

How-To Guide

Ultrasound of the IVC



How to do it:

1. Select the abdominal probe.
2. Hold it with two fingers, like a pencil.
3. With the probe indicator facing the patient's head, place the probe just left of the abdominal midline, near the costal margin.
4. Identify the aorta, by sliding the probe slowly across the abdomen towards patient right.
5. Slowly slide the probe further right to identify the IVC. The IVC is just lateral to the aorta.
6. Direct the ultrasound beam cranially to better visualize the IVC. This will be about half way between the diaphragm and the lower edge of the liver.
7. Confirm that you are visualizing the IVC (and not the aorta) by seeing it drain into the right atrium. You can assume you are seeing the right atrium if you see cardiac motion.
8. Decide if IVC looks either FLAT or FAT. Flat is when the walls of the IVC touch, or nearly touch, with respiration. Fat is when the IVC looks very full and has little to no variation with respiration.

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The Hands-On Ultrasound Education (HOUSE) Program is offered in close collaboration with the Rural Coordination Centre of BC (RCCBC)

How to do it better:

- Use the liver as your acoustic window to the IVC. Make sure you can see the liver on the screen.
- Ensure that you view the IVC at its maximum diameter. If your probe is off to one side, rather than over the middle of the vessel, you will have an erroneous impression of the IVC size.

How to do it safely:

POCUS for IVC is most helpful when the IVC is at its extreme of flat or fat. A flat IVC can be found in low fluid states, as in volume depletion, hemorrhage, or the relative hypovolemia of shock. A fat vein may be seen with volume overload, obstructive shock, or may be normal. It should be apparent by now that the IVC examination is most helpful when used in conjunction with the clinical situation. This is especially true of the fat IVC.

If the IVC is neither fat nor flat, this doesn't tell you very much. However, you can gather more information by repeating the scan over time, and seeing if there is a change in response to therapy, or in association with changes in patient condition.

Don't measure the IVC in patients on positive pressure ventilation.

Make sure you are not seeing an iatrogenic flat IVC. Too much probe pressure will compress the IVC.

How to use this in practice:

Measuring the IVC is most useful in 2 scenarios:

1. Undifferentiated shock. Knowing the IVC is flat (hypovolemia) or fat (possibly obstructive cause) is very helpful in prioritizing your differential diagnosis, especially if done as part of a full POCUS for shock assessment.
2. Guiding fluid resuscitation. Serial ultrasound done throughout your sepsis resuscitation can give you confidence that a flat IVC likely indicates the patient will still be fluid responsive and you can push more fluids. After your fluid boluses, if the IVC has gone from flat to fat, this likely indicates that more fluid is not going to benefit the patient, and that you need to consider adding vasopressors.