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# 3rd Trimester Sonographic Assessment

— Fetal Well Being —

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## 3rd Trimester Exam

Cervix

Placenta

Fetal Biometry

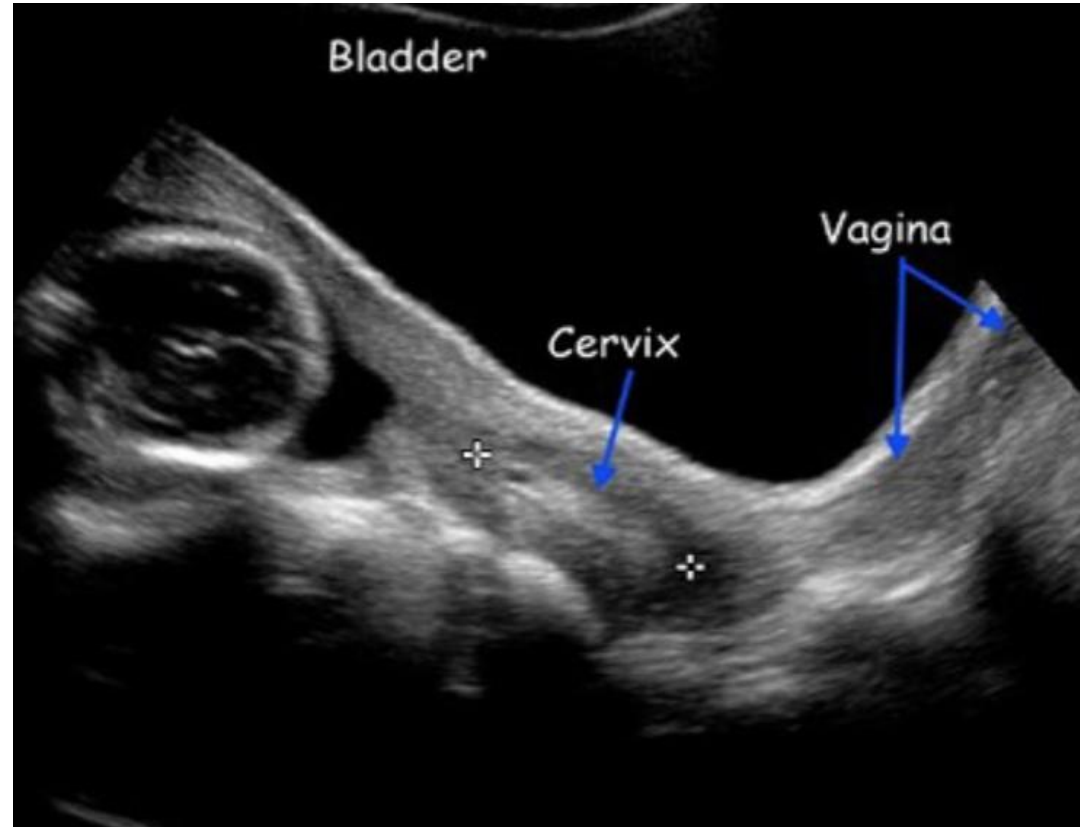
AFI

Umbilical Artery Doppler

Middle Cerebral Artery Doppler

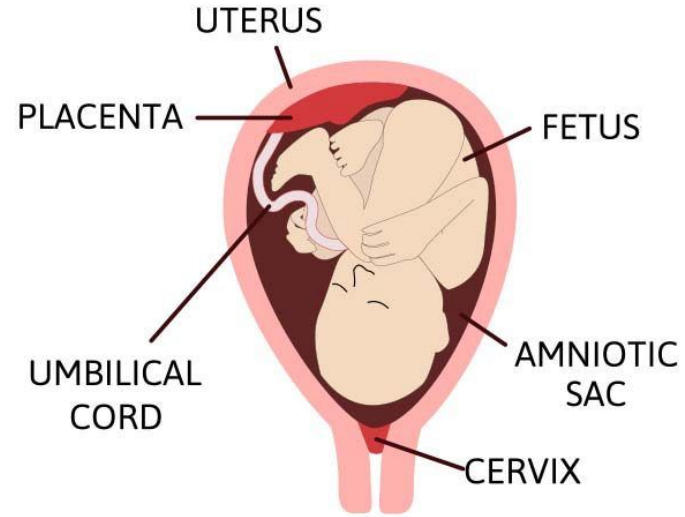
Ductus Venosus

Fetal Position



# Fetal Position

- By the 36th week, the head may "engage" (drop into the pelvic area). This is a process called "lightening."
- Baby should be in cephalic position
- If baby is still breech at 37 weeks, ECV can be attempted
- If it's not successful, C section will occur



**CEPHALIC  
PRESENTATION**

## 3rd trimester concerns

- Fetal growth
  - IUGR
  - Fetal macrosomia
- Preterm Labor
- Gestational Diabetes
- Placenta abruption
- Placenta previa
- Premature rupture of membranes

## IUGR

Sonographic EFW that is less than the 10th percentile for gestational age

How can we manage this?

- Evaluation of fetal blood vessels using pulsed wave doppler

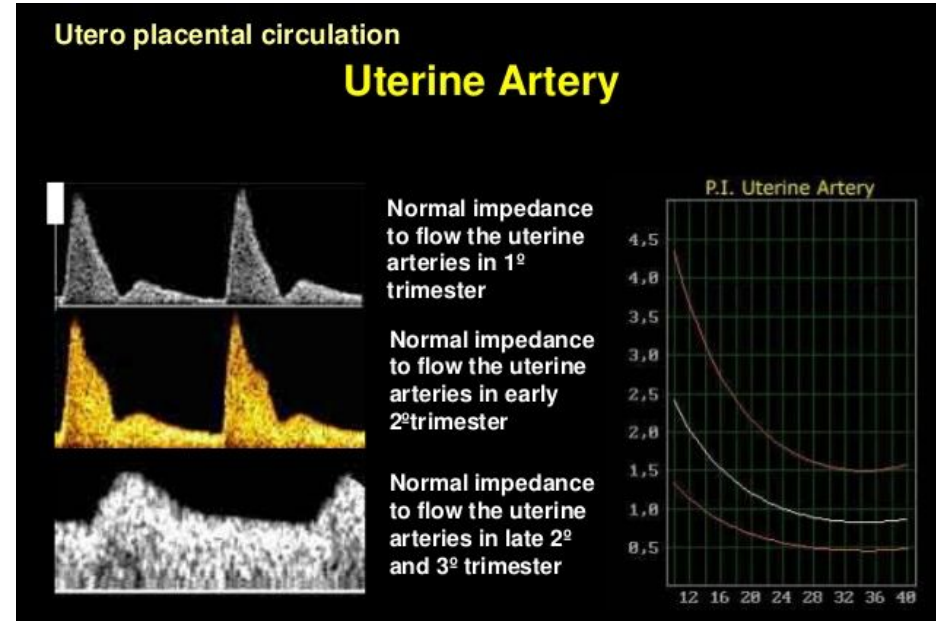
## Macrosomia

Sonographic EFW that is greater than the 90th percentile

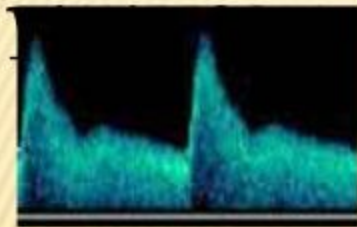
# Uterine Artery

Possible screening tool for IUGR

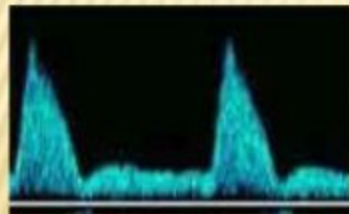
- An abnormal UTA Doppler could detect an increase in placental vascular resistance, and this could predict which women are at risk for diseases like IUGR.



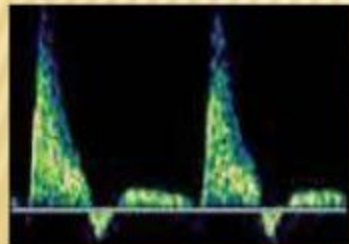
## ABNORMAL UTERINE A. DOPPLER



Normal impedance to flow in the uterine arteries (with the characteristic waveform of early diastolic notching)



Increased impedance to flow in the uterine arteries (with the characteristic waveform of early diastolic notching)

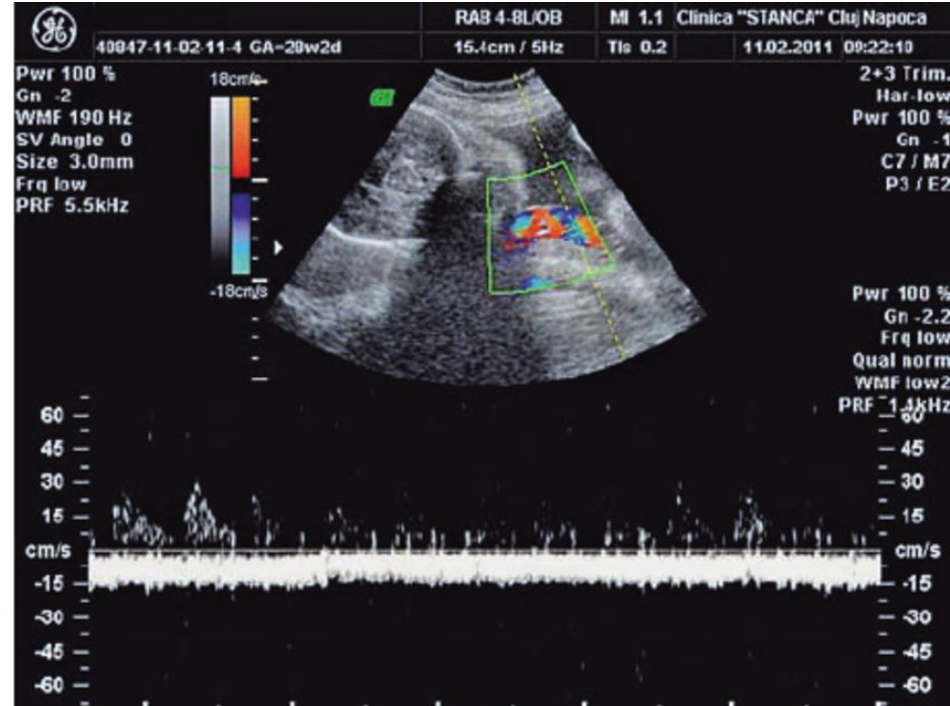


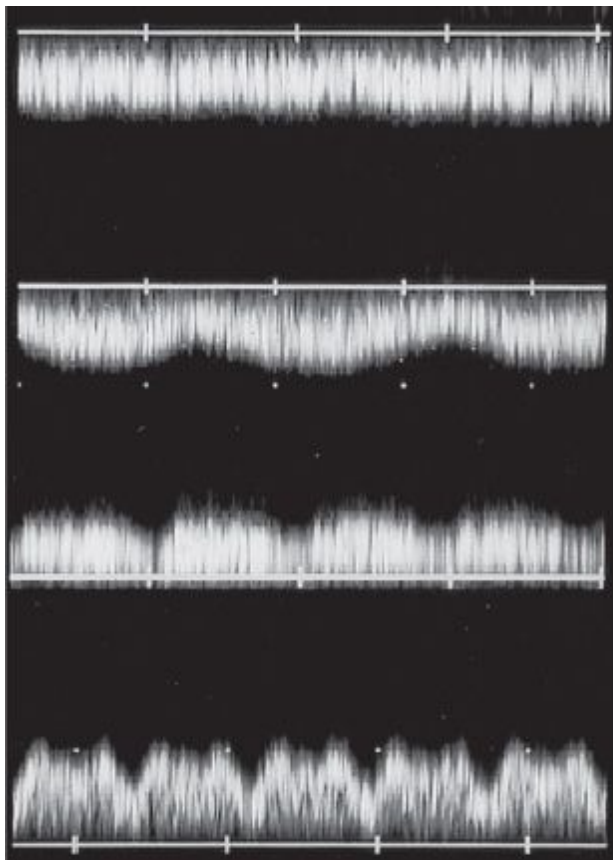
Very high resistance to flow in the uterine arteries (with reverse diastolic flow)

# Umbilical Vein

Fetal venous doppler velocimetry may be a useful tool for determination of fetal well-being for growth-restricted fetuses

- Abnormal waveforms will have pulsations that are synchronous with cardiac cycle
  - Indicative of abnormal cardiac function





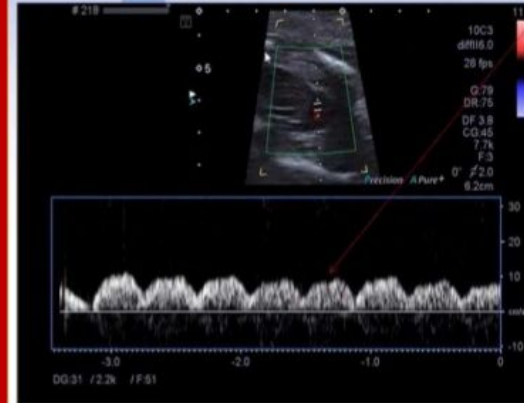
Normal

Breathing movements

Single pulsations

Double pulsations

## Umbilical Vein Doppler Trace Interpretation



- Abnormal umbilical vein Doppler can be characterised by a triphasic flow pattern
- Fetal mortality imminent



# Umbilical Artery Doppler

- Assessment is indicated in scenarios where there is a risk of:
  - fetal growth restriction
  - poor perinatal outcome

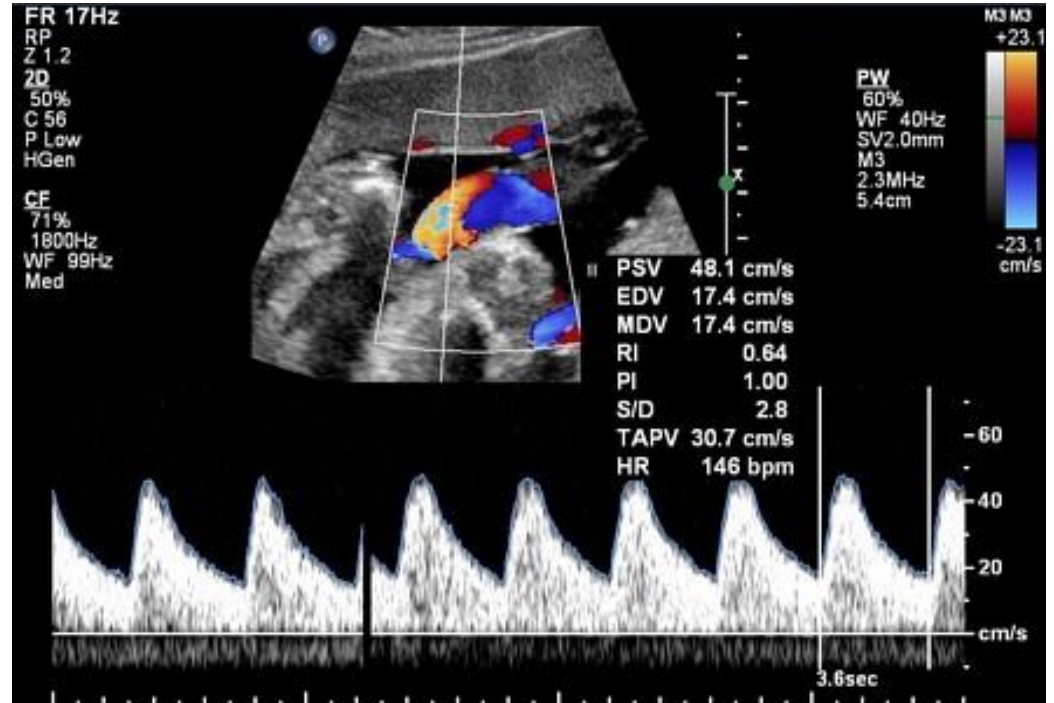
## Why?

### Maternal Conditions:

- Diabetes mellitus

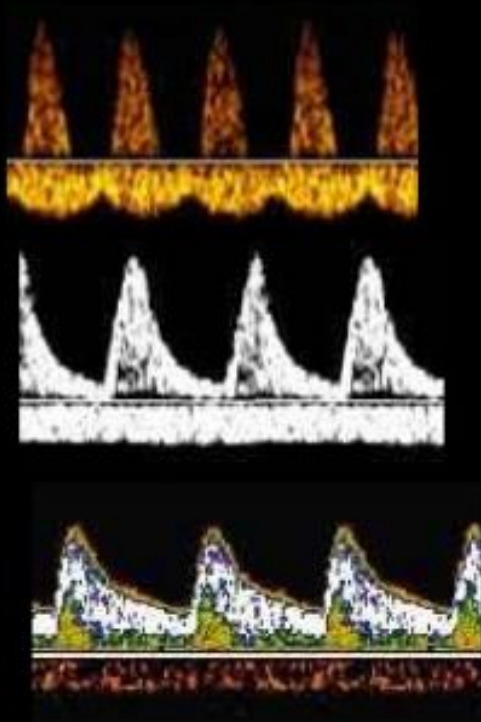
### Pregnancy related conditions:

- Suspected IUGR
- Decreased fetal movement
- Abnormal BPP



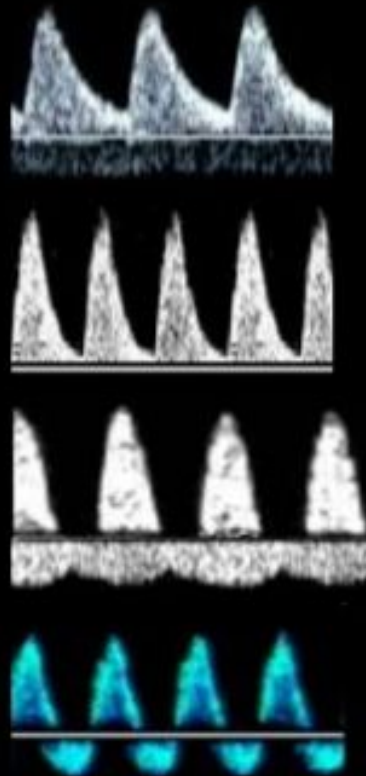
## Utero placental circulation

Normal



**Umbilical Artery**

Abnormal



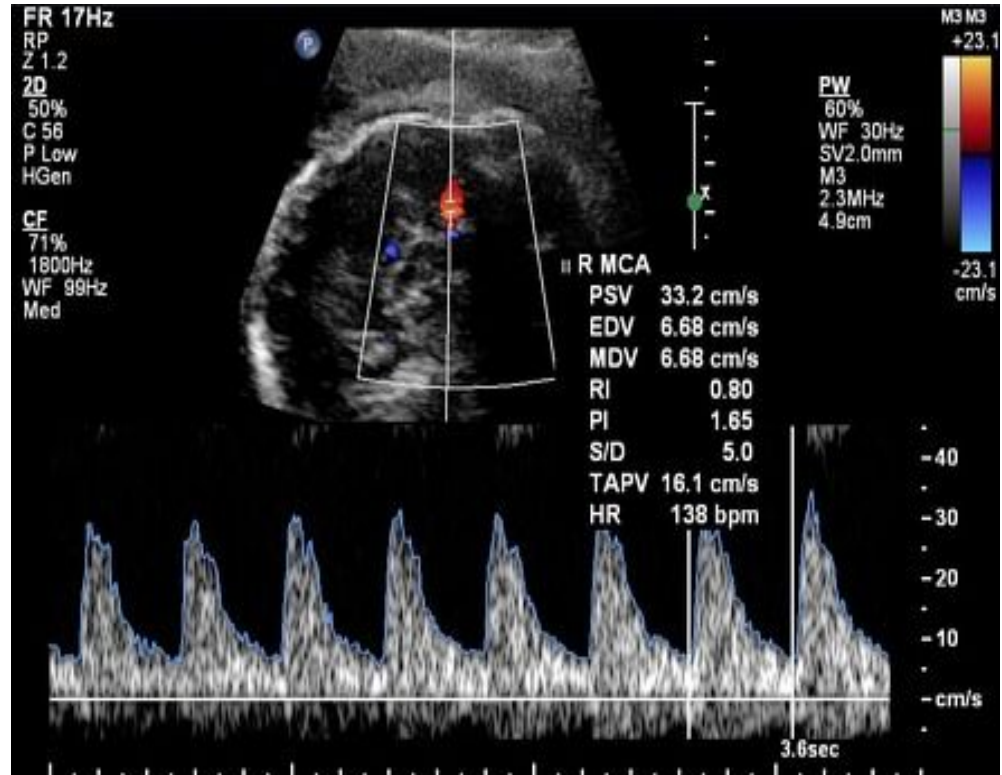
# Middle Cerebral Artery Doppler

- Assesses for fetal cardiovascular distress, fetal anemia or fetal hypoxia

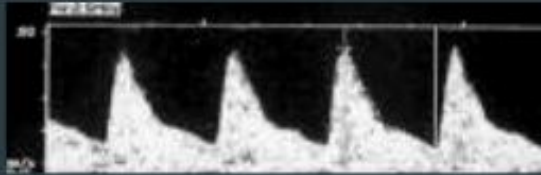
## Why?

Used in the additional work up of:

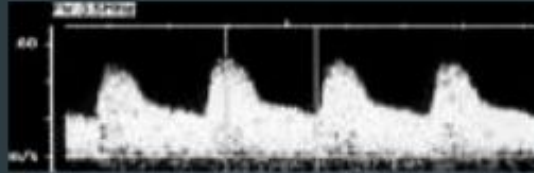
- IUGR
- TTTs
- TAPS



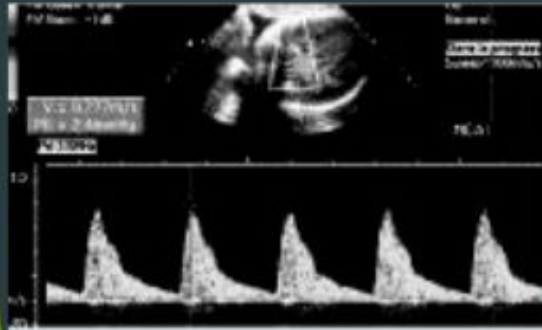
## Middle cerebral artery Doppler waveforms



(A) Normal middle cerebral artery (MCA) at term - normal peak systolic velocity (58 cm/s), high resistance, low end-diastolic velocity.



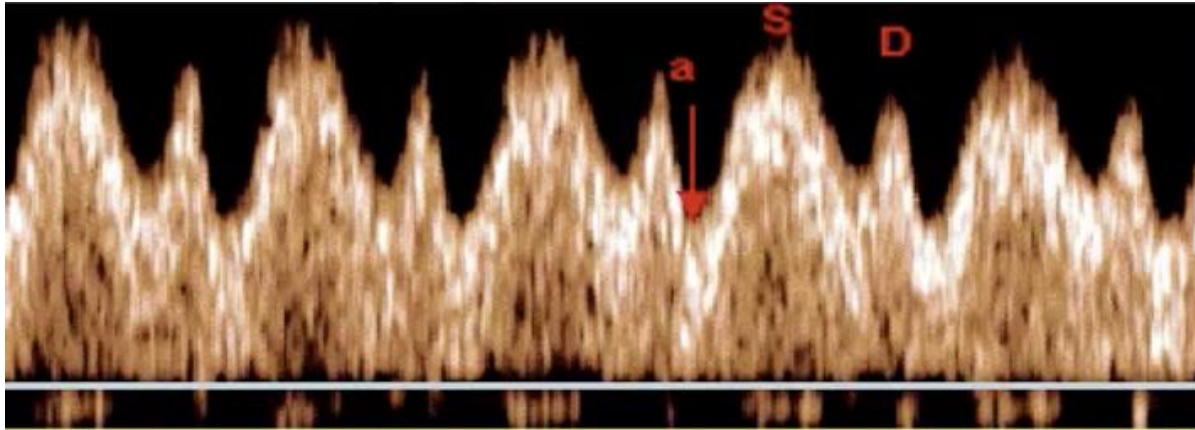
(B) 'Brain sparing' MCA - lower peak, much higher diastolic velocity suggests cerebrovasodilation



(C) Anemic fetus with retained high resistance, elevated peak systolic velocity (77 cm/s).

# Ductus Venosus Doppler

- The most accurate interpretation of fetal cardiac function, and myocardial hemodynamics
- Triphasic Waveform is normal- always forward
  - S=ventricular systolic contraction (highest peak)
  - D=early ventricular diastole (second peak)
  - A=atrial contraction (lowest point)



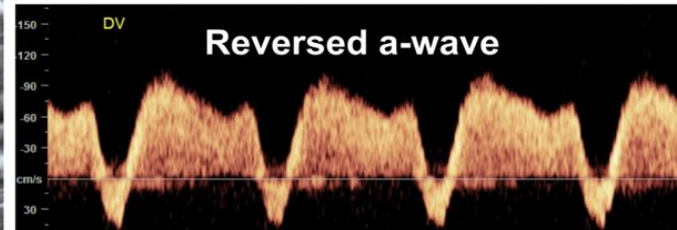
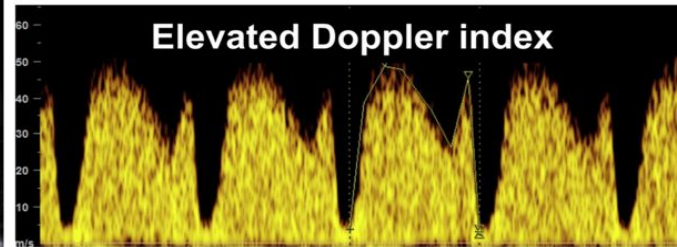
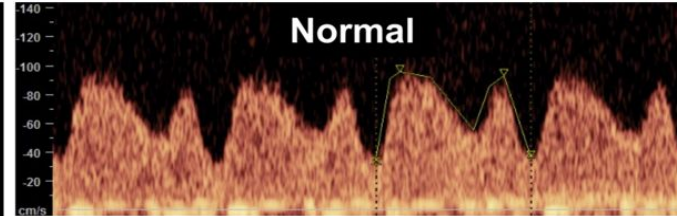
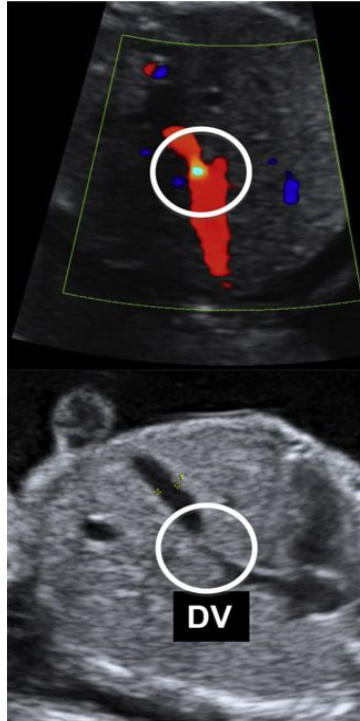


# Abnormal DV Doppler

Fetal ductus venosus flow assessment can be useful in a number of situations in fetal ultrasound:

Second and third trimester when there are concerns regarding

- IUGR
- Fetal cardiac compromise



# Biophysical Profile

**10 points**

Breathing

Tone

Movement

AFI

Non Stress Test

Component	Definition
Fetal movements	3 body or limb movements
Fetal tone	One episode of active extension and flexion of the limbs; opening and closing of hand
Fetal breathing movement	episode of $\geq 30$ seconds in 30 minutes Hiccups are considered breathing activity.
Amniotic fluid volume	single 2 cm x 2 cm pocket is considered adequate.
Non-stresstest	2 accelerations $> 15$ beats per minute of at least 15 seconds duration.

# Non Stress Test

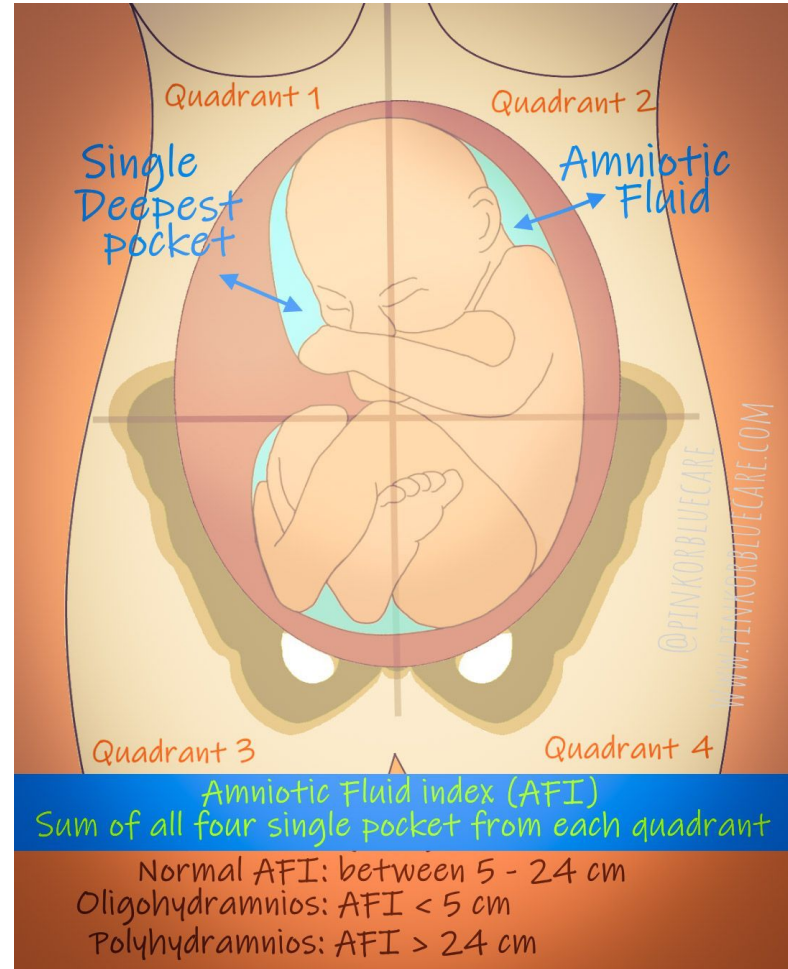
- The non stress test (NST) is a simple, noninvasive way of checking babies health
- A patient may need an NST if:
  - They are overdue
  - They had complications with the last pregnancy
  - They have low amniotic fluid levels





# AFI

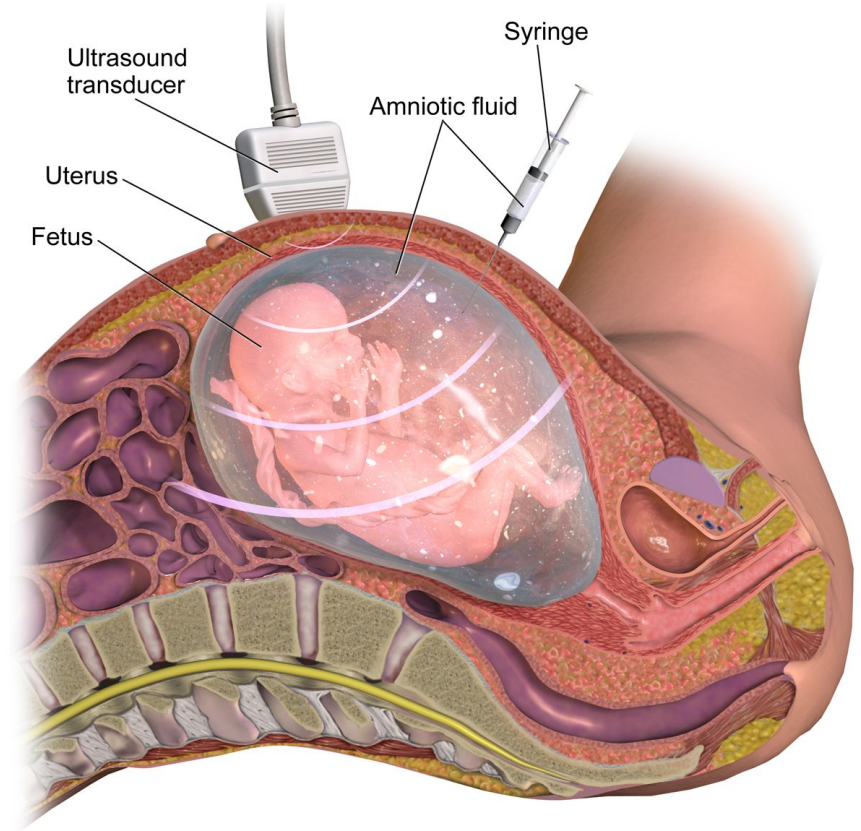
- Decreased in the 3rd trimester
- At term the rate of ingestion = urine production
- Normal AFI in 3rd tri is around 8-14 cm on average
- <5 oligohydramnios
- >25 polyhydramnios



# Amniocentesis

Amniocentesis may be used in the third trimester of pregnancy to check for:

- Fetal lung maturity when there is a potential for premature birth
- Uterine infection
- Rh disease



# References

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