# Assessing Abdominal Pain: A Practical Review

Peter Buch, MD, FACG, AGAF, FACP
Clinical Professor of Medicine, GI
University of New England College of Osteopathic Medicine
Associate Professor
University of Connecticut School of Medicine
Frank H Netter School of Medicine/Quinnipiac University
Manchester, CT
gieducator.com

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## Disclosure

I have no financial interests or relationships to disclose.

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# Objectives

- To describe atypical locations of GI illnesses
- To recognize frequently encountered gallbladder and common duct dilemmas
- To distinguish uncomplicated and complicated diverticulitis
- To examine controversies in evaluating and treating appendicitis

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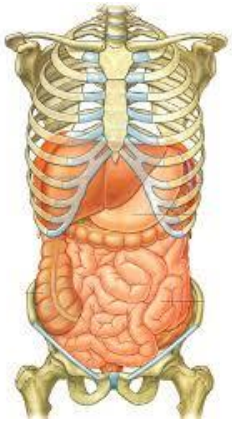
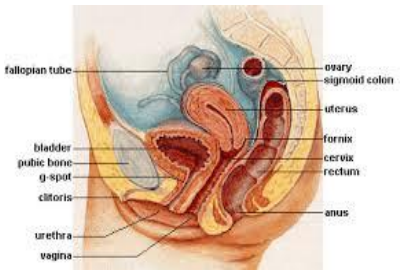
# Atypical Locations of GI Illnesses



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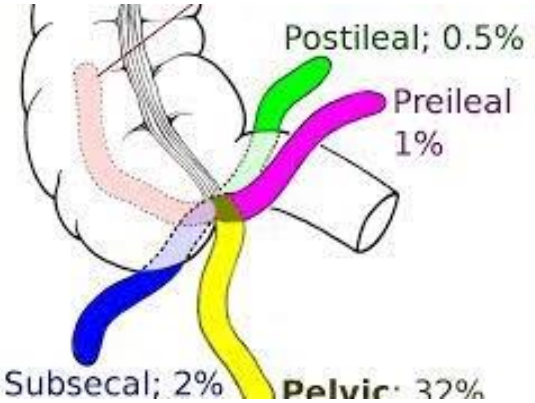
# Atypical Locations for Appendicitis

- Usually located 2 cm below the ileo cecal valve
- Also located: in pelvis
  outside the peritoneum
  behind the cecum

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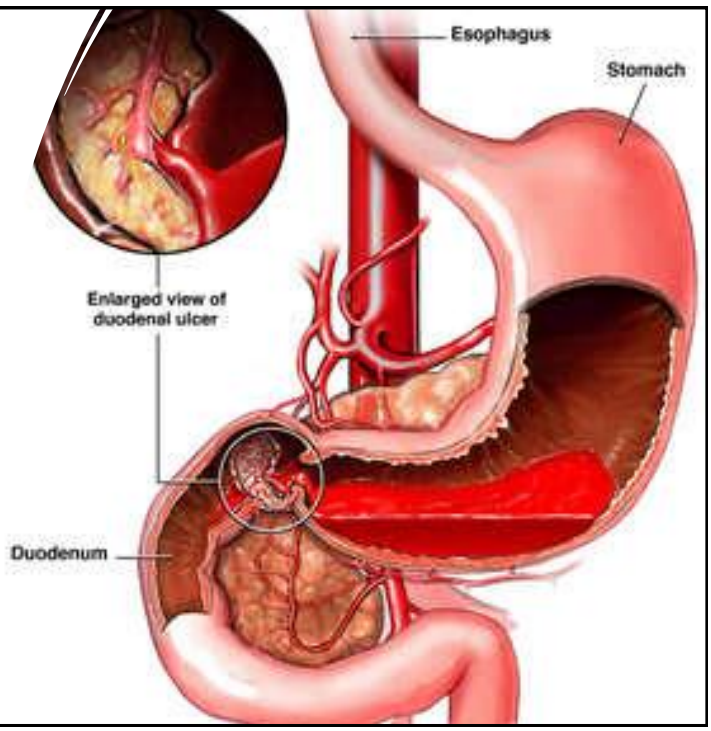
# Posterior Duodenal Ulcer

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# Pearl

Right Sided Diverticulitis Can Be Confused with Appendicitis

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## Name Some Non GI Sources of Abdominal Pain

Begin with the Most Serious

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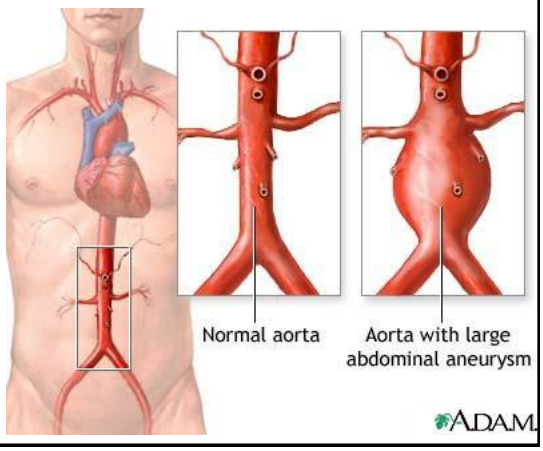
## Abdominal Aortic Aneurysms

- 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

Azhar B et al
Misdiagnosis of ruptured abdominal aortic aneurysm: systematic review and meta-analysis
J Endovascular Ther 2014:21;568

10

# Name Some Non GI Sources of Abdominal Pain

Name Some More

11

# More Non GI Sources of Abdominal Pain

- Abdominal wall hernias
- MI*
- Pneumonia
- Ectopic pregnancy
- Kidney stones
- Diabetic ketoacidosis


- *Canto JG et al
- Association of age and sex with myocardial infarction symptom presentation and in-hospital mortality
- JAMA 2012:307;813

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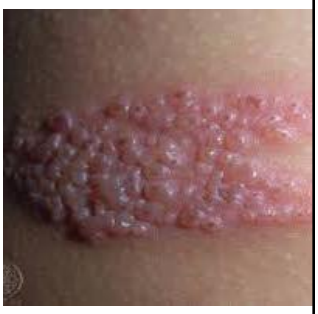
# More Non GI Sources of Abdominal Pain

- **Herpes zoster**
  - 75% of patients have prodromal pain that precedes the rash
  - Prodromal pain can precede the rash by 3+ days
  - Prior to the appearance of the rash, the pain is often confused with other diseases



Dworkin RH et al
Recommendations for the management of herpes zoster
Clin Infect Dis 2007:44; suppl 1:S1

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# What Is the Most Common Source of Gastroparesis?



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# Most Common Etiology

- Idiopathic in about 50% of cases
- Diabetes in 25-30% of cases
- Medications 20% of cases: narcotics, tricyclic antidepressants, calcium channel blockers, GLP 1 agonists
- Post viral
- Surgery: bariatric, cholecystectomy, antireflux

Lacy BE and Cangemi DJ

Controversies in gastroparesis: discussing the sticky points

Am J Gastroenterol 2021:116;1572

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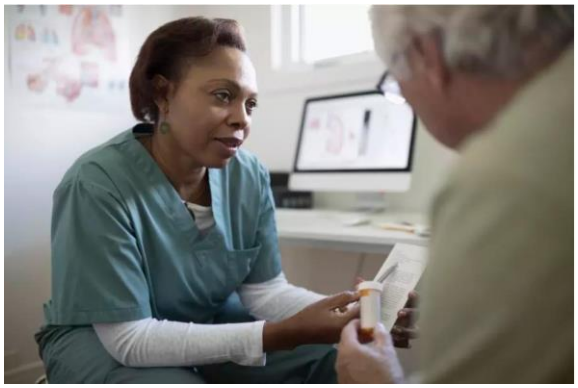
# How Do We Diagnose Gastroparesis?





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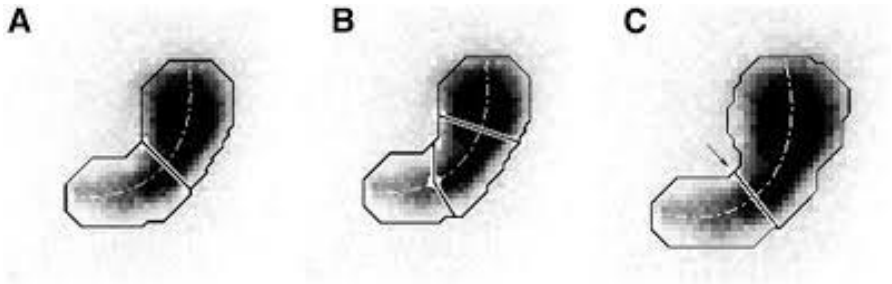
# How Do We Diagnose Gastroparesis?

- Eliminate the possibility of mechanical obstruction
- 4 hour gastric emptying study (scintigraphy)

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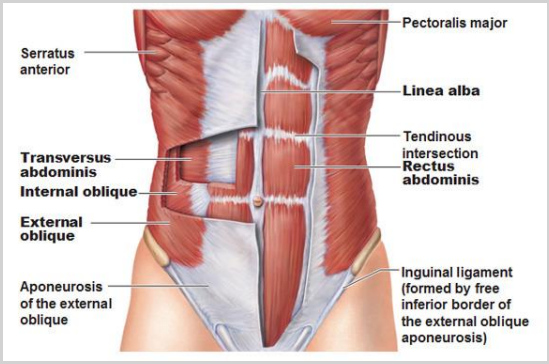
# Abdominal Pain From Muscles

- Key Finding: Pain exacerbated by flexion of the abdominal musculature

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# Clinical Pearl

- Up to **30%** of patients with chronic abdominal pain have components of abdominal wall pain
- Patients can point to a specific site
- Previous surgery and sports related injuries are common sources of abdominal wall pain

Glissen Brown JR et al
Chronic abdominal wall pain: An under-recognized diagnosis leading to unnecessary testing
J Clin Gastroenterol 2016:50;828

Sweetser S
Abdominal wall pain: A common clinical problem
Mayo Clin Proc 2019:94;347

20

# Treatment of Abdominal Wall Pain

- Lidocaine injection
- Lidocaine + triamcinolone
- NSAIDs in those who fail to respond to injections
- Lidocaine patches, topical diclofenac or capsaicin

Singla M et al
A stick and burn: our approach to abdominal wall pain
Am J Gastroenterol 2020:115;645

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# Nancy



- Age 73 has a 2 day history of severe LLQ pain and a temp of $101^0$
- PE: BP 160/92 p84 rr 16 t $99.8^0$
- Abdominal exam demonstrates tenderness in LLQ, no rebound, no masses

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# Nancy

MRI demonstrates an inflamed segment of sigmoid colon without abscess or perforation

Amoxicillin-Clavulanate

500mg po q 8 hr initiated

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The MRI Does Not Demonstrate a Colon Mass

## Should This Patient Have a Colonoscopy?

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## YES, at a Later Date with Resolution of Symptoms

- Colon cancer occurs in 2.8% of all patients with diverticulitis
- Cancer detection rate much higher after **complicated** diverticulitis:
  - Perforation
  - Abscess
  - Fistula
  - Obstruction

Lau KC et al
Is colonoscopy still mandatory after CT diagnosis of left-sided diverticulitis: can colorectal cancer be confidently excluded?
Dis Colon Rectum 2011:54;1265

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- **Uncomplicated Diverticulitis:** Inflammation in wall of colon
- **Complicated Diverticulitis**

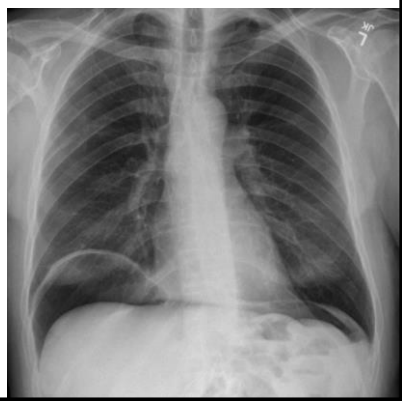
  Inflammation has evolved into:

  Abscess

  Fistula

  Obstruction

  Free perforation



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## AGA Clinical Practice Update on Medical Management of Colonic Diverticulitis: Expert Review

- "Antibiotic treatment can be used selectively, rather than routinely, in immunocompetent patients with mild uncomplicated diverticulitis"
- USE ANTIBIOTICS in uncomplicated diverticulitis with:
  - comorbidities
  - frail
  - fluid collection
  - long segment of inflammation
  - refractory symptoms/vomiting
  - WBC > 15K
  - CRP >140

Peery AF et al
AGA Clinical Practice Update on Medical Management of Colonic Diverticulitis: Expert Review
Gastroenterology 2021:160;906

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# Roberta

- Age 73 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

WBC 12,500 75% neutrophils



# What Testing Do You Recommend for Roberta?

A. Another CT or MRI
B. Another colonoscopy
C. No additional testing necessary

# Should Roberta Have Surgery?

31

## Paradigm Shift

- Previous guidelines recommend surgery after two episodes of diverticulitis
- Now more conservative approach
- Complicated* or uncomplicated** diverticulitis

Hall J et al
The American Society of Colon and Rectal surgeons clinical practice guidelines for the treatment of left-sided colonic diverticulitis
Diseases of the Colon and Rectum 2020;63;728

32

# Paradigm Shift

- Individualized approach because:
  - Increased morbidity and mortality in elderly
  - Recurrent diverticulitis may be LESS serious than the first episode
- Decide on a case by case basis

Hall J et al

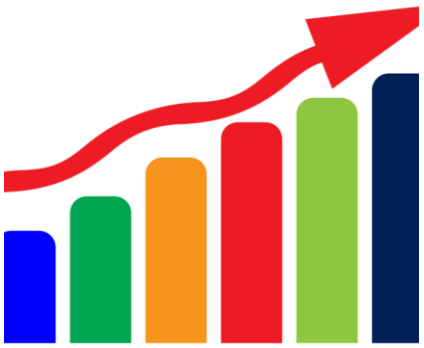
The American Society of Colon and Rectal Surgeons clinical practice guidelines for the treatment of left sided colonic diverticulitis

Diseases of the Colon and Rectum 2020:63;728

33

# But

- Despite the guidelines, rates of elective surgery have increased in the U.S.



Strassle PD et al

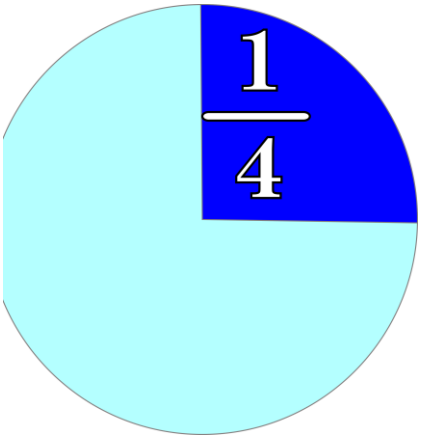
Rates of Elective Colectomy for Diverticulitis Continued to Increase After 2006 Guideline Change

Gastroenterology 2019:157;1679 e11

34

# And

- 22-25% of patients had abdominal pain after surgery




Egger B et al
Persistent Symptoms After Elective Sigmoid Resection for Diverticulitis
Dis Colon Rectum 2008:51;1044
AndewegC et al
Incidence and Risk Factors of Recurrence After Surgery for Pathology-Proven Diverticular Disease
World J Surg 2008:32;1501

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# Question

**Do Nuts, Seeds, and Popcorn Cause Diverticulitis?**

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# Does the Severity of Pain Help Us Distinguish Irritable Bowel Syndrome from Surgical Emergencies?

37

## Jeff

- Age 55 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
- H/H 11/33

# What Would You Do Next?

A. Symptomatic treatment of presumed hemorrhoids
B. Another colonoscopy
C. Do Fecal Immunochemical Test (FIT) to r/o Ca
D. Do a fecal DNA test (Cologuard) to r/o Ca



## The Presence of "Alarm Signs" Helps Distinguish Irritable Bowel Syndrome from Other Potential Serious Medical Problems

- Rectal bleeding
- Anemia
- Weight loss
- Fever


Brandt LJ et al
An evidence based position statement on the management of irritable bowel syndrome
American College of Gastroenterology Task Force on Irritable Bowel Syndrome
Am J Gastroenterol 2009:104;Suppl 1:S1

# The Presence of "Alarm Signs" Also Helps Determine if Another Colonoscopy is Warranted Sooner Than Planned

Interval Ca: a colon cancer diagnosed soon after a normal exam

Interval Ca rate 1.1% of all diagnosed cancers

Jennings P et al
A twelve year study of the prevalence, risk factors and characteristics of interval colorectal cancers after negative colonoscopy
Clin Research Hepatol Gastroenterol 2020:44;230

41

42

# Should a CT Ever Be Used to Diagnose Acute Cholecystitis?

43

## 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

44

# MRCP in Biliary Track Disease

- Less sensitive than U/S in evaluating gb disease (69 vs 96%)
- Common duct stones
  sensitivity 87%
  specificity 92%

Meeralam Y et al

Diagnostic accuracy of EUS compared with MRCP in detecting choledocholithiasis: a meta-analysis of diagnostic test accuracy in head to head studies

Gastrointest Endosc 2017:86;986

45

# When should We Be Utilizing HIDA Scans in 2024?



46

# HIDA Scan Use 2024

- Use limited to:

1. Suspected cholecystitis where **ultrasound normal**
2. Leaks after cholecystectomy

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## Wendy

A 40 y o otherwise healthy, with severe RUQ pain for the past 2 weeks

Also nausea/vomiting

On no meds

Exam: Normal except for moderate RUQ pain

CBC, LFTs, Lipase all normal

U/S normal gallbladder, normal CBD

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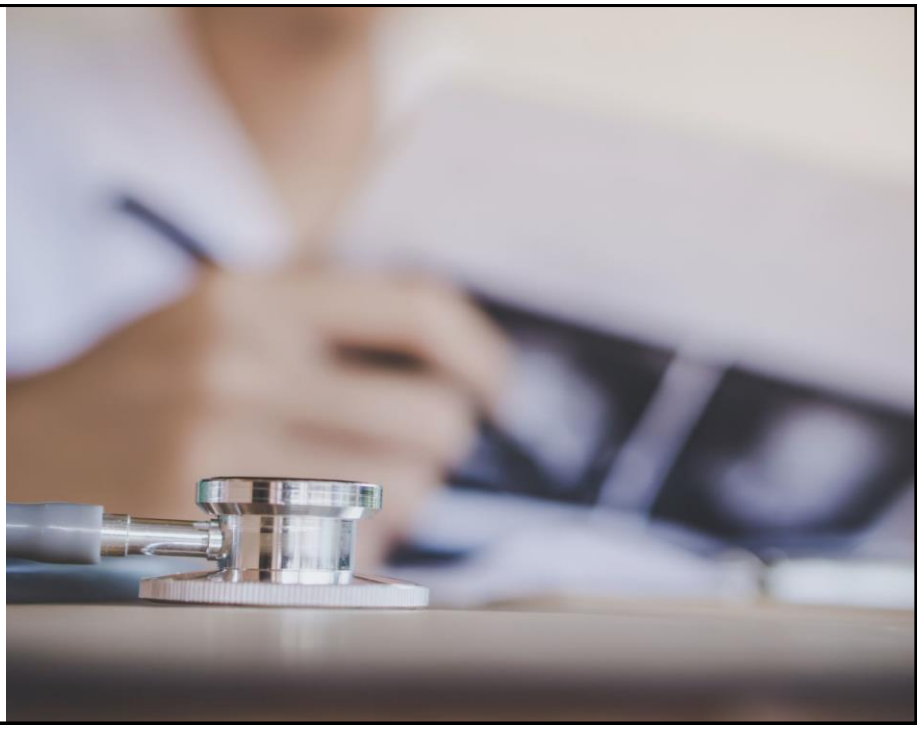
# What Is the Differential Diagnosis



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# Ddf

- Gallstone disease despite a negative ultrasound*
- Peptic ulcer disease
- Muscular pain
- Cardiac/pulmonary
- Herpes that has not yet manifested with a rash
- etc

50

# Myra

- Is a 42 y o 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



# Labs

- WBC 15, 200  82% neutros
- 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)

# What Should We Do Next?

A. MRCP
B. ERCP
C. CT
D. HIDA scan

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## Would We Approach Myra Differently If She Had a Normal Common Bile Duct



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## Very Strong Predictor of a Common Bile Duct Stones

- Cholangitis
- Bilirubin over 4mg/dL

Maple JT
The role of endoscopy in the evaluation of suspected choledocholithiasis
ASGE Standards of Practice Committee
Gastrointestinal Endoscopy 2010/T1/1

55

## MRCP vs ERCP in Detecting Common Duct Stones

- MRCP* sensitivity 90%
  specificity 86%
- ERCP** sensitivity 90% +
  specificity 97%

*Badger WR et al
Utility of MRCP in clinical decision making of suspected choledocholithiasis: An institutional analysis and literature review
Am J Surg 2017:214;251
**Moon JH et al
The detection of bile duct stones in suspected biliary pancreatitis
Am J Gastroenterol 2005:100;1051

56



57

# Is It Possible to Have an Acute Pancreatitis with a Normal Amylase/Lipase?

58

## 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

59

## Emma

- Is a 58 yr old P.A. with a 2 hour history of epigastric abd pain and nausea
- No significant PMH
- No meds

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

60

# Emma; Labs

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

All normal

61

# Missed Cardiac Issues in Women

- Women often mistake cardiac symptoms for other diseases
- Women with an acute coronary syndrome have less chest pain than men

Canto JG et al

Association of age and sex with myocardial infarction symptom presentation and in-hospital mortality

JAMA 2012;307;813

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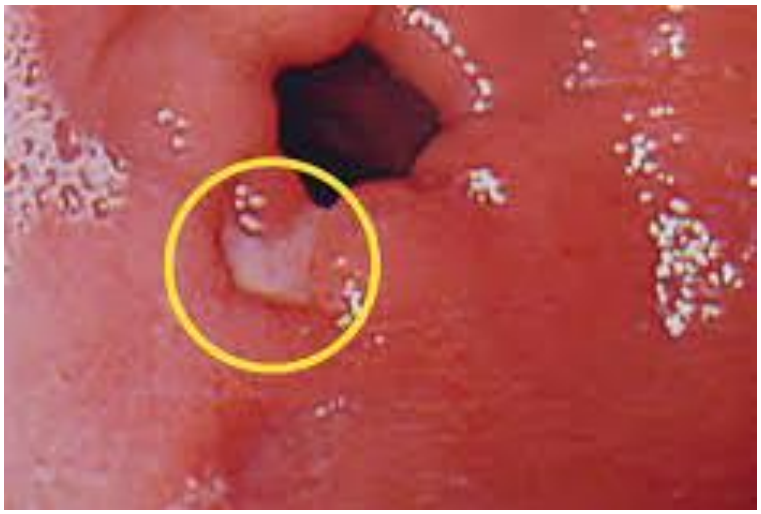
# Charlene

- **Is a 56 y o with a 2 week history of RUQ pain.**
- **Family history is significant for 2 first degree relatives with acute cholecystitis**
- **She had taken Ibuprofen 2 caplets every 3 hours for the pain**
- **PE WDWN BP 140/90 p 110 rr18 t 99**
- **Abd: Epigastric tenderness, no masses**
- Labs: CBC normal
  Gen Chem normal
  Lipase normal
  U/S normal



# What Would You Recommend as the Next Step?

A. MRCP
B. Repeat U/S
C. Endoscopy
D. Evaluate for stress factors



Seen on Endoscopy

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# Ed



- Is a 75 yr old admitted with a small bowel obstruction
- History: two recent episodes of small bowel obstruction
  appendectomy 60 yrs 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

66

# What Percentage of Patients with Adhesive Small Bowel Obstruction Resolve Spontaneously?

A. 25%
B. 50%
C. 65-80%

Tamaka S et al
Predictive factors for surgical indication in adhesive small bowel obstruction
Am J Surg 2008:196;23



67

# Ella

- Is a 19 y o 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 nl
U/A nl
Pregnancy test neg
CT of abd/pelvis nl

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The Surgeon Decides to Do an Exploratory Laparotomy

69

## The Laparotomy Is Completely Normal

- Question:

# What Is the Accuracy of CT in Diagnosing Appendicitis?

70

# Diagnosing Appendicitis

- 3540 urgent appendectomies
- 86% of patients had preop CT
- Accuracy of CT 90%

Cuschieri J et al

Negative appendectomy and imaging accuracy in the Washington State surgical care and outcomes assessment program

Ann Surg 2008:248;557

71

## The Laparotomy Is Completely Normal

- Questions:

Was the surgeon wrong in doing the laparotomy?

Would additional tests/treatments have been useful?

72

# Consider

- Pelvic ultrasound
- IV antibiotics while maintaining close observation
  1552 patients randomized surgery vs antibiotics
  In and out patients
- With antibiotics, 29% still needed surgery

Talan DA and Di Saverio S
Treatment of Acute Uncomplicated Appendicitis
NEJM: 2021:385;1116

73

# 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 NOT Initially Consider?

A. Colonoscopy
B. CT of abd/pelvis
C. hCG
D. Pelvic ultrasound

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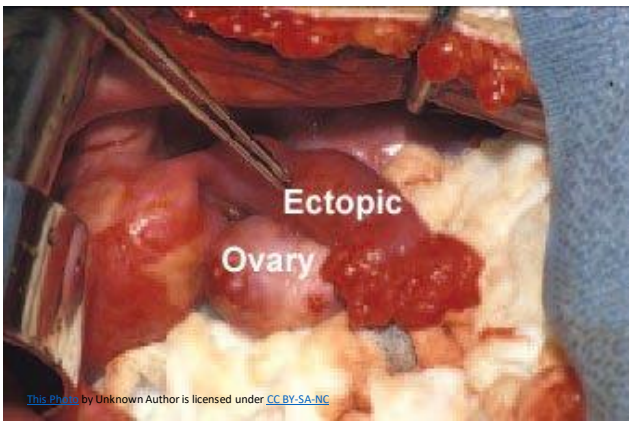




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# Rita

- 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 rr20 t 100
- Abd: LLQ pinpoint tenderness, no rebound; bright red blood on rectal exam

- Lab: CBC WBC 20,000 85% neutrophils
  H/H 9.7/ 30

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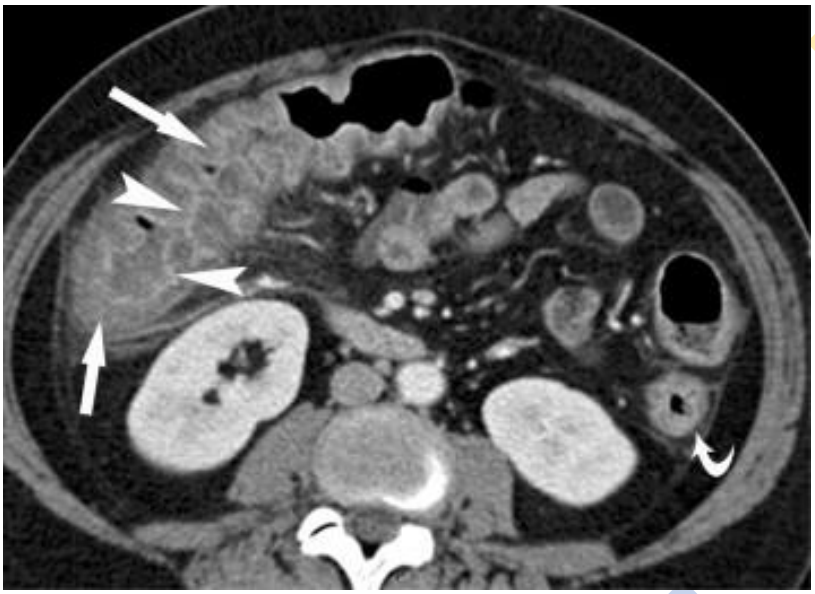

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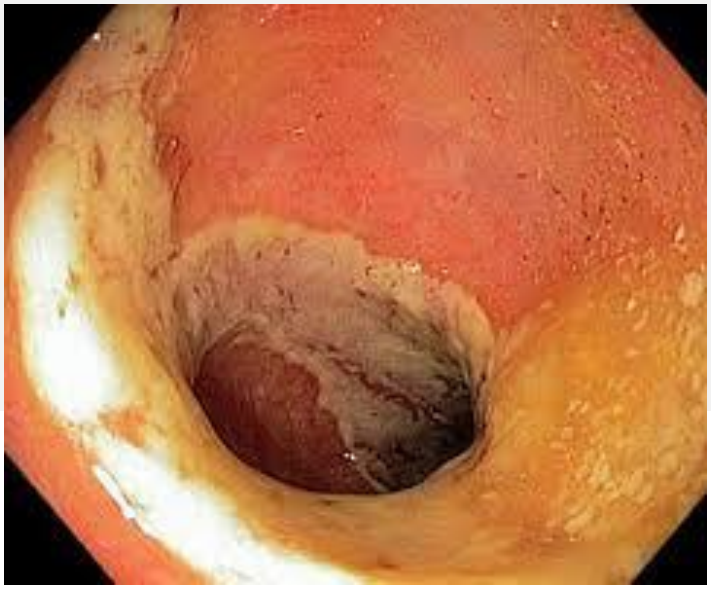

Rita
Colonoscopy

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## Given the Patient's History, What Is the Most Likely Diagnosis?

A. Diverticulitis
B. Crohn's disease
C. Ischemic colitis
D. Colon cancer

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## Ischemic Colitis

- Usually occurs in the elderly
- Vascular injury confined to the colon
- From inadequate blood supply/hypotension

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## Treatment of Ischemic Colitis

GUT REST

IV FLUIDS

GIVE IT TIME

CONTINUE TO MONITOR FOR WORSENING

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# Summary

- The severity of pain does not help distinguish Irritable Bowel Syndrome (IBS) from other medical conditions
- The presence of “Alarm Signs” helps distinguish IBS from organic conditions
- Ultrasonography is the preferred test to evaluate for acute cholecystitis
- Ischemic colitis usually occurs in the elderly, is not usually life threatening and readily reverses in most situations with bowel rest and IV fluids