Assessing Acute Abdominal Pain: A Practical Review

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Objectives

- To review anatomical locations for GI and non-GI illnesses that cause acute abdominal pain
- To define the appropriate workup for several interactive cases of acute abdominal pain
- To incorporate lower GI "Alarm Symptoms" into your practice
- To illustrate the pitfalls in making a diagnosis

The use of lower GI "Alarm Symptoms"

1. Can definitely distinguish Irritable Bowel Syndrome from organic illnesses
2. Can definitely diagnose Crohn's Disease
3. Can definitely diagnose colon cancer
4. Can distinguish patients more likely to have organic disease

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All of the following are useful to diagnose common duct stones EXCEPT:

1. Endoscopic ultrasound (EUS)
2. Magnetic resonance cholangiopancreatography (MRCP)
3. HIDA scan
4. Endoscopic retrograde cholangiopancreatography (ERCP)

4

- Your 46-year-old female patient has a 5-day history of diarrhea and LLQ pain
- Also 1-day history of rectal bleeding
- Hx thrombocytosis
- Hx of using birth control pills 20 years
- PE: Ill female, BP 160/100, p 120, rr 20, t 100
- Abd: pinpoint LLQ tenderness, no rebound or masses
- Some blood on rectal
- WBC 20,000, shift to L
- H/H 9.7/30

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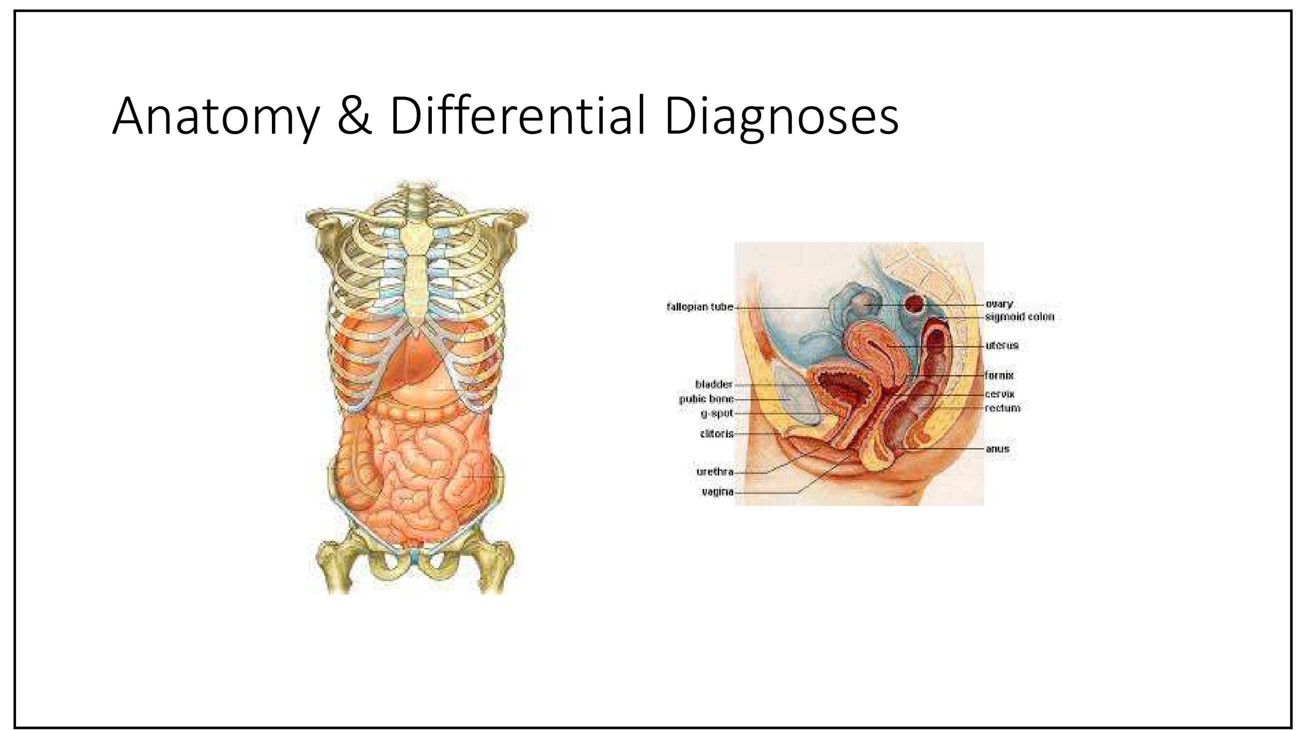
What is the most likely diagnosis?

1. Diverticulitis
2. Crohn’s disease
3. Ischemic colitis
4. Colon Ca



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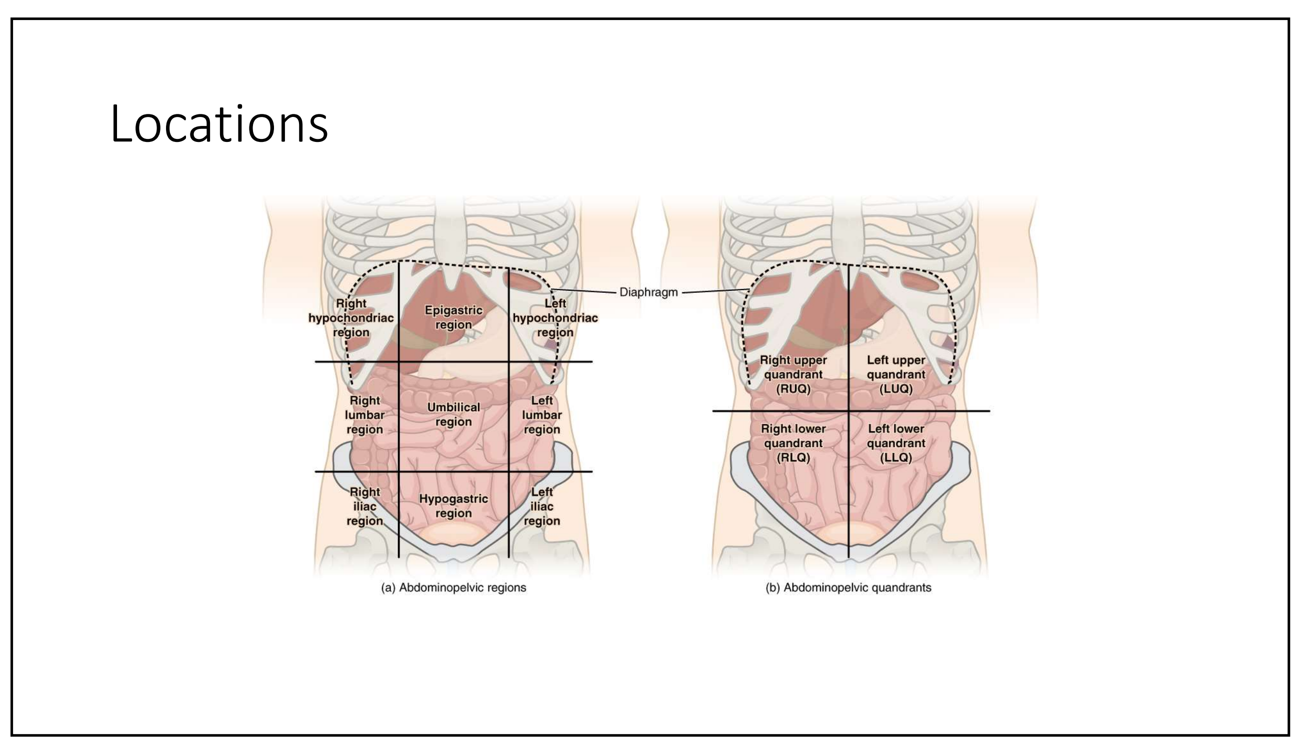
Locations



(a) Abdominopelvic regions (b) Abdominopelvic quandrants

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Which of the following GI illnesses can appear in unusual locations?

1. Appendicitis
2. Diverticulitis
3. Duodenal ulcer
4. All the above

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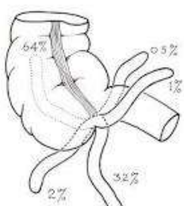
Atypical Locations for Appendicitis



Usually located 2 cm below the ileocecal valve

Also located: In pelvis
Outside the peritoneum
Behind the cecum

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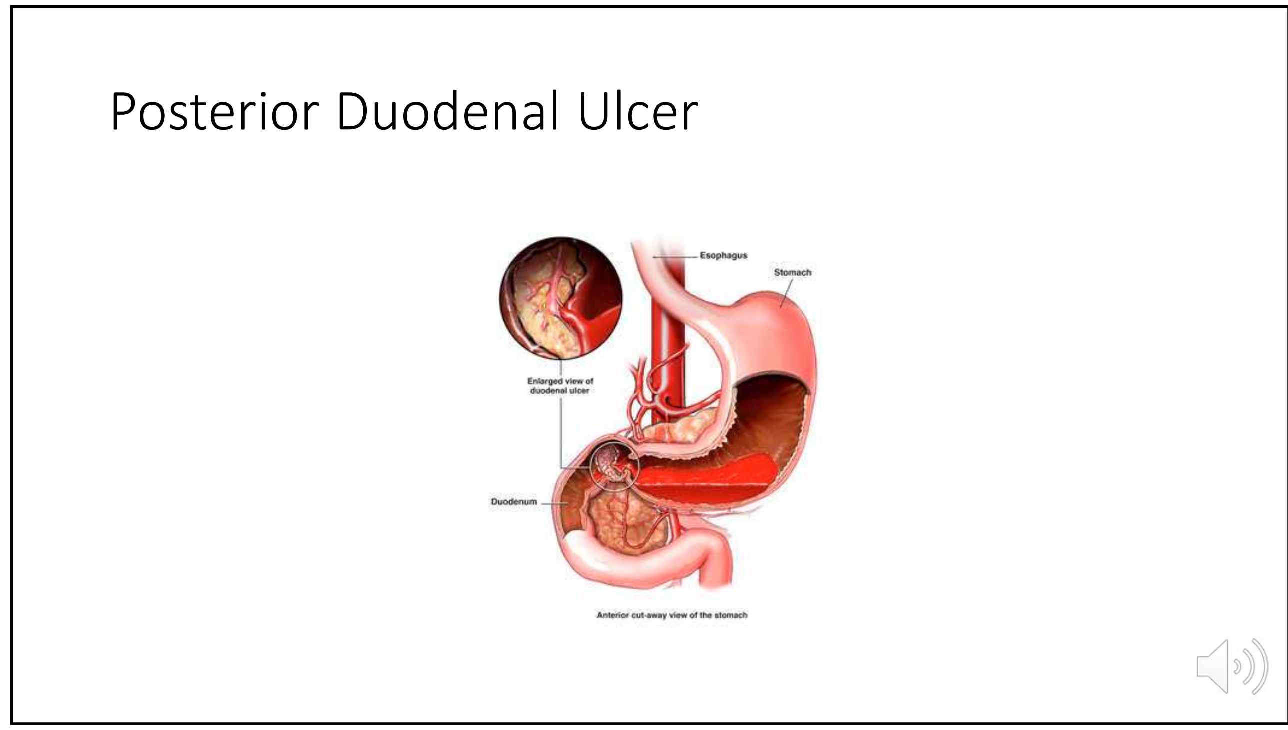

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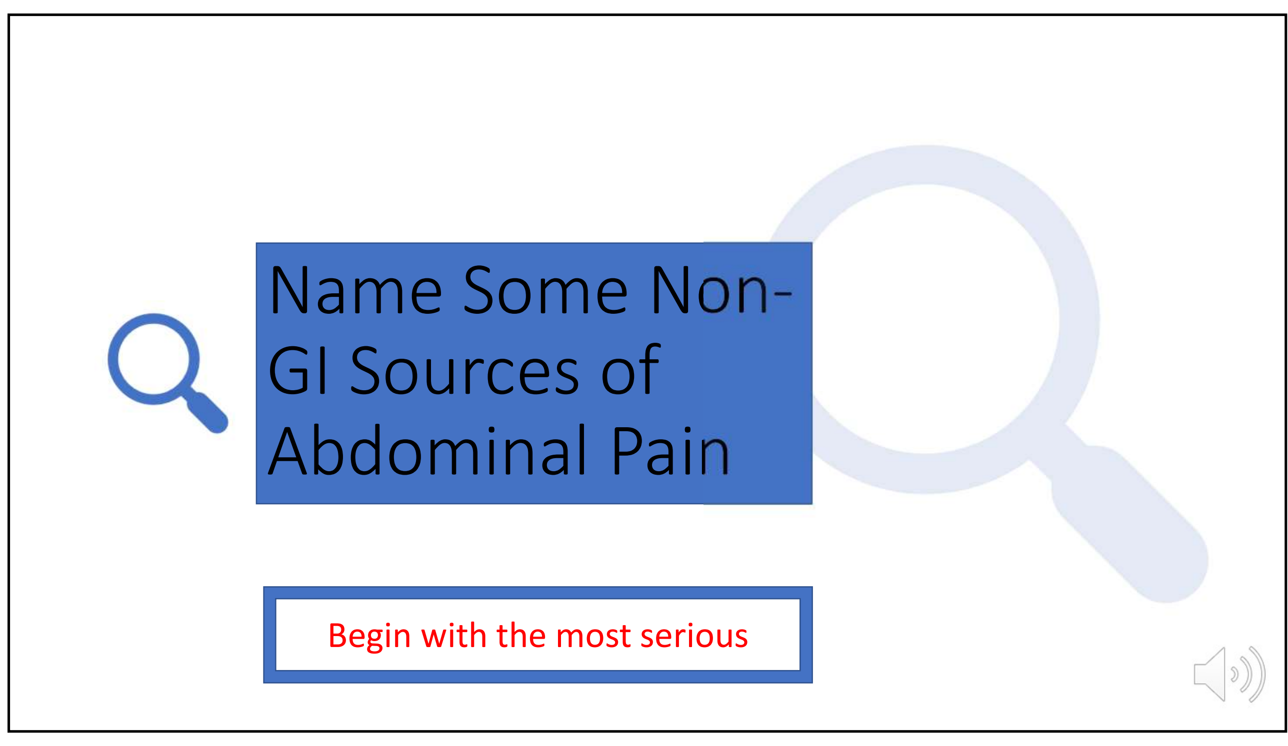

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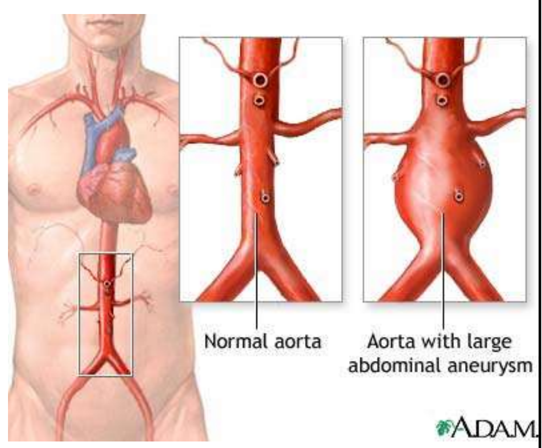
Abdominal Aortic Aneurysms

- Severe mid abdominal pain
- "Tearing" in nature
- Shock
- Pulsatile mass



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Missed Diagnosis of Ruptured AAA (meta analysis)

32%

Misdiagnosed as: Ureteric colic
MI
Colonic inflammation
GI perforation

This meta analysis did not measure mortality.

Azhar et al. (2014, Aug). Misdiagnosis of Ruptured Abdominal Aortic Aneurysm: Systematic Review and Meta-analysis. *Pub Med.* 21(4):568-575. *10.1583/13-4626MR.1.*

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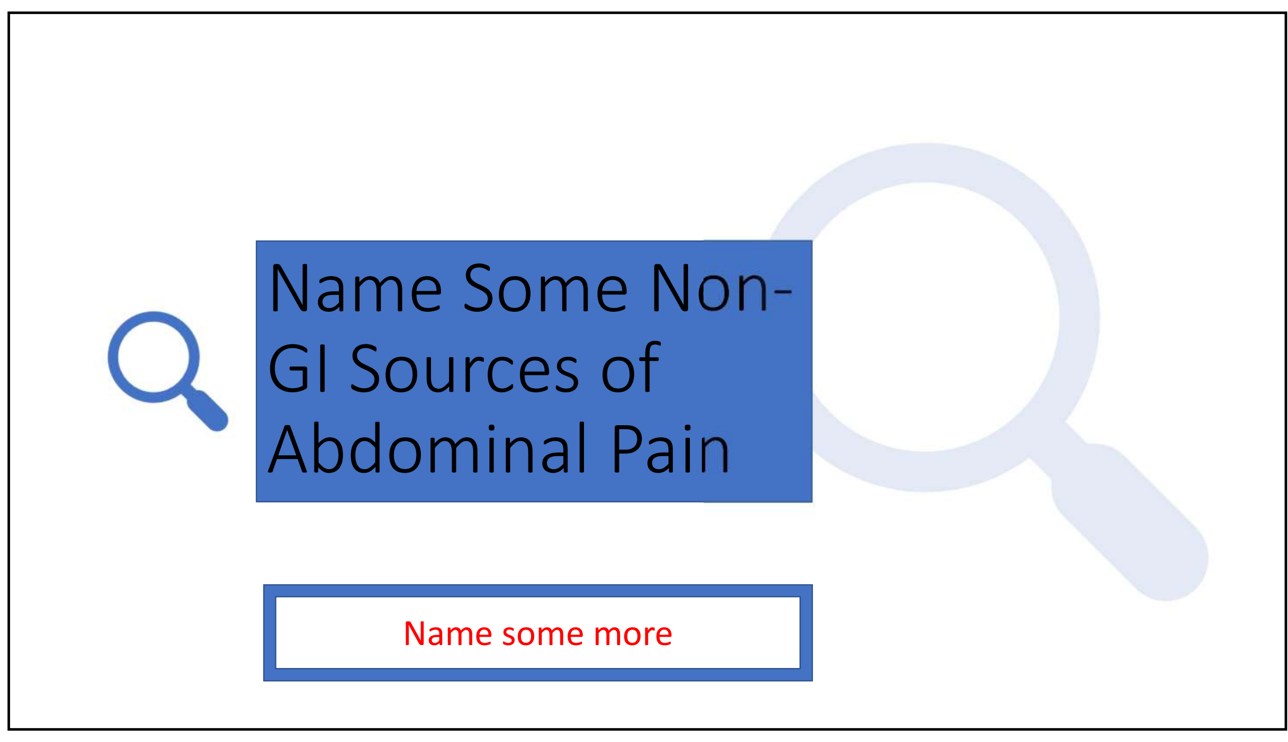

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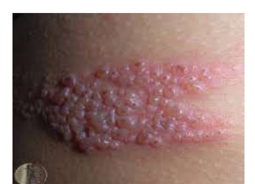
More non GI Sources of Abdominal Pain

- Herpes zoster
- Abdominal wall hernias
- MI*
- Pneumonia
- Ectopic pregnancy
- Kidney stones



*Canto et al. (2012, Feb 22). Association of Age and Sex with Myocardial Infarction Symptom Presentation and In-Hospital Mortality. *Journal of American Medical Associations.* 307(8): 813-822. 10.1001/jama.2012.199

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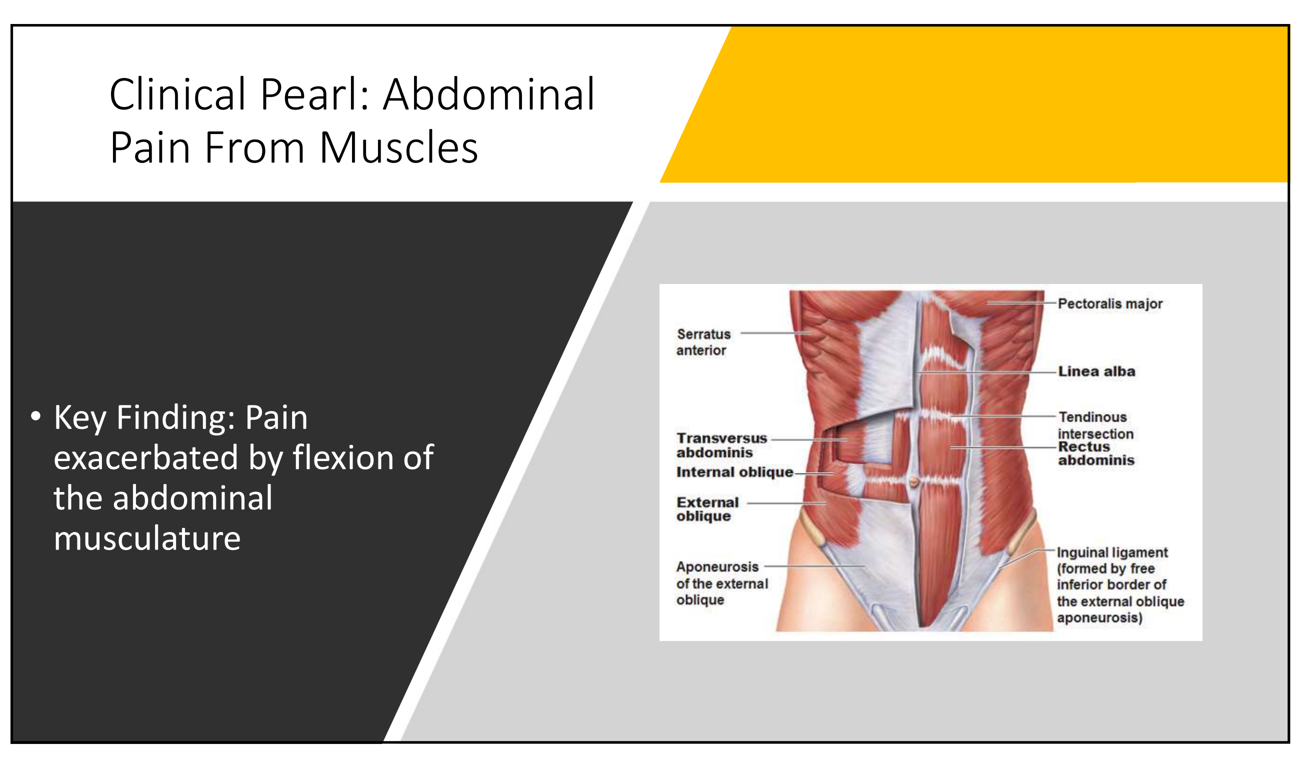
Clinical Pearl: Abdominal Pain From Muscles
• Key Finding: Pain exacerbated by flexion of the abdominal musculature
Serratus anterior
Pectoralis major
Linea alba
Tendinous intersection
Rectus abdominis
Transversus abdominis
Internal oblique
External oblique
Aponeurosis of the external oblique
Inguinal ligament (formed by free inferior border of the external oblique aponeurosis)
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Nancy

- Age 73 has a history of severe LLQ pain and a temp of 101^0 for the last two days
- PE: Ill pt, BP 160/92, p 120, rr 20, & t 102
- Abdominal exam demonstrates significant tenderness in LLQ, no rebound, no masses

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The MRI does not demonstrate a colon mass.

Is a colonoscopy eventually (at a later date) necessary ?

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YES

- Colon cancer occurs in 2.8% of patients with diverticulitis

Lau et al. (2011, October). Is Colonoscopy Still Mandatory After CT Diagnosis of Left-sided Diverticulitis: Can Colorectal Cancer be Confidently Excluded?. *Diseases of the Colon and Rectum.* 54(10):1265-1270. 10.1097/DCR.0b013e31822899a2

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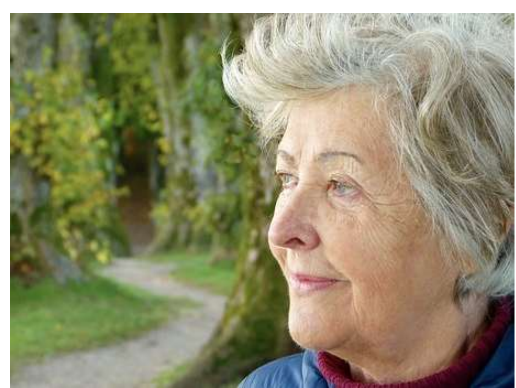
Roberta

- Age 73 has had 2 episodes of acute diverticulitis in the past 8 months diagnosed with CT scans
- Now with moderate LLQ pain, no N/V
- History of normal screening colonoscopy 2 years ago
- VS: BP 130/68, p 68, rr 12, & t 100.0
- Abd: mild tenderness, no rebound, no masses



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What do you recommend for Roberta:

1. CT
2. MRI
3. Colonoscopy
4. No additional testing necessary

What do you recommend for Roberta:

With documented diverticulitis and no acute abdominal features are additional tests really necessary?

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Does the severity of pain help us distinguish Irritable Bowel Syndrome from surgical emergencies?

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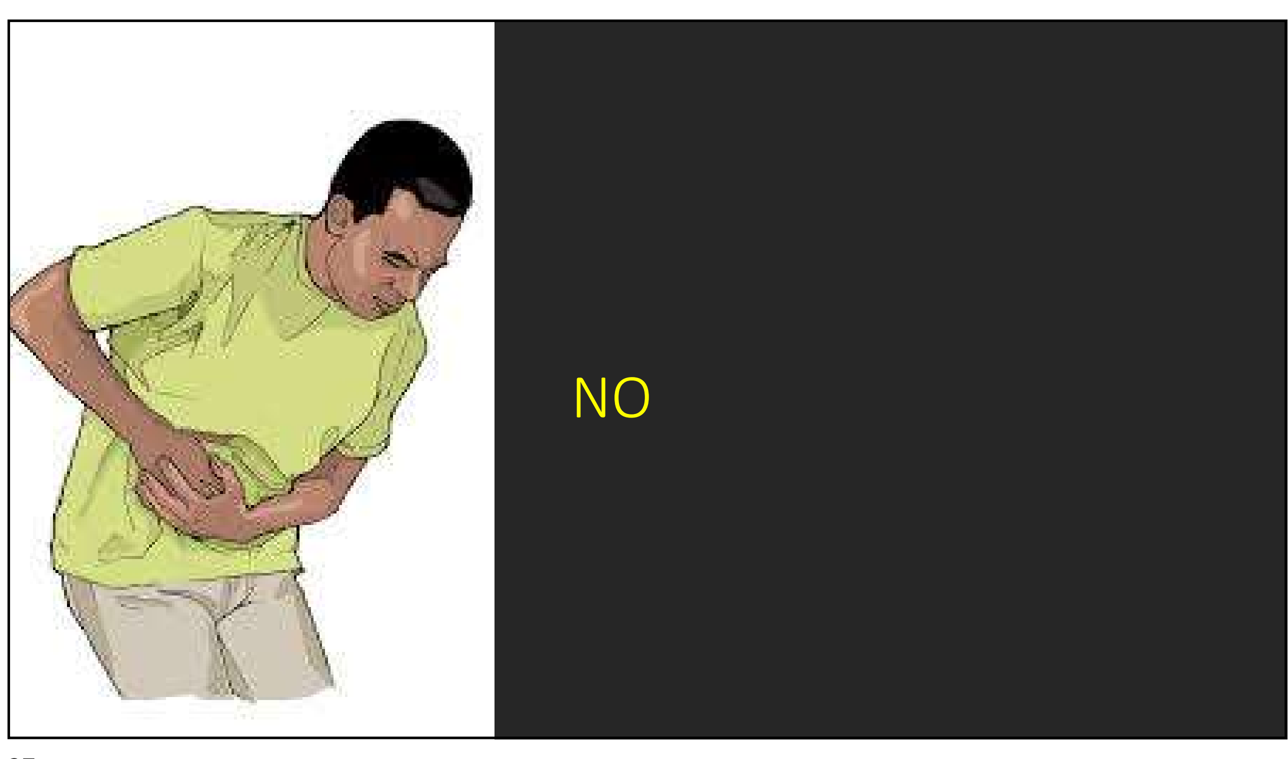

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Jeff

- Age 60 has longstanding Irritable Bowel Syndrome (IBS) manifested by intermittent bouts of severe abdominal pain and diarrhea.
- The IBS has been thoroughly evaluated; including colonoscopy done 5 years ago.
- Jeff now comes to see you for rectal bleeding that seems to fill the toilet bowl

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What would you do next?

1. Symptomatic treatment of presumed hemorrhoids
2. Strongly consider another colonoscopy
3. Do Fecal Immunochemical Test (FIT) to r/o Ca
4. Do a fecal DNA test (Cologuard) to r/o Ca

What would you do next?

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2. Strongly consider another colonoscopy
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The Presence of "Alarm Symptoms" Helps Distinguish Irritable Bowel Syndrome from Other Potential Serious Medical Problems

- Rectal bleeding
- Anemia
- Weight loss
- Fever

Brandt et al. (2009, January). An Evidence-based Position Statement on the Management of Irritable Bowel Syndrome. *The American Journal of Gastroenterology.* 104 Suppl 1:S1-35. 0.1038/ajg.2008.122.

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What is the best initial test to evaluate RUQ pain when you suspect acute cholecystitis?

1. CT
2. HIDA scan
3. U/S
4. MRCP

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What is the best initial test to evaluate RUQ pain when you suspect acute cholecystitis?

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CT Should Generally NOT Be Used to Make the Diagnosis of Acute Cholecystitis

- Low positive predictive value
- Does not visualize gallstones
- Underestimates gallbladder wall thickening

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MRCP in Biliary Track Disease

- Less sensitive than U/S in evaluating gb disease (69 vs 96%)
- Helpful to evaluate common duct stones (80% sensitivity)

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HIDA Scan Use 2020

- To assess:

1. Cholecystitis where ultrasound normal
2. Leaks after cholecystectomy

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Suzie

- Is a 60-year-old female, otherwise healthy, with severe RUQ pain for the past 2 weeks
- Also nausea and vomiting
- **Cholecystectomy:** 5 years ago
- On no meds
- Exam normal except for moderate RUQ pain, no rebound, or masses
- CBC and LFTs normal
- Lipase normal
- U/S: s/p cholecystectomy, normal CBD

What do you suggest?

1. MRCP
2. ERCP
3. CT
4. Endoscopy

What do you suggest?

1. MRCP
2. ERCP
3. CT
4. Endoscopy

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What approach do you suggest?

1. Antispasmodics
2. Biliary manometry
3. Treat her for muscle pain
4. Evaluate stress factors

What approach do you suggest?

1. Antispasmodics
2. Biliary manometry
3. Treat her for muscle pain
4. Evaluate stress factors

Let's talk about choices!

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Myra

- Is a 42-year-old female, otherwise healthy with severe RUQ pain for 1 week
- With N/V
- Cholecystectomy: 5 years ago
- On no meds
- PE: t 101.6, scleral icterus moderate RUQ tenderness

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Labs

- Alk Phos: 272 (nl 50-136 U/L)
- AST: 200 (nl 12-78 U/L)
- ALT: 150 (nl 15-37 U/L)
- Total Bilirubin: 4.0 mg/dL
- Lipase: normal
- U/S: shows s/p cholecystectomy, 1 .2cm CBD (dilated)

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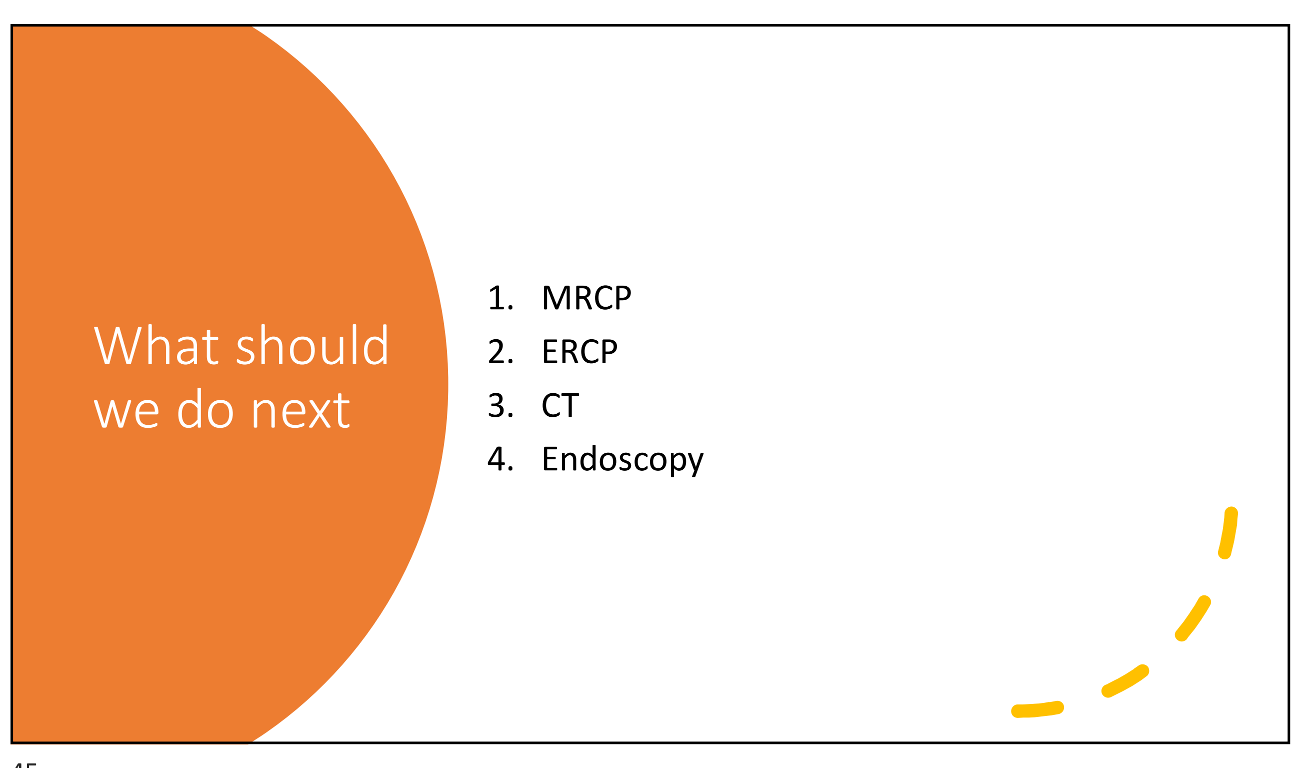

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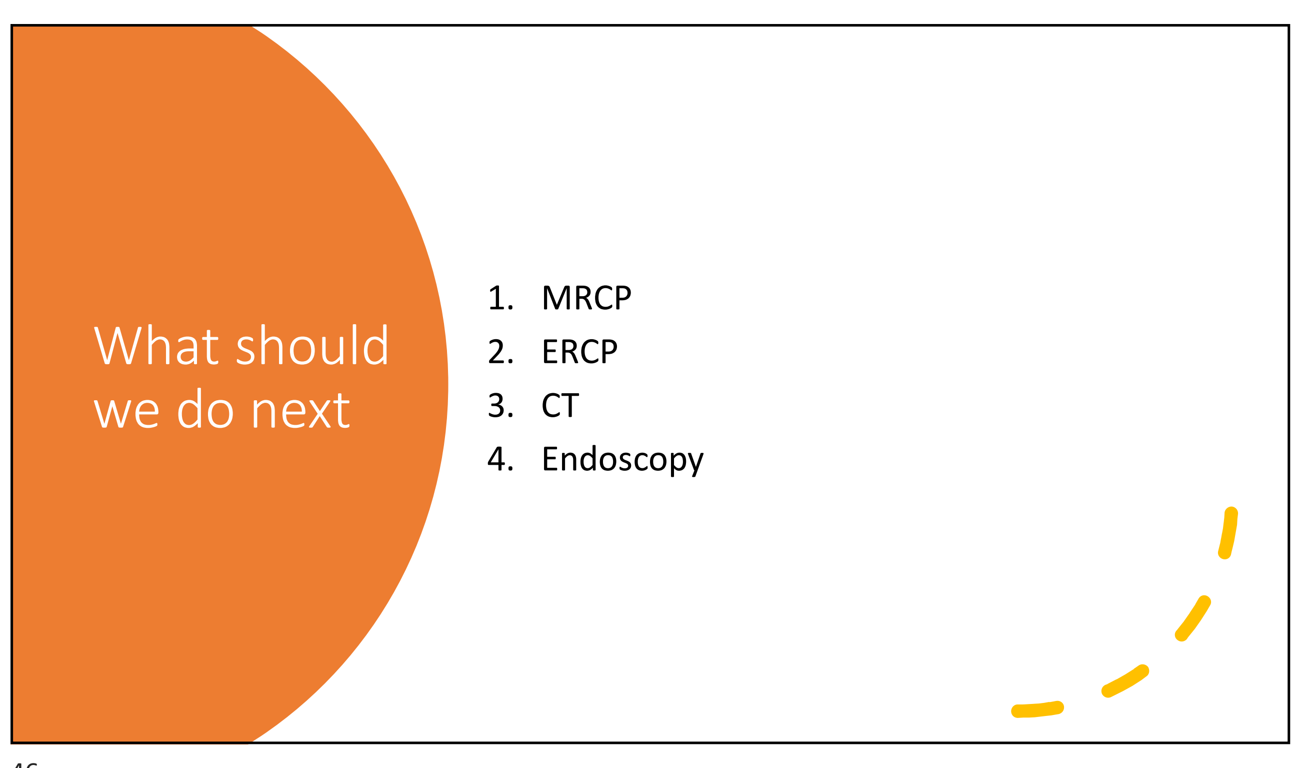
What should we do next
1. MRCP
2. ERCP
3. CT
4. Endoscopy
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Would we approach Myra differently if she had a normal common bile duct

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Would we approach Myra differently if she had a normal common bile duct

No difference in approach

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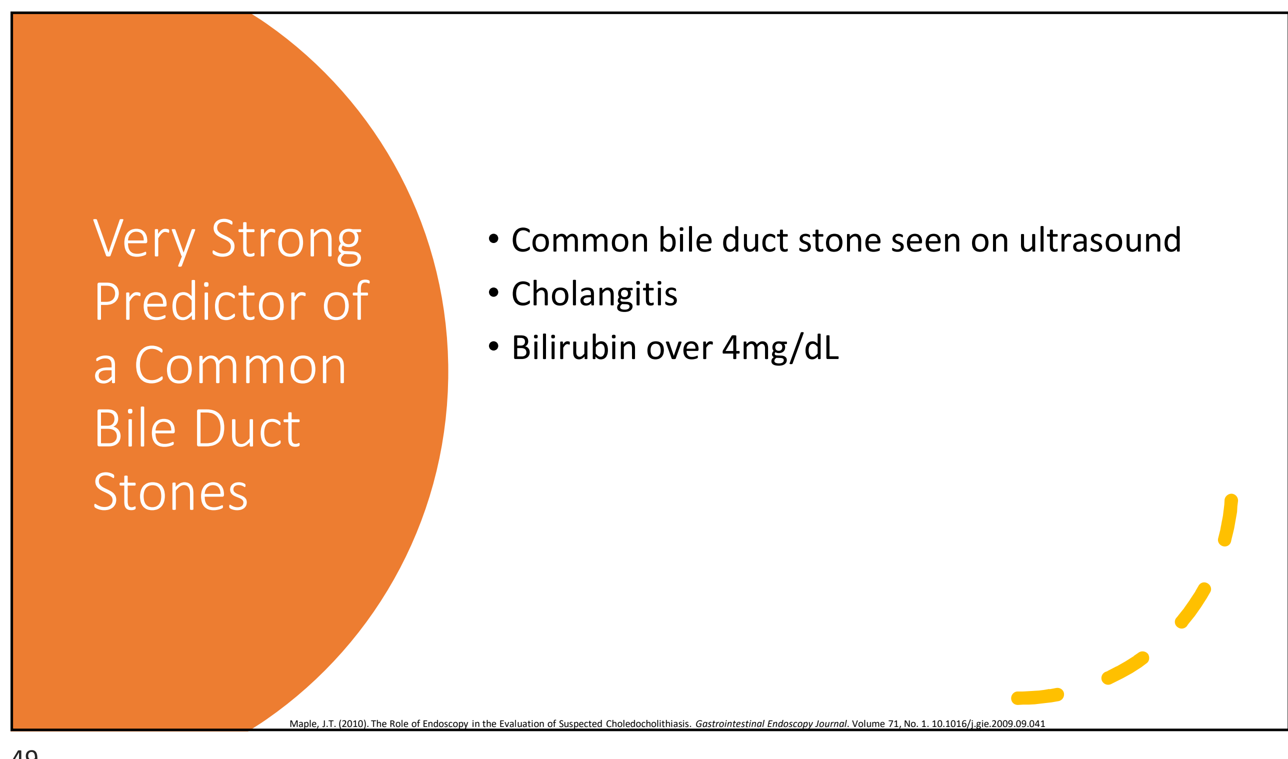

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MRCP vs ERCP in detecting common duct stones

- MRCP* sensitivity 90%
  specificity 86%

- ERCP** sensitivity 90% +
  specificity 97%

*Badger et al. (2017 August). Utility of MRCP in Clinical Decision Making of Suspected Choledocholithiasis: An Institutional Analysis and Literature Review. *The American Journal of Surgery*. 214(2):251-255. 10.1016/j.amjsurg.2016.10.025
**Moon et al. (2005 May). The Detection of Bile Duct Stones in Suspected Biliary Pancreatitis. *The American Journal of Gastroenterology*. 100(5):1051-1057. 10.1111/j.1572-0241.2005.41057.x

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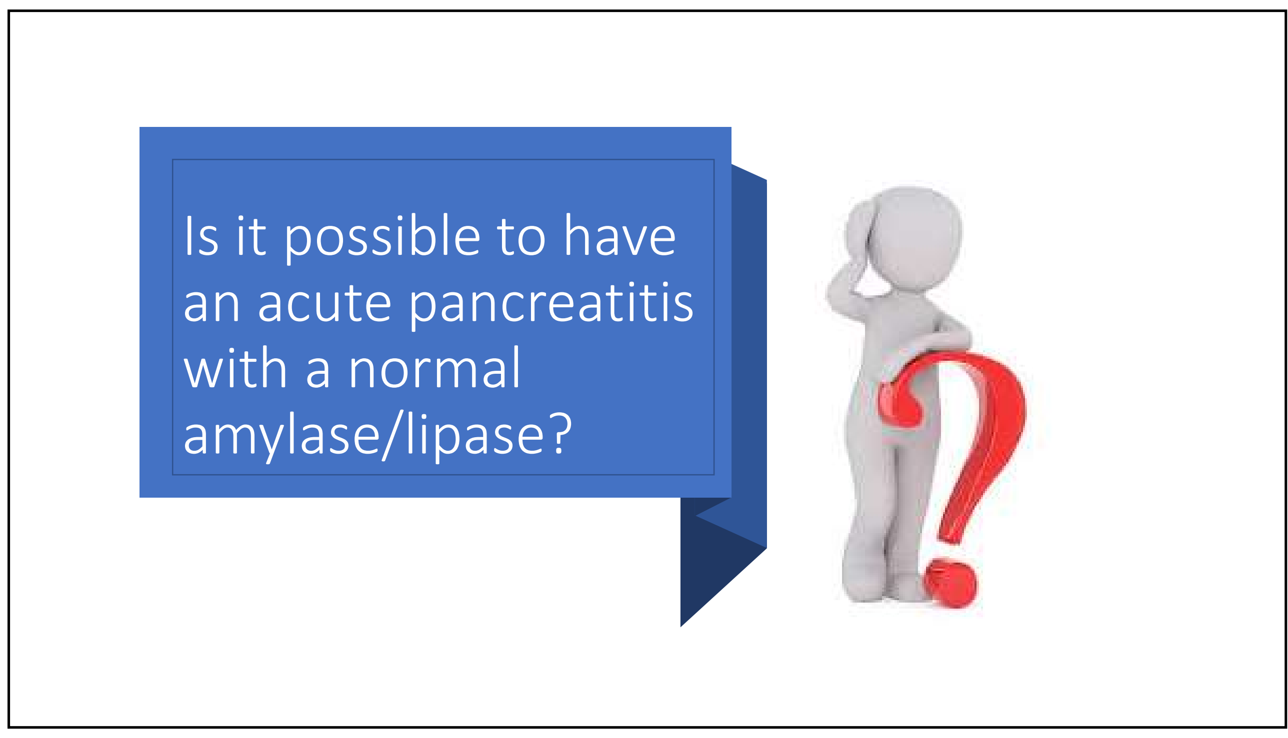
Tony

- Is a 57-year-old now in the ER with severe epigastric pain, nausea, and vomiting
- History significant for: chronic alcoholism
  multiple ER visits for acute pancreatitis

PE: Ill man writhing in pain
BP 180/95, p 120, rr 24, & t 100.1
Abd exquisite epigastric tenderness



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Two Out of Three Rule to Make a Diagnosis

- To diagnose acute pancreatitis, we must have two out of three of these:
  - SEVERE EPIGASTRIC PAIN
  - ELEVATED AMYLASE/LIPASE
  - CHARACTERISTIC FINDINGS ON IMAGING

Emma

- Is a 58-year-old PA with a 2-hour history of epigastric abdominal pain and nausea
- No significant PMH
- No meds

- PE: WDWN, BP 170/90, p110, rr 20, & t 99.9
  Lungs clear
  Cor tachycardia, no murmurs, gallops, or rubs
  Abd mild epigastric tenderness, no masses, stool heme neg

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Emma's Labs

- CBC
- General Chem
- Amylase
- Lipase
- Abdominal ultrasound
- MRI of abd/pelvis

All normal

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What tests should we consider now? And why?

1. Endoscopy
2. EKG
3. MRCP (MRI of biliary tree and pancreas)
4. Colonoscopy

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- Women often mistake cardiac symptoms for other diseases

- Women with an acute coronary syndrome have less chest pain than men

Canto et al. (2012, February 22). Association of Age and Sex with Myocardial Infarction Symptom Presentation and In-hospital Mortality. *The Journal of the American Medical Association*. 307(8):813-822. 10.1001/jama.2012.199

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Charlene

- Is a 56-year-old with a 2-week history of RUQ pain
- Family history is significant for 2 first degree relatives with cholecystitis
- She has taken Ibuprofen 2 caplets every 3 hours for the pain
- PE: WDWN, BP 140/90, p 110, rr 18, & t 99
- Abd: Epigastric tenderness, no masses
- Labs: CBC normal
  Gen Chem normal
  Lipase normal
  U/S normal

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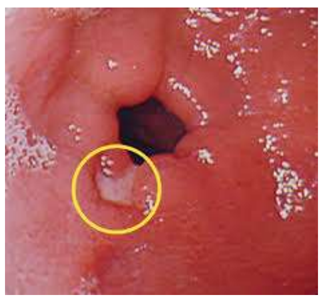
What would you recommend as the next step?

1. Cholecystectomy
2. Repeat U/S
3. Endoscopy
4. Evaluate for stress factors

Seen on endoscopy



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Ed

- Is a 75-year-old admitted with a small bowel obstruction
- History: two recent episodes of small bowel obstruction
  appendectomy 60 years prior
- Has been hospitalized 5 days with NG tube in place
- Testing to date includes routine bloods plus:
  CT scan demonstrating small bowel obstruction that arises around the terminal ileum

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Ed: What would you consider next and why?

1. Exploratory laparotomy
2. Colonoscopy
3. Capsule study of the small intestine
4. Magnetic Resonance Enterography of small intestine

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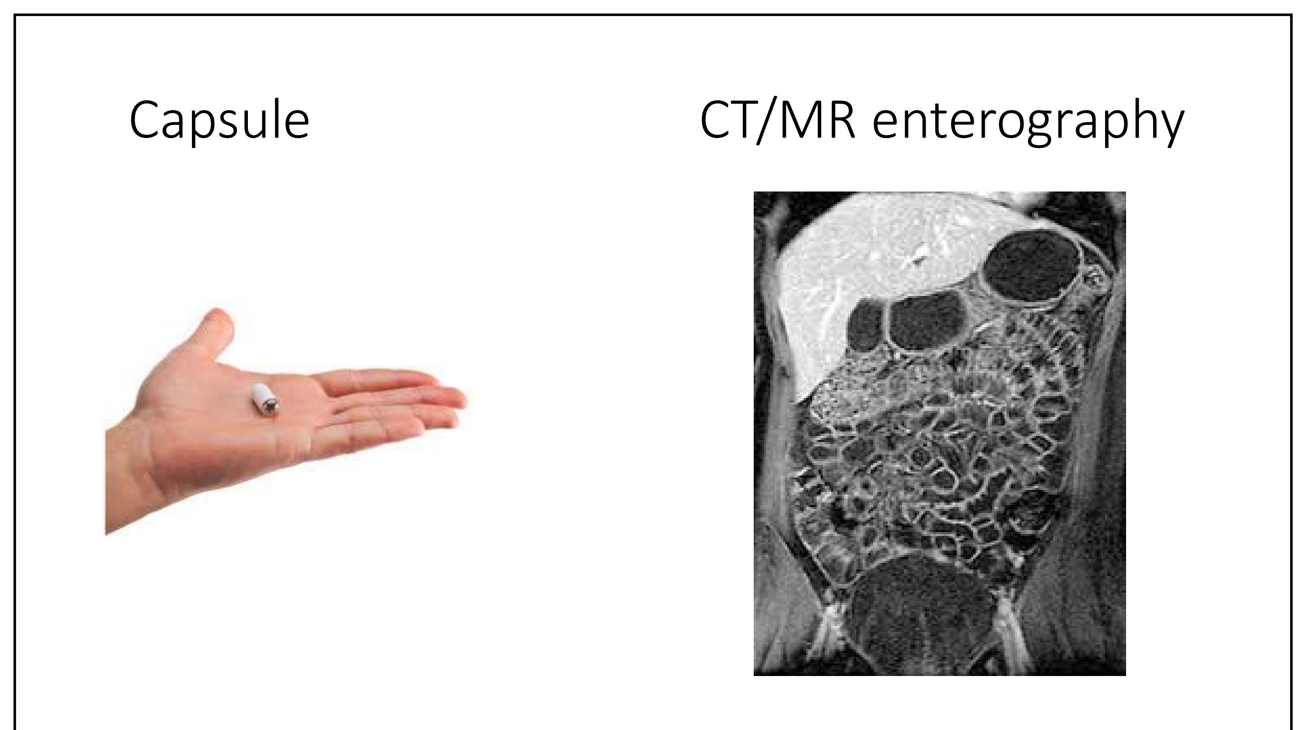
Capsule
CT/MR enterography
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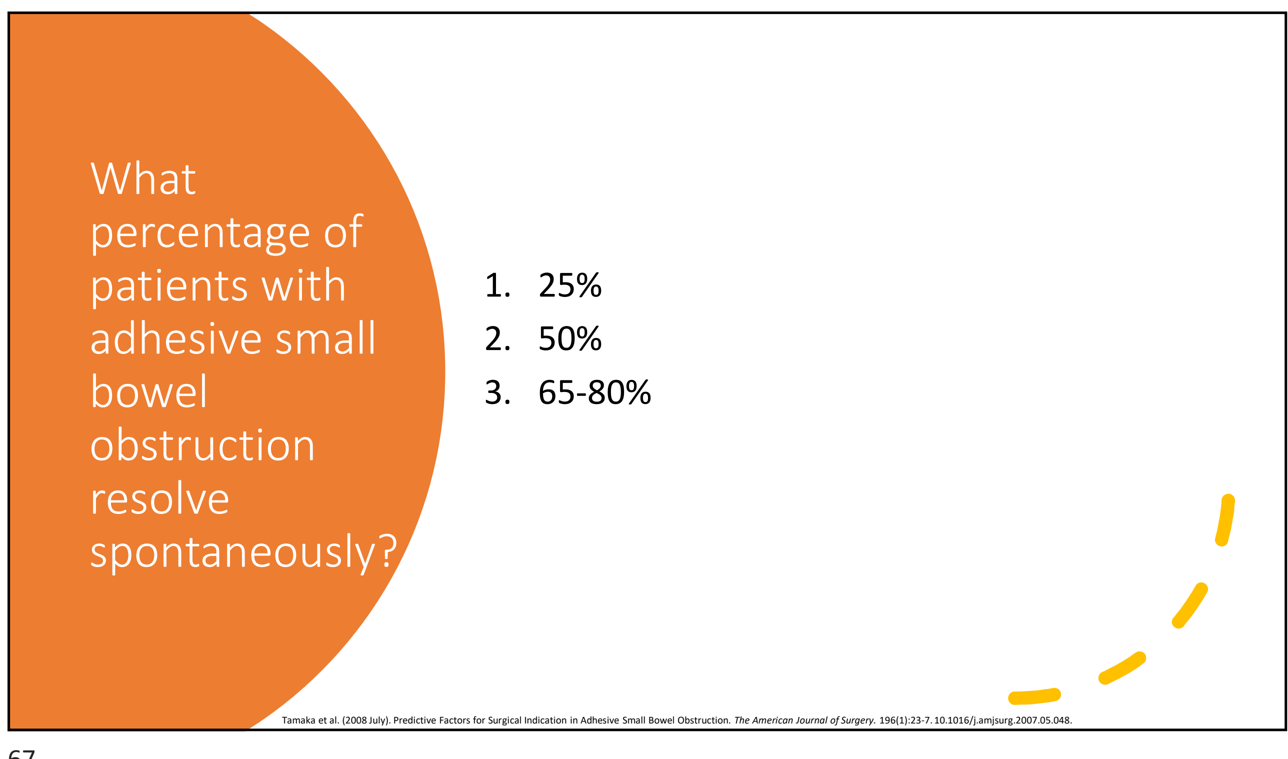

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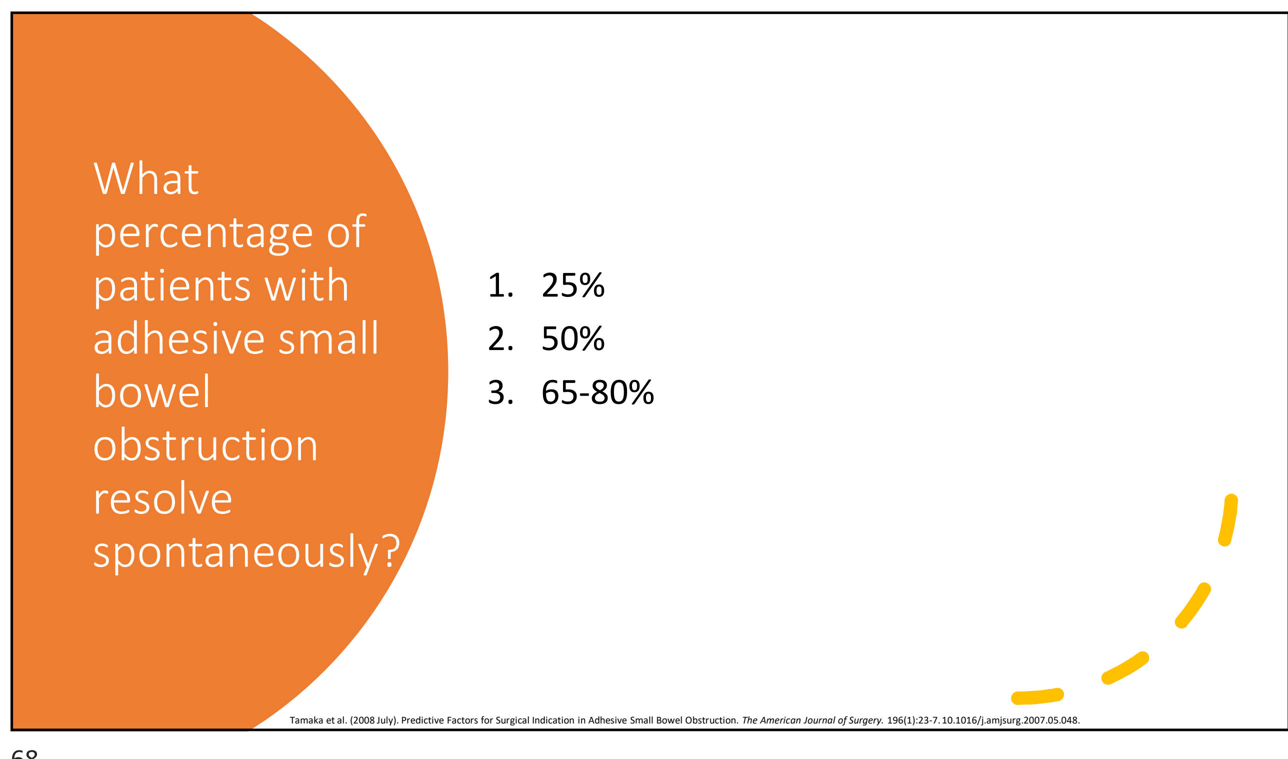

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Ella

- Is a 19-year-old who came to the ER with an 8-hour history of RLQ pain and nausea
- No significant PMH
- PE: Ill female writhing on the exam table
  BP 150/96, P 120, rr 24, & t 100.2
  Severe RLQ tenderness
  The surgeon orders a CBC WBC: 12,000
  Gen Chem: normal
  U/A: normal
  Pregnancy test: neg
  CT of abd/pelvis: normal

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The surgeon decides to do an exploratory laparotomy

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The laparotomy is completely normal

- Questions:

1. Was the surgeon wrong in doing the laparotomy?
2. Would additional tests be useful?
3. What percentage of all laparotomies looking for appendicitis are negative?

The laparotomy is completely normal

- Questions:

1. Was the surgeon wrong in doing the laparotomy?
   No
2. Would additional tests be useful?
   Let's talk
3. What percentage of all laparotomies looking for appendicitis are negative?
   10%

Diagnosing Appendicitis

- 3,540 urgent appendectomies
- 86% of patients had preop CT
- Accuracy of CT 90%

Cuschieri et al. (2008, October). Negative Appendectomy and Imaging Accuracy in the Washington State Surgical Care and Outcomes Assessment Program. *Pub Med.* 248(4); 557-563. 10.1097/SLA.0b013e318187aeca.

Ella goes home and is fine for 2 days

Then develops severe RLQ pain and a temp to 104

What is the most likely diagnosis?

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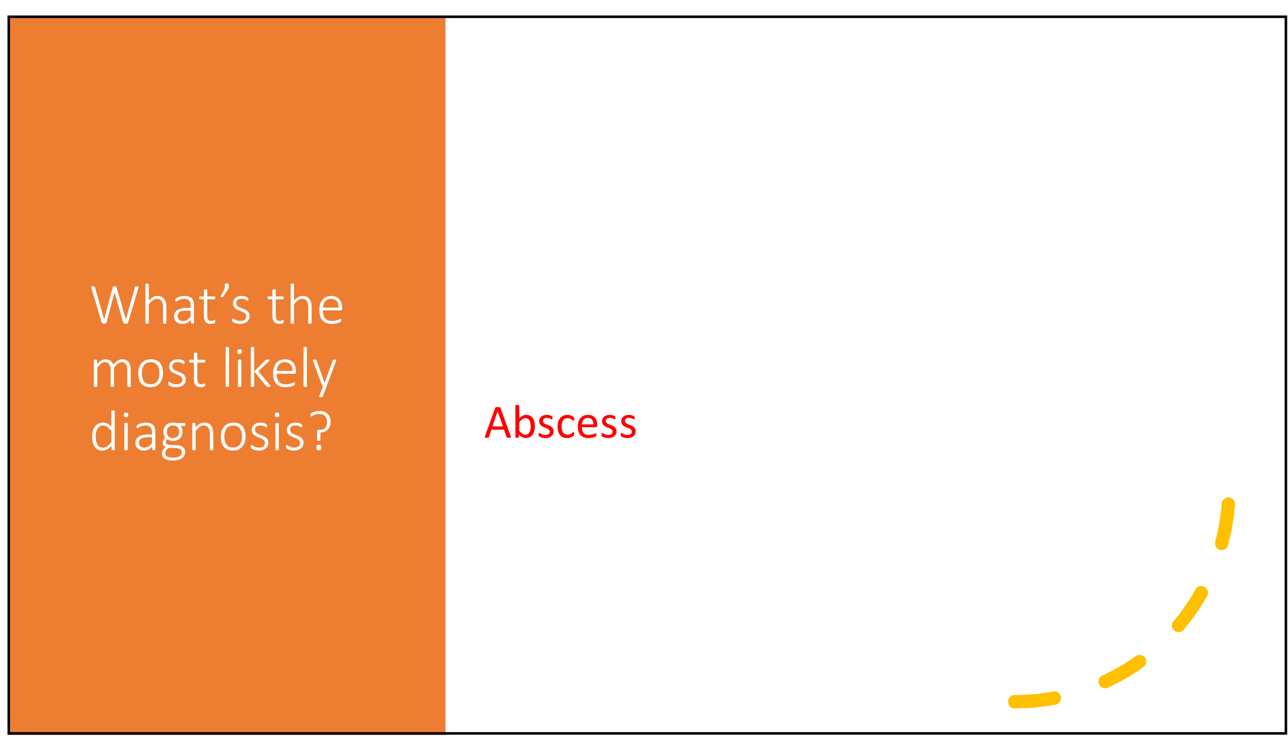

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Dawn

- Age 23 has a 4-hour history of worsening LLQ pain
- She has no significant PMH and is not taking any meds
- PE: Ill patient, BP 80/40, p 120, rr 24, & t 100.2

  Abd very tender LLQ, no rebound, heme -

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Which of the following tests should we consider among the first?

1. Colonoscopy
2. CT of abd/pelvis
3. hCG
4. Pelvic ultrasound

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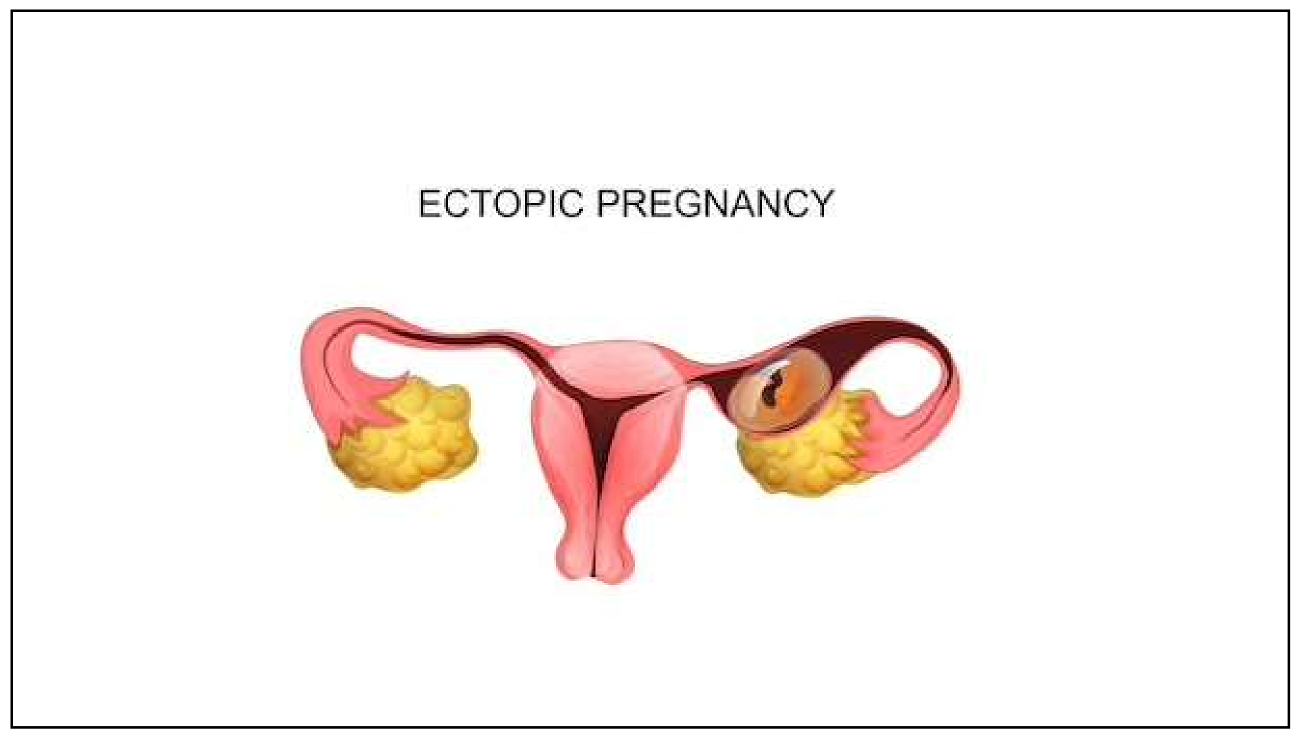

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Rita

- Age 46 has a 5-day history of diarrhea and LLQ pain
- Also 1-day history of rectal bleeding
- Rita has a history of **thrombocytosis**
- Rita has been taking birth control pills for 20 years
- PE: Ill female, BP 160/100, p 120, rr 20, & t 100
- Abd: LLQ pinpoint tenderness, no rebound; bright red blood on rectal exam
- Lab: CBC WBC 20,000 shift to left
  H/H 9.7/ 30

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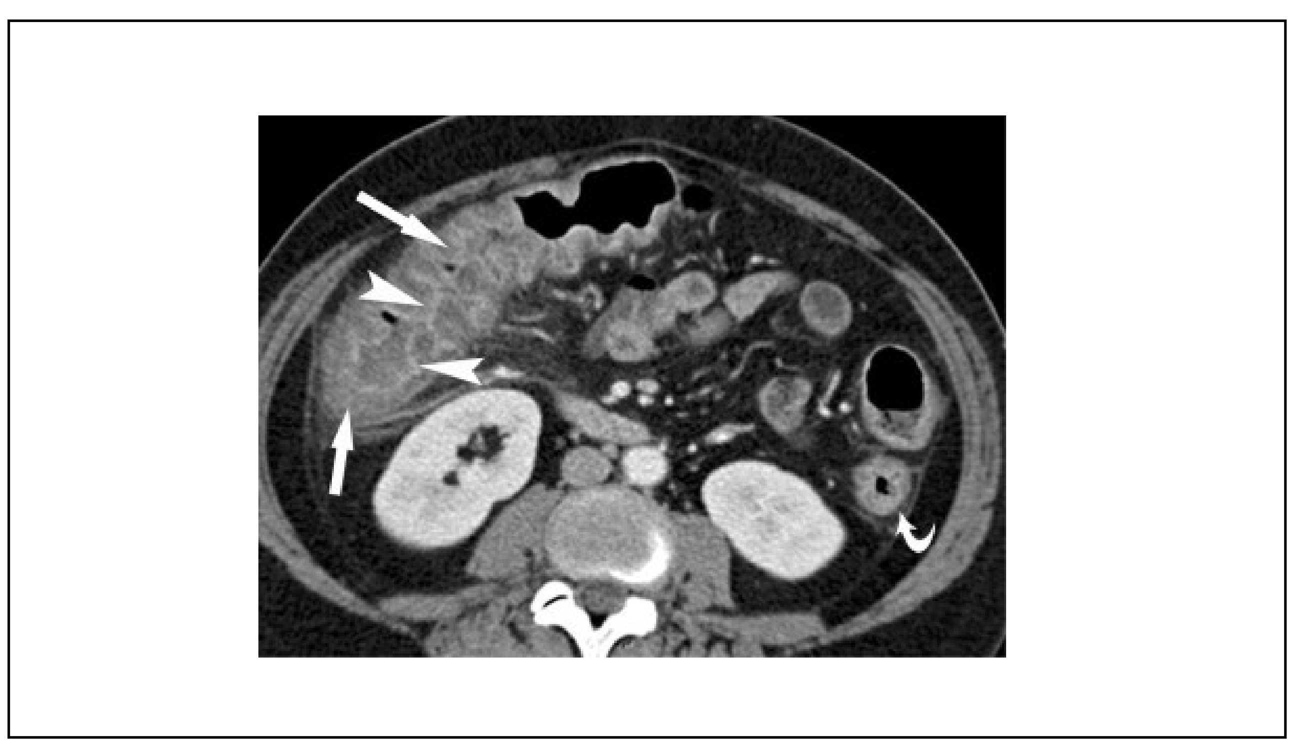

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Rita's
Colonoscopy
82

Given the patient’s history, what is the most likely diagnosis?

1. Diverticulitis
2. Crohn’s disease
3. Ischemic colitis
4. Colon cancer

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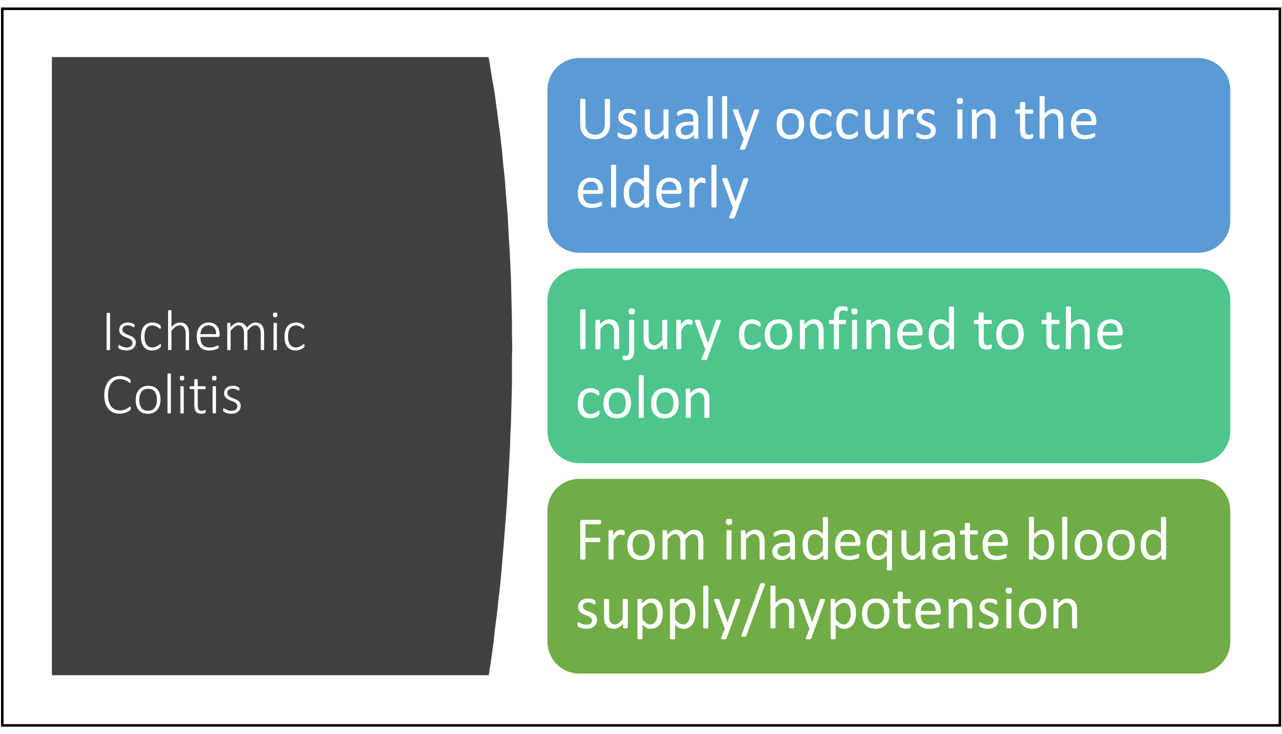

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References

Cartwright, S., & Knudson, M. P., (2008, April 1). Evaluation of Acute Abdominal Pain in Adults. *American Family Physician.* 77(7):971-978

Lameris et al. (2009, March 13). Imaging Strategies for Detection of Urgent Conditions in Patients with Acute Abdominal Pain: Diagnostic Accuracy Study. *BMJ.* 338;b2431. https://doi.org/10.1136/bmj.b2431

Summary

- The severity of pain does not help distinguish Irritable Bowel Syndrome (IBS) from other medical conditions
- The presence of “Alarm Symptoms” helps distinguish IBS from organic conditions
- A HIDA scan has limited usefulness in 2020: to evaluate gallbladder functioning when checking for acute cholecystitis OR to check for bile duct leaks post cholecystectomy
- Ischemic colitis usually occurs in the elderly, is not usually life threatening and readily reverses in most situations with bowel rest and IV fluids

Thank You

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The use of lower GI "Alarm Symptoms"

1. Can definitely distinguish Irritable Bowel Syndrome from organic illnesses
2. Can definitely diagnose Crohn's Disease
3. Can definitely diagnose colon cancer
4. Can distinguish patients more likely to have organic disease

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The use of lower GI "Alarm Symptoms"

1. Can definitely distinguish Irritable Bowel Syndrome from organic illnesses
2. Can definitely diagnose Crohn's Disease
3. Can definitely diagnose colon cancer
4. **Can distinguish patients more likely to have organic disease**

All of the following are useful to diagnose common duct stones EXCEPT:

1. Endoscopic ultrasound (EUS)
2. Magnetic resonance cholangiopancreatography (MRCP)
3. HIDA scan
4. Endoscopic retrograde cholangiopancreatography (ERCP)

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3. **HIDA scan**
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Patient Scenario:

- Your 46-year-old female patient has a 5-day history of diarrhea and LLQ pain
- Also 1-day history of rectal bleeding
- Hx thrombocytosis
- Hx of using birth control pills 20 years
- PE: Ill female BP 160/100, p 120, rr 20, & t 100
- Abd: pinpoint LLQ tenderness, no rebound, or masses
- Some blood on rectal
- WBC 20,000, shift to L
- H/H 9.7/30

What is the most likely diagnosis?

1. Diverticulitis
2. Crohn’s disease
3. Ischemic colitis
4. Colon Ca

95

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2. Crohn’s disease
3. **Ischemic colitis**
4. Colon Ca

96