Umbilical Artery Doppler

Perform when Gestational Age (GA) is greater than 24 weeks and:

1. Abdominal Circumference (AC) < 10th percentile
   OR
2. Estimated Fetal weight (EFW) < 10th percentile

Umbilical Artery S/D ratio of > 95th percentile would be considered abnormal.
https://www.perinatology.com/calculators/umbilicalartery.htm

Call to the referring provider is required for all patients with AC or EFW <10th percentile. In addition, absent or reversed diastolic flow is a critical finding which may have time sensitive management implications. These should be reported as "Absent diastolic flow" or "Reversed diastolic flow" rather than using a resistive index number or percentile.

All patients with AC or EFW <10th percentile should have a nonstress test (NST) and referral to maternal fetal medicine (MFM) regardless of the umbilical artery doppler findings.

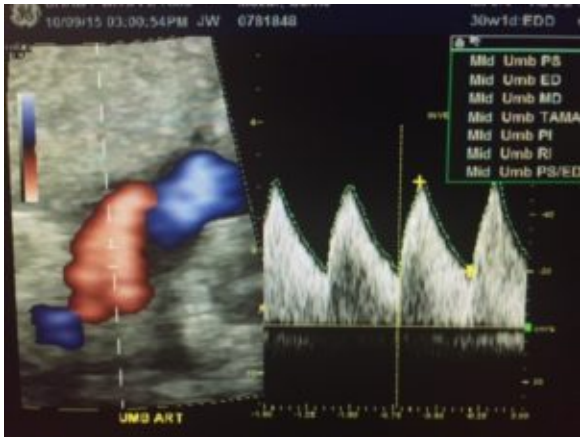
Technique:

- Make sure the fetus is not breathing while taking the sample. Hiccups and movement will also disrupt a nice waveform
- Minimum of three wavelengths that should all look identical to obtain the s/d ratio. We use a calc package and it takes the three waveforms selected and averages the s/d ratio of the three and gives it to you.
- Sample gate should fit within the artery
- A zero degree angle as much as possible. We don't change the angle on the machine (like you would for a carotid), we just try to adjust the angle with the transducer or find a different loop of cord.
- Sample in the most middle part of the cord away from the placental cord insert and away from the abdominal cord insert. You will get a higher velocity at cord insertion sites.
- If the umbilical artery keeps going in and out of the sample gate, try having the patient hold their breath.
- A free loop of cord that isn't tightly coiled will give the best flow pattern. Think… the tighter the coil, the faster the blood flow, which might give us a false reading.
- The most difficult part is now your target is moving, breathing, and hiccupping which can all hinder getting an accurate waveform. Otherwise the techniques are mainly the same as other vascular scans!

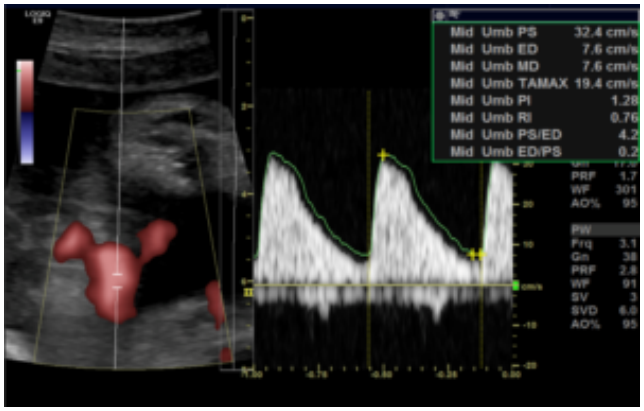
Websites for additional information
https://pubs.rsna.org/doi/full/10.1148/rg.2019180152

Image Analysis Examples:

Normal:

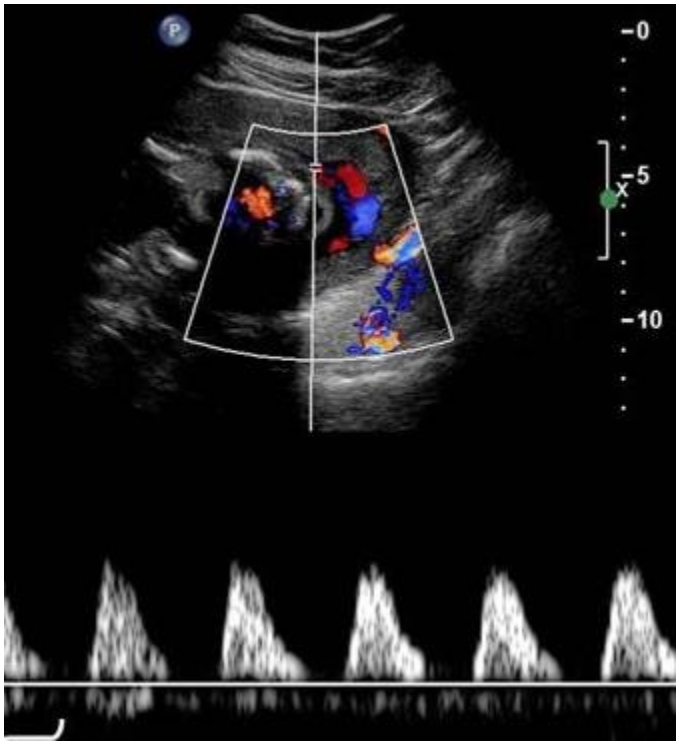


Low diastolic flow/ increased resistance:



Critical Results:

Absent end diastolic flow:



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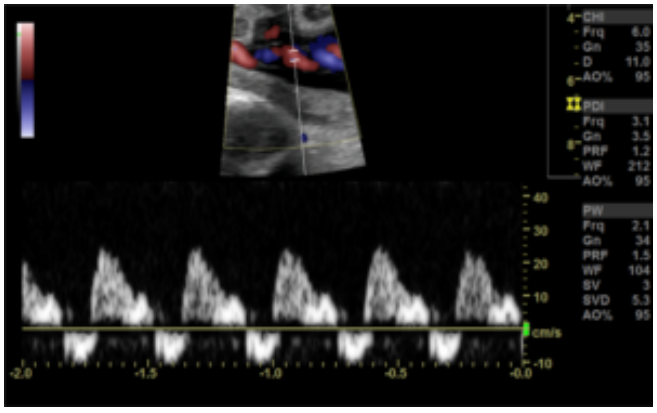
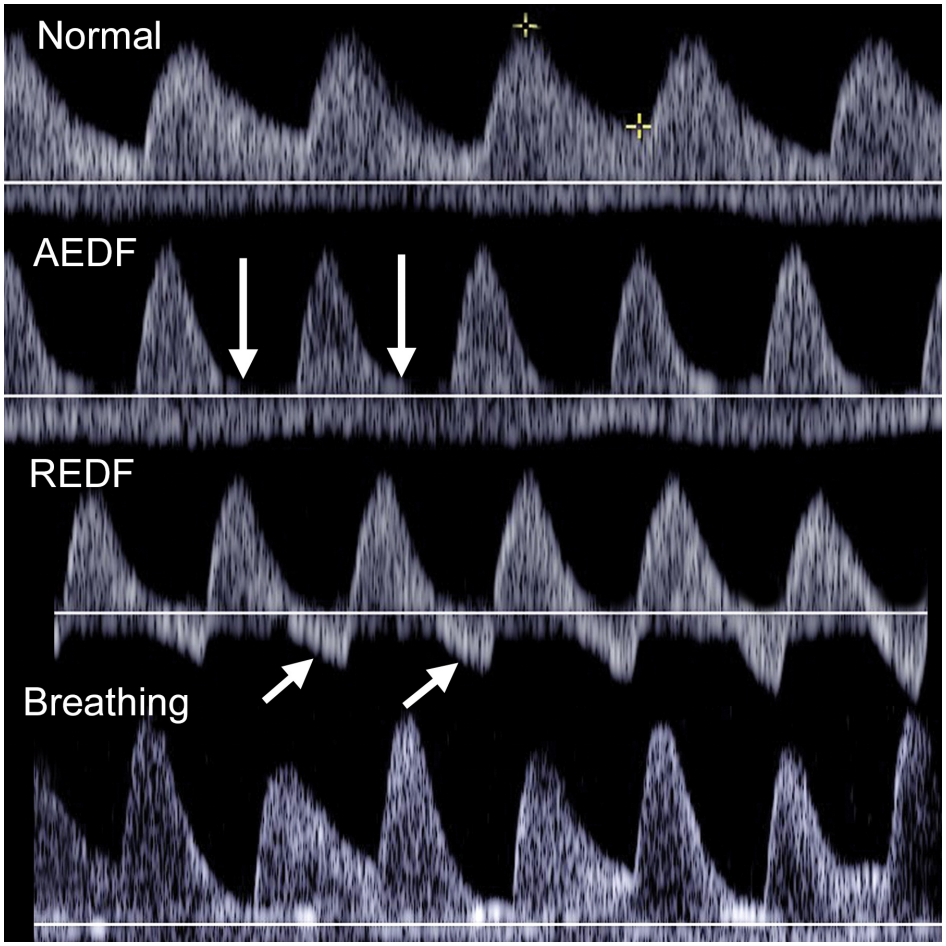
Reversal of diastolic flow





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