APPROACH TO ABDOMINAL PAIN

ACCOUNT FOR ~10% E.D. VISITS. A SPECIFIC DIAGNOSIS MAY NOT BE POSSIBLE IN ~25%

UP TO 7% MORTALITY IN THOSE PRESENTING TO E.D. WITH ABDOMINAL PAIN

SPECIAL CARE IN ELDERLY, IMMUNOCOMPROMISED AND WOMEN OF REPRODUCTIVE AGE:

- Elderly → higher mortality due to higher probability of more severe disease and ↓d diagnostic accuracy. Ruptured diverticulum, AAA rupture and mesenteric ischaemia may present atypically and progress rapidly
- Immunocompromised → presentation can be misleading owing to atypical physical and laboratory findings (e.g. lack of fever and leucocytosis)
- Women → pregnant and non-pregnant → expanded differential including pelvic structures

PATHOPHYSIOLOGY:

- **PAIN CAN ARISE FROM INTRA-ABDOMINAL AS WELL AS EXTRA-ABDOMINAL LOCATIONS**
- THREE DISTINCT PAIN PATHWAYS:
    - VISCERAL:
        - Results from stimulation of visceral peritoneum and can be perceived in a location remote from the actual disease process
        - Poorly characterised and difficult to localize
            - Foregut (stomach, duodenum, liver, pancreas) → upper abdominal pain
            - Midgut (small bowel, proximal colon and appendix) → periumbilical pain
            - Hindgut (distal colon and genitourinary tract → lower abdominal pain
    - SOMATIC:
        - Occurs with irritation of the PARIETAL peritoneum
        - Usually caused by infection, chemical irritation or other inflammatory process
        - Better localized as pain sensation conducted by peripheral nerves
        - Intense and constant
    - REFERRED:
        - Pain felt at a distance from its source because peripheral afferent nerve fibres from many internal organs enter the spinal cord through nerve roots that also carry nociception
            - Makes interpretation of pain location difficult

COMMON CAUSES OF ABDOMINAL PAIN:

GASTRIC, OESOPHAGEAL OR DUODENAL INFLAMMATION:

- All age groups

- Caused by hypersecretion, breakdown of protective barriers and infection
- Epigastric pain, may be burning and exacerbated by food and recumbency
- Perforation or bleeding leads to more severe findings
- Uncomplicated cases treated with H2 blockers and antacids

ACUTE APPENDICITIS:

- Peaks in adolescence and young adulthood
- Higher perforation rate in women, children, pregnancy and elders
    - Mortality in perforation 2-6% (vs 0.1% otherwise)
- Appendiceal lumen obstruction leads to swelling, ischaemia, infection and perforation
- Epigastric/periumbilical pain migrating to RLQ over 8-12 hours
- Low-grade fever and anorexia ~80%, vomiting 50-70%, RLQ tenderness in 95% (rebound in 40%)
- CT sensitive and specific
- UA may show sterile pyuria

BILIARY TRACT DISEASE:

- Peak age 35-60
- Female preponderance (3:1)
- RF → multiparity, obesity, alcohol, OCP
- Passage of stone causes biliary colic, impaction in cystic duct/CBD causes cholecystitis/cholangitis respectively
- Characteristic RUQ pain radiating to right subscapular area
    - Nausea and post-prandial pain
    - Longer duration favours cholecystitis and cholangitis
- WCC ↑'d and US suggestive in cholecystitis

URETERIC COLIC:

- Average age 30-40, prior history common
- RF → prior history, gout, family history, proteus infection, RTA and cystinuria
- Characterised by acute flank pain (radiating to groin)
    - N+V, pallor common
    - Vital signs normal
- UA usually shows haematuria, CT diagnostic

DIVERTICULITIS:

- ↑'G incidence with age, male preponderance, recurrences common
- Colonic diverticula may become infected or perforated or cause local colitis
- Obstruction, peritonitis, abscesses and fistulae result from infection or swelling
- Change in stool frequency or consistence commonly reported
- LLQ pain common, associated with fever, N+V
- CT diagnostic

ACUTE GASTROENTERITIS:

- SEASONAL
- Most common misdiagnosis of appendicitis

- Usually viral → consider invasive bacterial or parasitic in prolonged cases, travelers or immunocompromised
- Pain usually poorly localized, DIARRHOEA
    - Nausea and vomiting usually precede pain

CONSTIPATION:

- More common in females, the elderly and those on narcotics
- Can be idiopathic or due to hypokinesis from disease states or exogenous sources (diet, medications)
- DIAGNOSIS OF EXCLUSION

POTENTIALLY LIFE-THREATENING CAUSES OF ABDOMINAL PAIN:

- RUPTURED ECTOPIC PREGNANCY:
    - No method of contraception prevents ectopic
    - Occurs in ~1 in 100 pregnancies
    - RF include → non-white race, older age, history of STI/PID, infertility treatment, IUD within last year, prior ectopic
    - Severe, sharp and constant pain localized to the affected side, pain more diffuse with intra-abdominal haemorrhage → midline pain tends no to be ectopic
    - Shock or peritonitis may be present
    - Localized adnexal tenderness or cervical motion tenderness ↑s likelihood of ectopic
- RUPTURED OR LEAKING A.A.A.:
    - ↑s with advanced age, male preponderance
    - RF include → HT, DM, smoking, COPD, IHD
    - Often asymptomatic until rupture → acute epigastric and back pain often associated with or followed by syncope or signs of shock (may radiate to back, groin or testes
    - VITAL SIGNS MAY BE NORMAL (up to 70%!)
    - Bedside US can define diameter.
    - CT is test of choice in stable patients
- MESENTERIC ISCHAEMIA:
    - Occurs most commonly in elders with CV disease, CHF, cardiac arrhythmia, DM, sepsis and dehydration
    - High mortality (70%)
    - 20-30% lesions are non-occlusive
    - Arterial occlusive causes (65%) are due to emboli (75%) and thrombosis (25%)
    - Venous thrombosis associated with hypercoagulable states
    - Severe, colicky pain that becomes diffuse
    - Early exam benign
    - Pronounced leukocytosis and lactic acidosis (infarction)
- INTESTINAL OBSTRUCTION:
    - Peaks in infancy and older age
    - More common with previous surgery
    - Adhesions, carcinoma, herniae (also abscess, volvulus and infarction)
    - Can lead to vomiting, third-spacing or strangulation/necrosis of bowel

    - Abdominal distention, hyperactive bowel sounds, diffuse tenderness →peritonism indicates strangulation
- PERFORATED VISCOUS:
    - ↑'d incidence with advancing age
    - History of diverticular disease or PUD common
    - Spillage of bowel contents causes peritonitis
    - Acute onset of abdominal pain is common with vomiting in 50%
    - Pain may localize with omental walling off and peritoneal irritation
    - Shock present in bleeding or sepsis
    - Upright radiograph reveals free air in 70-80% cases with perforated ulcers
- ACUTE PANCREATITIS:
    - Peak age in adulthood, male preponderance.
    - Alcohol abuse and gallstones most common cause→ lead to pancreatic damage, saponification and necrosis
    - Sequelae → ARDS, sepsis, haemorrhage, renal failure
    - Acute onset epigastric pain radiating to back, pain disproportionate to physical findings
    - Low-grade fever common
    - Because pancreas is retroperitoneal → guarding only present unless severe
    - Lipase test of choice
    - CT may show abscess, necrosis, haemorrhage or pseudocysts

IMPORTANT EXTRA-ABDOMINAL CAUSES OF ABDOMINAL PAIN:

- THORACIC:
    - AMI, unstable angina
    - Pneumonia
    - PE
- GENITOURINARY:
    - Testicular torsion
- ABDOMINAL WALL:
    - Muscle spasm
    - Zoster
- INFECTIOUS:
    - Streptococcal pharyngitis
    - Mononucleosis
- SYSTEMIC:
    - DKA
    - Alcoholic ketoacidosis
    - Uraemia
    - Sickle cell disease
    - SLE
    - Porphyria
    - Vasculitis
    - Hyperthyroidism

PIVOTAL FINDINGS:

- HISTORY:
    - Focused history is crucial

- Nature of pain very subjective but can be helpful
- HIGH YIELD QUESTIONS:
  - Age → advanced age increases risk
  - What cam first…pain or vomiting ? pain first more likely to be surgical.
  - Duration of pain → if less than 48 hours, worse
  - Have you ever had abdominal surgery → think obstruction
  - Is pain constant or intermittent → constant worse
  - Have you ever had this before → no prior episodes is worse
  - History of cancer, diverticulosis, pancreatitis, kidney failure, gallstones, IBD → all bad
  - HIV?
  - Alcohol consumption
  - Are you pregnant → ectopic
  - Are you taking antibiotics or steroids → mask infection
  - History of vascular disease, HT or AF → think mesenteric ischaemia or AAA

PHYSICAL EXAMINATION:

- **VITAL SIGNS MAY BE MISLEADING:**
  - Interpret in context
  - Temperature is often normal in elderly patients with laparotomy proven intraperitoneal infections
- Abdominal exam obviously crucial:
  - Remember 20% of appendicitis patients do NOT have RLQ tenderness
- Rectal exam of limited utility → except in consideration of GI haemorrhage, perirectal disease or prostatitis
- Pelvic exam should be done early in female patient with abdominal pain
- In male patient → urogenital system for consideration of prostatitis, torsion, orchitis and epididymitis
- REPEAT EXAM IMPROVES DIAGNOSTIC ACCURACY

ANCILLARY TESTING:

- UA AND TESTING FOR PREGNANCY ARE PERHAPS THE MOST TIME AND COST-EFFECTIVE ADJUNCTIVE TESTS
  - Pyuria can be misleading → often present in appendicitis
  - Similarly, haematuria can be present in AAA rupture
- Lipase
- LFT, FBC, EUC, coagulation of limited utility but are always done!
- ABG with lactate in suspected mesenteric ischaemia
- Plain films of limited use in acute abdominal pain other than those with bowel obstruction and perforation
- CT:
  - Increased diagnostic utility in elderly
  - Older patients have twice rate of surgery and 6-8 fold increased mortality
  - IV contrast alone may now be adequate in evaluation of most acute processes

- US extremely useful adjunct, ↓g time to diagnosis of life-threatening abdominopelvic conditions, such as:
    - Identification of intrauterine pregnancy → lowers risk of ectopic to 1 in 20, 000. Beware fertility aids → increases chances of heterotopic pregnancy
    - Measurement of cross-sectional diameter of abdominal aorta
    - Detection of free intraperitoneal fluid (blood, pus, bowel contents)
    - Gallbladder and CBD disease
    - Hydronephrosis → obstructive uropathy

EMPIRICAL MANAGEMENT:

- Main therapeutic goals are:
    - Physiologic stabilization
    - Mitigation of symptoms (pain, vomiting)
        - There is no virtue/evidence in withholding analgesia to "preserve diagnostic accuracy" → indeed the opposite true
    - Expeditious diagnosis and referral
    - Antibiotics in suspected intra-abdominal sepsis → antifungals may be needed in immunocompromised