Assessment of Fetal Well-Being

- Fetal Heart Rate (FHR)
- Fetal Movement-‘Kick Count’
- Electronic Fetal Monitoring
- Fetal EKG
- Biparietal diameter (BPD]
- Biophysical Profile

Fetal Heart Rate (FHR)
- beats/minute
- week of pregnancy
- techniques
Fetal Movement-‘Kick Count’

- Daily fetal kick count - ‘fetal alarm’ if no FM for 12 hrs.

Electronic Fetal Monitoring

Late decelerations begins p ctx. is established, persists p ctx is over.

Causes:
- uteroplacental insufficiency b/c:
  - placenta previa
  - GDM
  - postmaturity
  - intra-amniotic infection
- fetal hypoxia-can lead to fetal acidosis.
Amniocentesis

**L/S ratio** – (Lecithin/Sphingomyelin)

- L/S - Protein components of lung enzyme surfactant
- Acceptable ratio: 2 to 1
- Last trimester - estimates fetal maturity with lecithin/sphingomyelin (L/S ratio) and presence of phosphatidylglycerol (Pg).
- Client empties bladder before procedure.
- Teach: report vaginal bleeding, movement changes

MRI

- Evaluates maternal/fetal structures & biochemical status of tissues & organs.
- Determination of amniotic fluid if question of hydramnios (oligohydramnios or polyhydramnios).
- Abnormal levels of AFP.

**Biophysical Profile (BPP)** - More accurate than any single assessment

- **Identifies 4 to 6 parameters**
  1. Fetal breathing movements - 1 episode of 30 sec. within 30 minutes
  2. Fetal movement - 3 episodes of limb/trunk movement in 30 minutes
  3. Fetal tone - extend & flex extremities or spine X1 in 30 minutes
  4. Amniotic fluid volume - ≥ 1 cm in vertical
  5. Placental grading
  6. Fetal heart reactivity - 2 or more accelerations of 15 beats/min. above baseline, lasting 15 sec. over 20 minute time period.
Biophysical Profile (BPP)
- Noninvasive, less costly, out-patient
- FHR reactivity-measured & interpreted from a NST; other 4 parameters measured by ultrasound.
- BPP can be done **daily** during high-risk PG
- Score: 8-10 (good fetal well-being)
  4-6 (fetus in jeopardy)

Stages of Labor

National Health Goal
- Reduce maternal deaths
- Reduce fetal deaths
- Reduce fetal and infant deaths during the prenatal period (28 weeks gestation to 7 days after birth)
**Labor Process**

- Process of moving fetus, placenta & membranes out of the uterus & through the birth canal.

- The upper uterus contracts actively during labor, maintaining tension to pull the more passive uterus & cervix over the fetus (presenting part).
- These actions result in cervical effacement and dilation.

**Onset of labor theories**

Combination of factors:
1. Oxytocin stimulation with prostaglandin initiate contraction
2. Placental age; associated with increasing myometrial irritability
3. ? Hormones produced at fetal hypothalamus, pituitary gland & adrenal cortex
4. ? ?certain alterations triggers others; how proper checks & balances are maintained
Signs of Labor

- Lightening-settling into pelvic “inlet”
- Increase in level of activity -
- Braxton Hicks contraction-increase in frequency & are uncomfortable.
- Bloody show –pink tinged mucus (vagina)
- ROM-rupture of membranes (amniotic fluid)
- Uterine contractions -

Four components affect the process of labor & birth

- Passageway - pelvis
- Passenger - fetus
- Powers - contractions
- Psychologic response - psyche

Passageway

maternal pelvis (pelvic inlet, cavity, outlet)

Four types of pelvis:

- **Gynecoid** - most common
- **Android** - extremely narrow, “male pelvis”
- **Anthropoid** – transverse is narrow
- **Platypelloid** –flattened & oval (least common)

Vagina & Introitus
Passenger

- Size of fetal head: has major effect on birth. Head is the largest single fetal part. Skull bones are united by sutures, fontanels intersect with sutures. ‘Molding’

- Fetal presentation: part that enters pelvic inlet first - cephalic, breech, shoulder.

- Fetal lie: relationship of long axis (spine) of fetus to long axis of mother

Fontanels

membrane-filled spaces

2 important fontanels:

- Anterior - diamond shaped, closes @ 18 months;

- Posterior - triangular shaped, closes @ 6-8wks

Passenger

- Fetal attitude: relationship of body parts to each other. Flexion with head flexed toward chest, arms & legs flexed over thorax.

- Fetal position: relationship of presenting part to 4 quadrants of mother’s pelvis.

- Engagement: largest transverse diameter of presenting part - passed through pelvic inlet.

- Station: relationship of presenting part of fetus to an imaginary line drawn between ischial spines of maternal pelvis. Ex. 0 station
Cardinal Movements-
- see handout
- engagement
- descent
- flexion
- internal rotation
- extension
- external rotation
- expulsion

Mechanisms of Labor
- **Engagement** - biparietal diameter of head passes the pelvic inlet.
- **Descent** - downward movement of head into birth canal
- **Flexion** - fetal chin flexes down onto chest

Mechanisms of Labor cont’d
- **Internal rotation** - rotation of head to pass through the ischial spines
- **Extension** - as head passes under symphysis pubis, fetal head extends
- **External rotation** - rotation of head to allow shoulders to pass through ischial spines
- **Expulsion**
Primary Powers

Primary – involuntary ctxs
Secondary – bearing down effort

Responsible for:
- effacement of cervix
- dilatation: widening of cervical opening(os)

Powers->Contractions
- tightening of uterine muscle during the labor process
  - Frequency - from beginning of one contraction to beginning of next one.
  - Duration - from beginning of one contraction until it relaxes.
  - Intensity - strength or dentability of uterus.
  - Rest period - time between contractions

Effacement & Dilation
- Effacement - shortening and thinning of cervix, expressed in %.
- Dilation - enlargement or widening of cervical opening, allows birth of fetus.
Stages of Labor

**FIRST STAGE**: onset of regular uterine ctxs. to full dilation
- *Latent*: true labor 0-4cm dilation, ctx lasting 15-30 seconds, intensity mild to moderate.
- *Active*: 4-7cm, ctxs. Q3-5 min. lasting 60 seconds, intensity-moderate.
- *Transition*: 8-10cm, ctx q 2-3min., lasting 45-90 seconds, intensity-strong.

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First Stage of Labor Characterized by:
- Regular uterine contractions (powers)
- Blood-tinged vaginal discharge
- Fluid discharge from vagina

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**SECOND**: full dilation of cervix to birth of the fetus.

**THIRD**: birth of fetus to placental separation and expulsion of placenta.

**FOURTH**: delivery of placenta to 2 hours after
Second Stage of Labor

Episiotomy - Surgical incision of perineum

Birth of the Head

Birth of the Shoulders
- anterior shoulder delivered with downward traction toward perineum

Birth of body and extremities
- expulsion is controlled, support weight of baby to prevent perineal trauma

Cutting & Clamping the Cord

Third Stage of Labor

placental separation & expulsion
- Assess progress: rhythmic cbxs
- Firmly contracted fundus
- Change in shape of uterus from discoid to globular ovoid
- Sudden gush of dark blood from introitus
- Apparent lengthening of umbilical cord
- Placenta must be examined for intactness.
- Assess: Never pull on cord to hasten separation.

Maternal Physiologic Changes During Labor
- Cardiac output increases by 10-15% in first stage, 30-50% in second stage
  - Systolic and diastolic pressure increases
  - Respiratory rate increases
### Physiological Adaptations

- **CV**: supine hypotension approx. 10-15% occlusion of vena cava by heavy uterus when lying on back (decreased BP, increased P, dizziness, pallor, cool clammy skin).
- **TX**: turn on left side, start O2-7l/min, monitor VS & FHR.
- **Systolic BP rises** during Contractions

### Maternal Physiologic Changes During Labor

- 1+ protein in urine may be present
- Temperature may be elevated
- WBC count increases
- Gastric motility is decreased

### Hemopoietic System

- Leukocytosis- increases to 25,000 WBCs while in labor
- Increase in plasma fibrinogen
- Increased risk - venous thrombus
Urinary System
- Concentrated urine to preserve both fluid & electrolytes
- Labor - reduced sensation of full bladder, unaware of need to void, contribute to discomfort, inhibit fetal descent, after birth-urine excreted in large amts

M/S-Neurologic
- Increased pubic flexibility
- Increased discomfort

Psychologic Response
- Assess readiness for labor. Fatigue, Fear
  - Include cultural beliefs into the laboring process.
  - Maternal catecholamines are secreted in response to anxiety and fear → can inhibit uterine contractility & placental blood flow.
Fetal Responses to Labor

- Increased pressure on fetal head
- Petechiae or ecchymotic areas, edema
- Full flexion
- Aids in maturation of surfactant production

Fetal Assessment During Labor

EFM: electronic fetal monitoring - trace both the FHR and the duration and interval of uterine contractions.
- Contractions - tocodynamometer
- FHR monitor - transducer

FHR patterns:
Baseline rate, variabilities in baseline rate, and periodic changes in the rate - (accelerations and deceleration)

Reassuring FHR Patterns

- Baseline within 110-160 bpm
- Early decelerations
- Mild variable decelerations with quick return to baseline
- Accelerations - occurs with fetal movements.
- Variability - most reliable indicator of fetal well-being. Balancing interaction of parasympathetic & sympathetic divisions of ANS.
Early decelerations

- Cause: head compression
- viewed as normal if they occur late in labor when the head has descended fairly low.

Nursing interventions:

Late decelerations

Nursing interventions:
- turn mother to left side,
- administer O2 at 7-10L/min. by face mask.
- Increase IV fluids to treat hypotension & to decrease intensity of contraction
- D/C pitocin if infusing
- Maintain continuous fetal monitoring tracing.

Variable decelerations
- occurs in half of all labors.
- Causes:
  - umbilical cord compression b/c:
    - knot in cord
    - short cord
    - prolapsed cord
    - cord around neck
    - maternal position with cord between fetus and maternal pelvis
Variable decelerations

Nursing interventions:
- change maternal position.
- If severe, administer O2 @ 7-10L.
- Be suspicious of prolapsed cord

Neonatal depression has occurred in 2nd stage severe or prolonged cord compression. FHR <70bpm lasting >30-60sec.; slow return to baseline, decreasing variability.

Fetal Tachycardia
>160bpm X10 minutes

Causes:
- early fetal hypoxia
- maternal fever, anemia
- fetal arrhythmia,

Nursing interventions:
1. Monitor maternal temperature
2. Reposition pt. as indicated
3. Monitor IV therapy

Fetal Bradycardia-<120
X10minutes

Causes:
- maternal hypotension/hypothermia
- epidural
- prolonged umbilical cord compression
- late fetal hypoxemia

Nursing interventions:
1.
2.
3.
Nonreassuring FHR patterns
- Progressive increase or decrease of baseline FHR
- Tachycardia of 160 or greater
- Decrease in baseline variability
- Severe variable decelerations

Nonreassuring FHR patterns
- Late decelerations
- Absence of variability
- Prolonged decelerations
- Severe bradycardia

Fetal Scalp pH
- Fetal acidosis occurs as a result of hypoxia.
- Blood gas values vary so rapidly with transient circulatory changes, not routinely done.
- Sample laboratory for analysis of pH, base excess or deficit, pO₂ & pCO₂.
- Done if fetal distress is indicated – less popular test.
Episiotomy:
- Incision made in perineum to enlarge vaginal outlet.
- Types:
  2. Mediolateral - begun in midline of perineum but directed laterally away from the rectum.

Lacerations
Vaginal and/or Cervical
- 1st degree: extends through the skin.
- 2nd degree: extends through muscles of perineum.
- 3rd degree: continues through anal sphincter muscle.
- 4th degree: also involves anterior rectal wall.

Oxytocin
- Used to minimize uterine bleeding in 3 & 4th stages.
- Dosage: 10 units mixed in 1000cc of IV solution
- NC: NPO, VS, FHR must be monitored, IV fluid
- Can cause HTN by vasoconstriction, obtain a baseline BP.
Augmentation with Oxytocin

used to augment labor

- Must have at least a 20 minute baseline EFM strip
- Usually begin at 0.5 to 3 mu/minute, increases of 1 to 2mu at 15 to 60 minute intervals
- Common response range: 4-16mu/min
- Discontinue oxytocin for deceleration activity.

FOURTH stage: delivery of placenta to 2 hours after

- Perineal repair
- Nursing Care: VS q15 min X 1 hour, then q4h (BP, P & R may be elevated)
- Palpate fundus – size, consistency, position
- Monitor lochia amount, characteristics
- Perineal pad
- Monitor chills & shaking-excess epinephrine production during labor.

Evaluation

- Client understands & practices safety measures.
- Experiences safe labor & birth,
- Mom & NB has physiological parameters WNL
- Mom feels comfortable & supported
- Uses self-care & support measures
- Parental-newborn attachment & bonding