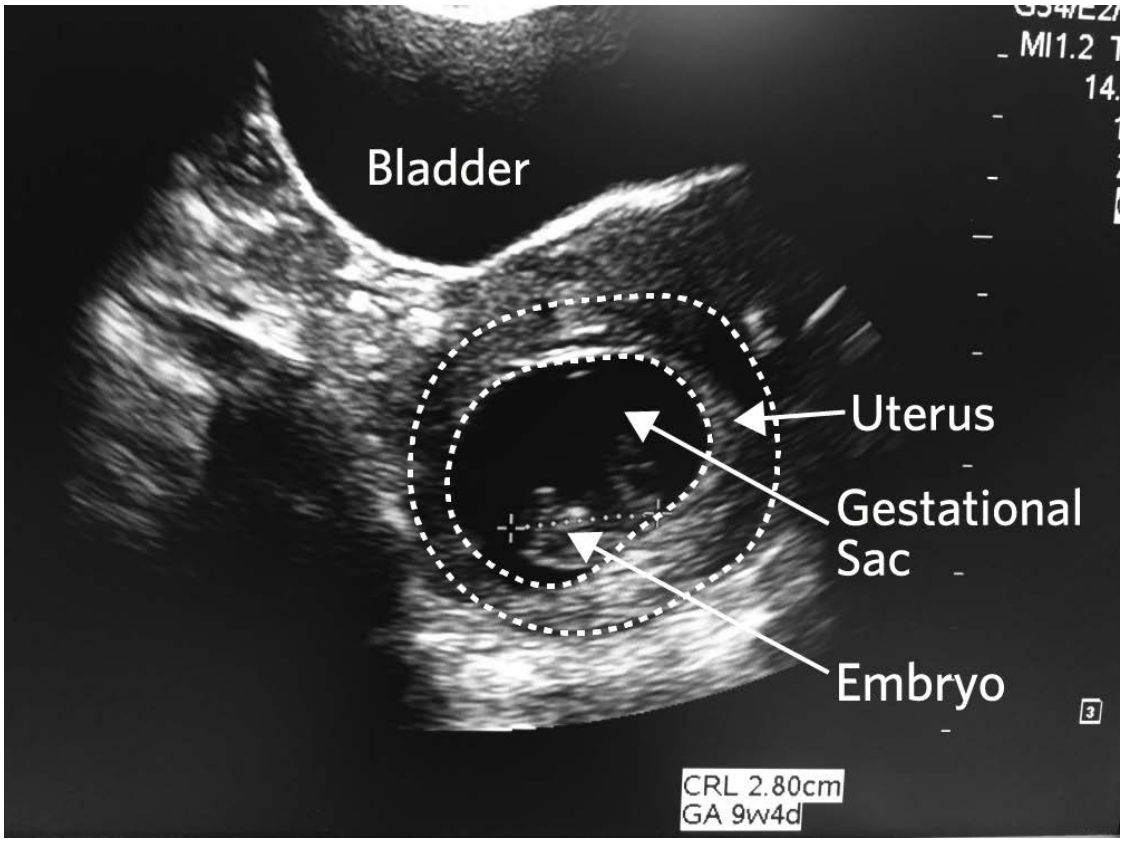
HOUSE

HANDS-ON ULTRASOUND EDUCATION

HOUSE EM

FIRST TRIMESTER PREGNANCY POCUS: The How-To Guide

Updated: April 9 2018



How to do it:

Start by performing a bimanual pelvic exam to ascertain the size and orientation of the uterus in the pelvis. Then pick up your probe and start with the trans-abdominal POCUS Scan.

Trans-abdominal POCUS scan:

1. Ensure the patient has a FULL bladder. Without a full bladder, it is easy to miss an intra-uterine pregnancy (IUP) that is otherwise visible. Do not make this avoidable mistake.
2. Use the abdominal probe, starting with a longitudinal orientation. *The indicator points to the patient's head.*
3. Start with the probe touching the pubic symphysis.
4. Take three steps to see the IUP – you must complete each step in order to proceed to the next one. *Yes means proceed, no means stop*. Failure to do so could lead to the dreaded false positive IUP result.
5. Identify the bladder. **If you are unable to identify the bladder, do not proceed.**

6. Identify the uterus next to the bladder. **If you are unable to do so, do not proceed further.**
7. Sweep through the entire uterus to identify a pregnancy within the uterus. You need to see a decidual reaction, a gestational sac and a yolk sac to confirm a pregnancy. (With a more advanced pregnancy you may also see a fetal pole.) **If you do not see this, you cannot confirm an IUP. If you see a gestational sac and yolk sac, you can confirm an IUP. If you see a fetal heart, you can confirm a LIVE IUP.**

For further information, especially in an early first trimester pregnancy, switch to the trans-vaginal approach:

1. At this point your patient needs an empty bladder.
2. Have the bed set up for a pelvic exam, with the patient's buttocks at the edge of the mattress. (Alternatively you can elevate the buttocks with a bedpan).
3. Use the trans-vaginal probe and apply a probe cover.
4. Insert, or have the patient insert, the probe into the vagina, aiming towards the tailbone. Stop when the probe is against the vaginal vault.
5. Orient the probe in the sagittal plane. The probe marker faces upward, and the hand is in a trigger hold position.
6. Push the probe handle towards the floor and look for the bladder. (You may in fact not see the bladder if it is completely empty.)
7. You must identify the uterus with 100% certainty. The uterus is found adjacent to the visible bladder. If you are unable to visualize the bladder, ensure that you visualize myometrial tissue, which will have the same appearance as on the trans-abdominal scan.
8. Sweep the probe from right to left and back, visualizing the entire uterus. *Simply flex and extend your wrist.*
9. Sweep through the entire uterus to identify a pregnancy within the uterus. You need to see a decidual reaction, a gestational sac and a yolk sac to confirm a pregnancy. (You may also see a fetal pole in a more advanced pregnancy.) **If you do not see this, you cannot confirm an IUP.**
10. Look in another plane, in this case the coronal plane. Rotate the probe so that the marker faces towards the patient's right.
11. Sweep the probe from top to bottom (again simply flex and extend your wrist) to visualize the entire uterus.
12. Look for the bladder in the midline. (You may in fact not see the bladder if it is completely empty.)
13. You must identify the uterus with 100% certainty. The uterus is found adjacent to the visible bladder. If you are unable to visualize the bladder, ensure that you visualize myometrial tissue, which will have the same appearance as on the trans-abdominal scan.
14. Sweep through the entire uterus to identify a pregnancy within the uterus. You need to see a decidual reaction, a gestational sac and a yolk sac to confirm a pregnancy. (You may also see a fetal pole in a more advanced pregnancy.) **If you do not see this, you cannot confirm an IUP. If you see a gestational sac and yolk sac, you can confirm an IUP. If you see a fetal heart, you can confirm a LIVE IUP.**
15. Numbers to Remember:

Structure	Date seen on TA scan	Date seen on TV scan
Gestational sac	6 weeks	5 weeks, 10 mm

Yolk sac	6-7 weeks	5-6 weeks
Fetal pole	7-8 weeks	6 weeks, 3 mm

Visible heart beat expected with a fetal pole size of 10 mm on TA scan or 5 mm on TV scan

How to do it better:

- Make sure the patient empties her bladder before a TV scan.
- Mild probe pressure can help reduce artifact and produce clearer images.
- If finding the uterus is challenging, make your sweeps bigger. A retroflexed uterus may require you to lift the probe handle towards the ceiling, aiming the transducer towards the coccyx. An anteflexed uterus may require the opposite: push the handle down to raise the transducer up.
- If a ruptured ectopic is a consideration, also perform a FAST exam to look for intra-abdominal free fluid.
- Practice identifying the cervix to avoid missing a rare cervical pregnancy.

How to do it safely:

There is no room for error in diagnosing an intra-uterine pregnancy. This can be a life-threatening mistake.

Always ensure the fetus is located within the uterus. Do this by starting with the trans-abdominal approach first. If you focus on the IUP and skip the step of identifying the uterus, you may in fact be seeing an ectopic pregnancy in the adnexa, cervical or cornual regions. Once you have identified an IUP contained within the uterus, you must look at the myometrium and ensure that you see a thickness of greater than 5 mm. If you see are not confident that the myometrium is clearly greater than this, you need to get a formal scan.

Heterotopic pregnancy is a concern, although thankfully rare. Consider this situation if the clinical picture fits, even in the setting of a confirmed IUP (for example, IUP plus abdominal pain and free fluid). This is especially important to consider in the patient who has an increased chance of multiple gestations.

How to use this in practice:

Perform this scan on every pregnant first trimester patient who presents with pelvic pain or bleeding. Identifying an IUP is very helpful as it almost definitively rules out ectopic pregnancy. Confirming a live IUP is also very reassuring to the patient with a suspected miscarriage.

Perform a FAST exam on any hypotensive female to look for free fluid in the abdomen, which may make the diagnosis of ruptured ectopic. This test can aid in the diagnosis of a condition than can be clinically confusing by history alone.

Any hypotensive young female with non-traumatic free fluid in her abdomen should be considered to have a ruptured ectopic pregnancy until proven otherwise.

Created by the UBC CPD Hands-On Ultrasound Education (HOUSE) Program (house.ubccpd.ca)

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