IBUS Hybrid Module 1 Workshop
Tutor Handout and Teaching Objectives

Hands-on #1: Ultrasound Techniques

Teaching objectives:

At the beginning of the hands-on session, it is important to spend about ten minutes demonstrating the practical aspects: how to handle the probe, how to visualise the intestine, and how to perform all the necessary scans — starting from the rectum/sigmoid, moving up to the terminal ileum, and then the small bowel. After this demonstration, all participants should take turns handling the probe themselves and rotating through the examination.

How to set the machine

- Manage the transducer using the right hand only and the keys of the ultrasound machine using the left hand only
- Orient the transducer properly and assess for this using a tilting technique
- Identify the main landmarks (ileac vessels, psoas muscle, and ileac crest)
- Identify the bowel wall (colon or TI)
- Optimize the image: optimize the gain, focus, and depth while the bowel is centered
- Identify the freeze button and freeze an image
- Visualize haustrations in the colon, comment on air and shadowing
- Possible movements with the probe: Turning. shifting, tilting. Try to keep the orientation right. Try to center and object and follow it. Try smooth compression
- Identify the caliper button and measure the bowel wall thickness
- Identify the color or power Doppler button and center/adjust the window on top of the bowel wall
- Discuss the difference between the small bowel and the colon
    - Content
    - Motility
    - Haustra

Normal IUS Findings (healthy volunteers)

- Identify a normal sigmoid and follow it lengthwise and cross sectional, check the compartments abdominal wall, retroperitoneum, small bowel and mesentery.
- Identify the descending colon using the spleen as landmark, check the compartments retroperitoneum, descending bowel, small bowel in horizontal probe position
- Identify the transverse colon using the stomach as starting point
- Identify the right colonic flexure.
- Identify the ileocecal valve, TI and if existing, the appendix
- Reassess the first and last position with a high-resolution probe, and measure the BWT of the sigmoid and the TI
- Meander through the small bowel, identify the jejunum in a lateral hand position
- Try to visualize the rectum through the bladder

Hands-on #2: UC Patients

Participants will rotate to the next room after 30 minutes

Teaching objectives:

- Identify the sigmoid, descending, transverse and ascending colon as well as cecum
- Trace the colon in a systematic fashion while maintaining proper orientation of the transducer
- Identify the 3 bowel wall layers
- Measure the bowel wall thickness
- Assess for hyperemia using color Doppler
- Assess for preservation or loss of bowel wall stratification
- Assess for mesenteric fat proliferation and lymphadenopathy
- Assess for submucosal prominence

Hands-on #3: Non-IBD case studies

Video library interactive discussion (participants divided in two groups)

Assigned tutors should familiarise with the cases and notes prior to the session

Teaching objectives:

- Diverticulitis
- Complicated diverticulitis, abscess
- Complicated diverticulitis covered perforation.
- Red flags (peritonitis, free intraperitoneal air)
- Appendicitis, size of the whole diameter, judge the worst case from the amount of inflammatory fat
- Finding a stenosis in ascending colon, helpful air, train your eyes.
- Colon cancer, penetrating disease
- Foreign body (capsule)
- Polyp in a child
- Patterns of small bowel movements in malassimilation syndrome, celiac disease

Hands-on #4: Crohn's Patients

Participants will rotate to the next room after 30 minutes

Teaching objectives:

- Identify the terminal ileum (using landmarks and ileocecal valve)
- Identify the 3 bowel wall layers
- Measure the bowel wall thickness
- Assess for hyperemia using color Doppler and quantify the degree of hyperemia
- Assess for preservation or loss of bowel wall stratification
- Assess for mesenteric fat proliferation and lymphadenopathy or a stricture (measure bowel dilation if it exists)
- Assess for submucosal prominence
- Evaluate the motility of the TI
- Trace the TI proximally
- Scan the entire small bowel in a systematic fashion
- Discuss the difference between the small bowel and the colon
    - Content
    - Motility
    - Haustra

Hands-on #5: Complications in IBD

Video library interactive discussion (participants divided in two groups)
Assigned tutors should familiarise with the cases and notes prior to the session

Teaching objectives:

- CD fistula tracts, pattern recognition of loops being torn or fixed
- CD stenosis dilation, movement of the prestenotic part
- CD Small bowel stenosis, assessment of endoscopic dilation procedure
- Small bowel obstruction, pattern recognition
- CD interenteric fistula tracts
- CD bladder fistula, air in the bladder
- CD abscesses, differentiation between fistula and abscess with CEUS
- UC intramural gas
- Show the corresponding histologic specimen
- UC Toxic megacolon

Hands-on #6: Team Challenge

All participants should work together to create a final report and collect the patient's ultrasound data using the provided form. Please make sure the participants understand, this is **not part of the exam**. The session is intended to be experienced as a treasure hunt.

A practical way to organize the task is to have each participant examine a different segment of the intestine, while the rest of the team records the measurements and observed features on the **standardized sheet** . The group should agree on the findings and measurements in real time during the examination.

Teaching objectives:

- Identify the landmarks and the ileocecal valve
- Identify the colon and the TI
- Measure the bowel wall thickness and assess if it is increased
- Assess for hyperemia using color Doppler and quantify the degree of hyperemia
- Assess for preservation or loss of bowel wall stratification
- Assess for mesenteric fat proliferation and lymphadenopathy or a stricture (measure bowel dilation if it exists)
- Assess for submucosal prominence
- Evaluate the motility of the TI
- Trace the colon in a systematic fashion while maintaining proper orientation of the transducer
- Scan the entire small bowel in a systematic fashion
- Provide an impression of the examination (disease activity, chronicity, complications, quality of examination, etc.)
- **Complete the description of the findings on a standardized sheet**