Bowel Ultrasound

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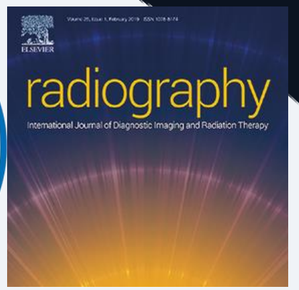
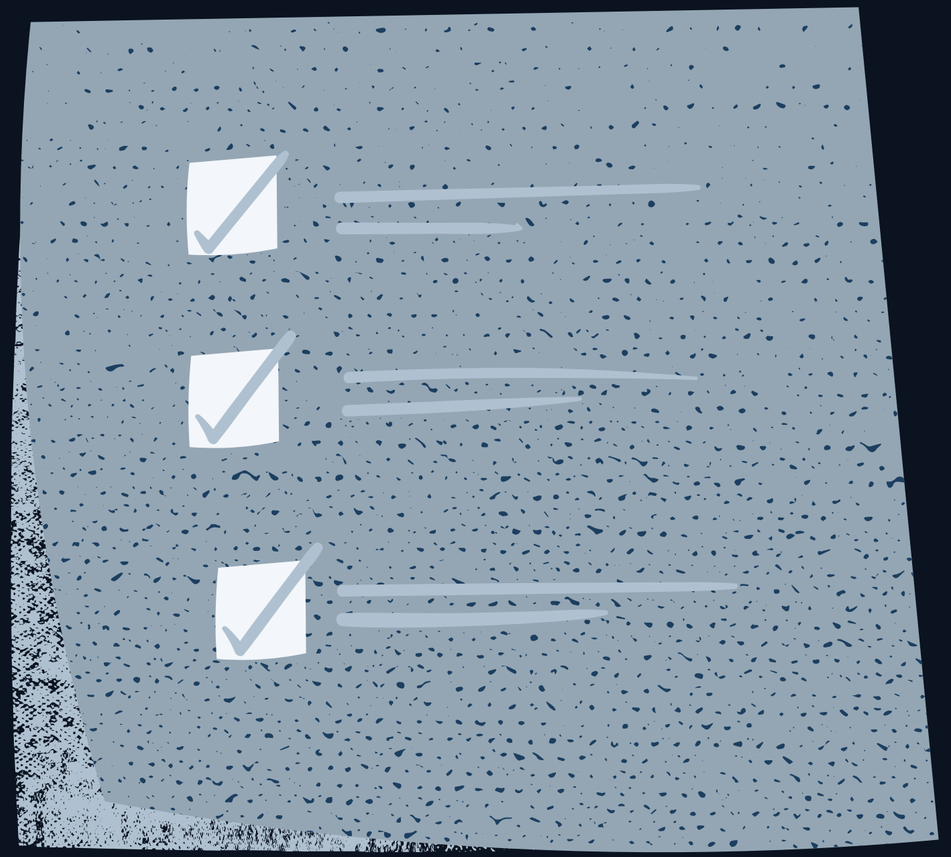


Talk objectives

- Anatomy
- Technique to assess bowel
- Ultrasound appearances of bowel
- Role of ultrasound
- Ultrasound appearances of common pathology



Normal Anatomy

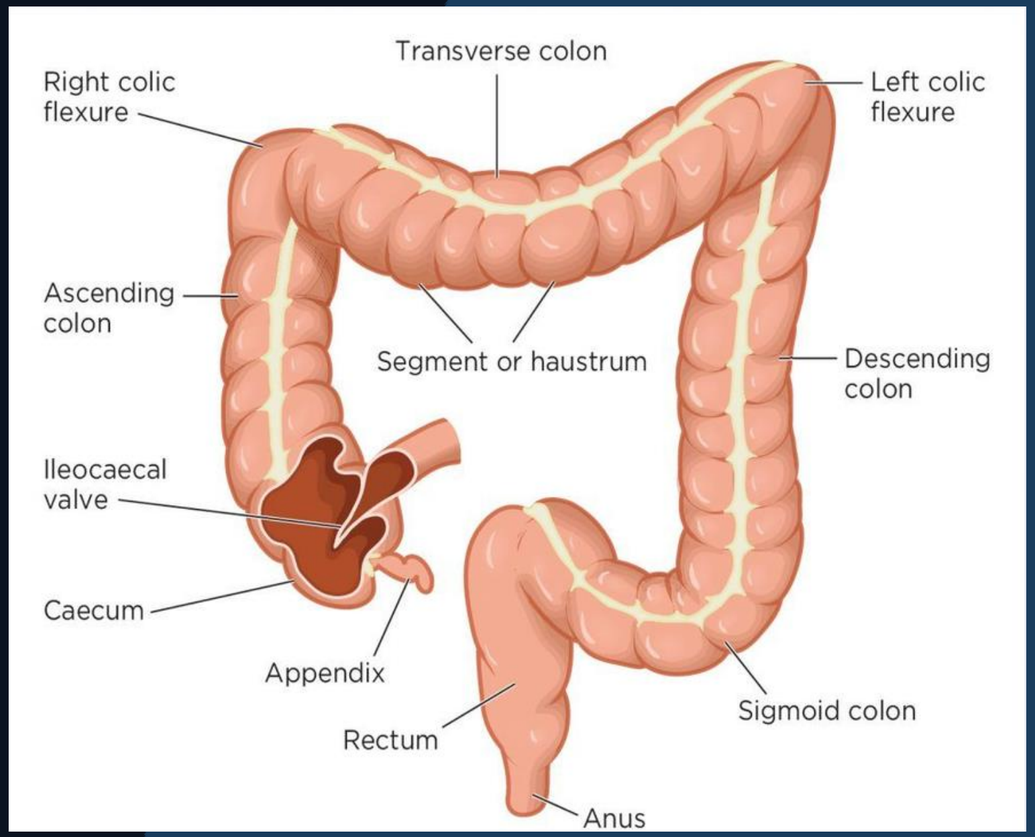
Normal bowel anatomy

Colon

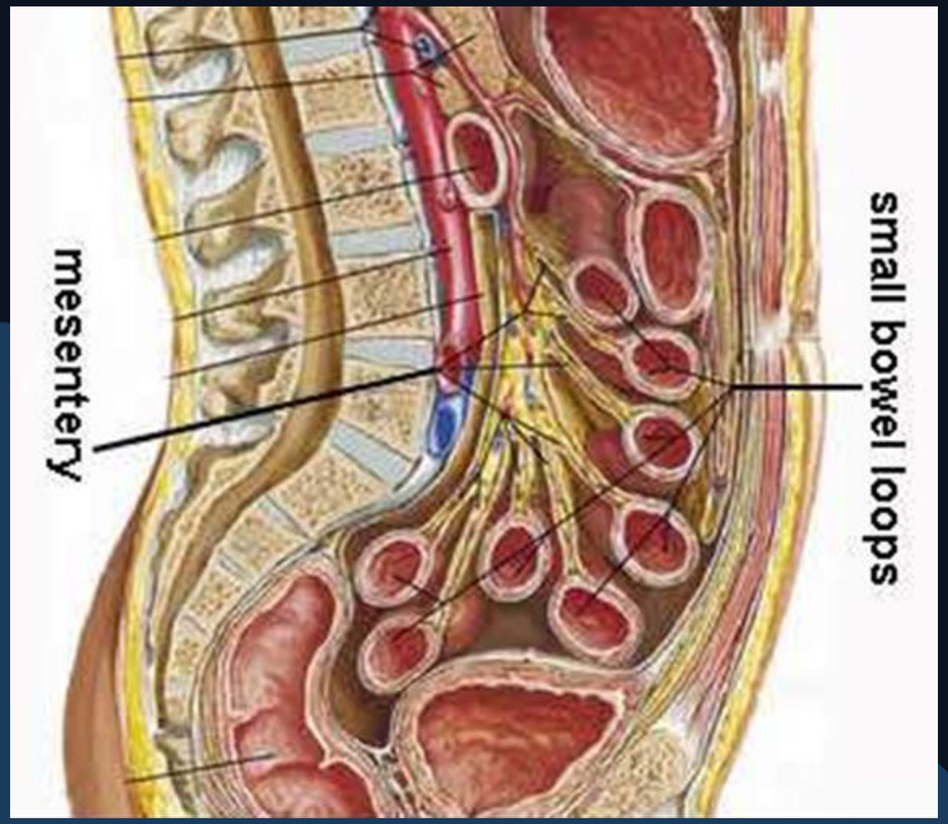
- Caecum
- Ascending
- Transverse
- Descending
- Sigmoid

Rectum

Anus



Normal bowel anatomy



Small bowel

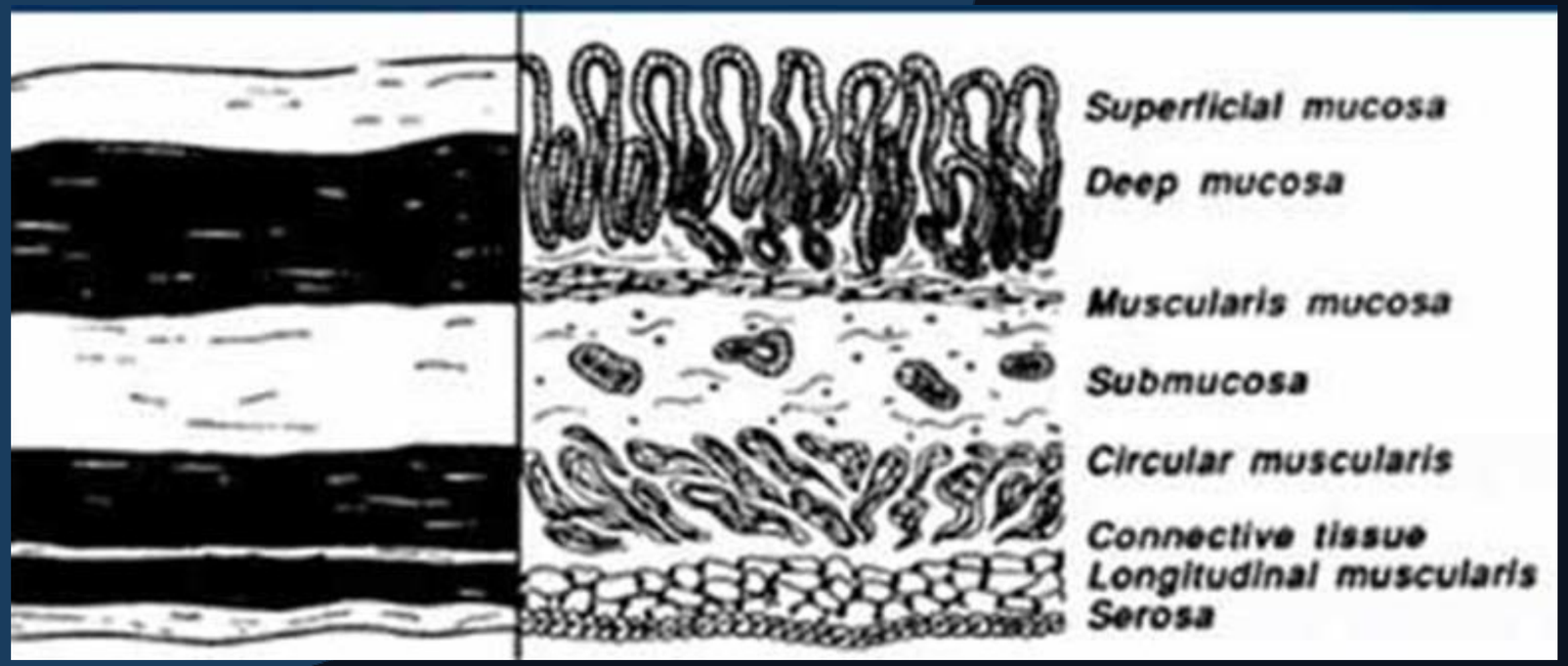
- Duodenum: 20 -25 cm long
- Jejunum: 2.5 m long
- Ileum: 3 m long

Suspended on Mesentery

- Celiac Axis
- SMA

Peristalsis

Normal bowel anatomy



5 layers

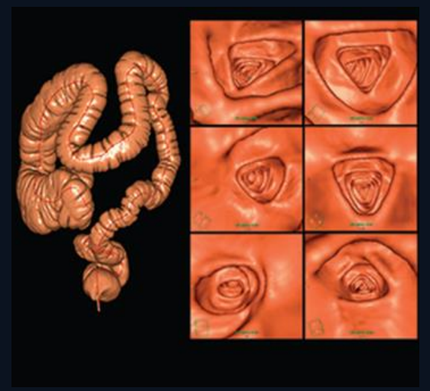
Methods of investigating the bowel

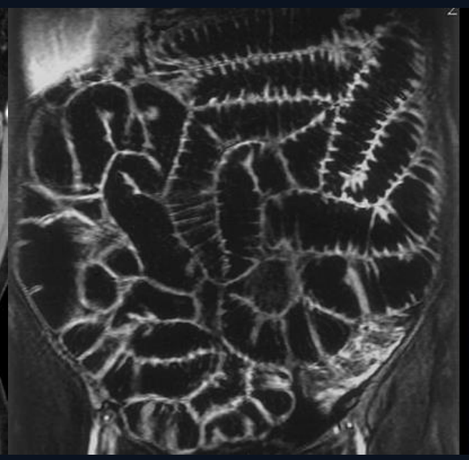
Endoscopy

- colonoscopy
- double balloon enterography
- capsule endoscopy

Radiologically

- Barium studies
- CT colonography
- SB enterocolysis
- MRI enterography
- Ultrasound

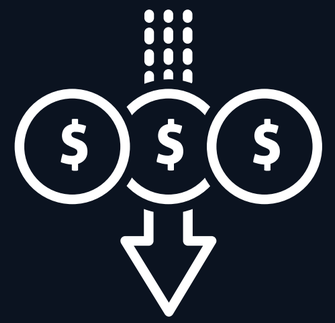




Why Ultrasound

No radiation exposure
(particularly important for the young patient cohort in context of a chronic relapsing disease)

Accessible and cost efficient

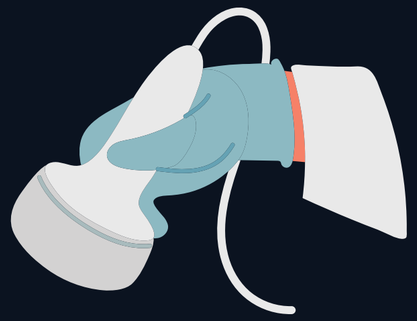


Benefits

Why Ultrasound

Patient habitus

Operator dependant



Limitations

Ultrasound Technique

What do you need?

Patient preparation:

- No requirement for oral fluid or other pre-ultrasound preparation

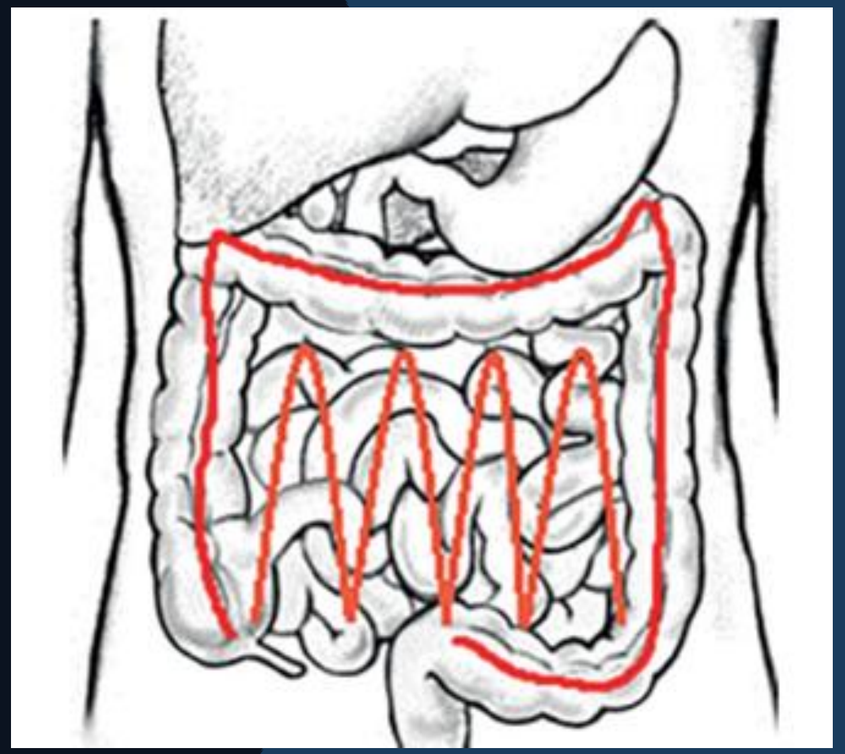
Ultrasound probe selection:

- Low frequency curvilinear ultrasound probe for general assessment
- Combination of high frequency probes for detailed assessment
- A curvilinear high frequency probe can sometimes be helpful when there poor images due to additional soft tissues

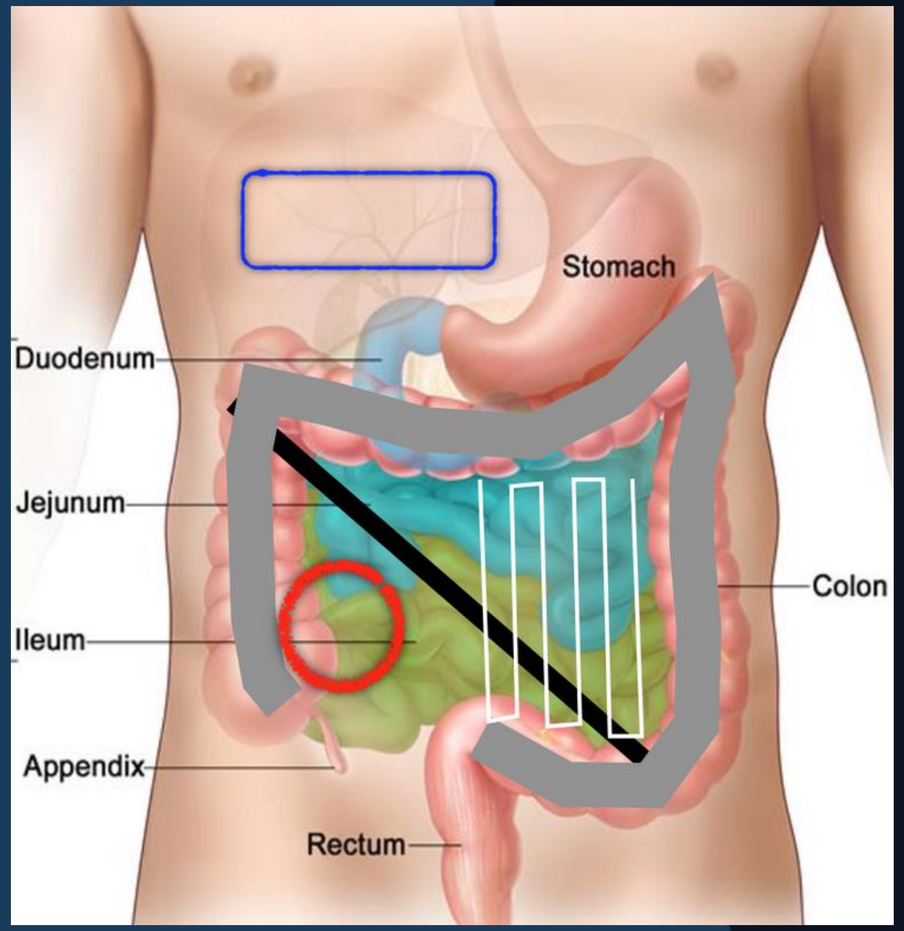
Other ultrasound settings:

- Colour Doppler: to assess bowel wall vascularity

Ultrasound technique



What do I do?

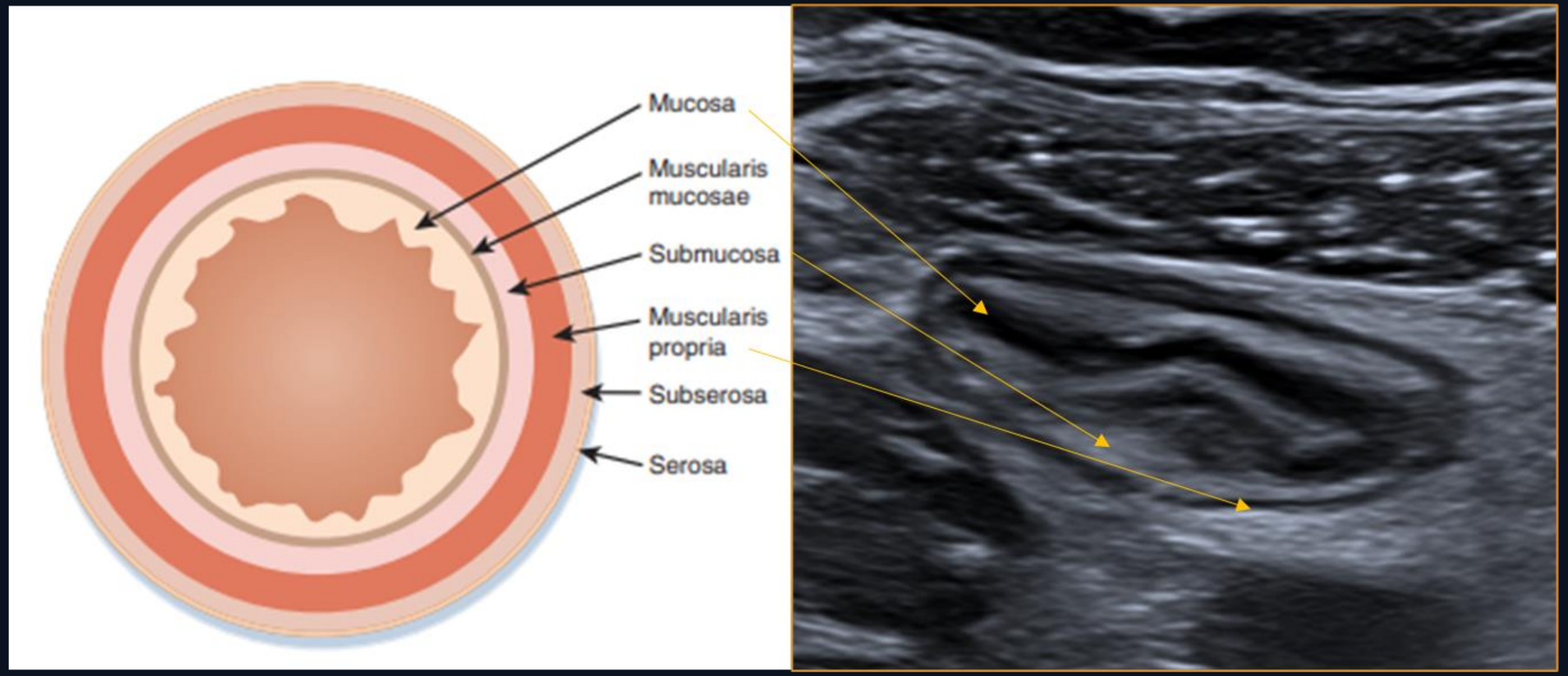


Start with low frequency curvilinear transducer for general assessment followed by a combination of high frequency transducers

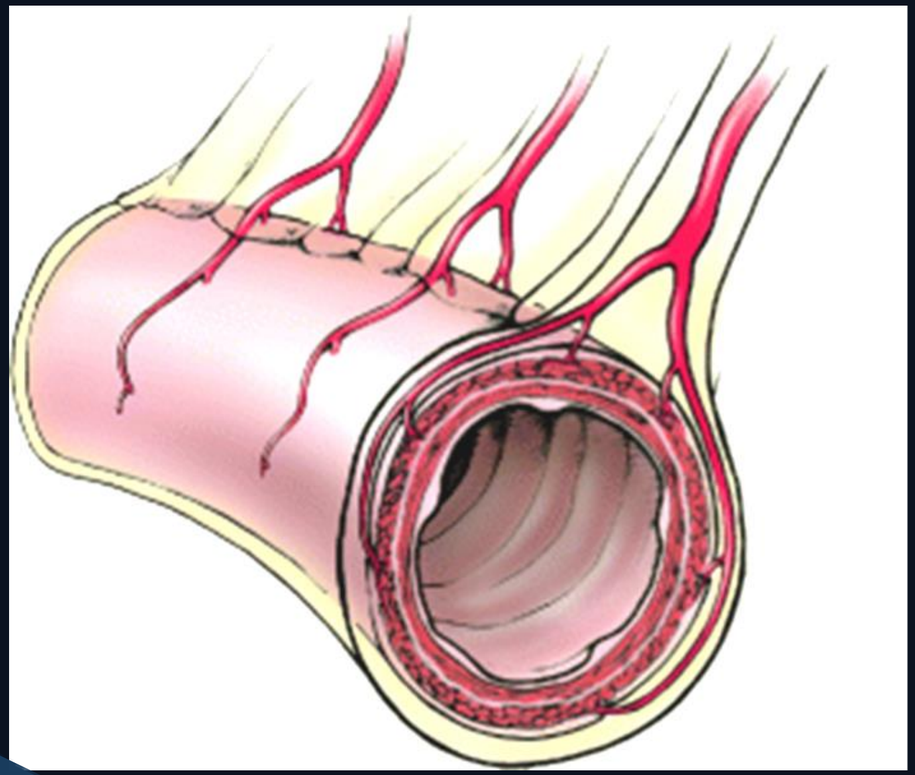
Systematic transabdominal ultrasound technique assessing colon and small bowel using graded compression to improve image quality

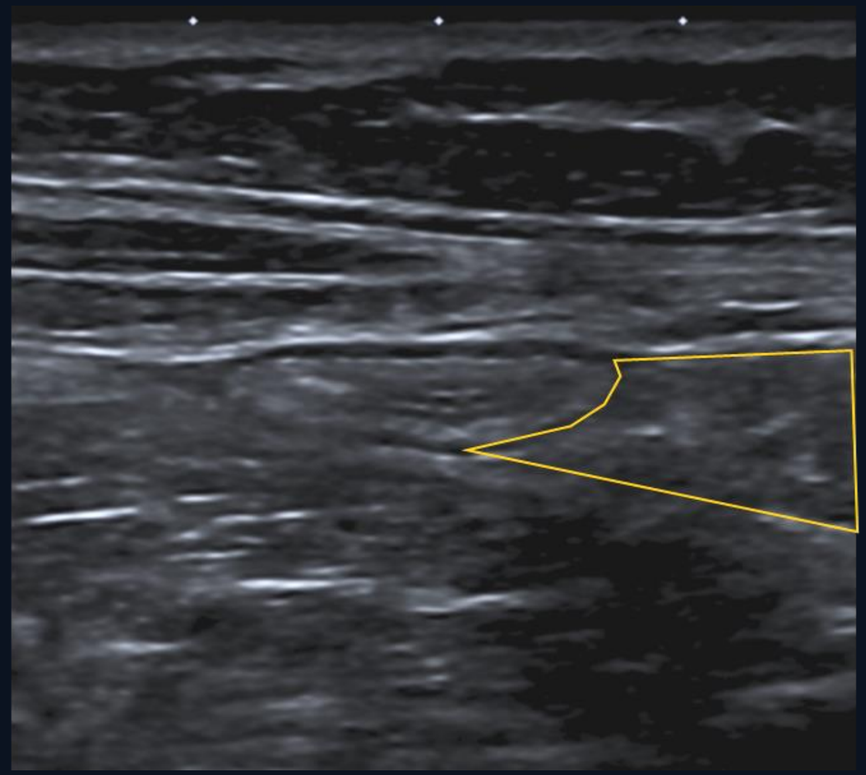
Ultrasound Appearances of Bowel

Normal bowel anatomy

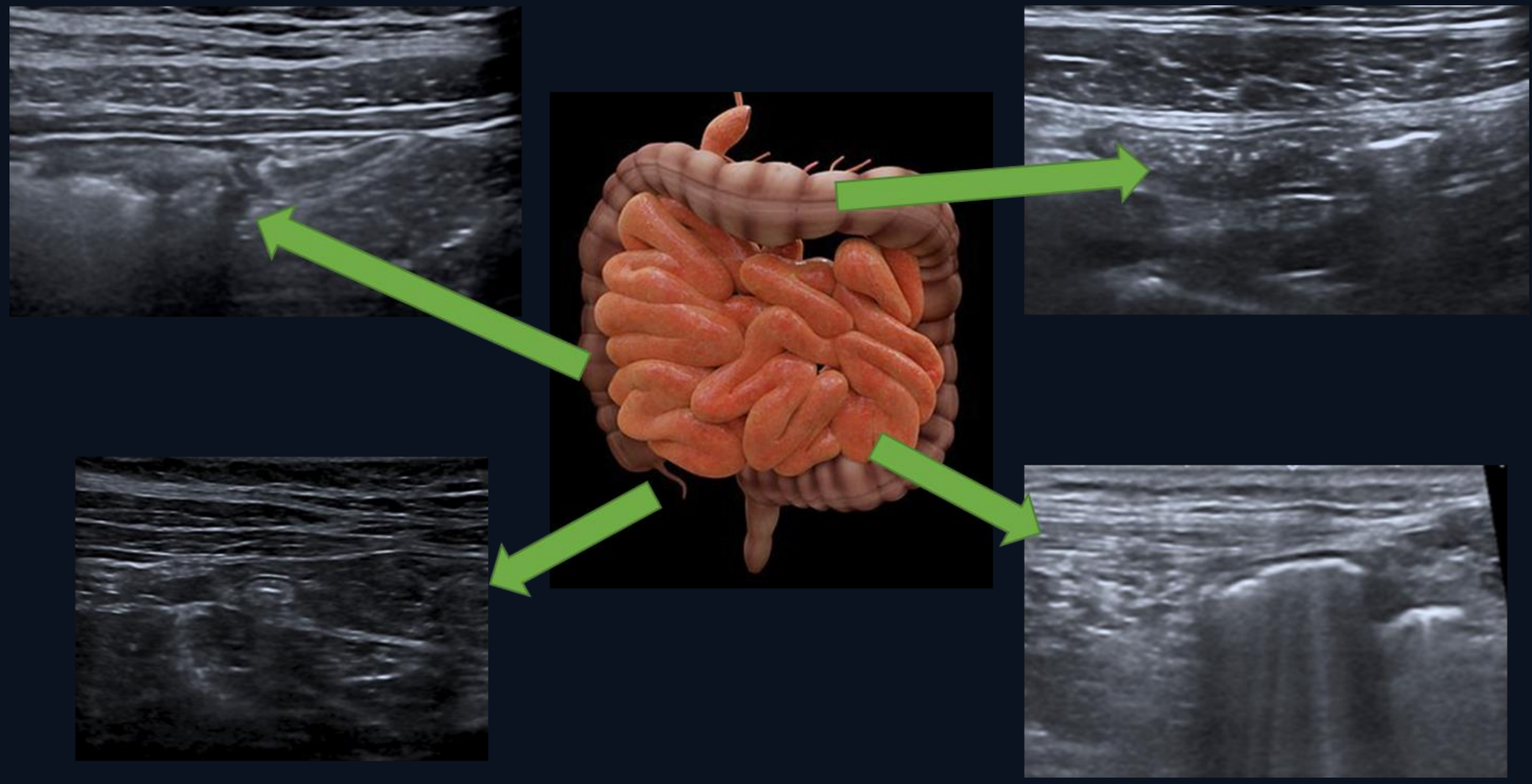


Normal bowel anatomy

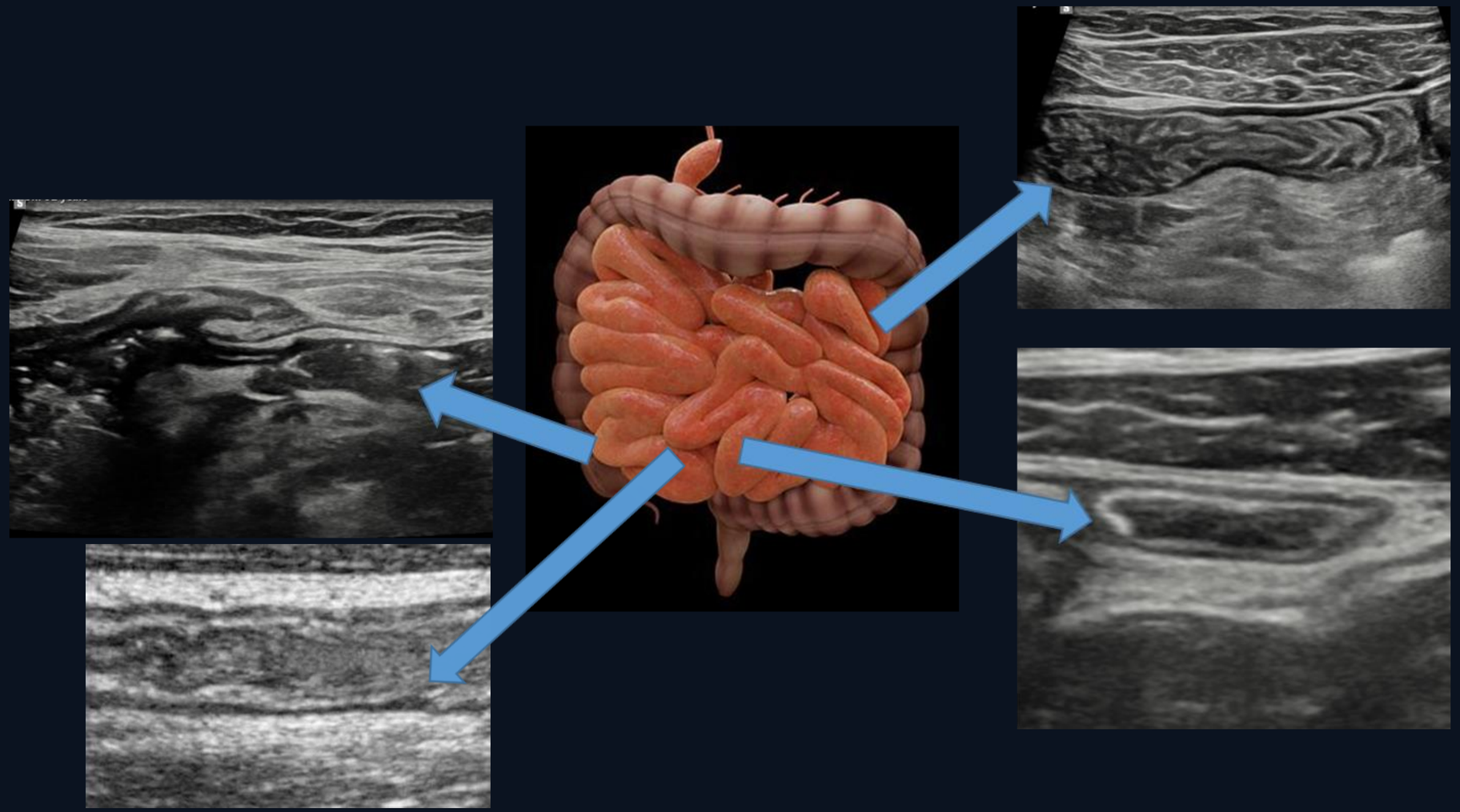




Normal large bowel anatomy



Normal small bowel anatomy



Role of US

To detect

Ultrasound can be used to seek an initial diagnosis for several diseases:

- appendicitis
- certain types of IBD (Crohns/Colitis)

To monitor

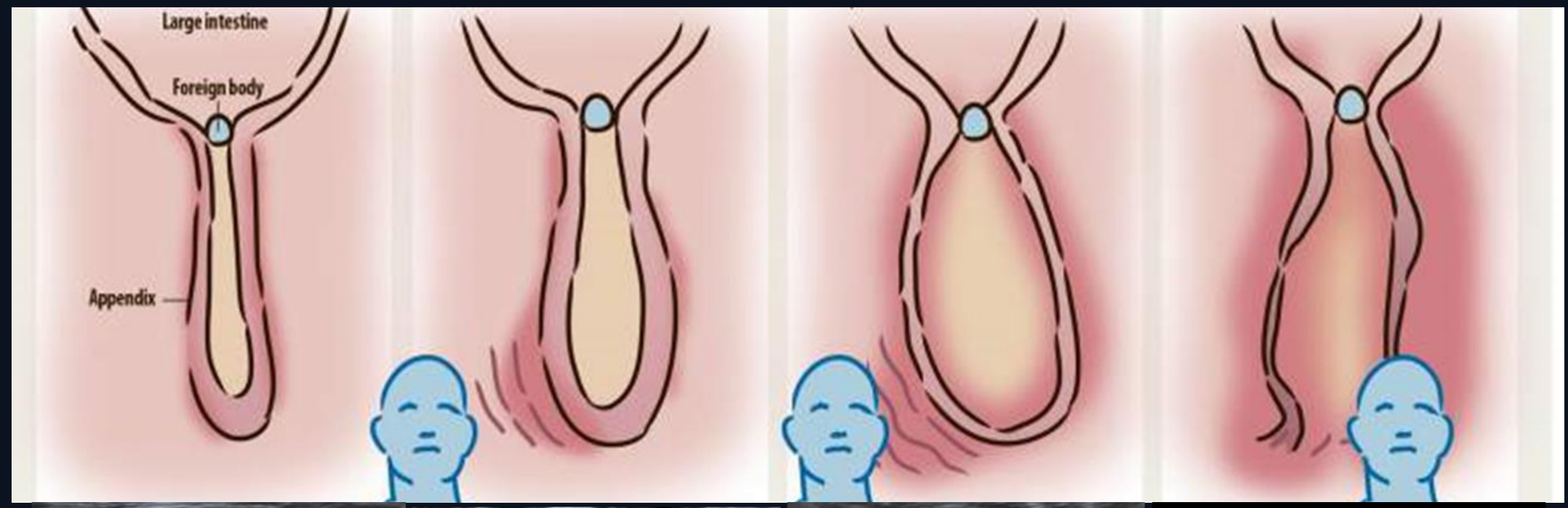
Ultrasound can be used to monitor disease activity and guide patient management:

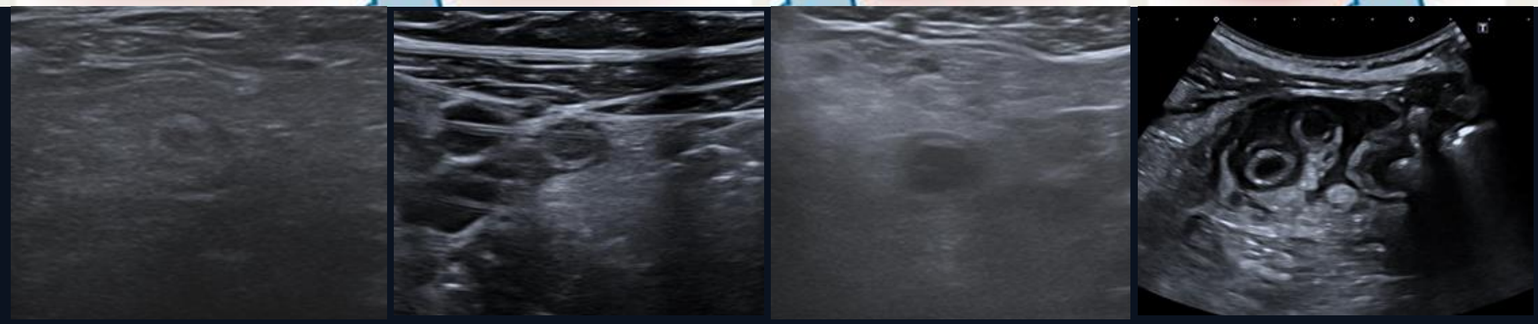
- Monitor disease activity
- Identify complications and guide treatment

Ultrasound Pathology

Acute appendicitis

Clinical History :
- : RIF pain good hx appendix- migratory pain. prev R oophorectomy / dermoid.
Detail of relevant previous trauma or surgery or known condition : as baove
Suspected diagnosis or clinical question : ? appendicitis or ? gynae problem
Relevant blood results WCC / CRP or "normal"? : crp 68





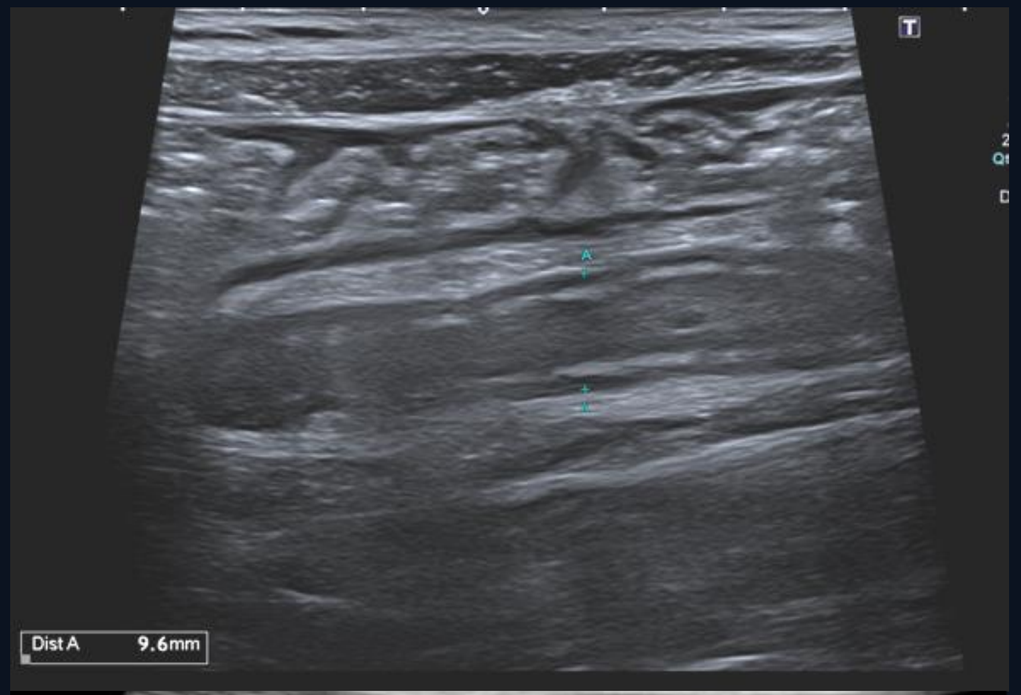
Acute appendicitis

Thickening of wall

layers

Ill-defined layers

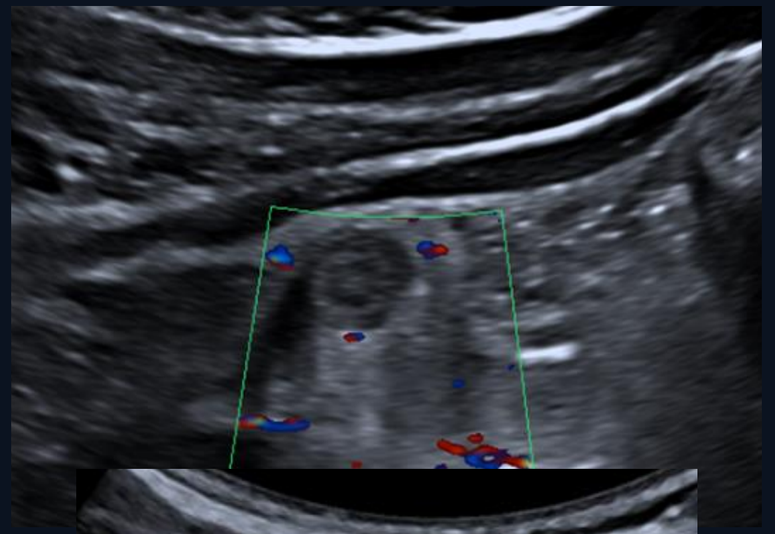
Non-compressible



Acute appendicitis

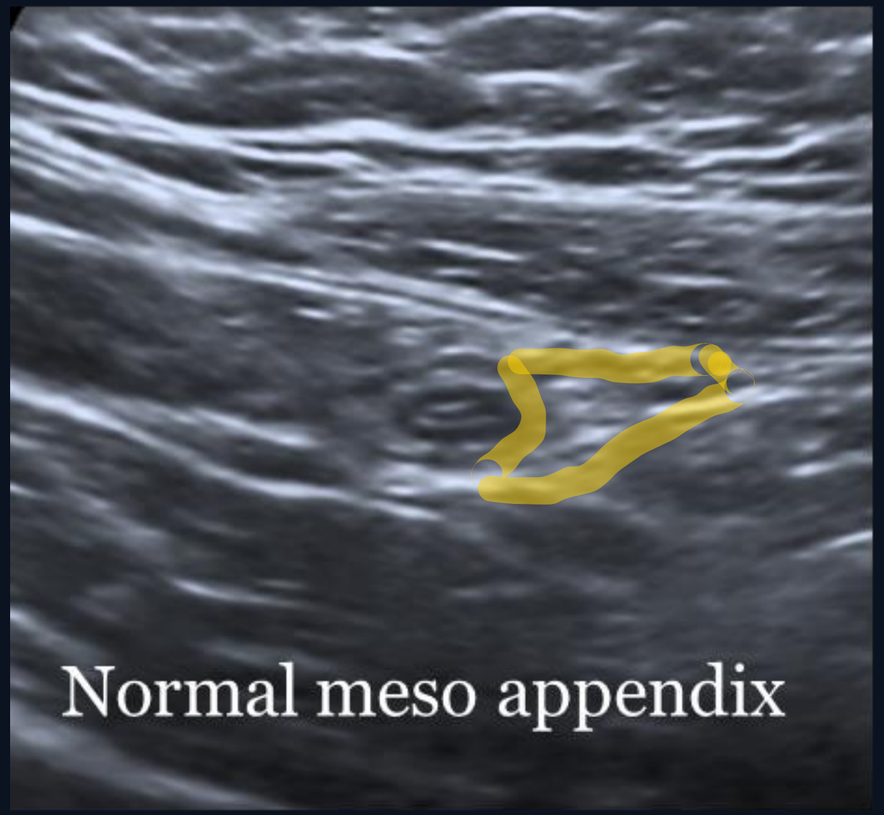
Hypervascularity with Doppler

Localised free fluid / collections



Acute appendicitis

Changes in the mesentery!

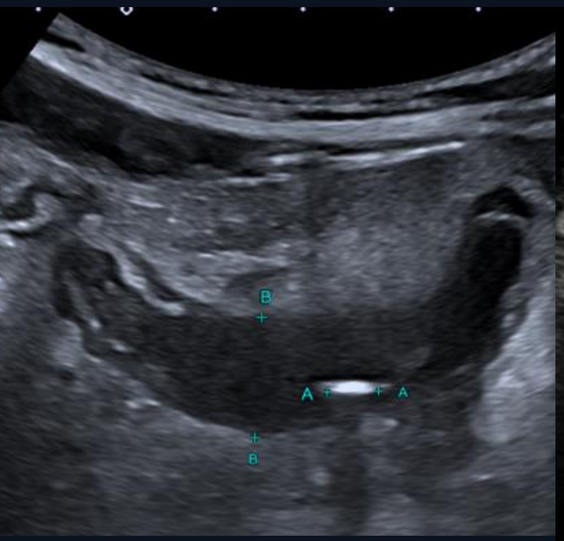


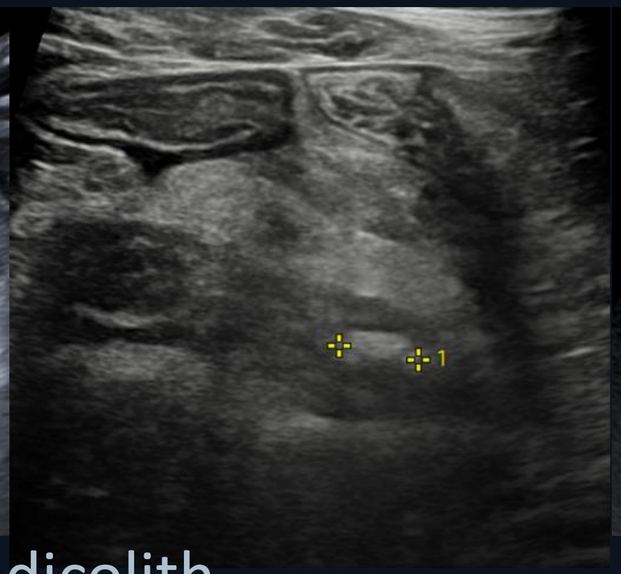
Acute appendicitis

Changes in the mesentery!

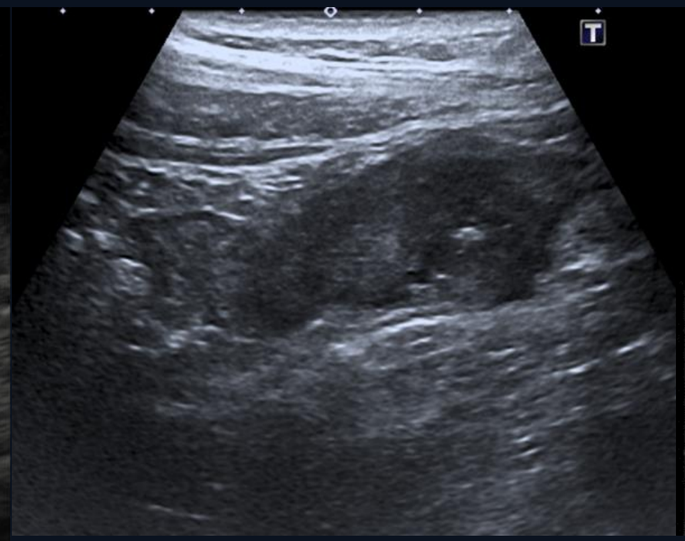
Acute appendicitis

Cause for appendicitis

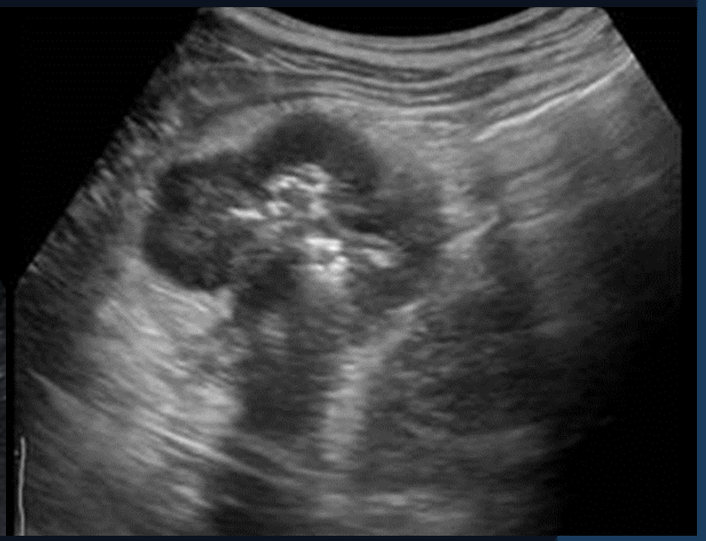




Appendicolith



Tumours in the app

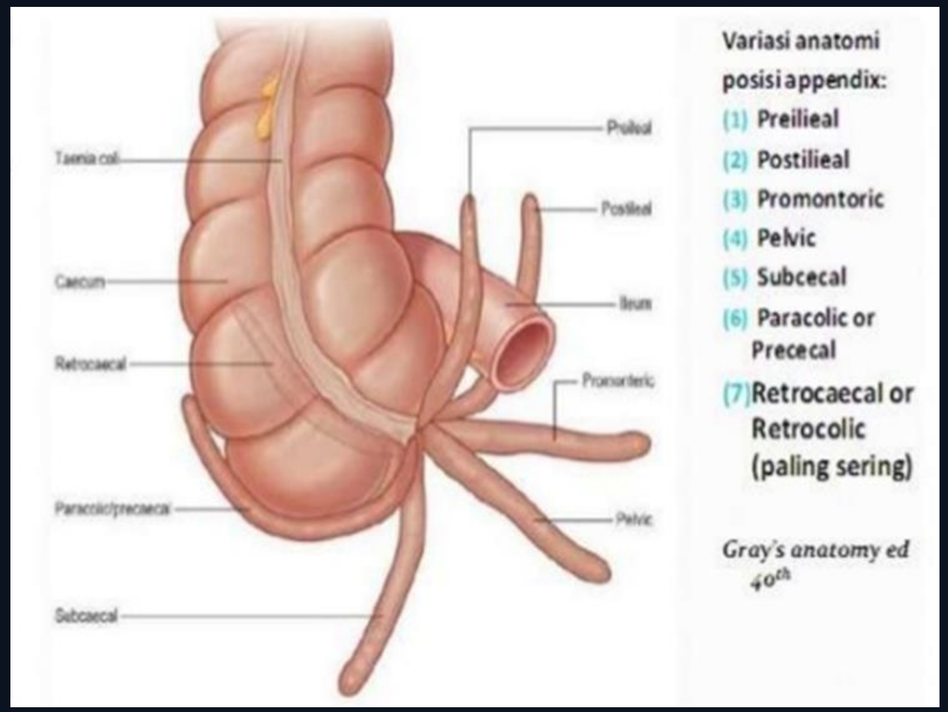


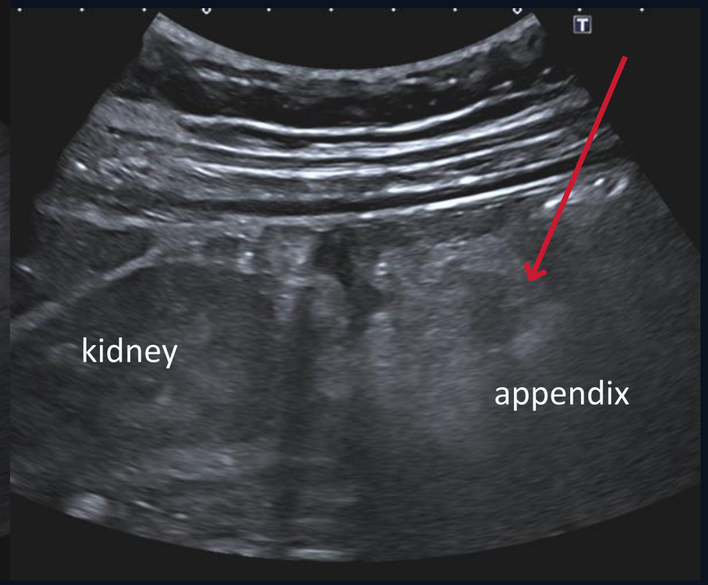
Tumours in the colon

TOP TIPS

Be aware of the possible positions

Have a systematic approach to locating it

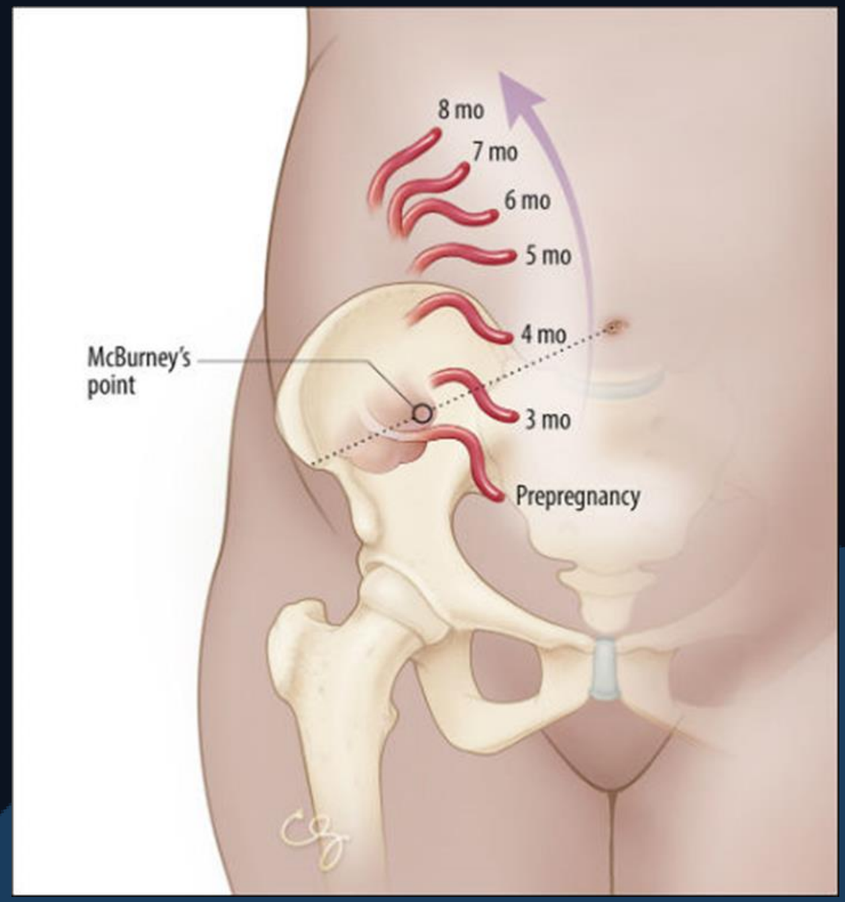




TOP TIPS

Finding the appendix in pregnancy

Be aware in pregnant patients the location of the appendix will vary depending on patient gestation



Acute appendicitis

HOW TO REPORT

Is the appendix normal/abnormal?

Are the surrounding structures normal (mesentery, caecum, small bowel)

Where is the abnormality – base of appendix, whole appendix, tip of appendix?

Are there any complicated features – free fluid, collections, tumours?

Can you see an appendicolith? - Antibiotics are less effective if an appendicolith is present.

Clinical History : RIF scan for ?appendicitis

US Abdomen :

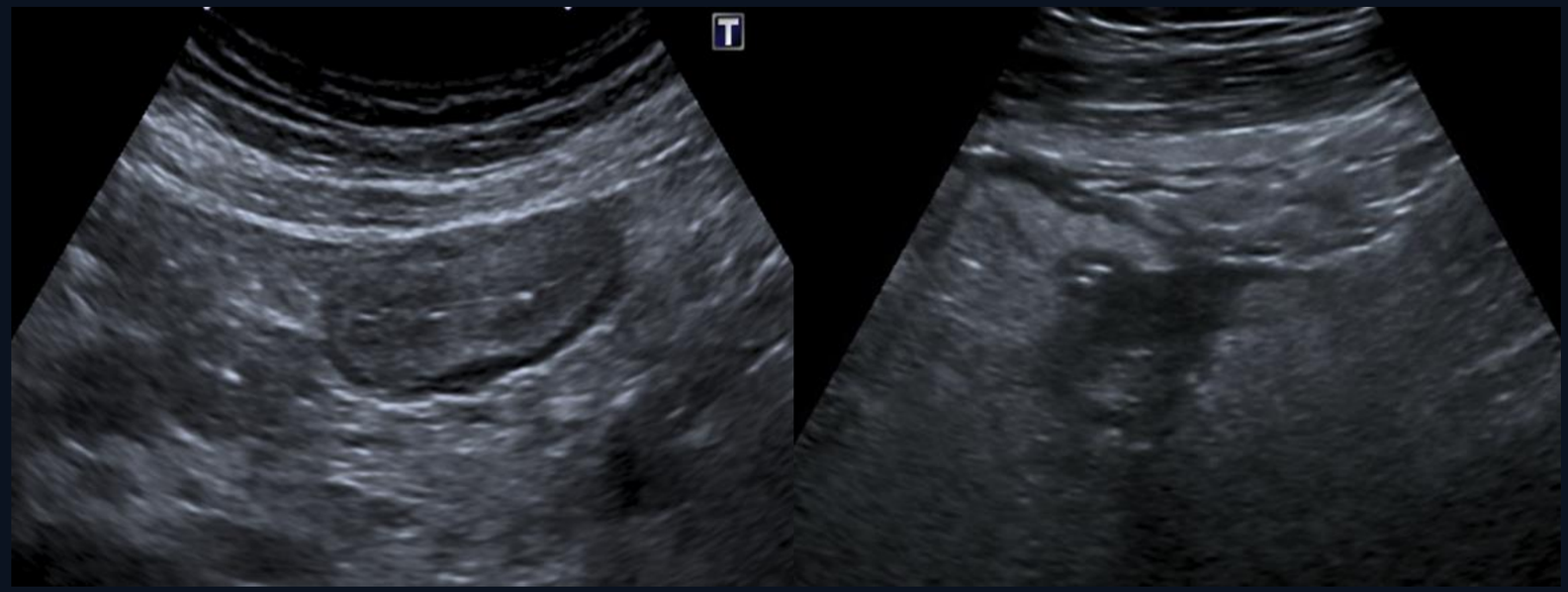
Thickened tender appendix measuring 9mm with associated increased colour Doppler flow and inflammatory changes in the mesoappendix. Caecal pole and terminal ileum appear unremarkable. No free fluid or collection seen in the RIF.

Conclusion:
Ultrasound appearances are suggestive of acute appendicitis.

Inflammation in colon

Different types depending on aetiology

One’s we may be able to identify



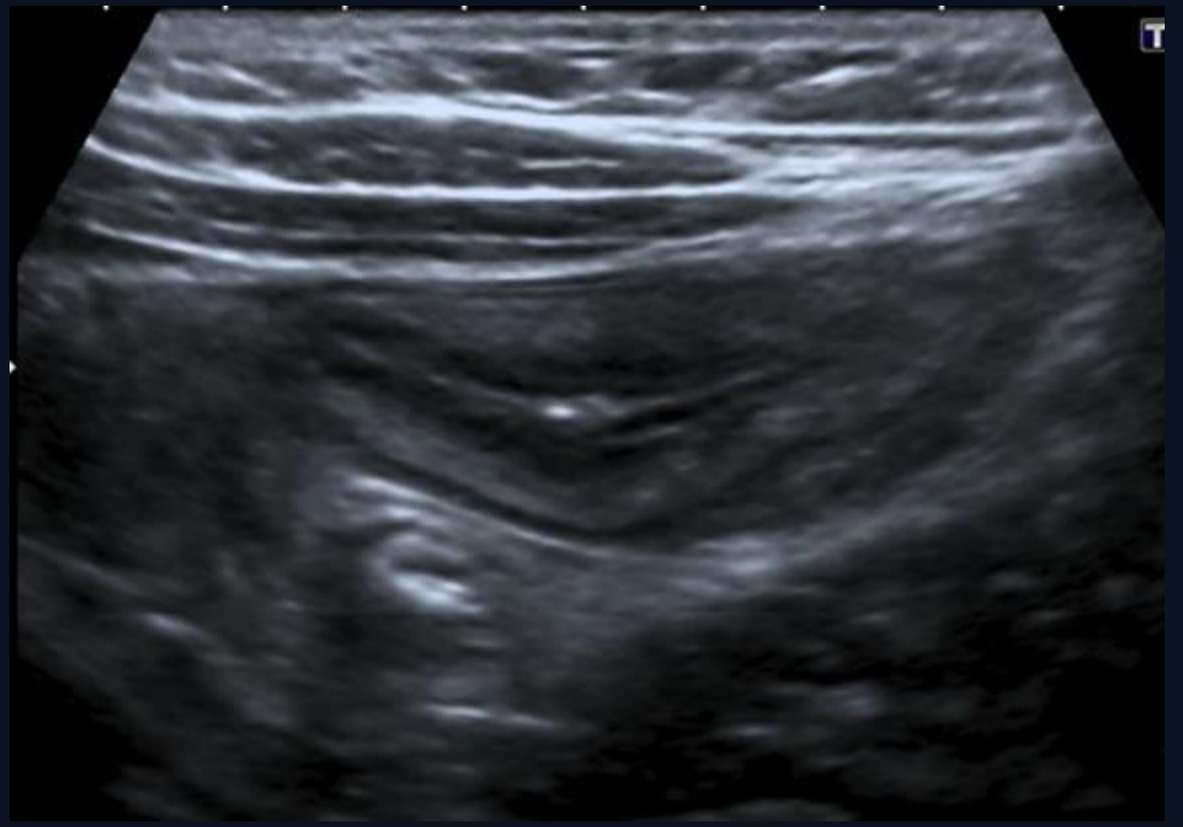
colitis

diverticulitis

Small bowel inflammation

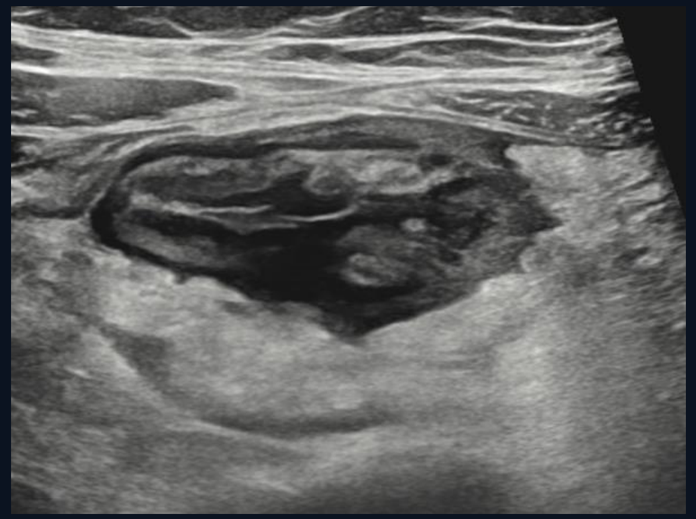
Ileitis

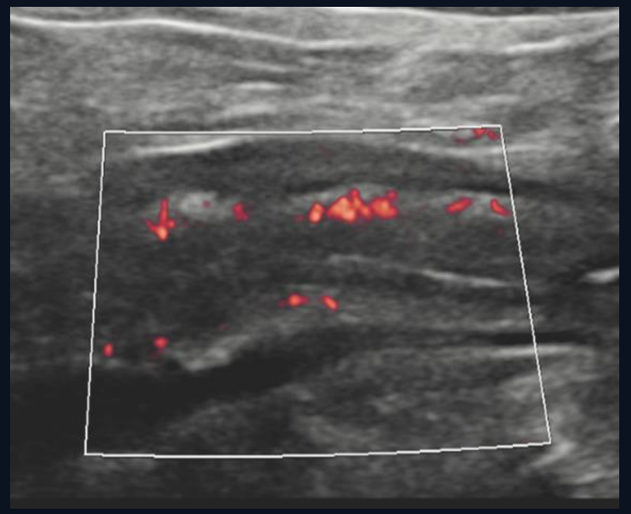
- Wall thickening
- Increased Doppler signal
- Ileocolic nodes
- NO mesenteric fat wrapping!

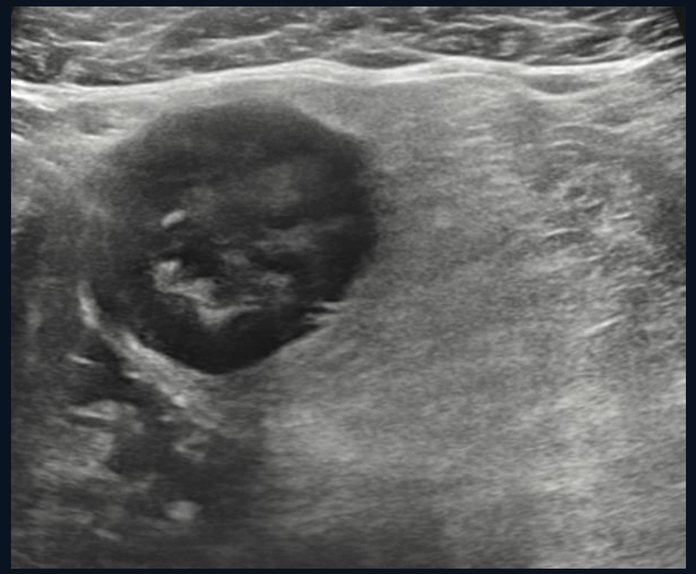


Small bowel inflammation
Crohn's disease

- Wall thickening
- Focal hyperechoic mesentery (with or without fat wrap)
- Terminal ileum (most common location)
- Skip lesions
- Ulceration and fistulation
- Abscess

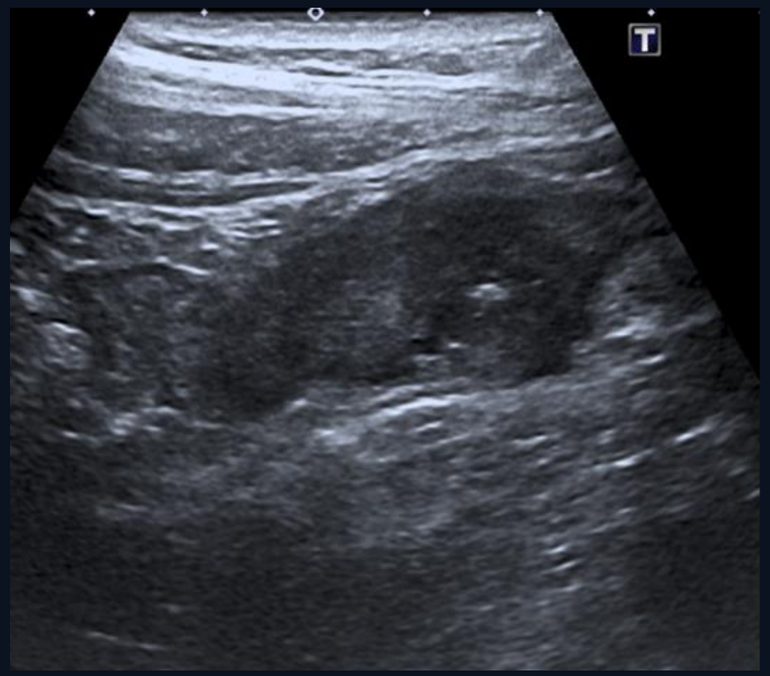


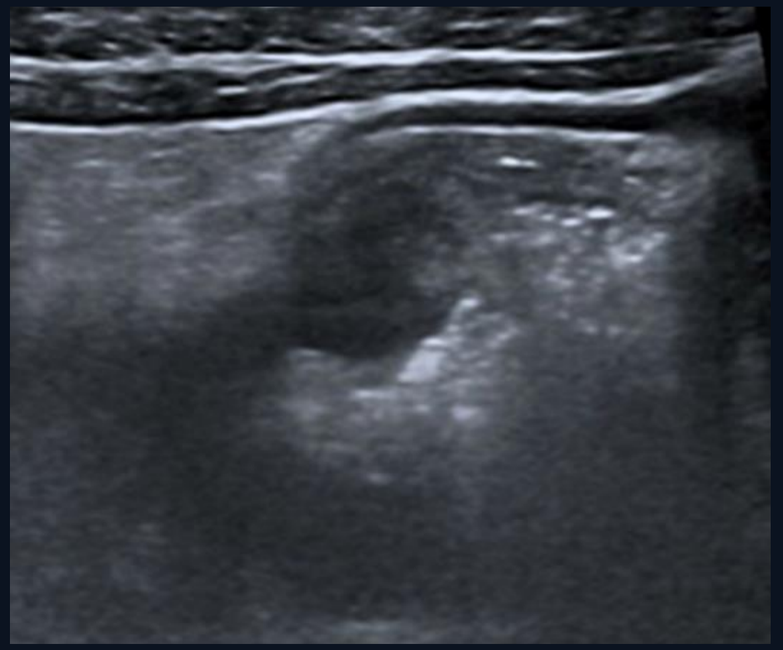




GI Malignancy

- Abnormal wall thickening
- Loss of mural stratification - layers
- Hypoechoic wall
- May be semi-circumferential
- May be circumferential
- Non-compressible
- Luminal narrowing





Thank you

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