

Physiology of normal labor
partograph
Intrapartum fetal evaluation
Postpartum family planning

For MSc midwifery students

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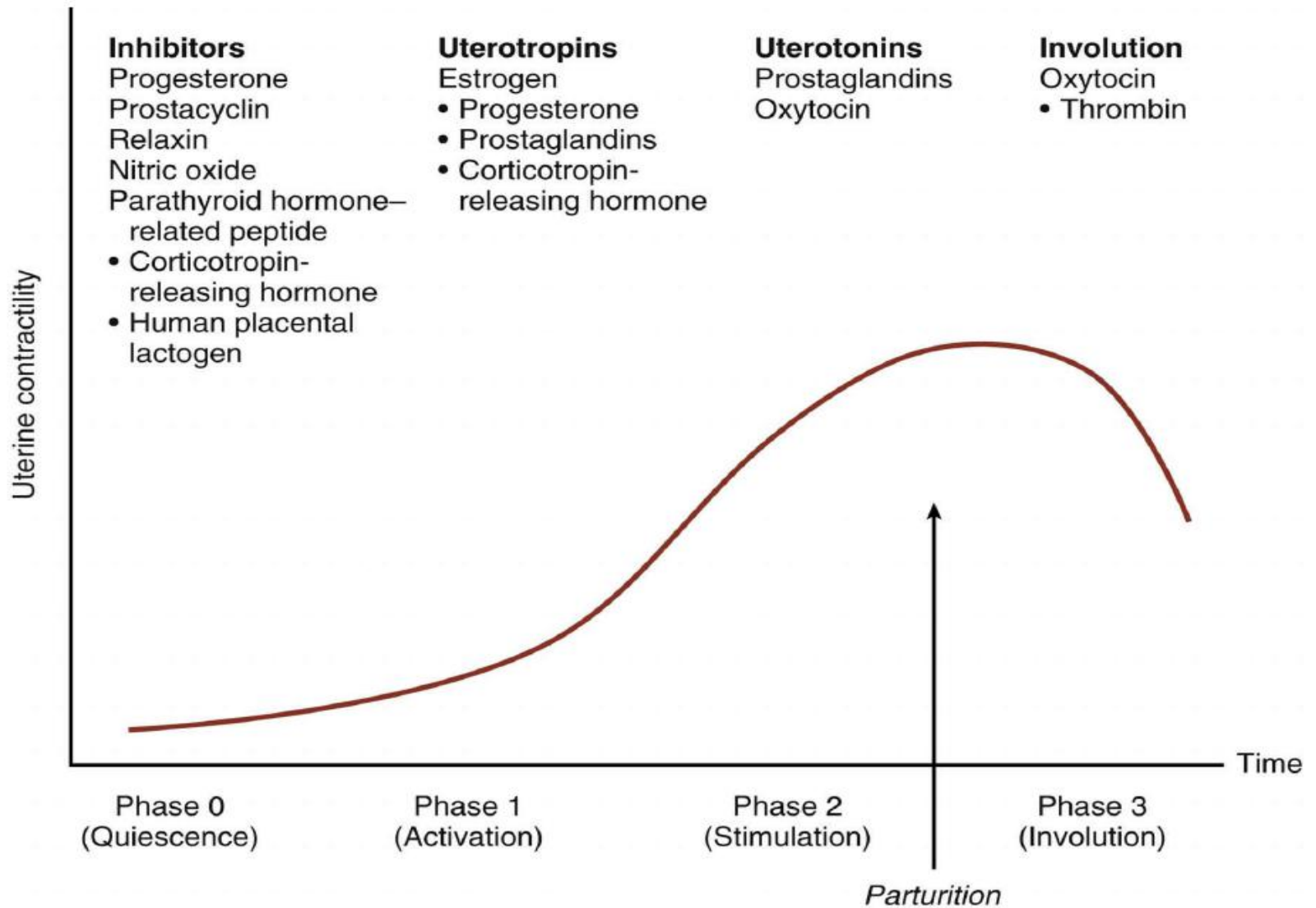
Physiology of normal labor

At the end of this session you are expected to know

- Phases and stages of labor
- Mechanics of labor and delivery
- Cardinal movements in labor
- Interventions that affect normal labor outcomes
- Details on physiology of normal labor

Introduction

- Labor is a clinical diagnosis that includes regular painful uterine contractions and progressive cervical effacement and dilation.
- This process lead to expulsion of the fetus from the uterus
- The four phases of labor



Mechanics of labor and delivery(L & D)

- Labor and delivery are not passive process
- The ability of the fetus to successfully negotiate the pelvis during L & D depends on the complex interactions of three variables(3 P'S)
- Uterine activity(powers)
- The fetus(passenger)
- The maternal pelvis(passage)

a.Uterine activity

- Characterized by the frequency ,intensity and duration of duration of contractions.
- Pace maker
- Polarity of uterus
- Uterine dysfunctions
- Adequate uterine contraction
- *Tachysystole*
- The term *hyperstimulation* should no longer be used

b.Fetus

- *Fetal weight- macrosomia*
- *Fetal lie*
- *Presentation*
- *Position of the fetus*
- *Station*

c. Maternal pelvis

- Clinical pelvimetry is currently the only method of assessing the shape and dimensions of the bony pelvis in labor
- An adequate trial of labor is the only definitive method to determine whether a fetus will be able to safely negotiate through the pelvis.

Cardinal Movements in Labor

- Although labor and birth comprise a continuous process, seven discrete cardinal movements are described:
 - (1) engagement
 - (2) Descent
 - (3) Flexion
 - (4) internal rotation
 - (5) Extension
 - (6) external rotation or restitution, and
 - (7) expulsion

Normal Progress of Labor

- Progress of labor is measured with multiple variables.

uterine contraction

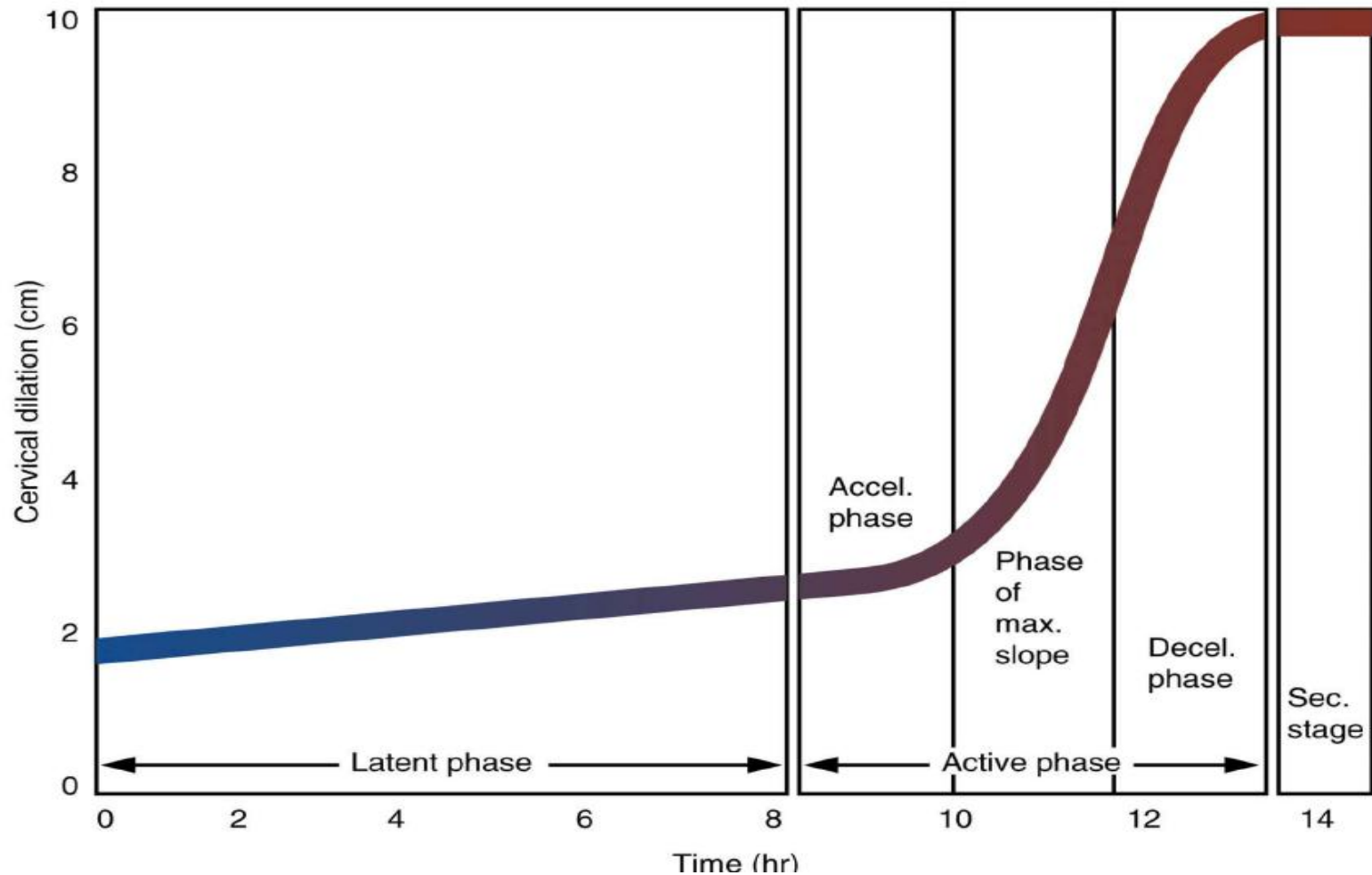
Cervical effacement and dilatation

Fetal station and position

- Labor occurs in three stages

- Labor length is affected by many variables
 - parity
 - epidural use
 - fetal position
 - fetal size, and maternal body mass index.

Modern labor graph. Charact. of the average cervical dilation curve for nulliparous



- Factors significantly associated with a prolonged second stage
 - induced labor
 - chorioamnionitis
 - Older maternal age
 - occiput posterior position
 - delayed pushing
 - nonblack ethnicity
 - epidural analgesia, and parity of five or more

Interventions that affect normal labor outcomes

- Upright, rather than recumbent, positioning during labor is associated with a significantly shorter first stage of labor, less epidural use, and a reduction in the risk of cesarean delivery by 30%.
- The presence of a labor doula is @ with a significant reduction in the use of analgesia, oxytocin, and operative Vx delivery or cesarean delivery and an increase in patient satisfaction.
- Continuous labor support with a friend or family member should be encouraged.
- The available data suggest that IV fluid is beneficial in labor.

Active management of labor

- Management of stages of labor
- Active mgt of the 3rd stage of labor is associated with a significant reduction in blood loss >1000 mL and therefore a lower risk of maternal anemia.

Episiotomy and Perineal Injury and Repair

- Following delivery of the placenta, the vagina and perineum should be carefully examined for evidence of injury.
- Degree of tear(4)
- All 2nd , 3rd , and 4th -degree tears should be repaired
- Based on the lack of consistent evidence that episiotomy is of benefit, routine episiotomy has no role in modern obstetrics.
- No data suggest that episiotomy protects the woman from later incontinence

Partograph

Objective of this session is to

- Know when to start a Partograph
- List use of partograph
- Understand and complete all parts of the Partograph
- Know how to recognize prolonged labour on the Partograph
- Know when to transfer a woman in labour
- Have some knowledge of possible management options

Partograph

- Graphic recording of the progress of labour ,maternal and fetal conditions

Uses

- to detect labour that is not progressing normally
 - to indicate when augmentation of labour is appropriate
 - to recognize CPD long before obstruction occurs
- Partograph

Uses...

- Increases the quality of all observations on the mother and fetus in labour
- Serves as an “Early warning system”
- Assists in early decision on transfer, augmentation, termination of labour

Observations charted on the Partograph

- The Progress of labour
 - Cervical dilatation
 - Descent of fetal head
 - Uterine contractions – duration, frequency
- Fetal condition
 - Fetal heart rate
 - Membranes and liquor
 - Moulding of the fetal skull

Observations charted on the Partograph...

- Maternal condition

Pulse/ BP / Temp

Urine – volume, acetone, protein

Drugs & IV Fluids

Oxytocin regime

When to start?

- it should be started only when a woman is in active phase of labour
- Contractions must be 1 or more in 10mins, each lasting for 20secs or more

- The dilatation of Cx is plotted with an X.
- Vaginal examinations are done at admission and every 4 hours
- The width of the 5 fingers used to assess descent
- A head that is mobile above the brim will accommodate the full width of 5 fingers(5/5)
- As the head descends, the portion of the head remaining above the brim will be represented by fewer fingers

Uterine Contractions

- Observations are every half hour in active phase
- Frequency - No. of contractions in a 10 minutes period
- Duration – Measured in seconds from the time the contraction sets in to the time the contraction passes off
- On the Partograph below the time line, there are 5 blank squares going across the length of the graph.
- Each square represents 1 contraction

Points to Remember

- When the woman comes in the active phase of labour, recording of cervical dilatation starts on the alert line
- When progress of labour is normal, plotting of cervical dilatation remains on the alert line or to the left of it

Points to Remember...

Abnormal Progress of Labour

- If it moves to the right of the alert line, labour may be prolonged
- Transfer if facility for emergencies is not available
- Transfer allows adequate time for assessment for intervention when she reaches the action line

Prolonged active phase of labour

At the Action Line

- It is 4 hours to the right of Alert line
- Assess the cause of slow progress and take action
- Action should be taken in a place with facility for dealing with obstetric emergencies is available
- Remember warning transfer from hospital reaching the action line means possible danger on further management

WHO Protocol

Normal Latent and Active Phases

- Latent phase is < 8 hrs and active phase remains to the left of or on the alert line
- Do not augment with oxytocin or intervene unless complications develop
- ARM may be done at any time in the active phase

WHO Protocol

Between Alert and Action lines

In a Health Centre:

- Transfer to hospital with facilities for Cesarean section, unless Cervix is almost fully dilated
- ARM may be performed if membranes are still intact and observe labour for a short period before transfer

In Hospital: Perform ARM if membranes are intact and continue routine observations

WHO Protocol

At or Beyond Action Line

- Full medical assessment
- Consider IV infusion/bladder catheterization/analgesia Options:
- Delivery if fetal distress or obstructed labour
- Oxytocin augmentation if no contraindication
- Supportive therapy (only if satisfactory progress is now established and dilatation could be anticipated at 1cm/hr or faster)

=You are expected to practice on partograph

- Intrapartum fetal evaluation

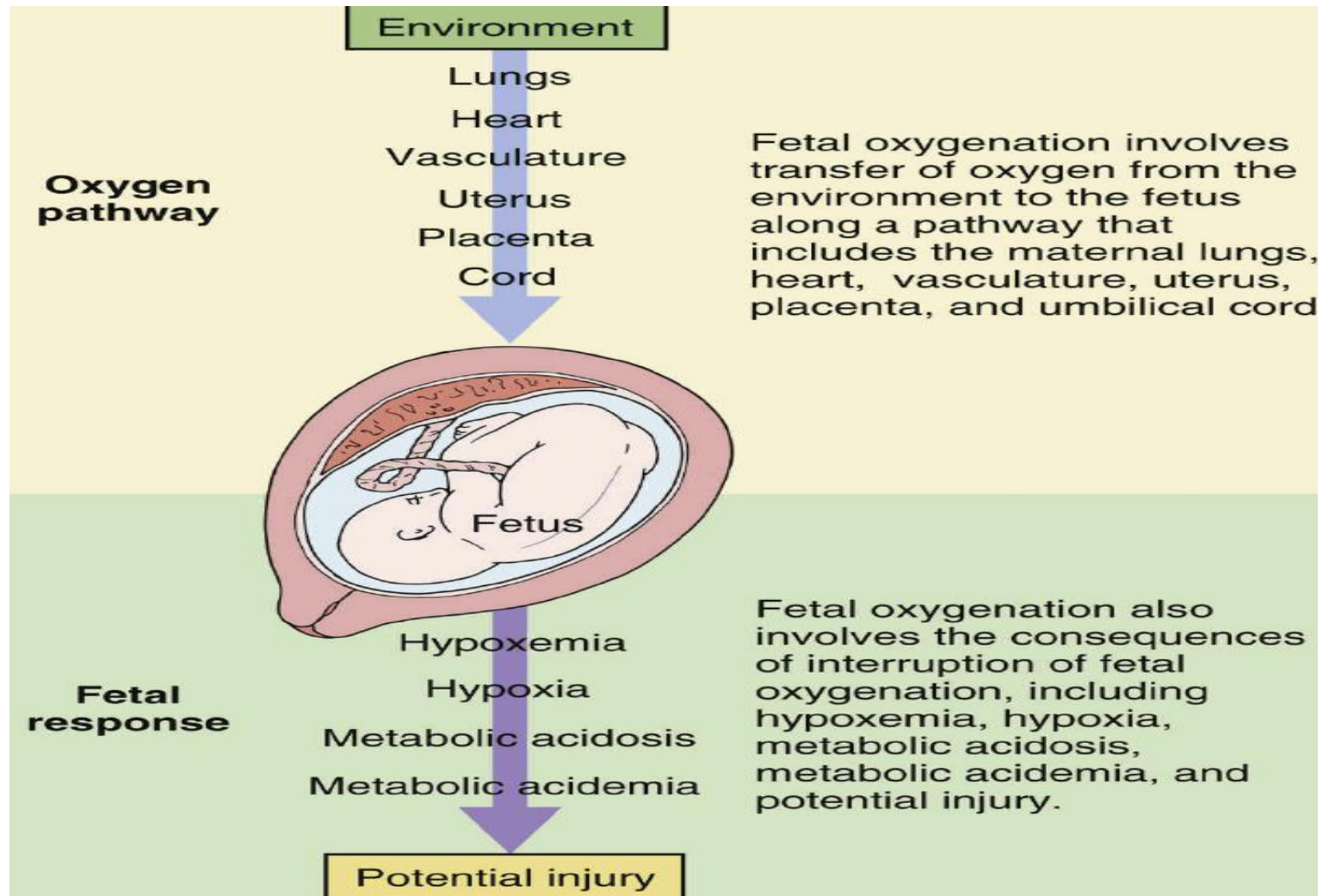
At the end of this session you are expected to know

- Goal of intrapartum fetal FHR monitoring
- The oxygen pathway
- Fetal response to interrupted oxygen transfer
- Interpretation of electronic FHR monitoring and management of abnormal FHR tracing
- Category fetal heart rate tracings

Introduction

- The goal of intrapartum FHR monitoring is to assess the adequacy of fetal oxygenation during labor so that timely and appropriate steps can be taken when necessary to avoid fetal hypoxic injury.
- The FHR monitor provides reliable information regarding interruption of the oxygen pathway.

The Oxygen pathway



- Normal labor consists of uterine contractions which intermittently interrupt the transplacental passage of oxygen from the mother to the fetus.
- These brief episodes are well tolerated in most labors
- However, in a small number of cases, severe oxygen deficiency may occur and result in fetal hypoxic injury or even death.

Cont...

- Many causes of fetal injury are not related to intrapartum interruption in fetal oxygenation
- Fetal monitoring is commonly employed to assess the adequacy of fetal oxygenation during labor.
- Evidence of the interruption of fetal oxygenation can alert the clinician as to the need for further evaluation and interventions to improve oxygen delivery to the fetus.
- The goal of such interventions is to prevent the potential consequences of fetal hypoxia.

Fetal response to interrupted oxygen transfer

- When oxygen is in short supply, tissues may be forced to switch from aerobic to anaerobic metabolism
- It generates energy less efficiently and results in the production of lactic acid.
- Accumulation of lactic acid in the tissues results in metabolic acidosis.
- *Respiratory acidemia vs metabolic acidemia*
- Respiratory acidemia is relatively common and clinically benign.

Mechanisms of Injury

- most cases of cerebral palsy (CP) are unrelated to intrapartum events and therefore cannot be prevented by modification of intrapartum mgt, including fetal heart rate (FHR) monitoring.
- It is important to recognize that even when significant metabolic acidemia is present, neonatal encephalopathy and fetal neurologic injury are uncommon.

Cont...

- Conditions such as epilepsy, mental retardation, and attention deficit/hyperactivity disorder do not result from intrapartum fetal hypoxia in the absence of CP.

Pattern recognition and interpretation

- The clinical application of electronic FHR monitoring consists of three independent elements:
 - (1) definition
 - (2) interpretation
 - (3) management(mgt)

- The 2008 NICHD consensus report concluded that moderate variability reliably predicts the absence of fetal metabolic acidemia at the time it is observed.
- However, minimal or absent variability doesn't confirm the presence of fetal metabolic acidemia or ongoing hypoxic injury.

Cont..

- It was also concluded that accelerations reliably predict the absence of fetal metabolic acidemia.
- However, the absence of accelerations doesn't confirm the presence of fetal metabolic acidemia or ongoing hypoxic injury.
- Accelerations can be provoked with a variety of methods that include vibroacoustic stimulation, transabdominal halogen light stimulation, and direct fetal scalp stimulation.
- Accelerations provoked by external stimuli have the same clinical significance as spontaneous accelerations

Cont...

- **Early decelerations**

- are not associated with interruption of fetal oxygenation or adverse neonatal outcome
- are considered clinically benign.

- **Late deceleration**

- a reflex fetal response to transient hypoxemia during a uterine contraction.

...Late deceleration

- May result from direct hypoxic myocardial depression during a contraction
- Regardless of the underlying mechanism, all late decelerations reflect interruption of oxygen transfer from the env't to the fetus at one or more points along the oxygen pathway

- **Variable decelerations**

- represent a fetal autonomic reflex response to transient mechanical compression or stretch of the umbilical cord.

- **Prolonged deceleration**

- reflects interruption of oxygen transfer from the env't to the fetus at one or more points along the oxygen pathway.

- Although the pathophysiologic mechanism of a **sinusoidal pattern** is unknown, this pattern is classically associated with severe fetal anemia.

Standard Fetal Heart Rate Definitions

Pattern	Definition
Baseline	<p>Mean FHR rounded to increments of 5 beats/min in a 10-min window, excluding accelerations, decelerations, and periods of marked FHR variability (>25 beats/min). There must be at least 2 min of identifiable baseline segments (not necessarily contiguous) in any 10-min window or the baseline for that period is indeterminate.</p> <ul style="list-style-type: none"> • Normal baseline FHR range 110 to 160 beats/min • Tachycardia is defined as an FHR baseline >160 beats/min • Bradycardia is defined as an FHR baseline <110 beats/min
Variability	<p>Fluctuations in the FHR baseline are irregular in amplitude and frequency and are visually quantitated as the amplitude of the peak to the trough in beats per minute.</p> <ul style="list-style-type: none"> • Absent—amplitude range undetectable • Minimal—amplitude range detectable but ≤ 5 beats/min • Moderate (normal)—amplitude range 6 to 25 beats/min • Marked—amplitude range >25 beats/min
Accelerations	<p>Abrupt increase (onset to peak <30 sec) in the FHR from the most recently calculated baseline. At ≥ 32 weeks, an acceleration peaks ≥ 15 beats/min above baseline and lasts ≥ 15 sec but <2 min. At <32 weeks, acceleration peaks ≥ 10 beats/min above baseline and lasts ≥ 10 sec but <2 min.</p> <p>Prolonged acceleration lasts ≥ 2 min but <10 min.</p> <p>Acceleration ≥ 10 min is a baseline change.</p>
Early	<p>Gradual (onset to nadir ≥ 30 sec) decrease in FHR during a uterine contraction.</p> <p>Onset, nadir, and recovery of the deceleration occur at the same time as the beginning, peak, and end of the contraction, respectively.</p>
Late	<p>Decrease in FHR is gradual (onset to nadir ≥ 30 sec) during a uterine contraction.</p> <p>Onset, nadir, and recovery of the deceleration occur after the beginning, peak, and end of the contraction, respectively.</p>
Variable	Decrease in the FHR is abrupt (onset to nadir <30 sec) and ≥ 15 beats/min below the baseline and lasting ≥ 15 sec but less than 2 min.
Prolonged	Deceleration is ≥ 15 beats/min below baseline and lasts ≥ 2 min or more but <10 min. Deceleration ≥ 10 min is a baseline change.
Sinusoidal pattern	Pattern in FHR baseline is smooth, sine wave-like, and undulating with a cycle frequency of 3 to 5/min that persists for at least 20 min.

Approach to FHR management

Assess the Oxygen Pathway

- Vital signs
- Uterine activity
- Suspected uterine rupture or placental abruption requires immediate attention and targeted evaluation.
- Umbilical cord prolapse usually can be excluded by visualization or examination.

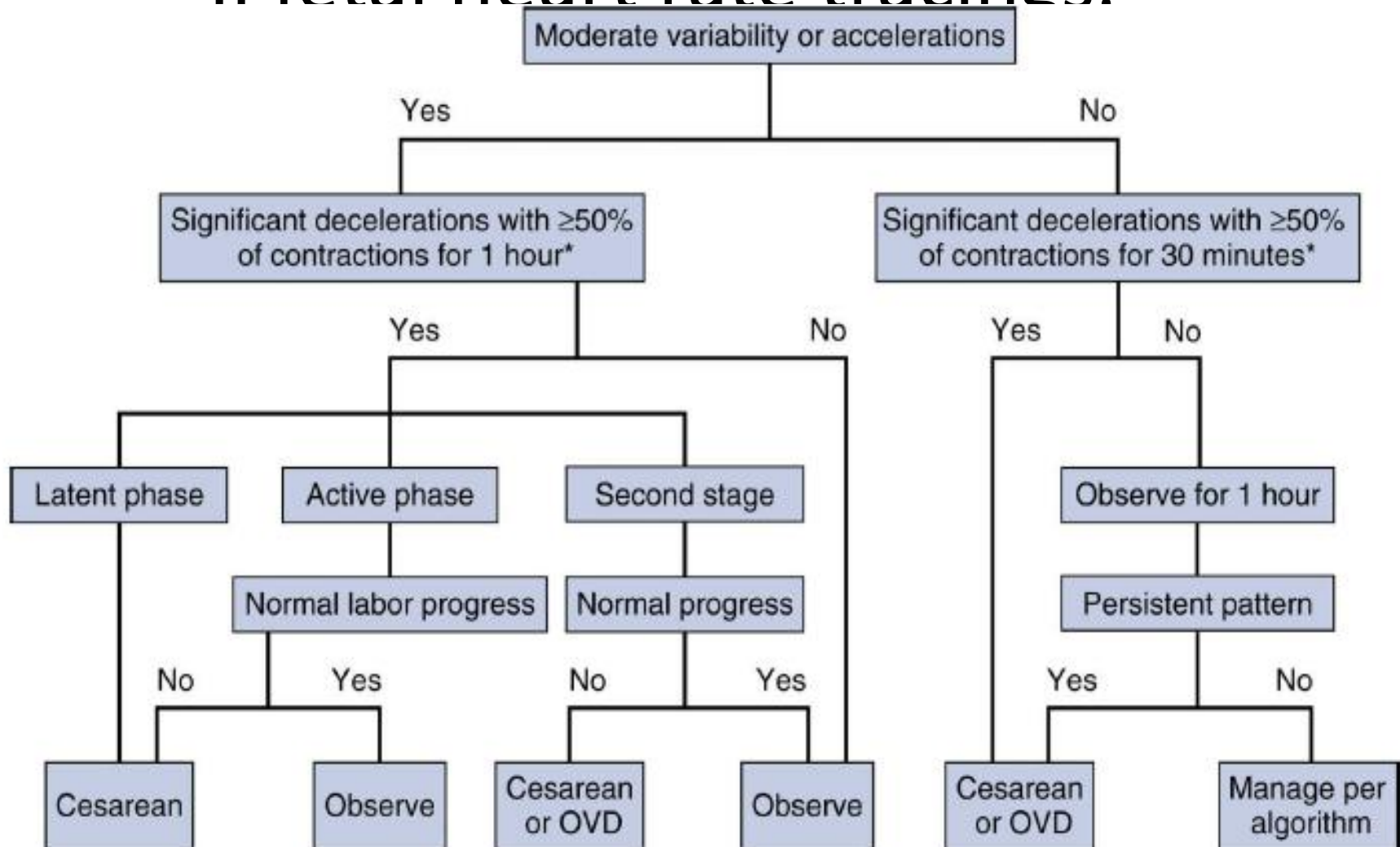
Begin corrective measures as indicated

- The choice of appropriate corrective measures is based on interpretation of the FHR tracing as a whole.
- These include
 - supplemental oxygen
 - maternal position changes
 - IV fluid administration
 - reduction of uterine activity, and amnioinfusion.

Cont...

- The tracing should be reevaluated after corrective measures.
- The decision to perform routine or heightened surveillance is based on clinical judgment.
- If the FHR progresses to category 3, despite corrective measures, delivery is expedited as quickly as possible.
- Tracings that remain in category 2 warrant additional evaluation

Algorithm for management of category II fetal heart rate tracings.



Umbilical Cord Blood Gas Determination

- No contraindications exist to obtaining cord gases
- The ACOG Committee on obstetric practice recommends that physicians should attempt to obtain umbilical venous and arterial blood samples in the following situations:
 - cesarean delivery for fetal compromise
 - low 5-minute Apgar
 - severe intrauterine growth restriction
 - abnormal FHR tracing
 - maternal thyroid disease
 - intrapartum fever, and multiple gestations.

Limitations of Electronic Fetal Monitoring

- Electronic FHR monitoring is not a diagnostic test for hypoxic neurologic injury
- It is a screening test that detects *transient* intrapartum interruption of fetal oxygenation.

Postpartum family planning

- Objective of this session to discuss postpartum contraception options, timing of method initiation and breast feeding consideration

Postpartum family planning

- Focuses on the prevention of unintended and closely spaced pregnancies through the first 12 months following childbirth.
- The recommended interval before attempting the next pregnancy after live birth, is at least 24months.
- This intervals reduce the risk of adverse maternal, perinatal and infant outcomes

Postpartum contraception options(timing of method initiation and breast feeding consideration)

Copper IUD

Can be inserted immediately or up to 48hrs after birth or any time after 4 weeks PP

Female sterilization(FS)

Can be performed immediately or up to 4 days after delivery or any time after 6 weeks PP

For non breast feeding women

- in addition to IUD & FS ,Progesterone only methods can be initiated immediately following birth
- COC can be initiated starting 3 weeks after birth

Cont...

- **For breast feeding women**
 - all progesterone only methods can be initiated at 6 weeks following birth
 - COC cannot be initiated until 6 months after birth
- All women, breast feeding or not, can initiate use of condoms immediately after birth, emergency contraceptive after 4 wks and the diaphragm or cervical cap after 6wks

- Read WHO and other guidelines on PP family planning
-END.....