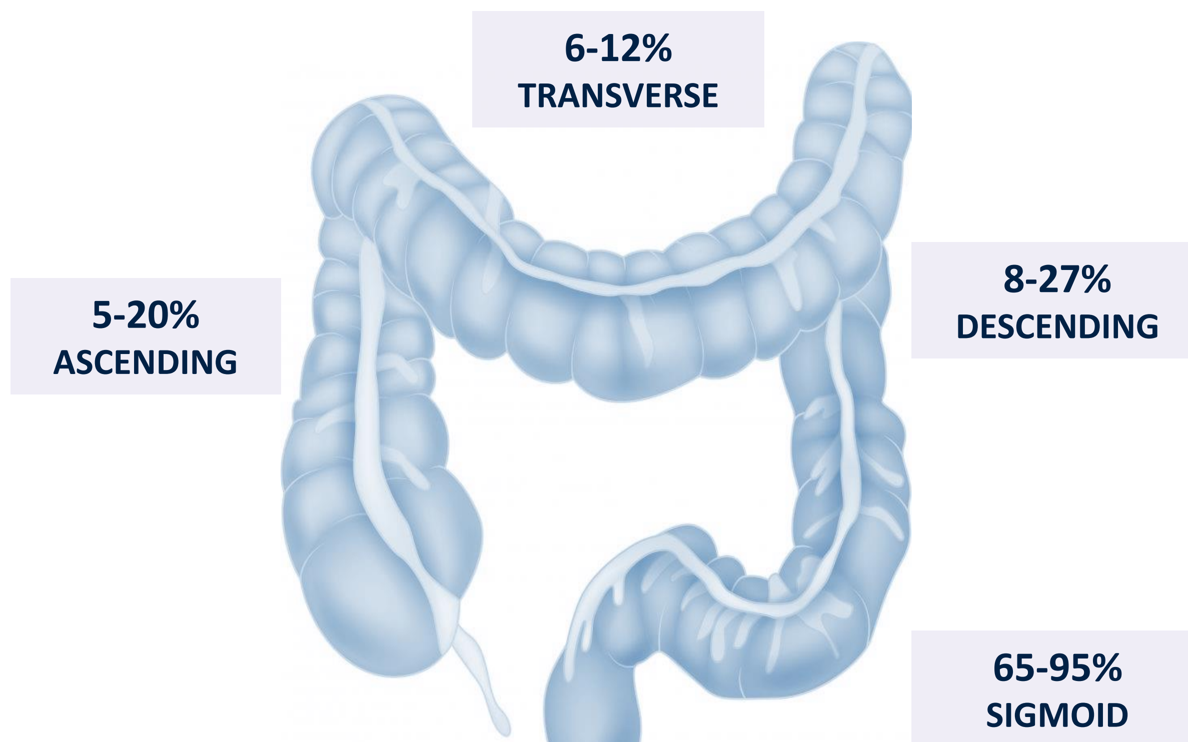
Definition and Pathophysiology

	Diverticulosis	Diverticulitis
Definition	Herniation of mucosa and submucosa through muscular layers of bowel wall	Multifactorial inflammatory reaction centred on thin walled diverticula
Pathophysiology	• False diverticula • Natural weakness where vasa recta penetrate serosa • Propulsion phenomenon caused by high intraluminal pressures • Occur between mesenteric + anti-mesenteric teniae coli	• Bacterial stasis leads to mucosal inflammation • Inflammation then causes regions of focal ischemia • Ischemic Segment can subsequently evolve into micro or large perforations

Distribution of Diverticulosis

Thorson, A and Beatty, J., 2014 ASCRS Manual
Yeo CJ., et al. 2013 Shackelford's Surgery of the Alimentary Tract, 7 ed.
Simpson, J, Schofield, J, Spiller, R., 2003 BJS

Distribution of Diverticulosis



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Epidemiology

Diverticulosis	Diverticulitis
• Prevalence increasing	• Develops in 10 – 20% of affected individuals
• Disease of aging ○ 5-10% at age 40 ○ 40-60% at age 60 ○ >80% at age 80	• **Nuts/Popcorn:** Does not increase incidence of diverticulosis or complications (Link)
• Risk Factors ○ Low fibre “Western” diet ○ NSAIDs ○ Immunosuppression ○ Smoking ○ Obesity	

Mahmoud, N. *et al.*, 2017, Sabiston Textbook of Surgery. 20 ed.
Thorson, A and Beatty, J., 2014 ASCRS Manual
Yeo CJ., et al. 2013 Shackelford’s Surgery of the Alimentary Tract, 7 ed.
Jacobs, D., 2007 NEJM

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History of Presenting Illness

Acute	• Constant left lower quadrant pain • Pain radiating to back or groin • Altered bowel habit • Nausea and vomiting • Urinary symptoms (dysuria/polyuria)
Chronic Symptoms	• **Stricture** ○ Constipation ○ Large bowel obstruction
	• **Fistula** ○ Pneumaturia ○ Fecaluria ○ Frequent UTI ○ Vaginal discharge

Mahmoud, N. *et al.*, 2017, Sabiston Textbook of Surgery. 20 ed.
Thorson, A and Beatty, J., 2014 ASCRS Manual

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Physical Examination

Vitals
- SIRS response
  - Tachycardia
  - Fever
  - Hypotension

Mental Status
- Confusion

Abdominal Exam
- **Focal/Diffuse Pain**
  - Point tenderness
  - Rebound tenderness
  - Suprapubic tenderness
  - Palpable mass

Findings of diffuse peritonitis and hemodynamic compromise should alert the clinician to consider:

↓

Complicated Diverticulitis

Mahmoud, N. *et al.*, 2017, Sabiston Textbook of Surgery. 20 ed.
Thorson, A and Beatty, J., 2014 ASCRS Manual

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Laboratory Investigations

Investigations	Finding	Reason
Complete Blood Count	↑ WBC ↑ Platelets	Acute phase reaction
Kidney Function Tests	↑ Cr	Decreased circulating volume
Electrolytes	N	
C-Reactive Protein	↑	Inflammatory response May correlate with severity and recurrence risk[1]
Urinalysis	+/- Culture +/- Leukocytes	Reactive inflammation Colonization due to fistula

Buchs, N., Konrad-Mugnier, B., Jannot, AS., et al., 2013 BJS
Mahmoud, N. *et al.*, 2017, Sabiston Textbook of Surgery. 20 ed.
Thorson, A and Beatty, J., 2014 ASCRS Manual

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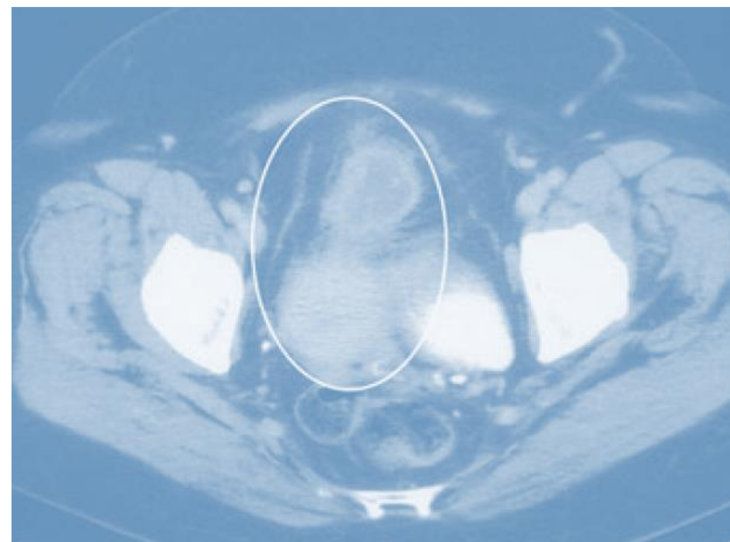
Imaging

CT Abdomen/Pelvis with IV contrast

- Most appropriate initial investigation (Level 1B Recommendation, ASCRS)
- Diverticulitis is *defined radiographically* (International Consensus Statement)

Severity	Findings
Mild	Segmental thickening Diverticula Fat Stranding
Moderate	Associated phlegmon Associated abscess (<3 cm) Localized free air
Severe	Large abscess Generalized free air Free fluid



O'Leary, DP., Lynch, N., Clancy, C., et al., 2015 JAMA Surgery
Feingold, D., Steele, SR., Lee, S., et al., 2014 Dis Colon and Rectum
Feurestein, J., Falchuk, K., 2016 Mayo Clin Proc

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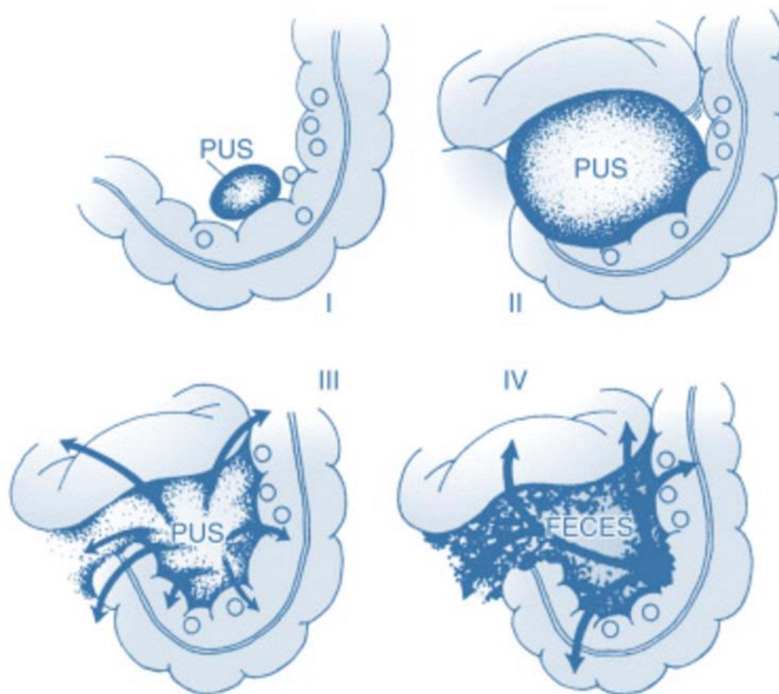
Complicated Diverticulitis (25%)

- Presence of:
  - Abscess (15-20%)
  - Free perforation (1-2%)
  - Fistula
  - Stricture

Hinchey Classification

Stage	Description
Stage I	Pericolonic or mesenteric abscess
Stage II	Pelvic abscess
Stage III	Generalized purulent peritonitis
Stage IV	Generalized feculent peritonitis



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Uncomplicated Diverticulitis (75%)

- Isolated segmental colon thickening
- Consider patient factors when determining need for admission/surgical therapy
  - Severity of pain
  - SIRS response
  - Elderly
  - Immunosuppression

Urgent Operative Management

Indications (ASCRS Grade 1B)

- Diffuse peritonitis, Hinchey III/IV
- Failure of non-operative management (Persistent pain and/ or ileus)

Goals of Operation

- Hartmann's Procedure (resection with end-colostomy)
    - Resection of perforated segment AND peritoneal cavity lavage

Technical Consideration	Recommendation
Abdominal Lavage (no resection)	Considered in purulent peritonitis; No consensus • ASCRS Guidelines suggest 'generally not appropriate' • No consensus in recent systematic review • RCT evidence (2017) suggests outcomes similar to resection • Not recommended in elderly or immunocompromised
Anastomosis	Primary anastomosis with diverting ileostomy is acceptable • Tailor to patient condition and bowel integrity • Not recommended in feculent peritonitis

Feingold, D., Steele, SR., Lee, S., et al., 2014 Dis Colon and Rectum
Regenbogen, SE., Hardiman, KM., Hendren, S., and Morris, AM. 2014, JAMA Surgery
Schultz, J., Wallon, C., Blecic, L., et al., 2017 BJS
Rade, F., Bretagnol, F., Auguste, M., et al., 2014 BJS

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Medical Management

Antibiotics

7-10 days Recommended

- IV Regimens
  - Ciprofloxacin and Metronidazole *or*
  - Ceftriaxone and Metronidazole

- Oral Regimens
  - Ciprofloxacin and Metronidazole *or*
  - Amoxicillin/Clavulanic Acid *or*
  - Septra and Metronidazole

Criteria for discharge

- Hemodynamically stable
- Tolerating oral intake
- Pain controlled
- Compliant

** Newer evidence suggests that antibiotics may not be necessary for uncomplicated diverticulitis [1,2], however the consensus recommendation endorses the utility of antibiotic therapy[3].

Jacobs, D., 2007 NEJM
[1] Daniels, L., Unlu, C., de Korte, N., et al., 2017 BJS
[2] Chabok, A., Pahlman, L., Hjern, F., et al., 2012 BJS
[3] Feingold, D., Steele, SR., Lee, S., et al., 2014 Dis Colon and Rectum

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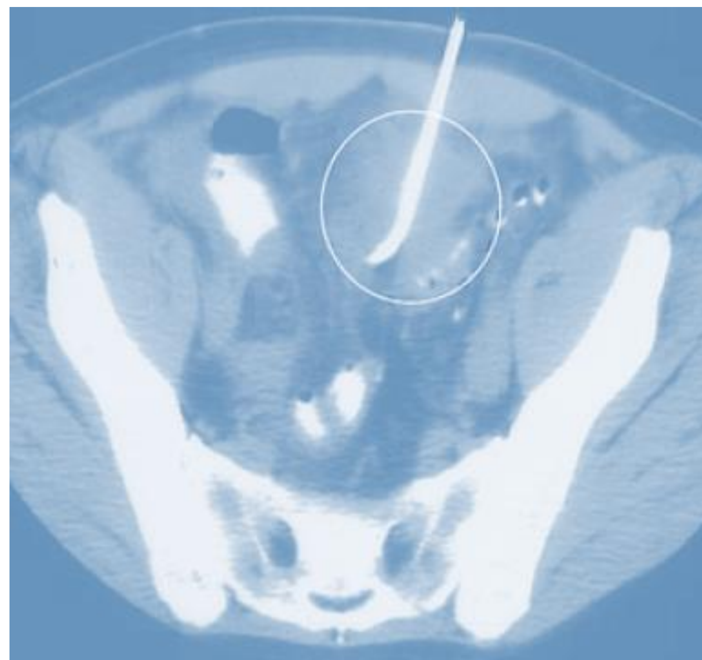
Percutaneous Drainage

Indications

- Abscess ≥ 4 cm
- Technically feasible with local expertise
- Stable patient



Use in conjunction with antibiotic therapy
Remove drain when no output x 48 hours

Increasing rates of percutaneous drainage has:

- Improved success of medical therapy
- Decreased emergency resections
- Increased single stage resections (elective)

Image from: Jacobs, D., 2007 NEJM
O'Leary, DP., Lynch, N., Clancy, C., et al., 2015 JAMA Surgery
Feingold, D., Steele, SR., Lee, S., et al., 2014 Dis Colon and Rectum

Follow-Up for Complicated Patients

Surgically Managed Group

- **Review pathology for differential:**
  - Malignancy
  - Inflammatory Bowel Disease
  - Foreign Body
- **Examine for Complications**
  - Anastomotic Leak (2-5%)
  - Anastomotic Stricture
  - Ureteral Injury (1-10%)
  - Disease Recurrence (3-13%)
- **Stoma Reversal**
  - Consider >3 months after Hartmann Procedure

Conservatively Managed Group

- **Elective colectomy**
  - Routine colectomy following complicated episode is no longer recommended [2]
  - Decision should be made on an individual basis incorporating risk of recurrence with risk of surgery
  - Elective surgery should be performed laparoscopically and with primary anastomosis [2,3]

Thorson, A and Beatty, J., 2014 ASCRS Manual
Feingold, D., Steele, SR., Lee, S., et al., 2014 Dis Colon and Rectum
O'Leary, DP., Lynch, N., Clancy, C., et al., 2015 JAMA Surgery

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Follow-Up for Uncomplicated Patients

Evaluate for Recurrence

- Recurrence in 10-30% of patients; factors increasing likelihood:
    - Young age
    - Obesity
    - Presence of Abscess

Role of Colonoscopy

- Patients should be screened based on colorectal cancer screening guidelines OR
- CT evidence of complicated diverticulitis that is unable to exclude malignancy OR
- Persistent symptoms

Consider for Elective Resection

- 3 to 4 episodes of uncomplicated diverticulitis are considered to be a threshold to consider elective colectomy, however there is no strict recommendation

Jacobs, D., 2007 NEJM
Westwood, D., Eglinton, T., Frizelle, F., 2011 BJS
O'Leary, DP., Lynch, N., Clancy, C., et al., 2015 JAMA Surgery

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Special Considerations

Immunocompromised

- Significantly higher rates of mortality (4X)
- Should be managed aggressively with early consideration for surgical resection

Ureteric Stents

- May be used at the discretion of the surgeon but are not required

Fistulas

- Present as complications of diverticulitis, most commonly as colovesicular, colovaginal, or colocutaneous
- Considered to be an indication for elective resection

Diet Modifications

- A high fibre diet (35 g/day) is considered an appropriate recommendation though has not been definitively shown to decrease rates of recurrence

Jacobs, D., 2007 NEJM
Brandl, A., Kratzer, T., Kafka-Ritsch, R., et al., 2016 Can J Surg
Feingold, D., Steele, SR., Lee, S., et al., 2014 Dis Colon and Rectum