ISUOG Basic Training

Assessing normal & abnormal findings between 10 & 14 weeks, in singleton & twin pregnancies

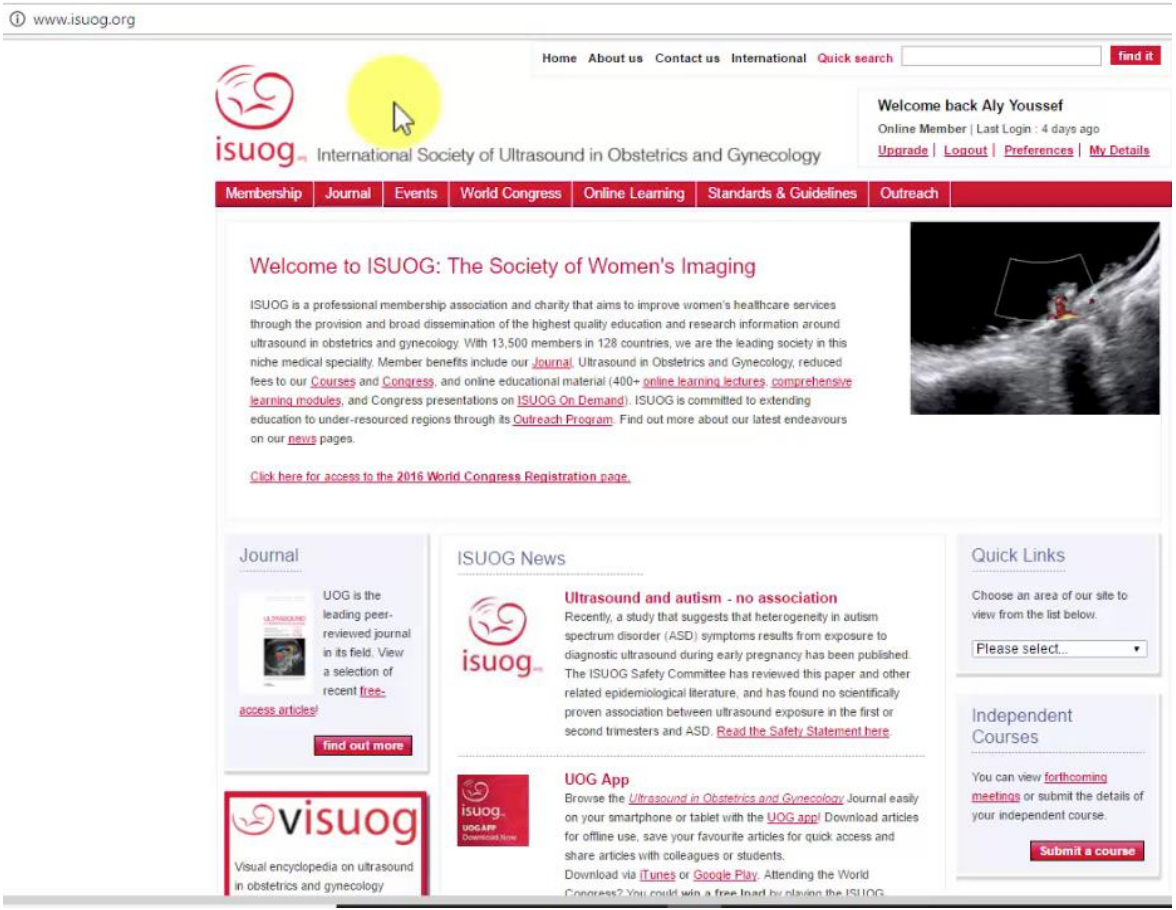
Learning objectives

At the end of the lecture you will be able to:

- Compare the differences between the typical normal and the common abnormal appearances of singleton, monochorionic diamniotic and dichorionic twin pregnancies between 10 and 14 weeks of gestation

Key questions

- How should gestational age be assessed, and the EDD assigned, between 10 and 14 weeks?
- What are the normal ultrasound appearance of a fetus at 10-14 weeks?
- What structural abnormalities can be diagnosed in the first trimester?
- What are the principal differences in the ultrasound appearances of a monochorionic twin pregnancy and a dichorionic twin pregnancy?



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CME platform

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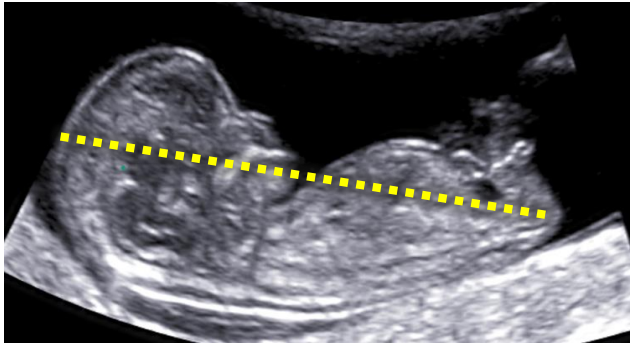
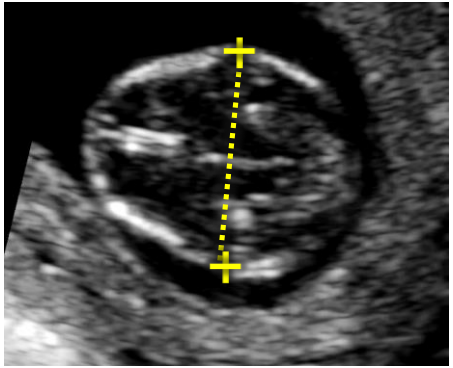
Ultrasound assessment of gestational age

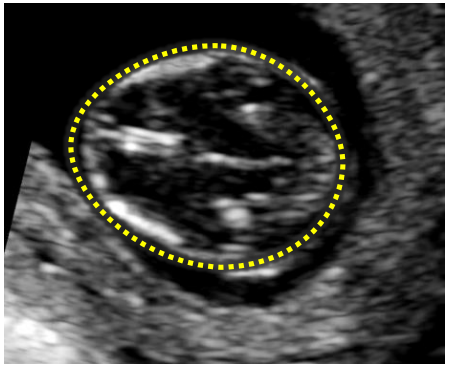
Pregnant women should be offered an early ultrasound scan between 10 + 0 and 13 + 6 weeks to establish accurate gestational age. **(Grade A recommendation)**



Crown-rump length (CRL)



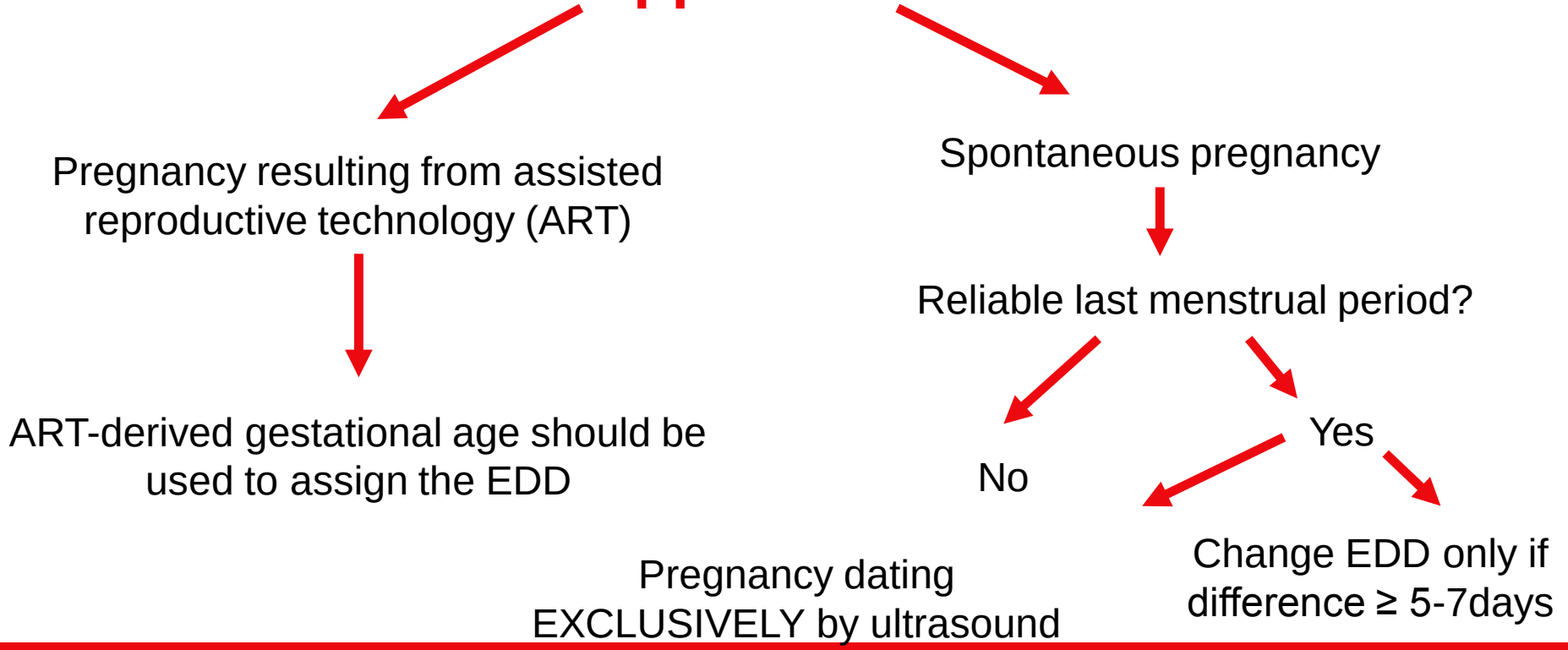
Biparietal diameter (BPD)



Head circumference (HC)

It is recommended that CRL should be used to determine gestational age < 84 mm
After this stage, HC can be used, as it becomes slightly more precise than is BPD.
(GOOD PRACTICE POINT)

Pregnancy dating at 10-14 weeks: a practical approach



Expected date of delivery (EDD) should be *clearly documented*

Weeks of amenorrea	12+3
EDD (amenorrea)	15/01/2015
Gestational weeks (US)	11+0
EDD (US)	**25/01/2015**

…fetal dimensions correspond to the menstrual age

OR

…fetal dimensions show discrepancy of +/- X days in respect to amenorrhea

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Head

- **Present**
- **Cranial bones**
- **Midline falx**
- **Choroid-plexus-filled ventricles**

Neck

- **Normal appearance**
- Nuchal translucency thickness (if accepted after informed consent and trained/certified operator available)*

Face

- Eyes with lens*
- Nasal bone*
- Normal profile/mandible*
- Intact lips*

Spine

- Vertebrae (longitudinal and axial)*
- Intact overlying skin*

Chest

- **Symmetrical lung fields**
- **No effusions or masses**

Heart

- **Cardiac regular activity**
- Four symmetrical chambers*

Abdomen

- Stomach present in left upper quadrant*
- Bladder – Kidneys*

Abdominal wall

- **Normal cord insertion- No umbilical defects**

Extremities

- **Four limbs each with three segments**
- Hands and feet with normal orientation*

Placenta Size and texture

Cord Three-vessel cord*

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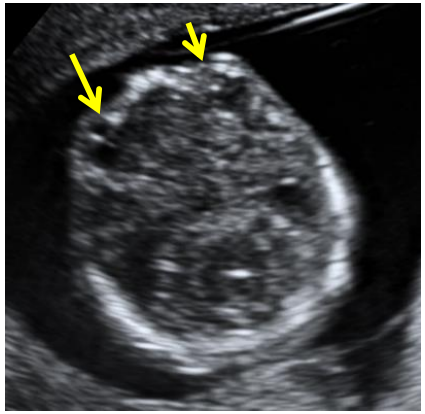

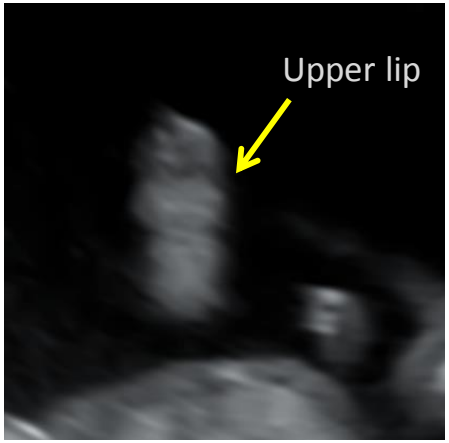

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Abdomen

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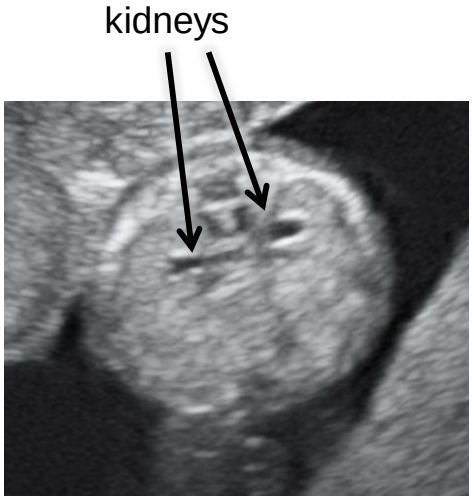
- Bladder*
- Kidneys*



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Extremities

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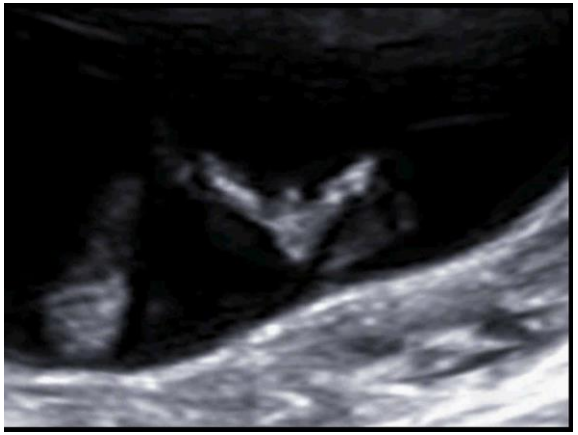

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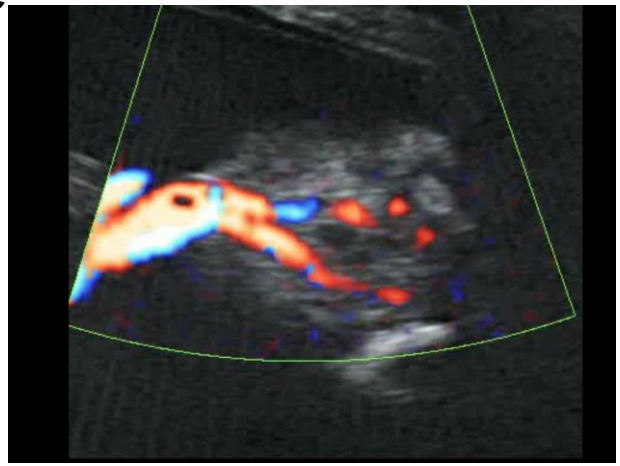
- Placenta Size and texture
- Three-vessel cord*



Accuracy of Ultrasonography at 11–14Weeks of Gestation for Detection of Fetal Structural Anomalies: A Systematic Review. *Rossi & Prefumo, Obstet & Gynecol 2013*

100% detection rate

- Acrania, anencephaly, ectopia cordis, encephalocele

1–49% detection rate

- Spina bifida, hydrocephalus, skeletal dysplasia, facial cleft, Dandy-Walker, aortic coarctation, arthrogryposis

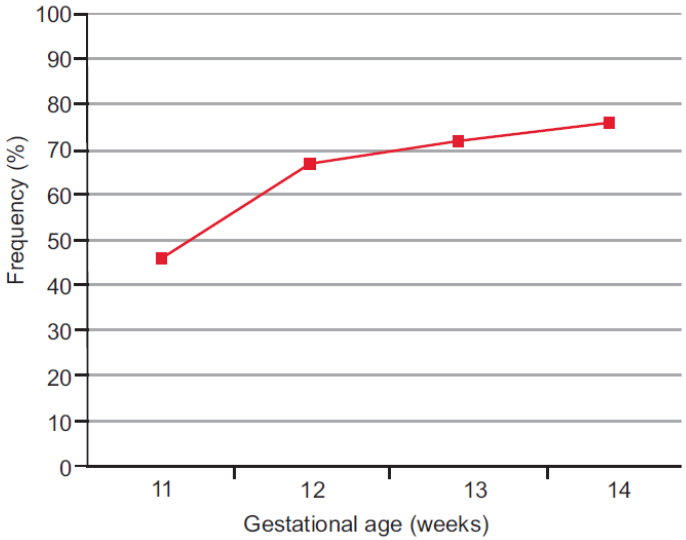
50–99% detection rate

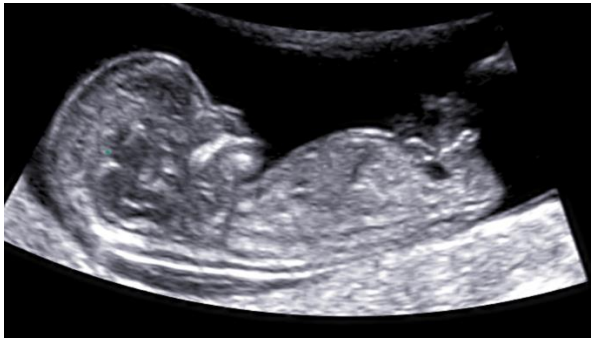
- Cystic hygroma
- Double-outlet right ventricular flow, Fallot, hypoplastic left heart syndrome, septal defects, transposition of great vessels, valvular disease
- Gastroschisis, omphalocele
- Holoprosencephaly, megacystis
- Limb reduction, polydactyly

0% detection rate

- Corpus callosum agenesis, cerebellar hypoplasia
- duplex kidneys, hydronephrosis, renal agenesis
- Congenital cyst adenomatoid malformation, extralobar sequestration
- Duodenal atresia, bowel obstruction

Detection rate of structural abnormalities by gestational age





CRL 78 mm

CRL 46 mm

Rossi & Prefumo, Obstetrics & Gynecology 2013

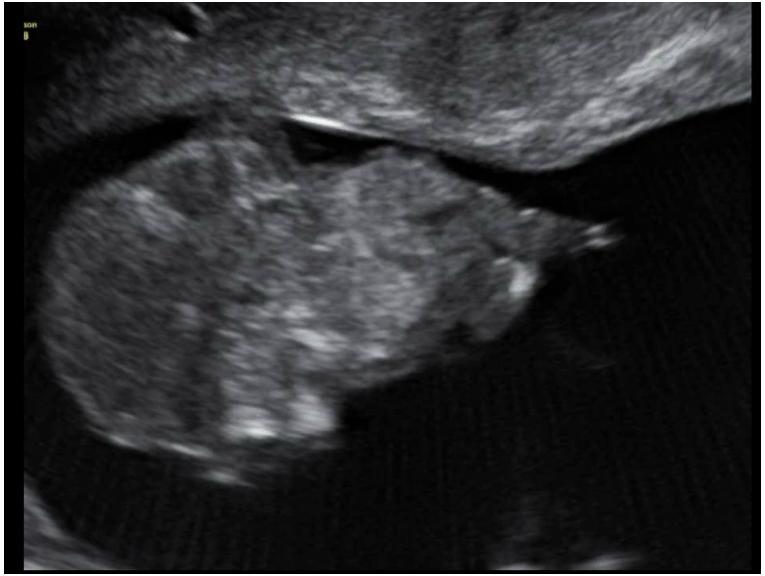
Acrania/exencephaly/anencephaly sequence

Normal

Alobar holoprosencephaly

Other neural tube defects

Encephalocele

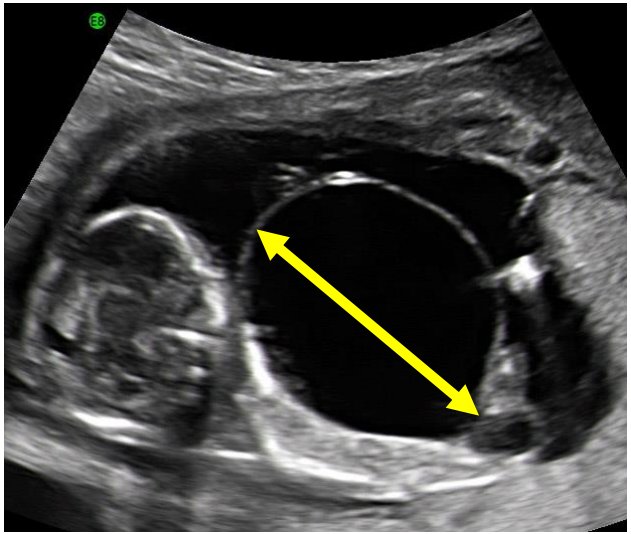


Encephalocele and severe spinal malformation

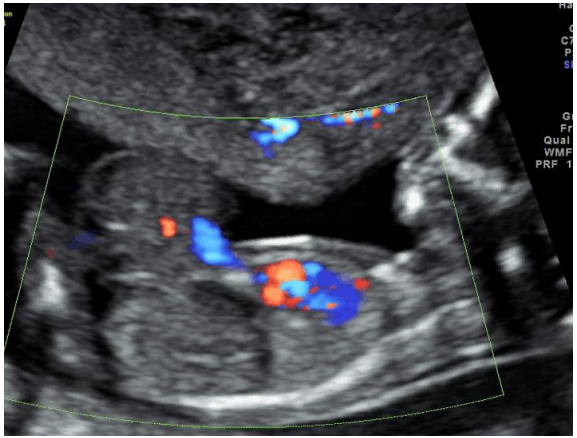
Lethal skeletal dysplasia

Micrognathia

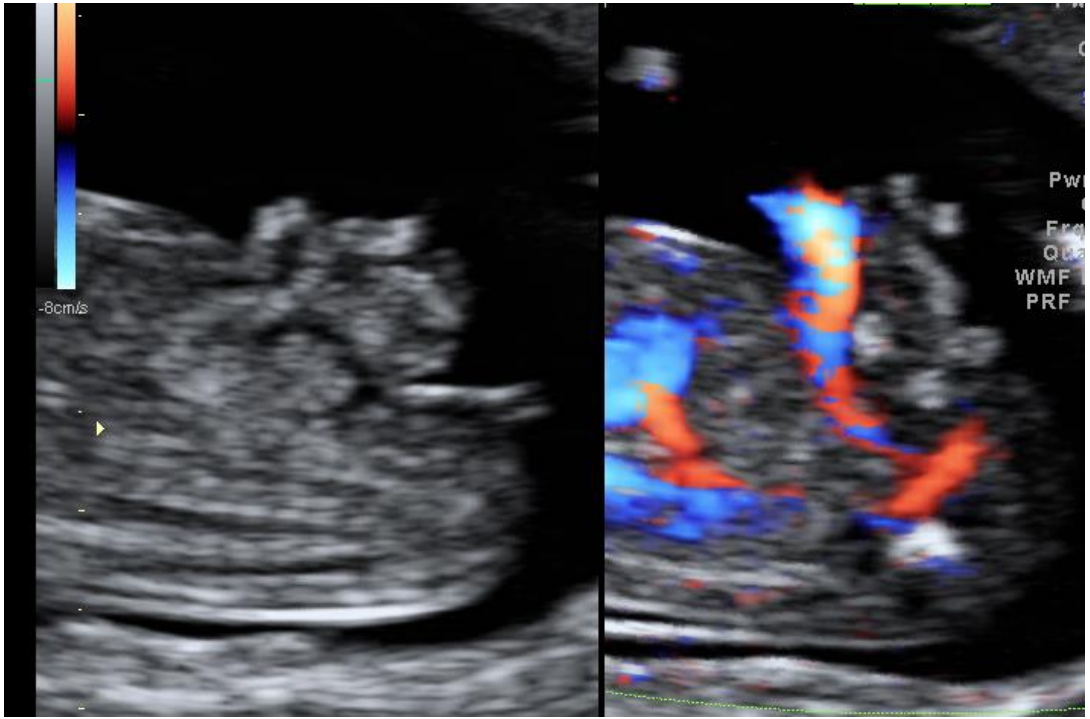
Megacystis
(longitudinal bladder diameter of 7 mm or more)



Exomphalos (omphalocele) ≠ Physiological bowel herniation(<11 weeks)



Abdominal wall defect: gastroschisis



Sacrococcygeal teratoma

Scanning twins at 10-14 weeks: objectives

1. Dating

- In pregnancies conceived spontaneously, **the larger of the two CRLs** should be used to estimate gestational age

2. Labelling

- Site (left/right, upper/lower)
- Cord insertion relative to the placental edges

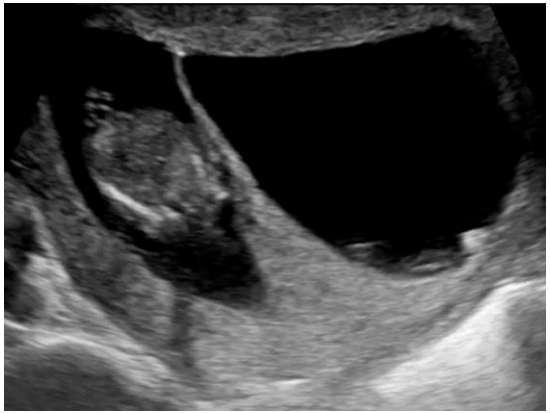
3. Chorionicity

- Membrane thickness at the site of insertion of the amniotic membrane into the placenta

(Lambda vs. T-sign)

Scanning twins at 10-14 weeks: chorionicity

Lambda sign =
dichorionic
diamniotic

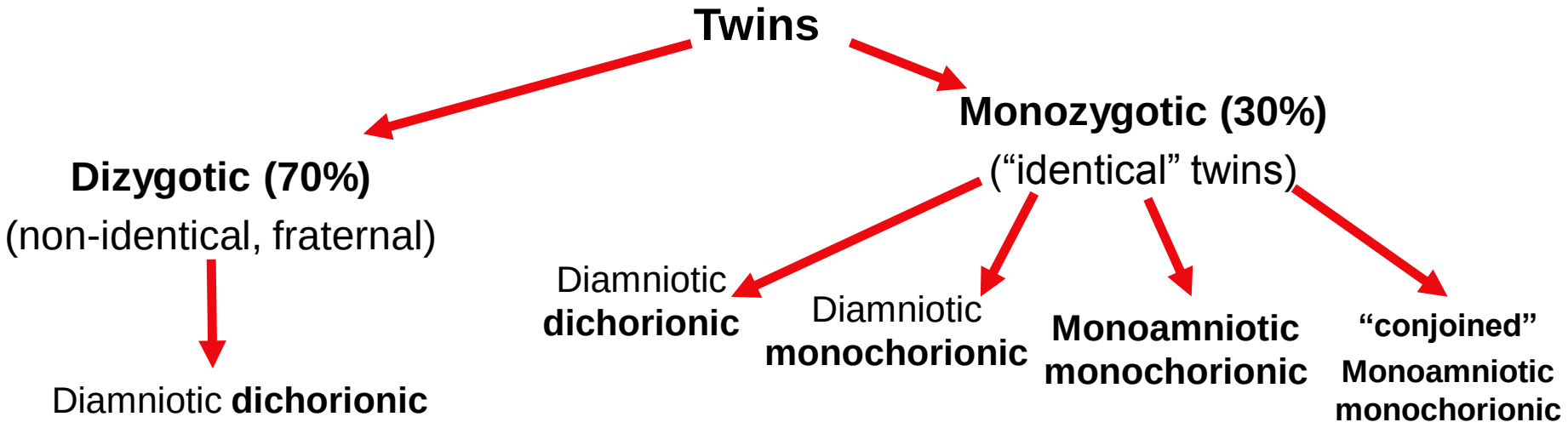


T sign =
Monochorionic
diamniotic

No membrane =
Monochorionic
Monoamniotic

Chorionicity and zygosity

- **Chorionicity**: number of placentas
- **Zygosity:** number of zygotes (are the twins “IDENTICAL”?)



Key points

1. Pregnant women should be offered an early ultrasound scan between 10 + 0 and 13 + 6
2. The aims of the first trimester scan are to
   - Confirm viability
   - Establish gestational age accurately
   - Determine the number of viable fetuses
   - If requested, evaluate fetal gross anatomy and risk of aneuploidy (after proper counselling)
3. Many gross malformations may develop later in pregnancy or may not be detected even with appropriate equipment and in the most experienced of hands.
4. In twin pregnancies chorionicity should be accurately determined and documented