

Case Authors: David Wasiak, MD and Neil Wallace, MD

Case Setup

Ultrasound Preparation:

- Ensure phased array, linear, and curvilinear probes are present, functioning and clean.
- Ensure the ultrasound screen is easily visible to the examinee, either directly or via screen share.

When Examinee Enters:

“Hello Doctor, I am Dr. _ and will be assisting as your examiner for this ultrasound case. As a reminder, please ask me to change probes, change depth, gain, or mode of ultrasound to assist you with the case. Please ask for help to reposition the patient or bed. Do you have any questions?”

Case vignette:

“As you have noted, the patient is presenting with abdominal pain and vaginal bleeding”

For diagnostic ultrasound:

“I would like for you to now demonstrate how you would assess [patient complaint] using ultrasound to evaluate [type of pathology (i.e. left ventricular function / soft tissue infection / biliary pathology)].

Which probe would you like to use?”

Probe settings:

- Linear
 - Gain 10, depth 5cm
- Phased array
 - Gain 10, depth 5cm
- Curvilinear
 - Gain 10, depth 5cm

If asked to change probe settings:

- “Tell me when to stop adjusting [gain/depth]
 - Adjust the gain and depth slowly, allowing the examinee to stop you.

“When you find an acceptable image, please let me know.”

After examinee has selected their image, **using their own clip/image:**

“Thank you, I will take the probe from you now. Please direct your attention to the screen. Please point out any artifacts, anatomy, or pathology that would be important for this complaint.”

“Thank you, now please obtain an image (using M Mode) to evaluate for fetal heart rate measurement. Please ask me where put the calipers on the screen for fetal heart rate measurement.”

Then show the examinee the pathology clip/image:

“Now assume this image/clip is the image obtained of this patient. Please point out any pathology/findings you see on this image/clip.”

Application:

“What guidance would you provide to the patient regarding the findings of fetal cardiac activity?”

-Refer to the grading criteria for next steps, if using as educational case

End of case:

“Thank you, that concludes your case.”

Case Pearls & Pitfalls:

- 1) Identify top to bottom: bladder/uterus/fetus/posterior cul de sac
- 2) Engage M mode for cardiac activity rather than pulse wave (decreased energy transmission to sensitive fetal tissues). The number adjacent to the FHR measurement is the number of cardiac cycles to measure (note the image has a 1 adjacent to the measured FHR, indicating a single fetal cardiac cycle). Measure at the same point of the cardiac cycle. In the shown image, the very beginning of the cardiac motion is measured from upslope to upslope.
- 3) Fetal heart rate in the first trimester should be between 110-160 (there is some degree of accepted variation). This patient has a viable pregnancy, however, given their vaginal bleeding and abdominal pain they should be counselled about threatened abortion/miscarriage.