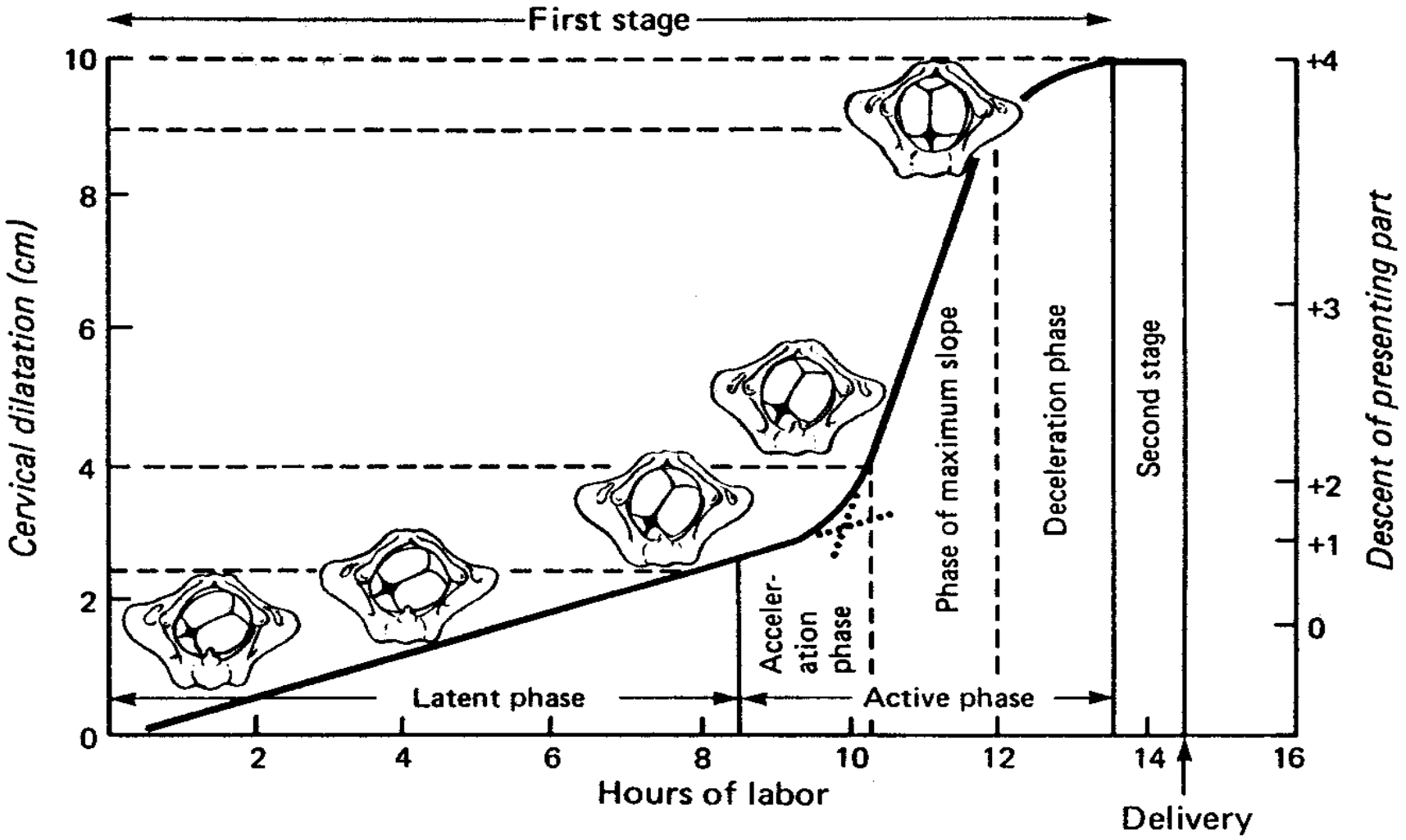
Labour Management

Clerkship Seminar Week 1

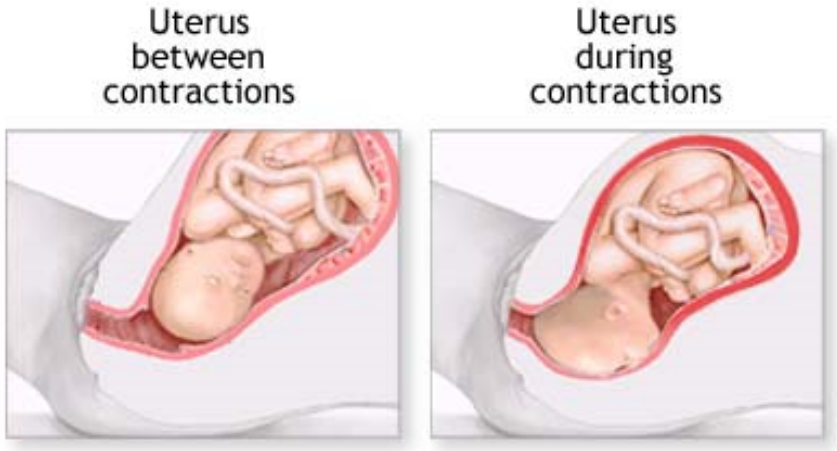
University of Western Ontario

Labour and Birth



First Stage of Labour

- Definition:
  - Onset of labour
    - →full dilatation
- Latent phase: 0-4 cm
- Active phase: 4-10 cm



A.D.A.M.

- True Labour: regular uterine contractions causing progressive cervical dilation

Describe FHR Patterns

Heart rate

- Baseline
  - Normal 120-160 beats per minute (bpm)
  - Tachycardia >160 bpm
  - Bradycardia <120 bpm
- Accelerations
  - > 10 bpm from baseline
- Decelerations
  - > 10 bpm from baseline
- Type of decelerations
  - Early, late, variable or mixed-pattern decelerations
- Baseline variability
  - + or – 5 bpm

First Stage of Labour

- Fetal Heart Rate (FHR) Monitoring
  - Intermittent:
    - q 15 min 1st stage / q 5 min 2nd stage
  - Continuous (CEFM) :
    - Meconium staining of amniotic fluid (MSAF)
    - High risk – Preeclampsia, bleeding, abN FHR
    - Induction / Augmentation – Syntocinon
    - VBAC (Vaginal Birth After Caesarean)
    - *Maternal, fetal or placental risk factors for adverse pregnancy outcomes ?

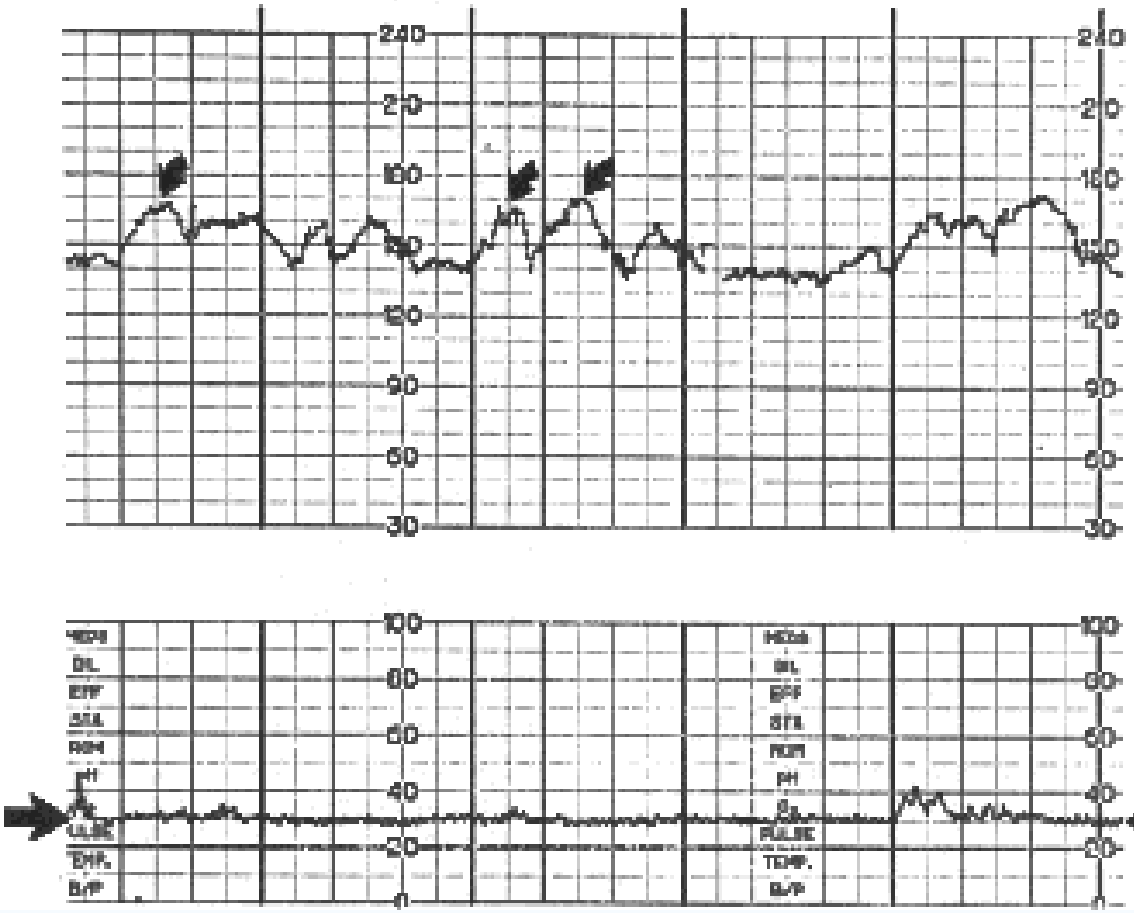
Table 12. Antenatal and intrapartum conditions associated with increased risk of adverse fetal outcome* where intrapartum electronic fetal surveillance may be beneficial

Antenatal	
Maternal	Hypertensive disorders of pregnancy
	Pre-existing diabetes mellitus/Gestational diabetes
	Antepartum hemorrhage
	Maternal medical disease: cardiac, anemia, hyperthyroidism, vascular disease and renal disease
	Maternal MVA/trauma
	Morbid obesity
Fetal	Intrauterine growth restriction
	Prematurity
	Oligohydramnios
	Abnormal umbilical artery Doppler velocimetry
	Isoimmunization
	Multiple pregnancy
	Breech presentation
Intrapartum	
Maternal	Vaginal bleeding in labour
	Intrauterine infection/chorioamnionitis
	Previous Caesarean section
	Prolonged membrane rupture > 24 hours at term
	Induced labour
	Augmented labour
	Hypertonic uterus
	Preterm labour
	Post-term pregnancy (> 42 weeks)
Fetal	Meconium staining of the amniotic fluid
	Abnormal fetal heart rate on auscultation

*Adverse fetal outcome: cerebral palsy, neonatal encephalopathy, and perinatal death.

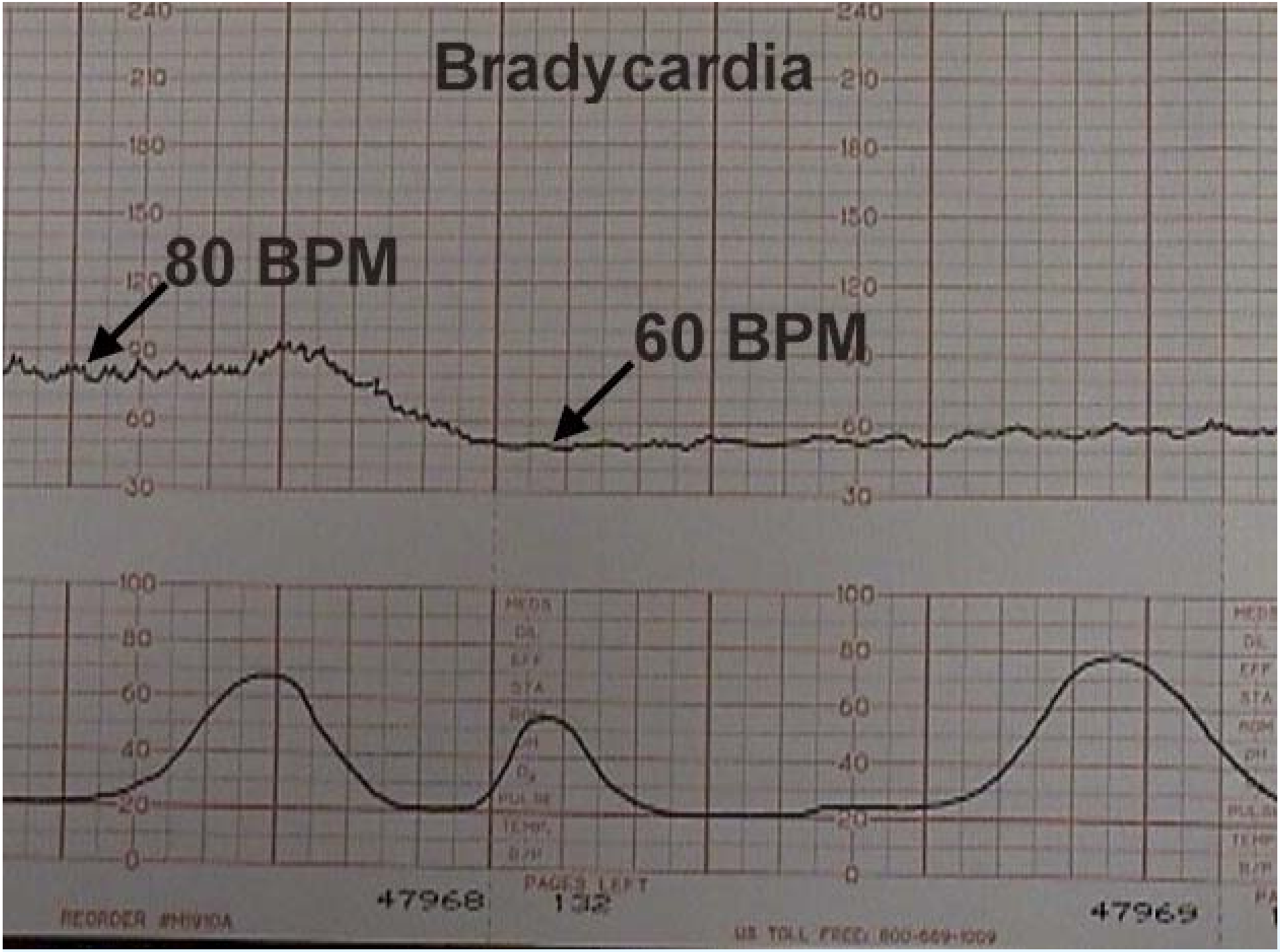
Adapted from RCOG Evidence-based Clinical Guideline Number 8, May 2001. The use of electronic fetal monitoring.[7]

Fetal Wellbeing in Labour



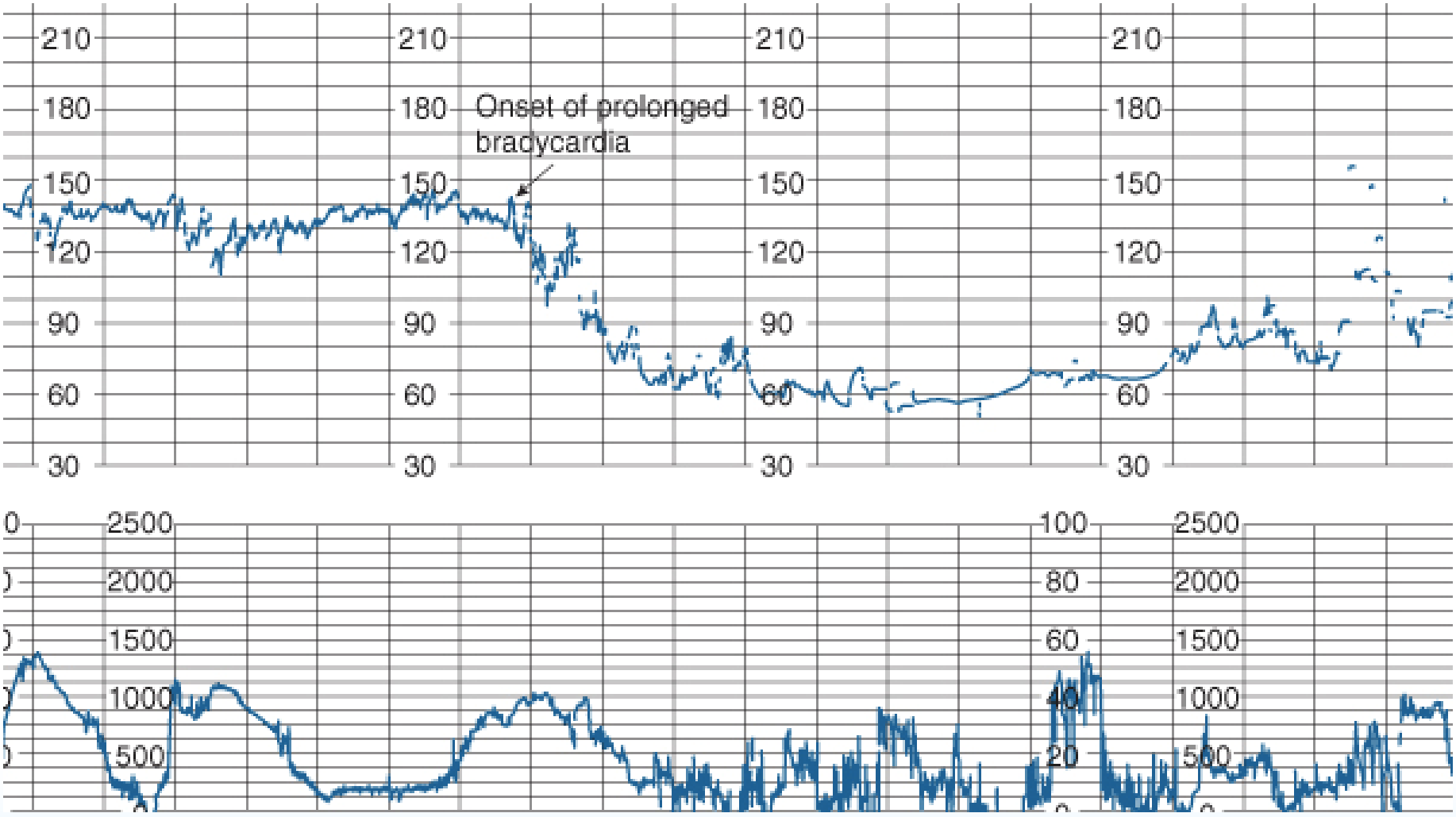
- Baseline FHR
- Accelerations
- Decelerations
- Type of decelerations
- Baseline variability

- Contractions
- Frequency
- Amplitude
- Duration
- Baseline tone


Bradycardia
80 BPM
60 BPM
240
210
180
150
120
90
60
30
100
80
60
40
20
0
47968
47969
PAGE 3 LEFT
132
RECORDER #HV10A

Bradycardia	Maternal: Hypotension Drug responses Maternal position Connective tissue diseases with congenital heart block (e.g., systemic lupus erythematous) Fetal: Umbilical cord occlusion Fetal hypoxia/acidosis Vagal stimulation such as with chronic head compression or with vertex presentation, occipital posterior or transverse position Fetal cardiac conduction or structural defect

Cause ?


210
180
150
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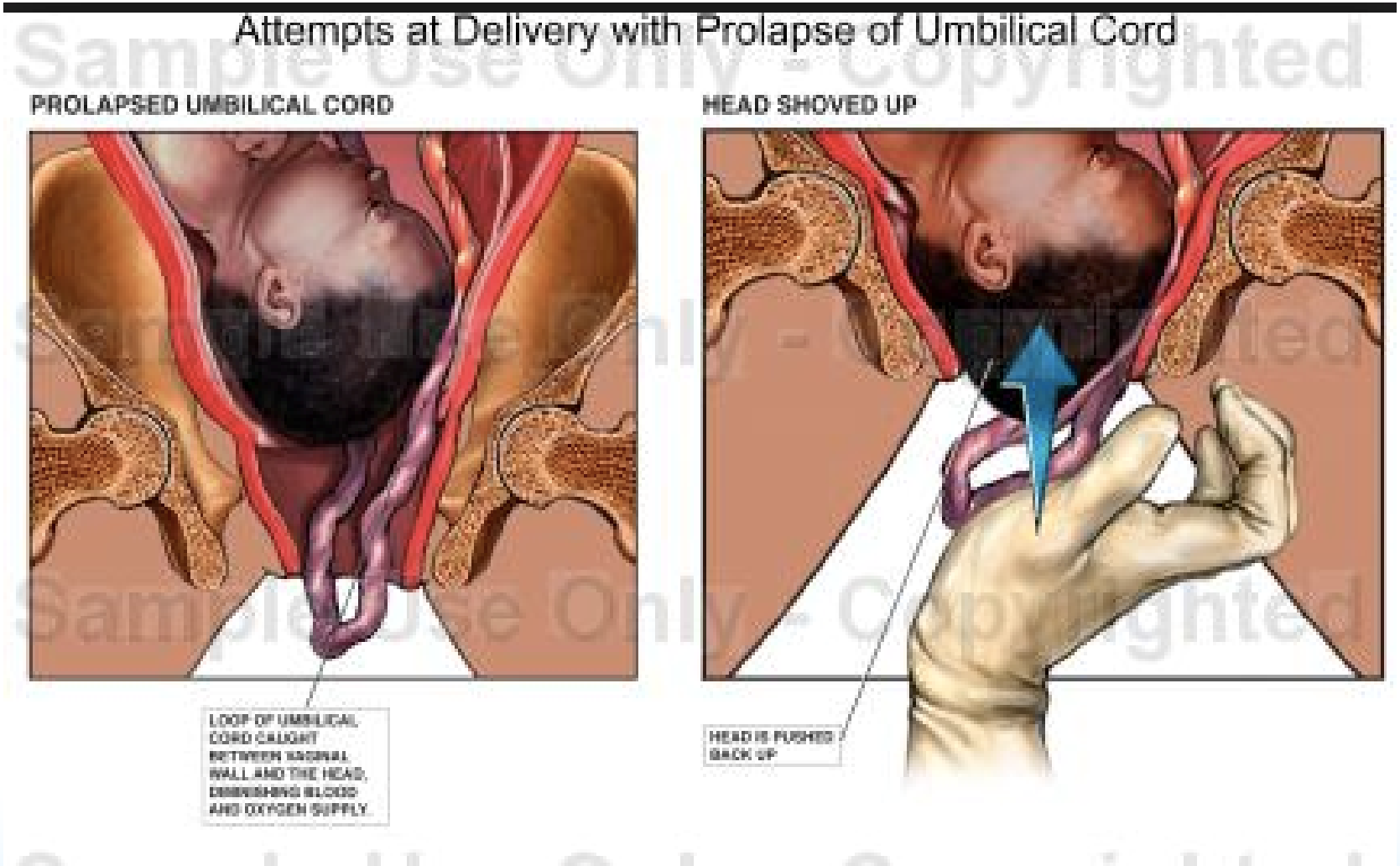
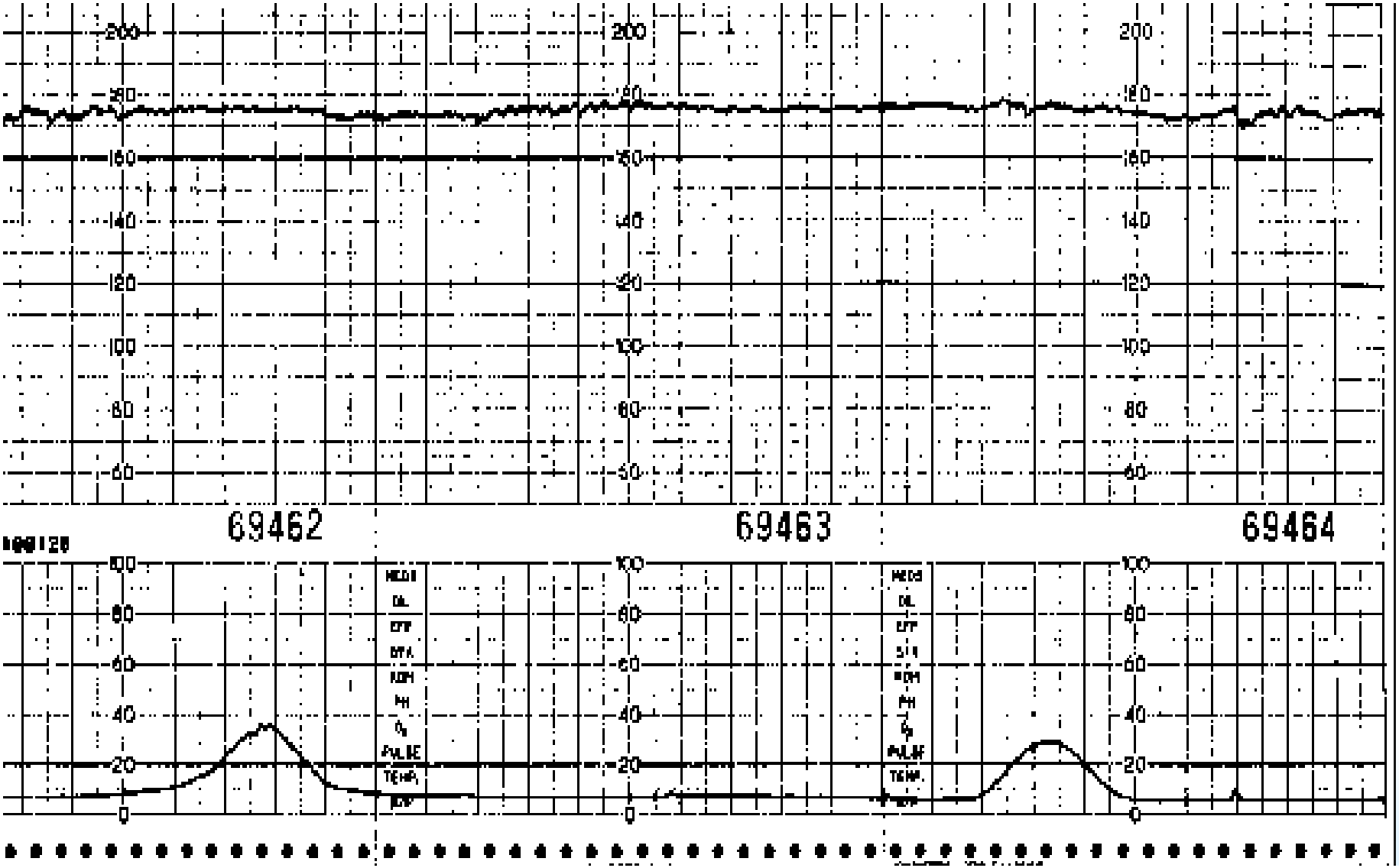
30
Onset of prolonged bradycardia
2500
2000
1500
1000
500
100
80
60
40
20

Cord prolapse

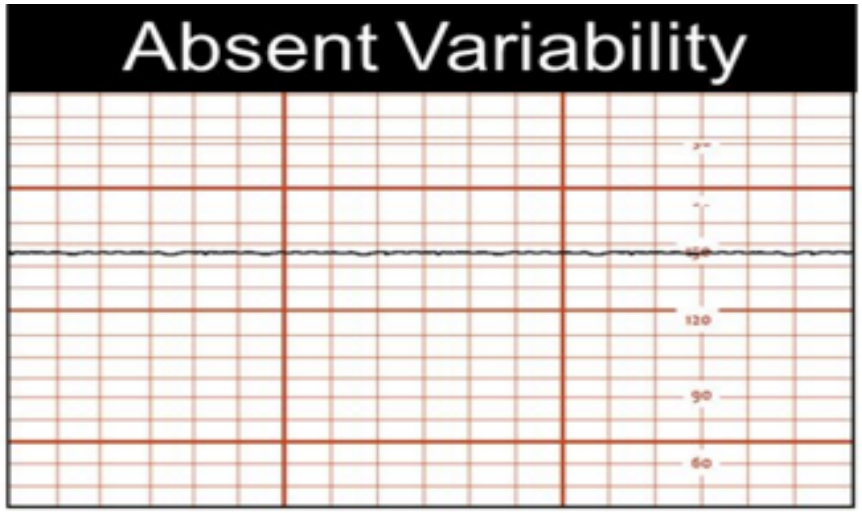


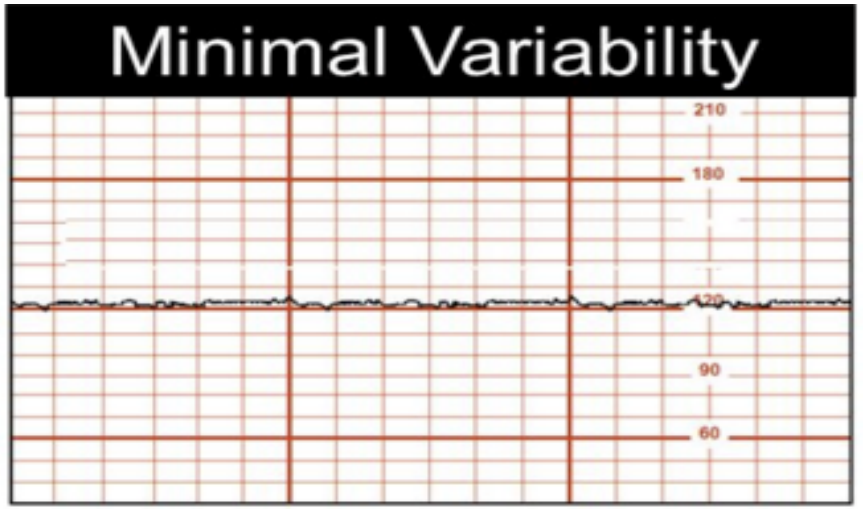
Fetal tachycardia

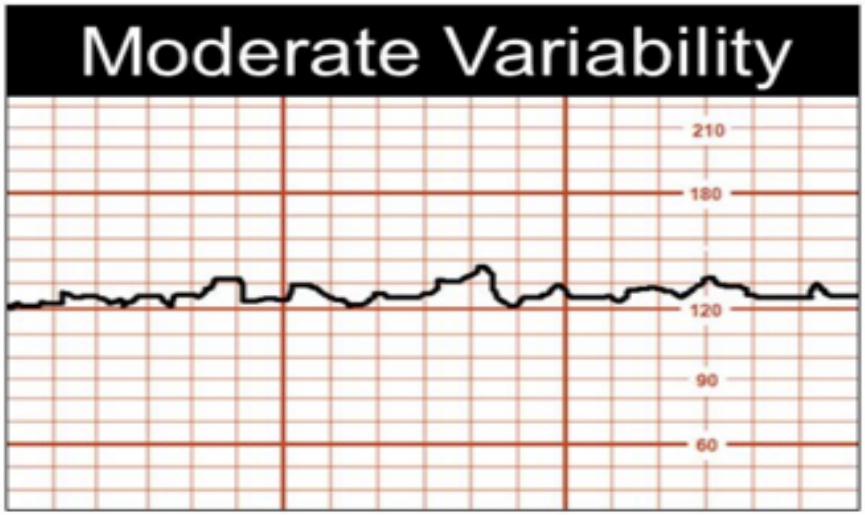


Tachycardia	Maternal: Fever Infection Dehydration Hyperthyroidism Endogenous adrenaline or anxiety Medication or drug response Anemia Fetal: Infection Prolonged fetal activity or stimulation Chronic hypoxemia Cardiac abnormalities Congenital anomalies Anemia

FHR variability is the result of integrated activity between the sympathetic and parasympathetic branches of the autonomic nervous system.







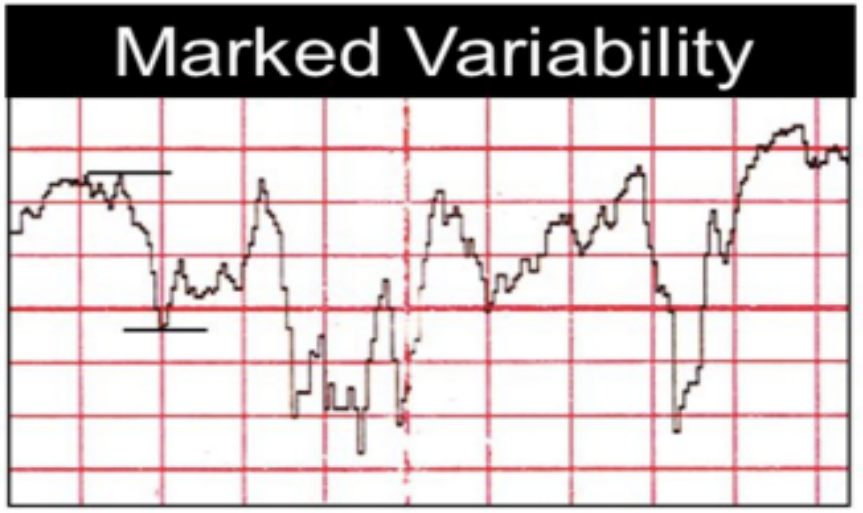


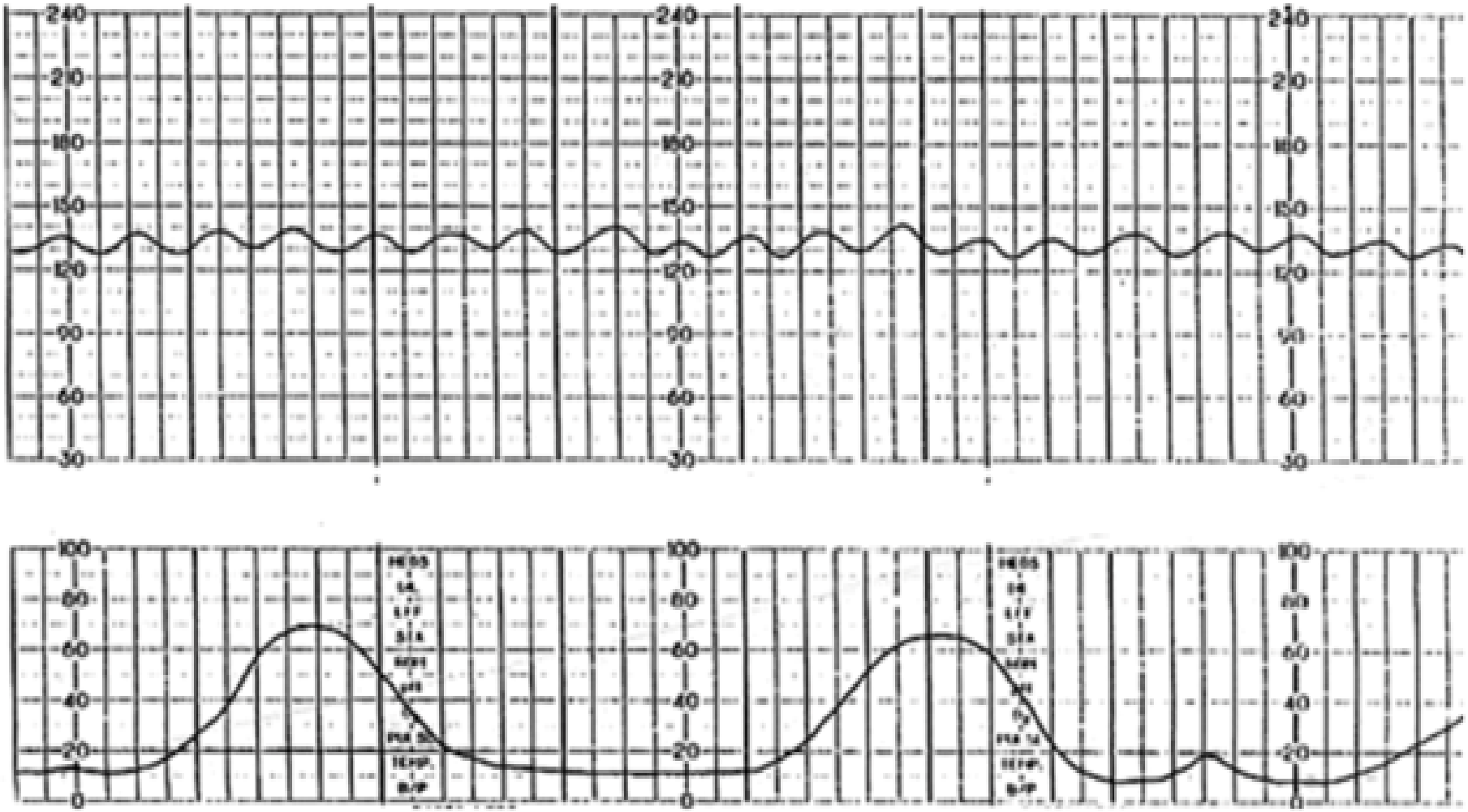
Table 14. Classification of variability

Range/Amplitude	Terminology
Undetectable	Absent
≤ 5 bpm	Minimal
6 to 25 bpm	Moderate
> 25 bpm	Marked

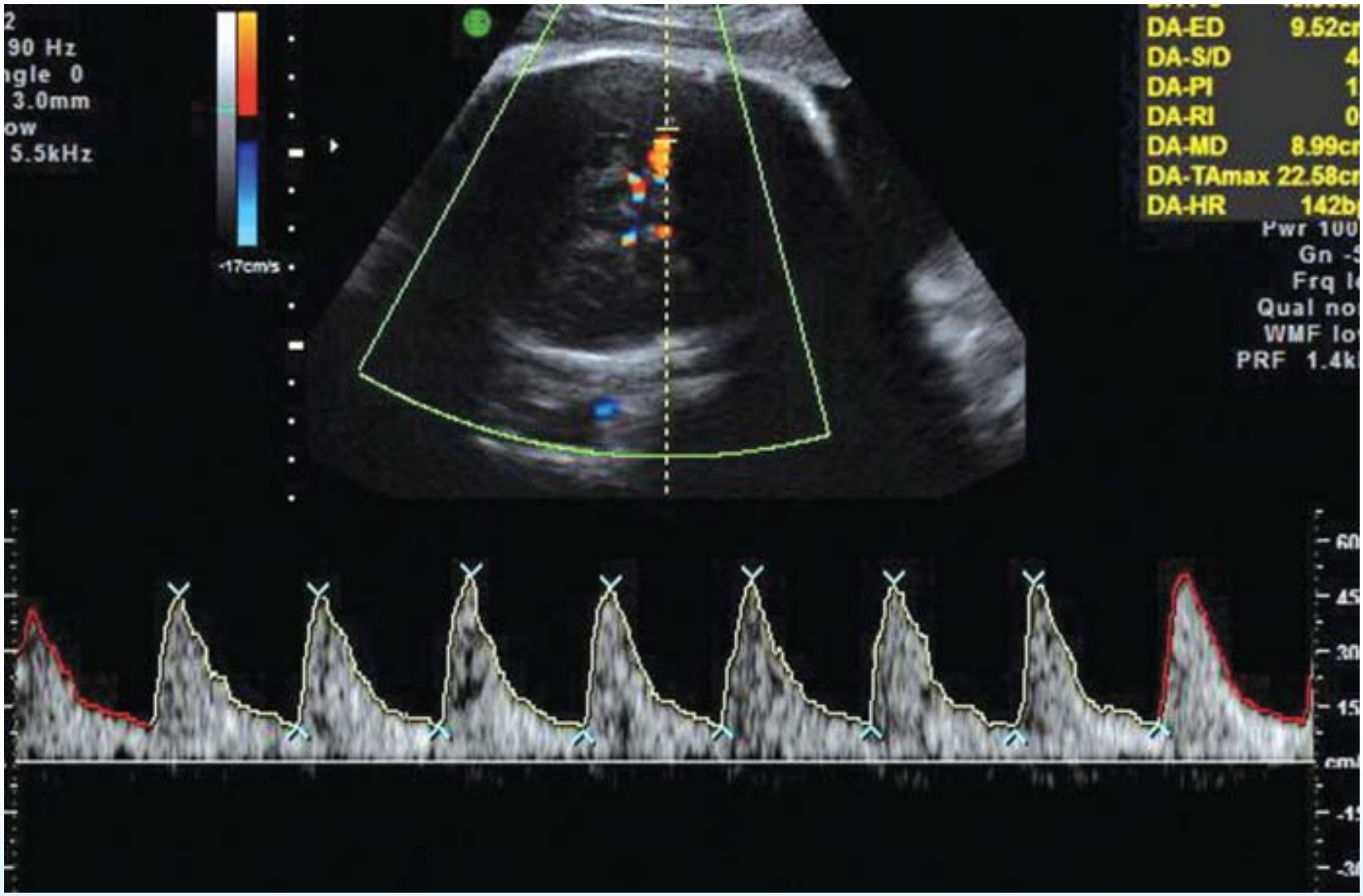
Minimal/absent Variability	Fetal sleep Prematurity Medications (analgesia, sedatives) Hypoxic acidemia
Marked Variability	Mild hypoxia Fetal gasping Unknown
Sinusoidal pattern	Severe fetal anemia (Hb < 70) Tissue hypoxia in fetal brain stem
Absent accelerations with fetal scalp stimulation or absent accelerations	Hypoxic acidemia Possible fetal abnormality

What FHR pattern would you expect in this fetus ?

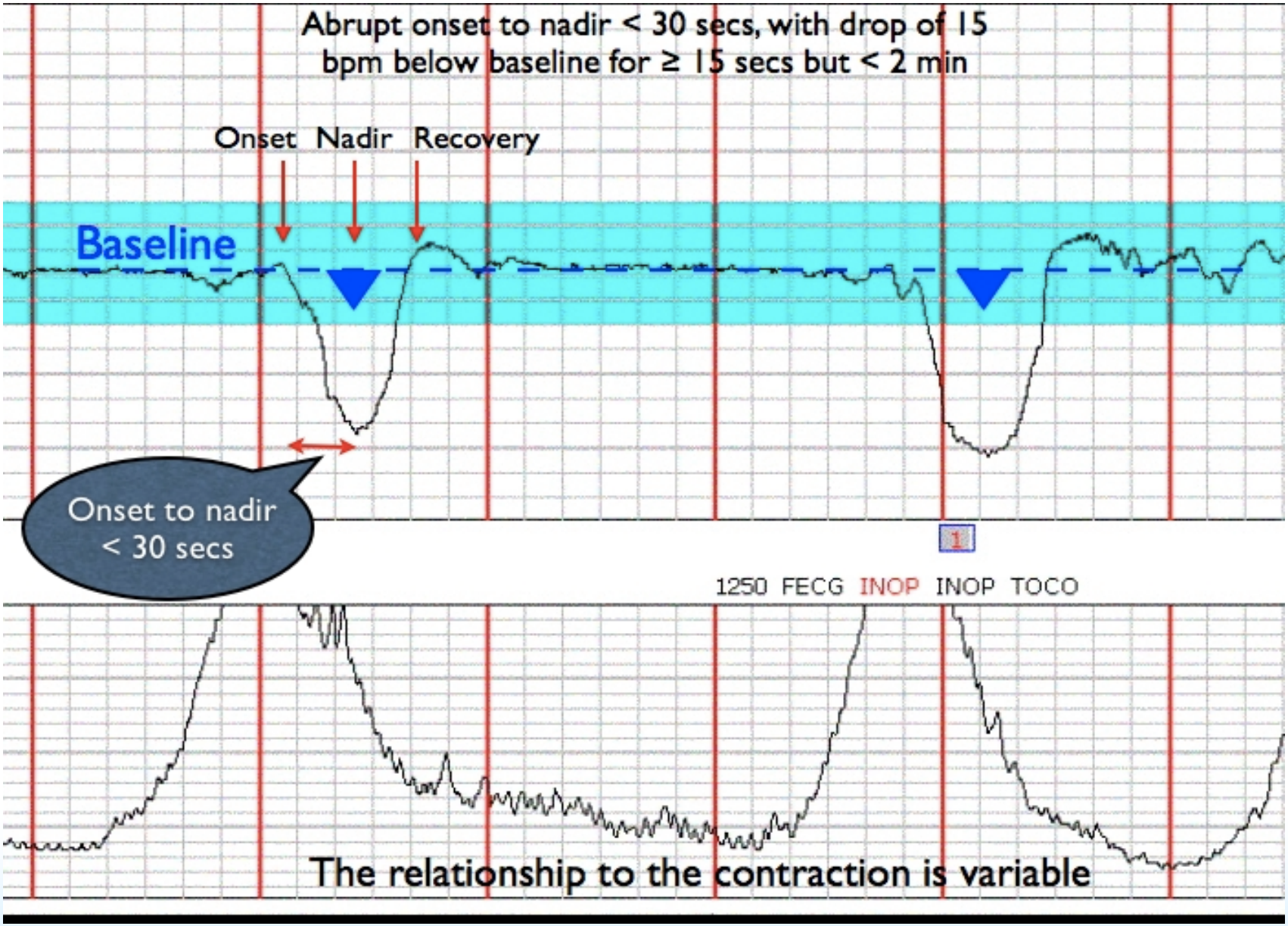
Sinusoidal pattern
Regular amplitude and frequency



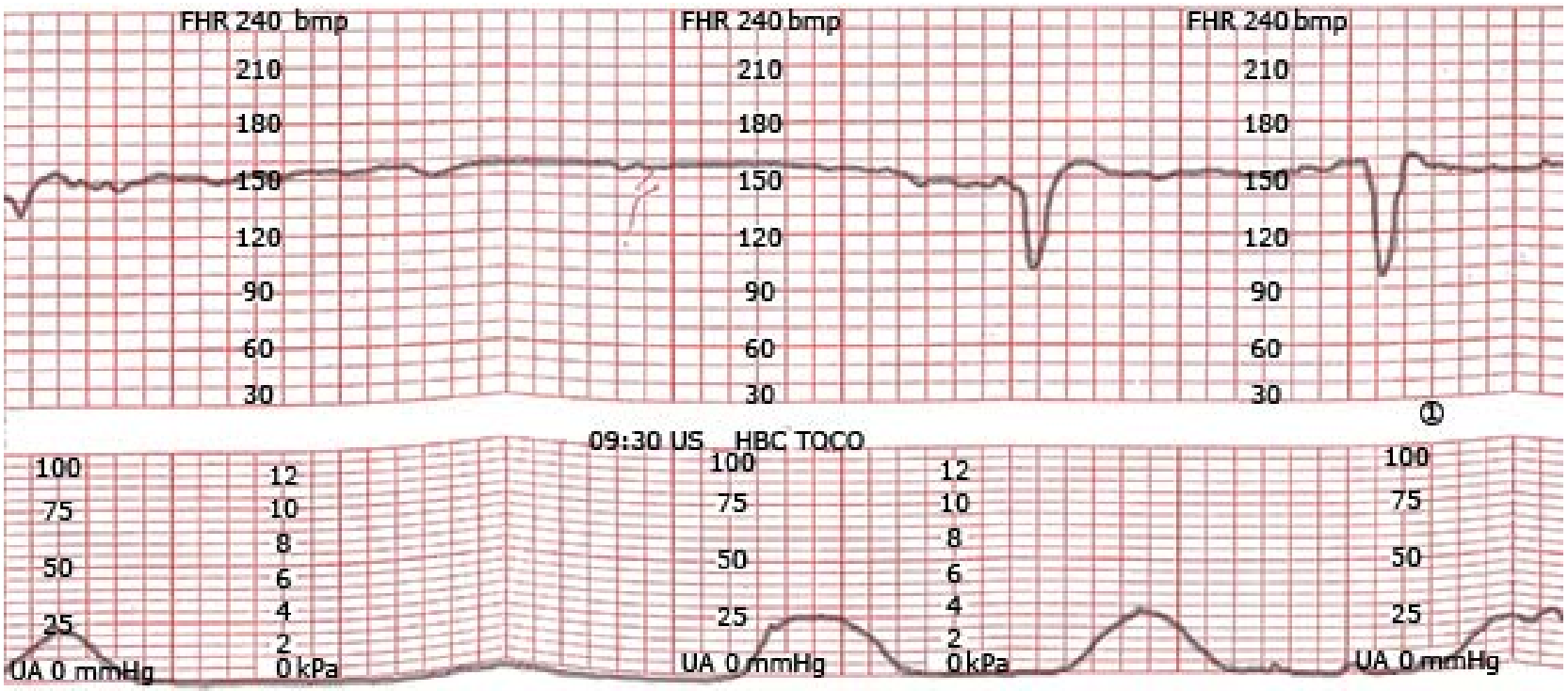
Fetal anemia
Hemolytic disease of fetus(Rh)



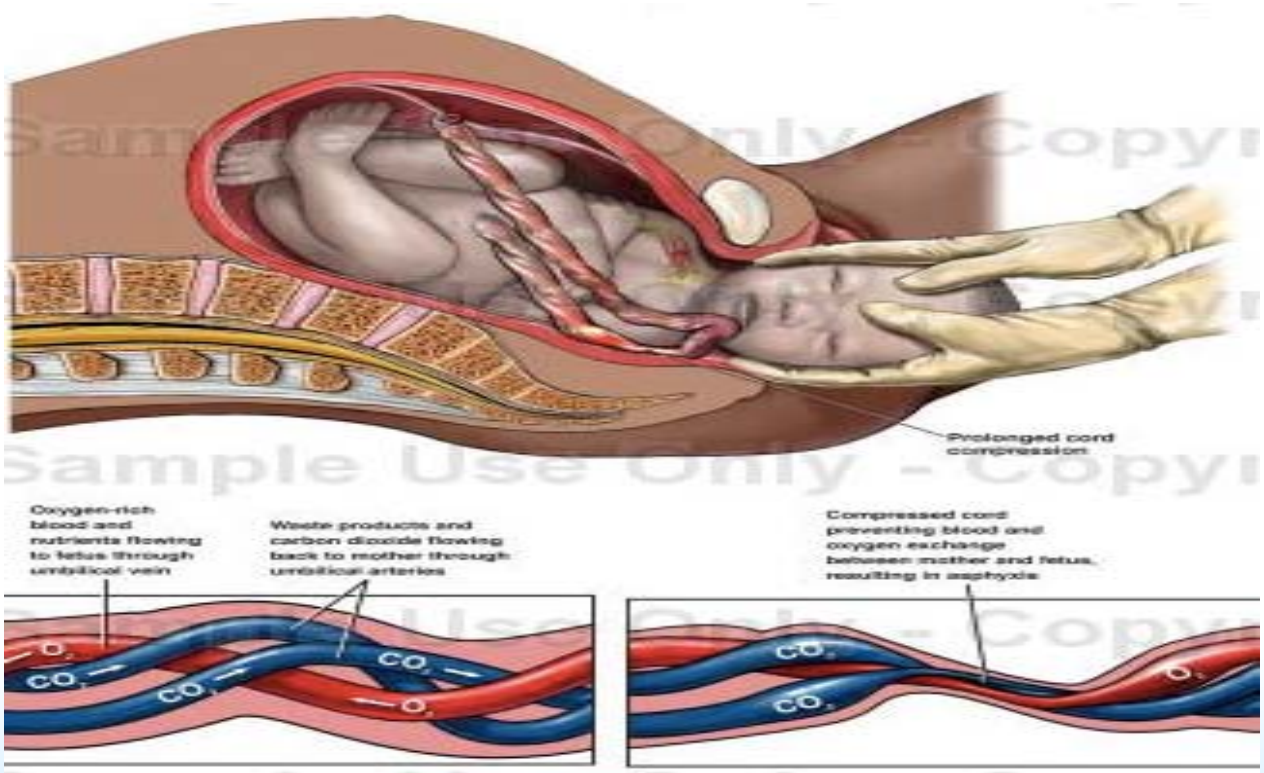
Variable decel



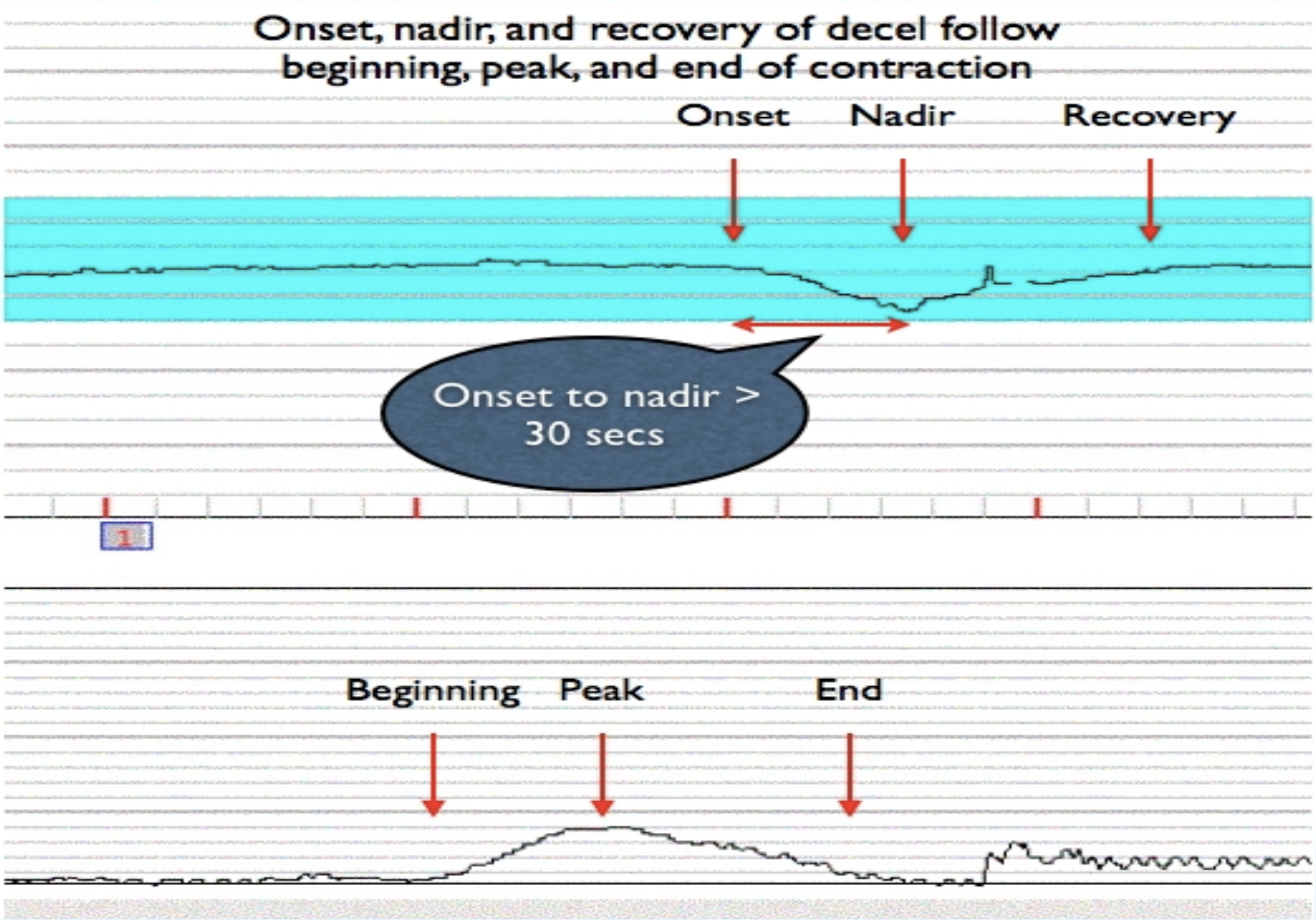
Variable deceleration



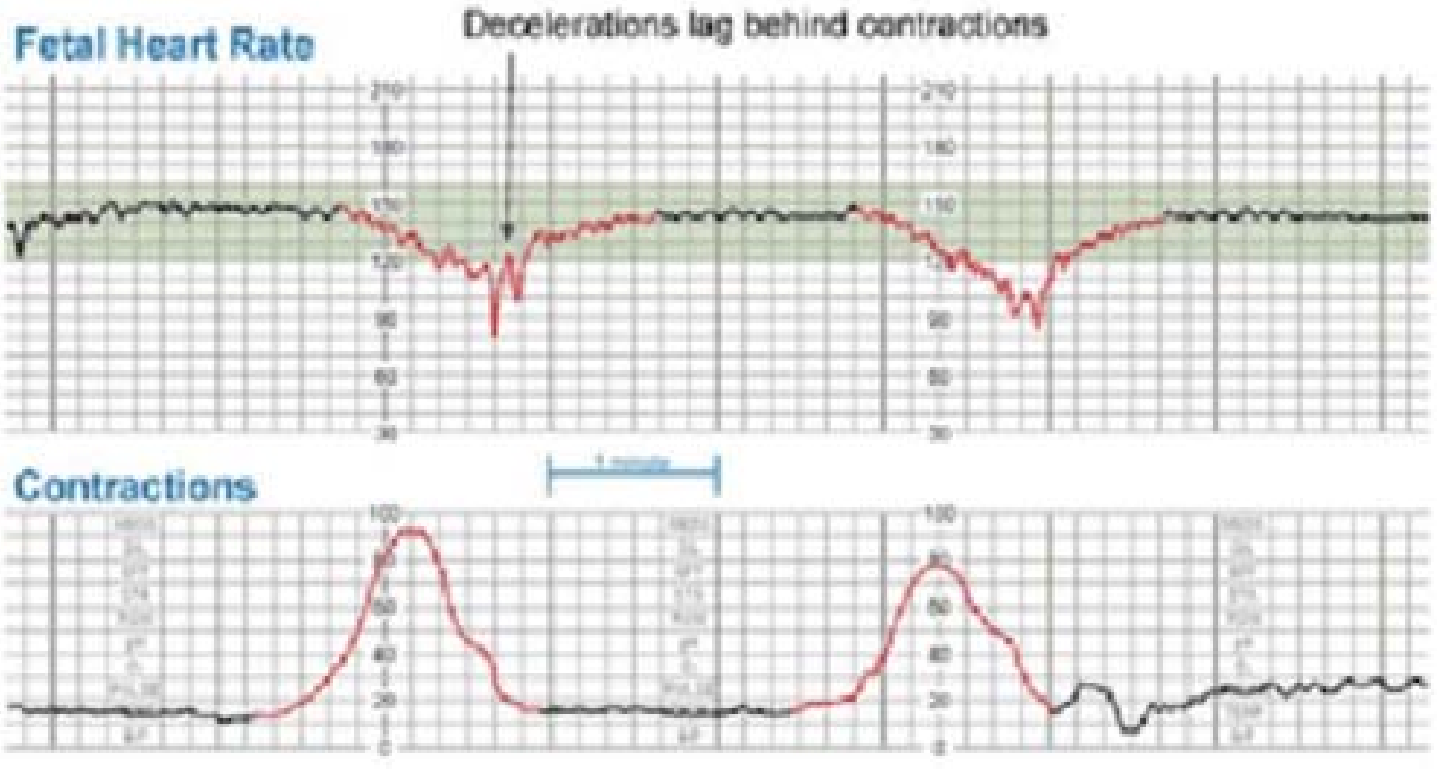
Variable decelerations	Associated with vagal stimulation due to cord compression. Complicated variable decelerations may be associated with fetal acidemia.



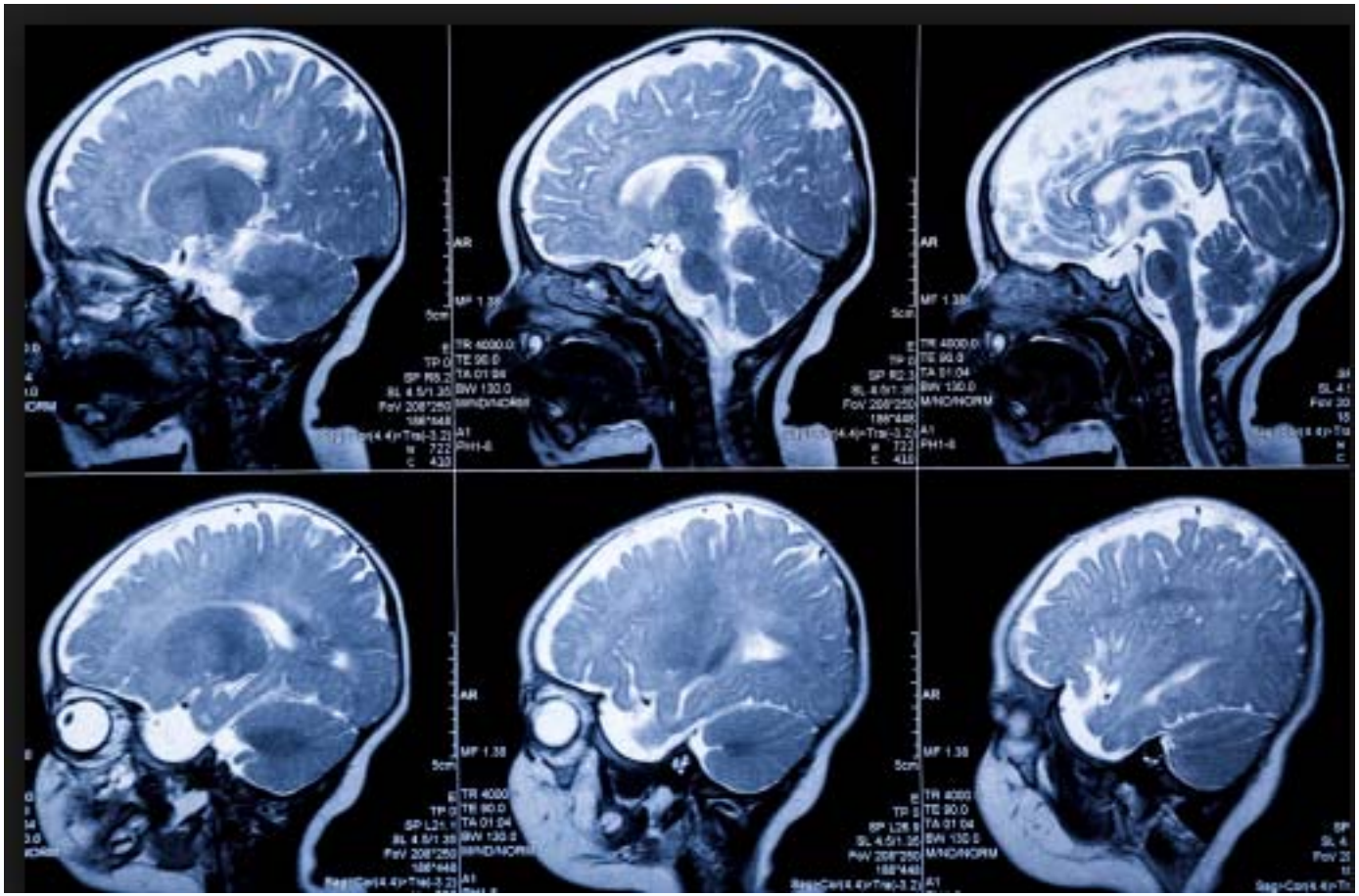
Late decel


Onset, nadir, and recovery of decel follow beginning, peak, and end of contraction
Onset
Nadir
Recovery
Onset to nadir > 30 secs
Beginning
Peak
End

Late decel


Fetal Heart Rate
Decelerations lag behind contractions
Contractions

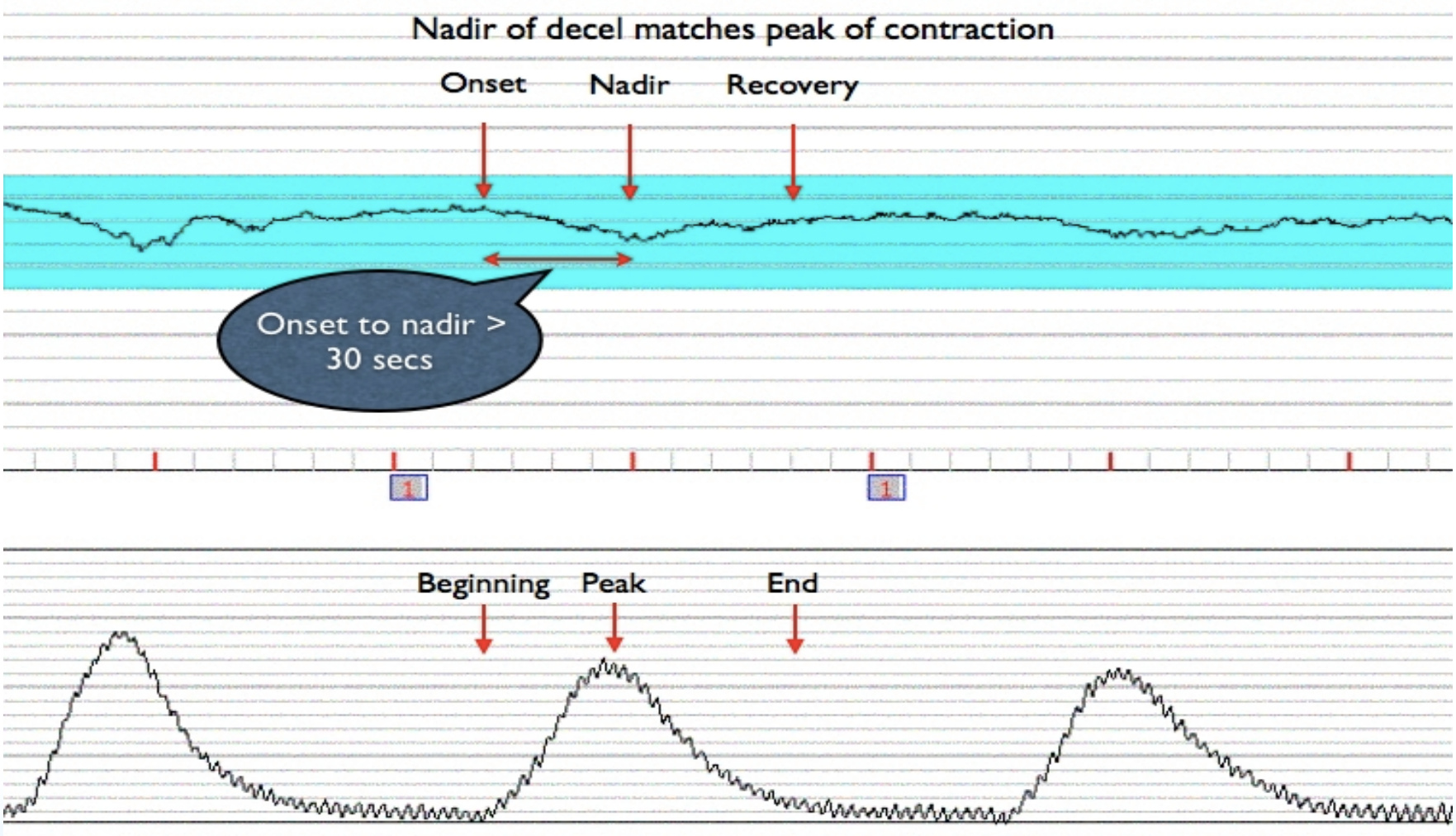
Fetal acidemia, hypoxia….



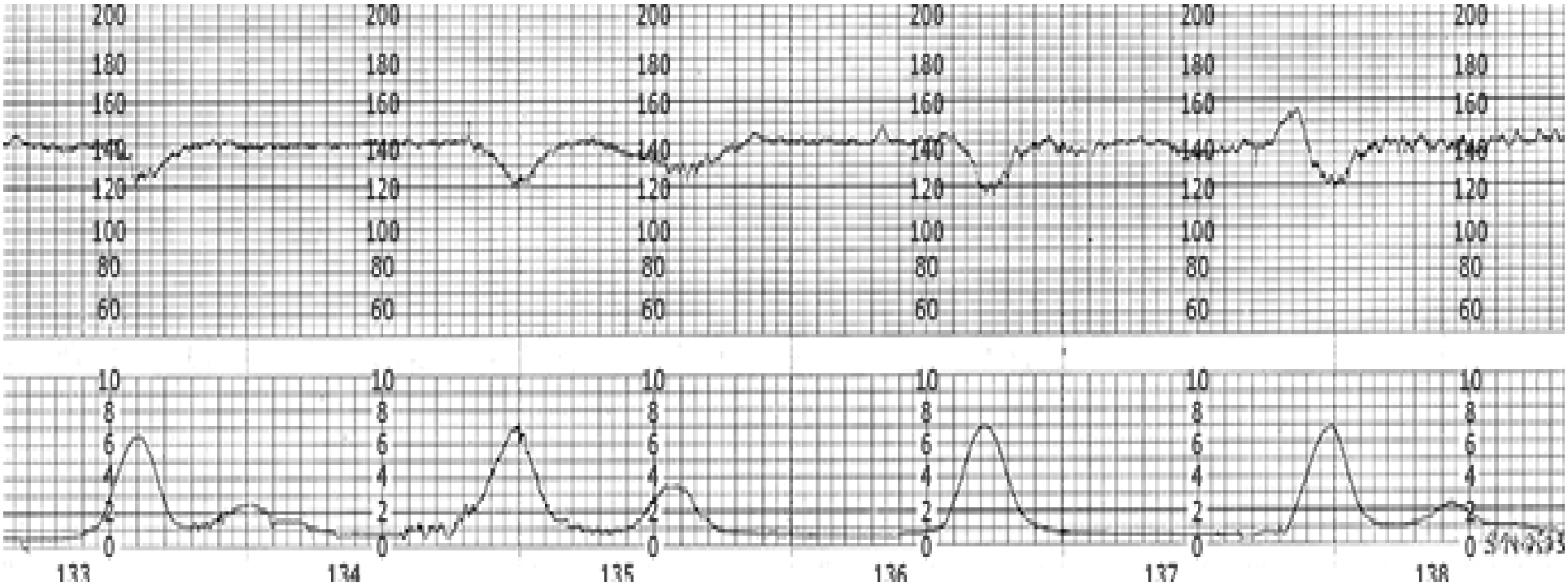
Fetal acidemia !!!

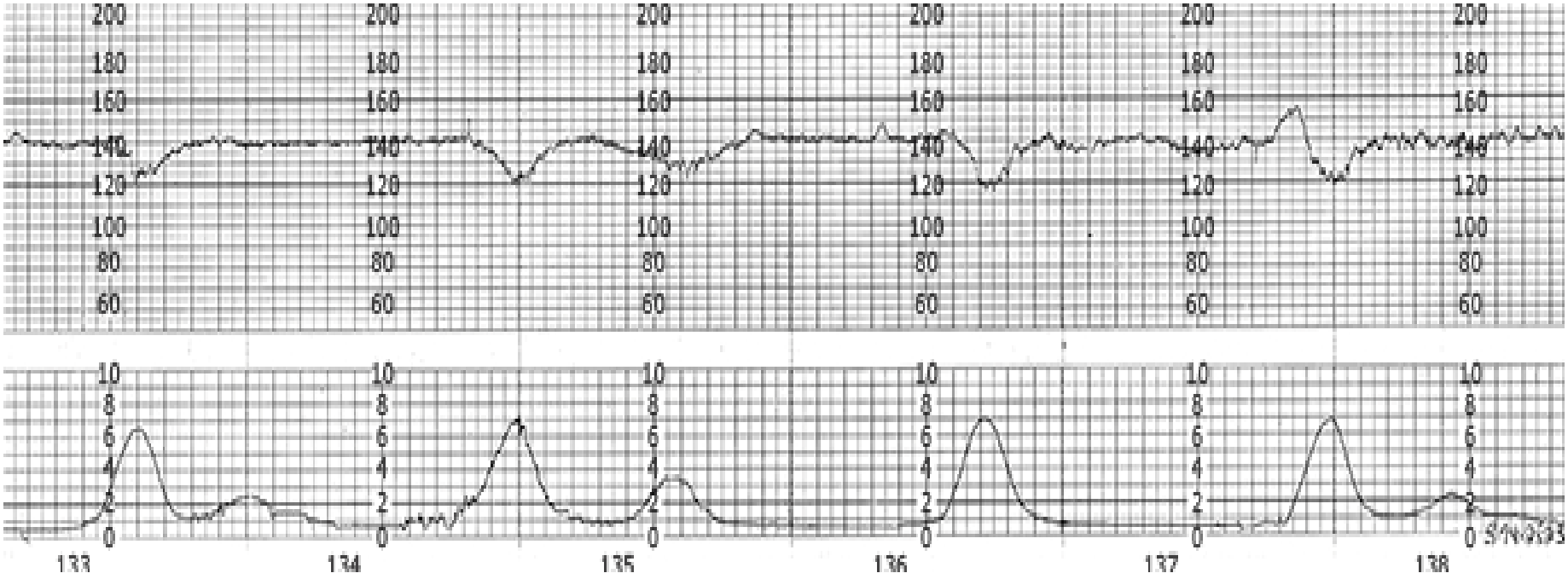
Late decelerations	Fetal chemoreceptor/vagal result due to decreased PO_2 Altered maternal blood flow to the placenta (e.g., maternal hypotension) Reduced maternal arterial oxygen saturation Placental changes altering maternal-fetal gas exchange (e.g., placental insufficiency, uterine hypertonus or tachysystole) May be associated with fetal acidemia

Early decel (mirror contraction)



Early decel




200
180
160
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120
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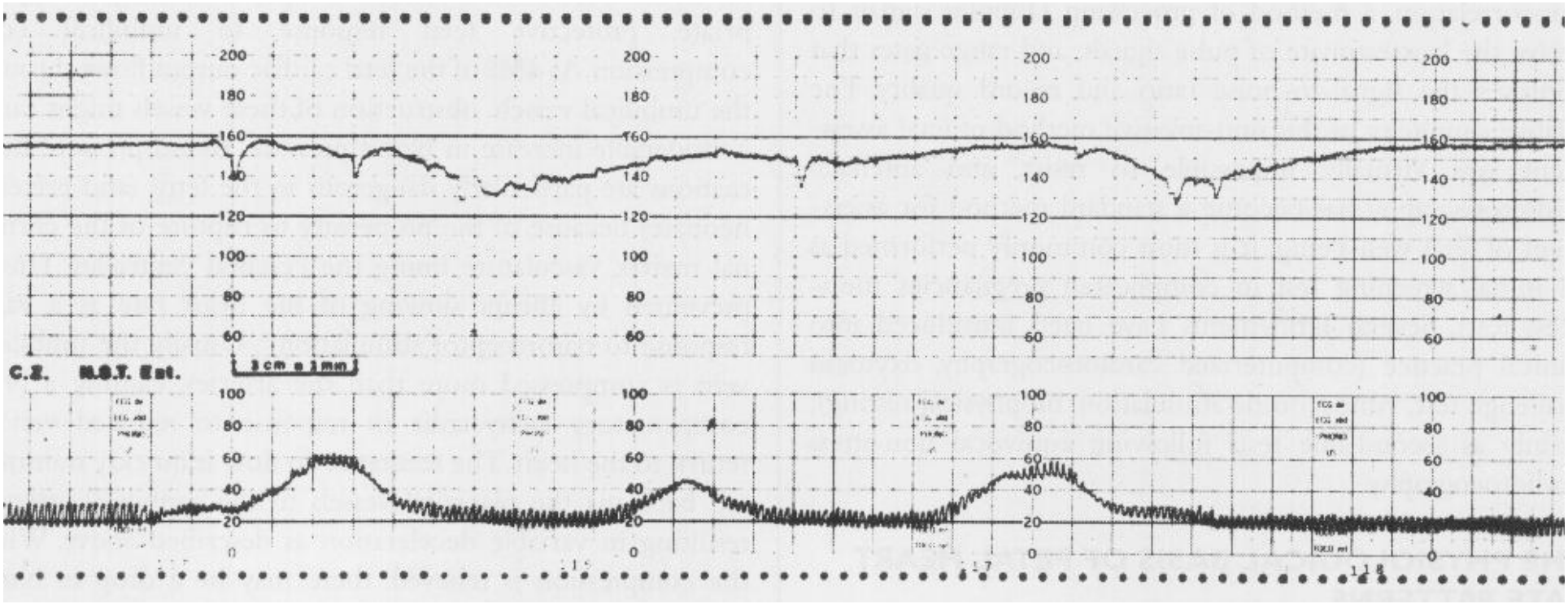
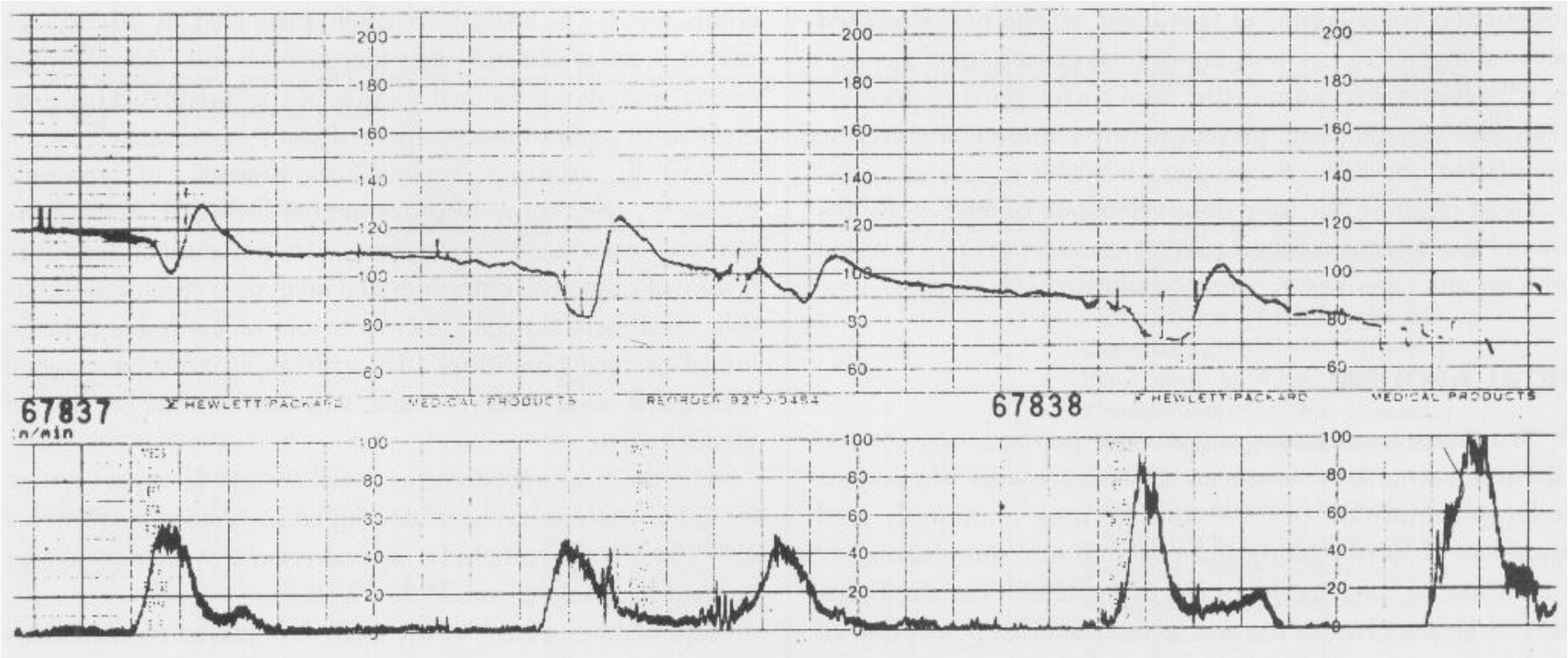
60
10
8
6
4
2
0
133
134
135
136
137
138


200
180
160
140
120
100
80
60
C.Z. M.S.T. Est.
3 cm = 1mn
100
80
60
40
20
0

Mixed pattern…



Assessment of
Uterine activity

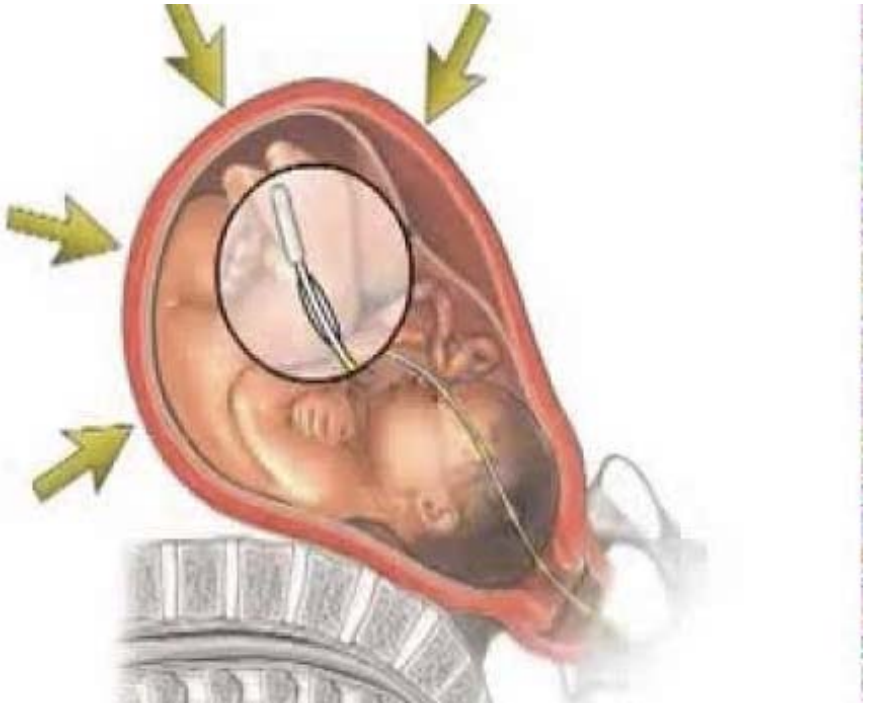
- Contractions
  - yes/no
- Frequency of contractions
  - Optimally every 2-3 min
- Amplitude
  - 40-60 mmHg
- Duration
  - 60-90 seconds
- Baseline tone
  - <15 mmHg

Progress in First Stage of Labour:
Monitoring

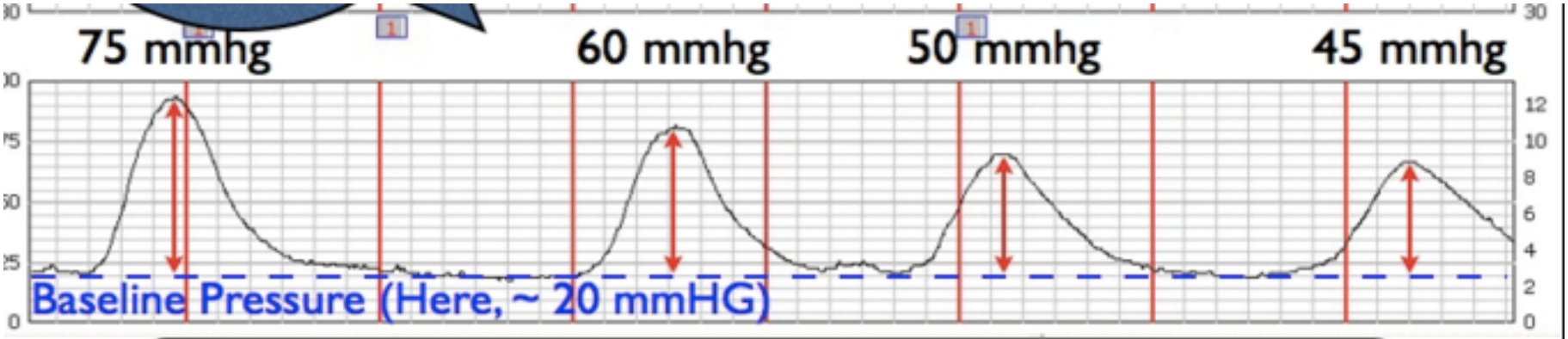
- Contractions:
  - by palpation – q 30 min early
  - Tocometer – in high risk or slow progress
  - IUPC (intra-uterine pressure catheter)

- Cervical change:
  - Q 2 hours in early labour
  - Sooner based on patient symptoms, FHR
  - Assess dilation, effacement, station

IUPC
Intrauterine pressure catheter

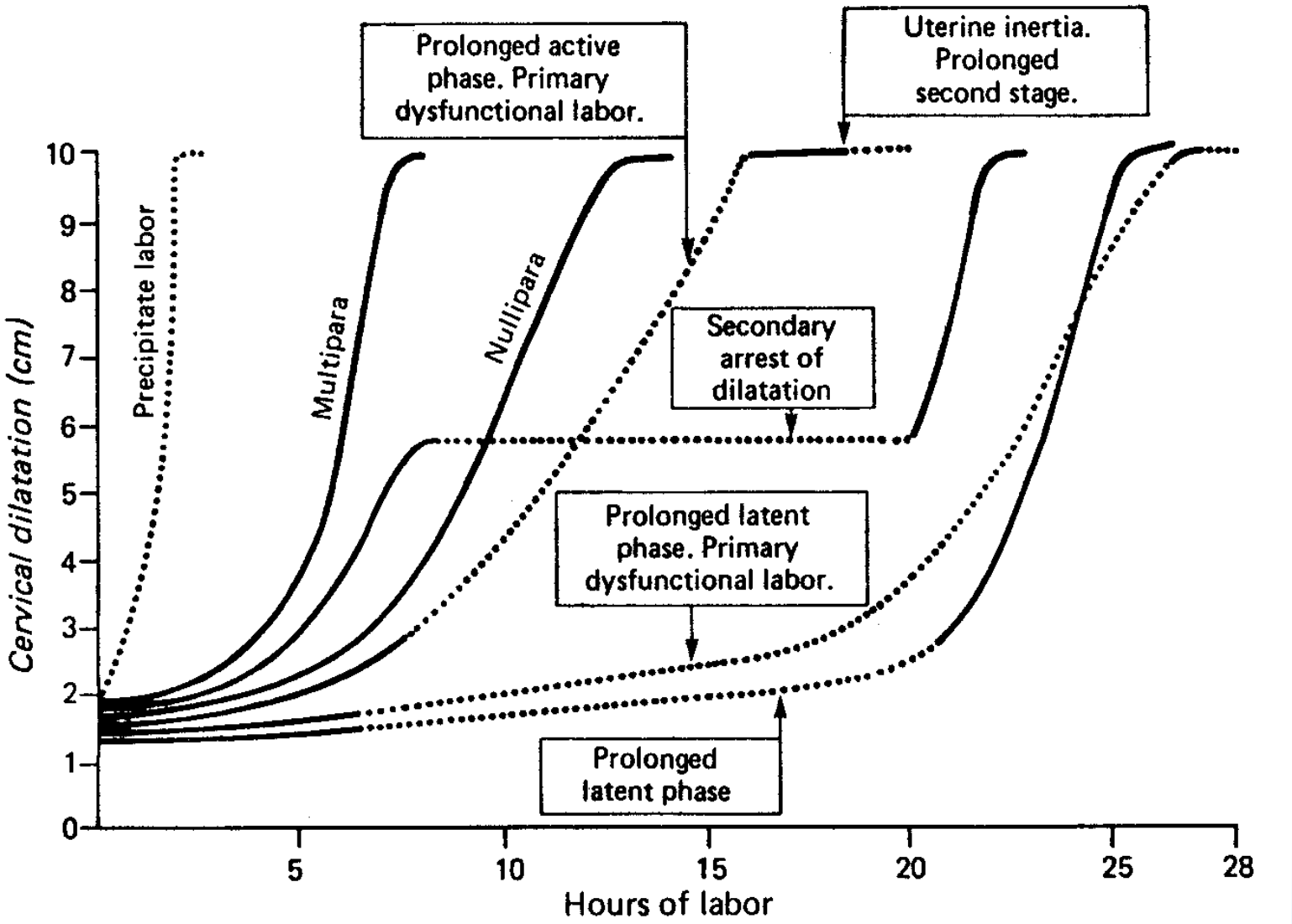


Contraction forces are usually reported in Montevideo Units (MVUs), which represent the total of the intensity of each contraction in a 10 minute period. MVUs > 200 are adequate for 90% of labors to progress.



75+60+50+45=230 MVUs
(Note that the baseline pressure was subtracted from each reading)

Friedman Curve



Friedman Curve (1967)

- Normal curves of progress of labour
- Not strict rules, but guidelines

- First stage
  - 6 - 18 hrs primip / active phase 1.2 cm/hr
  - 2 – 10 hrs multip / active phase 1.5 cm/hr

Friedman

Labor	NulliG	MultiG
1st Stage	Active	phase
Duration	6-18 h	2-10 h
Dilation	~1 cm/h	~1.5 cm/h
Arrested	>2 h	>2h
2nd Stage	0.5-3 h	5-30 min
3rd Stage	0-30 min	0-30 min

Labour Dystocia
(Failure to progress)

- Most common cited reason for C/S

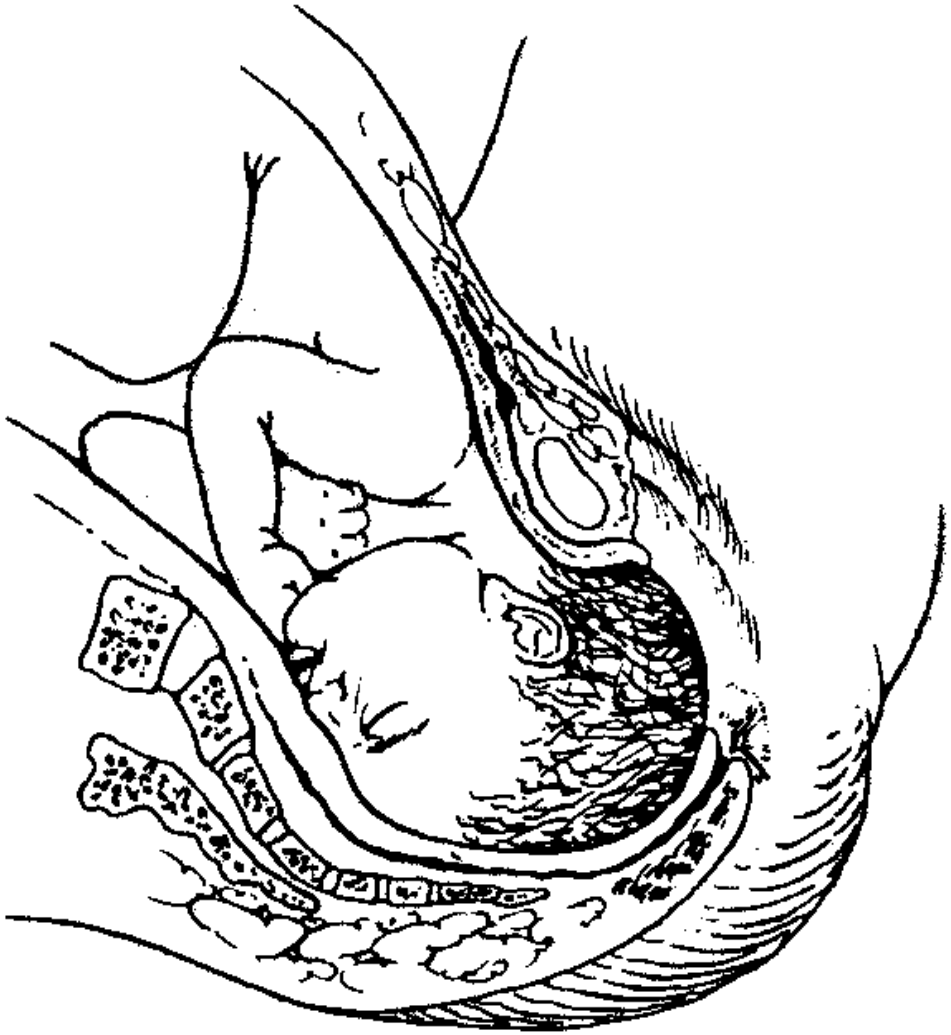
1. Passage – Abnormal pelvis
2. Passenger – LGA fetus
3. Powers

    poor contraction pattern

    poor pushing

Labour and Birth

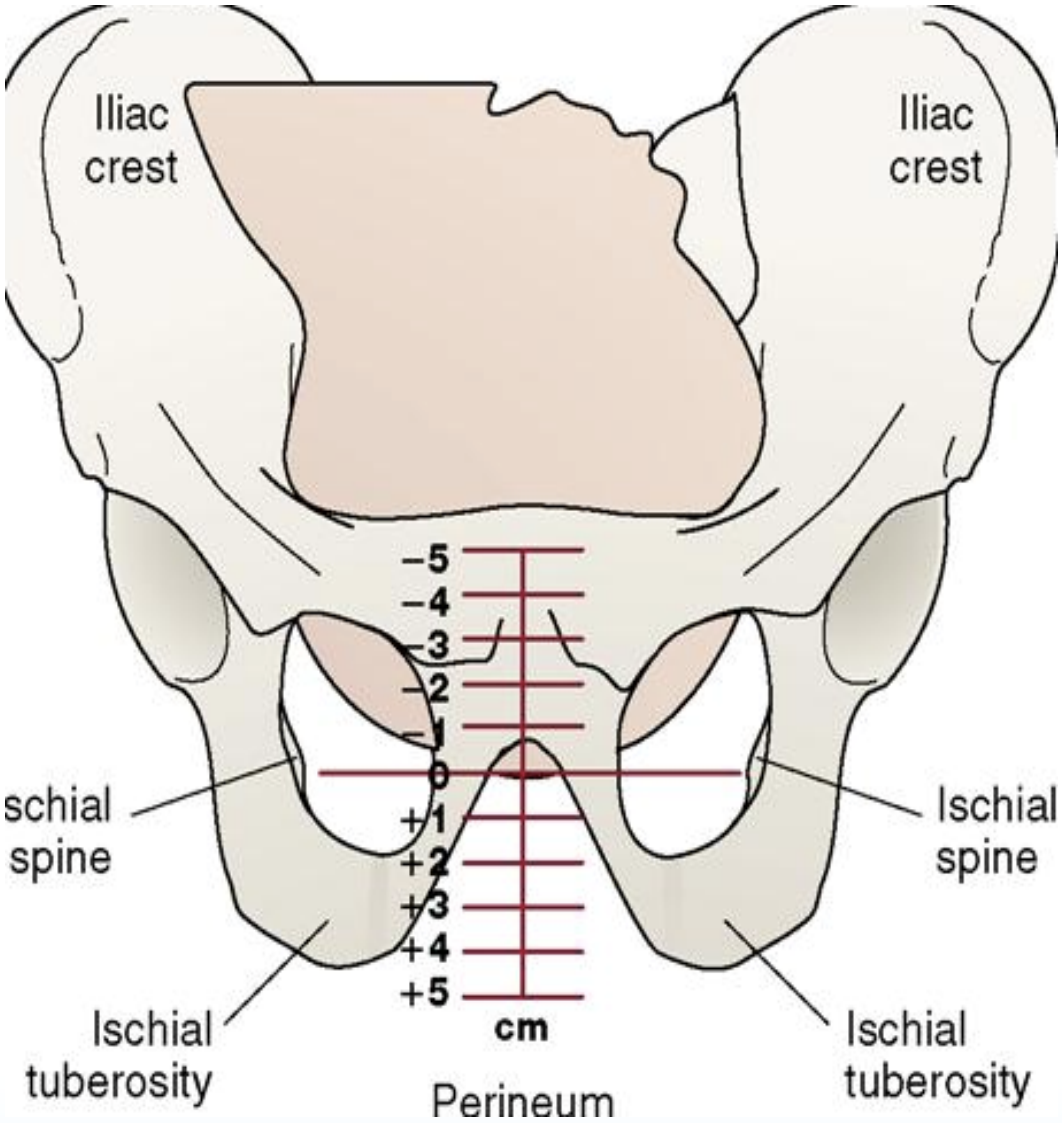
Second stage



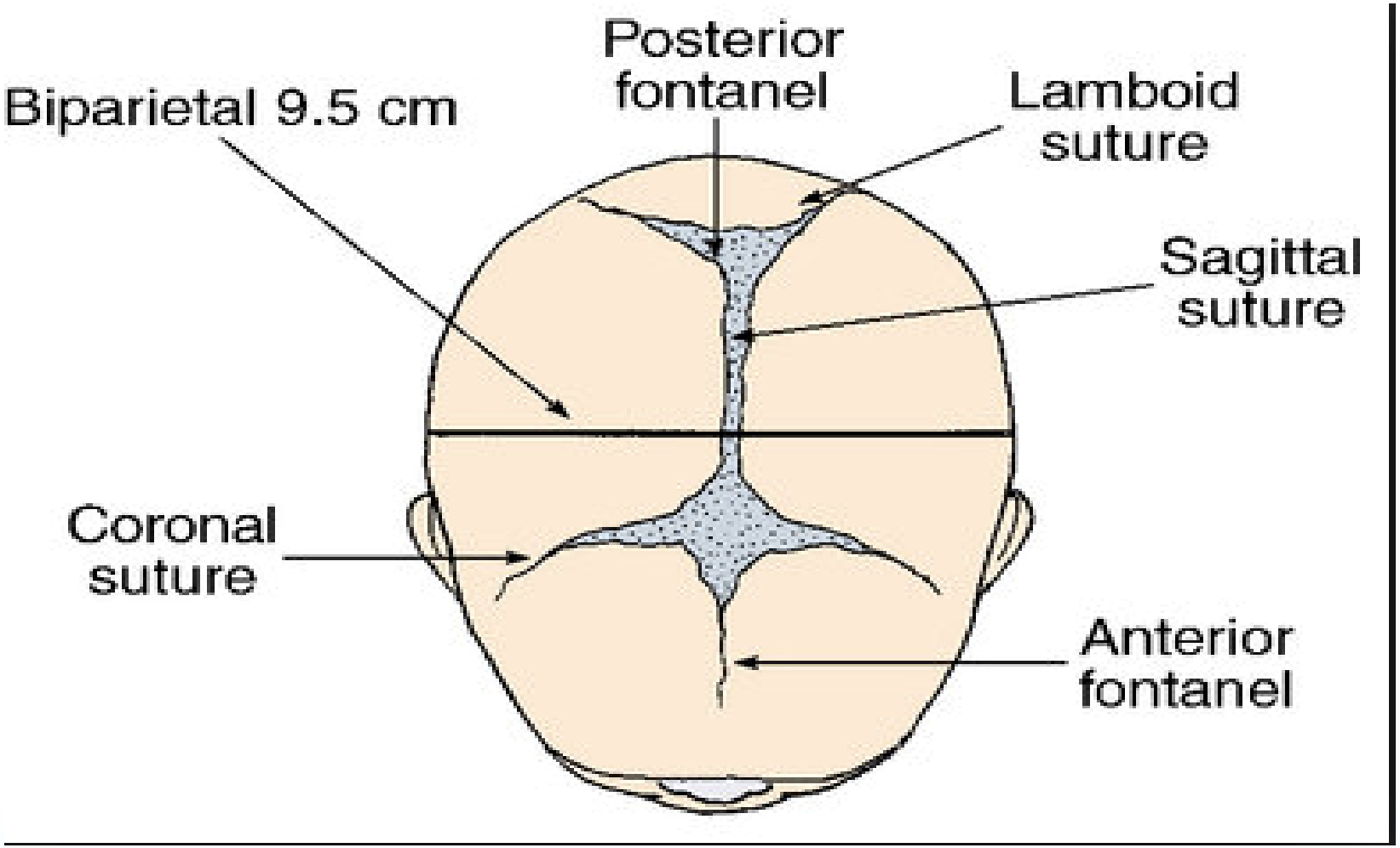
Second Stage of Labour

- **Definition:**
  - **Full dilatation → delivery of fetus**

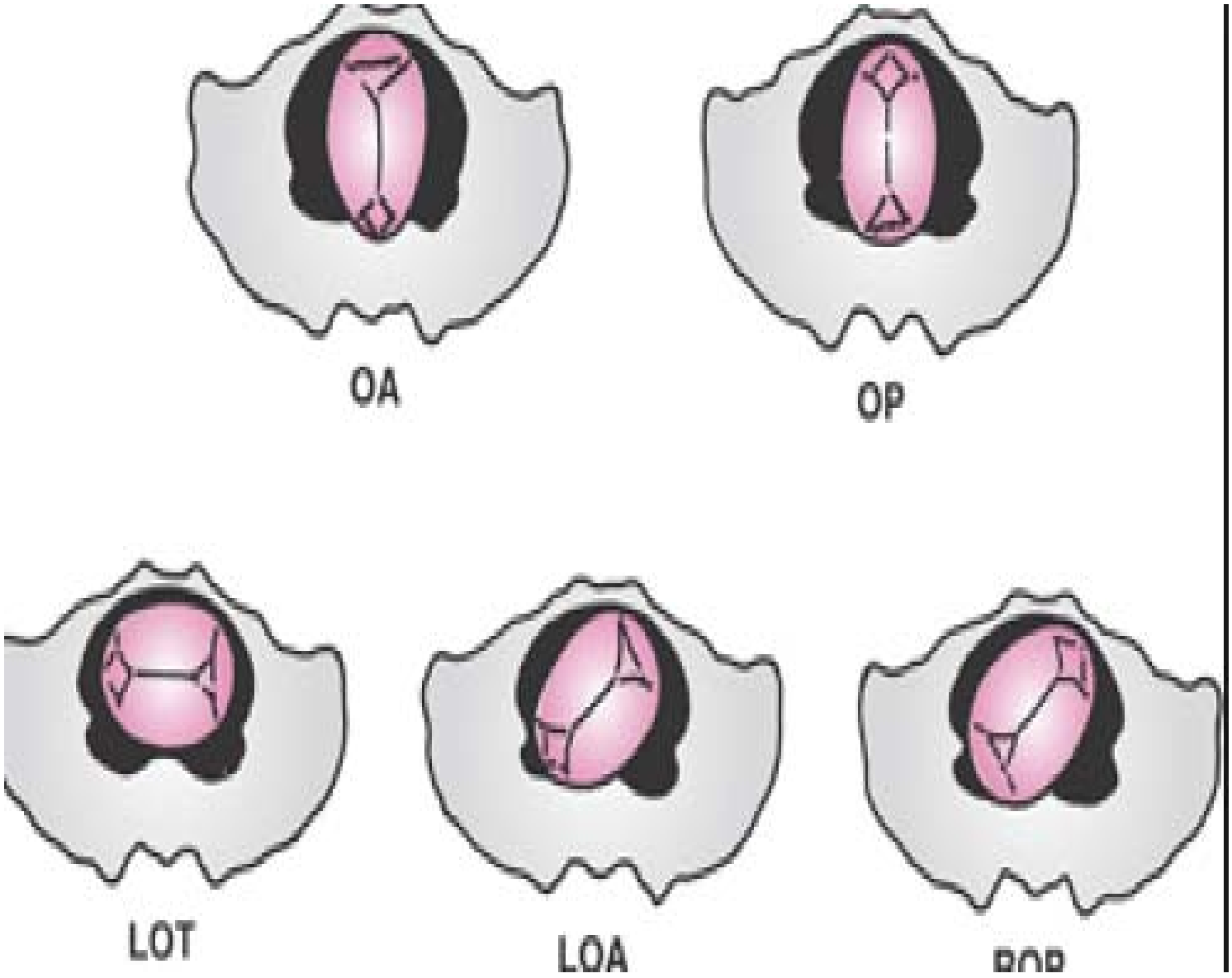
- **Friedman: 30 min – 3 hrs primip**
  5 min – 30 min multips
- **Progress monitored by station**
  - **0 = ischial spines**
  - **1-5 cm (or thirds) of total distance**


Iliac crest
Iliac crest
−5
−4
−3
−2
−1
0
+1
+2
+3
+4
+5
cm
schial spine
Ischial spine
Ischial tuberosity
Ischial tuberosity
Perineum

Fetal Position



Left occiput transverse (LOT)


OA
OP
LOT
LOA

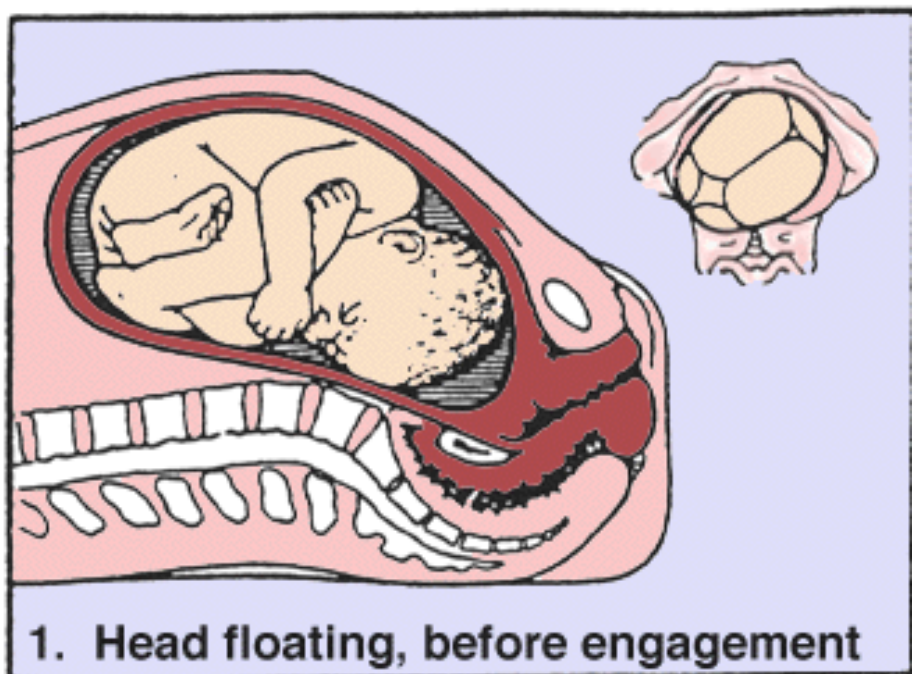
Labour and Birth

Mechanism of Normal Labour

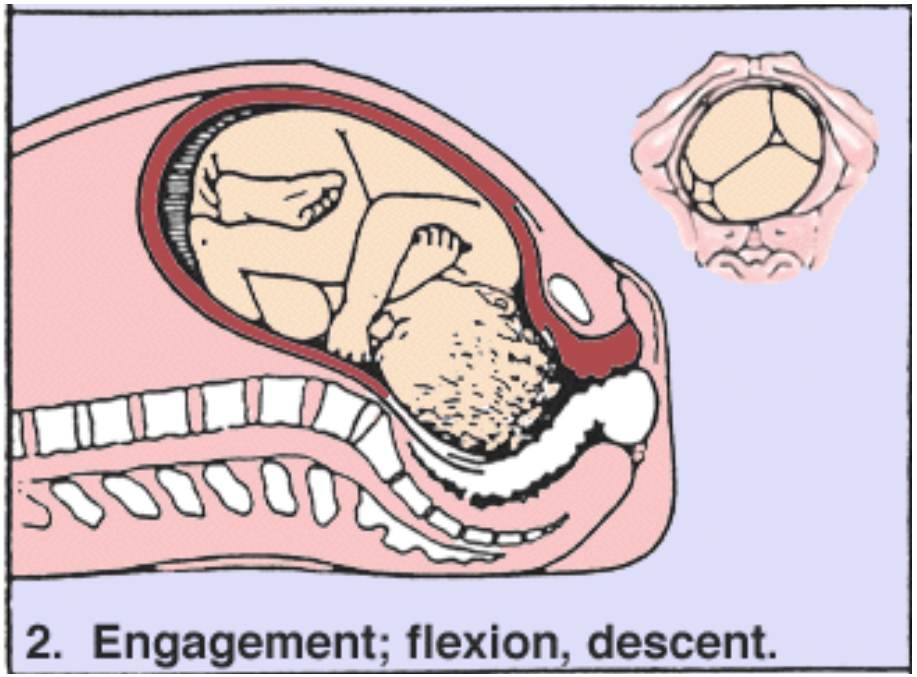
(Cardinal movements)

- **Engagement**
- **Descent**
- **Flexion**
- **Internal rotation**
- **Extension**
- **External rotation**
- **Expulsion**

Cardinal Movements

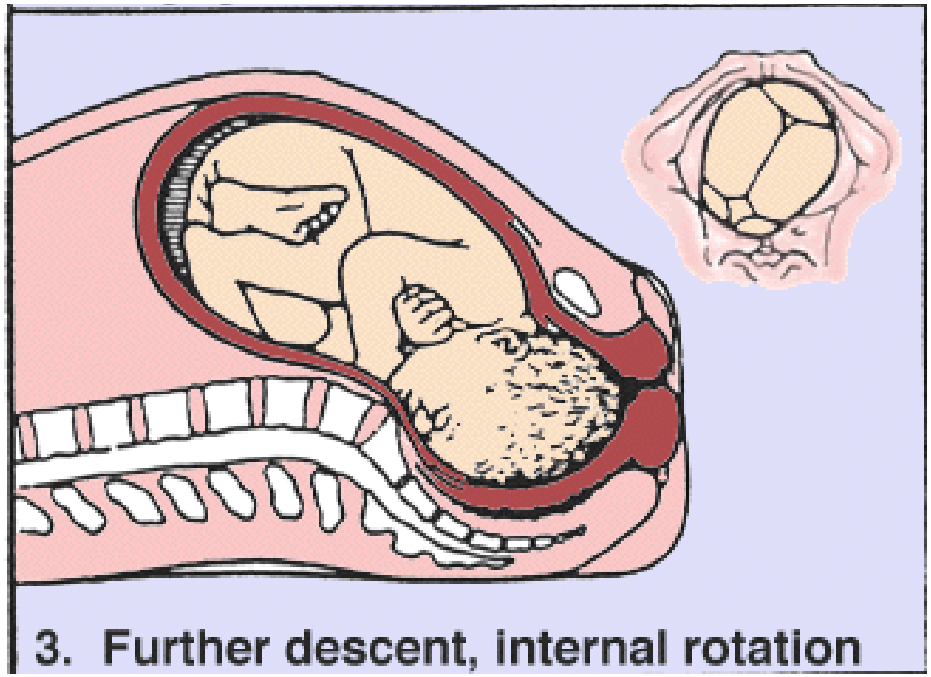


1. Head floating, before engagement

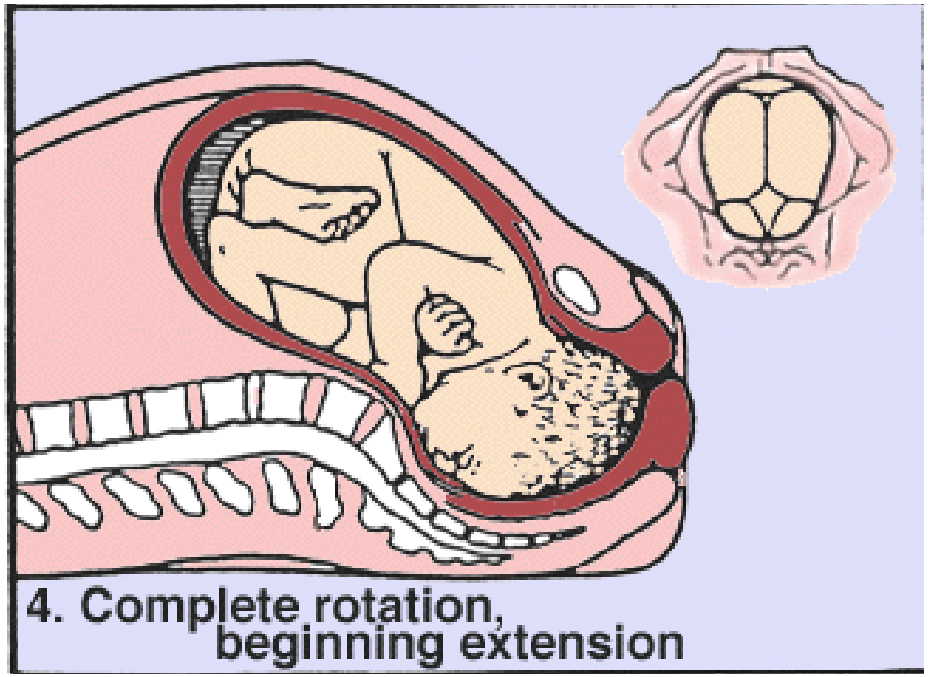


2. Engagement; flexion, descent.

Cardinal Movements

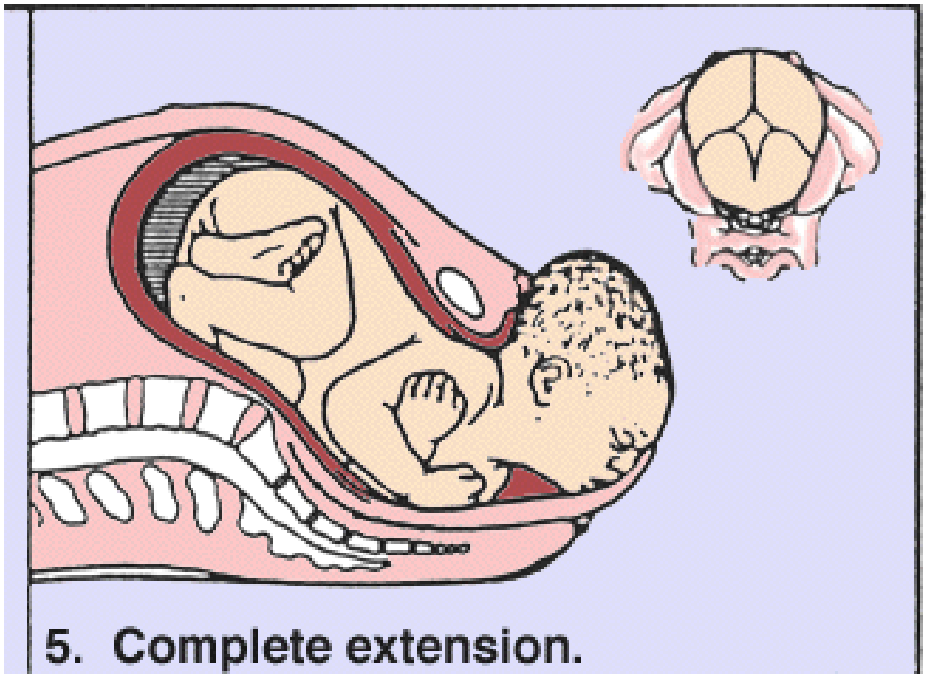


3. Further descent, internal rotation

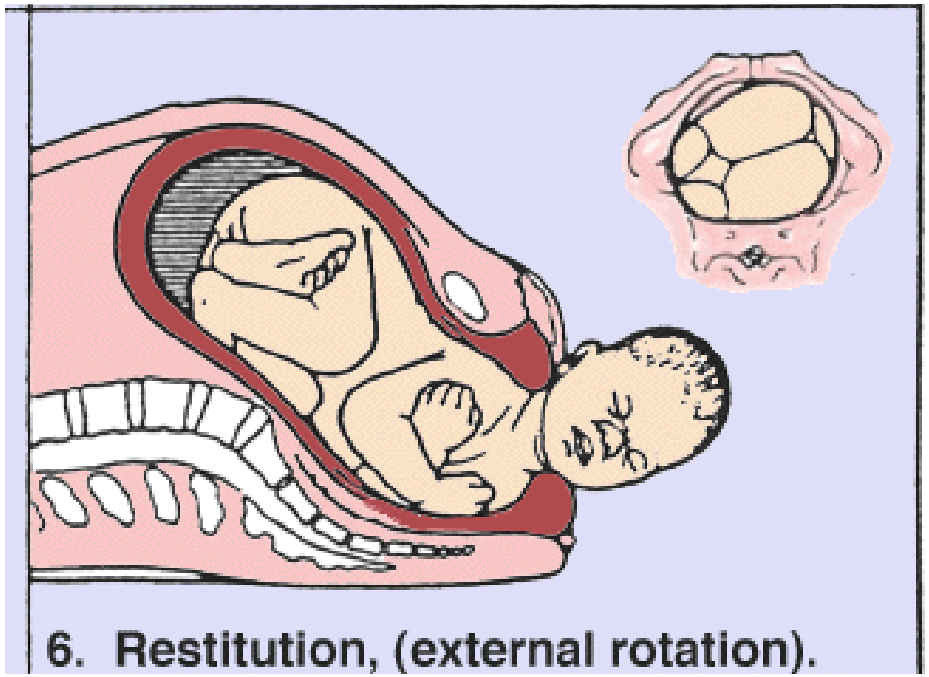


4. Complete rotation, beginning extension

Cardinal Movements

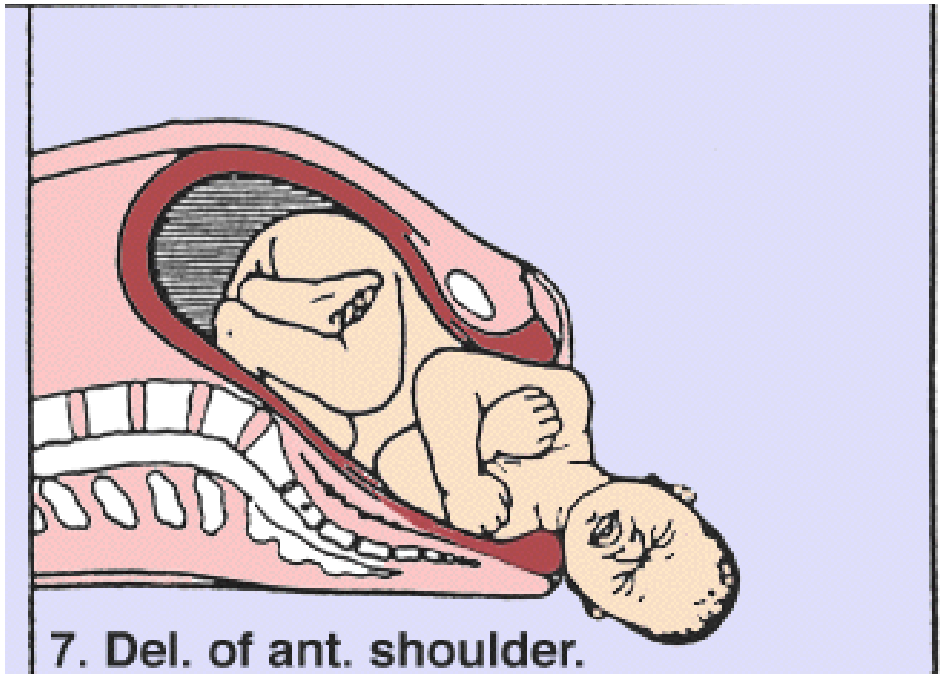


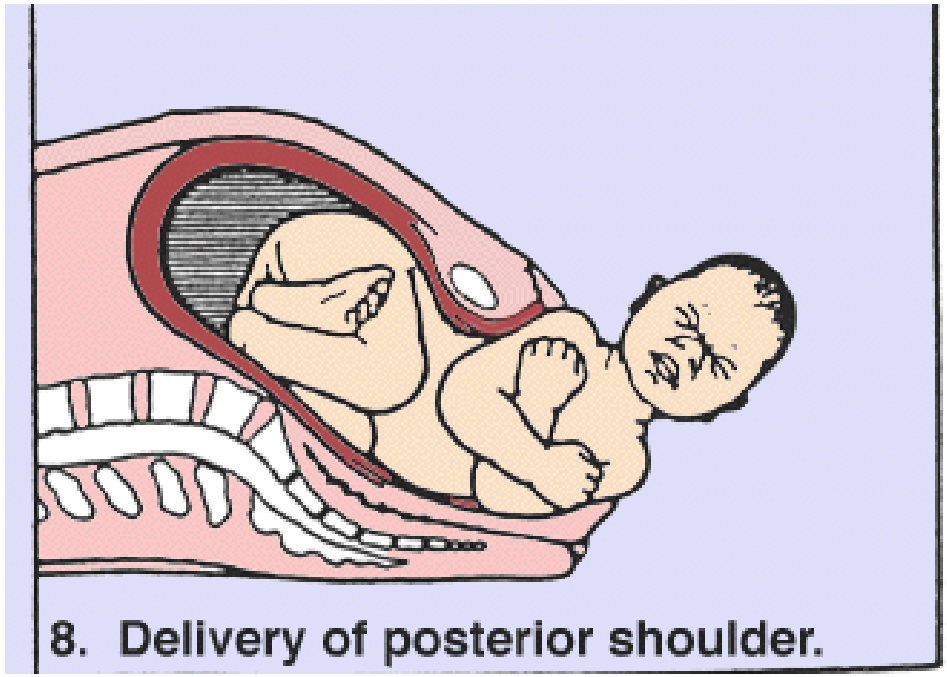
5. Complete extension.



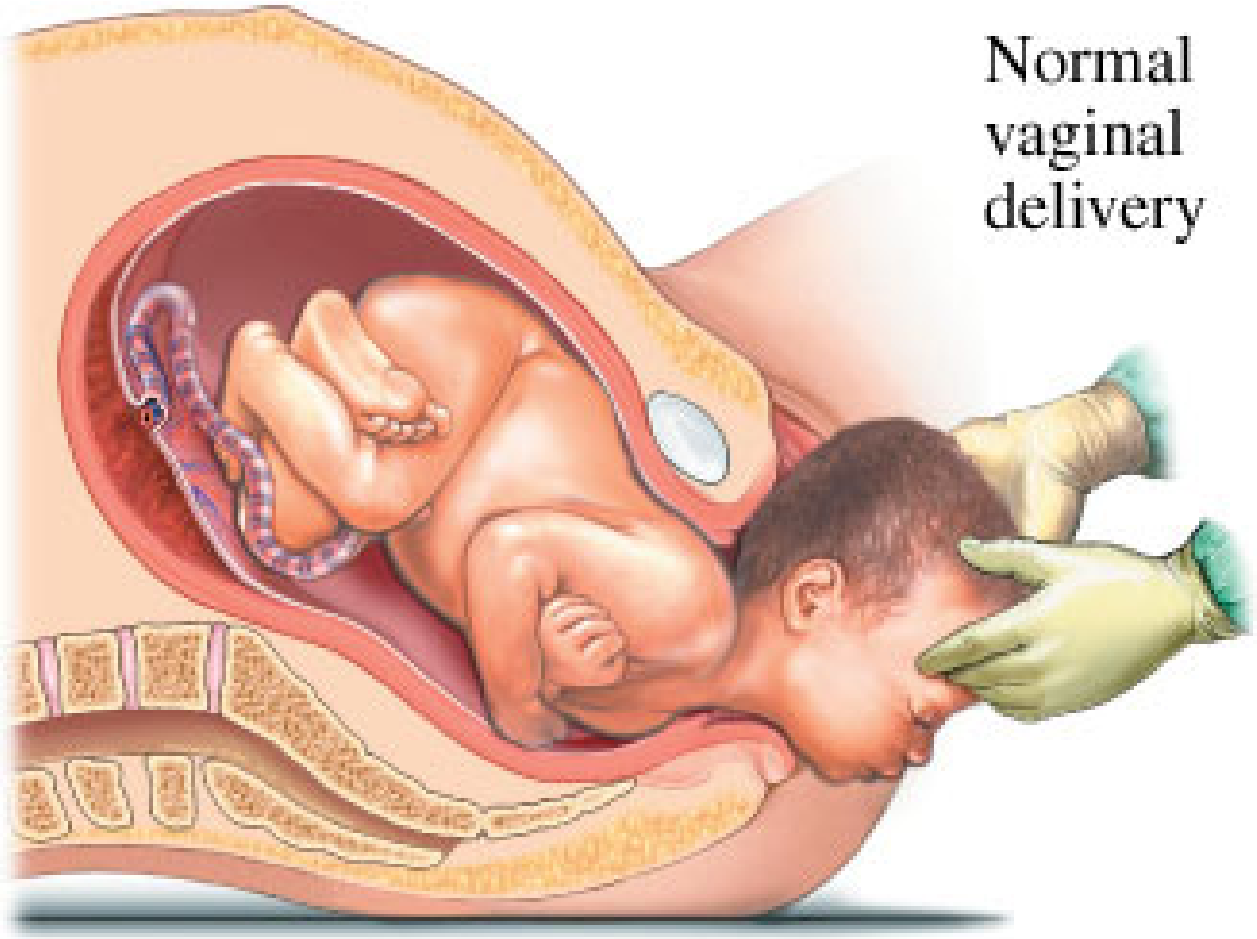
6. Restitution, (external rotation).

Cardinal Movements





Vaginal Delivery

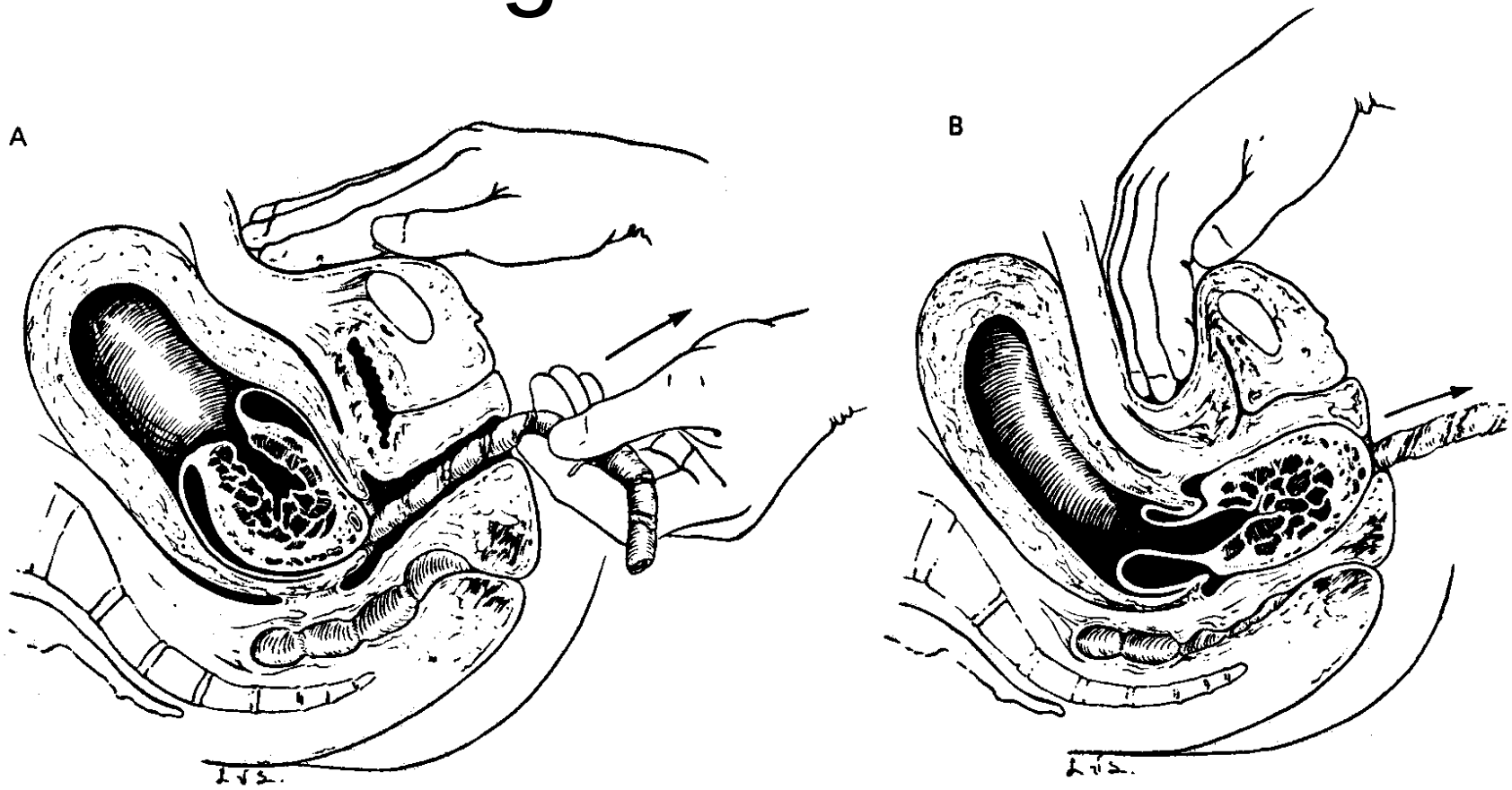


Second Stage of Labour

- **Pelvic architecture issues:**
- **Best outcomes with gynecoid & android pelvis**
- **Cardinal movements may be inhibited by narrow or flat pelvis**
- **Trial of labour is only true test of pelvic adequacy**

Labour and Birth

Third stage



Third Stage of Labour

- **Definition:**
  - **delivery of fetus → expulsion of placenta**

- **Timeline – 2 – 30 min**
- **Active management – WHO / SOGC**
  - **Uterotonic agents (Syntocinon / Misoprostol)**
  - **Gentle traction on cord**
  - **Fundal massage**

Third Stage of Labour

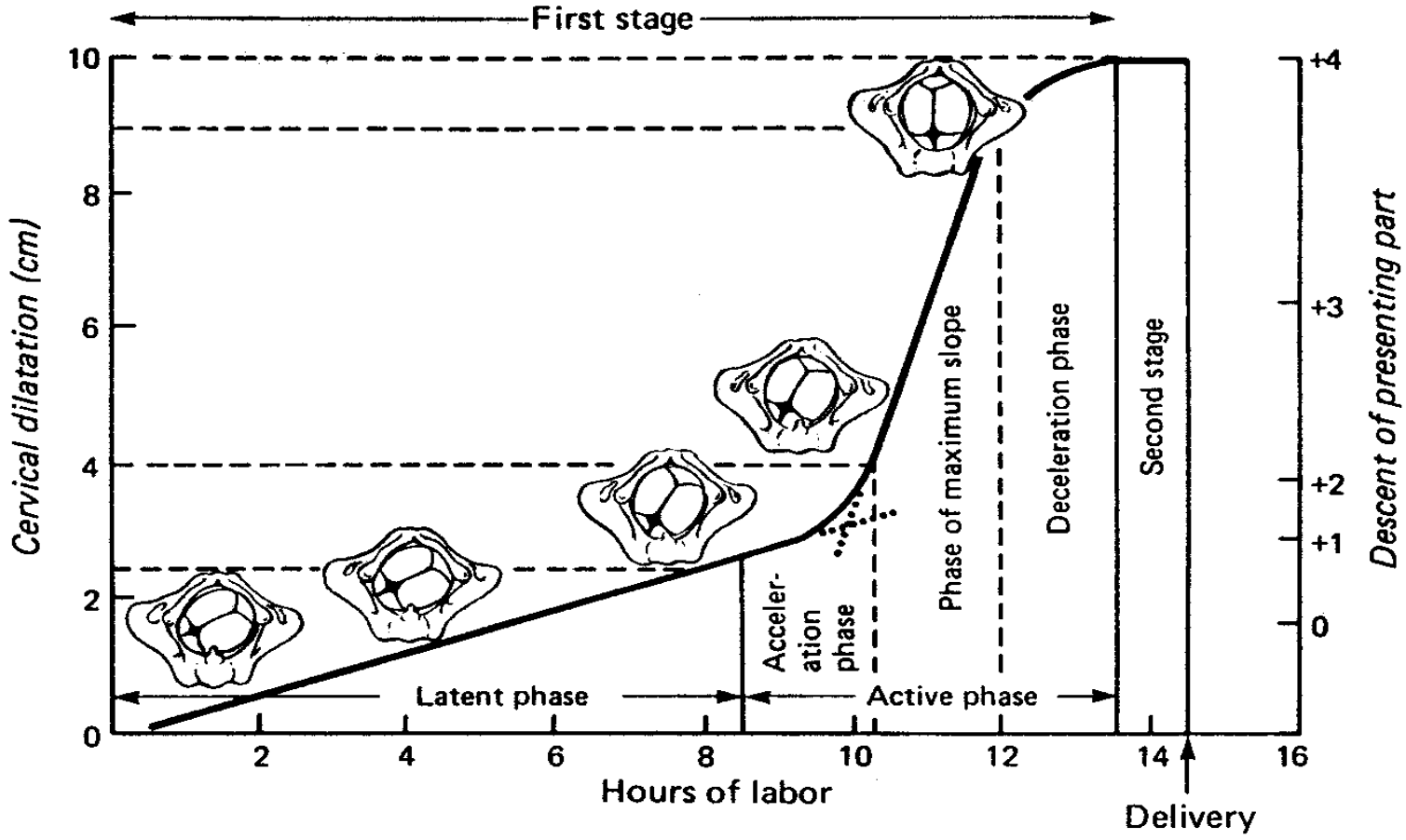
- **Signs of separation**
  1. **New onset bright bleed**
  2. **Lengthening of umbilical cord**
  3. **Globular and firmer uterus**

- **Uterine involution – oxytocin mediated**

- **Inspection and repair of lacerations**
- **(including visualization of cervix)**

Labour and Birth

Summary



Analgesia

- **Natural supported labour**
- **Narcotics**
- **Nitrous/Oxygen inhalation**
- **Regional analgesia (Epidural)**

Induction

- **Indications:**
  - **Post dates**
  - **Preeclampsia**
  - **Diabetes Mellitus**
  - **Maternal disease (cardiac)**
  - **PROM / IUGR**

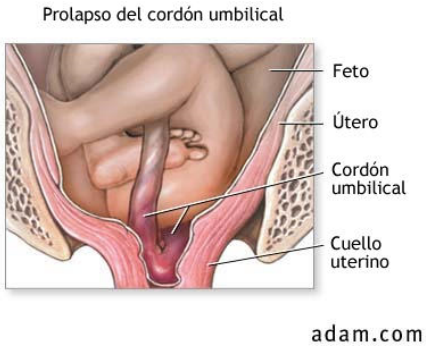
Induction

- Methods
  - **Syntocinon – synthetic oxytocin**
  - **ProstagaIndins – Cervidil, Prostin gel, Misoprostol**
  - **ARM – artificial rupture of membranes, may be enough to initiate labour**

Augmentation

- **Failure to progress**
- **Oxytocin infusion**
- **Titrate to good contraction pattern and cervical change**
- **Intrauterine pressure catheter (IUPC)**

Caesarean Section



- **Indications**
  1. **Failure to progress**
  2. **Non-reassuring FHR status**
  3. **Previous caesarean section**
  4. **Fetal malpresentation – breech, transverse**

- **Responsible for 70% of sections**

Labour Dystocia
(Failure to Progress)

- **Most common cited reason for C/S**

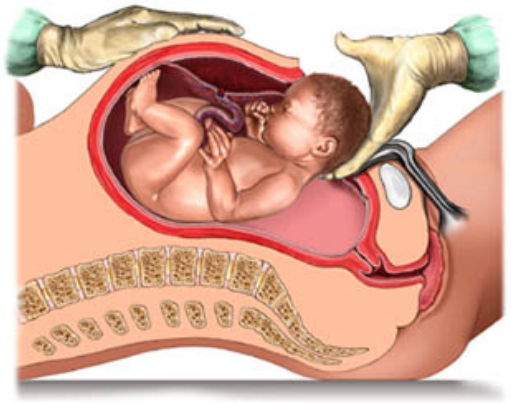
1. Passage – Abnormal pelvis

2. Passenger – LGA fetus

3. Powers – poor contraction pattern

- poor pushing

C/S Technique



- **Standard Uterine Incision**
  - **Lower uterine segment**
  - **Transverse**
  - **Low risk of rupture in subsequent labour (0.5%)**
- **Vertical (Classical), or “T” Incision**
  - **High risk of rupture in subsequent labour (5%)**