

# *FETAL ANOMALY SCAN*

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## **FIRST TRIMESTER SCREENING**


The American College of Obstetricians and Gynecologists (ACOG) recommends offering aneuploidy screening to all pregnant women.

***Every woman has a risk that her fetus/baby has a chromosomal defect***

The background or a priori risk depends on

- Maternal age
- Gestational age

# MATERNAL AGE

- ↑ Chromosomal defect
  - ↑ Trisomies
  - No change in Turner Syn and Triploidy
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# GESTATIONAL AGE

The earlier gestation , ↑risk for chromosomal defects :

As rate of T 21 **fetal death** between 12w to 40 w is about 30%

For T18 and T13 and Turner Syn about 80%

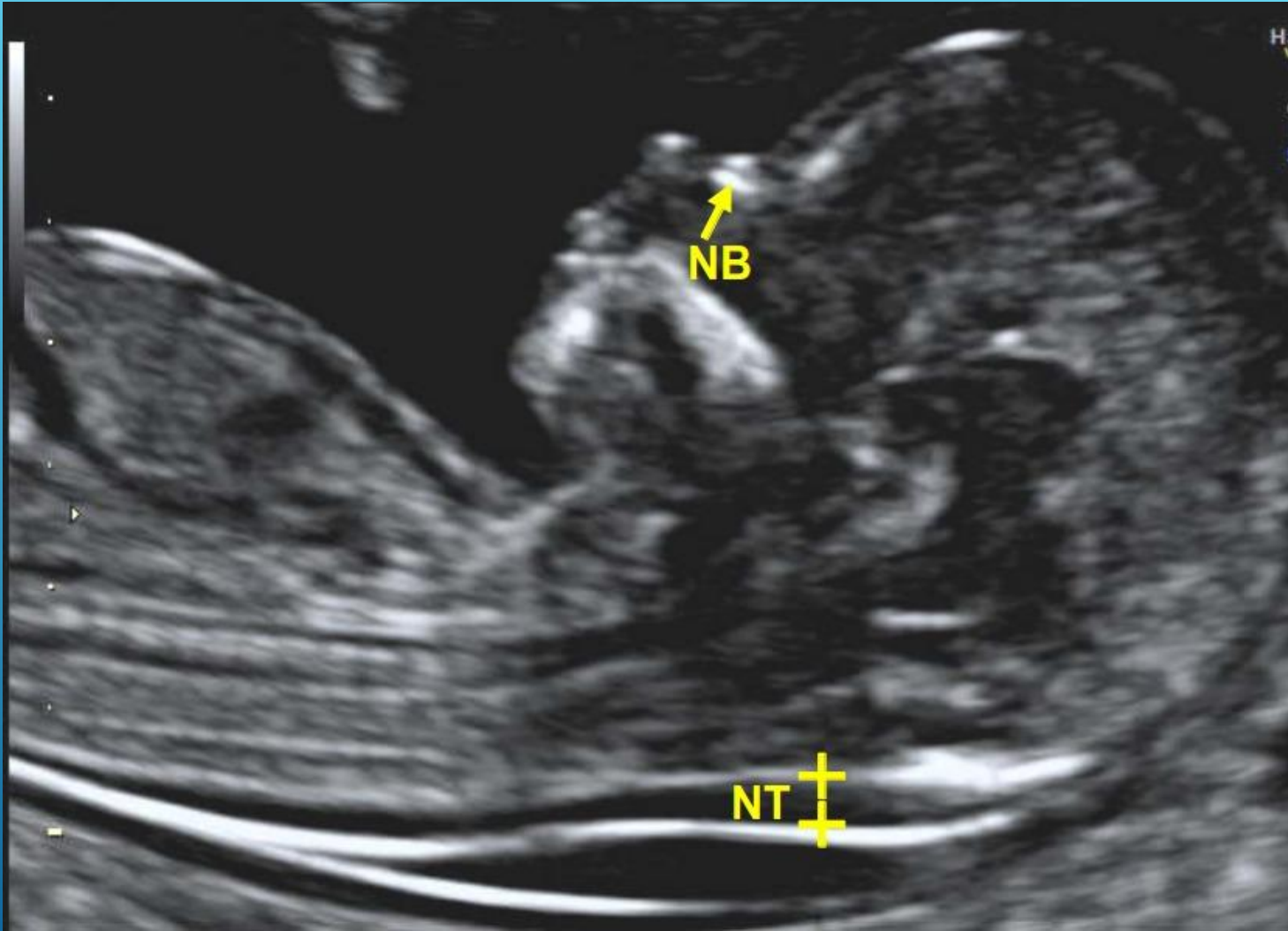
# FIRST TRIMESTER

- ▶ 11 w to 13w +6 d
  - ▶ CRL : 45 mm to 84 mm
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# FETAL NUCHAL TRANSLUCENCY


- In fetus with a given CRL (crown- rump length) , NT measurement represents a likelihood ratio which is multiplied by the priori MA and GA related risk to calculate a new risk
- $\uparrow$  NT  $\rightarrow$   $\uparrow$  Risk



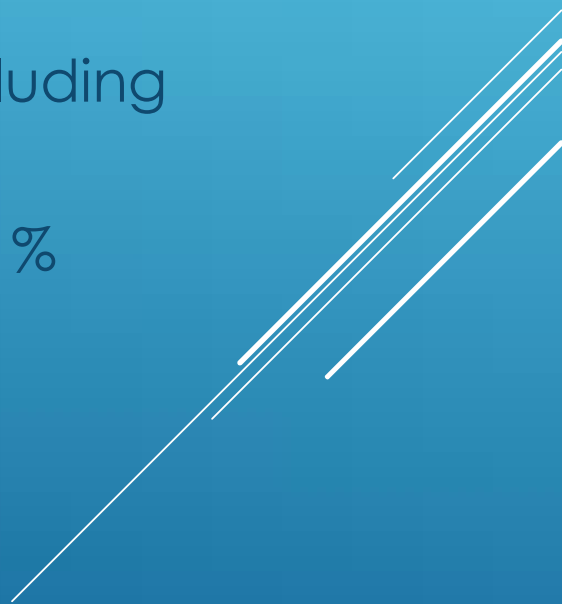





# OTHER SONOGRAPHY MARKERS

- Nasal bone : not visualized in 11- 13w+6d in 60-70% T21, 2-5% chromosome normal
  - Abnormality in flow wave of ductus venosus
  - Exomphalus
  - Megacystis
  - Single umbilical artery
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# FETAL NT AND MATERNAL SERUM TESTING IN FIRST TRIMESTER

- **Combined** fetal NT and maternal serum free b-HCG & PAPP-A
  - Nicolaides , 2004 , on a total 38,804 pregnancies, including 182 with T21:
  - Detection rate for T 21 **86%** , At a false positive rate 5 %
- 

# US STUDY IN 11W TO 13W+6D

- Viability
  - Plurality (chorionicity , amnionicity)
  - Accurate dating :
    - -Scheduling Obs screening tests
    - -detection of **fetal growth disorders**
    - -Delivery time
  - Aneuploidy screening
  - Major structural anomalies
  - **Preeclampsia screening**
- 

- **3D/4D sonography** with high frequency transvaginal transducer has resulted in prenatal diagnosis of fetal abnormalities from the second to the **first trimester of pregnancy**

- Low body mass index
  - Fetus in optimal position
  - Normal amniotic fluid
  - No fibroids and
  - No uterine malformations.
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**2<sup>ND</sup> TRIMESTER**





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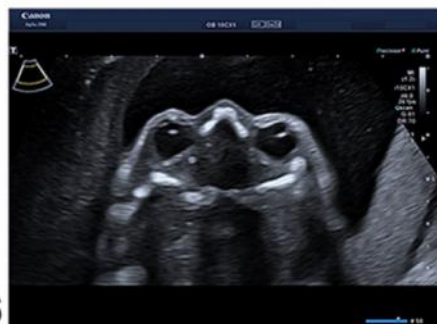
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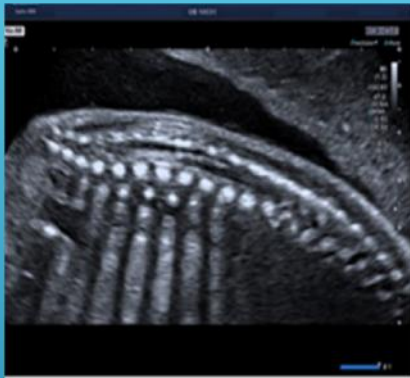
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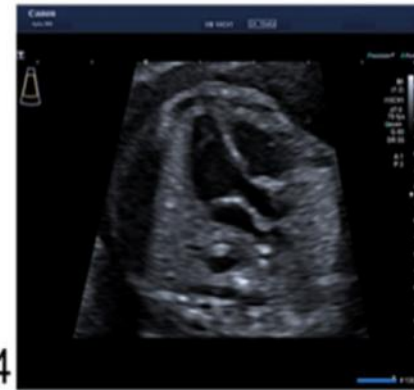
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# DELAYED ANOMALY SCAN


- **Late second and third trimester Ultrasound**
  - A long standing debate
  - 8074 fetuses were examined in prospective study
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- A decorative graphic consisting of several parallel white lines of varying lengths, slanted upwards from left to right, located in the bottom right corner of the slide.

- ❖ US exam in 3<sup>rd</sup> trimester is of additional benefit and can detect previously unknown structural abnormalities :

***Perinatal management and postnatal follow up***

# TOTAL INCIDENCE OF FETAL ABNORMALITY


## 1.9 %

- **67.7%** in 1<sup>st</sup> and/or 2<sup>nd</sup> trimester
  - **24.8 %** detected for the first time at 35-37 w
  - **7.4%** detected for first time POSTNATALY
- 

# FIRST DETECTED ABNORMALITIES AT 35-37 W

Incidence 0.5%

The most common :

- Hydronephrosis
  - Mild ventriculomegaly
  - VSD
  - Duplex kidney
  - Ovarian Cyst
  - Arachnoid cyst
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It seems that **all** pregnant women benefit from late anomaly scan after 24 w



# AS:

Some anomalies may be missed during 18-20 w

Late appearance of phenotypic expression of abnormality( after 20w):

- Short limbs in **achondroplasia**
- Dilated bowel in **bowel atresia**
- Abnormal shape of the head in **craniosynostosis**

Late development of abnormality:

- Ovarian Cyst (response to maternal estrogen)
- Ventriculomegaly (due to fetal brain hemorrhage /maternal infection)

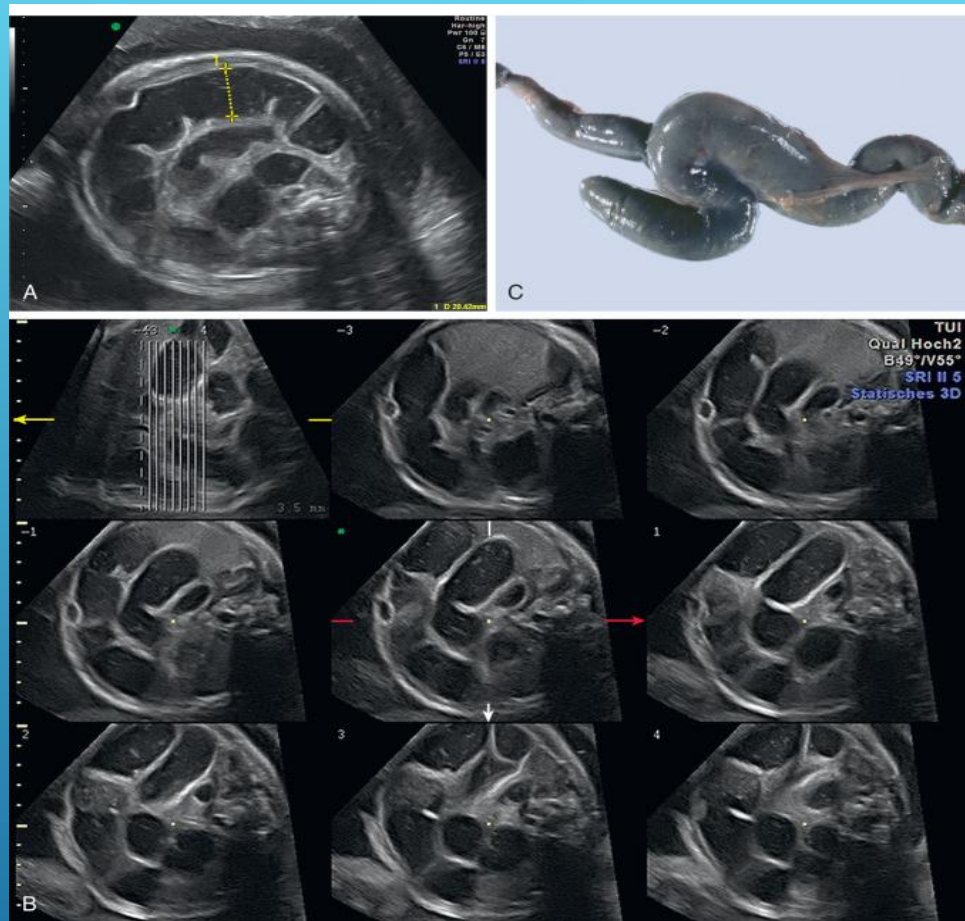


**32 weeks' gestation revealed rhizomelic shortening of the extremities. Femur length (FL) = 4.85 cm; about 26 weeks' gestation.**





**Antenatal sonogram of fetus at 27 weeks of gestation showing multiple dilated bowel loops.**



35 W




**Fetus with Apert syndrome in 30 + 3 weeks of gestation**





Fetus with bilateral coronal synostosis caused by Crouzon syndrome: a flattened occiput and mild bilateral frontal depressions of the skull

# DETECTION OF LATE ANOMALIES HELP US TO:

1. **Select the time and place of delivery**
  2. **Better perinatal and postnatal care**
  3. **Improve outcome**
  4. ***Monitoring (progression or regression ) of previously detected anomalies***
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# FETAL MRI

## ▶ CNS :

- parenchymal architecture (i.e corpus callosum agenesis)

- posterior fossa morphology

- prenatal assessment of :

1. spinal dysraphism
2. ventriculomegaly.

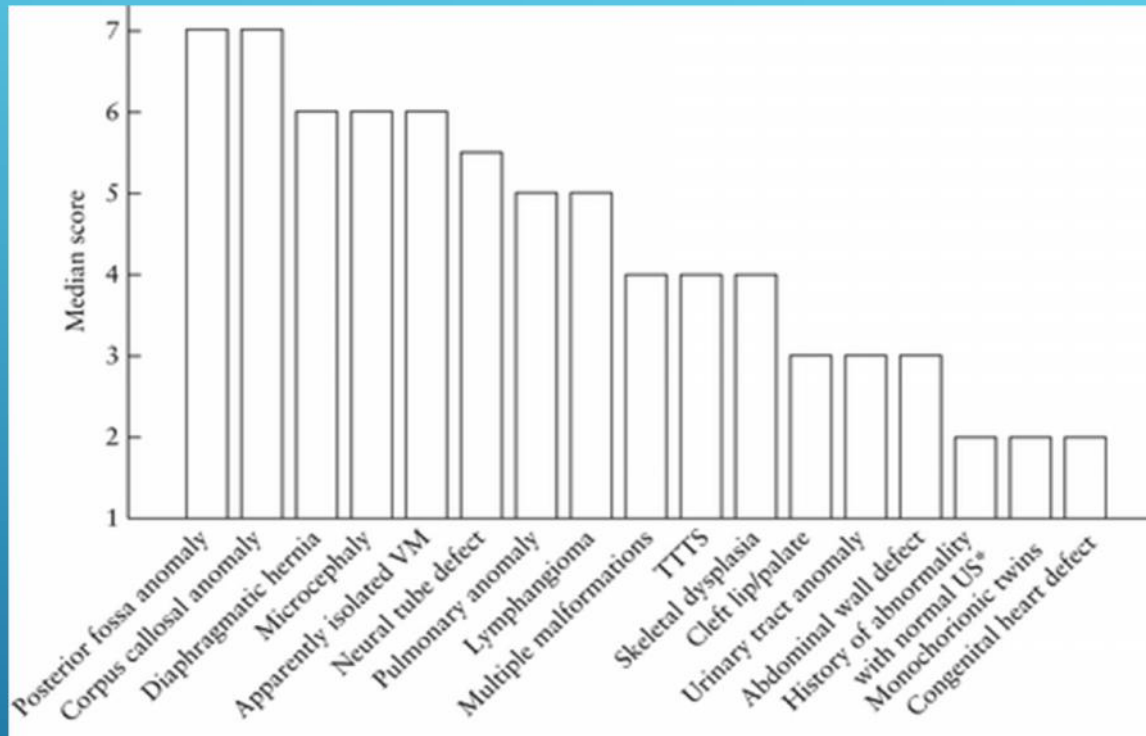
## ▶ Body :

- Neck/thoracic/abdominal mass

- Diaphragmatic hernia (location, extent)

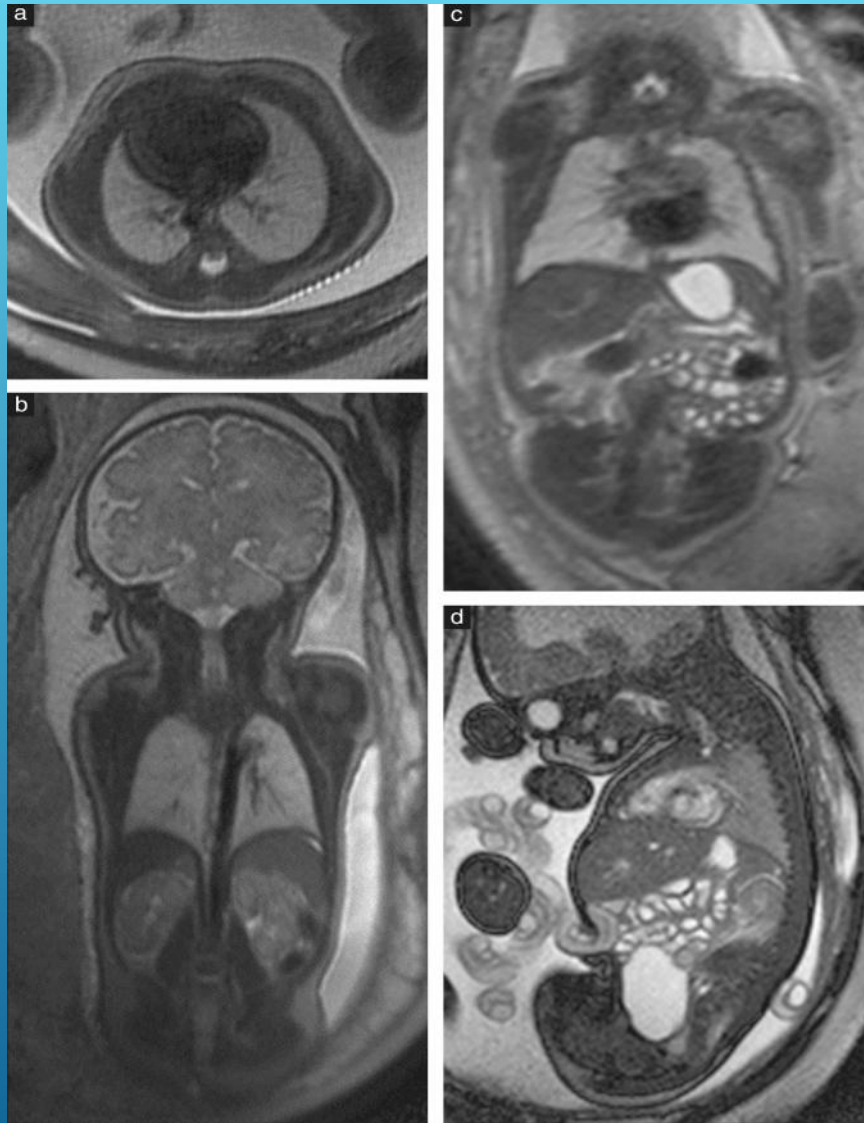
# FETAL MRI

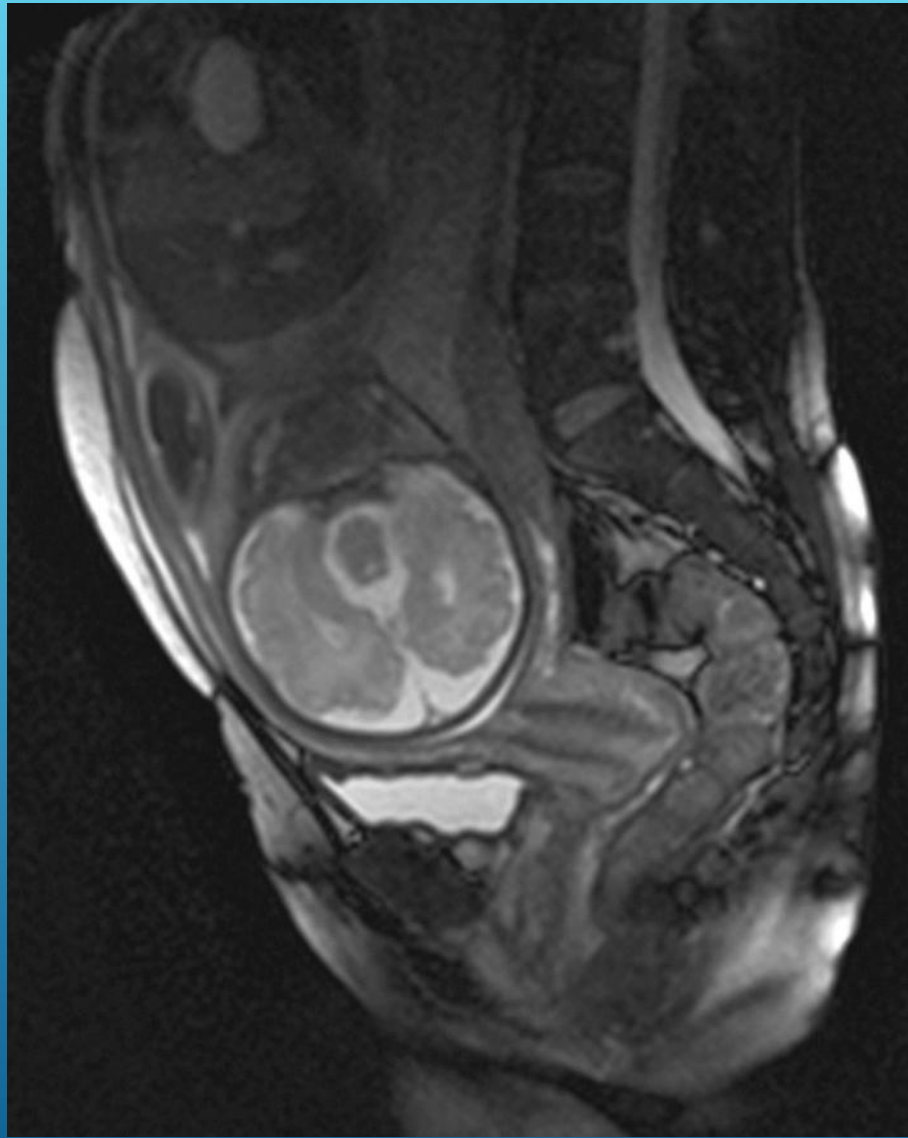
- ▶ - 26 to 32 w ,*Most organs can be visualized in detail*



ISUOG survey on indications for fetal MRI









**THANKS FOR YOUR ATTENTION**

The image features a solid blue background with a gradient from light blue at the top to a darker blue at the bottom. In the center, the text "THANKS FOR YOUR ATTENTION" is written in a bold, white, serif font. In the bottom right corner, there are several thin, white, parallel lines that create a sense of motion or a modern design element.