Your Pocus Cards
For Your Every Day Scanning

www.UltrasoundEM.com
### Heart Ultrasound

**Dimensions**
- Any obvious dimension abnormalities?
  - RV is around 2/3 of LV, LV wall is thicker than the RV

**Effort**
- How is the heart contracting?
  - LV should contract by at least 1/3. All the walls should contract equally

**Fluid**
- Is there fluid around the heart?
  - Small < 1cm, moderate 1-2cm, large > 2cm

**Gradients**
- Pressure gradients cause blood flow across valves: Do the valves look normal? Are they opening and closing normally?

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Images courtesy C. Carl Jaffe, MD, and Patrick Lynch, Yale University

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**IVC assessment**

**Normal IVC**

- Size: 2 cm
- Description: Liver and IVC shown separately.

**Collapsed IVC**

- Size: <1.5 cm
- Description: IVC completely collapses.

**Dilated IVC**

- Size: >2.5 cm
- Description: IVC minimally collapses.

<table>
<thead>
<tr>
<th>Size</th>
<th>Collapsing</th>
<th>Tank Status</th>
<th>Fluids Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>&lt;1.5 cm</td>
<td>Completely empty</td>
<td>Fluids should be given</td>
</tr>
<tr>
<td>Large</td>
<td>&gt;2.5 cm</td>
<td>Probably not empty</td>
<td>Fluids may not help</td>
</tr>
<tr>
<td></td>
<td>Collapsing completely</td>
<td></td>
<td>Look for non-hypovolemic causes of shock</td>
</tr>
</tbody>
</table>

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Abdominal Aorta

Proximal Aorta
- Normal Aorta = 3cm
- Normal Iliac arteries < 1.5cm

Level of bifurcation

Longitudinal view

Mid Aorta

<table>
<thead>
<tr>
<th>IVC</th>
<th>Aorta</th>
</tr>
</thead>
<tbody>
<tr>
<td>On patient’s right</td>
<td>On patient’s left</td>
</tr>
<tr>
<td>Compressible</td>
<td>Non-compressible</td>
</tr>
<tr>
<td>Thinner walls</td>
<td>Thick walls</td>
</tr>
<tr>
<td>Not pulsatile (or displays ‘double-pulsatile swing’ = transmitting the cardiac atrial and ventricular pressure wave)</td>
<td>Pulsatile (simple)</td>
</tr>
<tr>
<td>Usually larger (can depend on hydration status)</td>
<td>Usually smaller (unless AAA)</td>
</tr>
</tbody>
</table>
**Biliary Ultrasound**

- **GB Long Axis**
  - Fundus
  - Neck
  - GB

- **GB Short Axis**
  - GB

- **CBD Long Axis**
  - CBD
  - Portal Vein
  - CBD = 0.6 mm(+1mm /decade)

- **CBD Short Axis**
  - MCK ICE MOTE
  - CBD
  - Portal Vein

**Acute Cholecystitis Findings**

- **GB wall > 3mm**
- **GB distension >4cm short axis >9cm long axis**
- **Sludge**
- **Pericholecystic fluid**
- **Acoustic shadows from stones**

**X-minus 7cm**
- **Xyphoid**
- **Subcostal sweep**
- **Flattening the probe**

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Normal Rt Kidney

Pyramids
Cortex
Calyx
Medulla
Pelvis

Bladder Vertical

a

Bladder Horizontal

b
c

Bladder volume (ml) = a x b x c x 0.52

Hydronephrosis

<table>
<thead>
<tr>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine barely splits sinus</td>
<td>Full pelvis, major calyces dilated</td>
<td>Uniformly dilated minor calyces, parenchyma spared</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Parenchymal compromise</td>
</tr>
</tbody>
</table>

Bowel Ultrasound

**Normal Appendix**

**Small Bowel Obstruction**

**Abnormal Appendix long axis**

**Abnormal Appendix short axis**

- Outer Diameter > 6mm
- Non-compressible
- No peristalsis
- Appendicolith
- Target sign in short axis
- Increased vascularity with Color Flow Doppler
- Periappendiceal Fluid Collection

**ABCDEF mnemonic**

A. Activity (Ileus Vs Mechanical)
B. Bowel Thickness > 3mm
C. Colour Doppler
D. Diameter > 3 cm
EF. Extraintestinal Fluid

by Dr. Hadiel Azzam

**Intussusception cross section**

Crescent in a doughnut sign

Longitudinal section

Pseudokidney sign

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DVT Assessment

Common Femoral Vein
- CFA
- CFV

CFV Bifurcation
- SFA
- DFA
- CFV

Great Saphenous Vein
- CFA
- CFV
- GSV

Superficial Femoral Vein
- SFA
- SFA

Popliteal Vein
- PV
- PA

DVT in Left CFV

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Shoulder Dislocation

Left Shoulder Anatomy

Glenoid
POSTERIOR
Humeral head
MEDIAL
Scapula
LATERAL

Shoulder Dislocation

Anterior Dislocation

Posterior Dislocation

Elbow fractures

Bone longitudinal

Cortex
Tendon

Bone transverse

Cortex

https://www.researchgate.net/publication/225175785

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### Differences between artery and vein

<table>
<thead>
<tr>
<th>Artery</th>
<th>Vein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smaller diameter</td>
<td>Larger diameter</td>
</tr>
<tr>
<td>Thicker walls (although difficult to appreciate by US)</td>
<td>Thinner walls</td>
</tr>
<tr>
<td>Pulsatile (pulses seen clearly and are sustained)</td>
<td>Can transmit pulses (pulses are more wavy may not be sustained)</td>
</tr>
<tr>
<td>Color Doppler: pulsatile flow</td>
<td>Flow may not be seen in smaller veins, and can be enhanced by squeezing calf muscles</td>
</tr>
</tbody>
</table>

**IV access: In plane**

**IV access: out of plane**
Soft Tissue Scan

Foreign Bodies and Infections

### Normal Soft Tissue Anatomy

- Skin: Epidermis + Dermis
- Subcutaneous tissue
- Fascia
- Muscles
- Bone

### Tips
- Scan from normal to normal area
- Apply Doppler when needed

### Glass

- Hypoechoic collection

### Metal

- Anechoic collection with posterior acoustic enhancement

### Wood

- Diffuse collection

### Abscess: different sonographic appearances

- Hypoechoic collection
- Anechoic collection with posterior acoustic enhancement
- Diffuse collection

### Cellulitis with cobble stone appearance

- Images courtesy of Josef Minardi

### Necrotizing fasciitis (STAFF)

- Subcutaneous thickening
- Air shadowing
- Fascial disruption & Sub-Fascial fluid

Images courtesy of Josef Minardi