Prenatal Care

Clerkship Week 1 Seminar
Department of Obstetrics and Gynecology
University of Western Ontario
First Prenatal Visit

• Dating the pregnancy
  • Last menstrual period – Regular? Certain?
  • Naegele’s rule – add 1 week, subtract 3 months
  • Avg length of gestation ~ 280 days
  • Confirm with ultrasound
  • Society of Obs-gyn Canada:

1. When performed with quality and precision, ultrasound alone is more accurate than a “certain” menstrual date for determining gestational age in the first and second trimesters (≤ 23 weeks) in spontaneous conceptions, and it is the best method for estimating the delivery date. (II)
Determination of gestational age
Determination of gestational age

- CRL up to ~12-14 weeks: ± 5-7 days

- >16 weeks
  - Biparietal diameter (BPD)
  - Head circumference (HC)
  - Abdominal circumference (AC)
  - Femur length (FL)

- Measurements >16 weeks: ± 10 days
  weeks
Antenatal Visits

• Frequency
  • Initial assessment < 12 wks
  • Q 4-6 wks to 28 wks / Q2 wks to 36 wks / weekly to delivery
First and Second Trimester

Special considerations:

- Prenatal screening for aneuploidy and NTD (FTS, IPS, MSS)
- Prenatal investigations
- Fetal Ultrasound
Down syndrome
Risk for chromosomal abnormalities
### Risk for Chromosomal Abnormalities

<table>
<thead>
<tr>
<th>Maternal Age (yrs)</th>
<th>Trisomy 21 Gestation (wks)</th>
<th>Trisomy 18 Gestation (wks)</th>
<th>Trisomy 13 Gestation (wks)</th>
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Integrated screening - summary

• Offered to all pregnant women
• Screening test, **NOT** a diagnostic test

• Integrated screening
  • Maternal serum PAPP-A and $\beta$HCG at 11-14 weeks
  • Nuchal translucency at 11-14 weeks
  • uEstradiol, $\alpha$FP and $\beta$HCG at 15-16 weeks

  Detection of $\sim$90-95% of T21
  Offer amniocentesis when risk $> 1:200$
Nuchal translucency

normal

T21
Amniocentesis

- Genetic Counseling
- GA 16 weeks
- Ultrasonic visualization
- 20 cc amniotic fluid
- Culture fetal fibroblasts
- Result 2-3 weeks
- 0.5% risk pregnancy loss (1:200)
Chorion villus biopsy

- Genetic Counseling
- 10-12 weeks
- Transabdominal or transcervical
- Karyotype result in 2-3 weeks
- 0.8% risk pregnancy loss (1:100 – 1:150)
Nasal bone
First and Second Trimester

Special considerations:

• Prenatal screening for aneuploidy and NTD (FTS, IPS, MSS)

• Prenatal investigations

• Fetal Ultrasound
‘Routine’ tests in pregnancy

I. First diagnosis of pregnancy

• Hgb
• Blood group and antibody screen
• Urine dip for protein, infection
• VDRL
• Rubella titre
• HBsAg
• STD screen if indicated
• Discuss and offer HIV testing
• Ultrasound
Rhesus-immunization

- Rhesus negative pregnant women
- Sensitization either through previous pregnancy or transfusion
- IgG crosses placenta, coated erythrocytes destroyed in fetal RES
- Fetal anemia → hydrops
Rhesus-immunization

Maternal circulation

Placenta

Fetal circulation
Rhesus-immunization

Maternal circulation

Fetal circulation

Placenta
Prevention of HIV transmission

- Transmission of HIV dependent on viral load at delivery:
  - 10% at 1000 copies/mL
  - 17% at 1000-10,000 copies/mL
  - 33% at >10,000 copies/mL
  - 0.6-2% with HAART

- Monitoring: Viral load & CD4 count

- Management:
  - All of cART regardless of viral count or CD4 count
  - Caesarean section if >1000 copies/mL
  - Intrapartum zidovudine
  - Neonatal ART x 6 months, avoid breastfeeding
First and Second Trimester

Special considerations:

• Prenatal screening for aneuploidy and NTD (FTS, IPS, MSS)

• Prenatal investigations

• Fetal Ultrasound
Ultrasound in obstetrics
1st trimester (0-12 weeks)

- Diagnosis of pregnancy
- Assessment of viability
- Gestational age
- Ectopic pregnancy
- Risk assessment for chromosomal abnormalities
- Multiple pregnancy - chorionicity
Ultrasound in obstetrics
2nd trimester (18-20 weeks)

- Gestational age
- Structural defects
- Placental localization
- Assessment of the cervix
- Amniotic fluid volume
Diagnosis of pregnancy

Gestational sac
4-5 weeks

Fetal heart rate
6 weeks
Chorionicity in multiple pregnancies

Lambda-sign ($\lambda$)  
Dichorionic

Thin membrane  
Monochorionic

No membrane  
Monoamniotic
Twin-twin transfusion syndrome
CONSENSUS STATEMENT #24

In consideration of the high perinatal mortality rate accompanying a diagnosis of TTTS, all monochorionic twin pregnancies should be seen in consultation by a maternal-fetal medicine specialist for counselling and monitoring of fetal condition. Urgent consultation should be sought for the criteria listed in Section 23(b) above. (II-3 B)

a) Monitoring (uncomplicated monochorionic twin pregnancy):
Following diagnosis of uncomplicated monochorionic twin pregnancy and detailed second trimester anomaly screen, serial ultrasound surveillance of fetal health performed every two weeks, looking for evidence of suboptimal growth and/or emergence of features suggestive of TTTS. ((III C)
Assessment of cervix
cerclage
Placental localization
Diagnosis of fetal anomalies

• Assessment of fetal growth, placenta, umbilical cord and amniotic fluid

• Detailed survey of skeletal structures, brain, face, thorax, heart, diaphragm, abdomen, urogenital system, etc

• Best at 18-20 weeks:
  • Before 18 weeks: some structures not fully developed
  • After 24 weeks: legal termination issues and increased ossification
Third Trimester

Objectives:

• Determine gestational age
• Assess maternal health/wellbeing
• Assess fetal health/wellbeing

• Specific history questions
• Maternal weight, BP, urine dip
• SFH (in cm) should equal GA after 20 wks
• Plot growth on curve on A/N II
• Leopold’s maneuvers to determine lie
36 yo woman, first pregnancy, BMI 41. Fasting blood glucose 9.0 at 28 weeks
32 yo woman, first pregnancy, pre pregnancy weight 110 lbs, weight gain 25 lbs
18 yo woman, first pregnancy, smoker, poor nutrition

Match the history to the plot of SF heights

A B C
Ultrasound in obstetrics
3rd trimester (25-40 weeks)

- Fetal well-being
- Fetal growth
Amniotic fluid volume

- 12 weeks: 35ml
- 18 weeks: 250ml
- 36 weeks: 1000ml
- 40 weeks: 750ml
Ultrasound and amniotic fluid estimation

Largest vertical pocket >8 cm
Polyhydramnios

Largest vertical pocket <2 cm
Oligo- or anhydramnios
Amnioreduction
Assessment of fetal well-being

Assessment of fetal wellbeing
- Biophysical profile
- Non-stress test (Cardiotocography)

Testing for causative factors: ie placental function
- Doppler ultrasound of umbilical circulation
  - Umbilical artery
  - Middle cerebral artery
  - Umbilical vein
  - Ductus venosus
  - Uterine artery
# Assessment of Fetal Well-being: Biophysical Profile

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<thead>
<tr>
<th></th>
<th>Normal (2)</th>
<th>Abnormal (0)</th>
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<tbody>
<tr>
<td>Fetal breathing</td>
<td>&gt;30 sec in 30 min</td>
<td>&lt;30 secs in 30 min</td>
</tr>
<tr>
<td>Fetal movements</td>
<td>≥3 gross body movements in 30 min</td>
<td>&lt;3 movements in 30 min</td>
</tr>
<tr>
<td>Fetal tone</td>
<td>Limb movement from flexion to extension, return to flexion</td>
<td>Fetus in position with limbs extended or no fetal movements</td>
</tr>
<tr>
<td>Amniotic fluid</td>
<td>One pocket &gt; 2cm in two perpendicular planes</td>
<td>Largest pocket &lt;2cm</td>
</tr>
<tr>
<td>Non-stress test</td>
<td>≥2 accelerations in 40 min</td>
<td>&lt;2 accelerations</td>
</tr>
</tbody>
</table>
Doppler assessment of placental function
Brain sparing ....

Color Doppler examination of the circle of Willis (left). Flow velocity
Ductus venosus
Third Trimester

Special Considerations

- 26-28 weeks – GDM screening (earlier if risk factors)
- 28 weeks – Rh Ig if Rh negative
- 35-37 weeks – Vag/rectal swab for GBS