DATING A PREGNANCY

FLAME LECTURE: 50

TATSIS / STELLER 3.7.17

LEARNING OBJECTIVES

- Determine gestational age
- Prerequisites:
  - NONE
- See also – for closely related topics
  - FLAME LECTURE 49: Diagnosing Pregnancy

ESTIMATED DATE OF DELIVERY (EDD)

- STEP 1: Find your EDD based off last menstrual period (LMP) or date of conception
- The EDD will be 280 days after LMP, or 266 days from date of conception
  - However, who needs math when you have a pregnancy wheel or an app to calculate the EDD
  - Otherwise, you can also use Naegele's Rule
    - Count back 3 months from the LMP → Add 7 days
  - This assumes 28-day cycle, fertilization on day 14
- The LMP date is the FIRST DAY of full flow during menses
- The most accurate dating of a pregnancy is by LMP that is "confirmed by or consistent with" a first trimester ultrasound
  - Note, the earlier the ultrasound the better (once there is a crown-rump length)
- However, many times, the LMP is not known, and you must rely on ultrasound for dating

CONFIRMING DATING BY LMP

- STEP 2: To confirm the dating by an ultrasound, you either perform:
  - A crown-rump length (CRL) if < 14 weeks, or
  - Four measurements including bi-parietal diameter (BPD), head circumference (HC), abdominal circumference (AC), and femur length (FL) if ≥ 14 weeks
  - The computer give you a composite due date by ultrasound criteria
- Now that you know the estimated weeks by dates (WBD) and weeks by sono (WBS), you can consult the ACOG guidelines (right) to determine whether you will confirm the due date by LMP or re-date the pregnancy by the ultrasound

Gestational Age Range*	Method of Measurement	Discrepancy Between Ultrasound Dating and LMP Dating That Supports Redating
≤ 13 6/7 wk	CRL	
• ≤ 8 6/7 wk		More than 5 d
• 9 0/7 wk to 13 6/7 wk		More than 7 d
14 0/7 wk to 15 6/7 wk	BPD, HC, AC, FL	More than 7 d
16 0/7 wk to 21 6/7 wk	BPD, HC, AC, FL	More than 10 d
22 0/7 wk to 27 6/7 wk	BPD, HC, AC, FL	More than 14 d
†28 0/7 wk and beyond	BPD, HC, AC, FL	More than 21 d

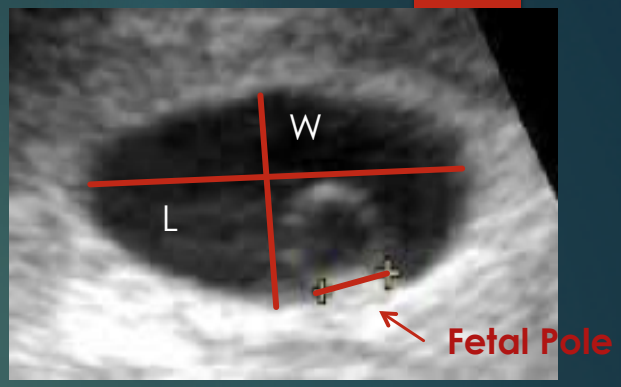
ACOG COMMITTEE OPINION #411

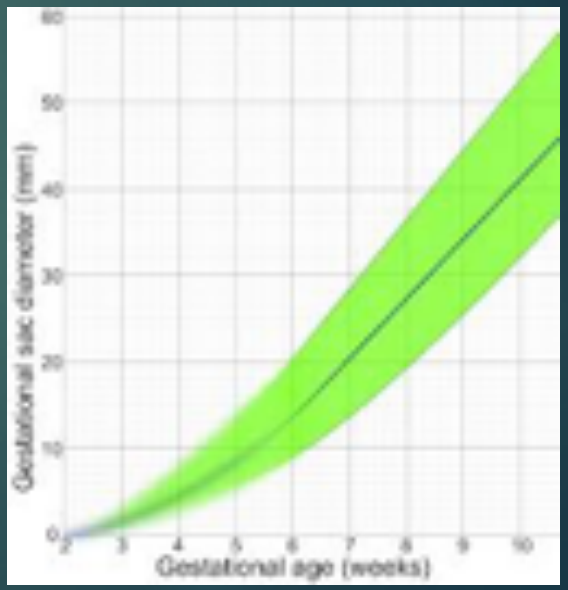
ESTIMATED DATE OF DELIVERY (EDD)

- Important points:
  - The reason for the increasingly liberal discrepancy found in the chart (ranging from 5-21 days) is because the further the pregnancy is along the more variability there is in the fetus' size due to genetic and environmental factors.
  - Once you have consulted the guidelines and determined the EDD, it is FINAL
    - The due date will never change based off a subsequent ultrasound, so if you are noting a discrepancy in size, this is not a dating discrepancy, and macrosomia or fetal growth restriction must be considered
  - A patient is considered to have "good dates" if their dating is confirmed by (or determined by) an ultrasound ≤ 20 weeks
    - The further after 20 weeks dating is established, the higher chance that a pregnancy can actually be much further along or much earlier, and this holds important implications for the timing of delivery (ex. concerns about fetal lung maturity, placental insufficiency)

MEAN SAC DIAMETER

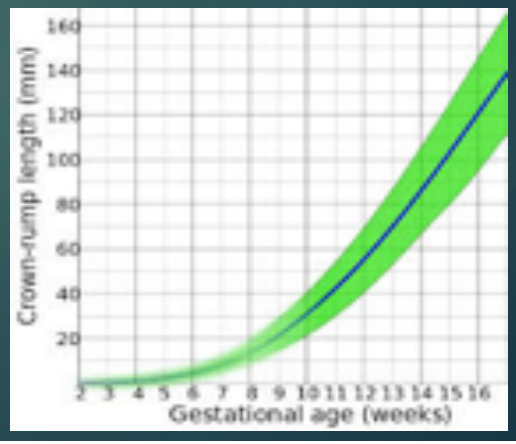
- If ultrasound is completed < 14 weeks, transvaginal ultrasound is recommended
- If the gestation is between 4-5 weeks, you may only see a gestational sac (GS)
  - A mean sac diameter can be used to date the pregnancy, but is less accurate than CRL
    - This is calculated by measuring the length x width of the sac, turning the probe 90 degrees and measuring the largest diameter in the third plane. Then add these up and divide by 3
    - You can then let the ultrasound tell you the date, or use a standard normogram (right) to calculate it yourself
  - Beware of mistaking a gestational sac for a "pseudosac" if no embryo or yolk sac is present
    - A pseudosac may just be fluid/blood in the uterine fundus, an the pregnancy could be extra-uterine





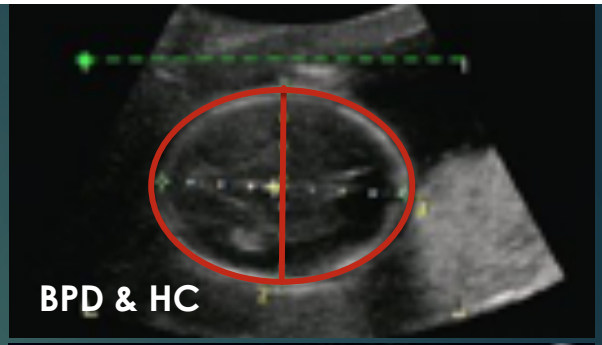
CROWN RUMP LENGTH

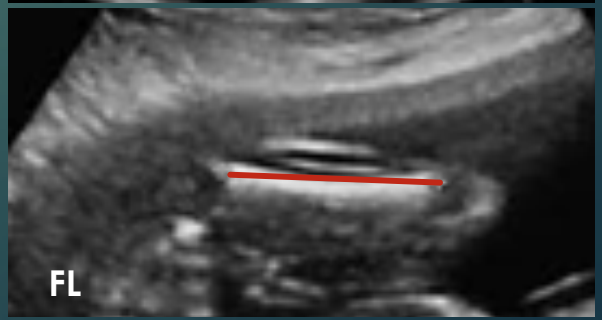
- CRL can be performed between ~6-14 weeks, thus may vary in appearance from a blob to fetus
- Performed by measuring longest straight-line measurement of embryo from outer margin of cephalic pole to the rump in the sagittal plane as seen in the second image
- Most accurate biometric parameter for dating a pregnancy
- Again, the ultrasound machine will give you the estimated dating based off your measurement unless it is too small or too big
  - However, you can also use a normogram (right)



FETAL BIOMETRY

- BPD & HC
  - Plane of section that intersects both the 3rd ventricle and the thalami
  - BPD measurement – outer calvarium closest to probe to the inner calvarium on the opposite side
  - HC measurement - outer to outer
- AC
  - Level of largest diameter of the fetal liver, stomach, umbilical vein typically visualized
  - Measure skin edge to skin edge
- FL
  - Femoral head/greater trochanter at proximal end to femoral condyle at distal end





DATING BY ART

- If pregnancy resulted from assisted reproductive technology (ART), you do not need an LMP or an ultrasound to estimate or confirm a due date; the due date is known precisely depending upon when and what is implanted
  - Date of intrauterine insemination (= date of conception)
  - 3-day embryo transfer (date of conception = 3 days prior to transfer)
  - 5-day embryo (blast) transfer (date of conception = 5 days prior to transfer)
- An example:
  - If LMP 1/1/17 → 10/8/17
  - If insemination occurs on 1/1/17 → 9/24/17
  - 3-day embryo transfer on 1/1/17 → 9/21/17
  - 5-day embryo transfer on 1/1/17 → 9/19/17

DATING BY CLINICAL EXAM?

- Often during antepartum care visits, we measure the fundal height as a means of monitoring growth
  - This is completed by placing a tape measure at the symphysis pubis and measuring to the top of the fundus in centimeters
    - <12 weeks: uterus still in the pelvis (can't measure objectively; if non-pregnant uterus feels like an orange on bi-manual exam, 12 weeks is a grapefruit)
    - 16 weeks: Midway from symphysis to umbilicus (still can't really measure)
    - 20 weeks: uterus at the level of the umbilicus; should be measuring 20cm
    - Each cm above umbilicus correlates to the number of weeks +/- 2 cm
      - Ex. 34 cm above the symphysis pubis should approximate 34 weeks gestation
  - This would just serve as an estimation of dating given there are many limitations
    - Fibroids, obesity, rotation of uterus, multiple gestation, growth restriction, diabetes

IMPORTANT LINKS / REFERENCES

- ACOG, SMFM, AIUM Committee Opinion #611: Method for Estimating Due Date, October 2014. http://www.acog.org/-/media/Committee-Opinions/Committee-on-Obstetric-Practice/co611.pdf?dmc=1