ABDOMINAL WALL ULTRASOUND EXAMINATION

POLICY: Abdominal wall ultrasound will be performed with an order from a physician or other qualified clinical practitioner. The examination will be supervised and interpreted by a radiologist or other licensed practitioner who is qualified by reason of training to understand the normal anatomy, pathophysiology of the urinary tract, and integration of ultrasound with other imaging techniques to optimize the probability of detecting disease.

PURPOSE: To assess the anatomy of the abdominal wall and document normal and abnormal structures therein.

INDICATIONS: Ultrasound of the abdominal wall is indicated for patients with signs and/or symptoms of abdominal wall disease (e.g. hernia; soft tissue mass). Common indications include pain and/or palpable mass.

PATIENT PREPARATION: There is no special preparation for an abdominal wall ultrasound examination.

PROCEDURE: A targeted examination of the abdominal wall in the symptomatic area of concern should be performed in two orthogonal planes (e.g. longitudinal and transverse views). Imaging is performed using both cine clips and still images. Cine clips are obtained with valsalva and/or compression in order to affectively demonstrate suspected hernias. The contralateral side of the abdominal wall may be imaged for comparison.

- The highest frequency transducer possible should be used, while still penetrating the entire abdominal wall (skin through underlying peritoneum).
- The area of concern should be surveyed in longitudinal and transverse planes prior to imaging. All layers of the abdominal wall should be surveyed for any masses, fluid collections or fascial defects (hernias).
- It is helpful to use a body marker to specify the area that is being imaged and the orientation of the transducer.
- Panoramic (Logiqview) images of the mass may be obtained and used for measurement and/or demonstration of surrounding anatomy.
- When any measurement is performed, an image should be captured with and without measurements.
- Identify and demonstrate surrounding anatomy in order to specify the type of hernia demonstrated (e.g. supraumbilical, umbilical, spigelian, incisional, direct inguinal, indirect inguinal, femoral).
- It may be helpful to scan the patient in an upright position if a hernia is suspected and cannot be demonstrated using valsalva techniques with the patient supine.
VENTRAL ABDOMINAL WALL: Examination of the symptomatic ventral abdominal wall commonly reveals a soft tissue mass (e.g. lipoma) or hernia. Ventral abdominal wall hernias include:

- **EPIGASTRIC** (9%)  
  o defect occurs through the **linea alba** (between the rectus abdominis muscles) in the **upper abdomen**  
  o Diastasis Recti: separation of the rectus muscles resulting in a bulge that is often mistaken for a hernia on clinical exam

- **PERIUMBILICAL** (periumbilical/umbilical 19%)  
  o defect is almost always **supraumbilical**, through the **linea alba** and within a few centimeters of the umbilicus

- **UMBILICAL** (periumbilical/umbilical 19%)  
  o defect occurs through the **umbilical opening**, resulting in an enlarged, protruding umbilicus

- **HYPOGASTRIC** (<1%)  
  o defect occurs through the **linea alba** in the **pelvis**  
  o the hypogastric linea alba is narrow  
  o Infraumbilical Divarication: separation of the rectus muscles

- **SPIGELIAN** (<1%)  
  o defect occurs through the **linea semilunaris**, typically near the level of the **arcuate line**  
    - Arcuate Line: Imaginary horizontal line that demarcates the lower margin of the posterior layer of the rectus sheath (where the inferior epigastric vessels perforate the rectus abdominis muscles).

- **INCISIONAL** (5%)  
  o defect occurs through a scarred area of previous incision

Minimal required images of the ventral abdominal wall are as follows:

- **one longitudinal view of the area of concern, labeled appropriately** (e.g. Sag Umbilicus; Long Supraumbilical; Long Rt Semilunar)

- **one transverse view of the area of concern, labeled appropriately**

- **one cine clip, in either plane, across of the area of concern, labeled appropriately**

  If there is a mass or fluid collection identified, the following additional images are required:

  - **one longitudinal image of the mass or fluid collection, with the maximal anterioposterior and longitudinal diameters measured, labeled appropriately**

  - **one view of the mass or fluid collection perpendicular to its long axis, with the maximal transverse diameter measured, labeled appropriately**

  - **sufficient images to demonstrate the relationship of the mass or fluid collection as it relates to the surrounding abdominal wall anatomy, including an intact underlying**
fascial layer free of defect (supporting the absence of a hernia)
If there is a fascial defect (hernia) identified, the following additional images are required:

- one longitudinal view of the fascial defect (neck of the hernia), with the maximal diameter measured, labeled appropriately
- one transverse view of the fascial defect (neck of the hernia), with the maximal diameter measured, labeled appropriately
- one cine, with valsala, obtained at the neck of the hernia, demonstrating movement through the fascial defect, labeled appropriately
- one view, with compression, obtained at the neck of the hernia, demonstrating the maximum reducibility of the hernia, labeled appropriately
- sufficient images to demonstrate the contents of the hernia (e.g. fat, fluid, bowel)
  - If the hernia contains bowel, then bowel contents, bowel wall thickness and presence or absence of peristalsis should be documented.

GROIN REGION: Examination of the symptomatic groin commonly reveals a soft tissue mass (e.g. lymph node) or hernia. Groin hernias include:

- INDIRECT INGUINAL (Inguinal 70-75% - 2/3 of them indirect)
  - defect occurs lateral to the origin of the inferior epigastric artery at the deep inguinal ring
  - hernia sac is oriented obliquely (parallel with the inguinal canal)
  - courses anterior to the inferior epigastric vessels, and if large enough, displaces them posteromedially (making them difficult to identify)
  - enters the canal through the deep inguinal ring, “indirectly” approaching the superficial inguinal ring in a roundabout way

- DIRECT INGUINAL (Inguinal 70-75% - 1/3 of them direct)
  - defect occurs medial to the origin of the inferior epigastric artery
  - hernia sac is typically oriented more sagittally
  - if large enough, displaces the inferior epigastric vessels anterolaterally
  - bypasses deep inguinal ring and proceeds “directly” towards the superficial inguinal ring, through the canal wall

- FEMORAL (3%)
  - hernia sac will be seen medial to the femoral vein and anterior to the pectineus muscle and superior pubic ramus
  - hernia sac is oriented sagittally and coarse parallel to the femoral vein
  - if large enough, compresses the femoral vein
When evaluating the groin for the presence of a hernia, the examiner should investigate for both femoral and inguinal hernias. The entire length (approximately 4cm) of the inguinal canal (from deep to superficial inguinal rings) should be assessed for the presence of a hernia. Representative images should be obtained at the proximal and distal ends of the canal and at the femoral canal. Additional images will be necessary if a hernia is present (see below). The following are landmarks that should be identified and demonstrated when evaluating for inguinal and femoral hernias:

1. Inferior Epigastric Artery (arising from the external iliac artery)
   - level of the deep (internal) inguinal ring (proximal/internal entrance into the inguinal canal)
2. Lateral Pubic Tubercle
   - level of the superficial (external) inguinal ring (distal/external exit out of the inguinal canal)
3. Superior Pubic Ramus
   - level of the femoral ring (proximal entrance into the femoral canal)
4. Greater Saphenous Vein
   - level of the saphenous opening (distal exit out of the femoral canal)

Minimal required images of the inguinal/femoral region are as follows:

- one transverse view at the level of the deep inguinal ring, demonstrating the inferior epigastric artery as it arises from the external iliac artery, labeled Trans Rt or Lt Inf Epi Art
  *Color Doppler may be used to demonstrate this if a grayscale image is insufficient

1. **Proximal inguinal canal** images should be obtained at the level of the deep inguinal ring
   - one longitudinal view of the proximal inguinal canal, labeled Long Rt orLt Inguinal Canal Prox
   - one longitudinal view of the proximal inguinal canal, with valsalva, labeled Long Rt orLt Inguinal Canal Prox w/ Valsalva
   - one longitudinal cine of the proximal inguinal canal, with valsalva, labeled Long Rt orLt Inguinal Canal Prox w/ Valsalva
   - one transverse view of the proximal inguinal canal, labeled Trans Rt or Lt Inguinal Canal Prox
   - one transverse view of the proximal inguinal canal, with valsalva, labeled Trans Rt or Lt Inguinal Canal Prox w/ Valsalva
   - one transverse cine of the proximal inguinal canal, with valsalva, labeled Trans Rt or Lt Inguinal Canal Prox w/ Valsalva

2. **Distal inguinal canal** images should be obtained at the level of the superficial inguinal ring (lateral pubic tubercle should be demonstrated)
   - one longitudinal view of the distal inguinal canal, labeled Long Rt orLt Inguinal Canal Dist
• one longitudinal view of the distal inguinal canal, with valsalva, labeled Long Rt or Lt Inguinal Canal Dist w/ Valsalva
• one longitudinal cine of the distal inguinal canal, with valsalva, labeled Long Rt or Lt Inguinal Canal Dist w/ Valsalva
• one transverse view of the distal inguinal canal, labeled Trans Rt or Lt Inguinal Canal Dist
• one transverse view of the distal inguinal canal, with valsalva, labeled Trans Rt or Lt Inguinal Canal Dist w/ Valsalva
• one transverse cine of the distal inguinal canal, with valsalva, labeled Trans Rt or Lt Inguinal Canal Dist w/ Valsalva

3. Femoral canal images should be obtained at the level of the superior pubic ramus, medial to the common femoral vein
• one transverse view of the femoral canal, labeled Trans Rt or Lt Femoral
• one transverse view of the femoral canal, with valsalva, labeled Trans Rt or Lt Femoral w/ Valsalva
• one transverse cine of the femoral canal, with Valsalva, labeled Trans Rt or Lt Femoral w/ Valsalva

If a hernia is identified, the type should be specified based on the origin or neck of the hernia (as described above). The following additional images area required:
• one longitudinal view of the fascial defect (neck of the hernia), with the maximal diameter measured, labeled appropriately
• one transverse view of the fascial defect (neck of the hernia), with the maximal diameter measured, labeled appropriately
• one cine, with valsalva, obtained at the neck of the hernia, demonstrating movement through the fascial defect, labeled appropriately
• one view, with compression applied to the distal end of the hernia sac, demonstrating the maximum reducibility of the hernia, labeled appropriately
• sufficient images to demonstrate the contents of the hernia (e.g. fat, fluid, bowel)
  • If the hernia contains bowel, then bowel contents, bowel wall thickness and presence or absence of peristalsis should be documented.
  • one longitudinal view, with valsalva or standing upright, of the blunt end of the hernia, demonstrating its most distal extent in relationship to a given landmark, labeled appropriately.
  • e.g. 2cm distal to the lateral pubic tubercle
NOTE: When describing hernia findings, the following information should be included in the description:

- Location/Type (e.g. right indirect inguinal)
- Contents (e.g. fat)
- Reducibility (e.g. partially)
- Extent (e.g. 1.5cm proximal to the lateral pubic tubercle)

  - The sonographer’s findings may read something like this:  
    *There is a fat-containing, indirect, right inguinal hernia. It is not completely reducible. With valsalva, the hernia sac ends 1.5cm proximal to the lateral pubic tubercle.*