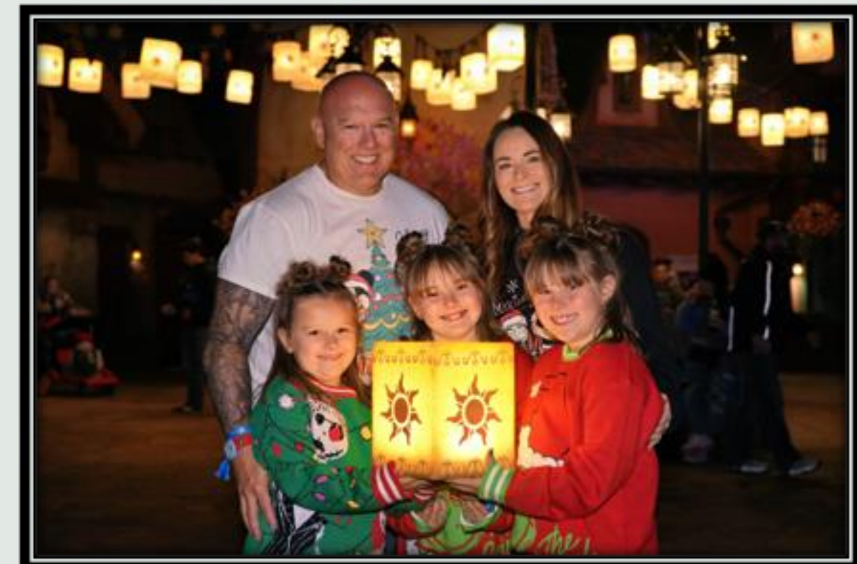
Electronic Fetal Monitoring For the Novice Nurse

2026

Housekeeping

- Please silence or turn cell phones off
- Refreshments are in the back of the room please help yourselves
- Breaks
    - Bathroom locations
    - Breastfeeding mothers
- Laptop plug ins
- Explanation of Handouts
- Refrigerator ☺☺☺☺☺

Special Thanks to Sue Weekly



Kayla Brickell MSN, C-EFM, RNC-OB, RNC-IAP, C-OBE

MARY SEGER BARKER, MSN, RNC-OB, C-EFM, CIMI[2]

To Access the Agenda(s) and QR for Online Presentations

Continuing Education Requirements

- In order to receive continuing education:
- You must attend the entire program. No partial credit can be awarded.
- You must complete an evaluation (it will be emailed to you). It must be completed within 7 business days after the program date or you will receive an incomplete.
- A link to access your certificate will be automatically generated and emailed to you within 24 hours of completing all requirements. Go to our website: www.methodistcollege.edu/pd, then click "Account Login" on the top right side of the page. Log in to your account, then click "Certificates."
- If you have any questions or need assistance, please email Nebraska Methodist College Learning Center at lc@methodistcollege.edu.

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- Attendance at the entire activity
- Completion/submission of evaluation form within 7 days of the program
- Relevant Financial Relationships with an Ineligible Company: No relevant financial relationships were identified for planners or presenters.

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Content presented through this educational program is intended to be used as a knowledge base only. Subject matter presented is not to be taken in isolation and outside the realm of patient's clinical context. Any written and or verbal didactic is to be used in conjunction with the healthcare workers own knowledge base and clinical judgment. Clinicians are highly encouraged to consider the entire clinical picture in which the patient presents before and during their care of him and or her.

Contacting Outreach

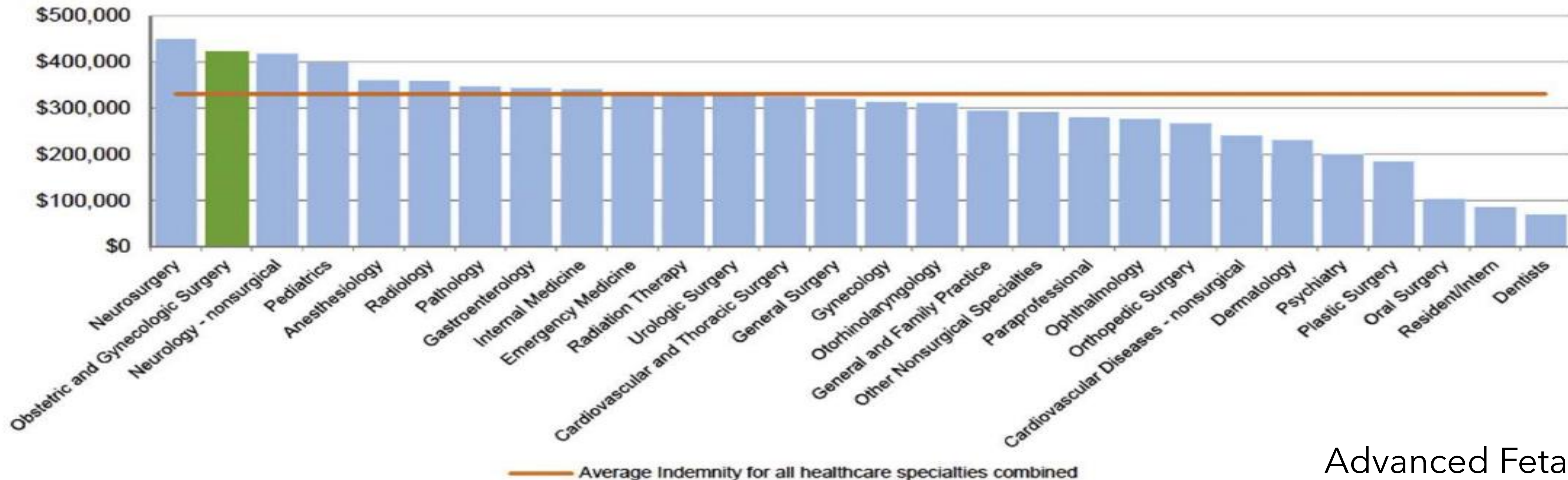
Clinical Nurse Educators work part-time

Please use the email contact below :

MWHOutreach@nmhs.org

Working in Obstetrics

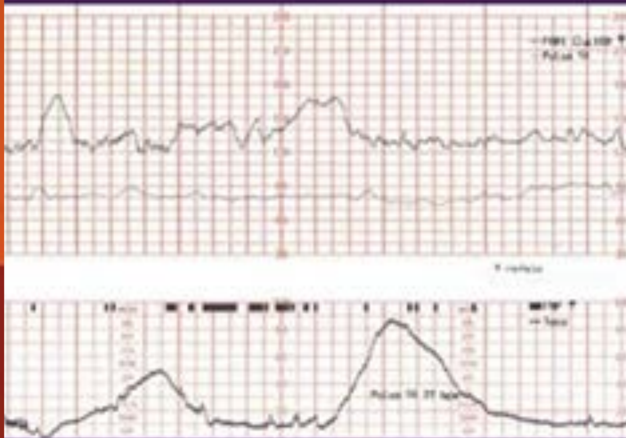
OBSTETRICS PRACTICE REMAINS HIGH LIABILITY



Average indemnity for paid medical claims from 2005 through 2014, subdivided by medical specialty and ranked by cost.
Glaser et al. Trends in obstetric and gynecologic malpractice claims. Am J Obstet Gynecol 2017.

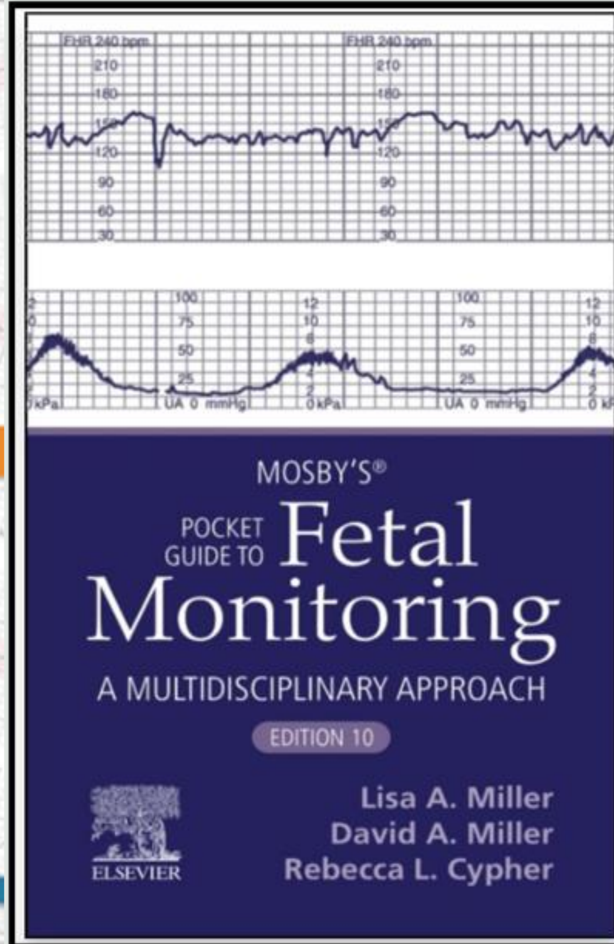
Fetal Heart Monitoring
Principles and Practices
SIXTH EDITION
Audrey Lyndon
Kirsten Wisner

ELECTRONIC
Fetal Heart Rate
Monitoring



Julian T. Parer | Tekoa L. King | Tomaki Ikeda

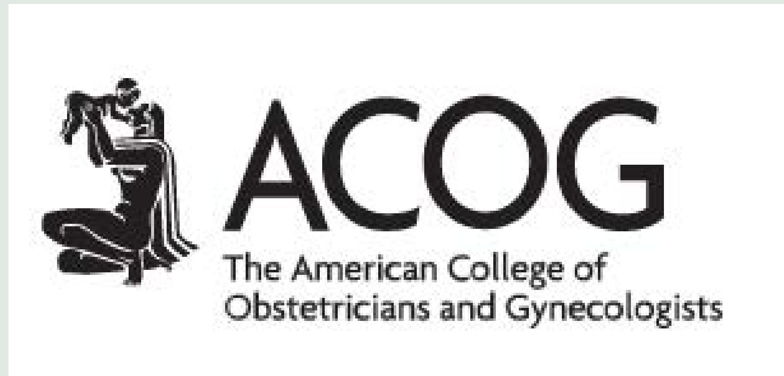
Electronic
Fetal
Monitoring
Concepts and Applications
Cydney Afriat Menihan
Ellen Kopel-Puretz
Wolters Kluwer
THIRD EDITION

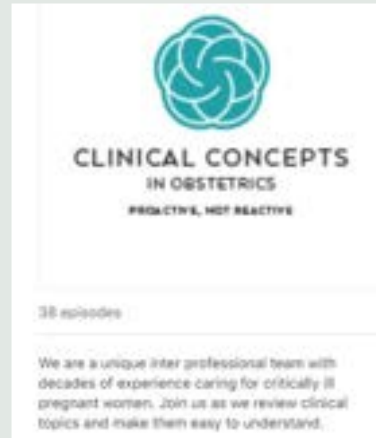


EFM References

Some On-Line References We Use

ALLIANCE FOR INNOVATION ON MATERNAL HEALTH





NCC EFM Tracing Game

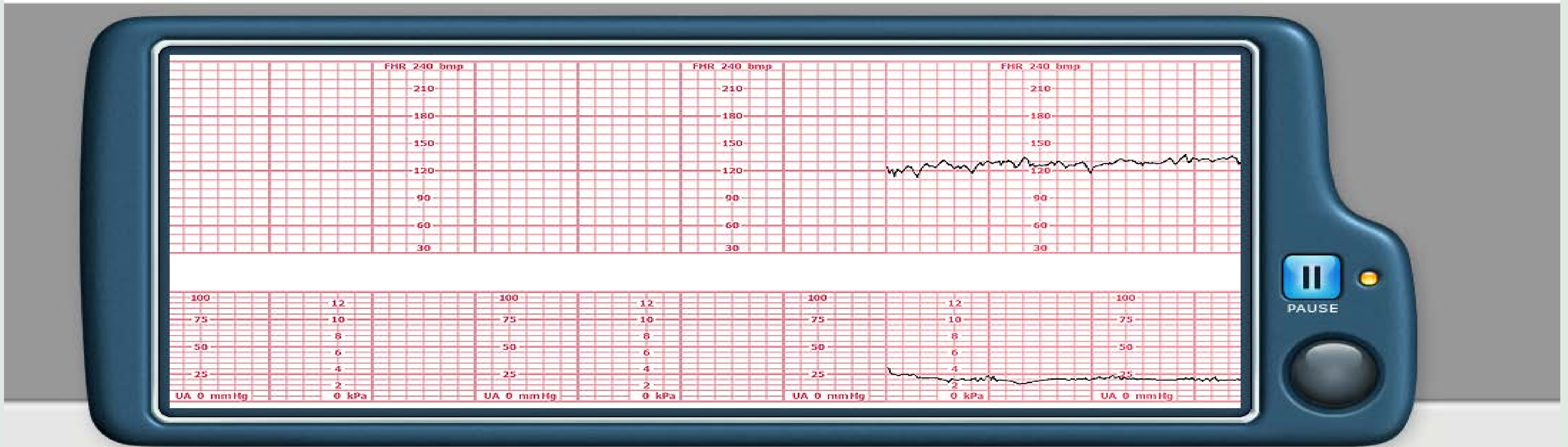
...can you recognize these strip elements?

- The NCC EFM Tracing Game uses NICHD terminology
- External monitoring (unless noted differently), paper speed is 3cm/min
- Collections are larger groups of tracings, 5 tracings are randomly selected each time a collection is played
- Select a game collection and click [Start]
- All collections can be played unlimited times
- Answers can be selected in any order, but cannot be changed once selected

Available Game Collections

- Collection A (10 tracings)
- Collection B (10 tracings)
- Collection C (30 tracings)
- Collection D (30 tracings)
- Collection E (30 tracings)
- Collection F (30 tracings)
- Collection G (30 tracings)
- Collection H (30 tracings)

https://ncc-efm.org/game/efmgame.cfm



Collection:**A** Tracing:**1** Gestational Age:**39-weeks** ID:015-022

Baseline	Variability	Acceleration(s)	Deceleration(s)	NICHD Category	Contraction(s)
Normal	Absent	Absent	Absent	I - Normal	Normal Frequency
Bradycardia	Minimal	Present	Early	II - Indeterminate	Tachysystole
Tachycardia	Moderate	N/A	Late	III - Abnormal	More data needed to define
Indeterminate	Marked		Prolonged	N/A	
Sinusoidal	N/A		Variable		
			N/A		

Answers are based on an overall assessment of the tracing

https://ncc-efm.org/game/efmgame.cfm

Read Between the Lines: Assessment of Uterine Activity: The Other Half of EFM

Retail Price:	$39.00	Details
Member Price:	$25.00	

Short Description
Expand your clinical skills with these leaders working in perinatal care.

Read Between the Lines: The Role of Maternal-Fetal Signal Coincidence in EFM

Retail Price:	$39.00	Details
Member Price:	$25.00	

Short Description
Fourth in the FHM Strip Review Series, this session will help attendees understand key concepts related to maternal-fetal heart rate coincidence and other types of artifact.

Read Between the Lines: Understanding the Sinusoidal Fetal Heart Rate Pattern

Retail Price:	$39.00	Details
Member Price:	$25.00	

Short Description
Expand your clinical skills with these leaders working in perinatal care.

Read Between the Lines: Understanding the Variable Deceleration

Retail Price:	$39.00	Details
Member Price:	$25.00	

Short Description
Expand your clinical skills with these leaders working in perinatal care.

All 4 webinars bundle

Read Between the Lines Fetal Monitoring Series

Retail Price:	$150.00	Details

Short Description
Expand your fetal monitoring clinical skills with this bundle of 4 webinars featuring guidance and resources from leading thought leaders working in perinatal care.

Expert Insights with Lisa A. Miller

About Lisa

Lisa Miller, CNM, JD, is a registered nurse and certified nurse-midwife with more than 40 years of clinical experience in a wide variety of clinical settings. An attorney since 1990, her legal background gives her a unique understanding of the impact of law on medicine and nursing.

Lisa served as Clinical Instructor for the University of Illinois College of Medicine in Champaign-Urbana and as an Assistant Professor in Obstetrics and Gynecology at Northwestern University Medical School in Chicago, where she directed an academic midwifery service.

Lisa as an inventor and an advisor

Lisa developed Miller's ReadRight EFM Ruler to aid clinicians in teaching and applying the NICHD nomenclature. The tool was so popular that an electronic version called E-Tools was developed and patented by Clinical Computer Systems, Inc., makers of the OBIX Perinatal Data System.

Lisa Miller - Oxytocin: Use vs. Abuse (CNE only)

Nonmember Price	$89.95
Member Price	$69.95

Lisa Miller-Physiologic Logic: Uterine Activity During Labor (CNE ONLY)

Nonmember Price	$69.95
Member Price	$59.95

Lisa Miller-Mistakes Were Made, But Not By Me (CNE only)

Nonmember Price	$69.95
Member Price	$59.95

Lisa Miller - What Do I Do With Category 2? (CNE only)

Nonmember Price	$89.95
Member Price	$69.95

Lisa Miller-Learning From Others: Case Studies in EFM (CNE only)

Nonmember Price	$89.95
Member Price	$69.95

Lisa Miller-The Oxygen Pathway & Standardized EFM Interpretation (CNE ONLY)

Nonmember Price	$69.95
Member Price	$59.95

https://www.awhonn.org/fhm/expert-insights-with-lisa-miller

Be Knowledgeable and Well Informed

READ ARTICLES AND MATERIALS YOURSELF TO FORM YOUR OWN OPINION

ATTEND OUTSIDE EDUCATION FROM NATIONAL SPEAKERS

IF OBSTETRICS IS YOUR MAJOR NURSING FOCUS – CONSIDER JOINING AWHONN

SUBSCRIBE TO LEGITIMATE SOCIAL MEDIA AND POD CAST VENUES

Suggested Online Resources for OB Clinicians

https://prmes.com/

https://evidencebasedbirth.com/

https://www.clinicalconceptsinob.com

https://www.awhonn.org/podcasts/

Questions during morning session of the presentation

Please feel free to ask questions at any time during the presentation

However, if you do not feel comfortable asking a question during class, feel free to access menti.com and enter the code or scan the QR code below to enter in your question

3774 9112

Additional References

- American College of Obstetricians and Gynecologists. (2014). Obstetric care consensus No.1: Safe Prevention of the primary cesarean delivery. *Obstetrics & Gynecology, 123*(3): 693-711.
- American College of Obstetricians and Gynecologists. (2024). First and second stage labor management. Clinical Practice Guideline No.8. *Obstetrics & Gynecology, 143*(1):144-162.
- American College of Obstetricians and Gynecologists (2025). Intrapartum Fetal Heart Rate Monitoring: Interpretation and Management . Clinical Practice Guideline Number 10. Replaces Practice Bulletin Number 106 and Practice Bulletin Number 116, and Practice Advisory, Oxygen Supplementation in the Setting of Category II or II Fetal Heart Tracings
- Association of Women's Health, Obstetric, and Neonatal Nurses (2021). Fetal Heart Rate Monitoring: Principles and Practices 6th Edition. Kendall/Hunt Professional. Washington, DC: AWHONN.
- Cabaniss, M.L., & Ross, M. G. (2010). Fetal Monitoring Interpretation. 2nd ed. Philadelphia: Wolters Kluwer/Lippincott, Williams, & Wilkins.
- Freeman, R. K., Garite, T. J., Nageotte, M.P., & Miller, L. A. (2012). Fetal Heart Rate Monitoring. 4th edition. Philadelphia: Lippincott Williams & Wilkins, a Wolters Kluwer business.
- Macones, G. A., Hankins, G. D., Spong, C.Y., Hauth, J., & Moore, T. (2008). The 2008 national institute of child health and human development workshop report on electronic fetal monitoring: Update on definitions, interpretation, and research guidelines. Obstetrics & Gynecology, 112(3), 661-666.
- Macones, G. A., Hankins, G. D., Spong, C.Y., Hauth, J., & Moore, T. (2008). The 2008 national institute of child health and human development workshop report on electronic fetal monitoring: Update on definitions, interpretation, and research guidelines. JOGNN, 37(5), 510-515.
- Menihan, C. A., & Kopel-Puretz, E. (2019). Electronic Fetal Monitoring: Concepts and Application, 3rd ed. Philadelphia: Wolters Kluwer.
- Menihan, C. A., & Kopel, E. (2014). Point-of-Care Assessment in Pregnancy and Women's Health: Electronic Fetal Monitoring and Sonography. Philadelphia: Wolters Kluwer/Lippincott.
- Miller, L. A., Miller, D. A., & Cypher, R. L. (2027). *Mosby's pocket guide to fetal monitoring* (10th ed.). St Louis, MO: Elsevier.
- Parer, J. T., King, T. L., & Ikeda, T. (2018). Electronic Fetal Heart Rate Monitoring: The 5-Tier System. Burlington, MA: Jones & Bartlett

Kahoot.it

- Please take out your phone and access Kahoot.it
- Enter in the code displayed on the screen
- Enter in an icon or username [Does not need to be your actual name]
- Points are awarded for accuracy and speed (Not applicable for this session) ☺

Basic principles of Electronic Fetal Monitoring

Continuous Electronic Fetal Monitoring (EFM)

Continuous External Fetal Monitoring (EFM)

Original observational studies showed a decrease in intrapartum stillbirth rates

Widespread use began in the 1970's

Was intended to be used with the high-risk laboring women

Miller, L. A., Miller, D. A., & Cypher, R. L. (2027)

EFM converts raw data into a ***visual*** *display*

EFM collects Fetal Heart Rate & uterine activity (UA) data

Can then be displayed on paper, a computer screen or both

EFM interpretation is a visual skill

Basic Principles for interpreting EFM

Mode of monitoring

Paper speed 3cm/min

Horizontal scale

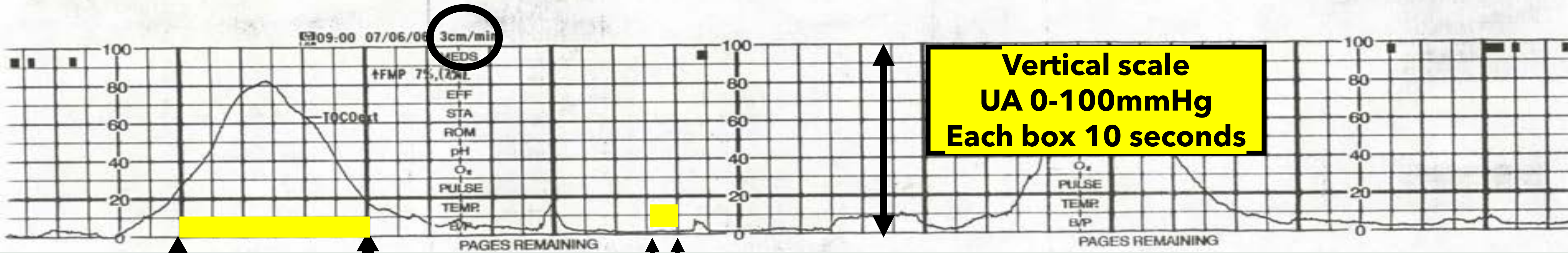
- Heavy dark lines are 1 minute
- Lighter lines are 10 seconds

Vertical scale ranges from 30-240 for FHR

Vertical scale ranges from 0-100mmHg for uterine activity

Basic Principles

Vertical scale
FHR 30-240



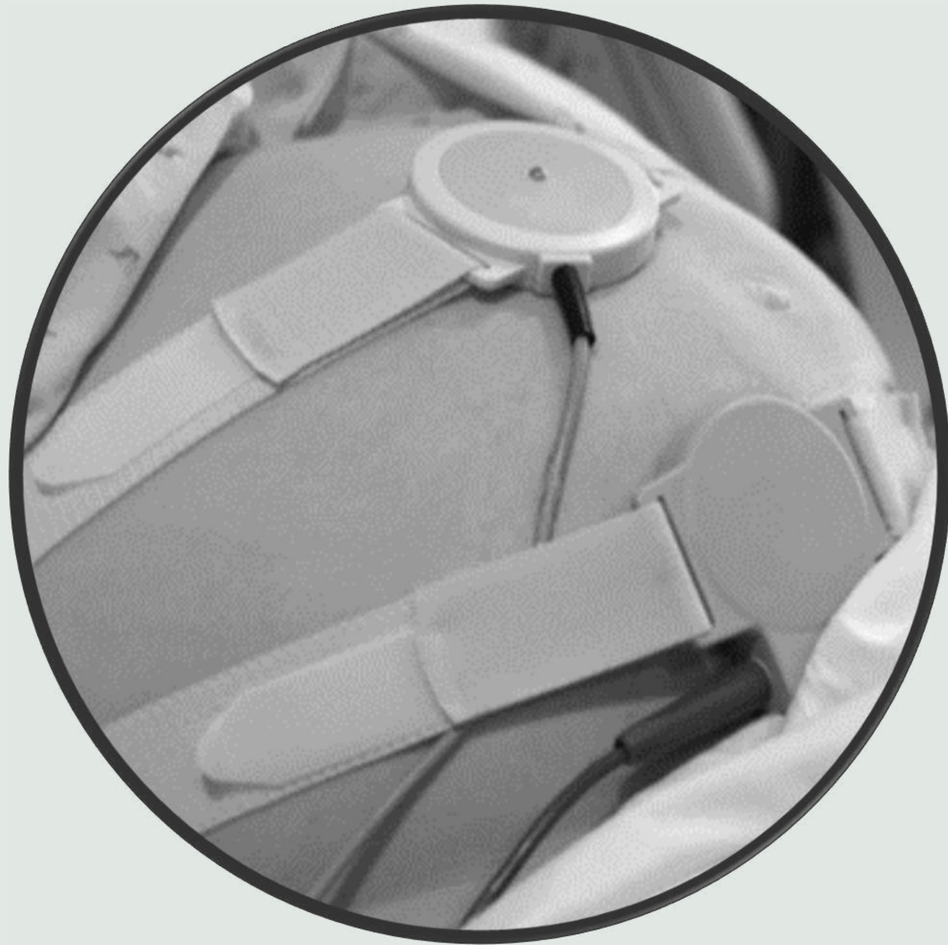
One minute of time

10 seconds of time

Instrumentation For Electronic Fetal Monitoring

External (indirect)

Internal (direct)



External (indirect) Monitoring

Tocotransducer for Contractions

Ultrasound Transducer for FHR

External (Indirect) Monitoring

Tocotransducer

- Uses a strain gauge. Place where contractions are best palpated usually over upper uterine segment

Ultrasound transducer

- Strongest signal is usually over the fetal back

External Tocotransducer to Monitor Uterine Contractions

Advantages

- Noninvasive
- Easily applied
- Does not require ruptured membranes
- Does not require cervical dilation

Limitations

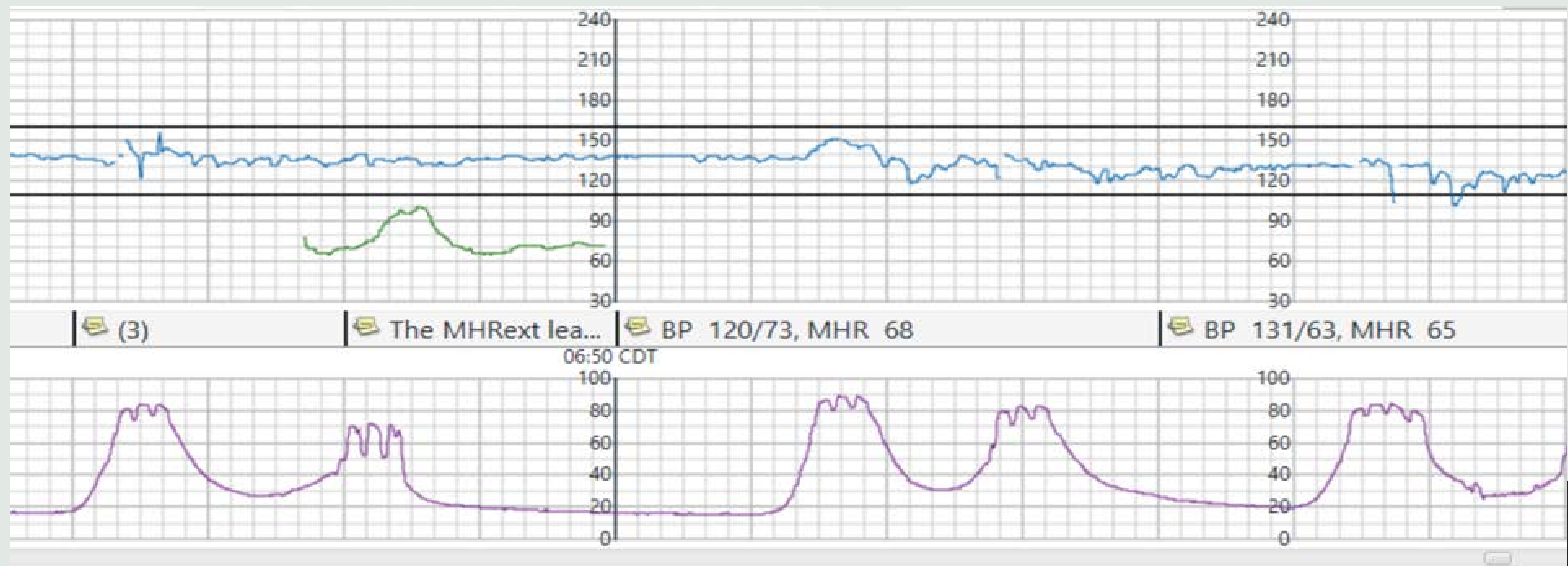
- *Cannot assess intensity or resting tone*
    - *Must palpate*
- Limits patient mobility
- Obese patients
- Frequent repositioning

External Tocotransducer to Monitor Uterine Contractions

Can determine frequency, relaxation time and duration of contractions, BUT

- **Intensity and resting tone need to be palpated**

Continually assess if you're picking up maternal HR or if the monitor is doubling or halving the FHR



External Ultrasound Transducer for FHR

Advantages

- Noninvasive
- Easily applied
- Does not require ruptured membranes
- Does not require cervical dilation

Limitations

- Restricts movement
- Lose signal when fetus or birthing person moves
- Double/Half count
- May count maternal HR
- Maternal Obesity

Internal (direct) Monitoring

Intrauterine Pressure Catheter (IUPC) for monitoring Uterine Contractions

Advantages

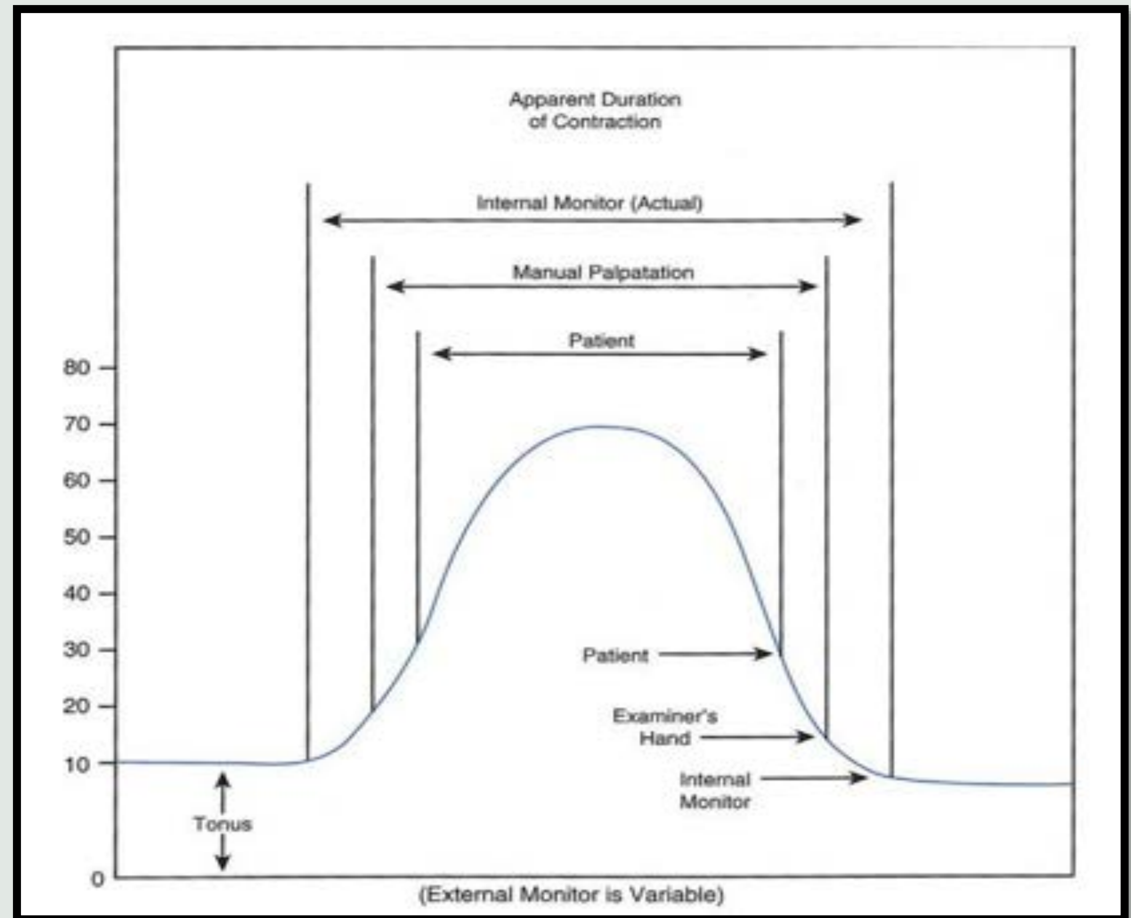
- Only accurate measure of resting tone & intensity
- Can also assess frequency & duration of contractions
- Not as affected by maternal position
- More comfortable?

Limitations

- Membranes must be ruptured
- Cervix must be dilated to allow insertion
- Improper insertion can cause maternal trauma
- Increased risk of infection

*Which assessment method for uterine contractions is **most** sensitive?*

- Internal Pressure Catheter
- Manual Palpation
- Patient Perception



Spiral Electrode for monitoring FHR

Advantages

- Eliminates gaps in tracing
- Maternal positioning doesn't affect
- Fetal cardiac dysrhythmias displayed

Limitations

- Membranes must be ruptured
- Cervix must be dilated to allow insertion
- Presenting part must be accessible
- May record maternal HR in the presence of a fetal demise

Spiral Electrode

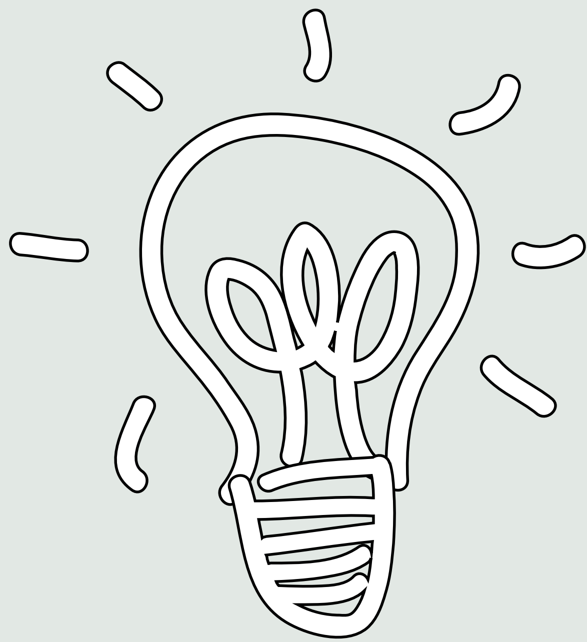
Containdications

- Planned Application to fetal face, fontanels or genitalia
- Active herpes lesions or HIV
- Maternal infection with Hepatitis B or C
- Presence or suspicion of placenta previa
- Known or suspected neonatal clotting disorder

Situations requiring caution

- Positive for GBS, syphilis or gonorrhea
- Fetus is premature

Important to remember manufacturer's guidelines and policies and procedures of the hospital unit



Indications for Internal Monitoring

Tracing cannot be picked up with the external monitor

- Obese, restless, excessive fetal movement

Accurate determination of efficiency of uterine contractions is needed

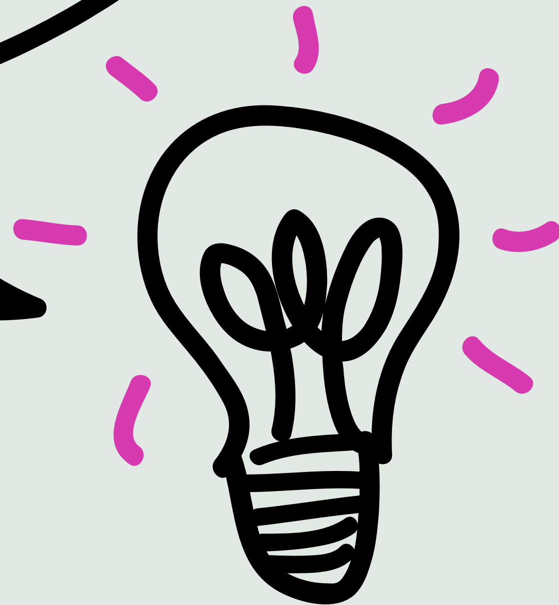
- Prior cesarean section or abnormal labor progress

Pitocin induction/augmentation especially if:

- Unable assess contraction activity and/or FHR with an external monitor
- Labor progress is abnormal

If there is difficulty labeling decelerations: are they early or late?

What if my patient isn't dilated or ruptured but I am unable to trace adequately??



Integrated Abdominal Fetal Heart Rate & Uterine Activity Monitoring

Noninvasive cable and belt free monitoring using transabdominal detection

Several adhesive patches are placed on the maternal abdomen

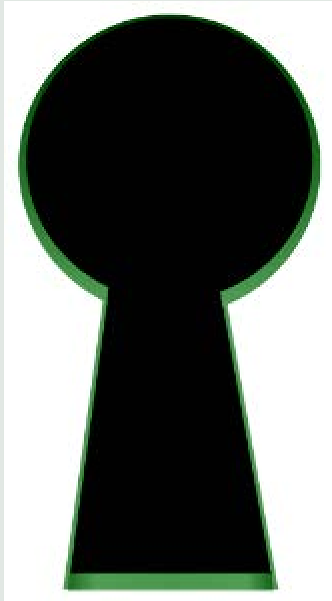
Collects electrical activity from MHR, FHR & UA

Waterproof for hydrotherapy use

Adipose tissue has less of an effect on the electrical signals

NOVII Wireless Patch System

Beware

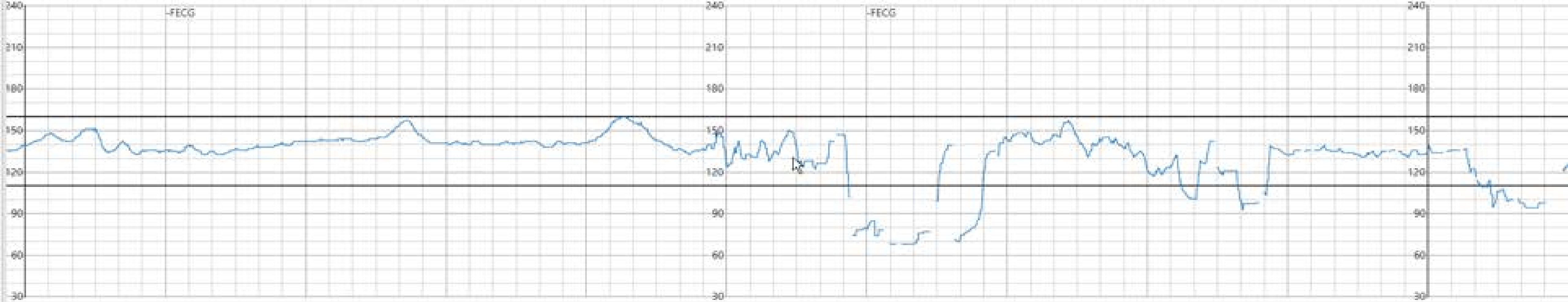


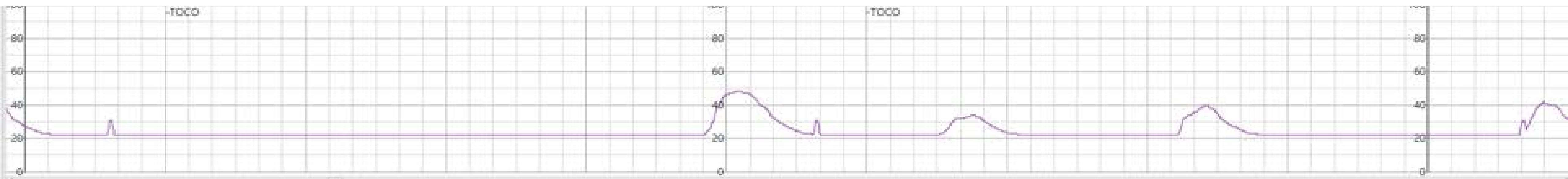
Difficult to troubleshoot with the Novii system

Bluetooth Communication Interruptions

Skin reactions from adhesive patches

System may periodically stops displaying FHR if out of interface range





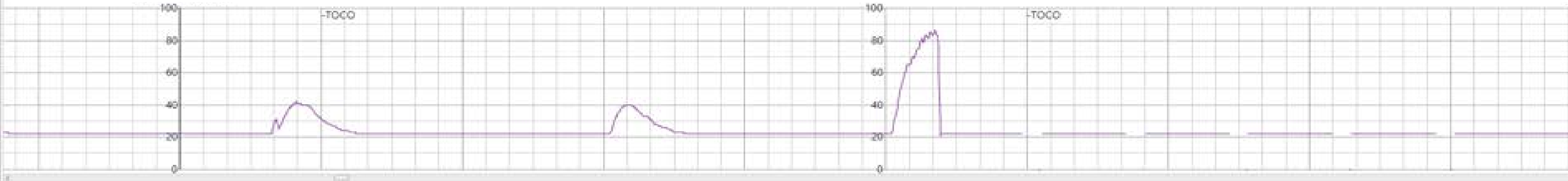
G1P0
37.2 weeks

AMA
HTN
IOL (medical)

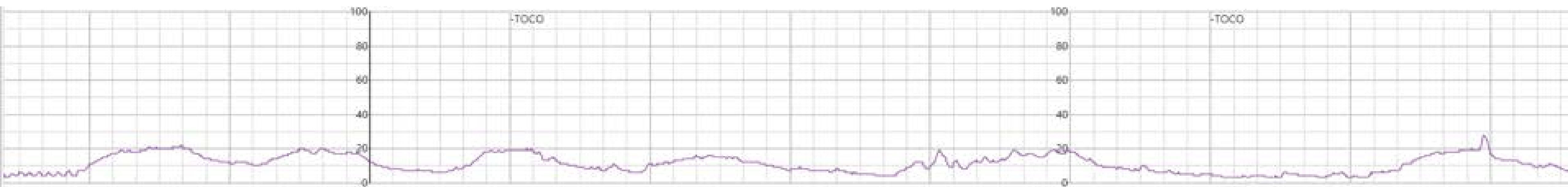
Maternal obesity

Cervical Ripening
Foley bulb in place

Can the Novii system pick up maternal HR??



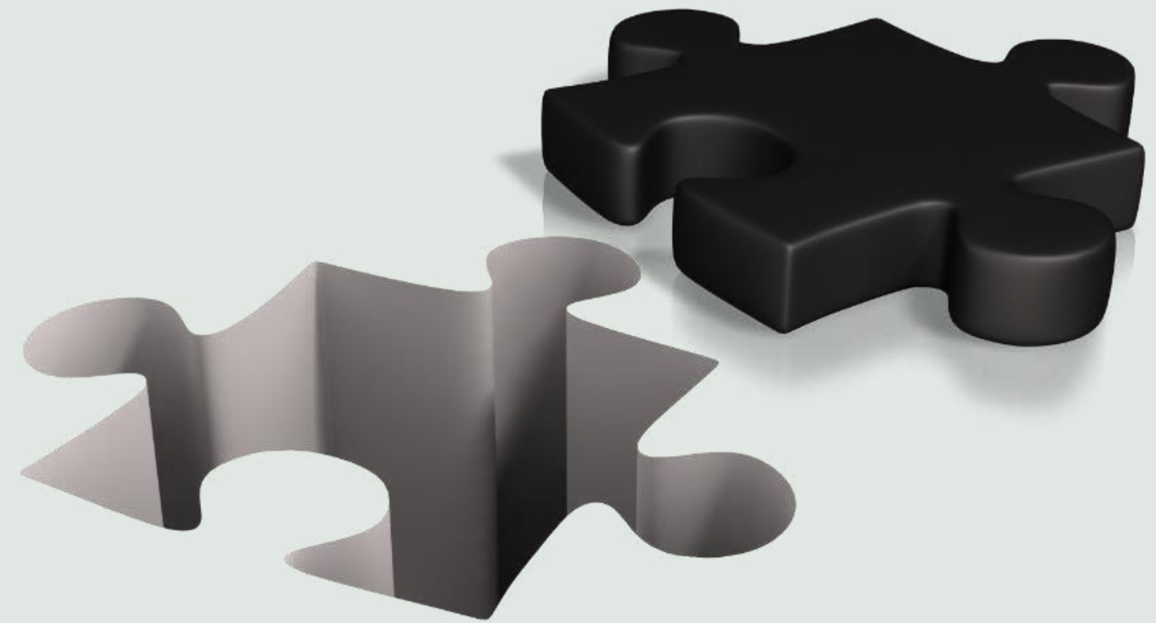
External toco and ultrasound reapplied



Tracings Should Be Evaluated In The Context Of…

- Gestational age
- Maternal medical conditions
- Prior fetal assessments
- Medications
- Fetal conditions
  - Growth restriction, known congenital anomalies, fetal anemia, arrhythmias
    - (NICHD EFM Workshop, 2008)

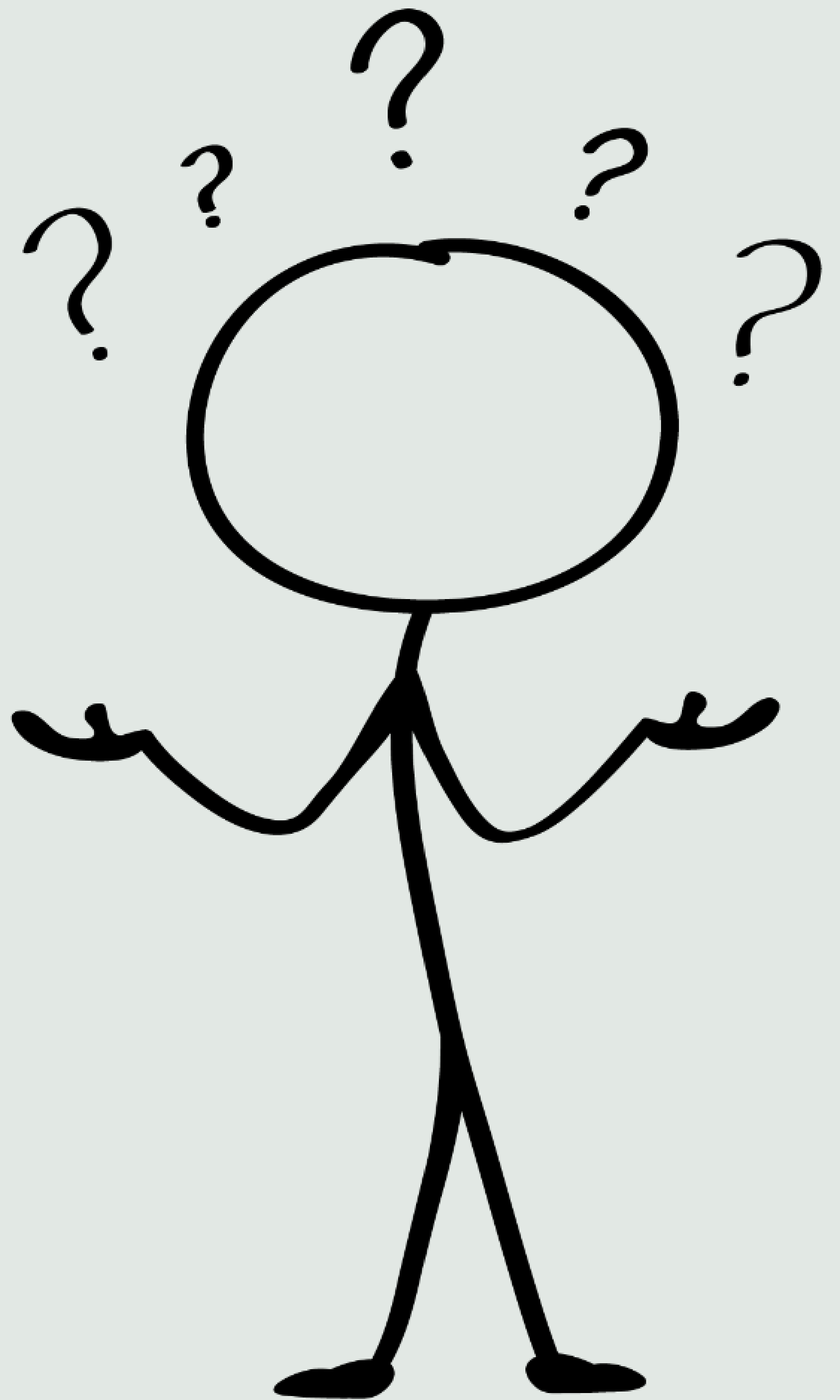
BE AWARE OF THE 5 Common Mistakes in FHR Monitoring



- Delayed use of internal monitors
- Discontinuing the monitor too early
- Confusing the maternal and fetal heart rates
- Not monitoring the fetus during placement of conduction analgesia
- Not monitoring the fetus in the OR

Nageotte, M. P. (2007). www.contemporaryobgyn.net

Questions

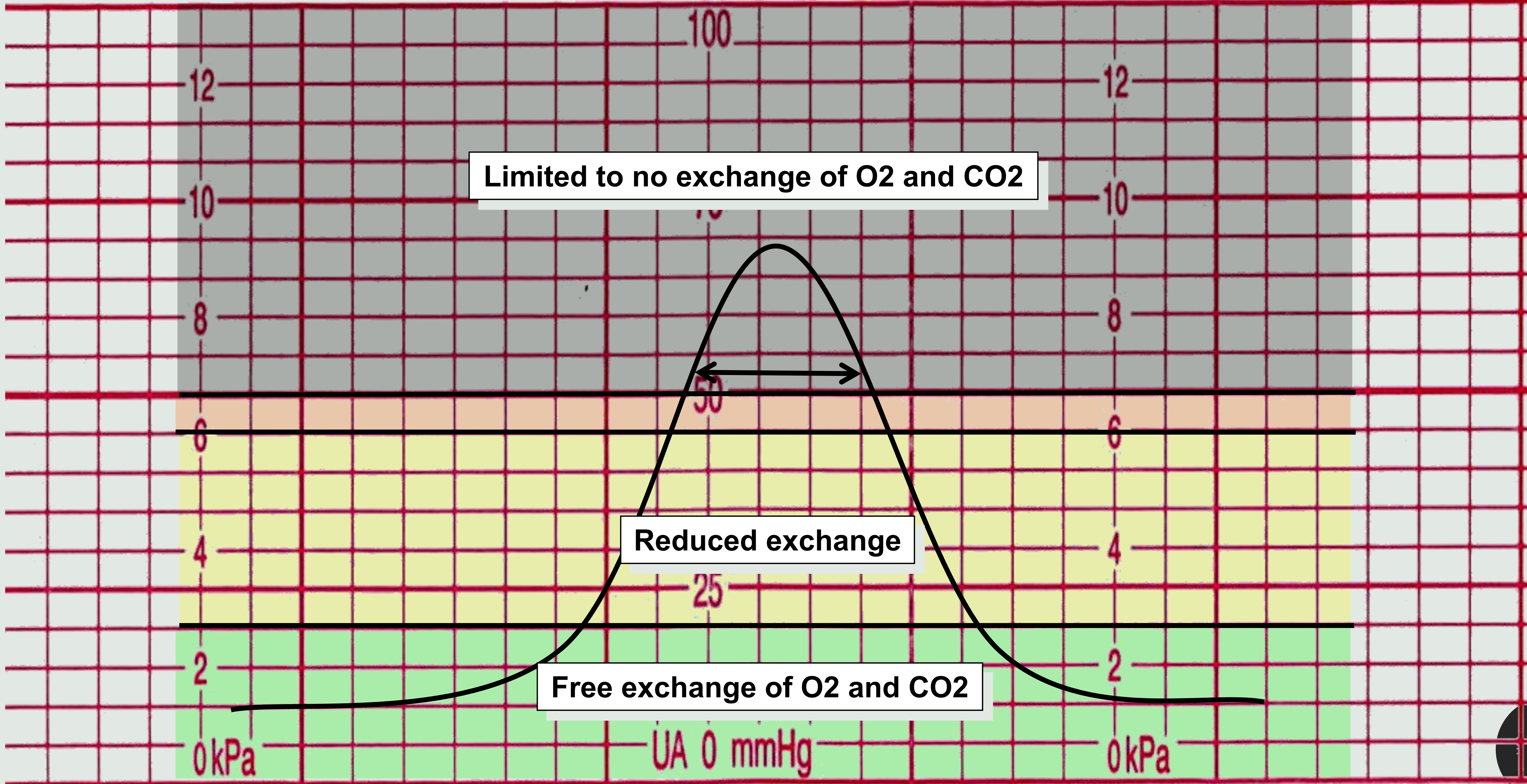


Four Steps to Assist You in Interpreting the Fetal Monitoring Tracing

However, remember to consider the entire clinical picture

Step One

- Evaluate the <u>uterine</u> contraction pattern
- Evaluates the possible stress the fetus is under

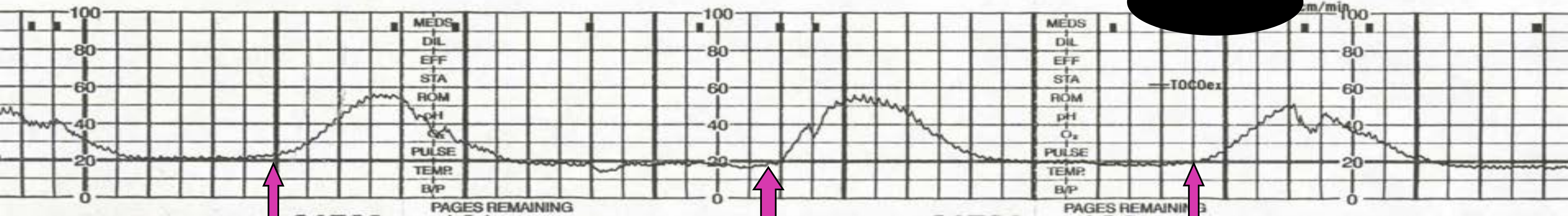


100
12
12
Limited to no exchange of O2 and CO2
10
10
8
8
50
6
6
Reduced exchange
4
4
25
2
2
Free exchange of O2 and CO2
0 kPa
UA 0 mmHg
0 kPa

Uterine Contraction Assessments

Contraction Assessment	Definition
Frequency	Time from the beginning of one contraction to beginning of next; documented in minutes
Duration	Time from the beginning of the contraction to the end of contraction; documented in seconds
Intensity	The strength of the contraction
Resting tone	Intrauterine pressure between contractions
Relaxation time	The amount of relaxation time between the end of one contraction and the beginning of the next contraction

Contraction Frequency

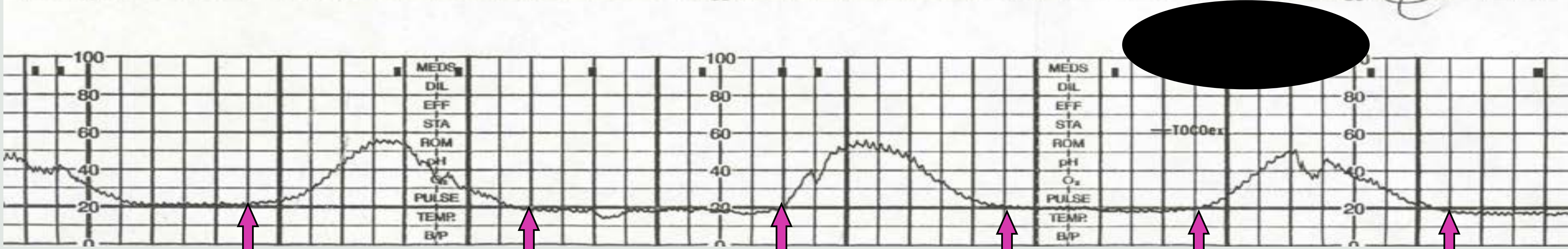


Approximately 2 ½ minutes

Approximately 2 minutes

Timing of contraction frequency is approximated by determining the time between the beginning of one contraction and the beginning of the next; documented in minutes: on the tracing above the contraction frequency is approximately q 2-2 ½ minutes

Contraction Duration



70-75 seconds

65 seconds

65-70 seconds

Contraction duration measured from beginning of a contraction to the end of the contraction and is documented in seconds; the contraction duration for the above tracing is 65-70 seconds (you could also document 65-75 seconds)

Contraction Duration

- Intrauterine pressure catheter

  Most accurate method to determine when the contraction begins and ends
- Palpation by a trained individual

  Next most reliable method
- Patient's perception

  Least reliable method of determining when the contraction begins and ends

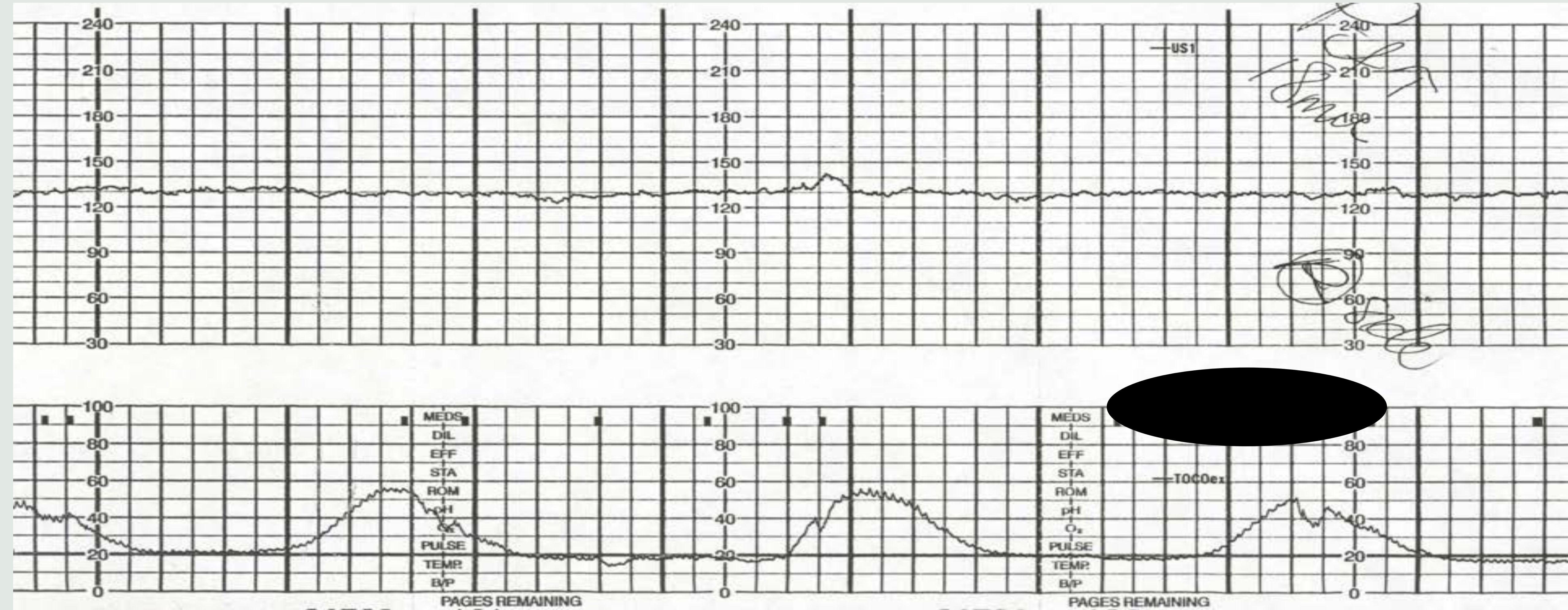
Resting Tone

- Evaluated and documented differently with Internal versus External Monitoring

  With intrauterine pressure catheter (IUPC), document in mmHg
- Periodically palpate to verify

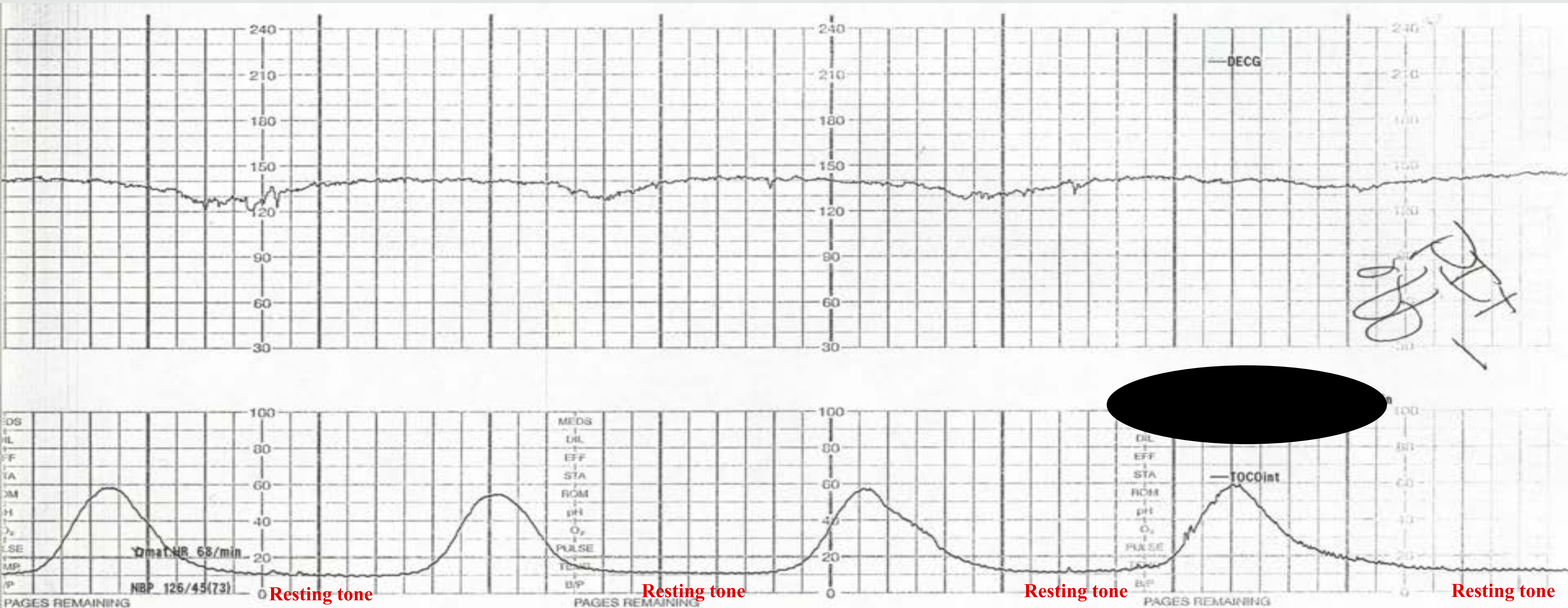
  With external monitoring must be evaluated by palpation between contractions
- should palpate soft between contractions
- Cannot document in mm/Hg

Contraction **Resting Tone**: **External Monitor**



How would you assess and document contraction resting tone on this tracing?

Contraction Resting Tone: Intrauterine Pressure Catheter



With an IUPC in place, document resting tone in mmHg

The resting tone in this tracing is 10 mmHg

Contraction Intensity

- Evaluated and documented differently with Internal versus External Monitoring

  External monitoring

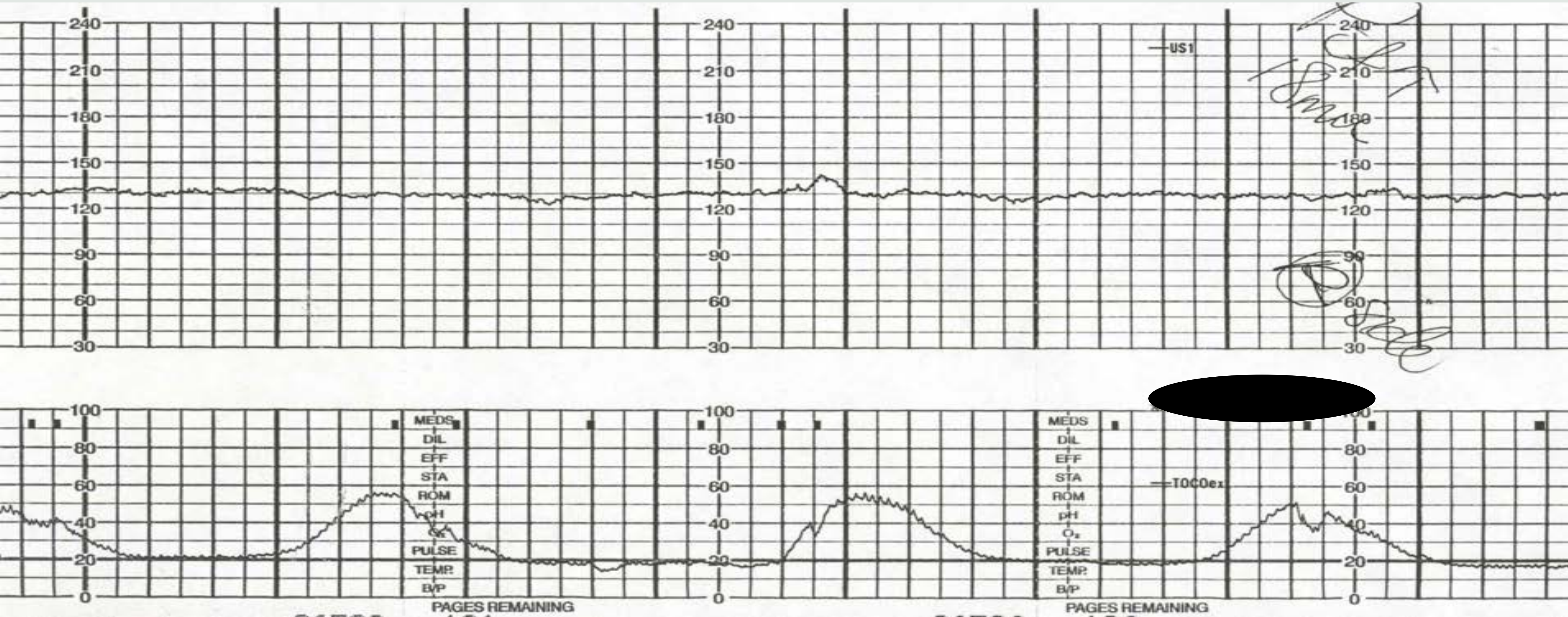
- Palpate indentability of the fundus during a contraction
- Document as mild, moderate or strong

  Tip of nose (mild); chin (moderate), forehead (strong)

  Internal monitoring using intrauterine pressure catheter

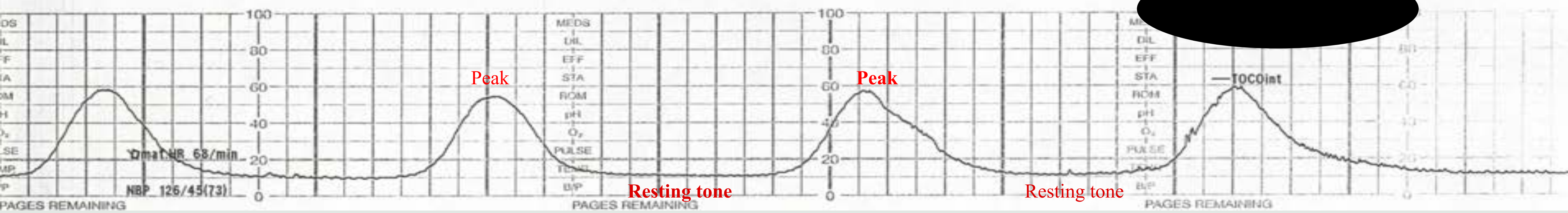
- Peak of contraction in mm/Hg minus resting tone in mm/Hg=intensity
- (document in mmHg)

Contraction Intensity: **External Monitor**



How would you assess and document contraction intensity?

Contraction Intensity: Intrauterine Pressure Catheter



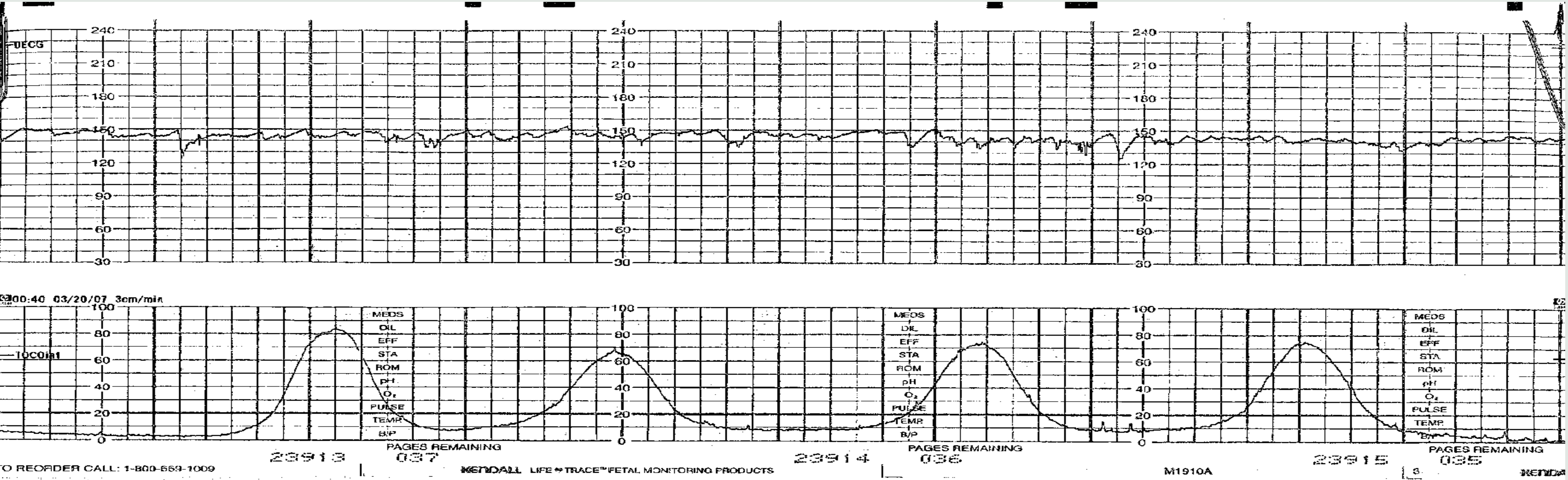
Calculate the intensity of these contractions?

Montevideo Units (MVU'S)

- Measures the quality and sum of contractions
- ***Only*** *obtainable with IUPC*
- Calculate by looking at the contractions in a 10-minute tracing
  - *Subtract the resting tone from the peak for each contraction*

  Then add all the sums together

Calculate



80-5=75 70-10=60 70-10=60 75-10=65

75 + 60 + 60 +65 = 260 MVU’s

MVU's Guidelines

- Typically range from 100- 250 MVU's in the first stage
- May be higher in the second stage
- Contraction intensities of greater than or equal to 40 mmHg and MVUs of 80-120 are generally sufficient to initiate labor
- (Miller, Miller & Cypher, 2027 pp. 79)

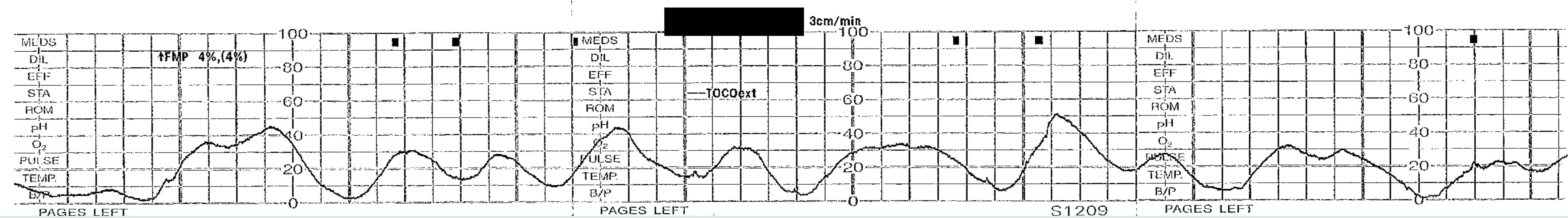
Identify Abnormal Contraction Patterns

Excessive Uterine Activity
Decreased Uterine Activity

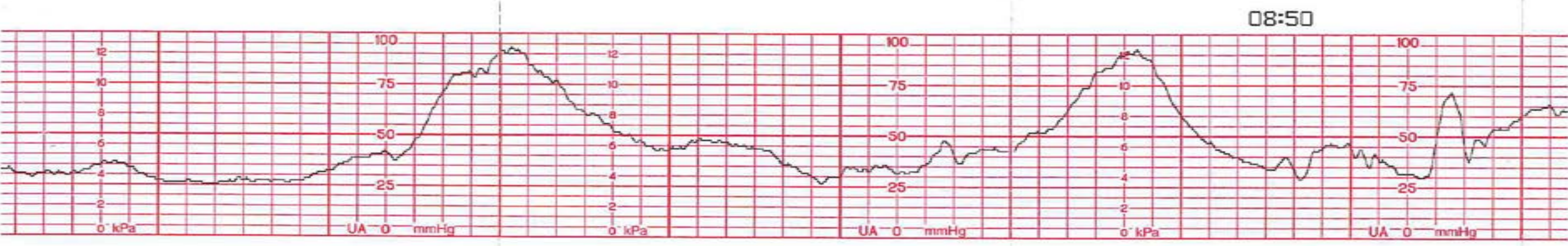
Excessive Uterine Activity

Tachysystole	Greater than 5 contractions in 10 minutes, averaged over 30 minutes
Excessive contraction duration (also known as tetanic contractions; uterine tetany)	A single series of contractions lasting 2 minutes or more
Hypertonus	Resting tone greater than 20-25 mmHg with an IUPC or a uterus that does not return to soft by palpation between contractions
Inadequate relaxation time between contractions	First stage: less than 60 seconds Second stage: less than 45 seconds

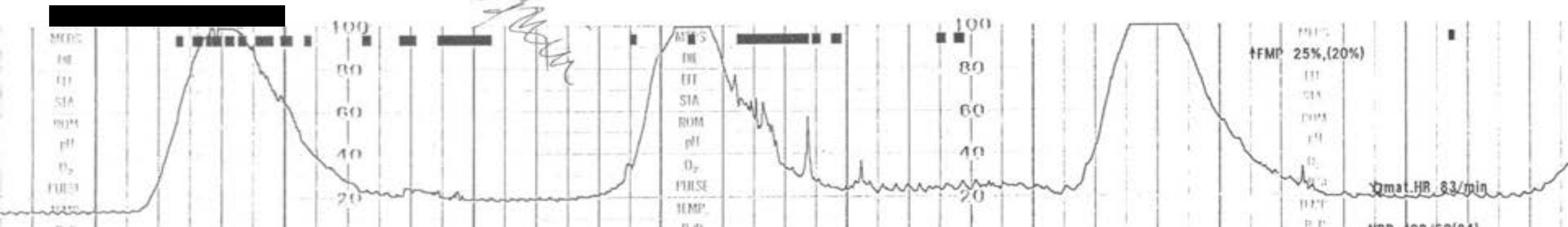
Miller, Miller, & Cypher 2027pgs. 82-86



What abnormal uterine activity is present in this tracing…The tracing continued like this for 30 minutes

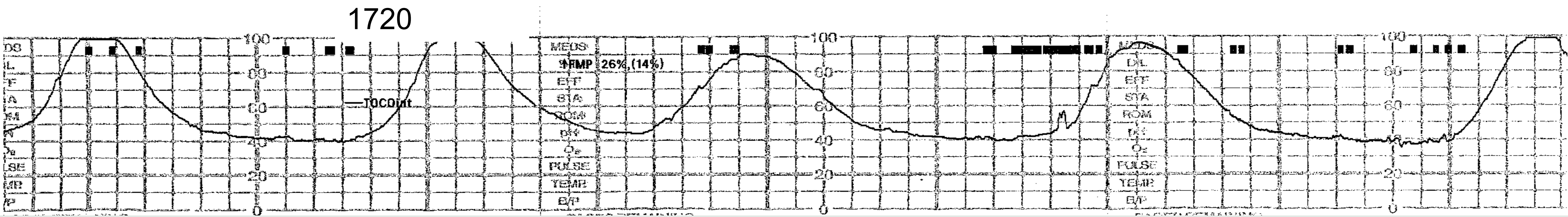


What do you observe here?



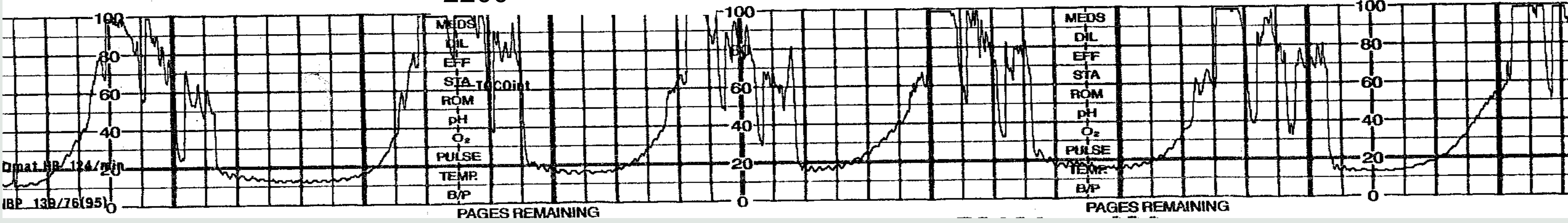
Patient is 2 cm with an IUPC

What do you observe about the contraction pattern?



This is an IUPC; patient is 6 cm dilated;
what is your assessment of the contraction pattern?

2200



Second stage;

What is your assessment of contraction activity?

Possible Causes of Excessive Uterine Activity

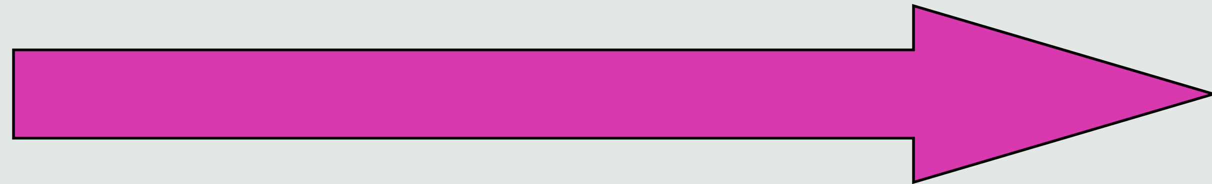
- Pitocin and prostaglandin ripening agents
- Abruption
- Uterine overdistention

  Hydramnios, multiples, macrosomic fetus
- Preeclampsia/eclampsia
- Drugs

  Illicit drugs such as cocaine

Excessive Uterine Activity May Decrease Uterine Blood Flow

- Attempt to prevent/correct it in order to promote fetal oxygenation



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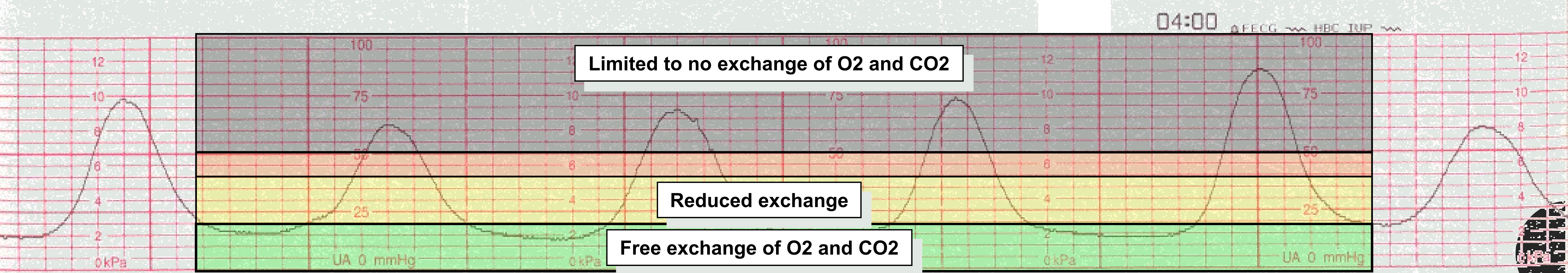
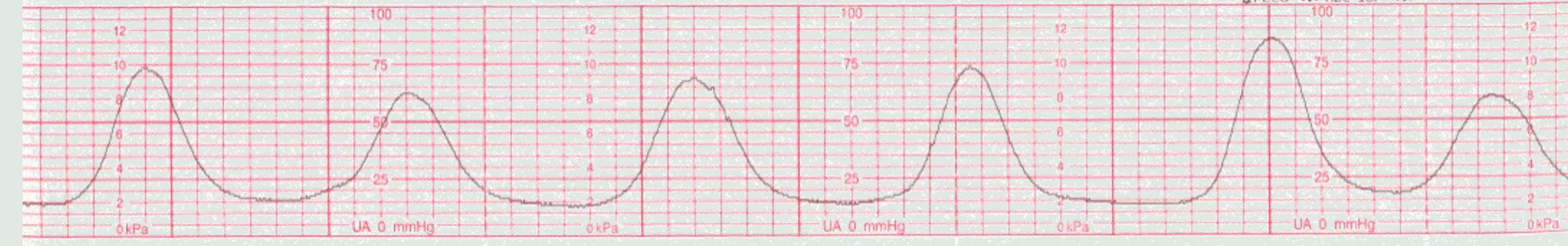
FHR 240 bpm 210 180 150 120 90 60 30

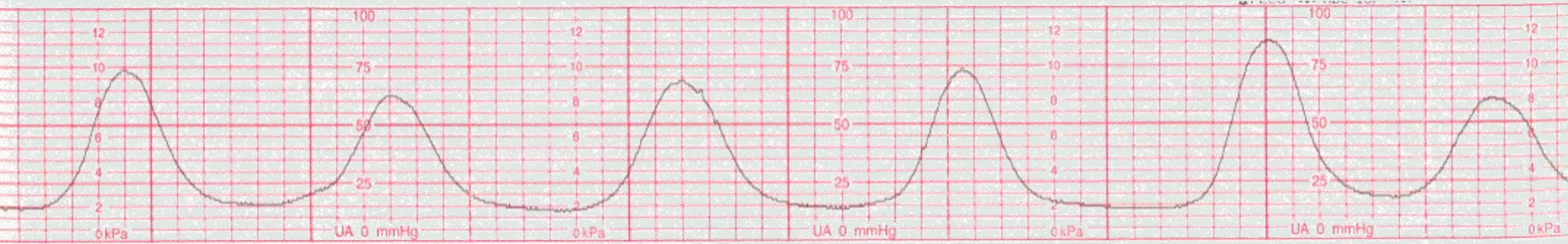
An example of tachysystole !!!!!!!

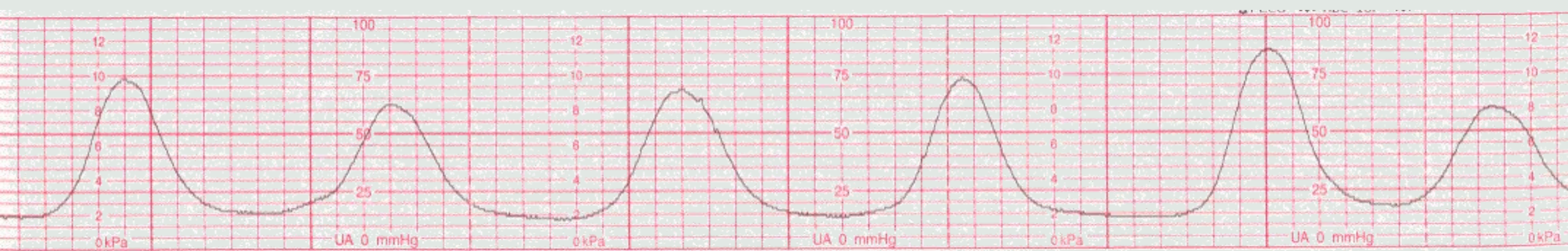


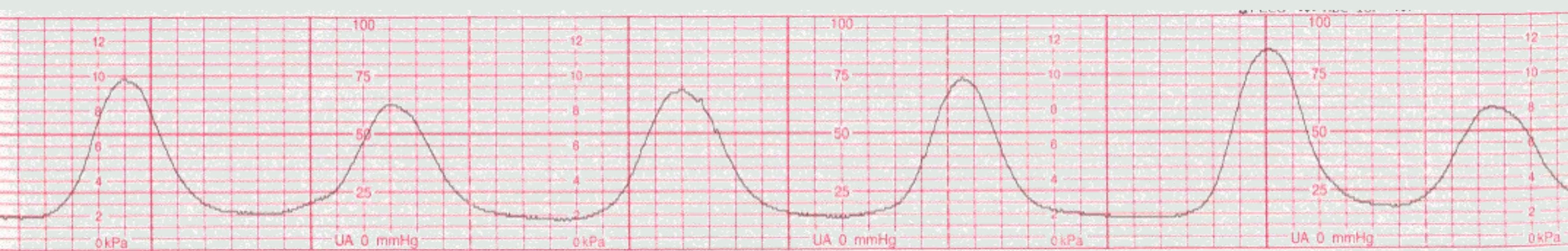
Management of Excessive Uterine Activity

- Evaluate the entire clinical picture
  - *Is patient contracting spontaneously or are the contractions the result of a uterine stimulant*
  - *Where is she in her labor progress*
  - *What is the fetal response*
  - *Are there any signs/symptoms of an abruption*
  - *Any history of drug use*









- "Excessive uterine activity should trigger clinician response whether or not fetal heart rate changes are observed."

  (Miller, Miller & Cypher, 2022, p. 92)

Interventions for Oxytocin-Induced Tachysystole

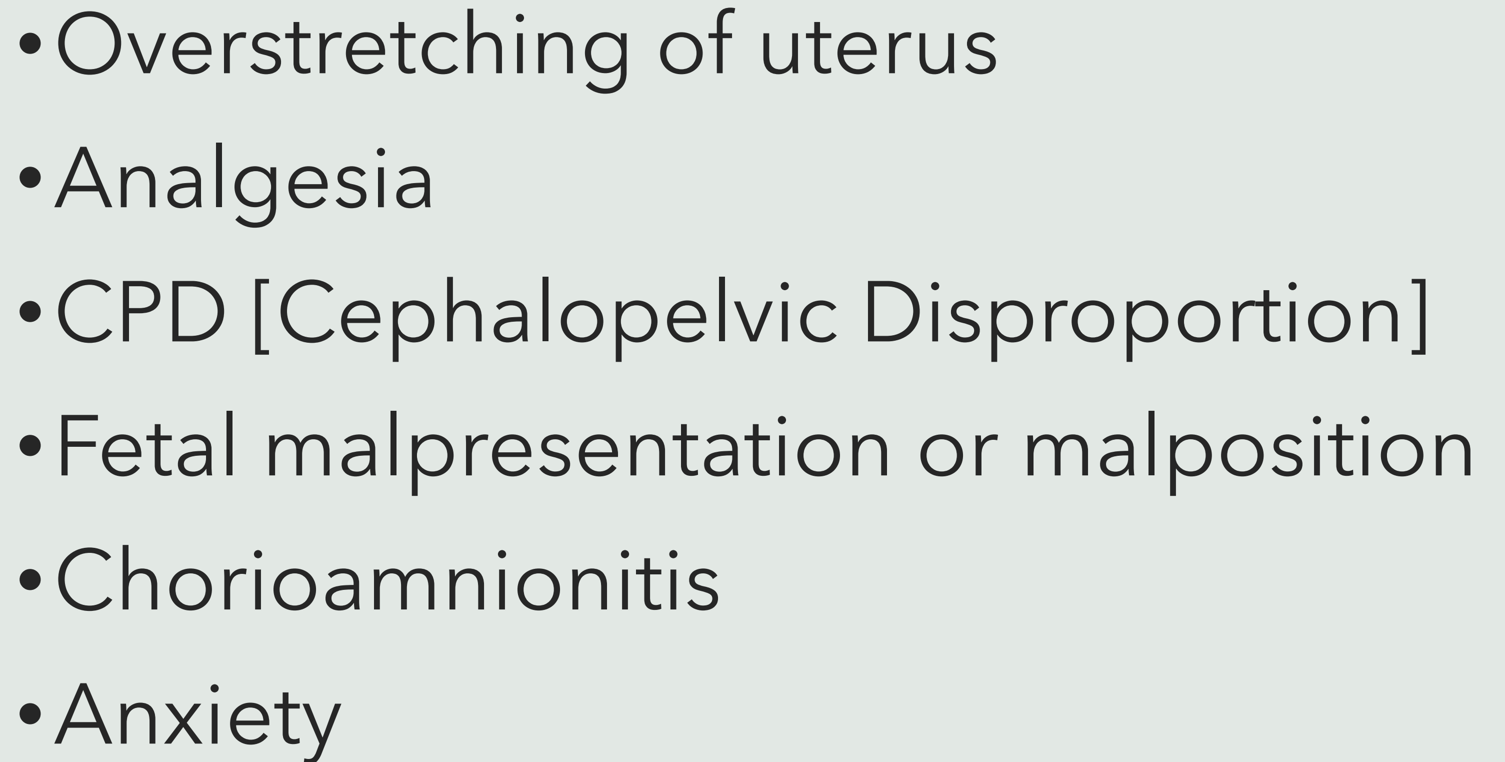
Oxytocin discontinuation	Resolution = 14.2 minutes
Oxytocin discontinuation plus IV fluid bolus of at least 500 mL LR	Resolution = 9.8 minutes
Oxytocin discontinuation plus IV fluid bolus of at least 500 mL LR plus change to lateral position	Resolution = 6.1 minutes

Simpson, 2008, p. 31; Simpson & James, 2008

Decreased Uterine Activity

Contractions insufficiently intense or frequent to achieve cervical dilation or fetal descent

Possible Causes for Decreased Uterine Activity



3cm/min

240
210
180
150
120
90
60
30

MEDS
DIL
EFF
STA
ROM
pH
O_2
PULSE
TEMP
B/P

mal HR 65/min

NBP 128/84(99)

100
80
60
40
20
0

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06:30 3cm/min

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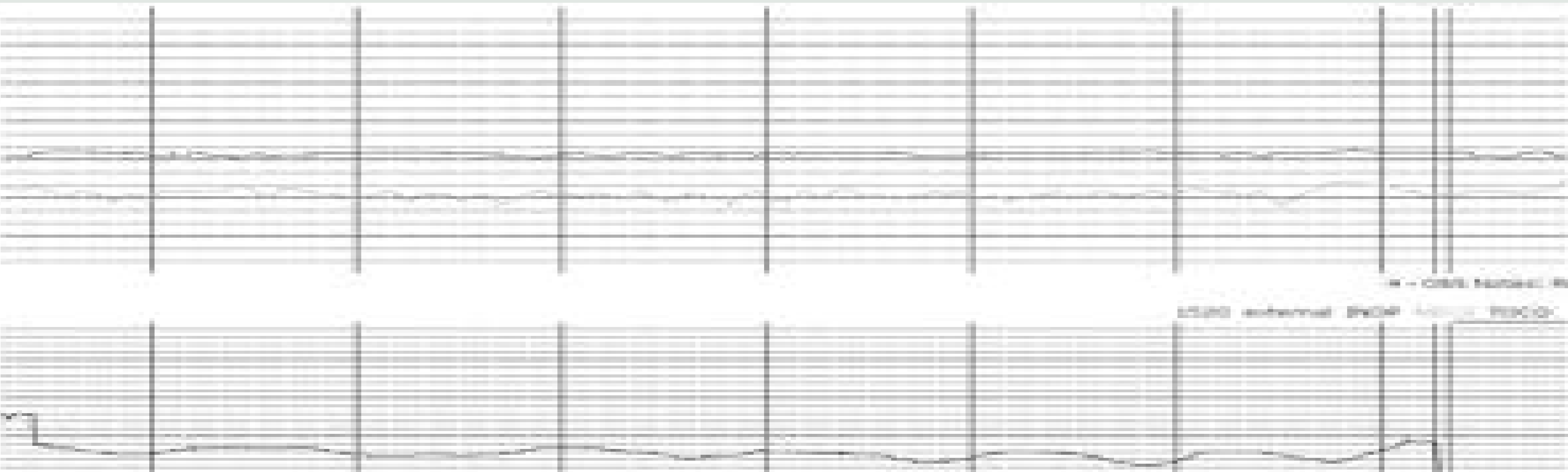
“Uterine Irritability” – High Frequency Low Amplitude Contractions



https://indianaawhonn.webs.com/documents/IN%20AWHONN%20Tachysystole%202013%20handout.pdf

Let’s Practice

Draw a contraction:
Frequency: 2-3 minutes
Peak: 50-60 mmHg
Resting Tone: 20mmHg
Duration: 80- 90 seconds

Draw an example of
Tachysystole

Draw an example of
an elevated resting tone

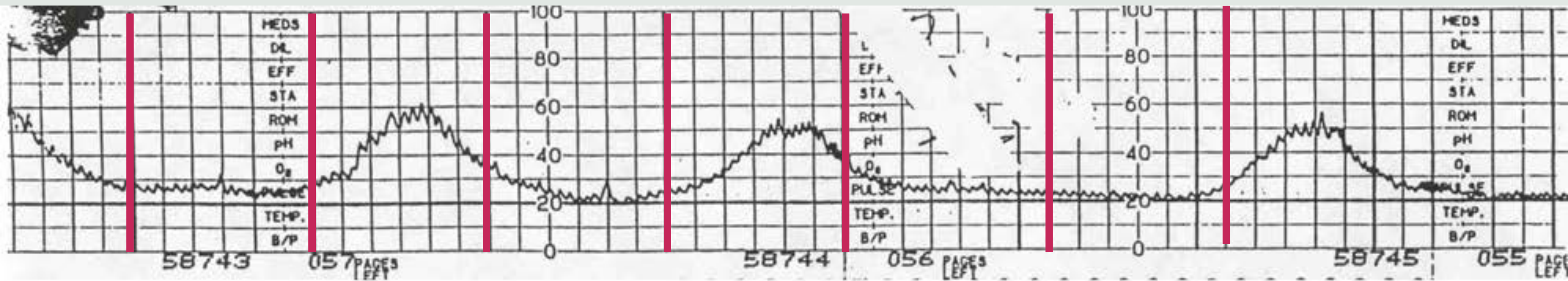
Contraction Pattern #1

Frequency 2-3 minutes

Peak 50 to 60 mmHg

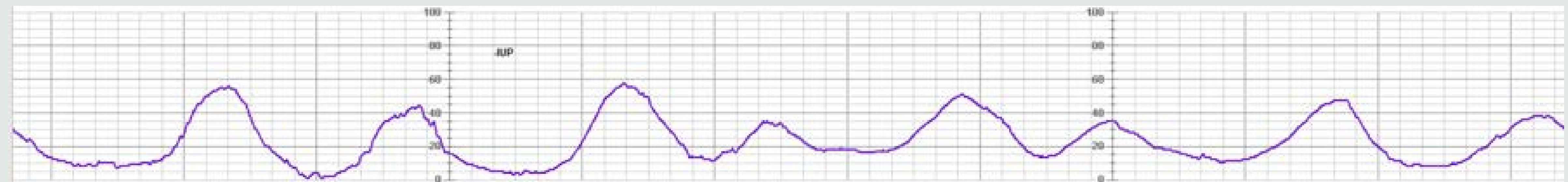
Resting Tone 20 mmHg

Duration 80- 90 seconds



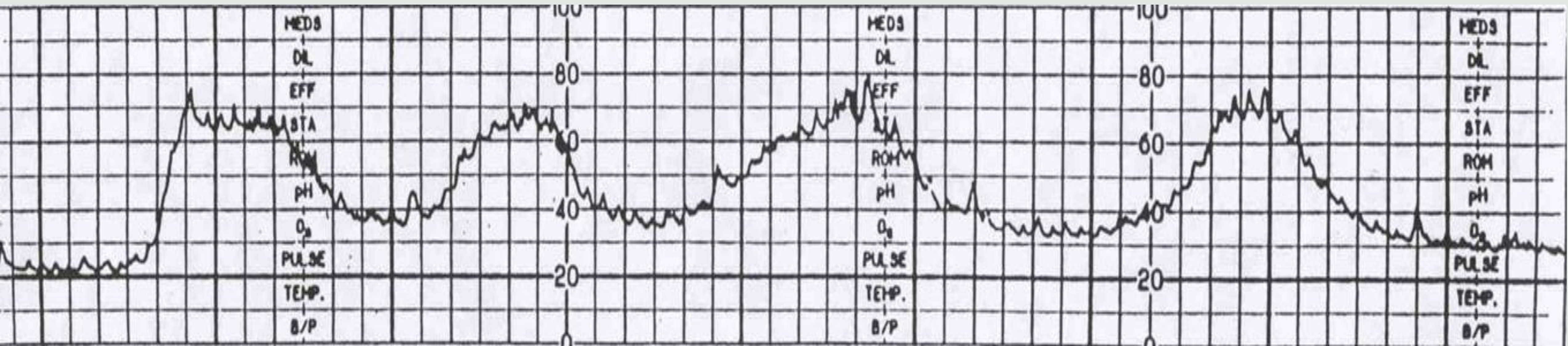
- **Contraction Pattern #2**

- Example of Tachysystole



Contraction Pattern #3

- Example of Elevated Resting Tone



What is Step One?

Step Two

Determine the baseline fetal heart rate

Definition of Baseline

Baseline FHR is the approximate mean FHR rounded to increments of 5 bpm during a 10-minute segment excluding:

- Excluding accelerations or decelerations
- Periods of marked variability

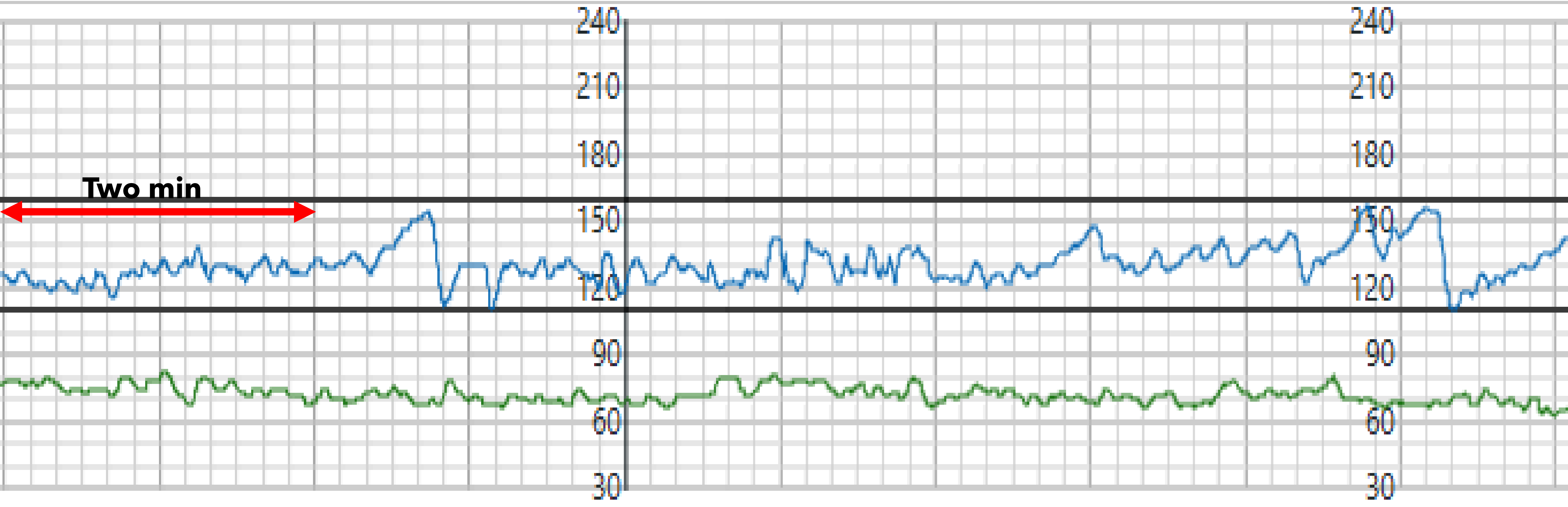
Baseline FHR

In any 10-minute window, there must be at least 2 minutes of identifiable baseline segments (not necessarily contiguous) or the baseline for that period would be ***indeterminate***

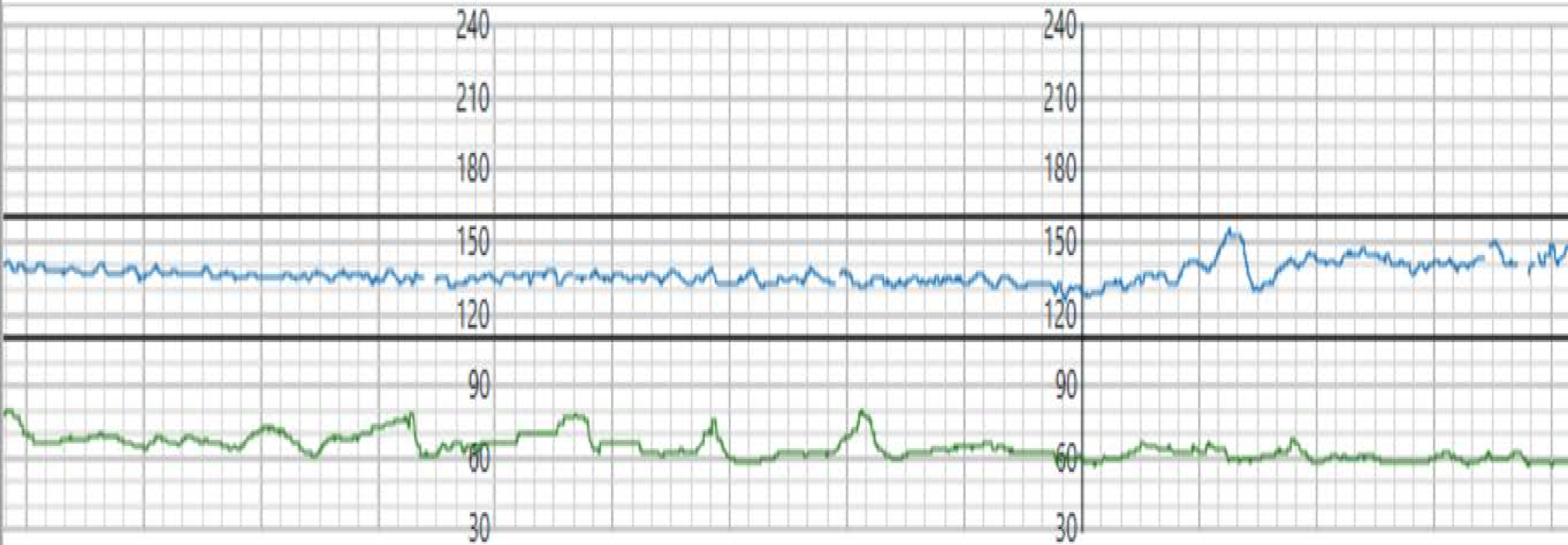
If this is the case, refer to the previous 10-minute segment(s) to determine the baseline

Normal Range

At term:	110-160 bpm
Preterm:	higher end of range
Post-term:	lower end of range



What is the fetal heart rate baseline??



What is the fetal heart rate baseline??

1505-1515

1520-1530

One min

50 sec

40 sec

What is the fetal heart rate baseline??

How many minutes do I need to identify fetal heart rate baseline??

Baseline Change

A new baseline FHR is established only when a change in baseline fetal heart rate persists for 10 minutes or longer.

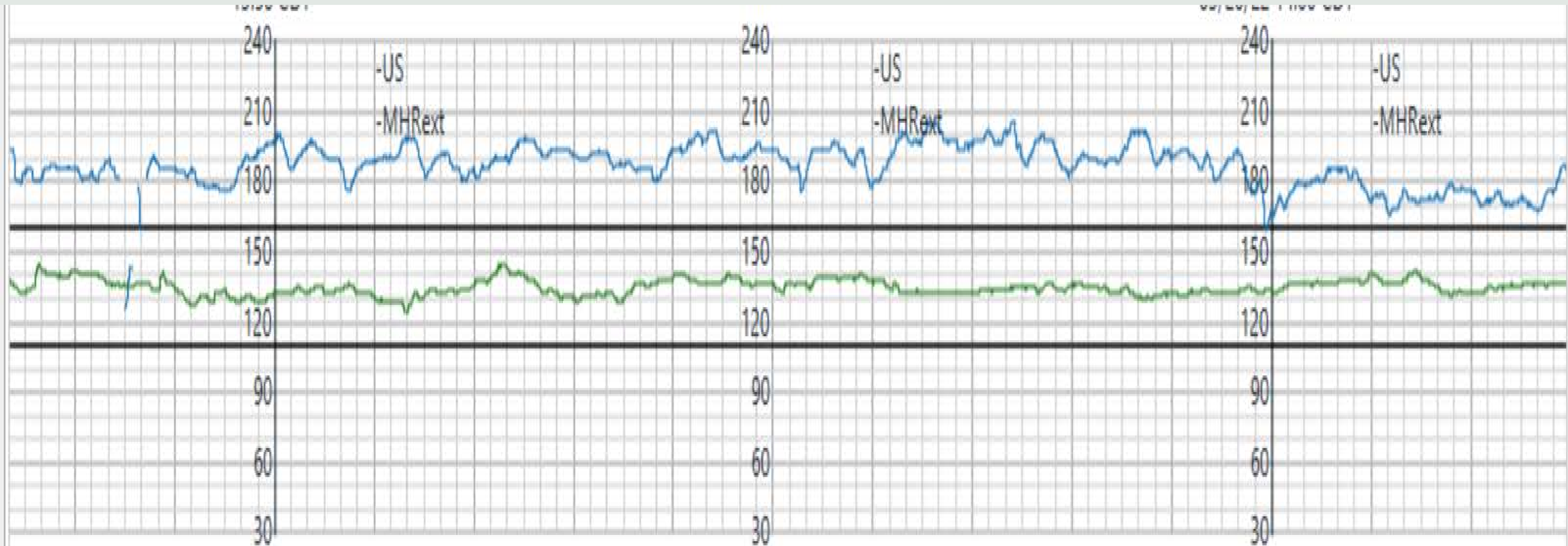
Be alert to a changing baseline that occurs gradually over time…

Variations in Baseline

Tachycardia

Bradycardia

Fetal Tachycardia
Baseline greater than 160 bpm



What is the fetal heart rate baseline??

Possible Risks for Development of Fetal Tachycardia

Infection

Dehydration

Medications & Drugs

Fetal Conditions

(anemia, placental abruption, arrhythmia)

Maternal Conditions

(hyperthyroidism)

Fetal hypoxia or metabolic acidemia

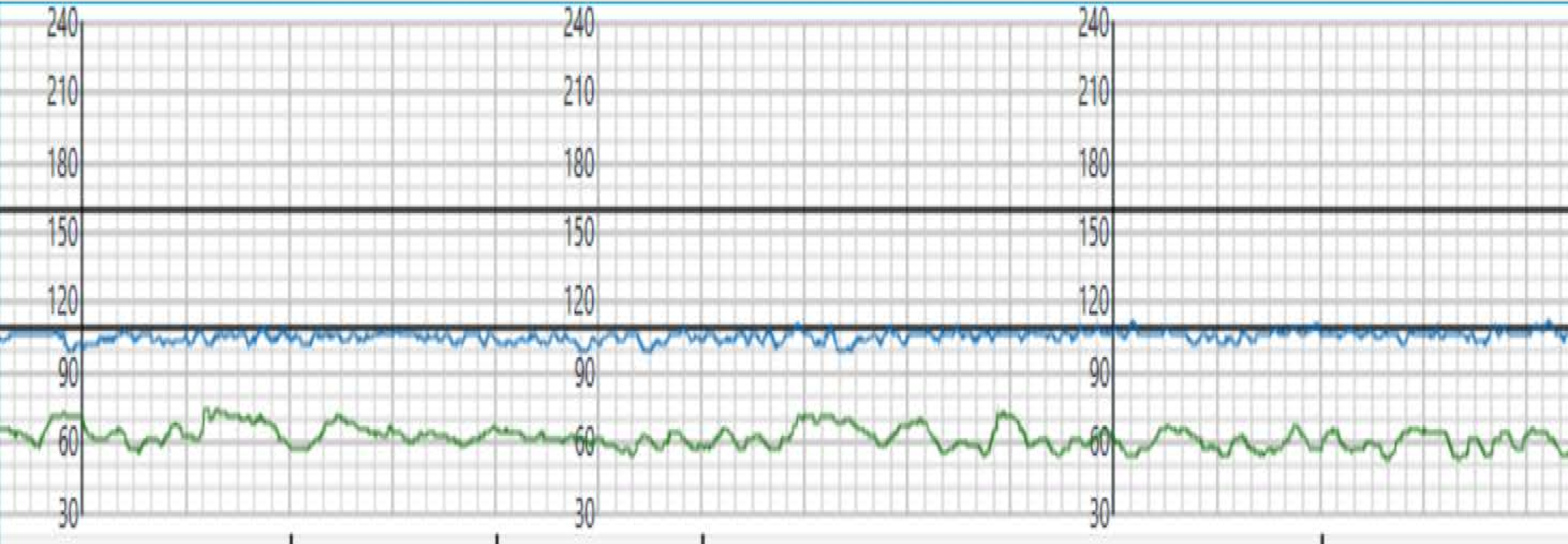
Assessments for Tachycardia

Determine and treat the underlying cause, if possible

Check maternal temperature

- for fever: antipyretics, IV hydration, IV antibiotics

Fetal Bradycardia
Baseline less than 110 bpm



What is the fetal heart rate baseline??

Possible Etiology of Fetal Bradycardia

Hypoxia r/t an acute ↓ in uteroplacental blood flow or gas exchange

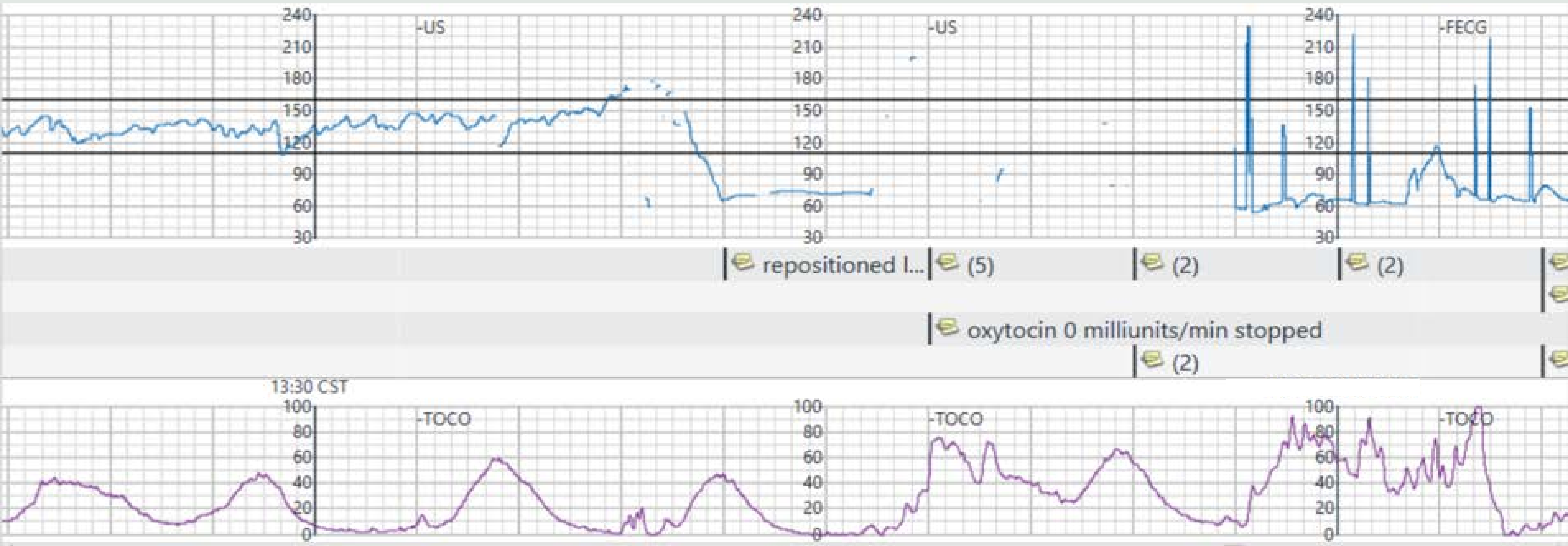
Umbilical cord prolapse, maternal hypotension, tachysystole, uterine rupture, placental abruption or eclamptic seizure

Medications

Vagal Stimulation

Hypothermia

Fetal cardiac arrhythmia (ex: complete heart block)

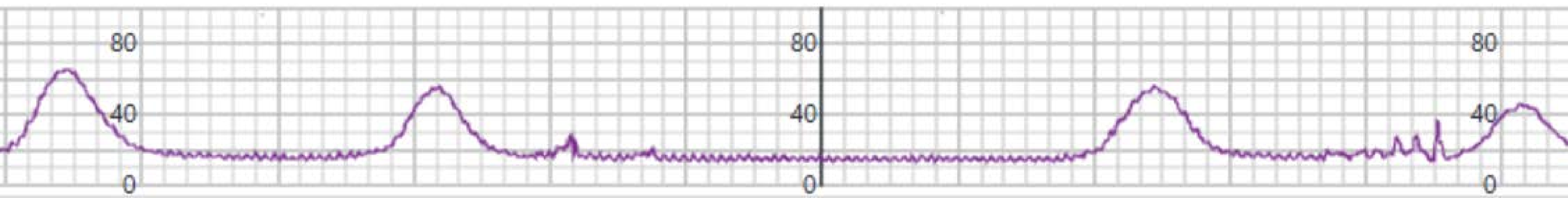


G3P2 38 wks, admitted for SROM & bleeding

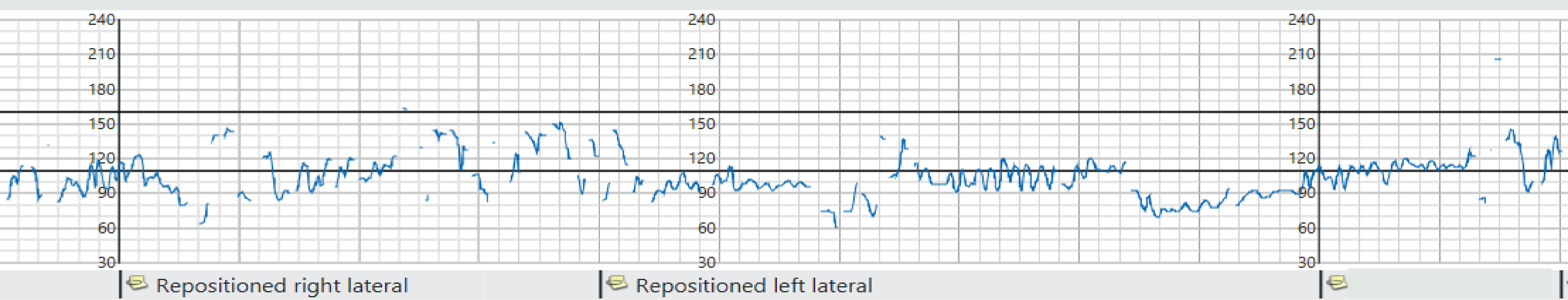
What do you think is a possible cause?

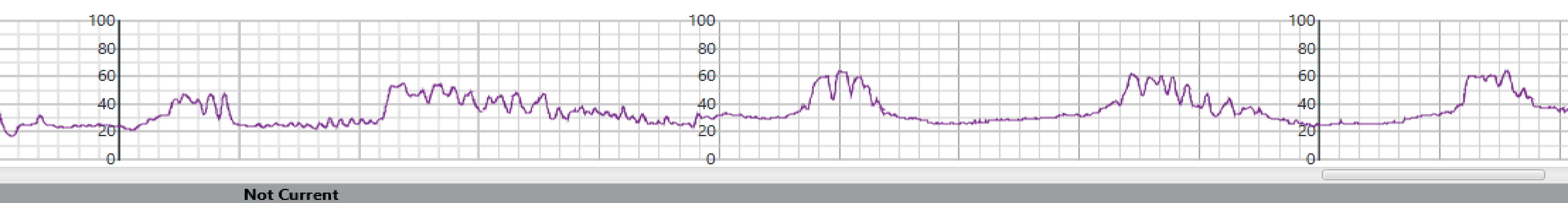
Pt's history includes chronic HTN & smoking. Emergent c-section performed, 30-50% of placenta had fully abrupted w/ 2 segments completely separated from the placenta. Apgars 1,4,8 w/ thick meconium-stained fluid

240
210
180
150
120
90
60
30
(2)
(2)
Reposition
13:30 CST



Notice how similar the maternal HR and fetal HR are

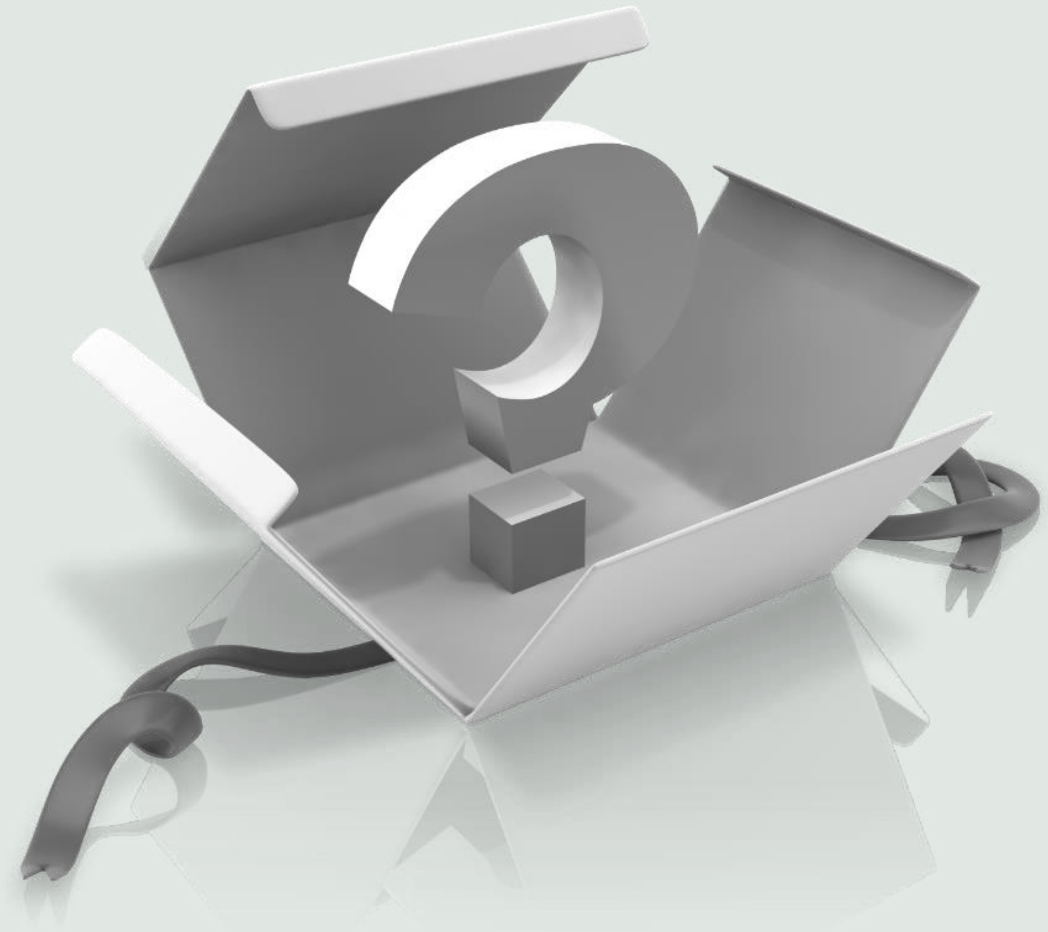




G1P0, 39.4 wks, Pt pushing, no epidural

What is the baseline?

Questions on how we determine FHR Baseline?



Let's Practice

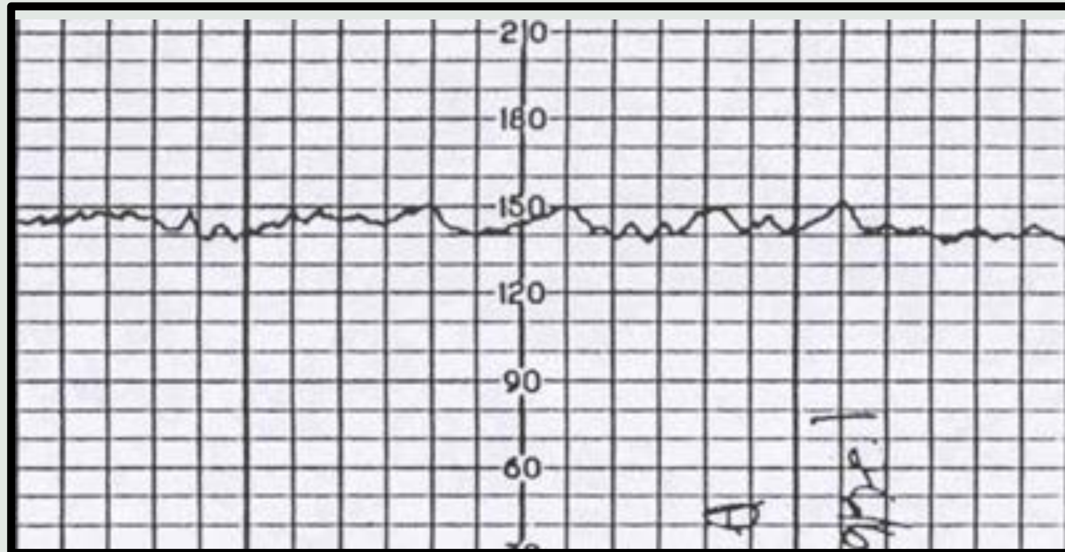
Draw a FHR baseline within normal limits

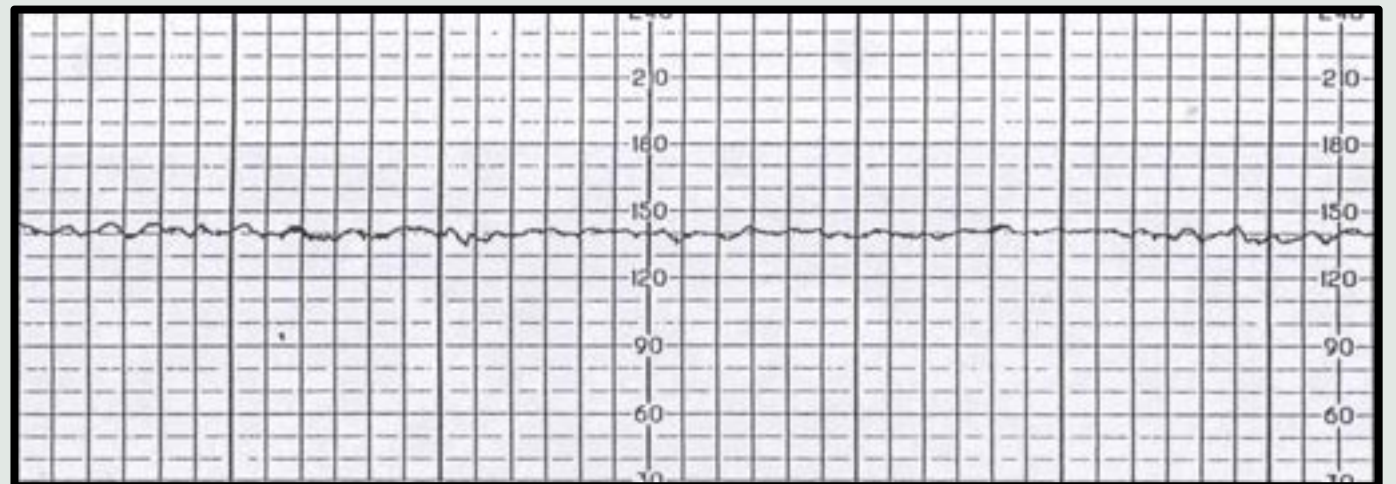
Draw a FHR baseline displaying bradycardia

Draw a FHR baseline displaying tachycardia

Examples of Normal Baseline

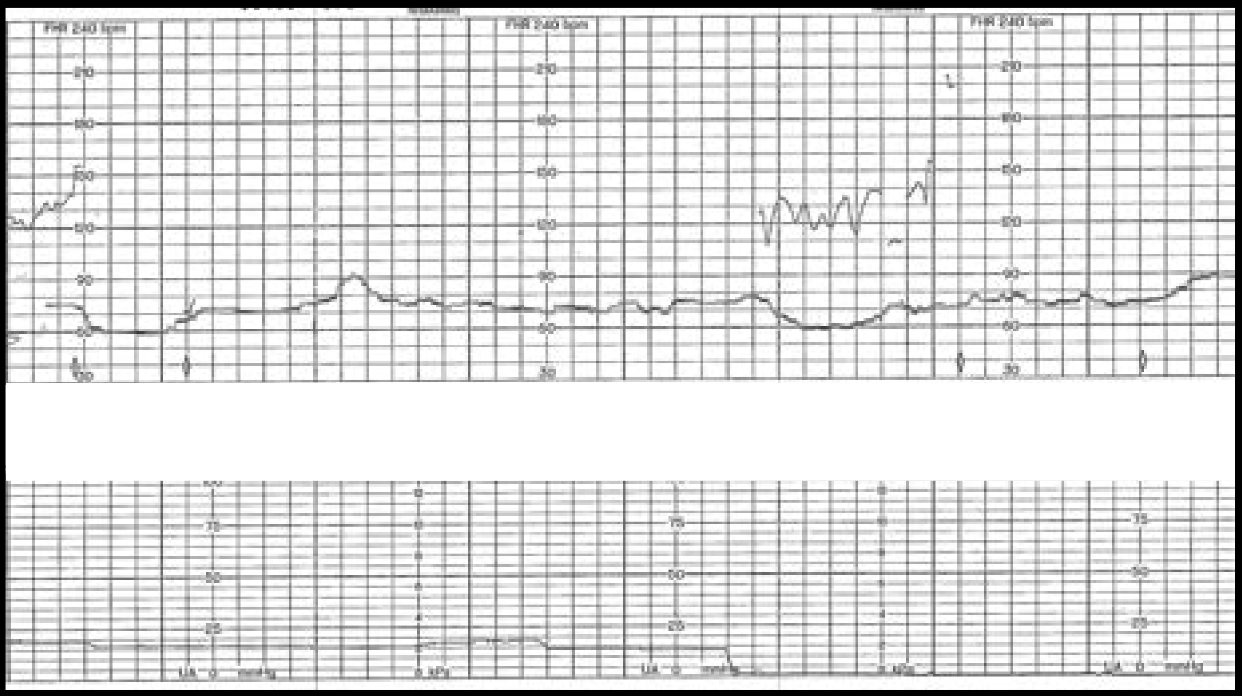
110-160 beats per min within a 2-minute time frame without accelerations or decelerations

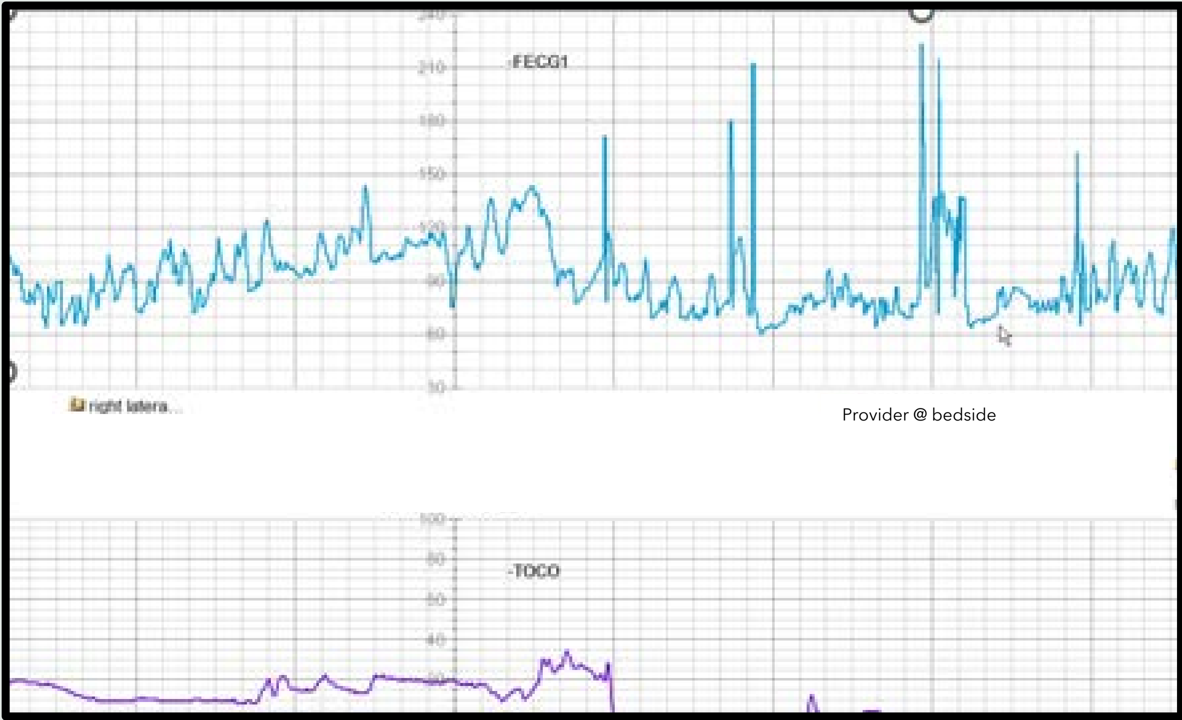




Example of Fetal Tachycardia

Examples of Fetal Bradycardia





What is Step One?

What is Step Two?

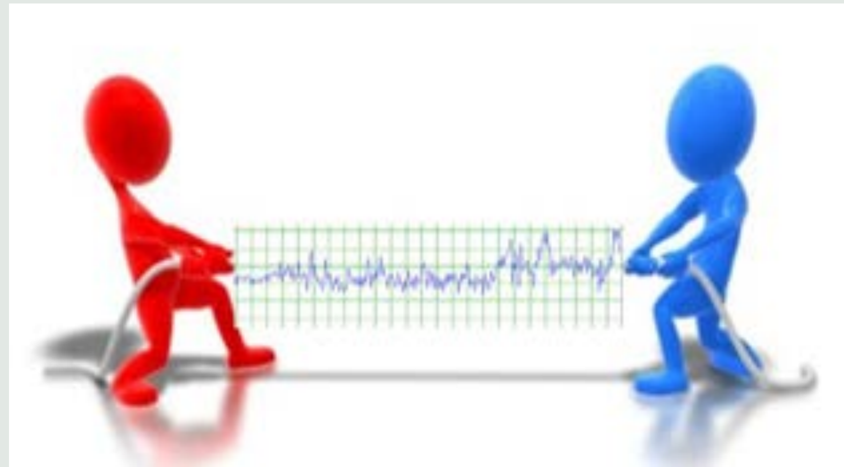
Step Three

Determine the fetal heart rate variability

Variability

- Result of the constant interplay between the sympathetic & parasympathetic nervous systems [Autonomic nervous system]

Sympathetic Parasympathetic

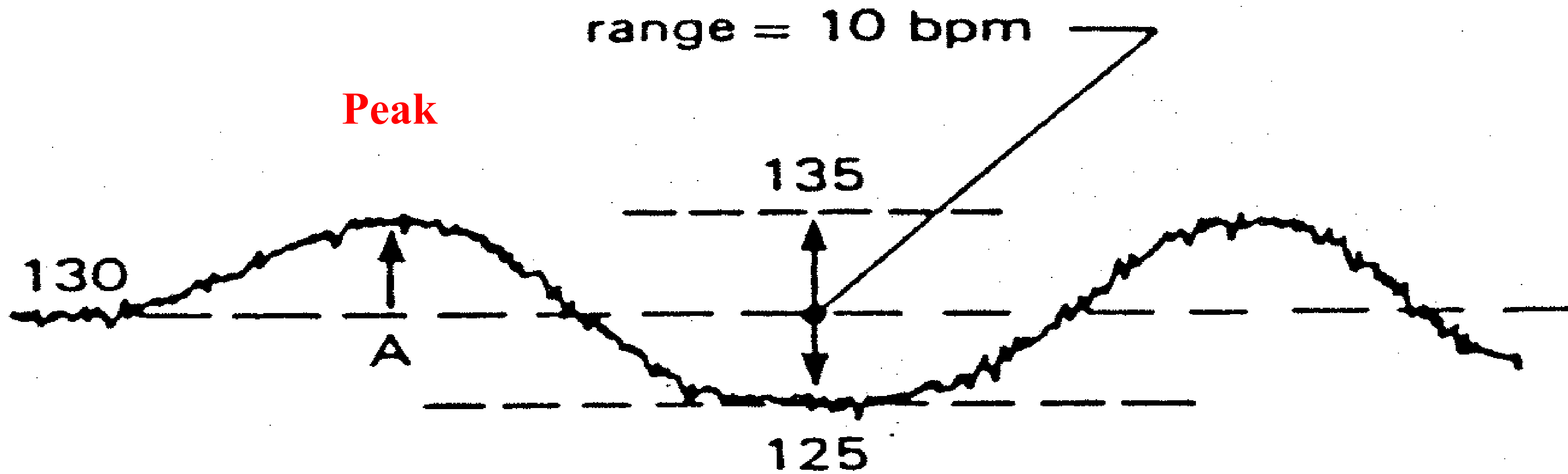


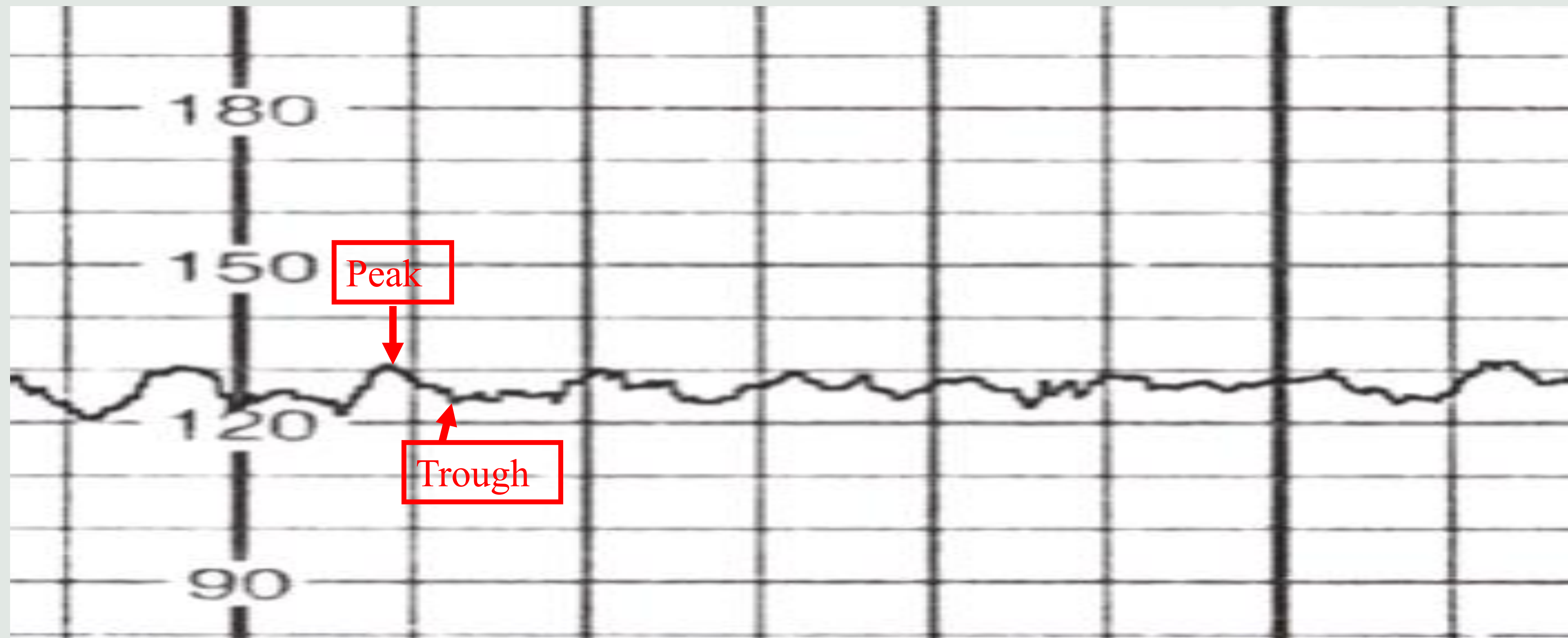
- Sympathetic nervous system matures earlier than parasympathetic nervous system

The Definition of FHR Variability

- **Defined as fluctuations in the baseline FHR that are *irregular in amplitude and frequency***
- Determined in a 10-minute window, **excluding** accelerations and decelerations
- Variability is based upon a visual assessment of the amplitude and frequency of the fetal heart rate complexes

  Excluding a regular, smooth sinusoidal pattern


range = 10 bpm
Peak
135
130
A
125
Trough or the lowest part



180
150
Peak
120
Trough
90

Baseline FHR Variability

- The fluctuations in the baseline FHR variability are visually quantitated as the amplitude of the peak-to-trough in bpm as follows:

Absent variability	*Amplitude <u>undetectable</u>*
Minimal variability	*≤ [less than or equal to] 5 bpm*
Moderate variability	*6-25 bpm*
Marked variability	*> [greater than] 25 bpm*

Absent FHR Variability

Defined as an amplitude range

<u>Undetectable</u>

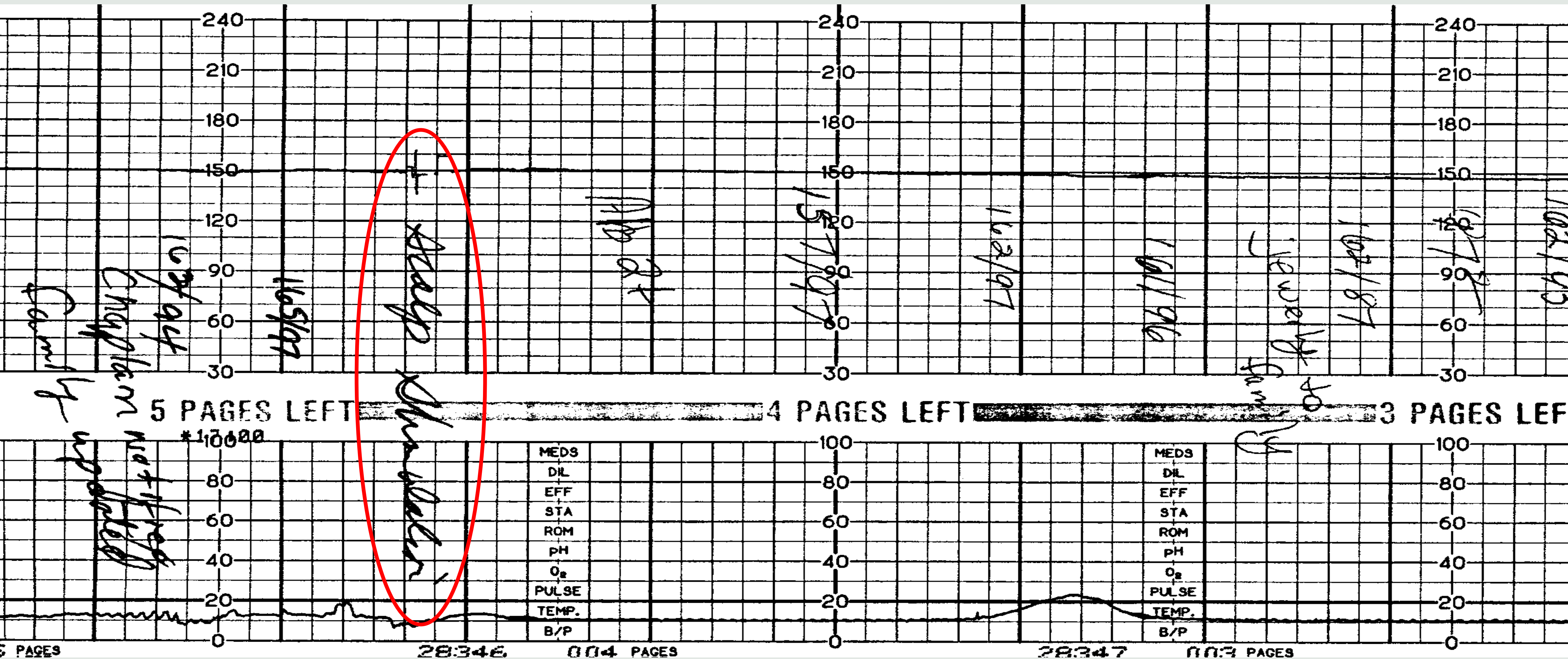
Conditions Associated With Minimal-Absent Variability

- Sleep (usually lasts 20 to 40 min)

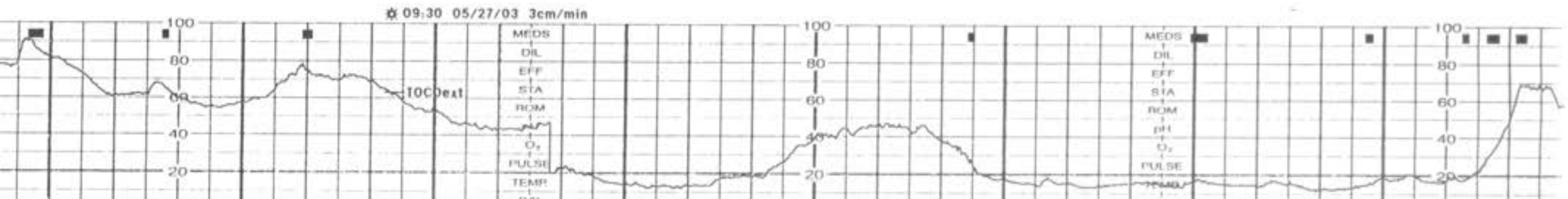
  AWHONN (2021, p. 41) states it may persist > 60 minutes
- CNS depressants

  Narcotics, barbiturates, phenothiazines, tranquilizers, general anesthetics
- Parasympatholytic
  - *Atropine, phenothiazines*
- Disrupted fetal oxygenation
- Prematurity
- Preexisting neurologic injury
- Congenital anomalies

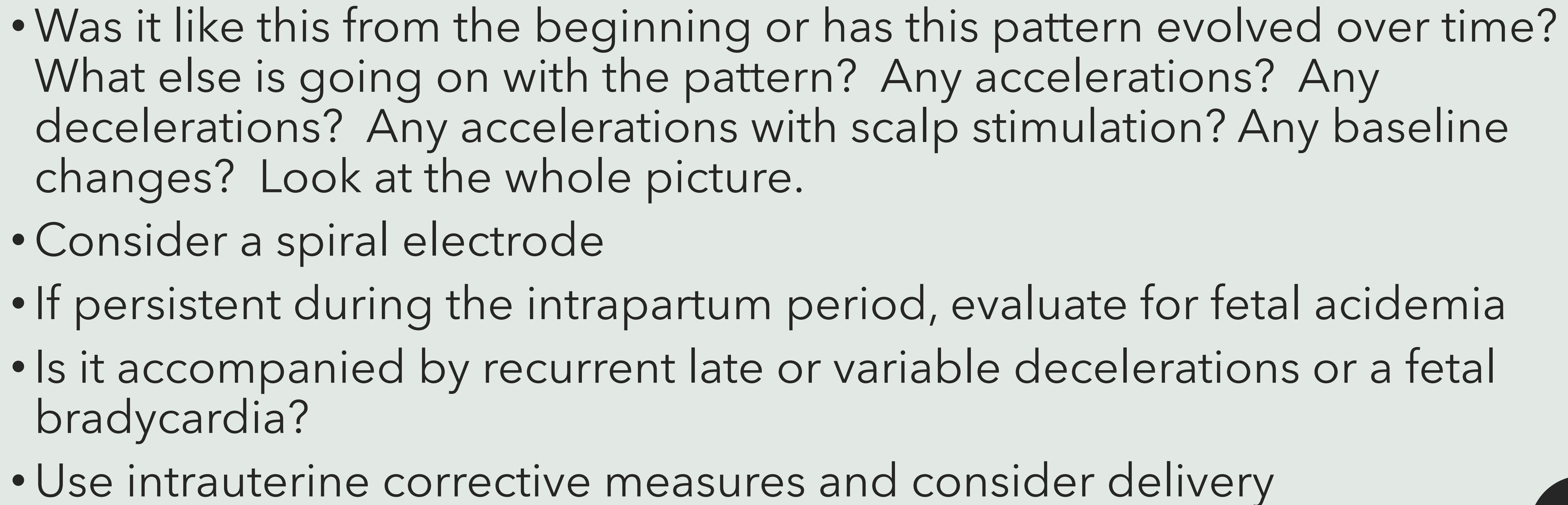
Eclamptic patient who had Fentanyl, Labetalol and Ativan Administered



Example of Absent Variability – Preexisting Congenital Anomaly



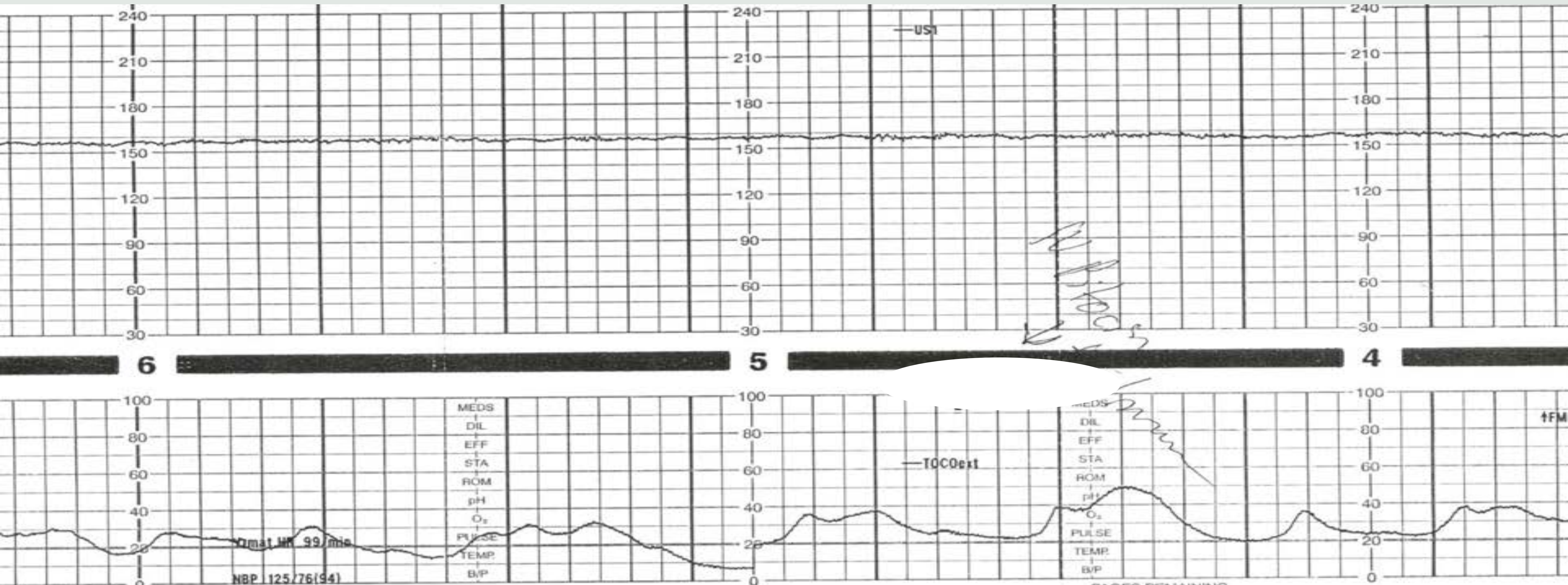
Possible Management of Absent Variability



Minimal FHR Variability

Defined as an amplitude range of
greater than undetectable
but less than or equal to 5 bpm

Example of Minimal Variability



Conditions Associated With Minimal-Absent Variability

- Sleep (usually lasts 20 to 40 min)

  AWHONN (2021, pp. 279-280) states- average is 23 minutes it may persist as long as75 minutes

- CNS depressants

  Narcotics, barbiturates, phenothiazines, tranquilizers, general anesthetics

- Parasympatholytics

  Atropine, phenothiazines

- Disrupted fetal oxygenation
- Prematurity
- Preexisting neurologic injury
- Congenital anomalies

NOTE: *Repeat Slide*

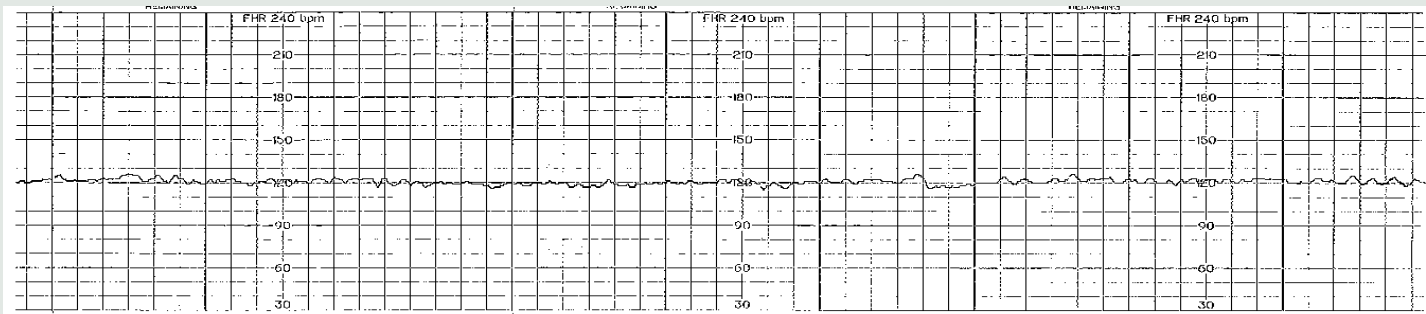
Possible Management of Minimal Variability

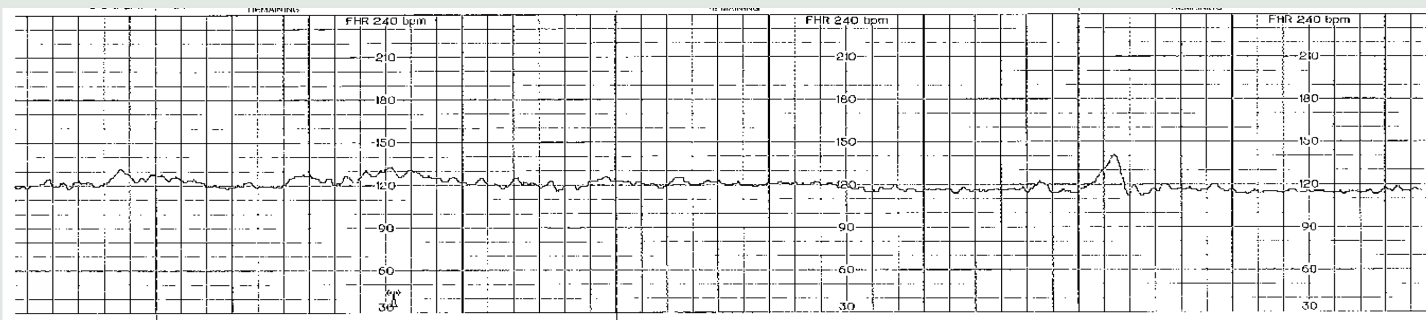
- Determine the underlying cause
- Rule out benign cause

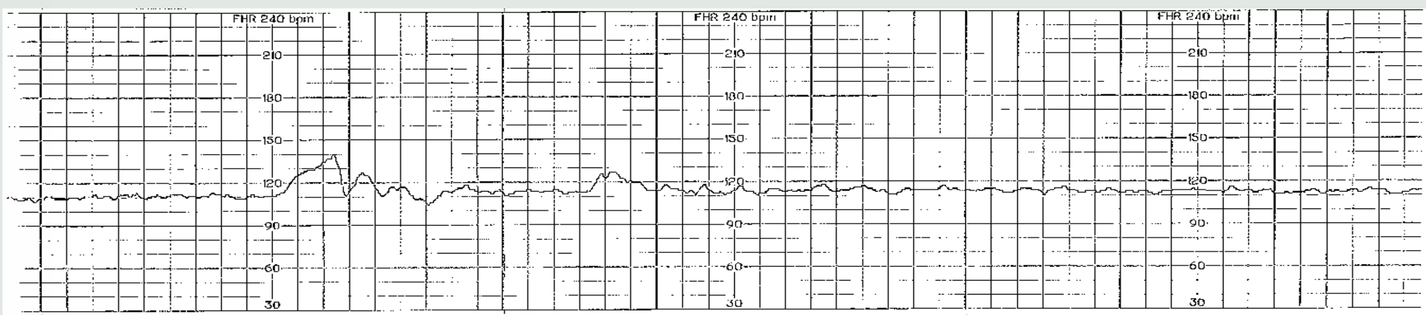
  Fetal sleep, drugs, etc
- Was it like this from the beginning or has this pattern evolved over time? What else is going on with the pattern?
- Any accelerations? Any accelerations with scalp stimulation? Any decelerations? Any baseline changes? Look at the whole picture.

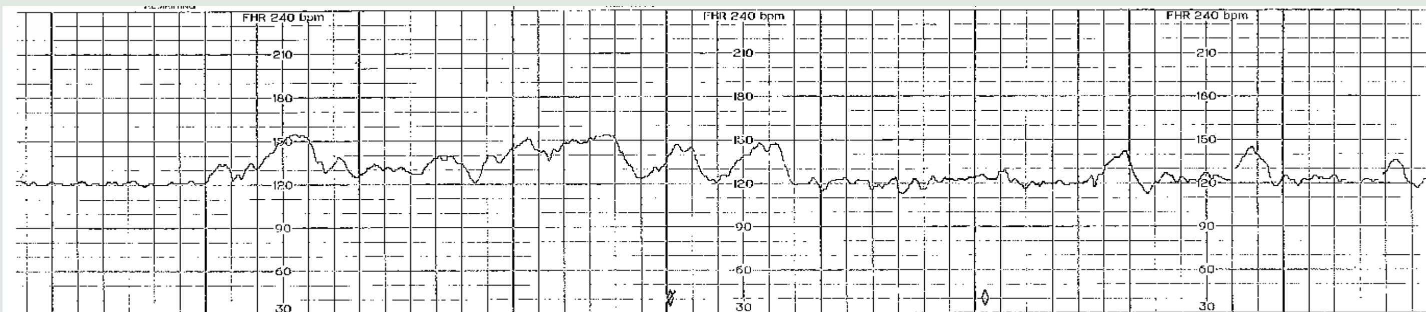
NOTE: *Repeat Slide*

Sleep Cycles for Fetuses









Fetal Sleep-Wake Cycles

- Vary considerably
- Well-established by third trimester
- During quiet sleep will most likely see

  Minimal variability and no accelerations
- In term fetuses

  Mean length of between active and quiet sleep is 40 minutes

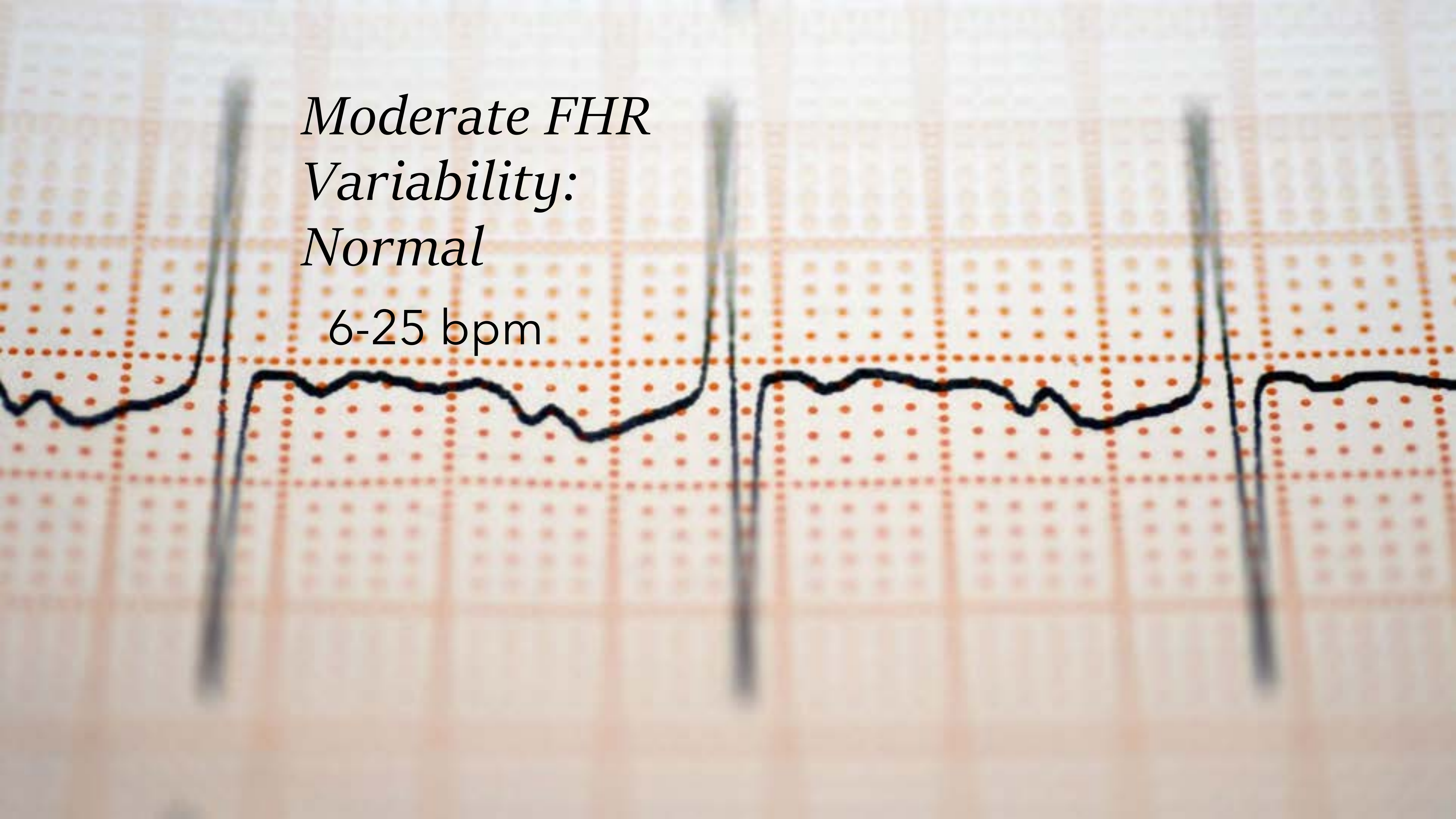
  But can last > 60 minutes

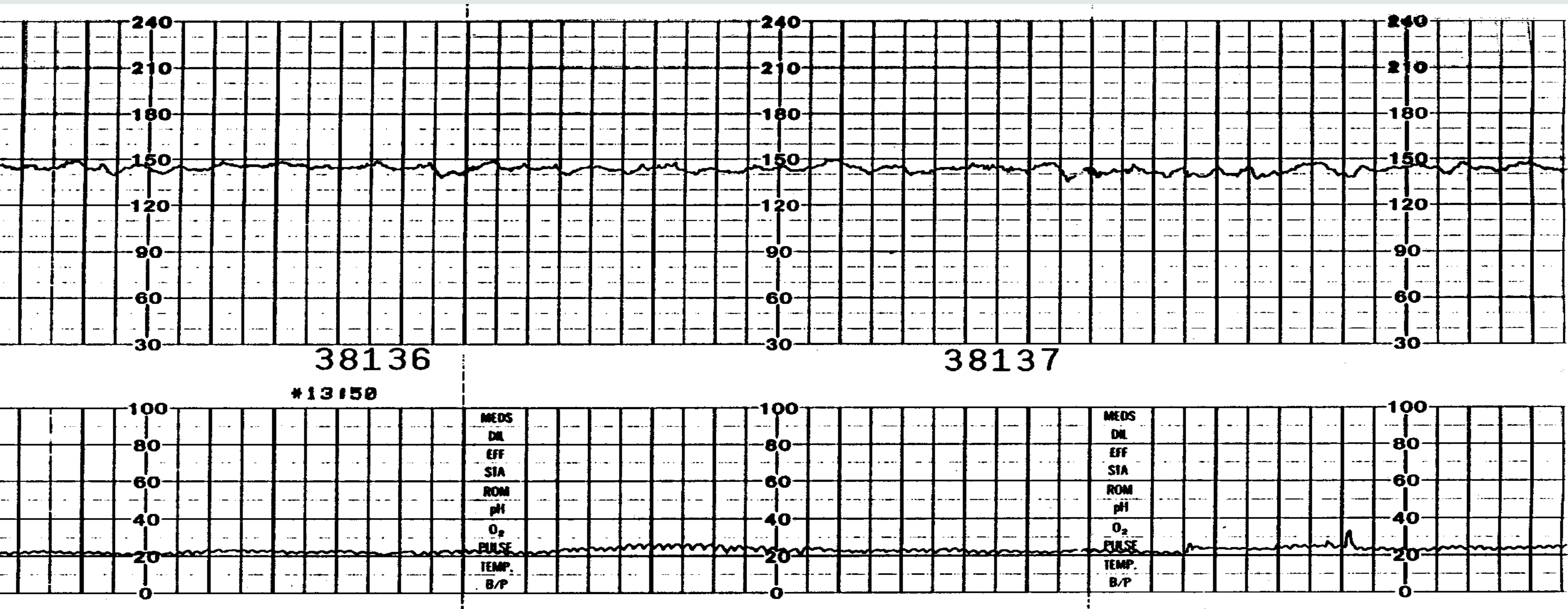
(AWHONN, 2021, pp. 39-41)

Sleep Wake Patterns

PHYSIOLOGY	
Quiet Sleep State (State 1F)	
• Quiescence (occasional brief body movements)	Normal baseline, FHR, minimal variability, accelerations absent
• Absent REM	Nonreactive NST
• FHR stable with narrow oscillation bandwidth	Responds to external stimuli (vibroacoustic stimulation)
Active (REM) sleep (State 2F)	
• Frequent gross body movements	• Moderate variability, accelerations present
• Rapid darting eye movements (REM)	• Reactive NST
• FHR with wider oscillation bandwidth and frequent accelerations with movements	• At term, duration of periods of active sleep are longer than quiet sleep

Adapted from AWHONN (2021) table pg. 41

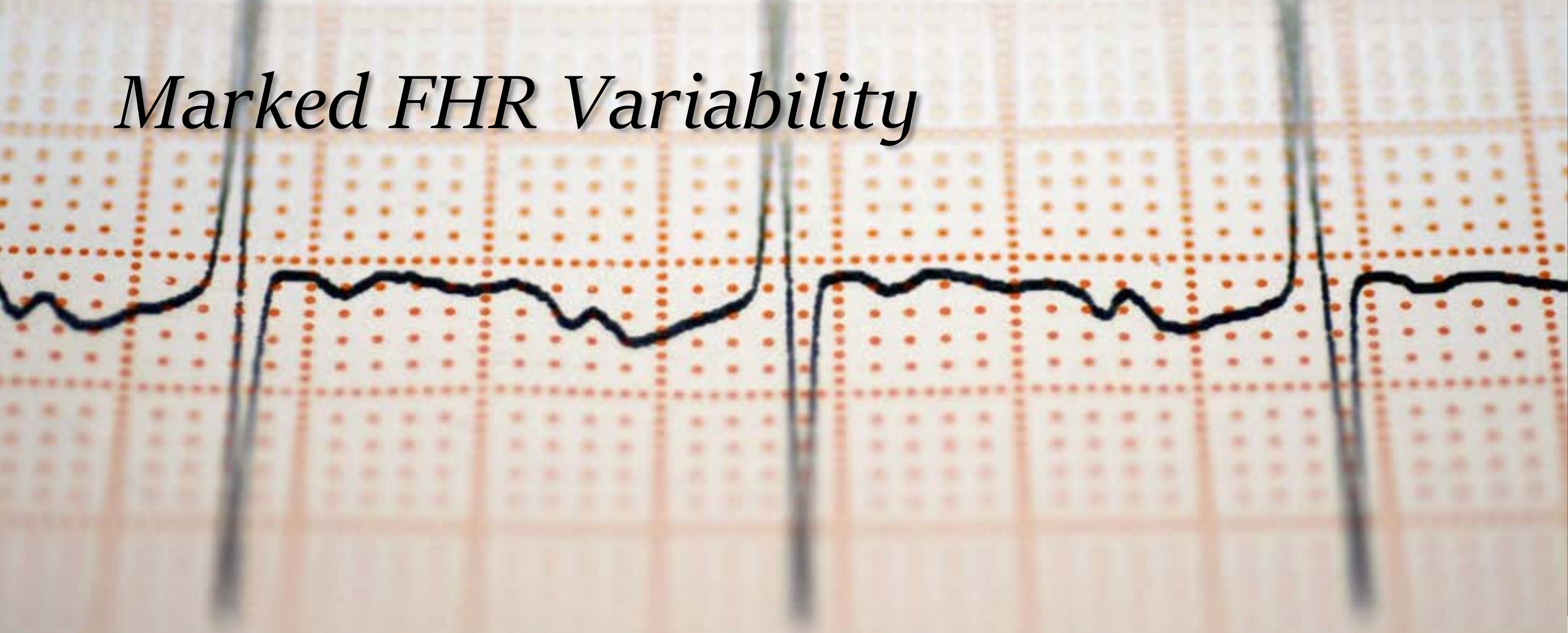

Moderate FHR Variability: Normal
6-25 bpm



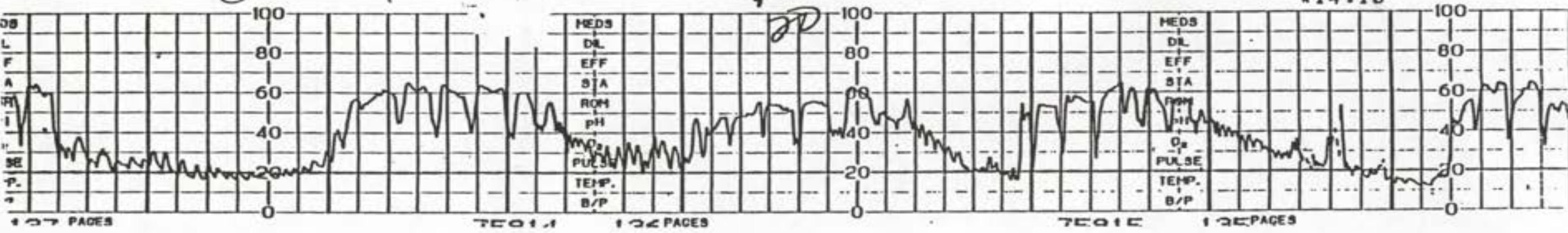
Moderate Variability

Highly predictive of the absence of fetal metabolic acidemia at the time it is observed...

Marked FHR Variability



Defined as an amplitude range of greater than 25 bpm


#14110
MEDS
DIL
EFF
STA
ROM
pH
O2
PULSE
TEMP.
B/P
PAGES
PAGES
PAGES

Marked Variability

- Significance remains unclear
- Is listed as a Category II tracing by the NICHD (2008)
- In some cases, might be a normal variant
- May reflect autonomic response in the setting of early hypoxemia
- Scientific evidence is limited
- (Miller, Miller, & Cypher, 2027, pgs. 116-118)

Possible Risks for Development of Marked Variability

- **Early mild hypoxemia** [Decreased oxygen in the blood]
- Excessive uterine activity

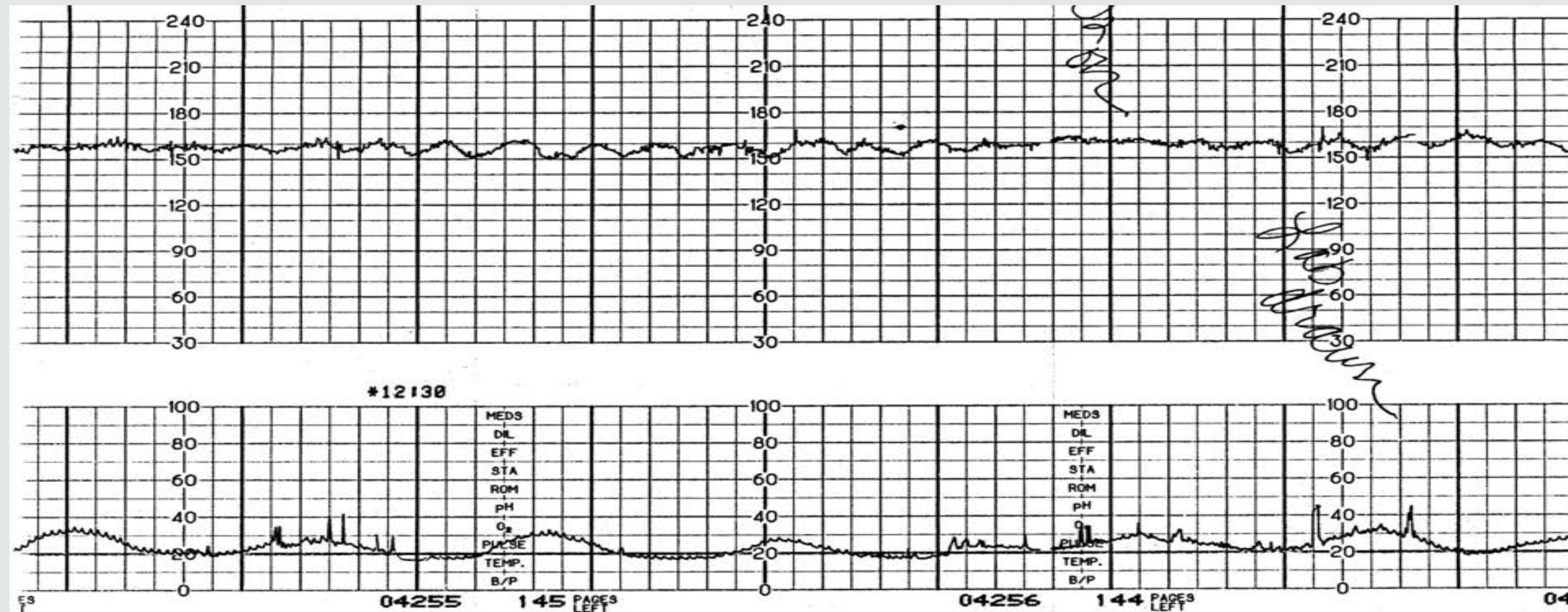
  Especially during second stage
- Drugs

  Has been reported to occur in response to ephedrine

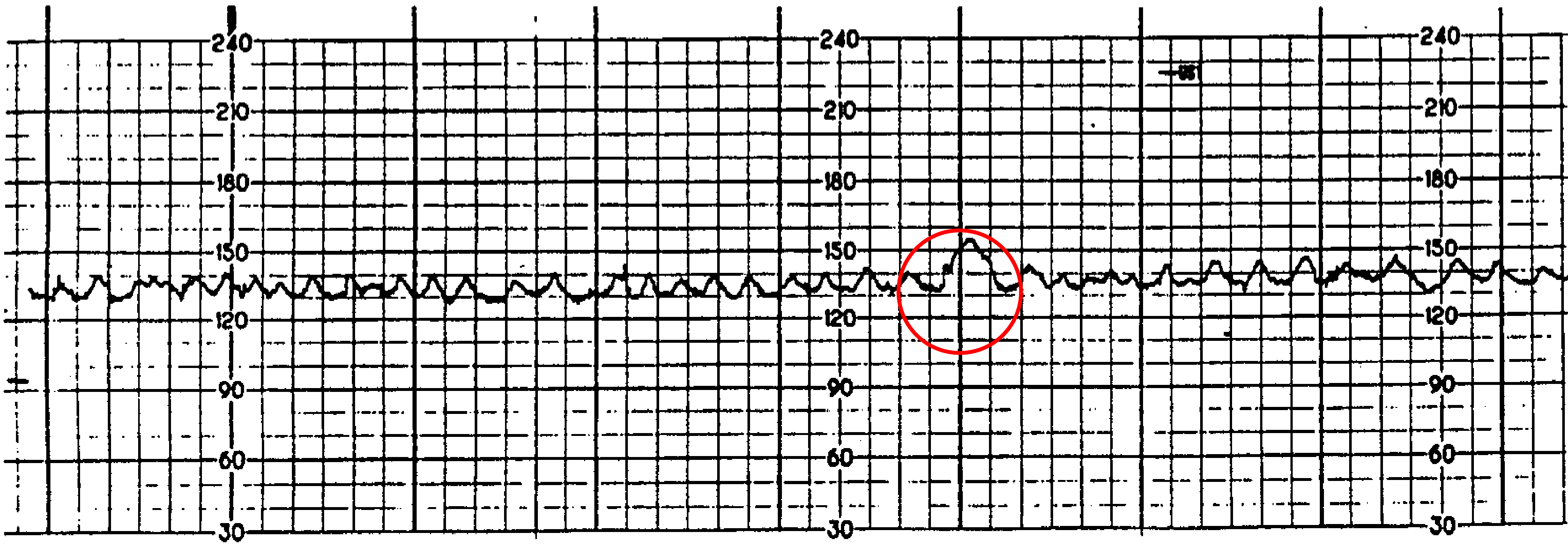
Sinusoidal Pattern

- A visually apparent, smooth, wave-like undulating pattern in the FHR baseline with a cycle frequency of 3-5/min that persists for greater or equal to **20** minutes
- ***Fluctuations in the baseline fetal heart rate that are regular in amplitude and frequency***
- Is listed as a Category III tracing

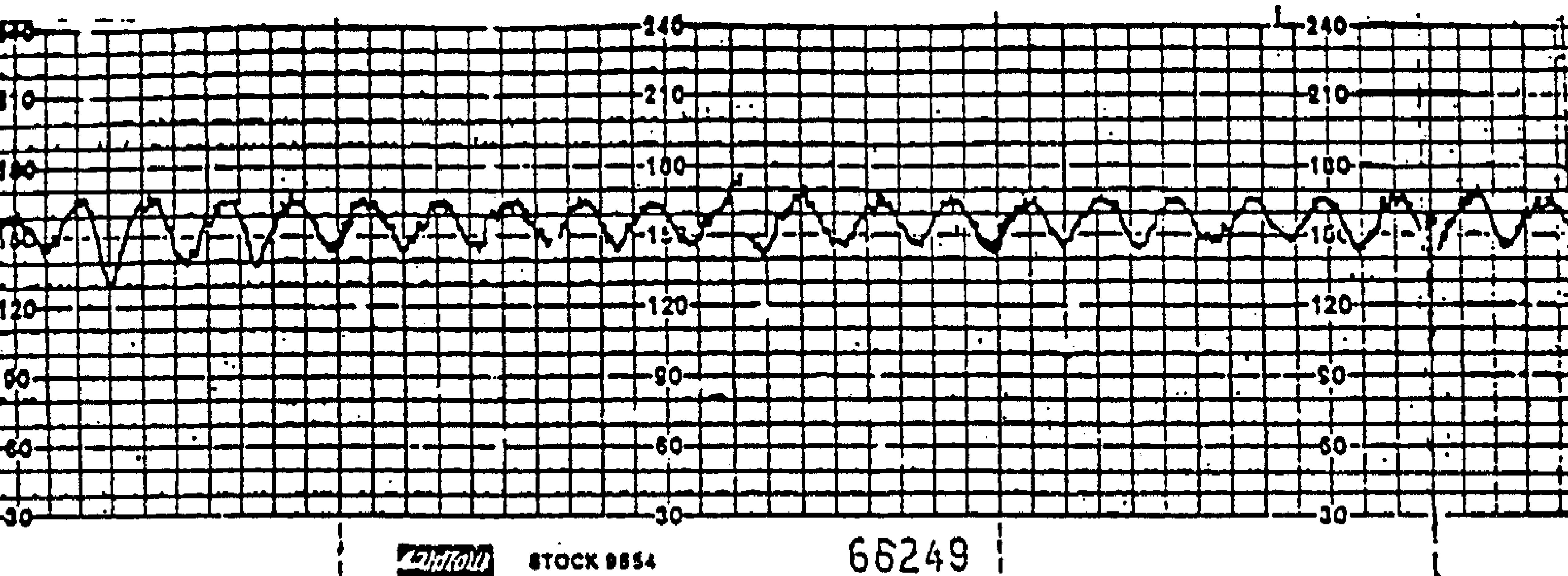
Sinusoidal Pattern from fetal-maternal hemorrhage



This FHR pattern is from a *narcotic*. Does not fit the *true* definition of sinusoidal because of the acceleration

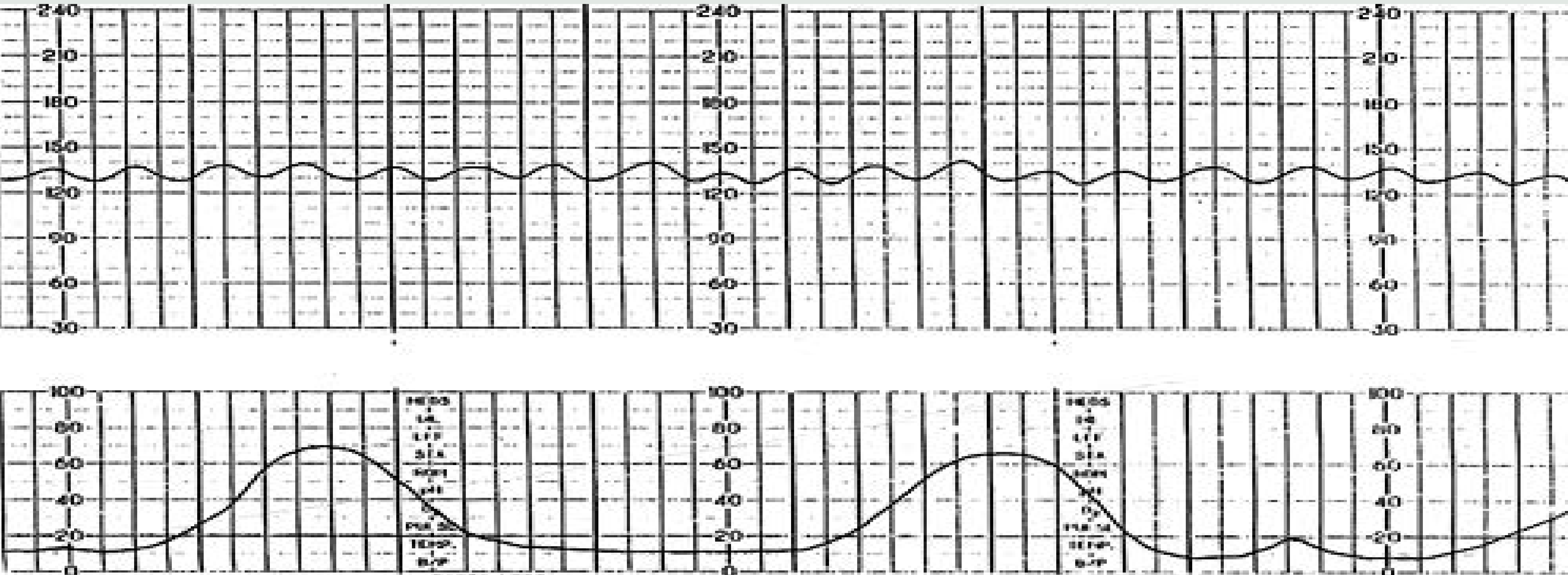


Sinusoidal pattern from Rh isoimmunization



Undulating Patterns With Narcotics

Narcotics may cause a benign undulating pattern…



http://sinoemedicalassociation.org/obgyn/FHA_files/image009.gif

Possible Sources of a Sinusoidal Pattern

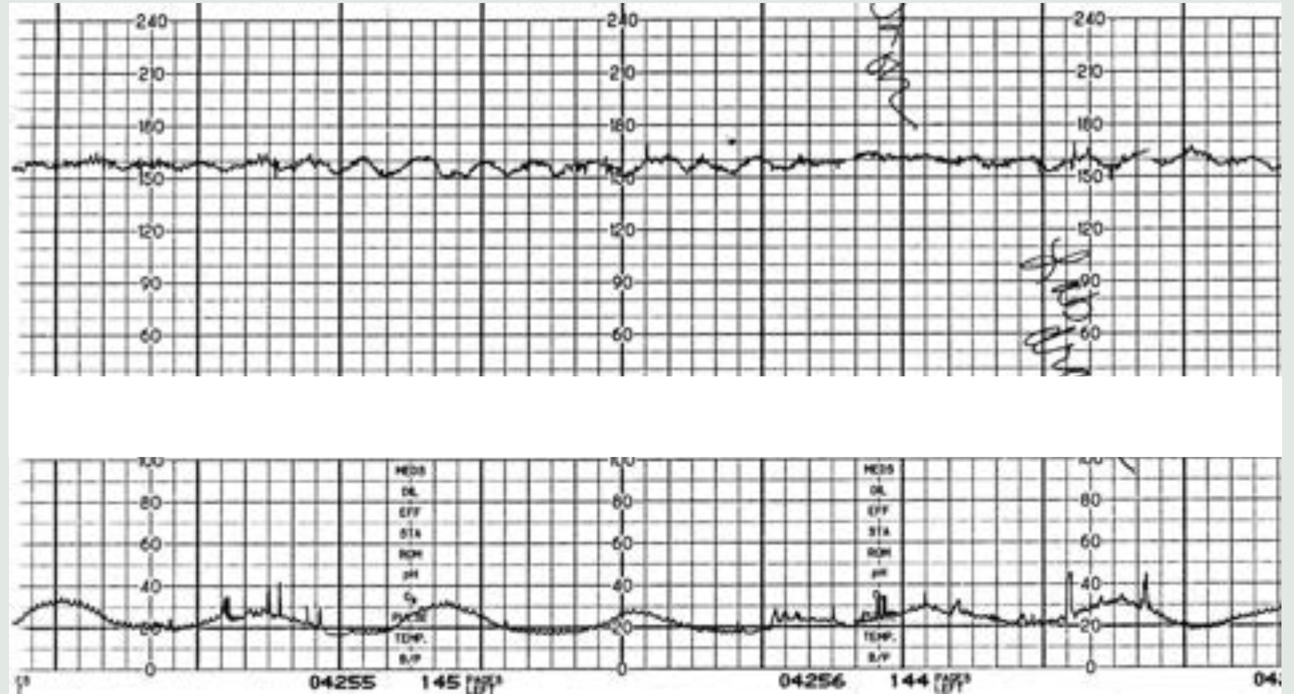
- Severe fetal anemia

  Severe Rh Isoimmunization

  Result of motor vehicle accident or blunt trauma to the abdomen

- Other disease processes

  Fetal sepsis



Interventions for Sinusoidal Pattern

- Rule out benign cause (Narcotics, etc)

  Wait for medication to wear off

- Notify provider if not from benign cause and institute intrauterine corrective meaures

Draw a FHR baseline with marked variability

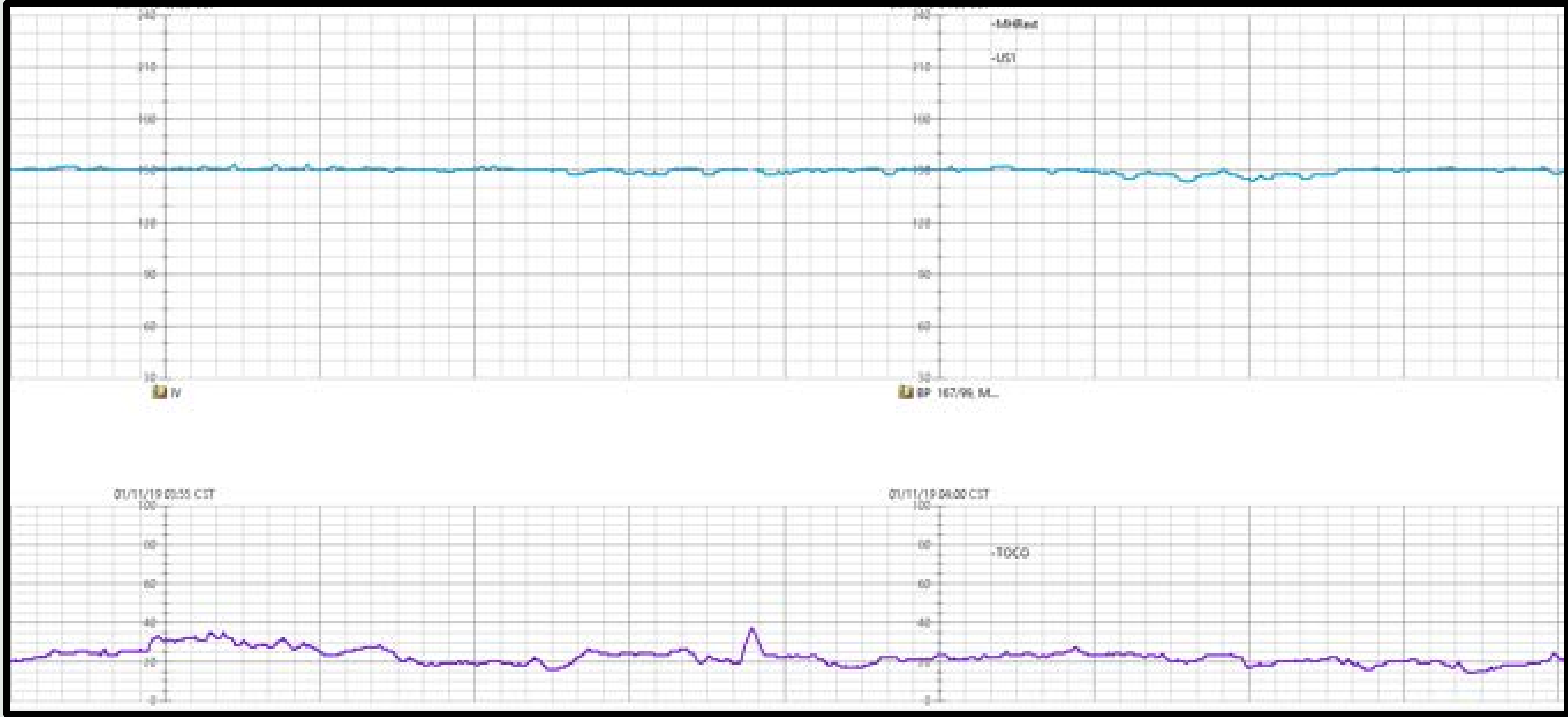
Let’s Practice

Draw a FHR baseline with minimal variability

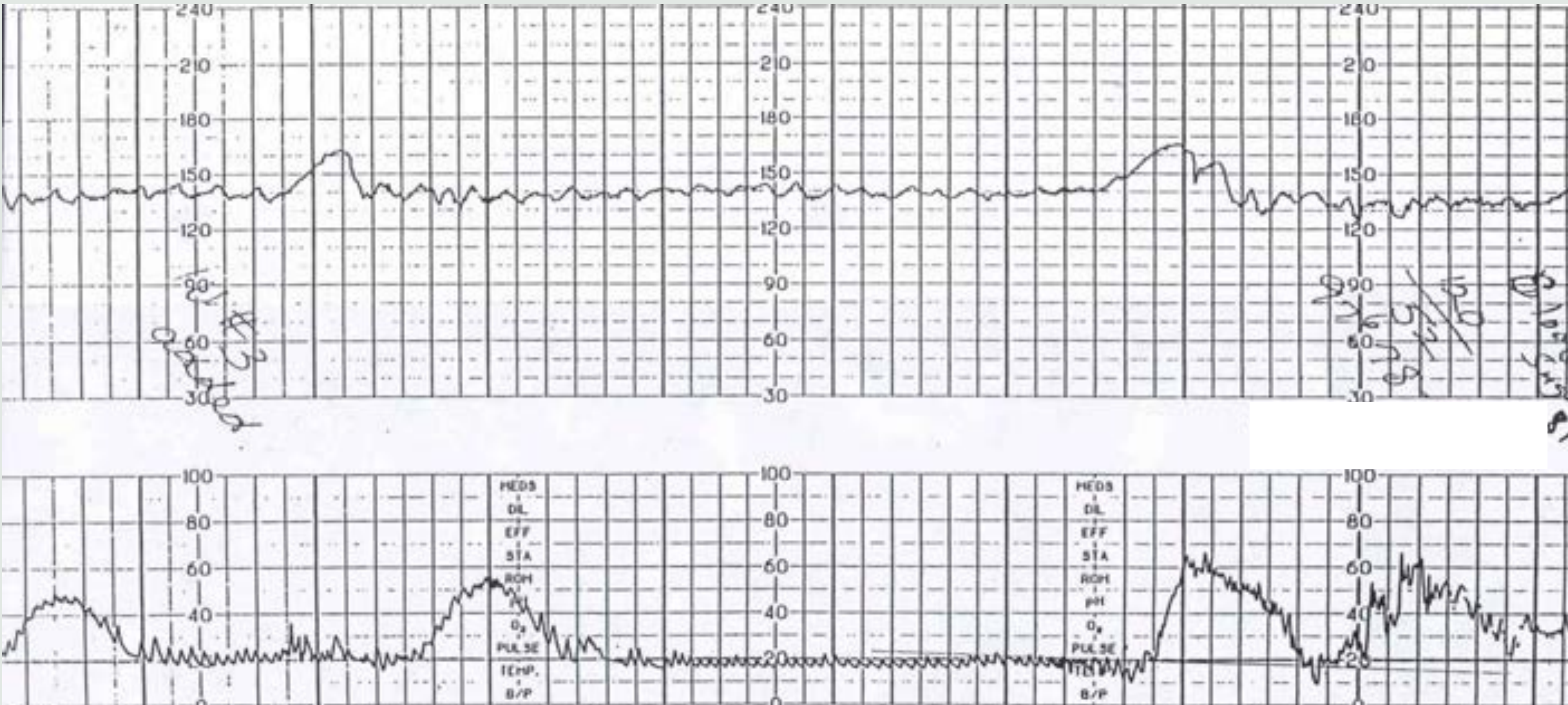
Draw a FHR baseline with absent variability

Draw a FHR baseline with moderate variability

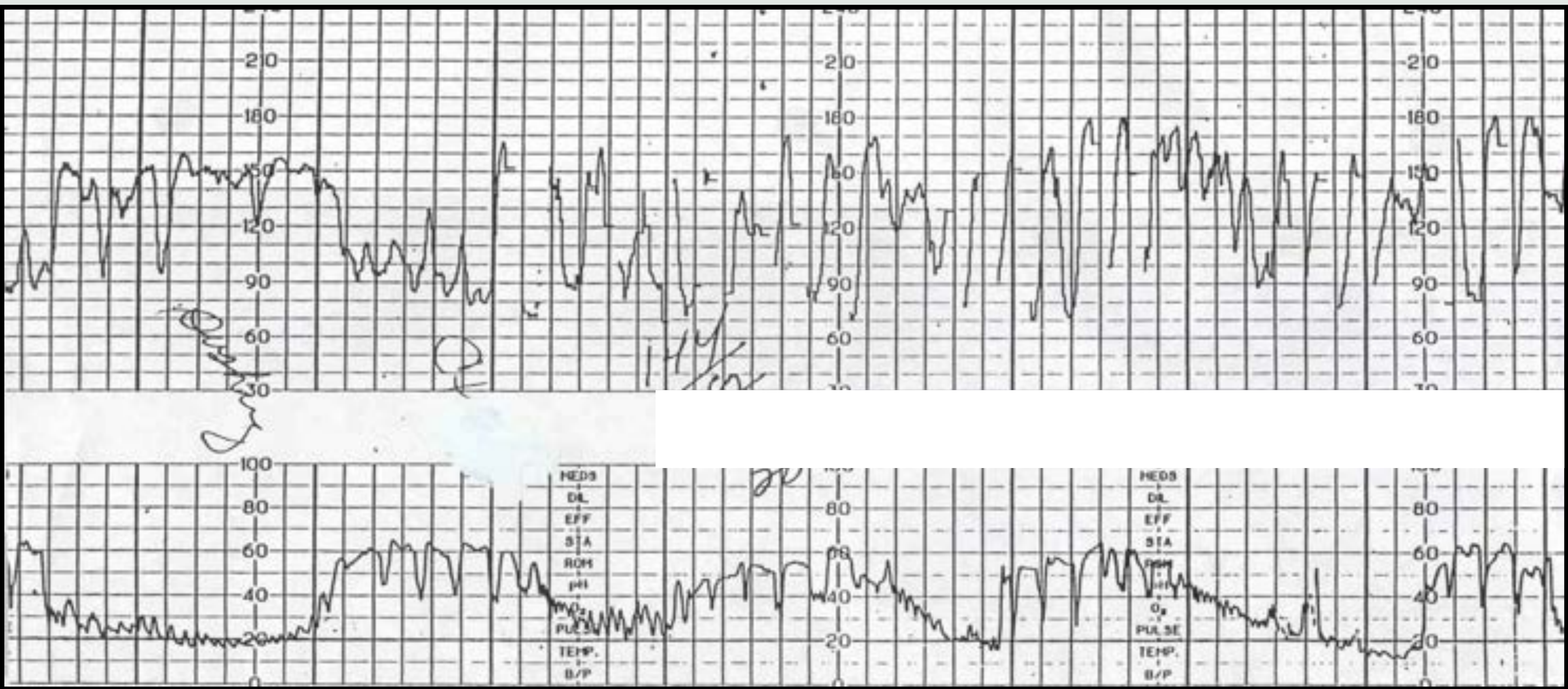
Example of Fetal Minimal Variability



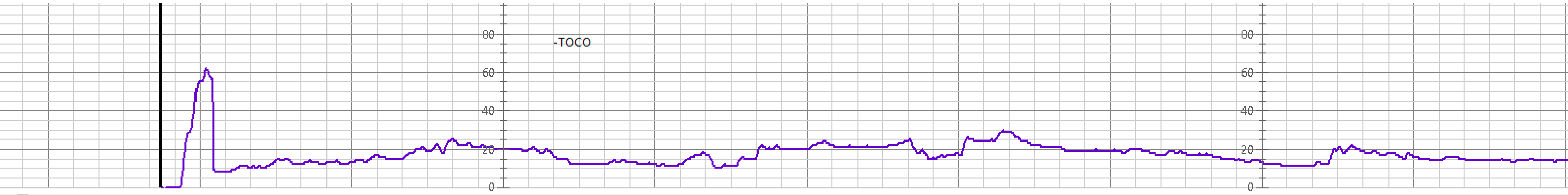
Example of Fetal Moderate Variability



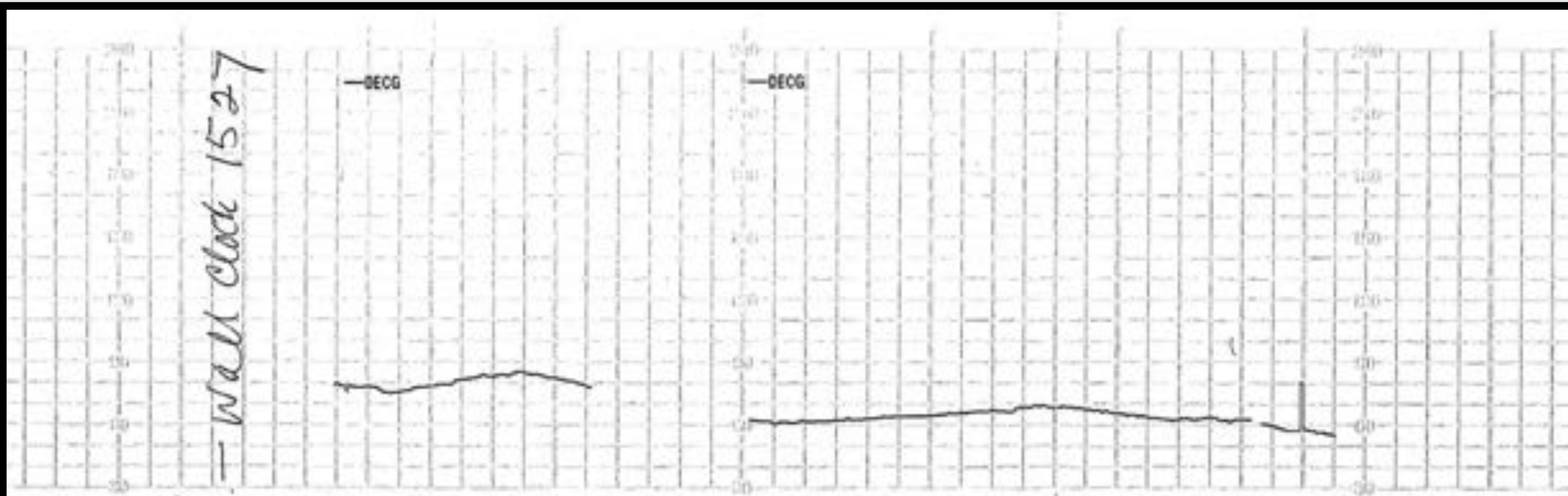
Example of Fetal Marked Variability



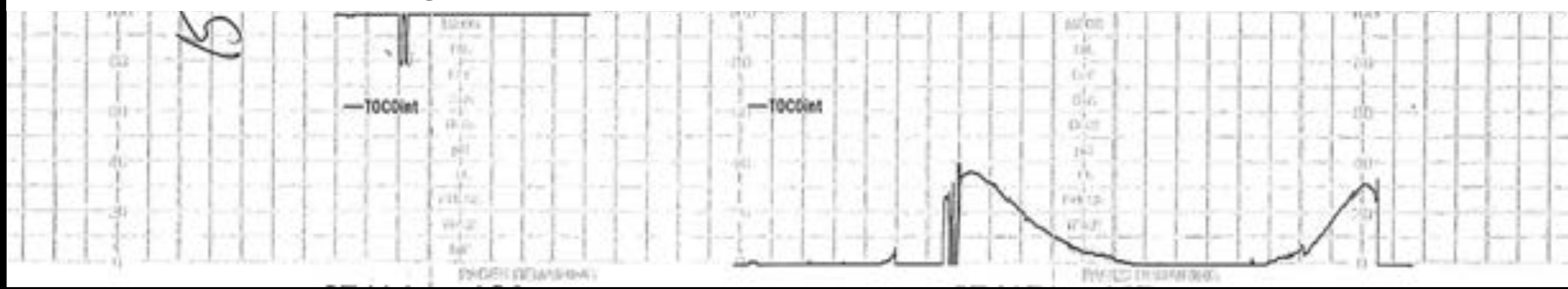
Example of Fetal Absent Variability



More Pronounced Case of Fetal Absent Variability



In OR- After Prolong Deceleration



What is Step Three?

Reminder........ Questions during the afternoon presentation

2444 3293

Please feel free to ask questions at any time during the presentation

However, if you do not feel comfortable asking a question during class, feel free to access menti.com and enter the code/ scan the OR code below to enter in your question

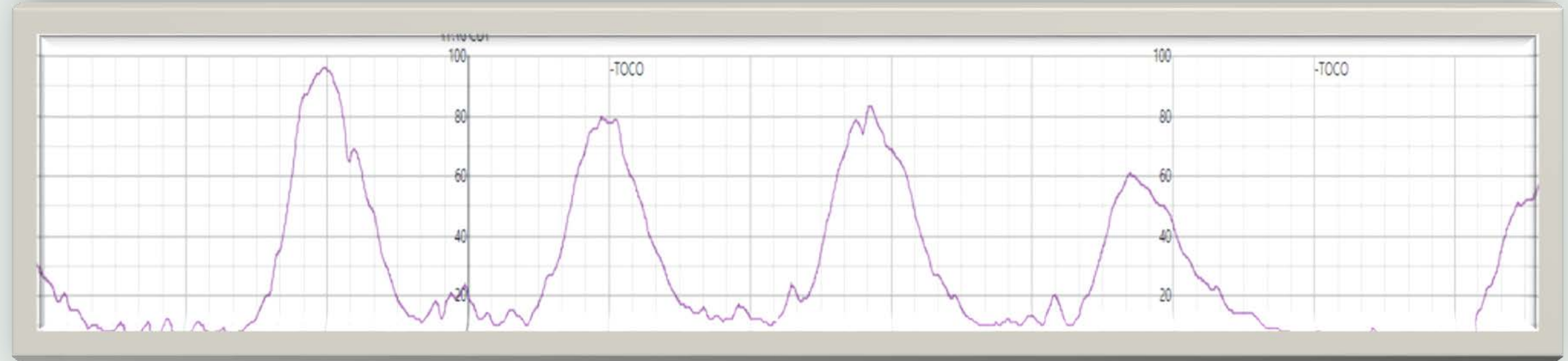
Step Four

Assess for episodic/periodic changes in fetal heart rate

3 Questions You Will Ask When Interpreting Changes in the Fetal Heart Rate

1. What is it?
2. What is the underlying reason or physiological basis for the pattern?
3. What am I going to do about it?

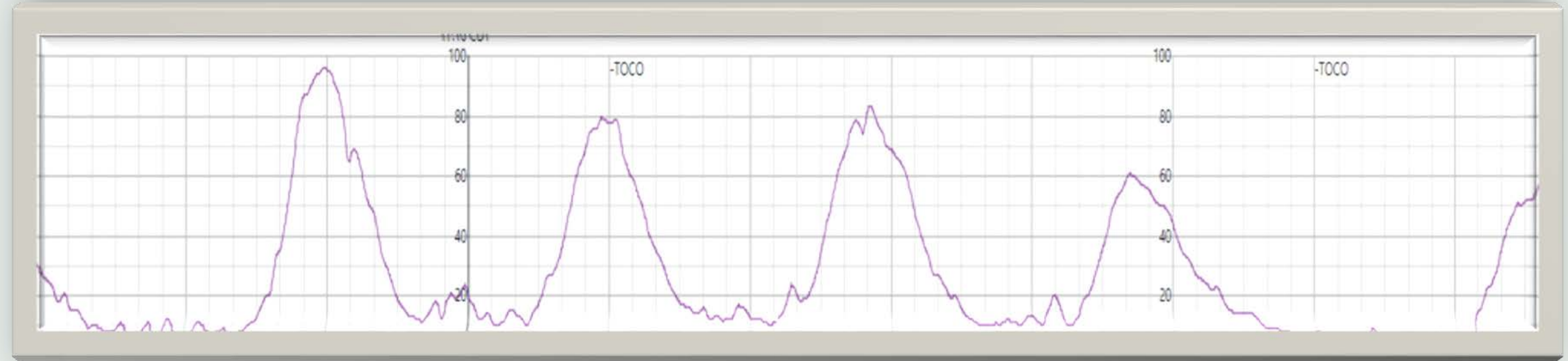
Periodic Changes



Periodic changes are *associated with contractions*

Periodic changes include: **accelerations, early decelerations, late decelerations, variable decelerations, and prolonged decelerations**

Periodic Changes

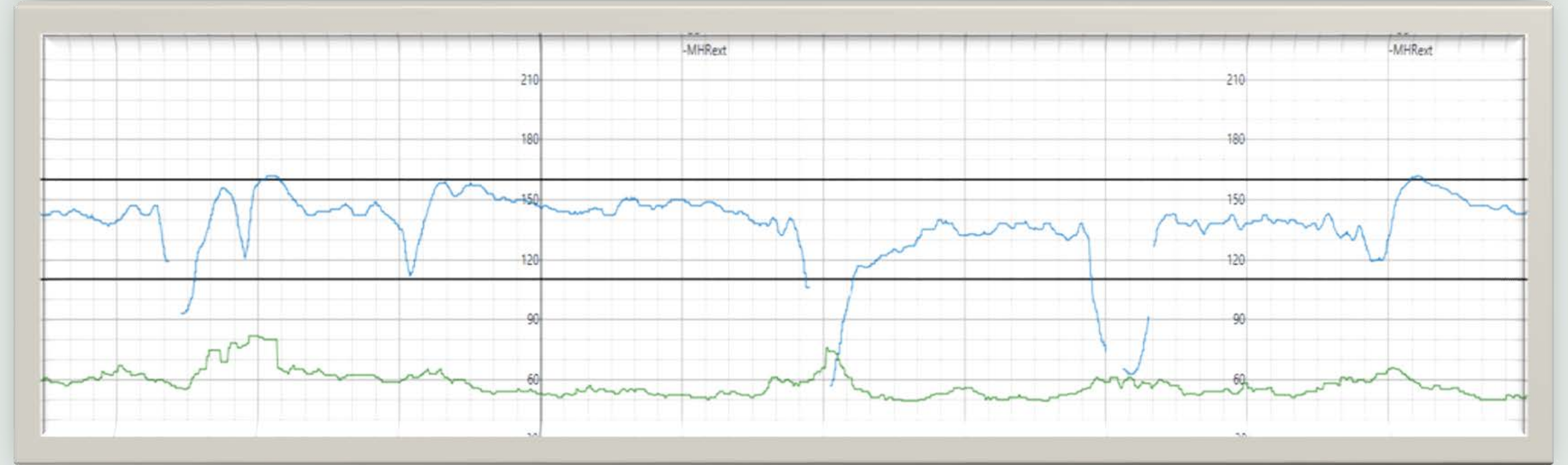


Periodic changes are *associated* ***with*** *contractions*

Periodic changes include:

accelerations, early decelerations, late decelerations, variable decelerations, and prolonged decelerations

Episodic Changes



Which are ***not*** *associated with contractions*

Includes: **accelerations, variable decelerations**, and **prolonged decelerations**

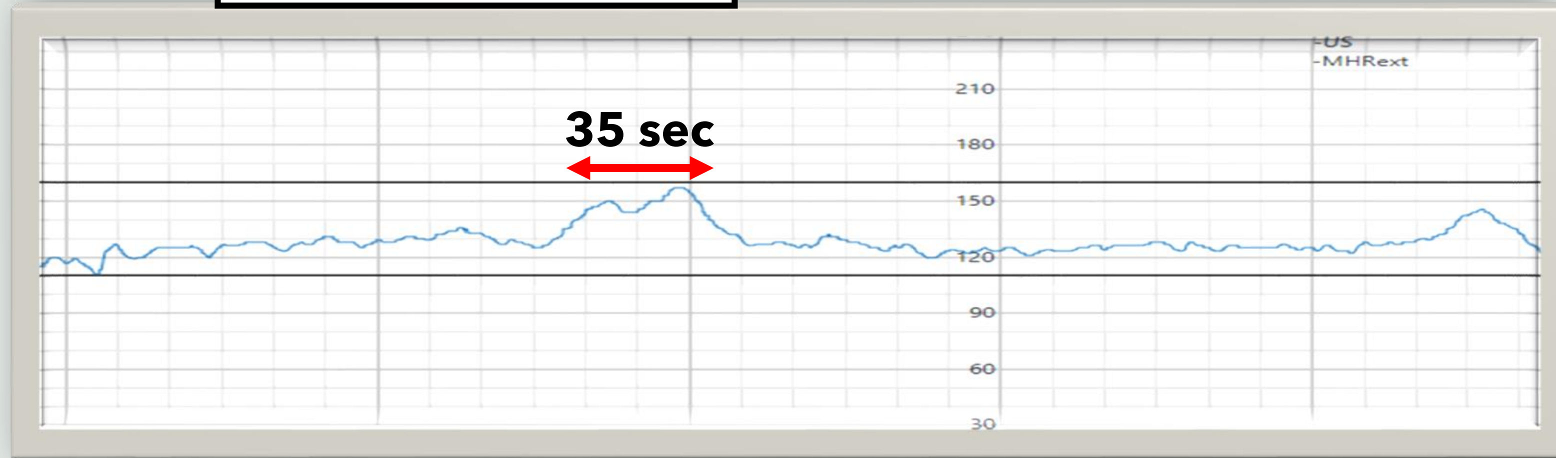
Definition of an Acceleration

A visually apparent ***abrupt* increase** in FHR above the baseline

- Abrupt is defined as **onset** of the acceleration **to the peak** of the acceleration is less than 30 seconds

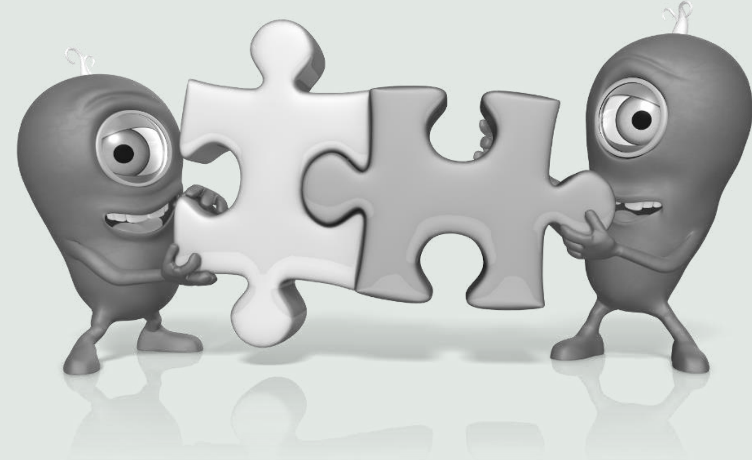
The increase is calculated from the most recently determined portion of the baseline

Definition: Acceleration

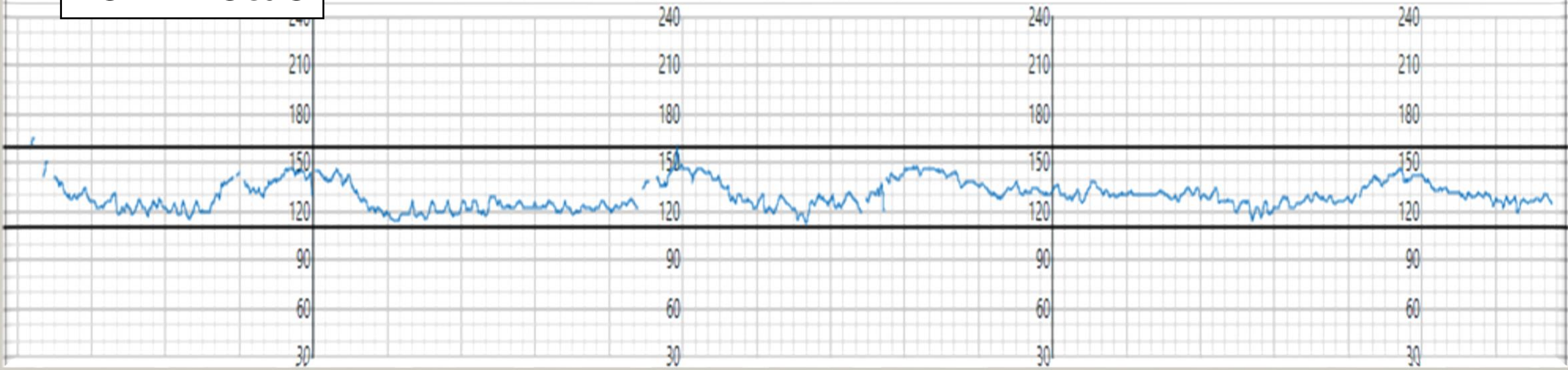


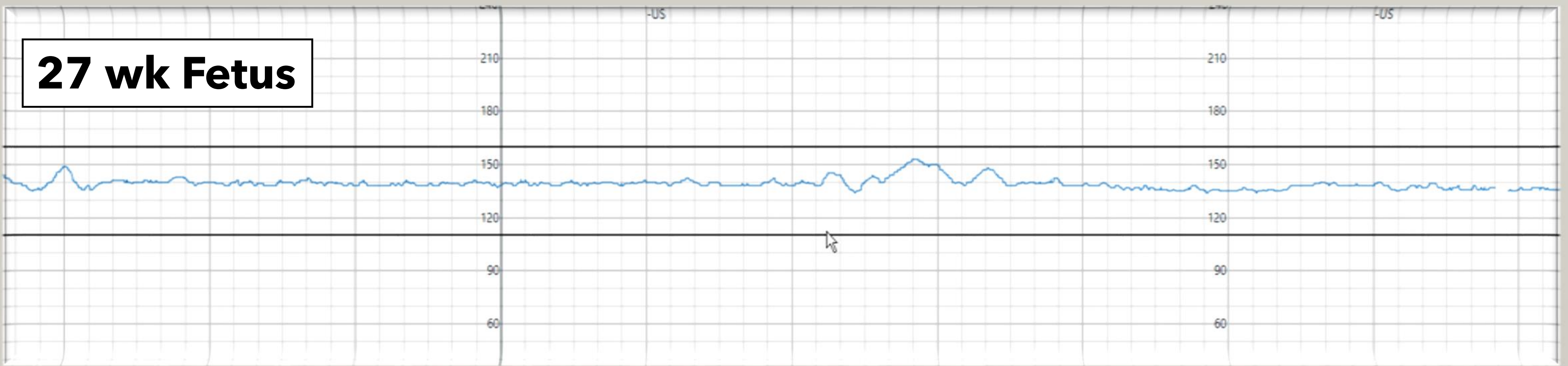
The acme (highest point of the accel) is **equal to or greater than 15 bpm above the baseline** and the **acceleration lasts equal to or greater than 15 seconds and less than 2 minutes** from the onset to the return to baseline

Accelerations Prior to 32 weeks



Before 32 weeks of gestation, accelerations are defined as having an acme (highest point of acceleration) as **equal to or greater than 10 bpm above the baseline** and a duration **of equal to or greater than 10 seconds**


Term Fetus
FHR1
FHR2
FHR3
FHR4
FHR5
FHR6
MHR
240
210
180
150
120
90
60
30


27 wk Fetus
US
210
180
150
120
90
60

Accelerations

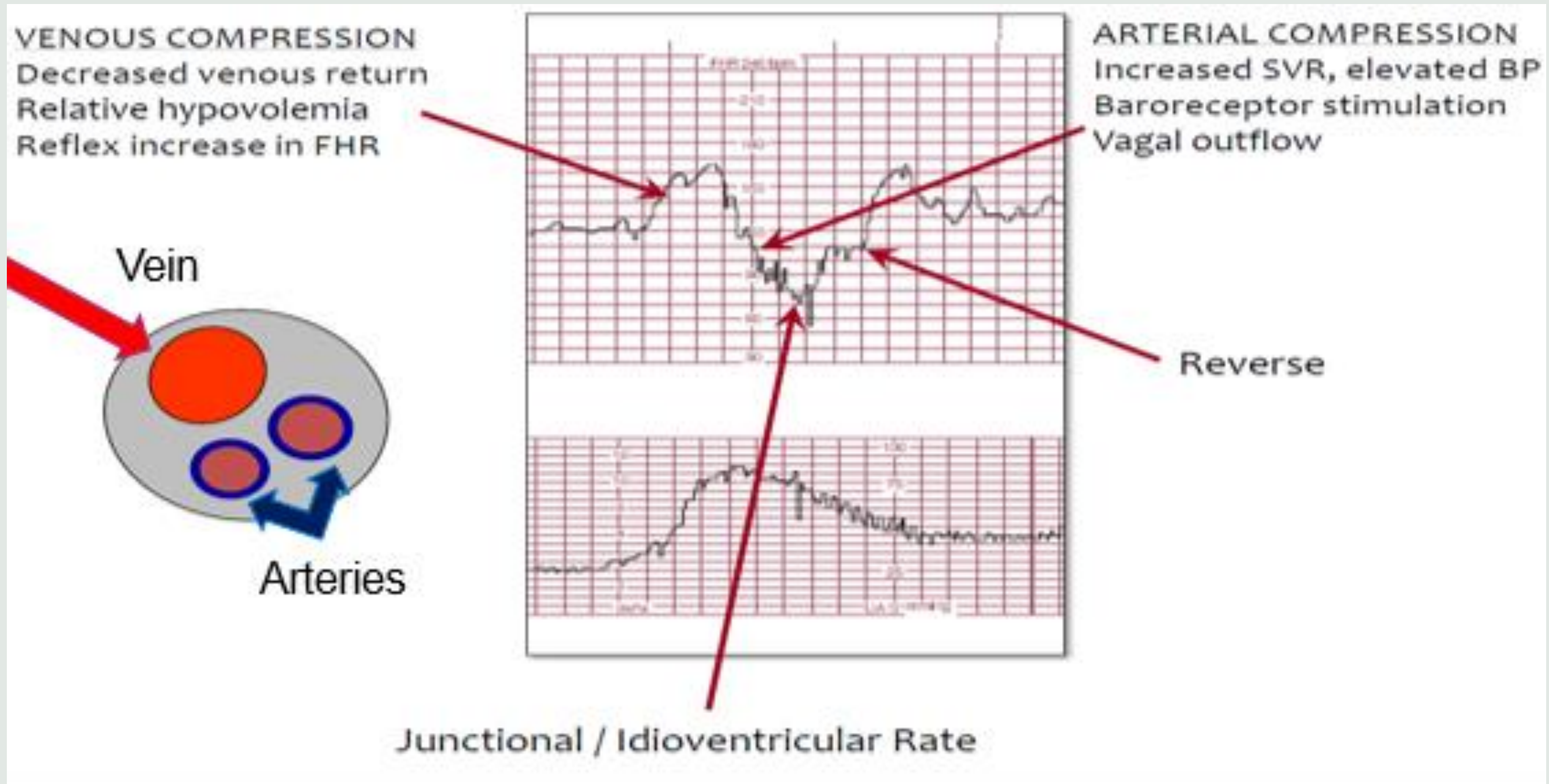
Highly predictive of the absence of fetal metabolic acidemia

Occur in association with fetal movement

- Sympathetic autonomic response

May also occur in response to umbilical vein compression

Compression of the Umbilical Vein



Reproduced with permission from Dr. David Miller's presentation *Safer and Easier Establishing a Shared Mental Model in EFM*.(2013).
14th Annual National Conference on Fetal Monitoring Maternal-Fetal Assessment and Interventions

Compression of the Umbilical Vein

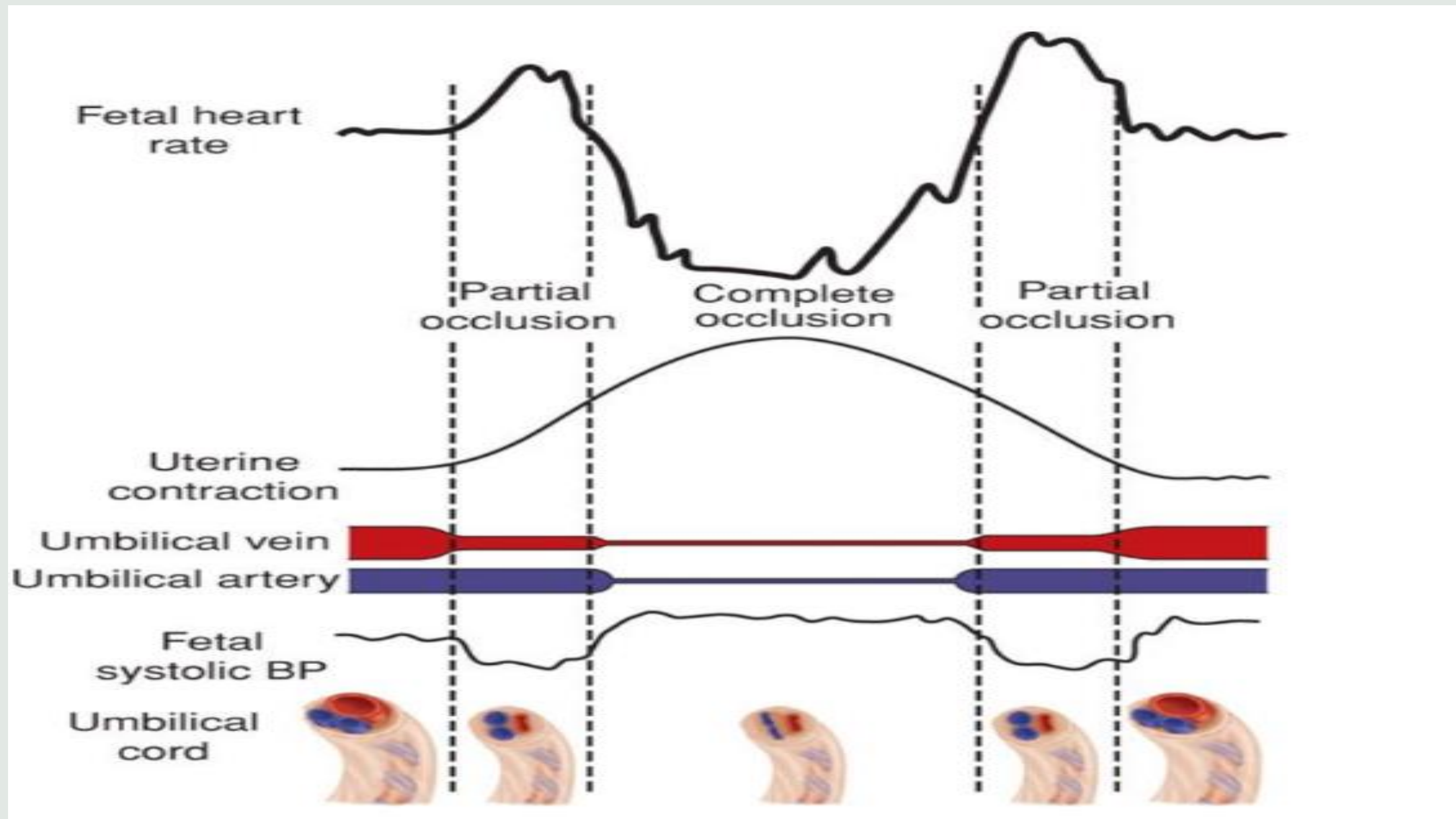
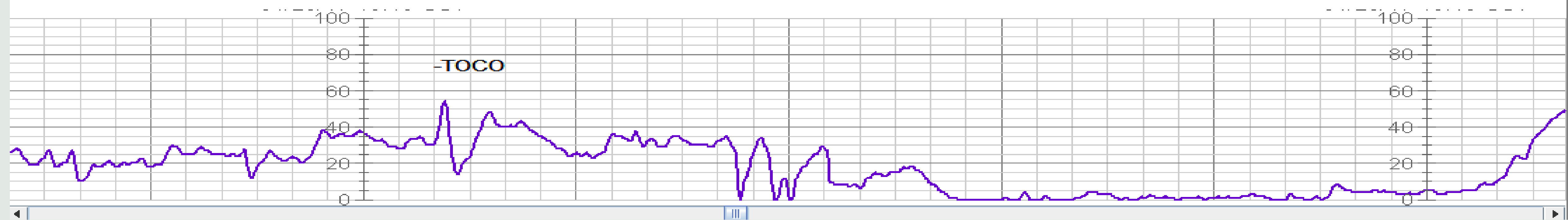
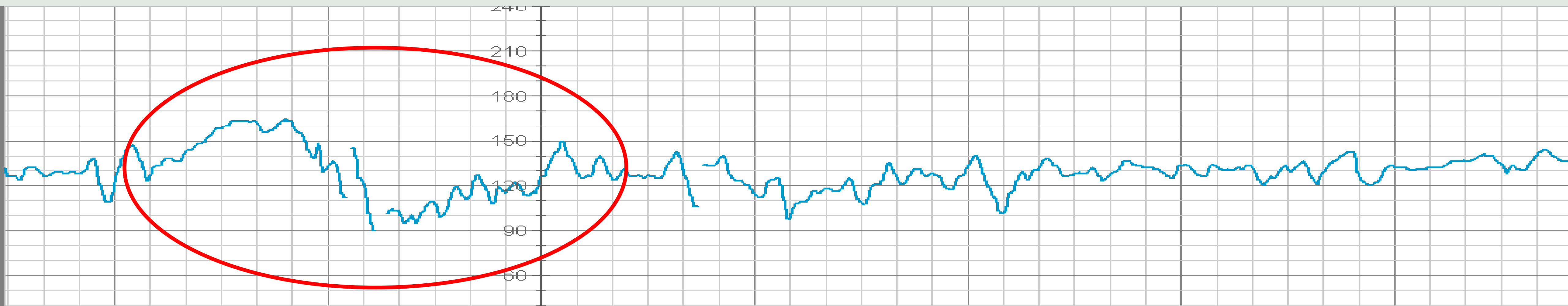


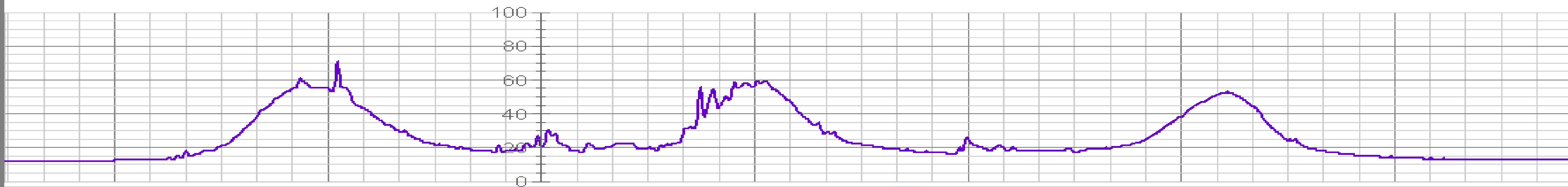
FIGURE 24-21 Varying (variable) fetal heart rate decelerations. Deceleration (*B*) exhibits "shoulders" of acceleration compared with deceleration (*A*). (Adapted from Künzel, 1985, with permission.)

Would you label this as an acceleration?



Would you label this as an acceleration?





Possible Causes of Accelerations

Sympathetic stimulation

- Vaginal exam
- Electrode application

May see with some breech presentations

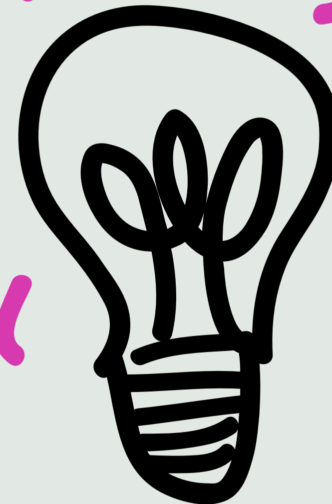
Associated with spontaneous fetal movement

Transient compression of umbilical vein

- ?cord compression

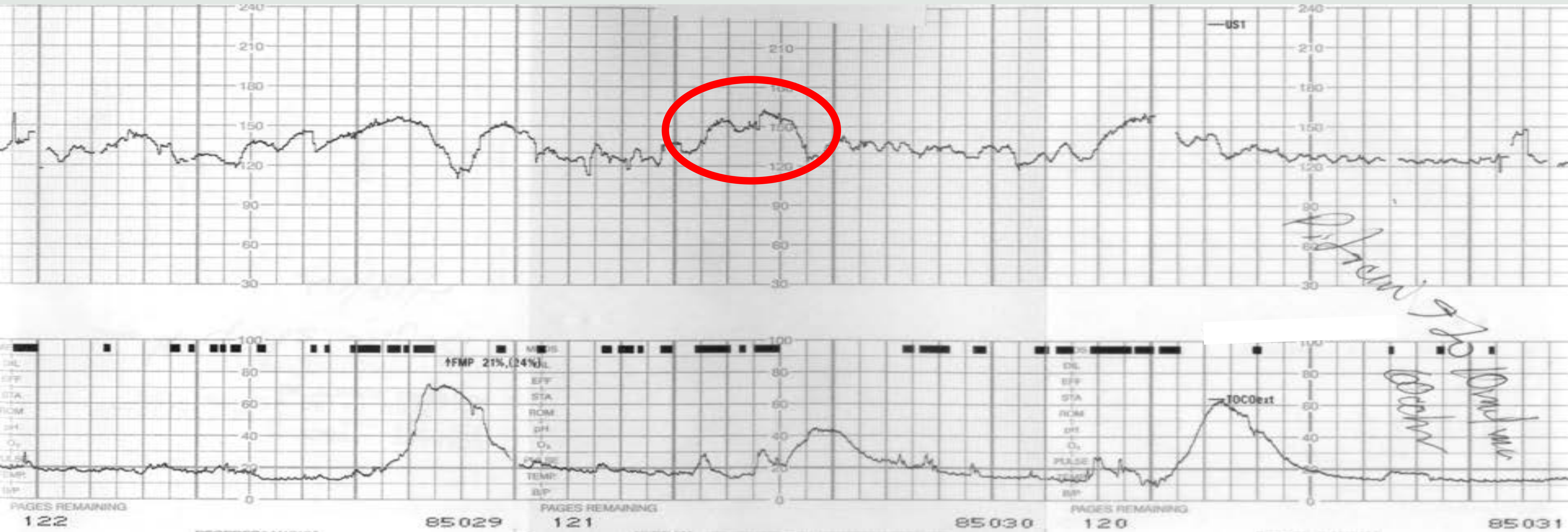
Do we do interventions for accelerations??

Observe uniform accelerations which may evolve into a pattern of variable or late decelerations as labor progresses



No interventions required

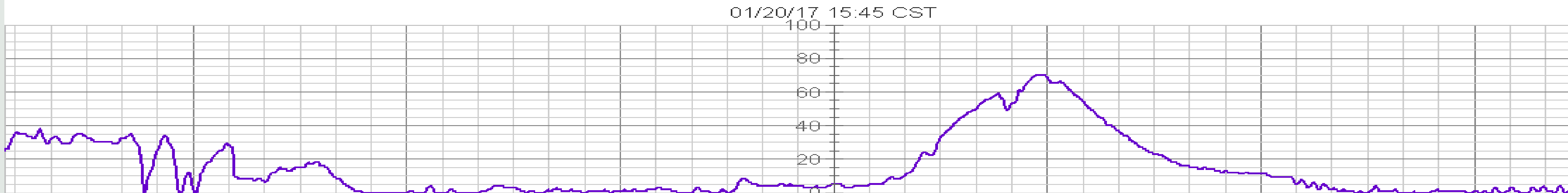
Uniform accelerations which may evolve into a pattern of variable decelerations



Are these Accelerations????

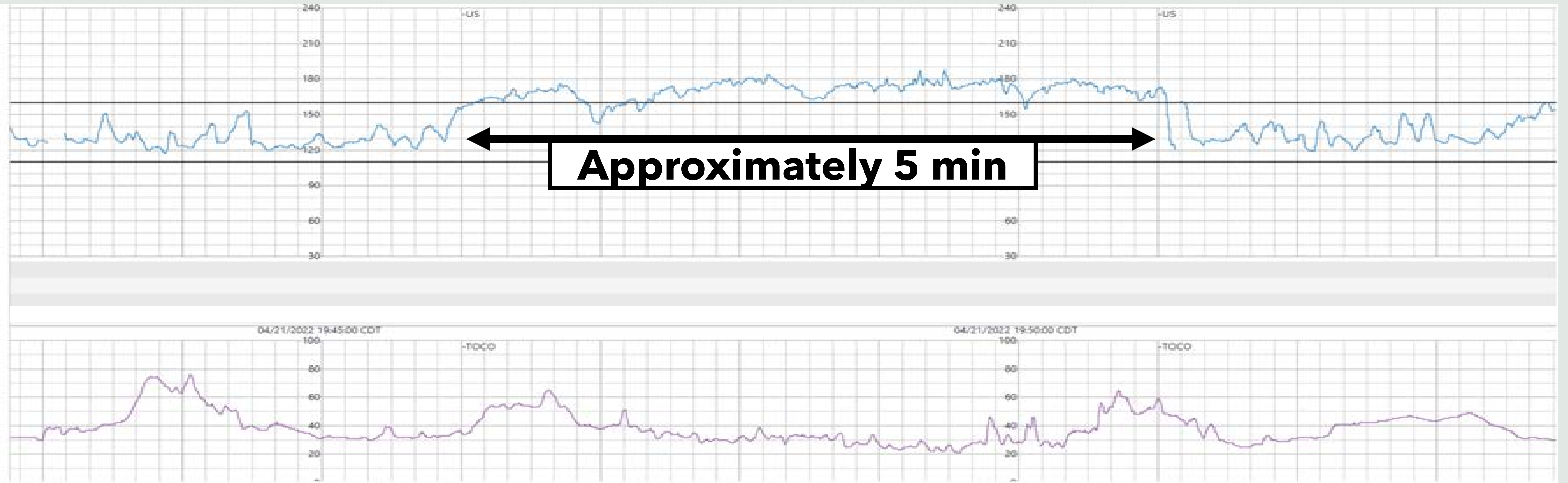
TERM

240
210
180
150
120
90
60



Prolonged Acceleration

- Defined as an acceleration that is **equal to or greater than 2 minutes and less than 10 minutes** in duration



Possible Cause of Prolonged Accelerations

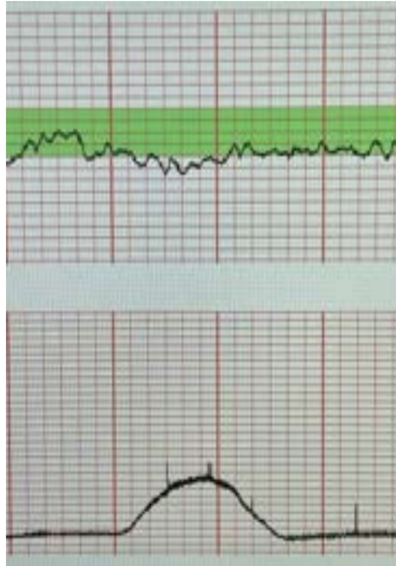
- Fetal activity
- Fetal stimulation
- Abnormal presentation
- Compression of the umbilical vein

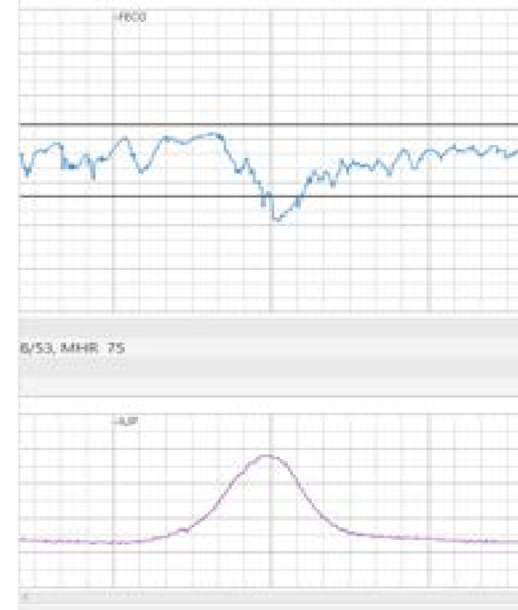
4 types of decelerations

1. Early
2. Variables
3. Lates
4. Prolonged

Please refer to the "decelerations handout"

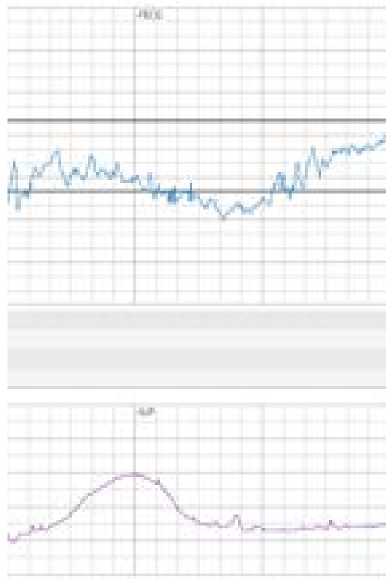
Early decel

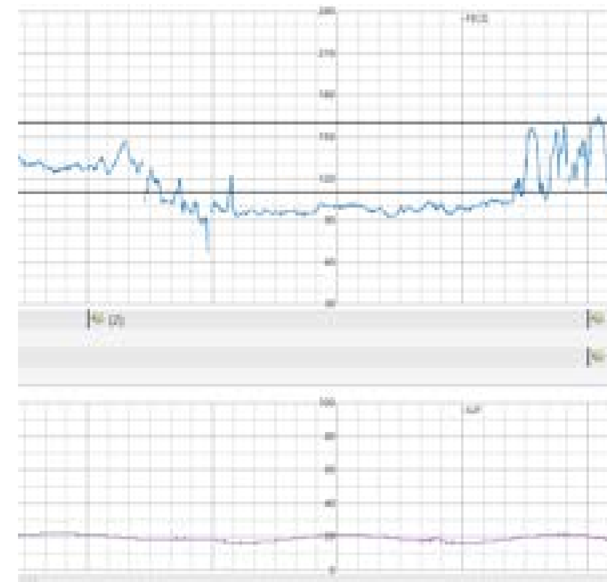




Variable decel

Late decel





Prolonged decel

Definition: Early Deceleration

A visually apparent usually **symmetrical gradual decrease and return to baseline** FHR associated with a contraction.

Gradual is defined as onset of deceleration to nadir (lowest point of deceleration) as **equal to or greater than 30 seconds**

The decrease is calculated from the most recently determined portion of the baseline

It is **coincidental in timing** with the **lowest point of the deceleration occurring simultaneously to the peak** of the contraction

Early Deceleration

35 sec to nadir

—US1

—TOCOext

↑FMP 0%,(3%)

MEDS
DIL
EFF
STA
ROM
pH
O_2
PULSE
TEMP
B/P

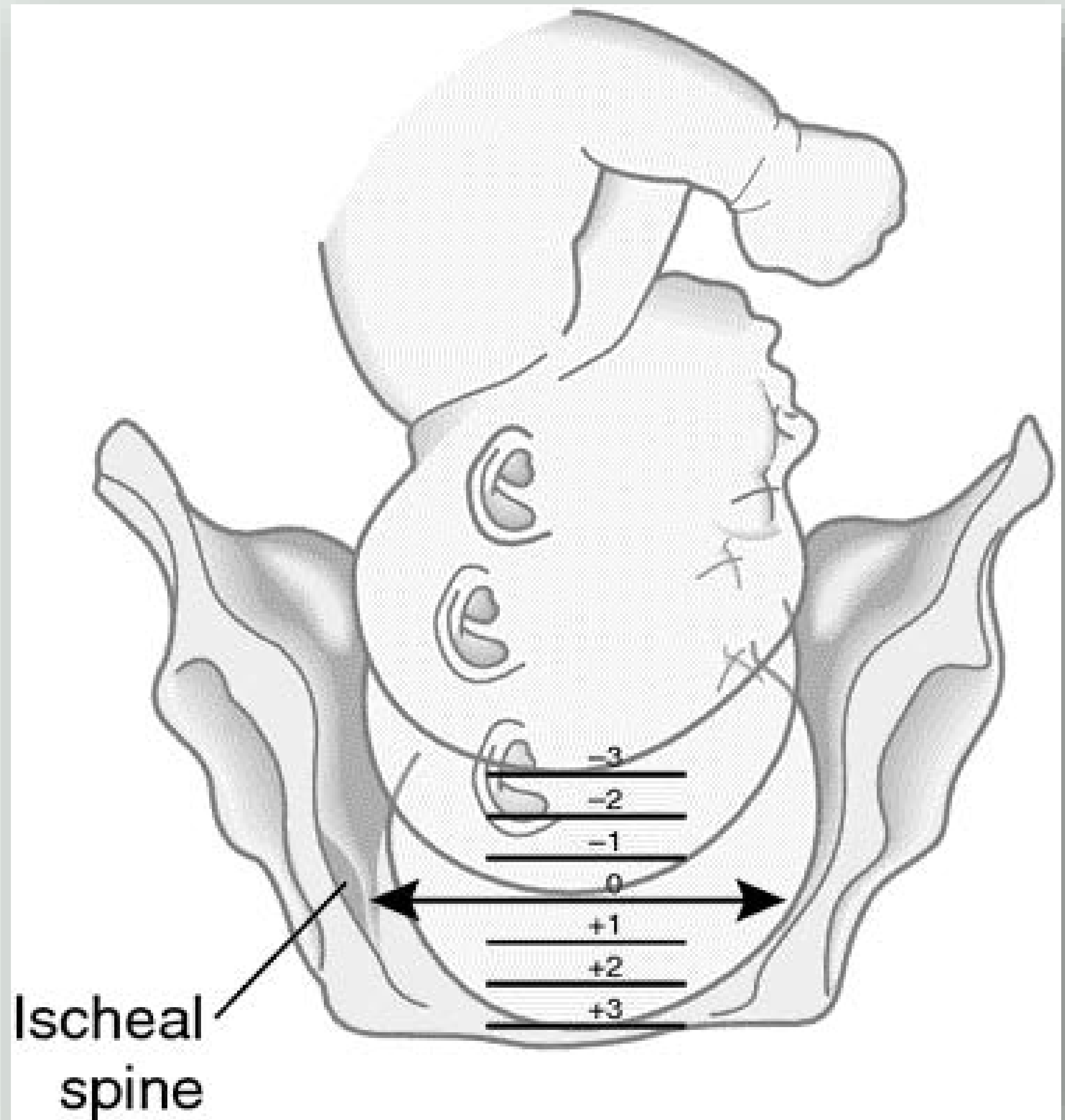
PAGES REMAINING 129

77172 PAGES REMAINING 128

77173 PAGES REMAINING 127

Early Decelerations

Reflect compression of the fetal head during contractions



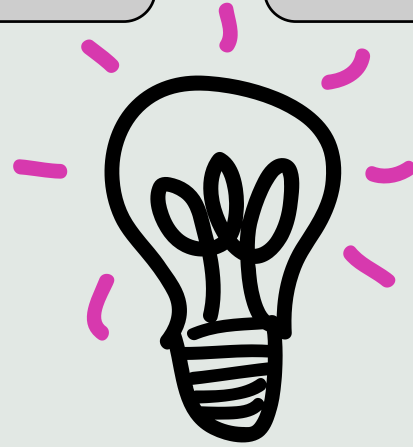
http://medical-dictionary.thefreedictionary.com/station

Vertex presentation

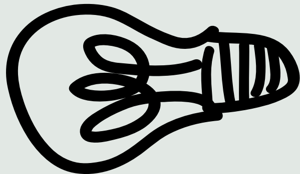
Active phase of labor

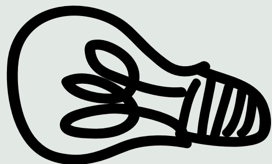
Primigravid labor

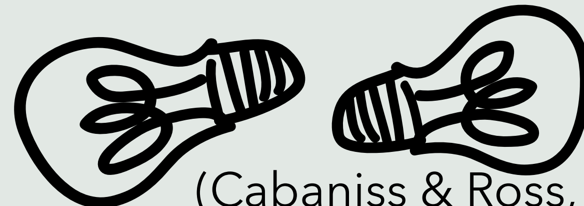
A large fetus for pelvic size



Early Decel's may be associated with:







(Cabaniss & Ross, 2010, p. 70)

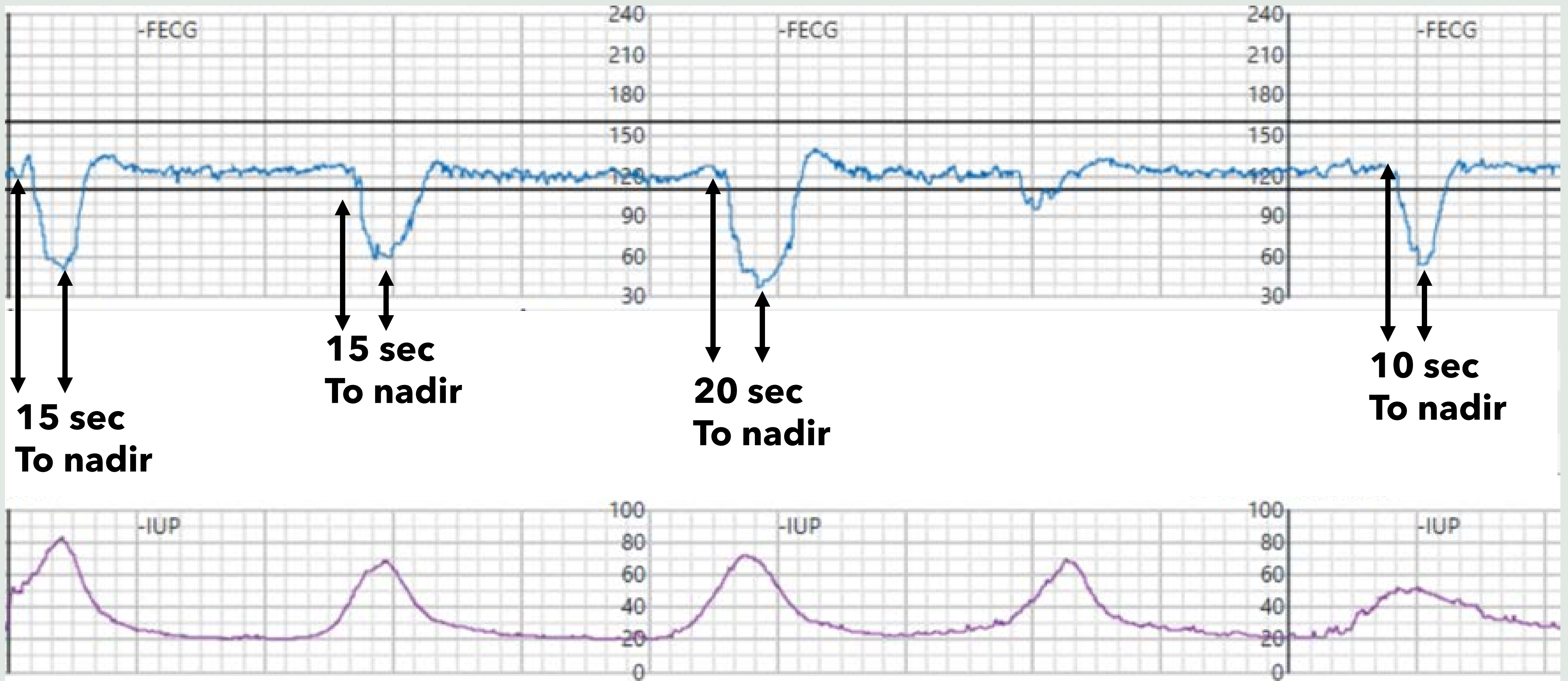
Definition: Variable Deceleration

A visually apparent **abrupt decrease in FHR** below the baseline.

Abrupt is defined as onset of the deceleration to the beginning of the lowest point as **less than 30 seconds**

The decrease is calculated from the most recently determined portion of the baseline

The decrease in FHR below the baseline is **equal to or greater than 15 bpm, lasting equal to or greater than 15 seconds, but less than 2 minutes from onset to return** to baseline



Are Variables episodic or periodic??

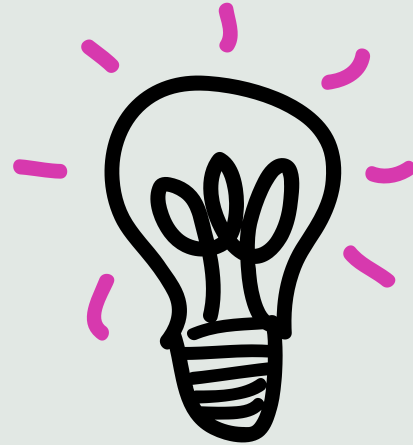
Compression of umbilical cord

Prolapse of umbilical cord

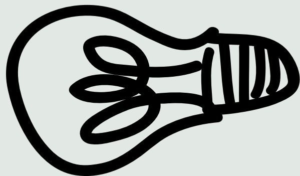
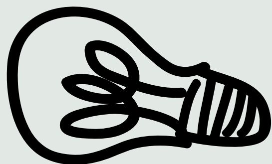
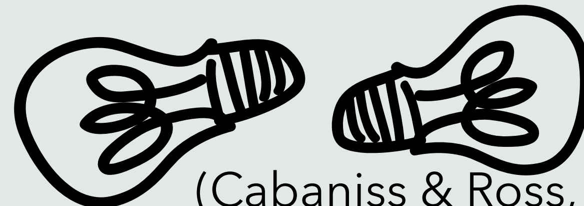
Nuchal cord

Short cord

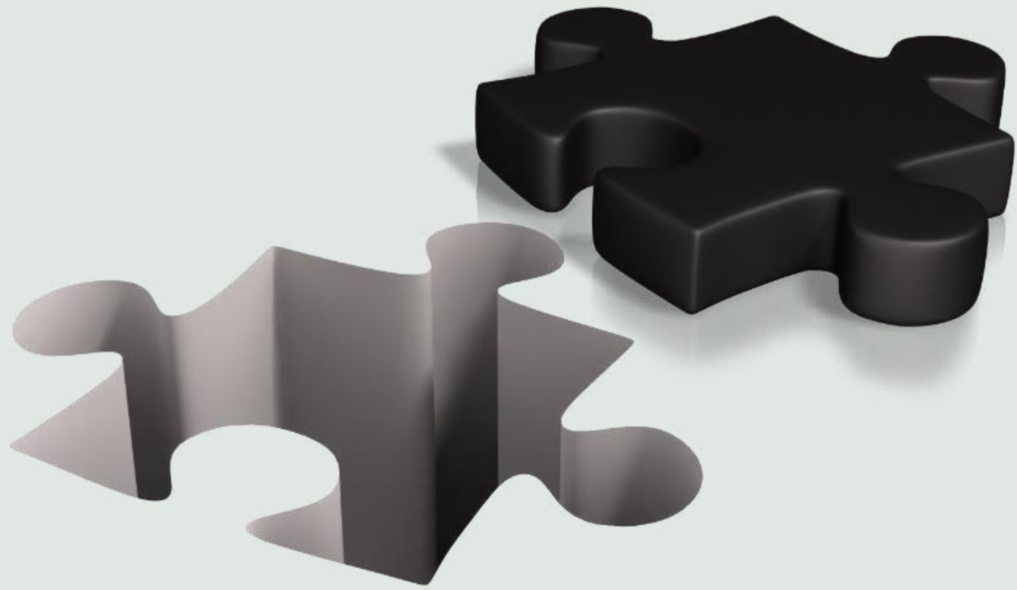
Cord entanglement



Possible etiology of Variables

(Cabaniss & Ross, 2010, p. 70)



Variable Decelerations

Reflects a temporary compression of the umbilical cord

A variable deceleration reflects interruption of oxygen transfer at one or more points of the oxygen pathway

(Miller, Miller, and Cypher, 2022, pg. 127-130)

Assessments/ Interventions for Variables

Goal: Relieve the pressure on the umbilical cord

Change maternal position

Perform a VE to check for cord

Amnioinfusion

- If recurrent variable decelerations during first-stage labor

Modify pushing efforts during second stage

Consider use of intrauterine corrective measures based upon tracing

Definition: Late Deceleration

A visually apparent usually symmetrical gradual decrease and return to the baseline FHR **associated with a uterine contraction**

Gradual is defined as onset of deceleration to the lowest point of the deceleration as **equal to or greater than 30 seconds**

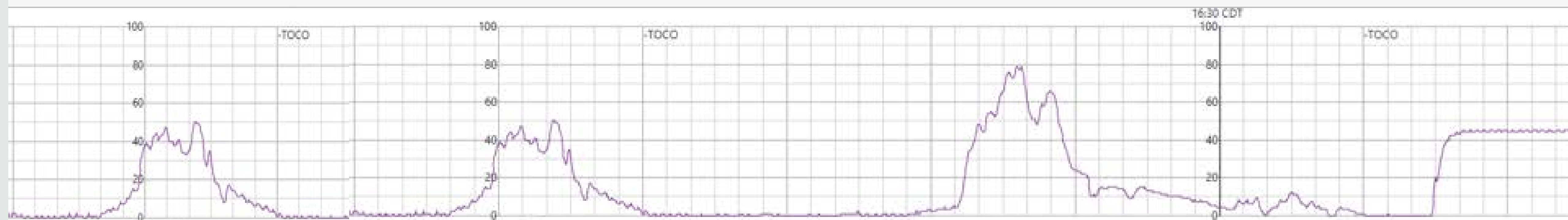
The decrease is calculated from the most recently determined portion of the baseline

The deceleration is **delayed in timing, with the lowest point of the deceleration occurring after the peak** of the contraction

FECG
MHRext

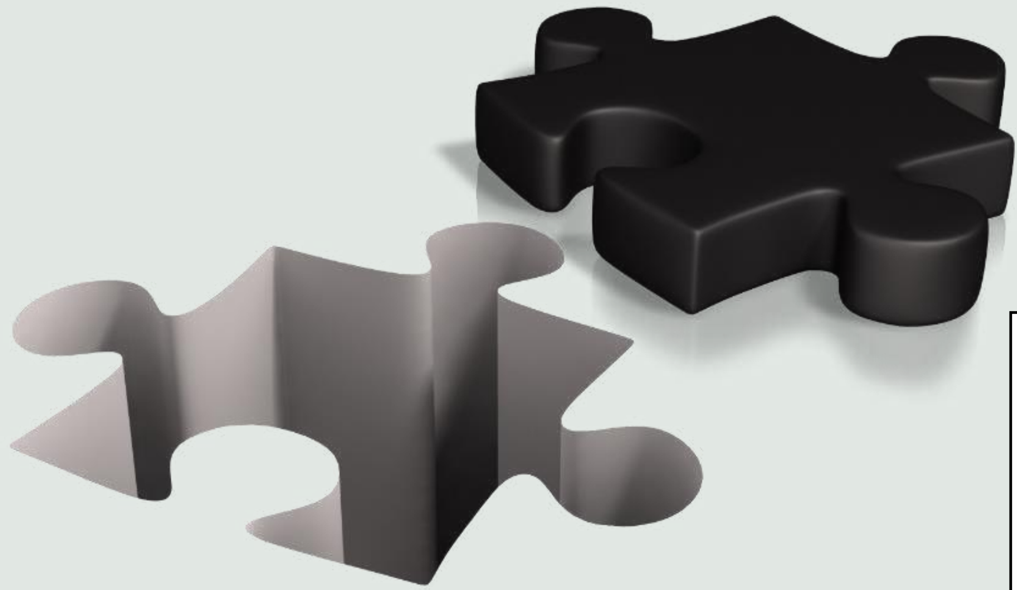
Approx 40 sec

SpO2 100%
phenylephrine 80 mcg IV Push
(2)
SpO2 100%



How is gradual defined?

How long does it take to reach the nadir?



Late Decelerations

Reflects transient interruption of oxygen transfer from the environment to the fetus during a uterine contraction resulting in transient fetal hypoxemia.

(Miller, Miller, and Cypher, 2022, pg. 126)

Late Decelerations may occur in conditions which interrupt the oxygen transfer from the environment to the fetus during a contraction:

Maternal hypotension
- supine hypotension, epidural or spinal

Tachysystole and tetanic contractions

Placental dysfunction

Bleeding disorders
- abruptio placenta, placenta previa

Hematological disorders
- anemia, sickle cell disease, Rh isoimmunization

Maternal disease
- Diabetes
- HTN

Assess for and address potential cause or causes

Ex: hypotension, excessive uterine activity

Provide intrauterine corrective measures

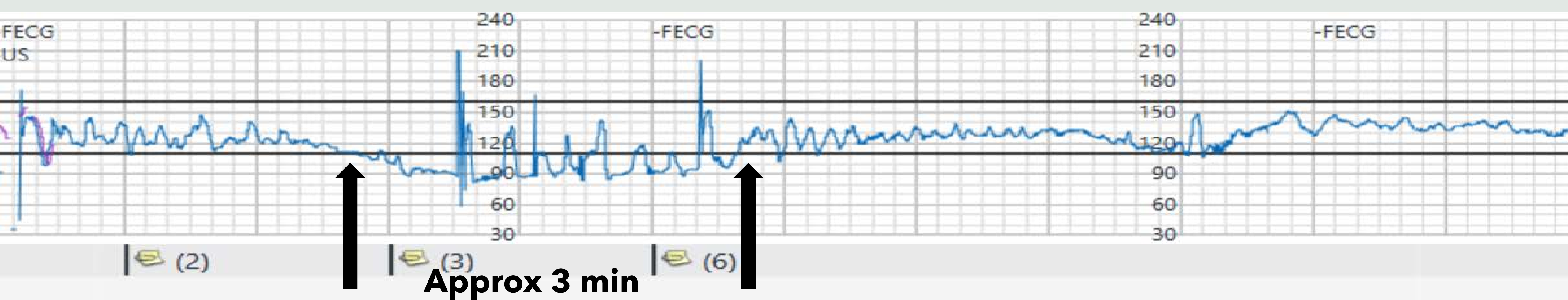
Assessments & Interventions

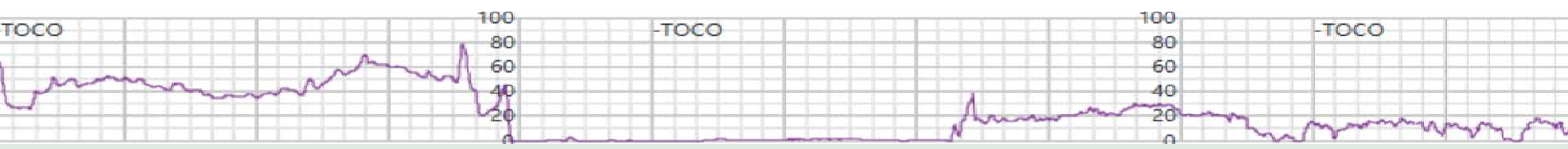
Definition: Prolonged Deceleration

A visually apparent decrease in the FHR below the baseline

The decrease is calculated from the most recently determined portion of the baseline

The decrease from the baseline is **equal to or greater than 15 bpm and lasts equal to or greater than 2 minutes but less than 10 minutes** from onset to return to baseline

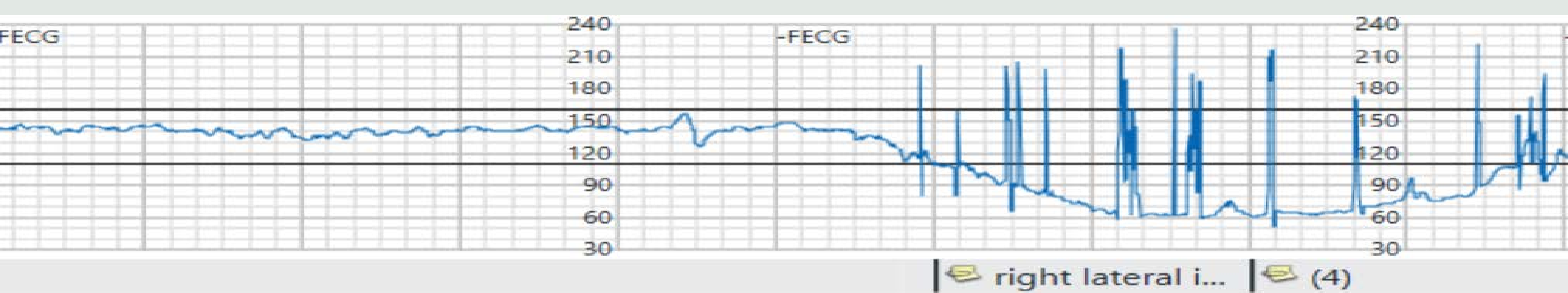


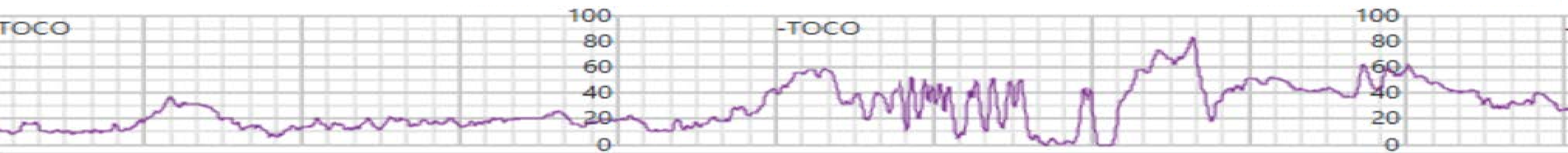


Are prolonged decelerations episodic or periodic?

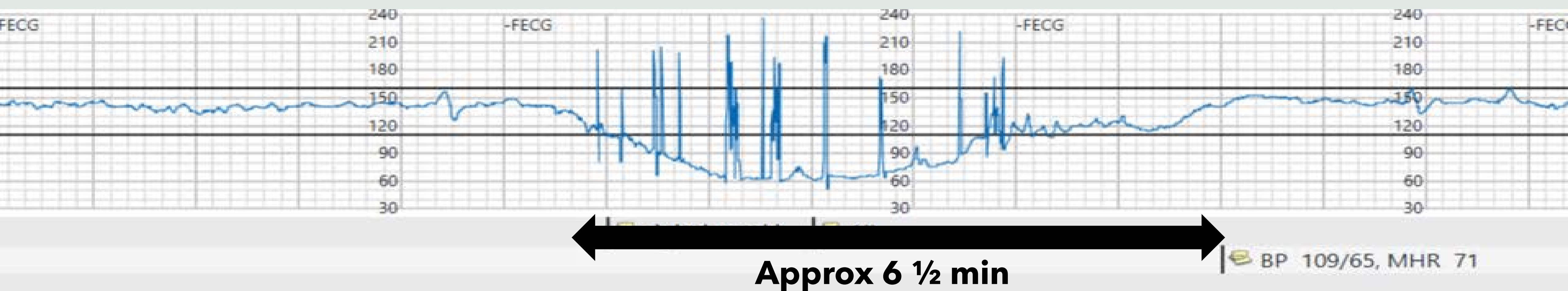
Is there depth criteria?

What is the criteria for how long they last?





Is this a prolonged deceleration or a baseline bradycardia?



Now can you define it?

A prolonged deceleration reflects an interruption in the oxygen transfer to the fetus in one or more points within the oxygen pathways

Occult or frank cord prolapse

Maternal hypotension

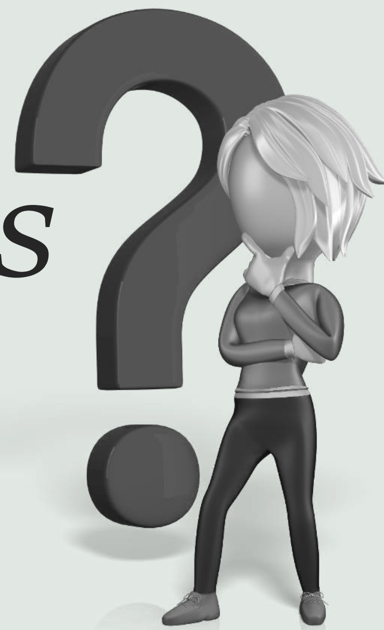
Tachysystole Tetanic contractions

Maternal hypoxia

Rapid fetal descent

(Miller, Miller, & Cypher, 2027, p. 125-126)

Assessments/Corrective Measures for Prolonged Decelerations



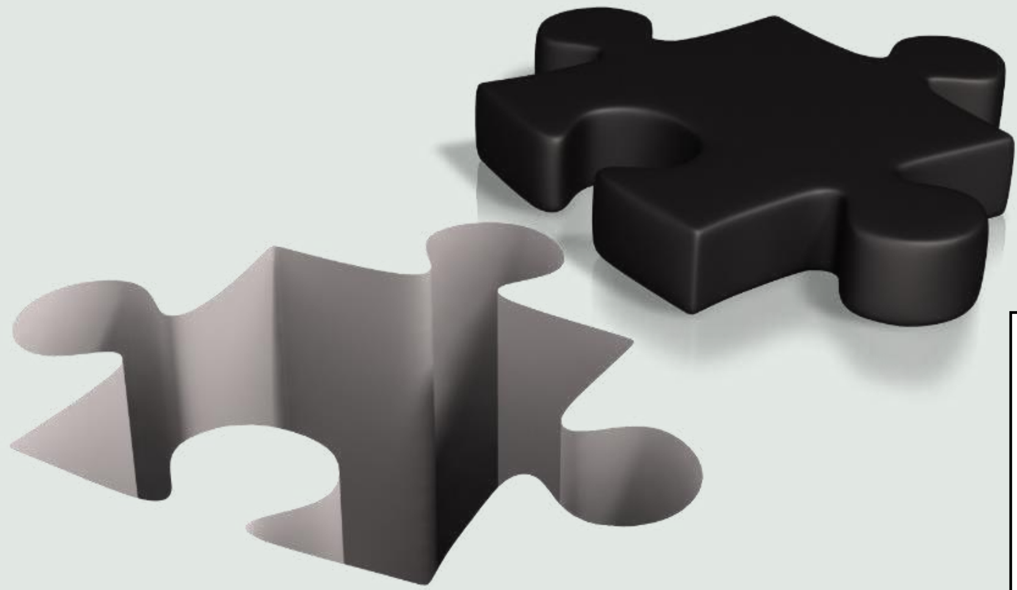
While trying to determine cause:

Perform a vaginal exam
- To look for cord or rapid labor progress

Consider applying a spiral electrode

Intrauterine corrective measures *discontinue Pitocin*

Anticipate preparations for cesarean



Recurrent Decelerations

Decelerations are defined as recurrent if they occur **with equal to or greater than 50% of uterine contractions** in any 20-minute segment

Intermittent Decelerations

Decelerations are defined as intermittent if **they occur with less than 50% of uterine** contractions in any 20-minute segment

VEAL CHOP MINE Nursing Mnemonic

FHR Pattern (VEAL)	Cause (CHOP)	Management (MINE)
V Variable deceleration	**C** Cord compression	**M** Maternal repositioning
E Early deceleration	**H** Head compression	**I** Identify labor progress
A Acceleration	**O** Okay!	**N** No interventions
L Late deceleration	**P** Pathway of Oxygen	**E** Execute interventions

Let's Practice

3. Draw a late deceleration

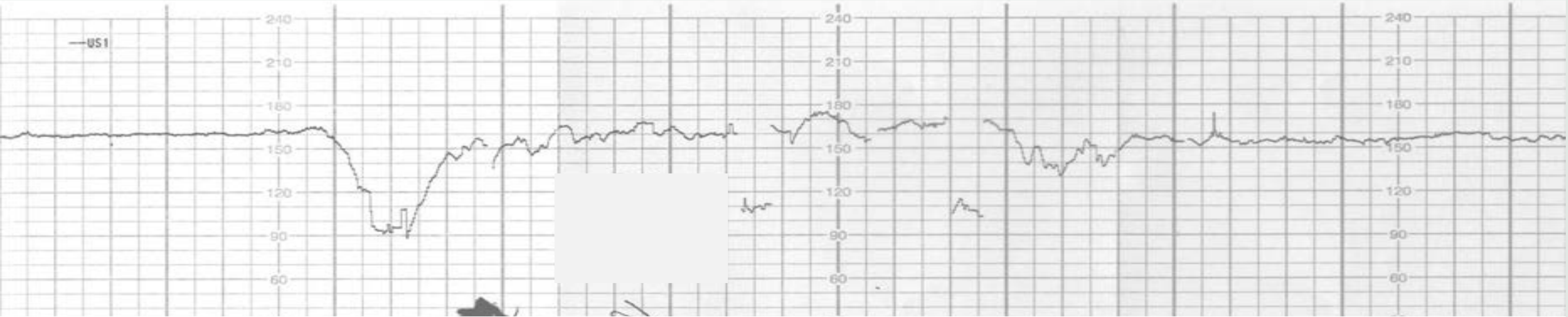
4. Draw a prolong deceleration

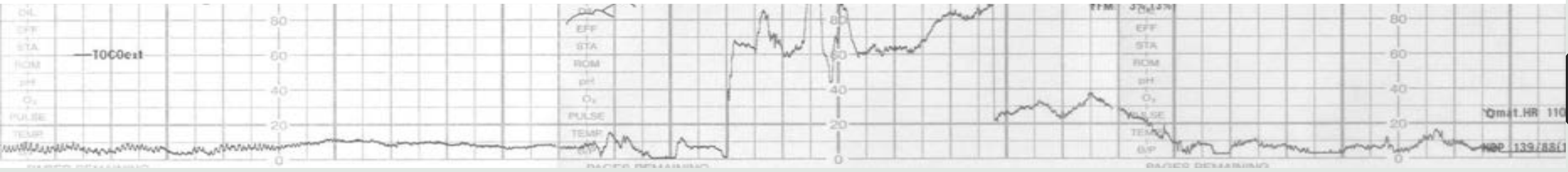
1. Draw an episodic variable deceleration

2. Draw a periodic variable deceleration

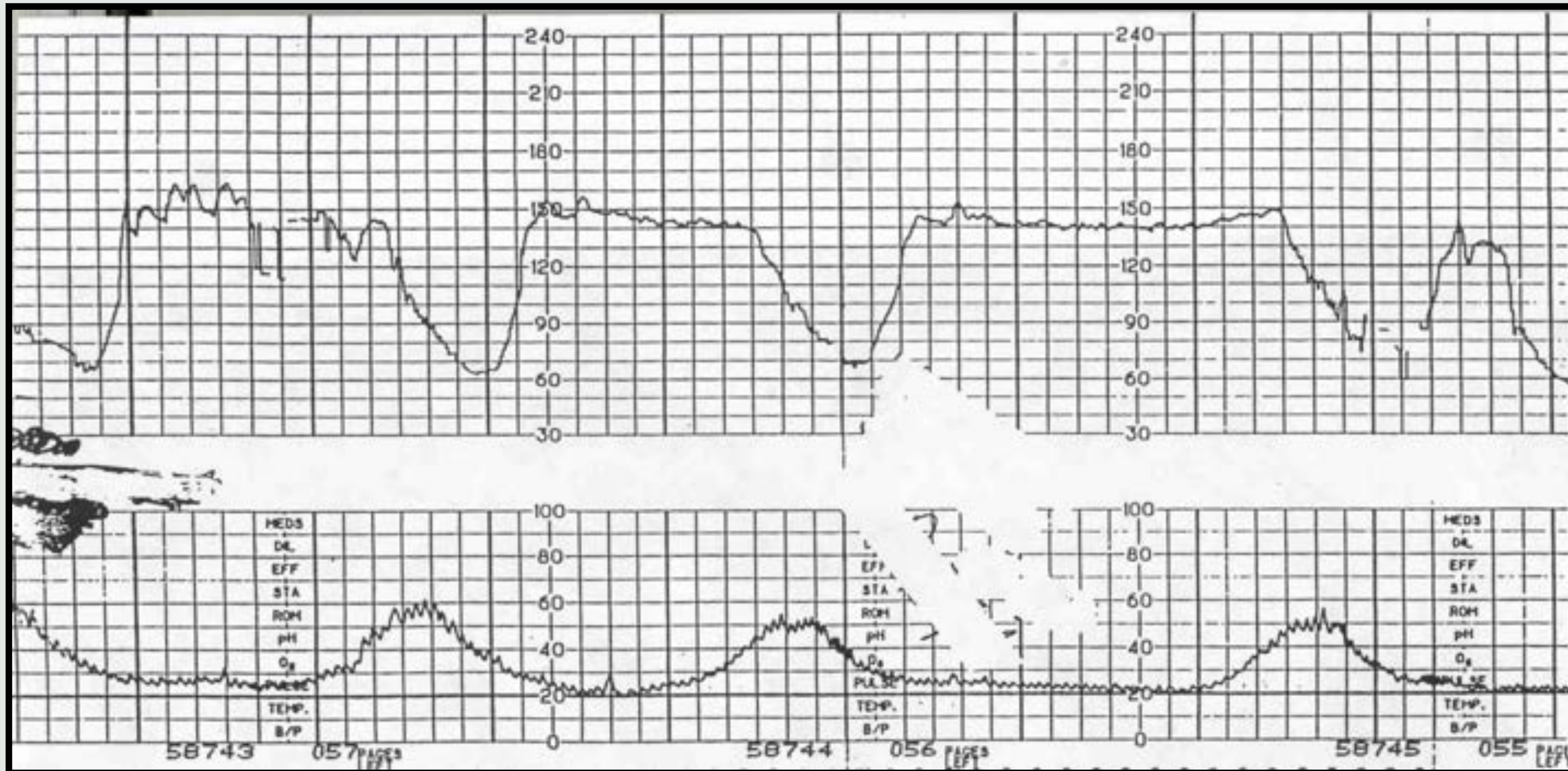
5. Draw an early deceleration

Fetal Episodic (without the presence of a Contraction) Variable

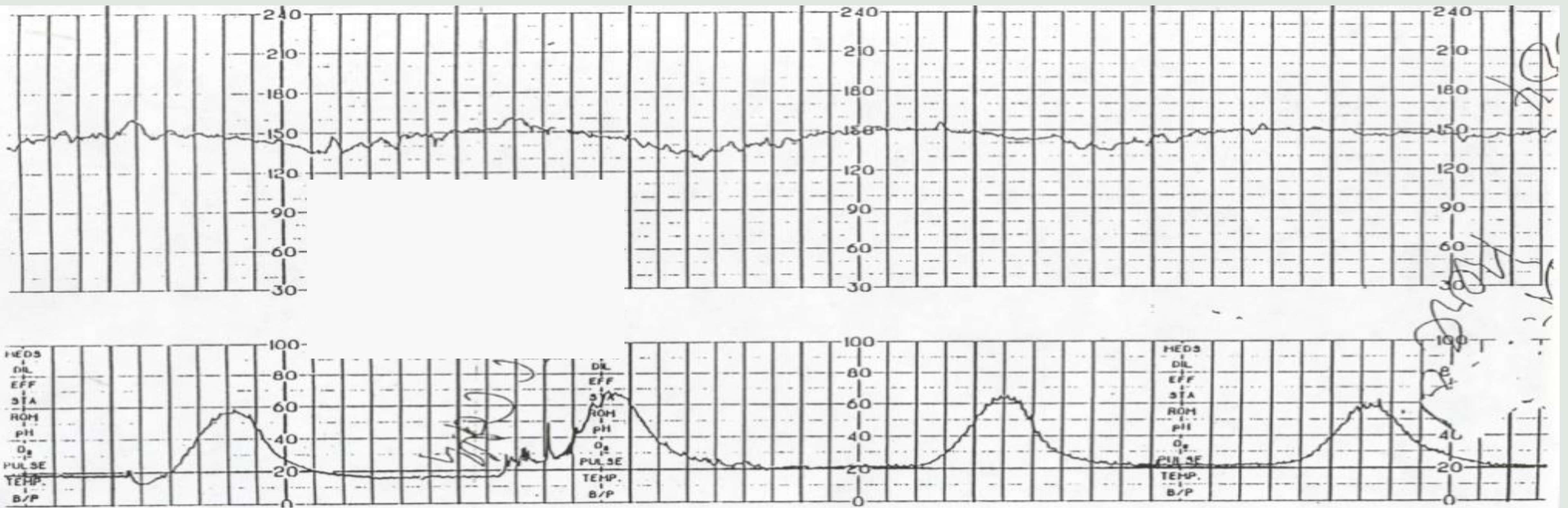




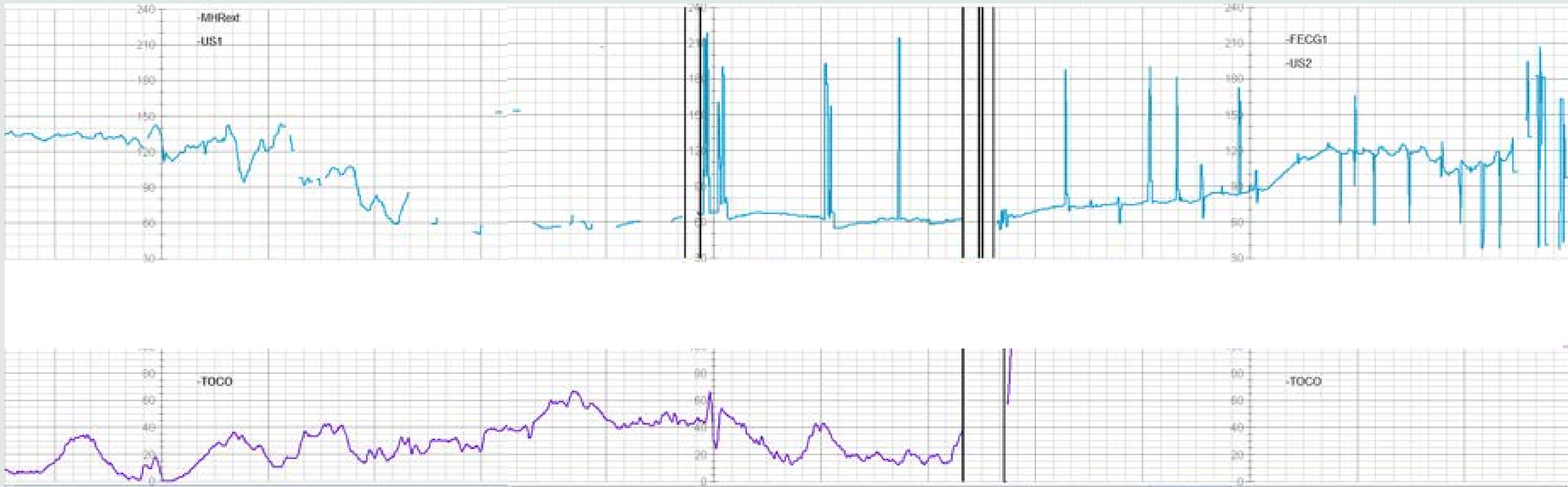
Example of recurrent (greater than or equal to 50%) and periodic (with contractions) Fetal Significant Variable Decelerations



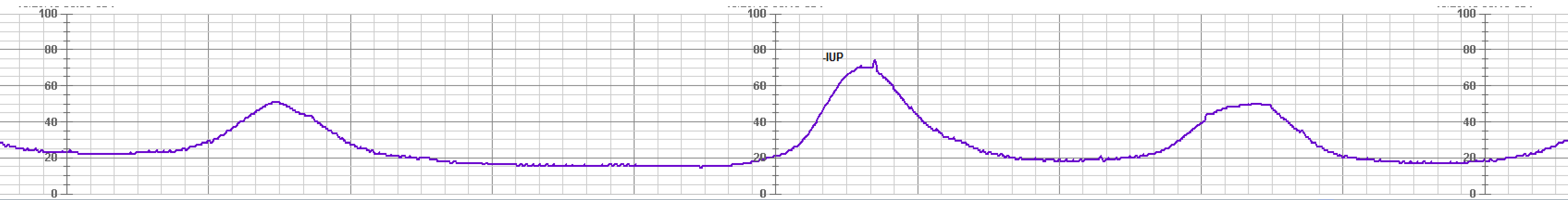
Example of Fetal Late Deceleration



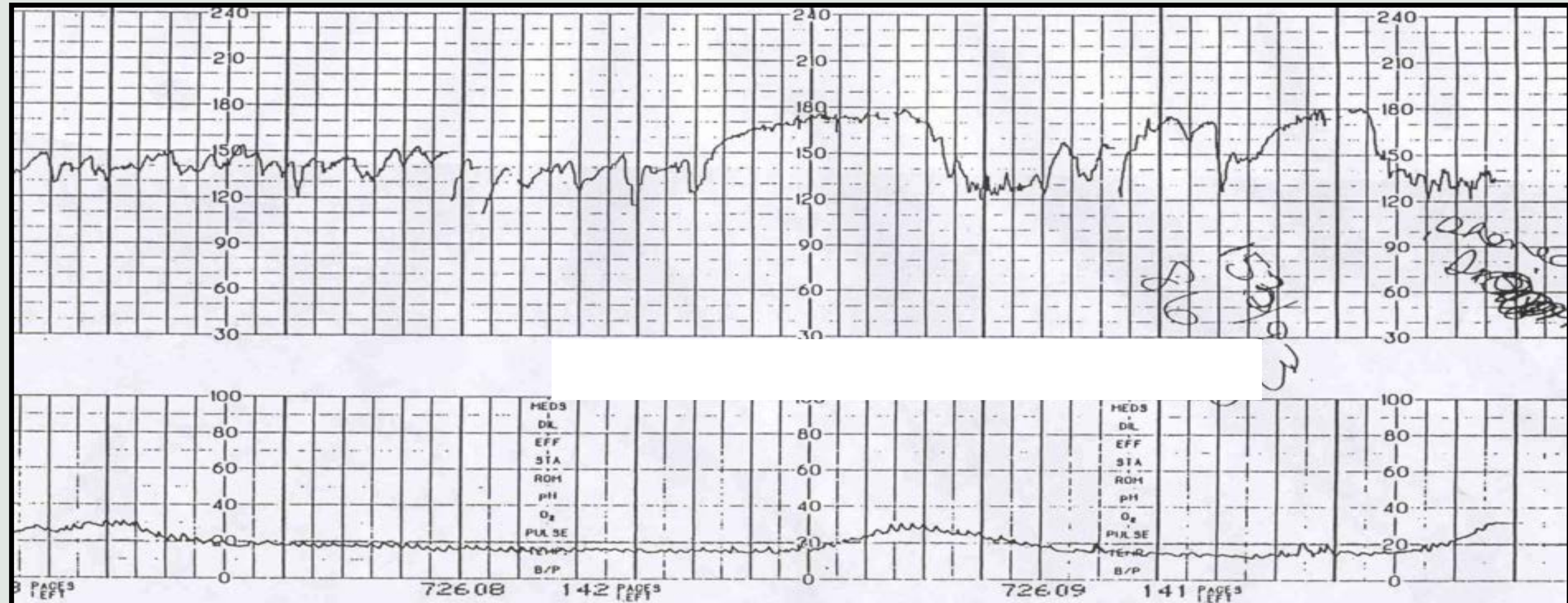
Example of a Fetal Prolong Deceleration



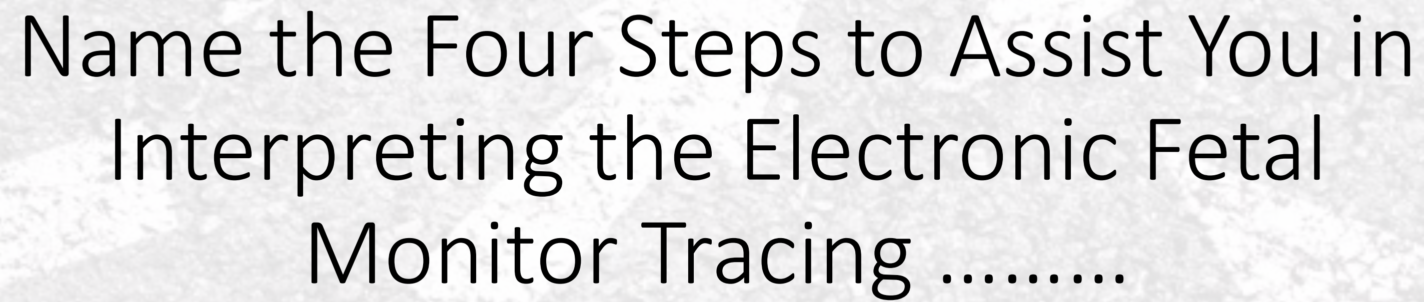
Fetal Early Decelerations



Example of Fetal Accelerations



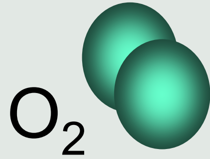
Name the Four Steps to Assist You in Interpreting the Electronic Fetal Monitor Tracing ………

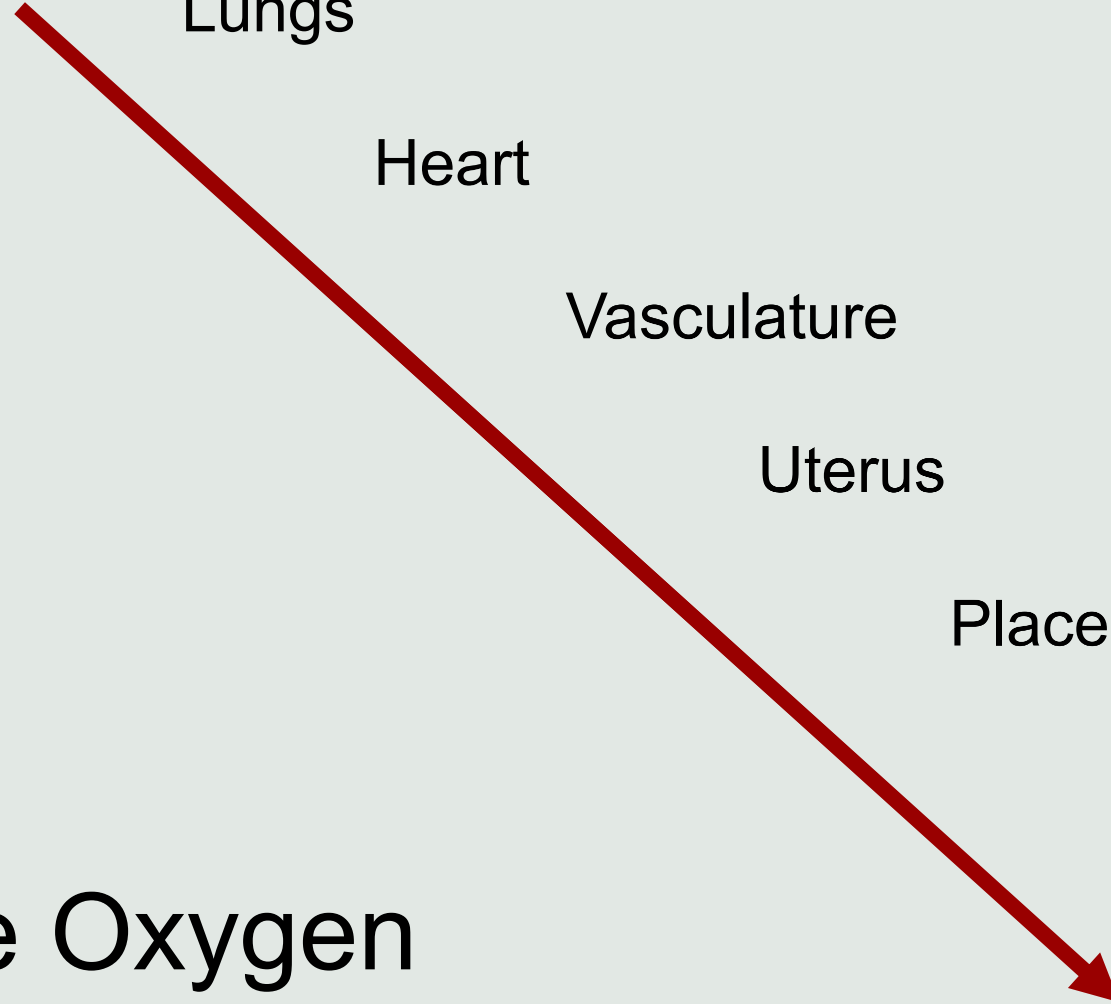


Oxygen Pathway (refer to your handouts)

Miller’s Management Model

Environment





A Tool You Can Use!

The Oxygen Pathway

Oxygen pathway

- **Environment**

  Lungs

  Heart

  Vasculature

  Uterus

  Placenta

  The umbilical cord

- **The fetus**

  ***Miller,** Miller, & Cypher (2017, p. 11)*

Adapted with permission from Dr. David Miller's presentation *Safer and Easier Establishing a Shared Mental Model in EFM.*(2013).
14th Annual National Conference on Fetal Monitoring Maternal-Fetal Assessment and Interventions

Intrapartum FHR Monitoring Management Decision Model©

Confirm FHR and uterine activity

FHR Category?

I

II or III

"ABCD"

"A" - Assess oxygen pathway and other causes*
"B" - Begin corrective measures if indicated

FHR Category?

I

II

III

Presence of moderate variability or accelerations
and
Absence of clinically significant decelerations

Yes

No or unsure

"C" - Clear obstacles to rapid delivery
"D"- Determine decision to delivery time

Is vaginal delivery likely before the onset of metabolic acidemia and potential injury?

Yes

No or unsure

Is the patient "low-risk"?

No

Yes

Routine Surveillance

- Every 30 min in the active phase of the 1st stage
- Every 15 min in the second stage

Heightened Surveillance

- Every 15 min in the active phase of the 1st stage
- Every 5 min in the second stage

Expedite Delivery

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Fetal Heart Rate Categories

I

Category I includes all of the following:
- Baseline rate 110-160 bpm
- Moderate variability
- No late decelerations
- No variable decelerations
- No prolonged decelerations

II

Category II includes all tracings not assigned to Category I or Category III

III

Category III includes at least one of the following:
- Absent variability with recurrent late decelerations
- Absent variability with recurrent variable decelerations
- Absent variability with bradycardia for at least 10 min
- Sinusoidal pattern for at least 20 min

A Practical "ABCD" Checklist Approach to FHR Management

	"A" Assess Oxygen Pathway	"B" Begin Corrective Measures
Lungs	❑ Airway and breathing	❑ Supplemental oxygen
Heart	❑ Heart rate and rhythm	❑ Position changes ❑ Fluid bolus
Vasculature	❑ Blood pressure ❑ Volume status	❑ Correct hypotension
Uterus	❑ Contraction strength ❑ Contraction frequency ❑ Baseline uterine tone ❑ Exclude uterine rupture	❑ Stop or reduce stimulant ❑ Consider uterine relaxant
Placenta	❑ Check for bleeding ❑ Exclude abruption	
Cord	❑ Vaginal exam ❑ Exclude cord prolapse	❑ Consider amnioinfusion

	"C" Clear Obstacles to Rapid Delivery	"D" Determine Decision to Delivery Time
Facility	Confirm: ❑ OR availability ❑ Equipment availability	Consider ❑ Facility response time ❑ Location of OR
Staff	Consider notifying ❑ Obstetrician ❑ Surgical assistant ❑ Anesthesiologist ❑ Neonatologist ❑ Pediatrician ❑ Nursing staff	Consider: ❑ Staff availability ❑ Training ❑ Experience
Mother	Consider ❑ Informed consent ❑ Anesthesia options ❑ Laboratory tests ❑ Blood products ❑ Intravenous access ❑ Urinary catheter ❑ Abdominal prep ❑ Transfer to OR	❑ Surgical considerations *(prior abdominal or uterine surgery)* ❑ Medical considerations *(obesity, hypertension, diabetes)* ❑ Obstetric considerations *(parity, pelvimetry, placentation)*
Fetus	Consider: ❑ Estimated weight ❑ Gestational age ❑ Presentation ❑ Position	Consider: ❑ Estimated fetal weight ❑ Gestational age ❑ Presentation ❑ Position
Labor	❑ Consider IUPC	Consider: ❑ Arrest or protraction disorder ❑ Remote from delivery ❑ Poor expulsive efforts

Three Principles of Fetal Heart Rate interpretation

Environment

Lungs
Heart
Vasculature
Uterus
Placenta
Cord

1. Decelerations (late, variable or prolonged) signal interruption of the oxygen pathway at one or more points

Fetus

Hypoxemia
Hypoxia
Metabolic acidosis
Metabolic acidemia

Potential Injury

2. Moderate variability or accelerations exclude metabolic acidemia
3. Exclusion of metabolic acidemia excludes on-going hypoxic injury

*Other Causes of Fetal Heart Rate Changes

Fetal	Maternal
❑ Fever	❑ Fever
❑ Infection	❑ Infection
❑ Medications	❑ Medications
❑ Anemia	❑ Hyperthyroidism
❑ Arrhythmia	
❑ Heart block	
❑ Congenital anomaly	
❑ Extreme prematurity	
❑ Preexisting neurologic injury	
❑ Sleep cycle	

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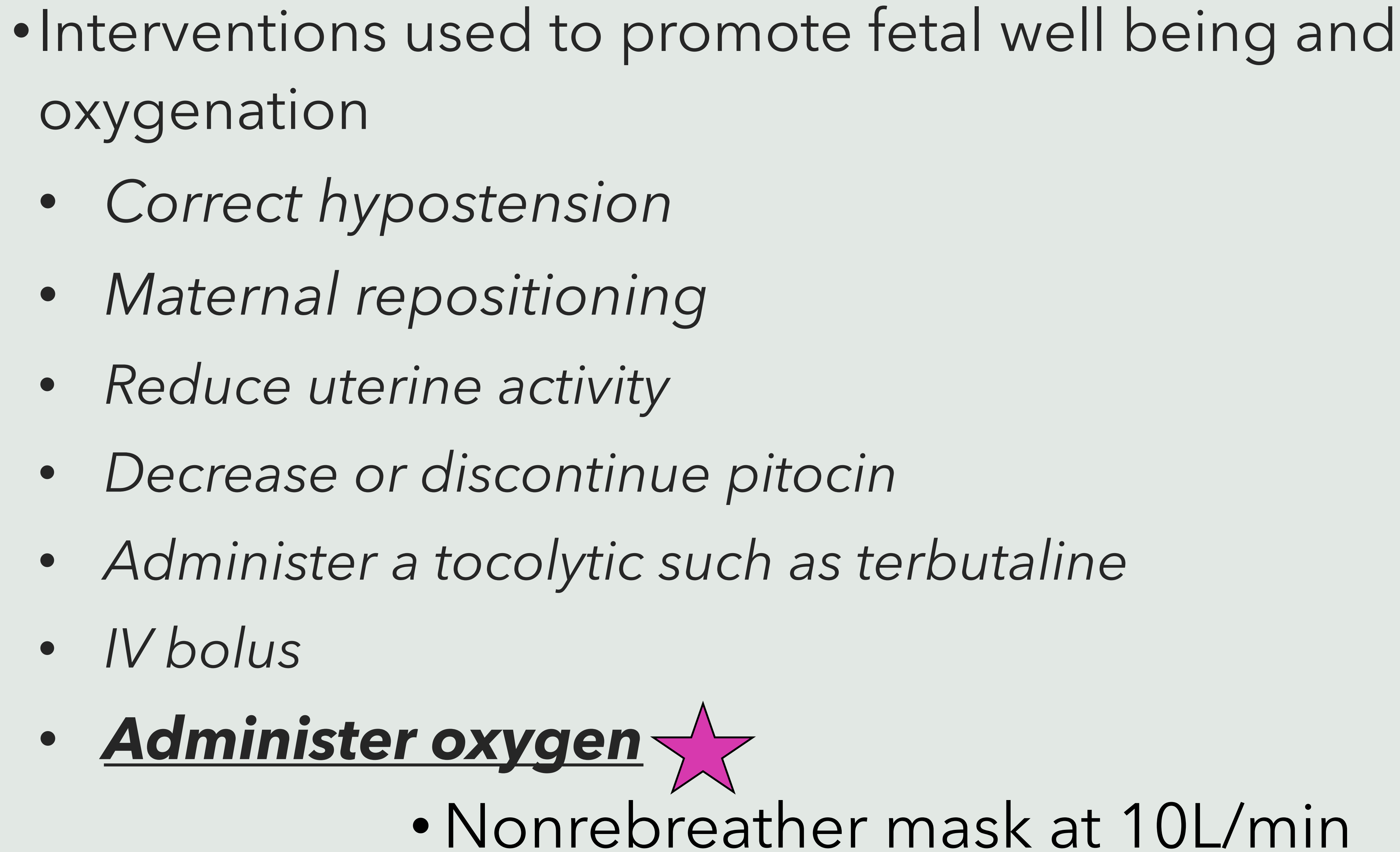
Intrauterine Corrective Measures

Please Refer To Handout

Intrauterine Corrective Measures



- Interventions used to promote fetal well being and oxygenation
  - *Correct hypostension*
  - *Maternal repositioning*
  - *Reduce uterine activity*
  - *Decrease or discontinue pitocin*
  - *Administer a tocolytic such as terbutaline*
  - *IV bolus*
  - ***Administer oxygen***
    - Nonrebreather mask at 10L/min

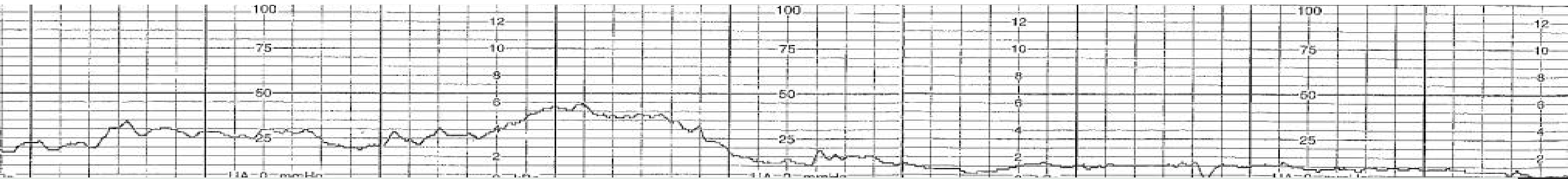
NICHD Terminology

NICHD 2008 Three Tier

- *Please refer to the handout titled NICHD Terminology*

Category I

FHR Baseline 130 with Moderate Variability



Category III Tracings

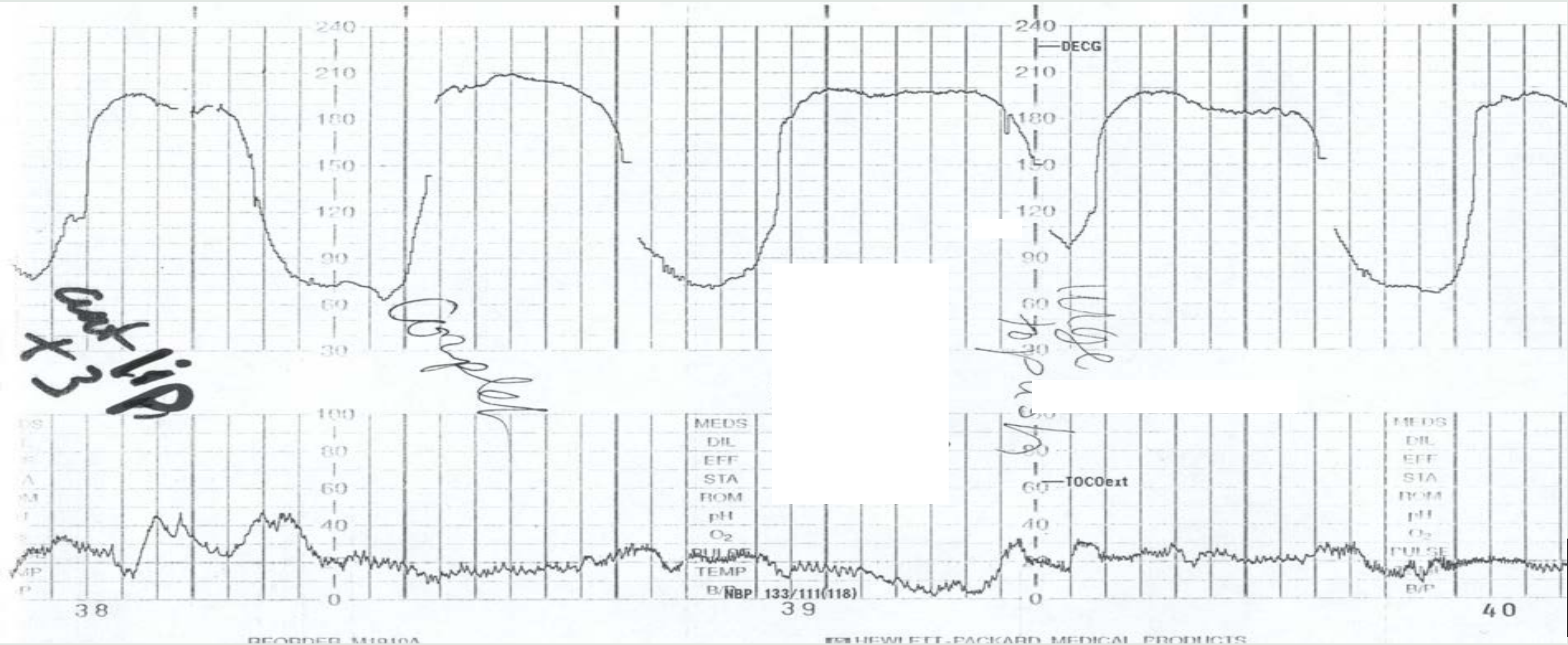
- Includes ***Absent*** **Baseline Fetal Heart Rate Variability** and:
- *Recurrent (defined as greater than 50% decelerations in a 20-minute window) Late Decelerations*
- *Recurrent (defined as greater than 50% decelerations in a 20-minute window) Variable Decelerations*
- *Bradycardia for at least 10 minutes*

OR

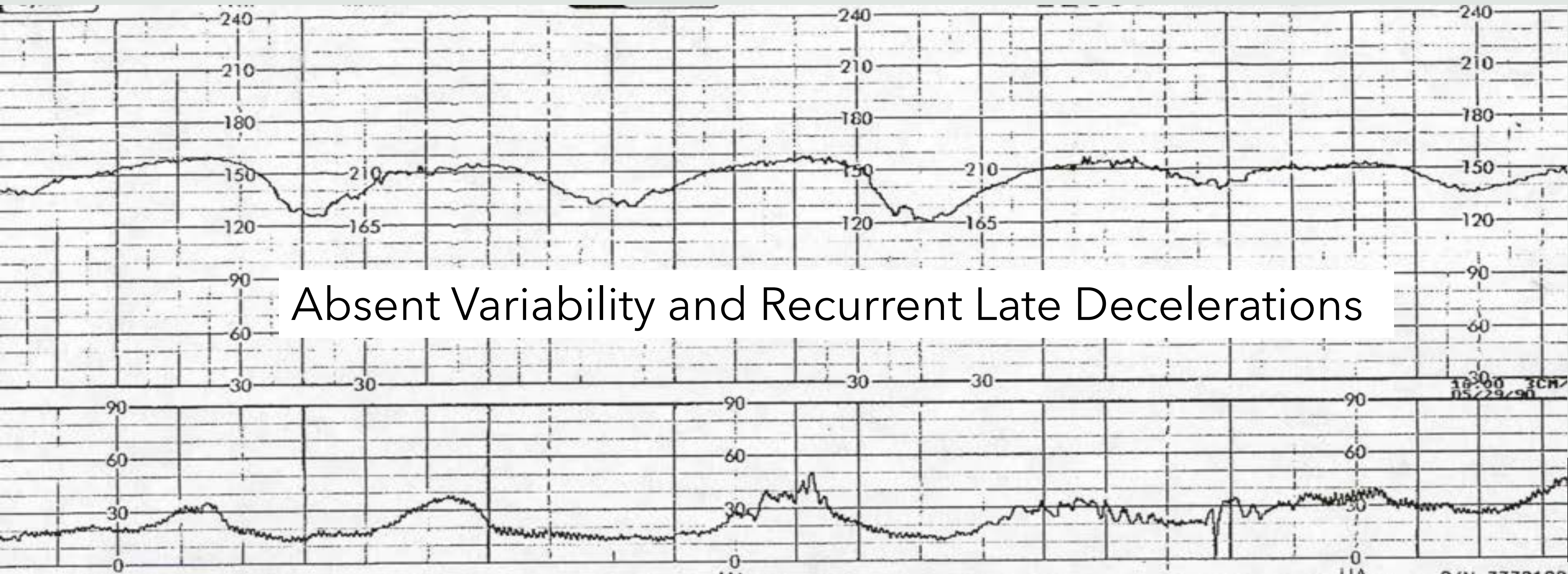
Sinusoidal pattern for at least 20 minutes

Category III

Absent Variability and Recurrent Late and Variable Decelerations

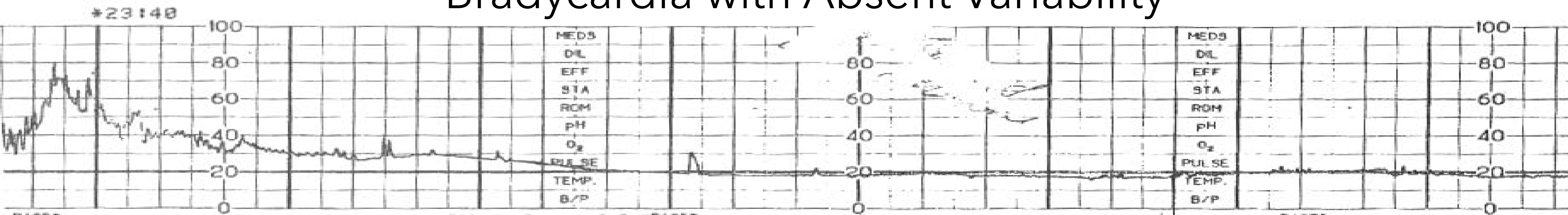


Category III



Category III

Bradycardia with Absent Variability

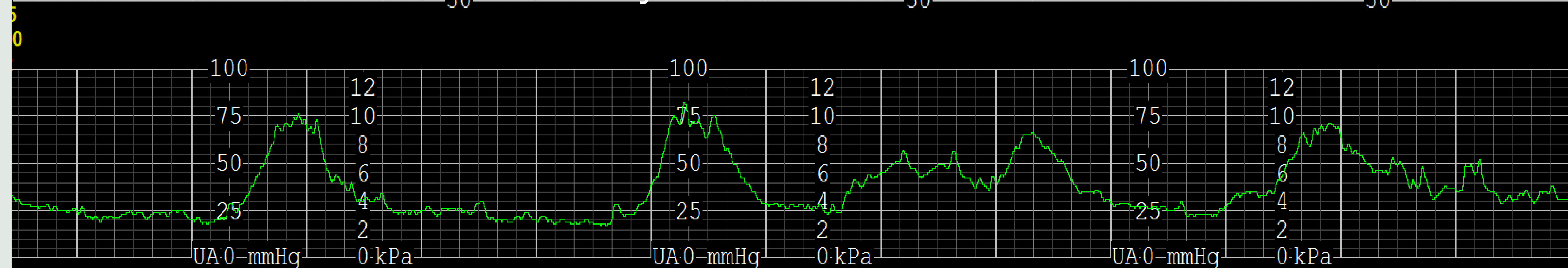


Category II Tracings

- All tracings not in categories I and III
- 80% of fetal monitoring tracing may display a Category II Tracing

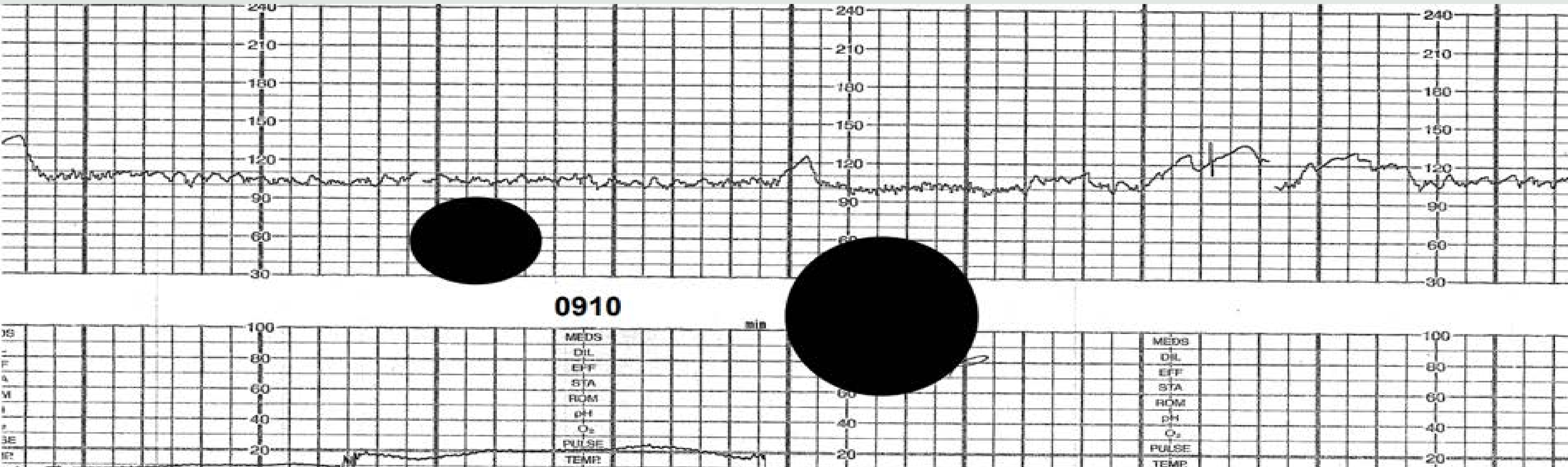
Category II Tracing

Minimal Variability, with Recurrent Variable Decelerations



Category II Tracing

Moderate Variability, Accelerations Present – Baseline of **100** bpm



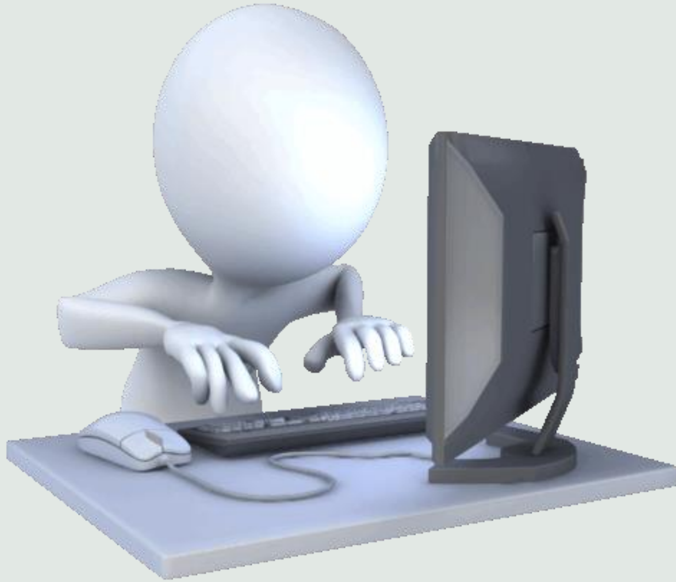
Documentation of Categories

- Documenting in Categories alone does not describe the clinical picture of the fetal heart rate tracing and trending of the fetal heart rate

  Example

- Admission strip baseline of 110, moderate variability, no decelerations. – Category I tracing
- 4 hours later baseline of 160, moderate variability, no decelerations – Category I tracing

Let's Practice NCC Website game



Labor Stages & Phases

Stages and Phases of Labor

How many Stages of labor are there??

What are the phases of labor??

Stages of Labor

Stage I

- 0-10cm
- Has 2 phases

Latent Phase

Active Phase

Latent Phase

0-5cm	U/C May be Irregular, May start infrequently (3-30 min)
Duration is short, 15-20 seconds then progressing to 30-60 seconds	Palpate Mild at beginning then progress to moderate
Pt may describe as mild menstrual cramps, low dull backache, or uterine tightening	Pt's behavior may be relief that labor has started, coping well, able to ambulate and talk through u/c
Pt may have a variety of emotions: excitement, talkative, mild anxiety	With an IUPC 25-40 mm Hg

How long do you think the latent phase of labor takes?

Regardless of Parity:

Is not considered prolonged until

> 16 hrs

Nulliparity:

Cesarean for failed IOL should not be considered until at least 15 hrs after both ROM *and* oxytocin initiation

Labor Progress

Vaginal exam is used to assess labor progress

Onset of labor is established by observing progressive effacement & dilation of cervix

Differentiation between true & false labor may require multiple exams

Active Phase

6-10cm

U/C Palpate Mod-Strong; IUPC 50-70mmHg

Duration 45-90 seconds; Q 2-5min

↑ discomfort; accepts coaching efforts

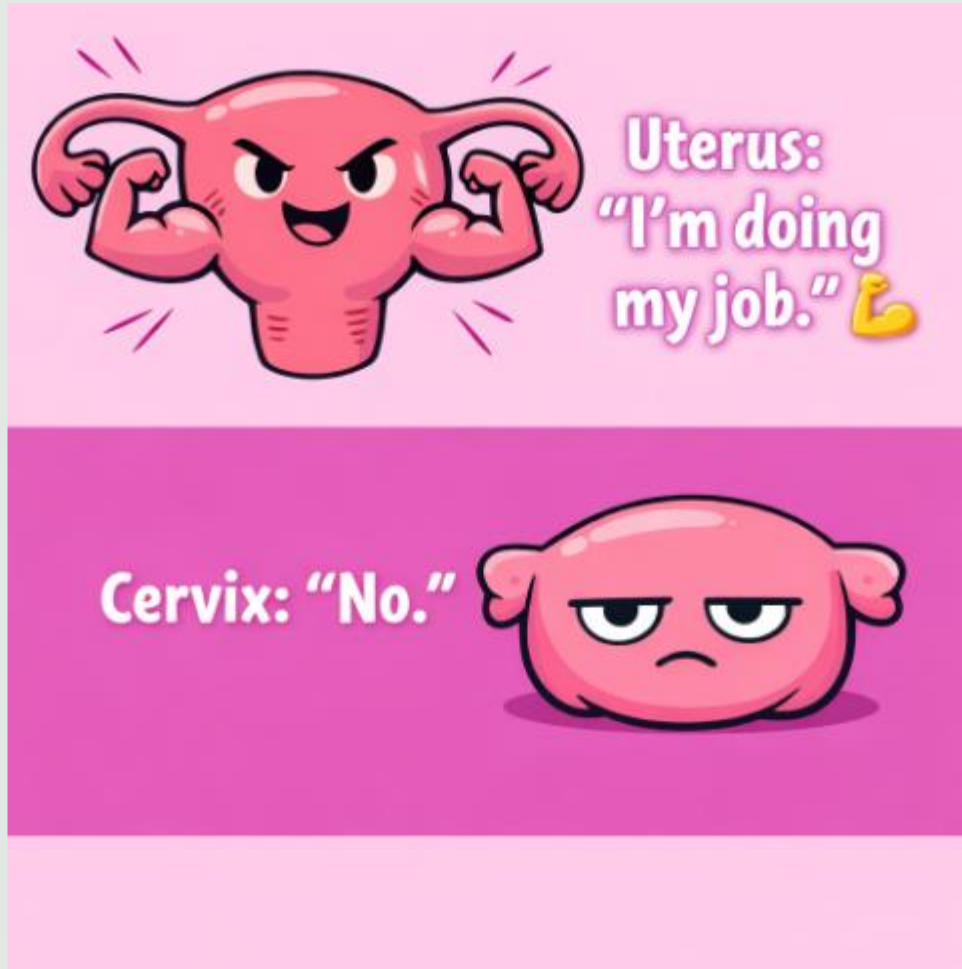
Flushing of cheeks; trembling of thighs

↑ Bladder and rectal pressure

Emotionally: alert, serious & demanding

Evidence of fatigue

Active Phase Labor Arrest



ACOG suggests:

No progress following 4 hours of uterine activity exceeding 200 MVUs per IUPC

OR

6 hours of inadequate uterine activity in patients who are at least 6cm dilated *with* rupture of membranes *and* receiving oxytocin augmentation

ACOG Clinical Practice Guideline, No.8, Jan, 2024, First and Second Stage Labor Management

Stages of Labor

Stage II

- 10cm to delivery of baby

U/C Q 2-3min	Lasting 60-90 sec
IUPC 70-100 mm Hg	↑urge to push, ↑ Rectal pressure
Perineal burning	Divided into passive fetal descent or active pushing

Stages of Labor

Stage III

- from birth of baby to delivery of placenta

Signs of separation

- Gush of blood
- Cord lengthens
- Fundus rises in abdomen

Types of placental delivery

- Spontaneous
- Manual extraction

Stages of Labor

Stage IV

- Immediate post delivery
- 1-4 hours

Placenta & Uterus had 700-800 ml/min of blood perfusing prior to delivery. This blood is now being recirculated into the mom's system.

Assess Maternal

- B/P & HR q 15 min
- Fundal height, tone & position
- Amount of Lochia

Questions?

Let's Talk about Clinical Context

Fetal Heart Rate monitoring

Is a __________ tool

Screening

A number of conditions &/or exposure can influence the appearance of an FHR tracing

Fever

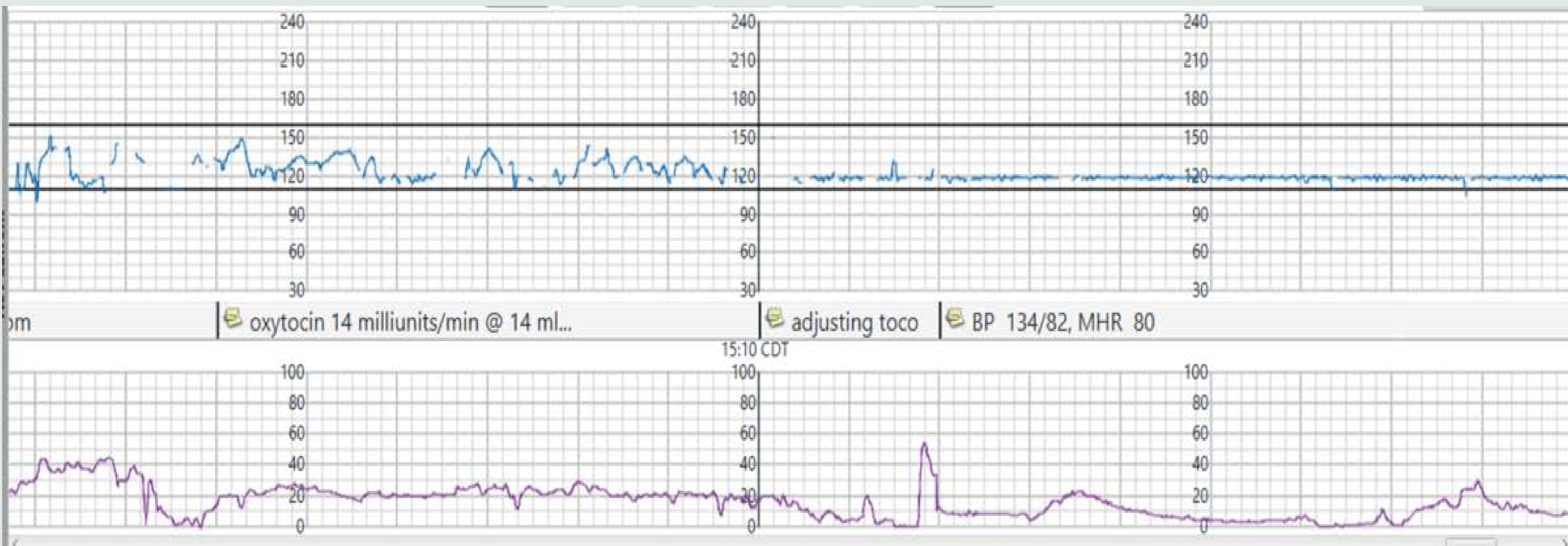
Infection

Medications

Gestational Age

Fetal sleep cycles

When evaluating an FHR tracing think about what else may be affecting the tracing



Strip Review in Groups