Ultrasound
Aorta
in the critically ill patient

Rohit Patel, MD
University of Florida Health
Director, Critical Care Ultrasound Surgical ICU
Center for Intensive Care
Gainesville, Florida
A few points about didactic lectures

Hands on instruction better explained in Bedside Videos

Reading material important to cover aspects not discussed in this lecture portion

Important to mix hands on Active Learning with the reading/didactic material to best learn ultrasound application
Aorta in the ICU

Focused Questions:

What is the size? Abdominal > 3 cm, Iliacs > 1.5 cm → +hypotension = rupture of the aorta

Is it patent? although not as important as size

Probe: Abdominal or cardiac probe
Fanning probe to patient’s anatomical right to view the IVC
Figure 5.11
Longitudinal imaging.

Beam placement

Screen image

Thoracic/abdominal aorta

--- Spinal shadow

Outer wall to Outer wall
Distal Aorta split
Figure 5.12

Probe angles to avoid bowel gas when imaging the abdominal aorta.
Rupture of the pipes

Aortic aneurysm and dissection

Some cases present with shock as only finding

Traditionally pulsatile mass fastest way but sensitivity and specificity poor (29% for AAA 3–4 cm, 76% for 5 cm or larger)

Rapid, accurate, noninvasive, inexpensive, reproducible, non–ionizing, bedside

Rohrer MJ. Arch surgery. 1988
Lederle FA. JAMA. 1999
Can I do this?

Sensitivity 93 to 100%
Specificities approaching 100%

Knaut et al.... Good agreement between measurements emergency physicians made and CT by radiology staff (2005 study involving 104 patients)

125 pt over 2 years

Constantino TG. J Emerg Med. 2005
Tayal VS. Academic Emerg Med. 2003
Rupture of the pipes

Epigastrium to iliac bifurcation

Circular vessel immediately anterior to vertebral body

Left of paired IVC

Outer wall to outer wall; short and long axis

Greater than 3cm abnormal

Thrombus or rupture harder to visualize
Rupture of the pipes

Perera P. "http://www.sound-bytes.tv"
Rupture of the pipes

Perera P. "http://www.sound-bytes.tv"
Video

Perera P. "http://www.sound-bytes.tv"
Correct Measurement AAA:
Outer Wall to Outer Wall

Perera P. "http://www.sound-bytes.tv"
Video

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Rupture of the pipes

Entire course evaluation (infrarenal most common)

Retroperitoneal bleeding (not visualized well on US)

Slow steady pressure can help with bowel gas

Contrast enhanced may help (microbubbles)

AAA + hypotension ... Consider rupture and plan
Rupture of the pipes

Evaluation for dissection has poor sensitivities (65%)

Aortic root dilation and aortic intimal flap

Parasternal long axis: aortic root > 3.8 cm is abnormal

Suprasternal view placed in suprasternal notch aimed caudally and anteriorly

Color flow can help
Aorta in the ICU

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