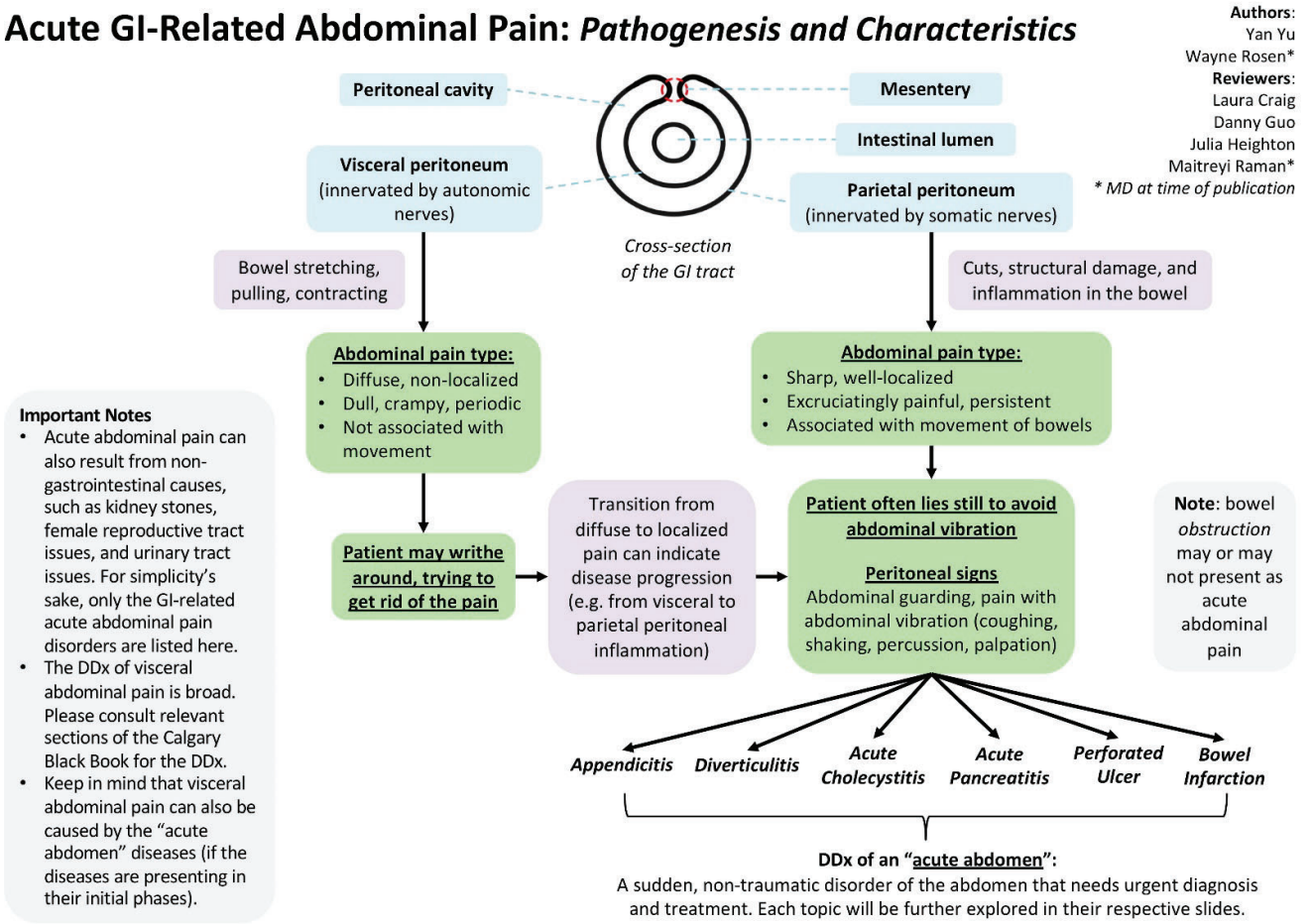
Abdominal pain



Key Hx questions

- Pain
  - nature – constant v ITM
  - intensity – rate out of 10
  - location – epigastric, RUQ, RLQ, RLQ, LLQ
  - duration – acute v. chronic
  - onset – when do you get the pain?
  - ↑/↓ - milk, antacids, food
- Associated symptoms
  - A, N, V
  - Micturition – change in colour, burning
  - Bowel fx – ? change, constipated, diarrhoea, blood in faeces
  - Fever / chills
- Drug intake
  - NSAIDs e.g. aspirin, paracetamol
  - Illicit drugs – heroin, cocaine
- Smoking
- Alcohol intake
- Diet
  - how much milk?
- Recent travel Hx
- Menstruation
  - ? stage of cycle → ? overdue
- PMHx
  - hernia
  - operations in abdomen
  - ? appendix removed
- FHx – abdo pain, GI Ca

Very important to take a detailed Hx of the pain

Onset	
Sudden	Vascular pain e.g. infarction
Insidious/Chronic	Infection or malignancy
Character:	
Waves of pain	Hollow viscous pain e.g. obstruction
Site & Radiation – refer to diagrams	
Aggravating/relieving factors	
Meals	Occ relieve peptic ulcer p
Antacids	Relieve peptic ulcer p
Vomiting	Occ relieve peptic ulcer p
Defecation/flatus	Temp relief for colonic disease
Mvt	No mvt eases peritoneal p ↑ mvt relieves colicky pain

Red Flag Symptoms

- collapsing in toilet → ? intra-abdo bleeding
- light-headedness
- progressive intractable vomiting
- progressive abdo distension
- progressive intensity of pain
- prostration

Red Flag Signs

* pallor & sweating (shock)→ ? acute blood loss
* hypotension
* AF → ? mesenteric artery obst.
* tachycardia → sepsis / volume depletion
* fever
* rebound tenderness
  → peritoneal irritation – bacterial peritonitis, blood
* guarding → peritonitis
* ↓ urine output

Medical	Surgical
Peptic Ulcer	Appendicitis
Pancreatitis	AAA
Hepatitis	Obstruction
Pyelonephritis	Perforation
UTIs	Diverticulitis
Inflammatory BD	OBS & GYN
Incarcerated hernia	Gall stones

GIT Red Flags

- Dysphagia
- Wt loss
- Protracted vomiting
- Anorexia
- Haematemesis
- Melena

Epigastric

Pancreatitis
MI
Peptic ulcer
Acute cholecystitis
Perforate oesophagus

Parietal Peritoneum – Inflammation

- Character = steady, aching
- Location = directly over inflamed area → somatic nerves supply parietal peritoneum
- Intensity = depends on inflammatory process → acidic/enzymatic/bacteria → ↑ pain
- Aggravation – pressure, Δs in tensions e.g. sneezing, palpation, straining
- Alleviation – lie perfectly still
- Concomitant – tonix spasms of musculature, fever, anorex, N, V
- Causes – PUD perforation, PID, pancreatitis

Hollow Viscera Obstruction

Character – intermittent (colicky → pain w/muscular contraxn & no contraxn → no pain, cramping)

Location – not as well localized as peritonitis

- SI – periumbillica
- SI – infraumblicla, lumbar pain
- Bladder – dull supreapubic pain
- Ureter – sever suprapubic and flank pain
- Biliary tree obstruction → 'biliary colic' → misnomer b/c pain is steady

Vascular

SMA and ruptured AAA

- Severe, diffuse
- Can persist prior to rupture, radiated to flan, genitalia, sacral region

Sickle cell anemia

- Microemboli → severe and diffuse?

Abdominal Wall

- Character = dull, aching
- Location = depends on muscles involved
- Intensity = depends on inflammatory process → acidic/enzymatic/bacteria → ↑ pain
- Aggravation – mov't, prolonged standing, pressure

e.g. hematoma, distortion or traction of mesentery, trauma or infxn to muscles

Physical Examination

- General appearance
- Vitals
- Oral cavity
- Chest – heart & lungs
- Abdomen
    - inspect
    - palpation
        Murphy's sign → peritoneal tenderness w/ acute cholecystitis
        Mcburry's point → appendicitis
    - percussion
    - auscultation
        - silent abdomen → ? diffuse sepsis, ileus, mechanical obst (advanced)
        - hypertympany → mechanical obstruction
- DRE

Specific "Signs" on Physical Examination

- **Blumberg's sign (rebound tenderness)**: constant, held pressure with sudden release causes severe tenderness (peritoneal irritation)
- **Percussion tenderness**: often good substitute for rebound tenderness
- **Courvoisier's sign:** palpable, non-tender gall bladder with jaundice (pancreatic or biliary malignancy)
- **Cullen's sign:** blue discoloration around umbilicus (peritoneal hemorrhage)
- **Grey Turner's sign:** flank discoloration (retroperitoneal hemorrhage)
- **Iliopsoas sign:** flexion of hip against resistance or passive hyperextension of hip causes pain (retrocecal appendix)
- **Murphy's sign:** inspiratory arrest on deep palpation of RUQ (cholecystitis)
- **McBurney's point tenderness:** 1/3 from anterior superior iliac spine (ASIS) to umbilicus; indicates local peritoneal irritation (appendicitis)
- **Obturator sign:** flexion then external or internal rotation about the right hip causes pain (pelvic appendicitis)
- **Rovsing's sign:** palpation pressure to left abdomen causes McBurney's point tenderness (appendicitis)
- **Boas's sign:** right subscapular pain due to cholelithiasis
- **Fox's sign:** ecchymosis of inguinal ligament seen with retroperitoneal bleeding
- **Kehr's sign:** severe left shoulder pain with splenic rupture
- **Dance's sign:** empty right lower quadrant in children with ileocecal intussusception
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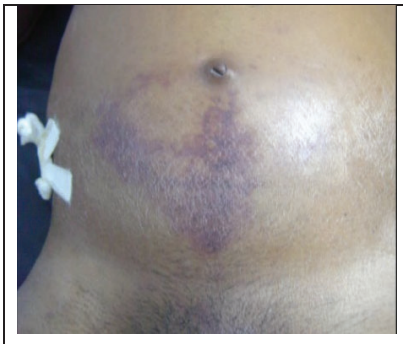
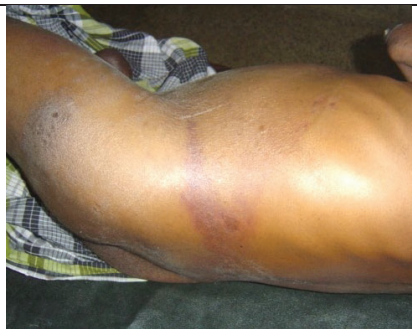
	
Cullers	Grey Turners

Investigations to consider

- Hb → anaemia (chronic blood loss – PUD, Ca, oesophagitis)
- Blood film → abnormal RCs with sickle cell disease
- WCC → leucocytosis ? infection
- ↑ CRP → infection/inflammation (preferred)
- ↑ ESR → ? Ca, Crohn's, abscess (non-specific)
- LFTs → hepatobiliary disorder
- Serum amylase ± lipase →
- Pregnancy tests – urine & β-HCG
- Urine

Bloods	urinary infection ureteric colic – stone or blood clot
WCs	urinary infection appendicitis (bladder irritation)
Bile pigments	gall bladder disease
Porphobilinogen	Porphyria
Ketones	Diabetic ketoacidosis
Air -pneumaturia	Fistula – diverticulitis, pelvic abscess, pelvic Ca

- Faecal blood – Mesenteric artery occlusion, intussusception (red currant jelly), Ca colon, diverticulitis, Crohn's, UC

Imaging

- Plain abdomen XR
- CXR
- U/S → hepatobillary, kidneys, female pelvis
- Contrast enhandced XR → bowel leakage
- Barium enema
- CT scan → masses, fluid collection
- ERCP
- MRI scan

Other tests

- ECG
- Endoscopy
- Sigmoidoscopy
- Colonscopy

Acute abdominal pain - adults

Probability Dx

- acute gastroenteritis
- acute appendicitis
- dysmenorrhoea/Mittelschmerz
- Irritable bowel syndrome

Serious disorders not to be missed

- Cardiovascular
  - myocardial infarction
  - ruptured AAA
  - dissecting aneurysm aorta
  - mesenteric artery occlusion
- Severe infection
  - acute salpangitis
  - peritonitis
  - ascending cholangitis
  - intra-abdominal abscess
- Neoplasia
  - large/small bowel obstruction
- Pancreatitis
- Ectopic pregnancy
- Small bowel obstruction
- Sigmoid vulvulus
- Perforated viscus
  - duodenal ulcer
  - colonic diverticulum
  - Meckel's diverticulum
  - colonic Ca

Pitfalls

- Acute appendicitis
- Myofascial tear
- Pulmonary causes
  - pneumonia
  - PE
- Faecal impaction – elderly
- Herpes zoster
- *Rarities*
  - porphyria
  - lead poisoning
  - haemachromatosis
  - sickle cell anaemia
  - tabes dorsalis
  - haemaglobinuria
  - Addison's disease

7 masquerades

depression	√	
diabetes	√	ketoacidosis
drugs	√	
anaemia	sickle-cell	
thyroid disease	-	
spinal dysfx	√	
UTI	√	incl urosepsis

Is this pt trying to tell me something?

V. impt to keep in mind

- Munchausen's syndrome
- Sexual dysfx
- Abnormal stress

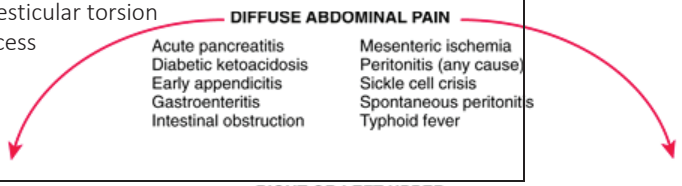
Referred pain

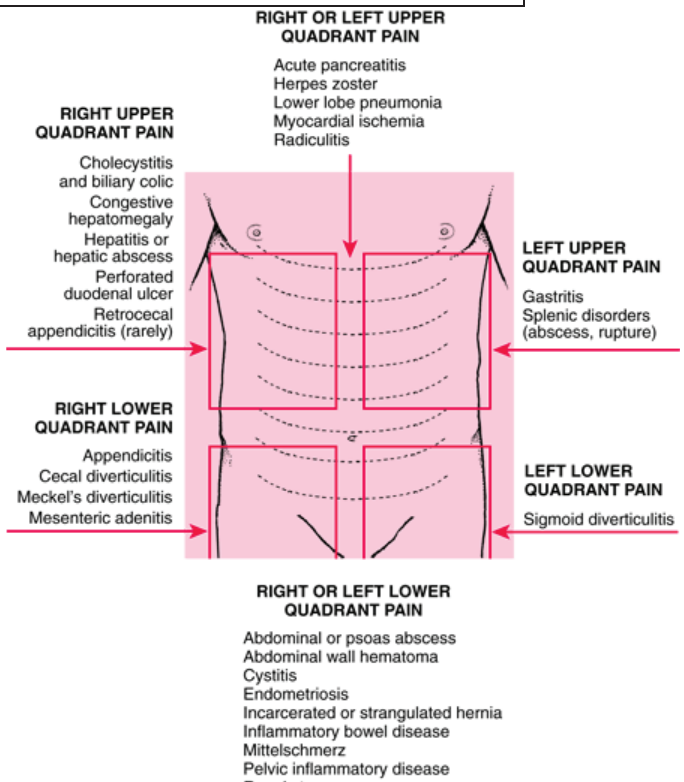
- Usu from thorax, spine, genitalia
- CV: AMI, CHF, myo-, endo-, Pericarditis
- RESP: pleuritic abdo pain, pneumonia, PE, pneumothorax, empyema
- Genitalia → torsion of testes
- Spine → nerve root compression or irritation
- Oesophageal disease → spasm, rupture, inflammation

Acute appendicitis characteristic "march" of symptoms

Pain → anorexia, nausea → vomiting

RUQ	LUQ
• Gallbladder (stones) - cholecystitis - cholangitis • Liver - hepatitis - hepatic abscess - congestive hepatomegaly (stretching capsule) • PancreaTITIS • (R) kidney: Stones, pyelonephritis • Atypical MI Referral from lungs/diaphragm	• Stomach - PUD / perforated ulcer - gastritis • Spleen - abscess - rupture • Pancreatitis • (L) kidney: stones, pyelonephritis • Colonic ischemia • Atypical MI Referral from lungs/diaphragm – pneumonia, PE
RLQ • Appendicitis • Colon • Chron's (term. Ileum & colon) • Meckel's diverticulum • perforated caecum • caecal diverticulitis • Ulcerative colitis • Hernia - strangulated • Renal/Ureteric – stones • UTIs • Reproductive organs: - ectopic pregnancy - endometriosis, PID - salpingitis (fallopian tube) - ovarian cyst rupture - testicular torsion Psoas abscess	**LLQ** • Colon - diverticulitis (sigmoid c) - Ulcerative colitis - Chron's - perforation • Hernia - strangulated • Renal/Ureteric – stones, UTIs • Reproductive organs: - ectopic pregnancy - endometriosis, PID - salpingitis - ovarian cyst rupture - testicular torsion Psoas abscess





Chronic/ recurrent abdominal pain – Adults

Causes

Most likely

1. IBS
2. Mittelschmerz/ dysmenorrhea
3. Constipation
4. Peptic ulcer/ gastritis

Not to be missed

1. Vascular – mesenteric artery ischaemia, AAA
2. Cancer – bowel/ stomach, pancreatic, ovarian
3. Infection – hepatitis, recurrent PID

Often missed

1. Adhesions
2. Appendicitis
3. Biliary disease – stones, sludge
4. Food allergies
5. Hernia

Other: lactose intolerance, constipation, chronic pancreatitis, coeliac disease, inflammatory bowel disease, crohn disease, endometriosis, diverticular disease, subacute obstruction

Masquerades

1. Depression
2. Drugs
3. Spinal dysfunction
4. UTI

Is the patient trying to tell me something – hypochondriasis, anxiety, sexual dysfunction, Munchausen syndrome

Red flags

1. weight loss
2. Fever
3. Nocturnal pain
4. Diarrhoea
5. Progressive symptoms

Acute Abdominal pain – children

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Neonatal

Surgical or serious conditions

- Intestinal Malrotation or Midgut Volvulus
- Necrotizing Enterocolitis
- Hirschprung's Enterocolitis
- Testicular Torsion (especially in Undescended Testicle)
- Incarcerated Hernia

Functional, self-limited or easily managed

- Colic
- Milk Protein Allergy
- Gastroesophageal Reflux

Assessment

History

1. Surgical
2. Non surgical
3. Age
4. Family history

Examination

1. General appearance
2. Vital obs
3. Abdo exam
4. Oral exam
5. Lungs

Investigation

1. Urinalysis
2. FBC
3. Inflammatory markers – ESR, CRP
4. Imaging as appropriate

Causes

DDx (most common)

1. Infant "colic" (2-16weeks age)
2. Gastroenteritis
3. Mesenteric adenitis

Not to be missed

1. Infection – acute appendicitis (5-15yrs age), Pneumonia (RLL), Pyelonephritis, Peritonitis
2. Cancer – colon cancer
3. Other – intussusception (peaks 6-9/12 age), bowel obstruction, coeliac disease, strangulated inguinal hernia

Often missed

1. Child abuse
2. Constipation
3. Torsion of testes
4. Lactose intolerance
5. Peptic ulcer

Other: Infection (mumps, tonsillitis, pneumonia, EBM, UTI, hepatitis), Adnexal disorders in girls, Meckel diverticulitis, HSP, IBD, Sickle crisis, Lead poisonin

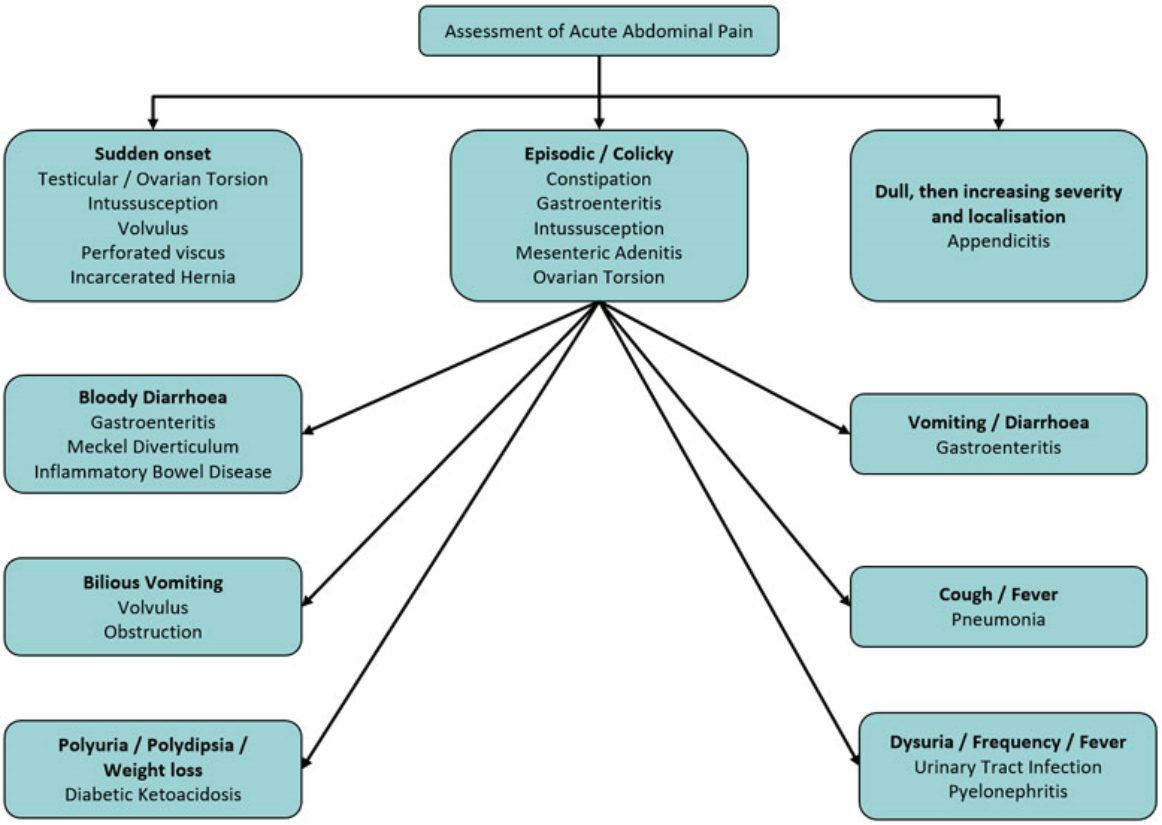
Masquerades

1. DM
2. Drugs
3. UTI
4. Psychogenic

Important non-abdominal causes of abdominal pain to consider:

- DKA
- Headache (Migraine)
- Henoch Schonlein Purpura
- Hip pathology
- Pneumonia
- Psychological factors
- Sepsis
- Sexually transmitted infection
- Sickle Cell Disease (vaso-occlusive crisis)
- Toxin exposure or overdose
- UTI/pyelonephritis

Infant, toddler and preschool (<5 years old)	Child (ages 5 to 11 years old)	Adolescent (age 12 to 18 years)
Miscellaneous Important causes • Intussusception • Intestinal Malrotation or Midgut Volvulus • Pyelonephritis (or Urinary Tract Infection) **Bowel Obstruction** • Pyloric Stenosis • Incarcerated Hernia • Internal Hernia • Hirschprung's Disease **Non-accidental Trauma (or Battered Infant)** • Duodenal Hematoma (classic presentation) • Jejunum perforation • Duodenal transection **Functional or self-limited** • Infantile Colic • Gastroenteritis • Constipation	**Miscellaneous serious causes** • Intussusception or Volvulus (children under age 6) • Abdominal Trauma • Sickle Cell Crisis • Henoch-Schonlein Purpura • Appendicitis • Pyelonephritis or Urinary Tract Infection • Pneumonia • Pancreatitis **Hernia** • Inguinal Hernia occurs in 5% of pediatric patients • Ovary Herniate Bowel Obstruction • Prior abdominal surgery • Abdominal masses (e.g. Wilm's Tumor in toddlers, Neuroblastoma) **Gall Bladder disorder** • TPN Cholestasis • Sickle Cell Anemia • Morbid Obesity **Benign or self-limited causes (or easily treated)** • Mesenteric Lymphadenitis • Gastroenteritis • Pharyngitis (e.g. Strep Throat) • Functional Abdominal Pain in Children • Constipation • Lactose Intolerance • Helicobacter Pylori	**Surgical and serious causes** • Appendicitis • Testicular Torsion • See Gallbladder disease above **Gynecologic cause** • Pregnancy (or Ectopic Pregnancy) • Mittelschmerz • Dysmenorrhea • Pelvic Inflammatory Disease • Ovarian Torsion • Imperforate Hymen **Miscellaneous important causes** • Drug and Alcohol use • Sexual abuse • Neoplasm • Inflammatory Bowel Disease • Nephrolithiasis • Pyelonephritis or Urinary Tract Infection **Benign or self limited conditions** • Gastroenteritis • Constipation • Mononucleosis



Relevant past medical history

Underlying condition	Potential complications causing abdominal pain
Hirschprung disease	Enterocolitis (presents with sudden painful abdominal distension and bloody diarrhoea. These children can rapidly deteriorate with dehydration, electrolyte disturbances and systemic toxicity and are at risk of colonic perforation)
Cystic fibrosis	
Liver disease and/or ascites	Primary bacterial peritonitis
Nephrotic syndrome	
Splenectomy	
VP shunt	
Chemotherapy	Pancreatitis
On immunosuppressants	
PEG / NG / NJ fed	
Inflammatory bowel disease (especially if concurrent *Clostridium difficile*)	Toxic megacolon
Immunocompromised	
Sickle cell disease	Vaso-occlusive crisis (acute painful episodes of abdominal pain)

Recurrent abdominal pain – children

Causes

Most common

1. Non-organic recurrent abdo pain
2. Constipation
3. Recurrent viral illness causing mesenteric adenitis

Not to be missed

1. Infection – recurrent UTI, ureteric reflux, parasitic infection, TB
2. Cancer – colon cancer
3. Other – hydronephrosis

Often missed

1. IBD
2. Childhood migraine equivalent (periodic syndrome)
3. Food allergy eg. Lactose intolerance
4. Gastritis/ oesophageal reflux
5. Meckel's diverticulum

Other: temporal lobe epilepsy, sickle cell disease, HSP, IBS

Masquerades

1. Depression
2. DM
3. Drugs
4. Spinal dysfunction
5. UTI

Is the patient trying to tell me something? – functional pain, anxiety, depression

-

Assessment

History

1. Frequency
2. Site
3. Radiation
4. Onset
5. Duration

Other: aggravating, relieving, associated factors (nausea, anorexia, vomiting, diarrhea, dysuria, weight loss, food intake), if pain wakes child at night/ interferes with activities, FHx of abdo pain/ migraine/ IBD/ IBS, social history, school difficulties, stressors, anxiety

Examination

1. Systematic exam
2. Growth chart

Investigations

1. Urine analysis, MCS
2. FBC
3. ESR/ CRP
4. AXR for faecal retention
5. USS for renal tract/ ovarian pathology

Flags for organic disease

1. Pain distant from umbilicus
2. Pain waking at night
3. Pain associated with vomiting
4. ↓ weight/ loss of appetite
5. change in bowel habit

Other: FTT, inability to undertake normal activities

Differentials	History	P/E	Ix
Inflammation - Peritoneum	Nature – steady, sharp Intensity - ↑ w/perforation, ↓pH, sepsis Location – over inflamed area, shifting pain (appendicitis) Alleviation – lying perfectly still Aggravation – pressure, Δ in tension Concomitant – fever, anorexia, N, V	GIT exam: General appearance: - moving around or lying still? - respiratory distress? Palpation/Percussion - Rebound tenderness - Tenderness on percussion - Guarding - Tenderness - Masses/ hepatomegaly/ splenomegaly - Abdo aorta >3cm, pulsatile horizontal - Renal tenderness Auscultation - renal bruits - no bowel sounds → ileus, ischemia DRE - blood - pus Pelvic Exam - genitalia - bimanual, speculum	Most laboratory tests don't tell us much • blood smear (sickle cell) • HCG → ? pregnancy • Serum lipase → ?pancreatitis Imaging: • Abdo – XR → gas/fluid levels, extra-peritoneal gas, obstruction • Colonoscopy • Endoscopy • KUB – XR, U/S → stones, size, • Pelvic – U/S → obstruction • Laparoscopy – if cannot exclude surgical emergency; definitive dx for PID
Obstruction – hollow viscera	Nature – colicky → pain w/muscular contraction Location – not as well localized as peritonitis - SI – periumbilical - LI – lumbar pain, below umbilicus - Bladder – suprapubic pain - Ureter – flank, suprapubic		
Vascular – embolus, thrombus, rupture AA, ischemia, sickle cell crises	Intensity – severe, tearing (AAA) Location – diffuse Onset – sudden Radiation		
Abdominal wall – muscle	Nature – dull, aching Location – depends on muscles involved Aggravation – mov't, prolonged standing, pressure		
Distension of visceral surfaces → capsules e.g. hemorrhage	RUQ – hepatic, renal LUQ – splenic, renal		
Referred pain	From thorax, spine, genitalia Resp – Δ w/ respiration CV – chest pain, palpitations Spine – back pain, ↓ ROM Genitalia – trauma, infection, torsion of testes		