

## **Intro to Obstetrics: Simulation Workshop - Student Handout**

### **History of the Labouring Obstetrical Patient**

- GTPAL
- Gestational age
- Degree of prenatal care (e.g., IPS, MSSS, ultrasounds, last medical appointment)
- Infection status (e.g., GBS, HIV)
- Medical conditions associated with pregnancy (e.g., gestational diabetes, pre-eclampsia)
- Fetal well-being (e.g., fetal movement)
- Current vaginal bleeding or leaking fluid from vagina
- Onset and frequency of contractions (if present)
- Past medical history
- Current medications
- Allergies
- Distance from home to hospital

### **Physical Exam of the Labouring Obstetrical Patient**

- Vitals
- Speculum exam for presence of fluid
- Cervical assessment:
  - Dilation
  - Effacement
  - Fetal station
  - Consistency
  - Position
- Assessment of fetal well-being
  - Fetal tracing

### **Definition of Labour**

Labour is defined as uterine contractions producing cervical changes and is divided into four stages:

- First stage
  - Onset of true labour to complete dilation of the cervix
  - Includes latent and active phase
    - Latent: early cervical effacement and dilation (usually considered up to 3-4 cm)
    - Active: more rapid cervical dilation (~1cm/hour)
- Second stage
  - Full dilation (10 cm) to delivery of the fetus
- Third stage
  - Delivery of fetus to delivery of the placenta
  - Generally occurs 2-10 minutes after the birth of the baby
- Fourth stage
  - Variability in the definition (6 hours to 6 week postpartum)

## Management of Labour

- First stage
  - Maternal ambulation or if lying, lateral recumbent position
  - CBC, Hgb, blood group, Rh type, HBV status, urinalysis
  - Maternal vitals q1-2 hours
  - Assess need for analgesia
  - Fetal monitoring (active phase) q30 minutes (uncomplicated pregnancy) or q15 minutes (obstetric risk factors)
  - Monitor uterine contraction q30 minutes (uncomplicated) or continuously (complicated)
  - Vaginal exams q2 hours (active phase)
- Second stage
  - Avoidance of supine position
  - Encourage mother to bear down with each contraction
  - Fetal monitoring q15 minutes (uncomplicated pregnancy) or continuously or q5 minutes (obstetrical risk factors)
  - Vaginal exam q30 minutes to monitor fetal descent
  - Put on gloves and set up tray
  - Modified Ritgen's maneuver or manual perineal support
  - After delivery of the head, clear airway and check for nuchal cord
  - Delivery of anterior shoulder (administer oxytocin)
  - Delivery of posterior shoulder
  - Place baby on to mum's belly (and then into infant warmer)
  - Clamp and cut cord and take cord samples
- Third stage
  - Placental separation occurs within 5-30 minutes
  - Avoid fundal massage
  - Inspect for signs of placental separation (fresh blood from vagina, umbilical cord lengthening, fundal rising, uterus feels firm) before applying traction on cord
  - Deliver placenta and inspect for abnormalities/ensure completeness
  - Examine mum for lacerations (and repair if necessary)
- Fourth stage
  - Monitoring for BP, HR, and blood loss

## Management of Shoulder Dystocia\*

- McRobert's maneuver (may be done in conjunction with suprapubic pressure)
  - Flexion of maternal legs against abdomen
- Suprapubic pressure
- Wood's/corkscrew maneuver
  - Apply pressure to scapula of posterior shoulder to try to rotate it into the anterior position
- Insert hand into vagina, grasp posterior arm and move it across the chest (results in delivery of posterior shoulder and displacement of anterior shoulder from behind pubic symphysis)
  - May result in fractured humerus
- Fracture of one or both clavicles
- Zavanelli maneuver
  - Push fetal head back into vagina and prepare for c/s (may require uterine relaxant)

*\*Note these are listed in the order that they should be attempted*

## Indications for Operative Vaginal Delivery and Caesarean Section

	Maternal	Fetal	Maternal-fetal
Operative vaginal delivery	Avoidance of voluntary expulsive effort (e.g., CVD) Impaired pushing effort (e.g., exhaustion, excessive analgesia)	Non-reassuring FHR Prolonged second stage Head stabilization during breech delivery	
Episiotomy	Prevention of tear Instrumental delivery		
Caesarean delivery	Obstruction Active herpetic lesions Invasive cervical cancer Previous uterine surgery (e.g., c/s) Maternal illness (e.g., eclampsia, HELLP, heart disease)	Non-reassuring FHR Malpresentation Cord prolapse Congenital anomalies	Failure to progress Placental abruption Placental previa

### History, Physical Exam, and Laboratory Findings of Pre-Eclampsia

Diagnostic criteria for preeclampsia are:

1. Development of hypertension (systolic BP >140 mmHg or diastolic BP >90 mmHg) in a woman whose BP was previously normal, after the 20<sup>th</sup> week of pregnancy AND
2. Development of new-onset proteinuria ( $\geq 0.3$  g protein in a 24 urine collection) after the 20<sup>th</sup> week of pregnancy

History	Physical Exam	Laboratory
Headache Visual disturbances (e.g., scotoma) Epigastric/RUQ pain Swelling (especially in face/hands; ask about abnormal weight gain) Family history of pre-eclampsia Oliguria	Hypertension Hyperreflexia Swelling (especially in face/hands)	Proteinuria Low platelets Elevated transaminases Increased hematocrit (hemoconcentration due to relative hypovolemia) Increased serum uric acid concentration Decreased creatinine clearance Elevated bilirubin (hemolysis)

### Labor Analgesia

#### Non-Pharmacologic Options

- Those requiring minimal training or equipment
  - Continuous support
  - Touch/massage
  - Therapeutic heat/cold
  - Hydrotherapy
  - Vertical position
- Those requiring specialized training
  - Biofeedback
  - Intradermal water injection
  - Transcutaneous electrical nerve stimulation (TENS)
  - Acupuncture
  - Hypnosis

## Pharmacologic Options

		Advantages	Disadvantages
Systemic analgesia	Parenteral agents		
	Patient controlled opioid (e.g., Remifentanyl PCA)	Less variable plasma concentration Superior pain relief with ↓dose ↓maternal respiratory depression ↓placental transfer of drug Higher patient satisfaction	Specialized equipment Opioid side effects Small doses are not always effective Risks to fetus/neonate are unclear
	Opioid adjuncts (e.g., barbiturates, BZDs)	Rarely used due availability of safer alternatives	
	Intermittent bolus parenteral opioid (e.g., meperidine, morphine, tramadol, fentanyl)	Simple Quick onset No specialized equipment or personnel	Maternal side effects (e.g., N <sub>x</sub> , dysphoria, respiratory depression, drowsiness, delayed gastric emptying) Fetal side effects (e.g., decreased FHR variability, respiratory depression)
Inhalational agents	Nitrous oxide	Negligible neonatal effect No effect on uterine activity	Requires maternal cooperation
	Volatile anesthetic agents (e.g., isoflurane, sevoflurane)	Not used clinically at present	
Regional analgesics	Epidural analgesia	Most effective analgesia Higher patient satisfaction Allows conversion to c/s if necessary	Contraindicated if: <ul style="list-style-type: none"> <li>• Increased ICP</li> <li>• Active neurological disorder</li> <li>• Infection at site of injection/systemic infection</li> <li>• Frank coagulopathy</li> </ul> Complications: <ul style="list-style-type: none"> <li>• Hypotension</li> <li>• Extensive motor block</li> <li>• Slowed labour progress</li> <li>• Fetal effects</li> <li>• Post-dural puncture headache (PDPH)</li> </ul>
	Spinal analgesia		
	Combined spinal-epidural analgesia	Rapid onset with good sacral analgesia	Delayed verification of functioning epidural catheter Higher incidence of pruritus Possible higher risk of fetal bradycardia Risk of PDPH Limited analgesia duration (in single-shot spinal)
	Paracervical block		Rarely used due to risk of ↓uteroplacental perfusion
	Lumbar sympathetic block		
	Pudendal nerve block (S2-S4)		Frequent failure with risk of direct fetal trauma
Perineal infiltration	Rapid onset	Incomplete epidural analgesia	

## Fetal Surveillance

### Baseline Assessment

- Rate
  - Normal (120-160 bpm)
- Variability
  - Short-term (beat-to-beat) is normally 5-25 bpm
  - Long-term variability is 3-10 cycles/minute

### Fetal Heart Rate Patterns

	Description	Fetal distress?	Potential Explanation	Intervention
Accelerations	↑FHR in response to contraction	No	Physiologic response	None needed
Early deceleration	↓FHR with lowest point at peak of the contraction	No	Seen when fetal head engaged (head compression)	None needed
Late deceleration	↓FHR with lowest point after peak of contraction	Yes	Uteroplacental insufficiency Fetal hypoxia Fetal metabolic acidosis Low arterial pH	Change maternal position (supine → lateral) Maternal oxygen Discontinue oxytocin IV tocolytic c/s
Variable deceleration	↓FHR with variable onset	Yes	Umbilical cord compression	Change maternal position 100% oxygen to mother Trendelenberg position Discontinue oxytocin IV tocolytics Amnio-infusion with normal saline Assisted vaginal delivery or c/s
Decreased beat-to-beat variability	<5 bpm	Possibly	Fetal acidosis Quiet sleep state Maternal sedation (drugs)	Acoustic stimulation to differentiate between sleep state and something more concerning

### Augmentation of Labour

- Artificial stimulation of labour
- Artificial rupture of membranes (ARM), which may be done in conjunction with IV oxytocin infusion
- Complications of oxytocin augmentation include:
  - Hyperstimulation causing fetal distress as a result of ischemia
    - May lead to uterine rupture
  - Antidiuretic effect of oxytocin may lead to severe water intoxication
  - Uterine muscle fatigue and post-delivery uterine atony (more commonly seen with prolonged oxytocin use)

### References

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- Wong, C. (2009). Advances in labor analgesia. *International Journal of Women's Health*, 1, 139-154.