

# Strip Reviews: Strategies and Best Practices

## *Additional Presentation Information*

### Target Audience

This course is targeted to physicians, both on staff and in private practice, registered nurses, risk managers, quality assurance directors, and C-level administrators focused on ensuring patient safety and health care quality.

### Accreditation – Physician Information

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### Learning Objectives

- Understand the value of multidisciplinary EFM strip reviews
- Outline a standard format for the EFM strip review process
- Identify recommendations for case selection
- Describe the importance of a structured approach for interpreting electronic fetal monitoring (EFM)
- Outline current NICHD criteria for EFM interpretation and its limitations
- Discuss potential management strategies for common abnormal EFM tracings

### Accreditation – Nurse Information

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This program is approved for 1 contact hours for nurses.

### Speakers

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### Faculty Disclosure Statement

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Nancy Hudacek—employee of Healthstream, Inc.

Martin November—employee of Advanced Practice Strategies, Inc

# Strip Reviews

## Strategies and Best Practices

Presented by:

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# Learning Objectives

## INTRODUCTION

## MULTIDISCIPLINARY PROCESS

## CASE SELECTION

## NICHD RECOMMENDATIONS

## EFM CASE REVIEW

## CONCLUSION

- Understand the value of multidisciplinary EFM strip reviews
- Identify recommendations for case selection
- Outline a standard format for the EFM strip review process
- Describe the importance of a structured approach for interpreting electronic fetal monitoring (EFM)
- Outline the current NICHD criteria for EFM interpretation and its limitations
- Discuss potential management strategies for common abnormal EFM tracings

# Why Focus on Electronic Fetal Monitoring (EFM)?

## INTRODUCTION

### MULTIDISCIPLINARY PROCESS

### CASE SELECTION

### NICHD RECOMMENDATIONS

### EFM CASE REVIEW

### CONCLUSION

- Over half of liability claims against physicians were obstetric and almost half of those (46%), EFM was a variable
- The #1 most frequent allegation in perinatal malpractice claims is delayed diagnosis of abnormal fetal acid-base status due to current or impending fetal asphyxia—which is monitored via EFM
- In 75% of birth-related lawsuits, the award or settlement is over \$1 million

# Recent Malpractice Case

## INTRODUCTION

## MULTIDISCIPLINARY PROCESS

## CASE SELECTION

## NICHD RECOMMENDATIONS

## EFM CASE REVIEW

## CONCLUSION

**November 10<sup>th</sup>, 2009**

“A California University Medical Center settled a 2004 birth injury lawsuit brought by the family of a 4-year-old boy with cerebral palsy for \$6 million. The plaintiffs’ attorney alleged the boy’s injuries were the result of the failure by medical personnel to recognize the signs of “*fetal distress*” and perform a cesarean section. Plaintiff received \$1.75 million up front and another \$4 million in annuities that are expected to pay for his medical and assistive care, as well as future lost earnings. His parents waived any future wrongful death claims for \$250,000 in settlement. ***The total settlement is the largest amount the university has ever agreed to pay to settle a medical malpractice case.***”

# Significant Demand for EFM Education

## INTRODUCTION

### MULTIDISCIPLINARY PROCESS

### CASE SELECTION

### NICHD RECOMMENDATIONS

### EFM CASE REVIEW

### CONCLUSION

- ACOG Practice Bulletin #106 on Intrapartum FHR Monitoring:
  - Wide variation in the way clinicians interpret and respond to EFM tracings
    - Study of four obstetricians who reviewed 50 tracings.
    - Agreed in only 22% of the cases.
    - Two months later, re-reviewed the same tracings and interpreted 21% differently than they did the first time.
- JCAHO Sentinel Event Alert #30
  - To prevent infant injury and death institutions are advised to “educate nurses, residents, nurse midwives, and physicians to use standardized terminology to communicate abnormal fetal heart rate tracings.”

# Obstetric Safety Also Comes from Working Together

MULTIDISCIPLINARY  
PROCESS

CASE SELECTION

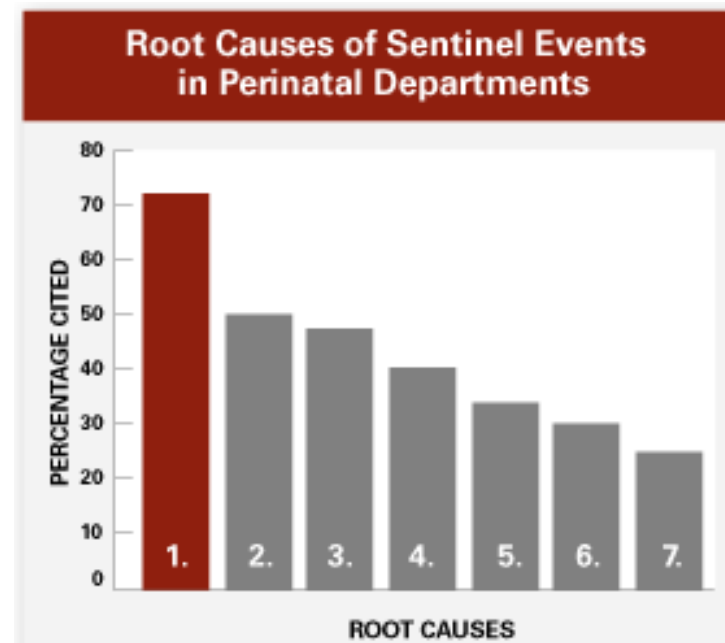
NICHD RECOMMENDATIONS

EFM CASE REVIEW

CONCLUSION

According to JCAHO, the leading causes of perinatal death or permanent infant disability are:

1. Communication issues (72%)
2. Organizational culture impeded teamwork (50%)
3. Competency of staff (47%)
4. Issues with orientation & training (40%)
5. Insufficient fetal monitoring (34%)
6. Concerns w/ credentialing & supervision (30%)
7. Staffing problems (25%)



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# Communication Breakdowns

MULTIDISCIPLINARY  
PROCESS

CASE SELECTION  
NICHD RECOMMENDATIONS  
EFM CASE REVIEW  
CONCLUSION

Three types of communication breakdowns in perinatal period:

1. Communication breakdowns among physicians
2. Communication breakdowns between physicians and nurses
3. Communication breakdowns between physicians and patients



# Communication Breakdowns Among Physicians

MULTIDISCIPLINARY  
PROCESS

CASE SELECTION

NICHD RECOMMENDATIONS

EFM CASE REVIEW

CONCLUSION

- 50% involve breakdowns in communication regarding the patient's condition
- 57% result in high severity injury (loss of life or limb) and high severity financial losses (> \$1M)
- 11% of the time, the responsible/attending provider was unaware of changes in the patient's condition.

# Communication Breakdowns Between Physicians and Nurses

MULTIDISCIPLINARY  
PROCESS

CASE SELECTION

NICHD RECOMMENDATIONS

EFM CASE REVIEW

CONCLUSION

- 31% of cases involving only physicians close with indemnity payment (avg \$309,000)
- 47% of cases involving only nurses do as well payment (avg \$441,000), BUT
- 53% of cases involving both physicians and nurses close with payment (avg \$709,000).

**Communication breakdowns between physicians and nurses are 13% more likely to close with payment than cases involving just nurses and 70% more likely than cases involving just physicians.**

**The actual payment amount for cases involving physician/nursing communication breakdowns is 60% higher than cases involving nurses alone and 129% higher than cases involving only physicians**



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# Communication Breakdowns Between Physicians and Patients

MULTIDISCIPLINARY  
PROCESS

CASE SELECTION

NICHD RECOMMENDATIONS

EFM CASE REVIEW

CONCLUSION

- 31% involve informed consent, and of these:
  - 23% will be related to surgical consent and
  - 8% linked to breakdowns in consent to treatment
- 28% involve bedside manner, and of these:
  - 15% linked to poor patient rapport
  - 13% due to insufficient patient/family education
- Average case costs \$208K

# Issues with a Collaborative Practice Approach

MULTIDISCIPLINARY  
PROCESS

CASE SELECTION

NICHD RECOMMENDATIONS

EFM CASE REVIEW

CONCLUSION

- Providing safe and efficient patient care requires coordination and communication between clinical team members
- However team members...
  - Are rarely trained together
  - Come from separate disciplines (OB, NICU, Anesthesia)
  - Have diverse educational backgrounds (RN, MD, CNM, etc.)

# Value of Multidisciplinary EFM Strip Reviews

MULTIDISCIPLINARY  
PROCESS

CASE SELECTION

NICHD RECOMMENDATIONS

EFM CASE REVIEW

CONCLUSION

Multidisciplinary EFM strip reviews will:

- Lead to **greater accuracy** in the interpretation and description of fetal heart rate pattern data amongst obstetrical clinicians and nursing personnel
- **Reduce miscommunications** that have the potential to contribute to undesired outcomes

# Beta OB Scorecard Requires EFM Strip Reviews

## MULTIDISCIPLINARY PROCESS

CASE SELECTION

NICHD RECOMMENDATIONS

EFM CASE REVIEW

CONCLUSION

- Multidisciplinary fetal monitor strip review is conducted monthly at a minimum. Participants must include an OB physician, L&D unit nurses, and, if available, residents and CNMs (as applicable).
- All required participants must attend a minimum of 4 multidisciplinary EFM strip reviews per year
- OB Department Quality Improvement Program includes strip review criteria for example:
  - Tachysystole, late decelerations, not noted random selection and near misses
- Multidisciplinary fetal monitor strip review sessions include documentation of EFM strips selected for discussion based on meeting established criteria. This includes classification of Category I, II and III FHR tracings.

# QA Case Review vs. Case-Based Education

INTRODUCTION
MULTIDISCIPLINARY PROCESS
CASE SELECTION
NICHD RECOMMENDATIONS
EFM CASE REVIEW
CONCLUSION

- QA Case Review
  - Evaluate cases of adverse events
  - Focus is to ensure compliance with standard of care
  - Review of all cases that meet selection criteria
- Case-Based Education
  - Using cases as a teaching tool
  - Goal is to educate staff
  - Review of a few selected cases

***Important to define process/logistics and embed in regular routine***

# Two Basic Criteria for Selecting Cases

- Cases of adverse outcomes

OR

- Cases of abnormal EFM strips



# Cases of Adverse Outcomes from QA Process

- Maternal mortality
- Maternal CPR/resuscitation
- Excessive blood loss/transfusion/ Hct<22%/ Hgb<maternal 7gms
- Pregnancy induced hypertension
- ***Umbilical cord gas less than 7.0***
- Acute fatty liver disease
- Physician unattended delivery
- ***C/S for fetal status***
- C/S for failure to progress
- Shoulder dystocia
- ***Uterine rupture***
- ***Prolapsed cord***
- ***Category II and III***
- Positive toxicology screen
- Maternal cardiac issues
- ***Neonatal death, stillbirth, intrapartum stillbirth***
- Delivery at 32 weeks or less in a facility without a NICU
- ***Low Apgar score (5 @ 1 minute and 7 @ 5 minutes)***
- ***Term infant admitted to NICU from newborn nursery***
- ***Neonatal sepsis***
- ***Prolonged 2<sup>nd</sup> stage***

# Cases of Abnormal EFM strips

- Abnormal baseline
  - Tachycardia
  - Bradycardia
- Decelerations
  - Late
  - Prolonged
  - Variable
- Other
  - Sinusoidal
  - Decreased/absent variability

# The NICHD's Efforts to Improve EFM Interpretation

INTRODUCTION
MULTIDISCIPLINARY PROCESS
<b>NICHD RECOMMENDATIONS</b>
EFM CASE REVIEW
CONCLUSION

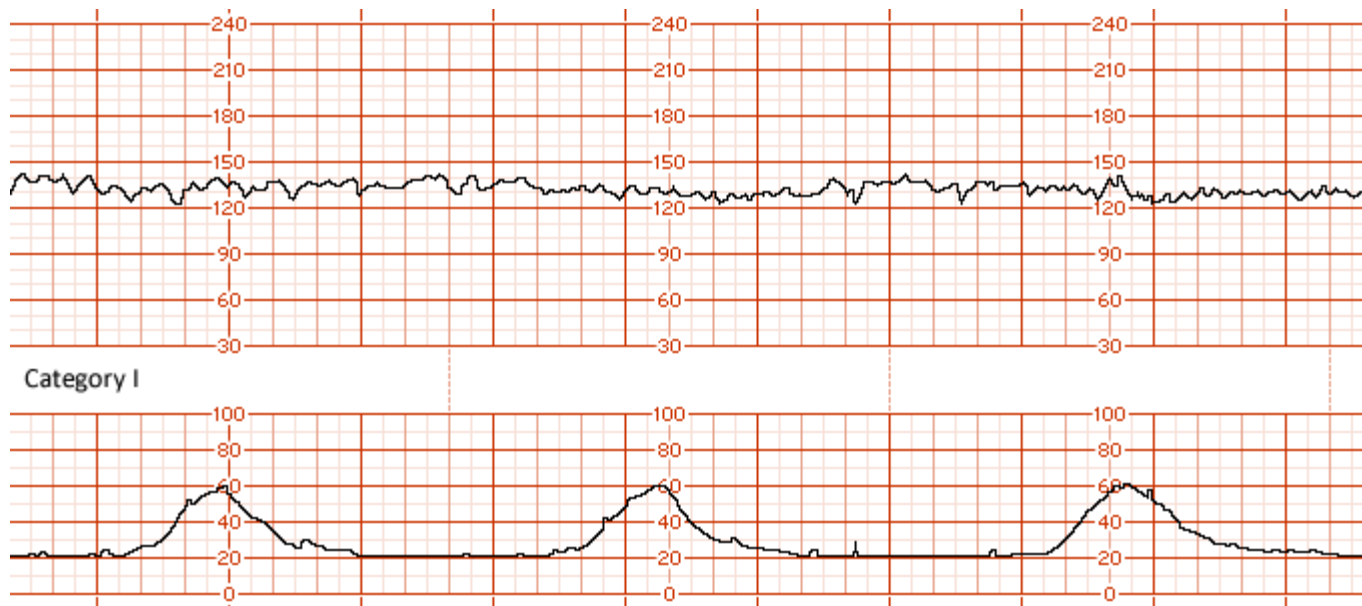
- The National Institute of Child Health and Human Development (NICHD) convened a series of workshops in the mid-1990s to develop standardized and unambiguous definitions for fetal heart rate (FHR) tracings
- This would allow for better assessment of EFM's value and for the development of more evidence based management of FHR tracings
- These initial recommendations subsequently were endorsed by ACOG and AWHONN

# 2008 NICHD FHR Interpretation System: Category I

- Category I FHR tracings include all of the following:
  - Baseline rate: 110-160 bpm
  - Baseline FHR variability: moderate
  - Late or variable decelerations: absent
  - Early decelerations: present or absent
  - Accelerations: present or absent

# Category I Tracing

INTRODUCTION  
MULTIDISCIPLINARY PROCESS  
NICHD  
RECOMMENDATIONS  
EFM CASE REVIEW  
CONCLUSION



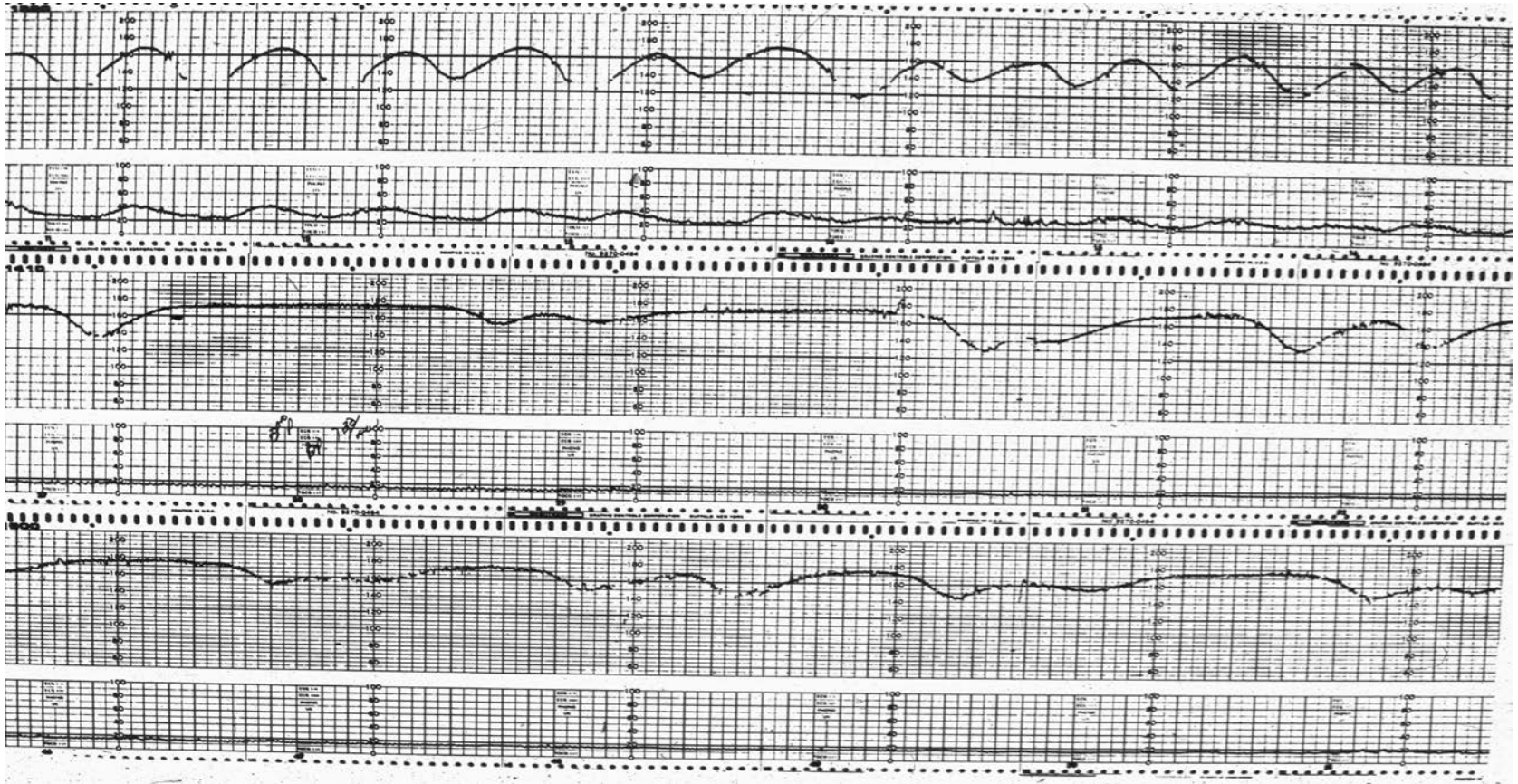
# 2008 NICHD FHR Interpretation System: Category III

INTRODUCTION
MULTIDISCIPLINARY PROCESS
NICHD RECOMMENDATIONS
EFM CASE REVIEW
CONCLUSION

- Category III FHR tracings include either:
  - Absent baseline FHR variability and any of the following:
    - Recurrent late decelerations
    - Recurrent variable decelerations
    - Bradycardia
  - Sinusoidal Pattern
    - Sine wave-like pattern with cycle frequency of 3-5/min persisting for  $\geq 20$  min

# Category III Tracing: Recurrent Late Decelerations

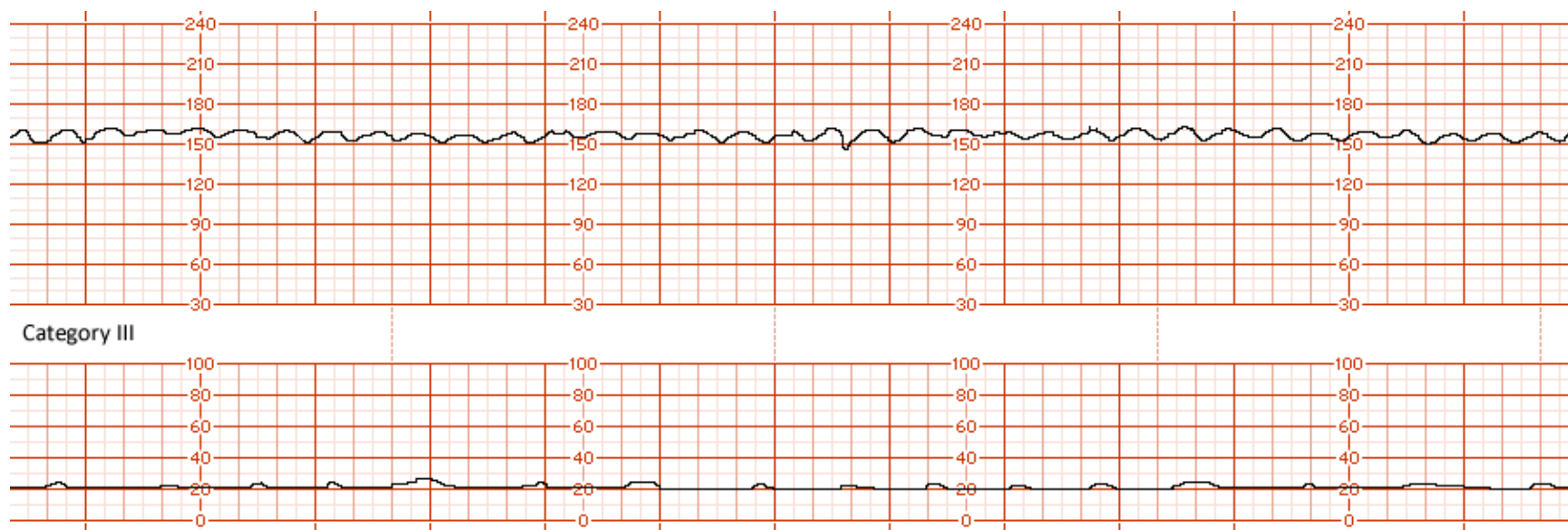
INTRODUCTION  
MULTIDISCIPLINARY PROCESS  
NICHD  
RECOMMENDATIONS  
EFM CASE REVIEW  
CONCLUSION





# Category III Tracing: Sinusoidal Pattern

INTRODUCTION  
MULTIDISCIPLINARY PROCESS  
NICHD  
RECOMMENDATIONS  
EFM CASE REVIEW  
CONCLUSION





# 2008 NICHD FHR Interpretation System: Category II

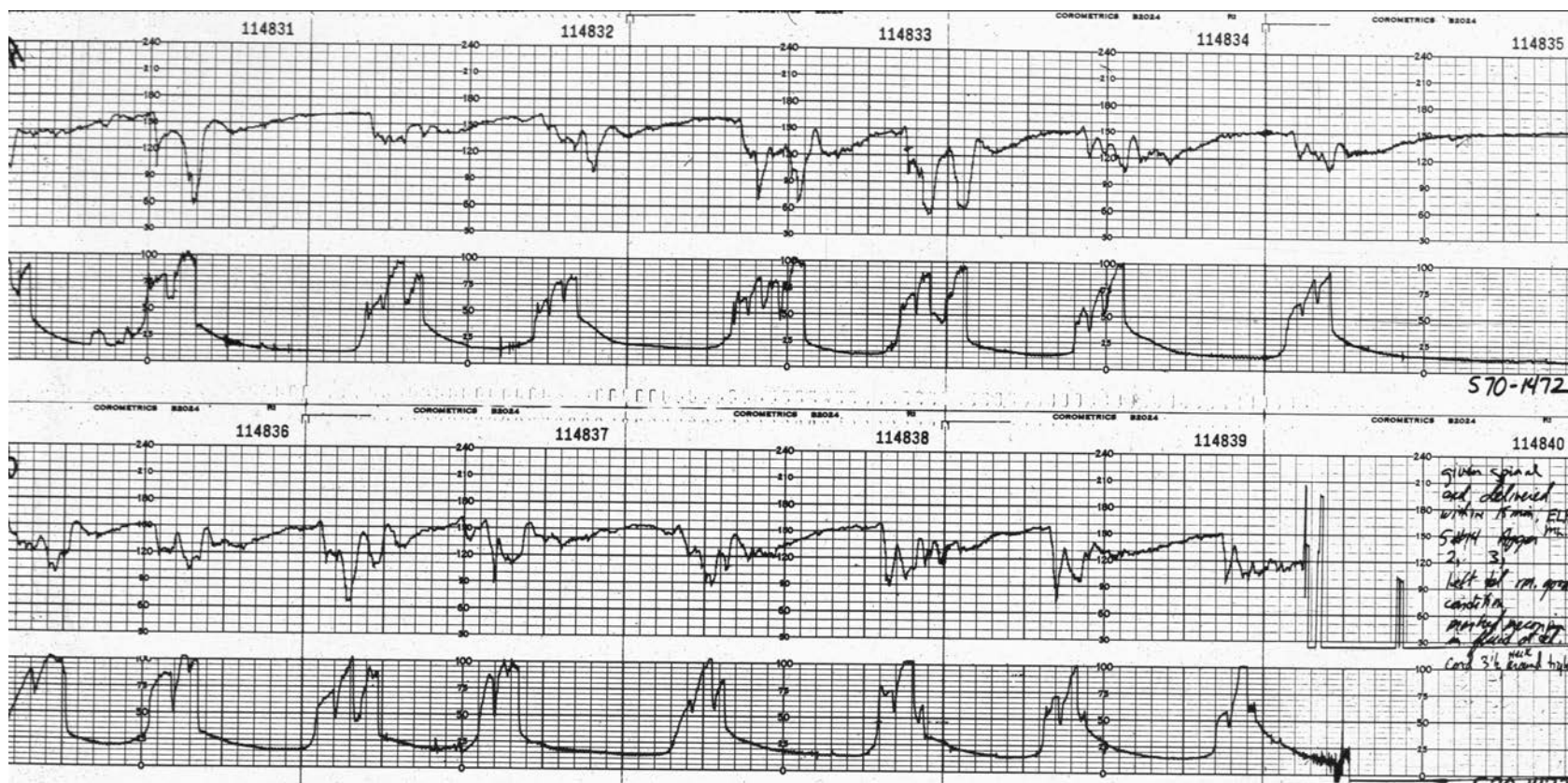
- Category II FHR tracings includes all FHR tracings not categorized as Category I or Category III. Category II tracings may represent an appreciable fraction of those encountered in clinical care.
- Examples of Category II FHR tracings include any of the following:
  - Baseline rate
    - Bradycardia not accompanied by absent baseline variability
    - Tachycardia
  - Baseline FHR variability
    - Minimal baseline variability
    - Absent baseline variability with no recurrent decelerations
    - Marked baseline variability
  - Accelerations
    - Absence of induced accelerations after fetal stimulation
  - Periodic or episodic decelerations
    - Recurrent variable decelerations accompanied by minimal or moderate baseline variability
    - Prolonged deceleration  $\geq 2$  but  $< 10$  minutes
    - Recurrent late decelerations with moderate baseline variability
    - Variable decelerations with other characteristics such as slow return to baseline, “overshoots,” or “shoulders”.

# Category II Tracing

INTRODUCTION  
MULTIDISCIPLINARY PROCESS

NICHD  
RECOMMENDATIONS

EFM CASE REVIEW  
CONCLUSION



# Management Recommendations

- Category I patterns: No intervention indicated
- Category III patterns demand successful correction or delivery
- Category II patterns
  - May continue to observe if moderate FHR variability and or accelerations spontaneous or induced
  - Unclear how to manage equivocal patterns with decreased variability and absence of accelerations

# Standardized Framework by Parer

**TABLE 5**  
Risk categories for fetal acidemia related to FHRV, baseline rate, and presence of recurrent decelerations

Variable	No	Early	Mild VD	Moderate VD	Severe VD	Mild LD	Moderate LD	Severe LD	Mild PD	Moderate PD	Severe PD
<b>Moderate (normal) variability</b>											
Tachycardia	B	B	B	Y	O	Y	Y	O	Y	Y	O
Normal	G	G	G	B	Y	B	Y	Y	Y	Y	O
Mild bradycardia	Y	Y	Y	Y	O	Y	Y	O	Y	Y	O
Moderate bradycardia	Y	Y			O		O	O			O
Severe bradycardia	O	O			O			O			O
<b>Minimal variability</b>											
Tachycardia	B	Y	Y	O	O	O	O	R	O	O	O
Normal	B	B	Y	O	O	O	O	R	O	O	R
Mild bradycardia	O	O	R	R	R	R	R	R	R	R	R
Moderate bradycardia	O	O			R		R	R			R
Severe bradycardia	R	R			R			R			R
<b>Absent variability</b>											
Tachycardia	R	R	R	R	R	R	R	R	R	R	R
Normal	O	R	R	R	R	R	R	R	R	R	R
Mild bradycardia	R	R	R	R	R	R	R	R	R	R	R
Moderate bradycardia	R	R			R		R	R			R
Severe bradycardia	R	R			R			R			R
Sinusoidal							R				
Marked variability							Y				

B, blue; G, green; LD, late decelerations; O, orange; PD, prolonged decelerations; R, red; VD, variable decelerations; Y, yellow.

- Patterns were color coded based on risk of acidemia and risk of evolution to a more serious pattern.

- Green: Category I
- Red: Category III
- Blue/Yellow/Orange: Sub-classification of Category II

Parer JT, Ikeda T. A framework for standardized management of intrapartum fetal heart rate patterns. AJOG 2007

# Key Factors in Evaluating Any Electronic FHR Strip

- From NICHD Consensus Report (2008):
  - FHR tracings always should be evaluated in context, considering the gestational age, prior results of fetal assessment, medications, maternal medical conditions, and fetal conditions (e.g., growth restriction, known congenital anomalies, fetal anemia, arrhythmia)
  - The individual components of defined FHR patterns do not occur independently and generally evolve over time

# Criteria for QA Case Review Format Helps Identify Contextual Factors

- Gravida/Para
- Prior cesarean section
- Prior uterine surgery if any
- EDD by ultrasound and/or dates
- Estimated gestational age (EGA)
- Chief complaint: (preterm labor, term labor, SROM, PROM, swelling, headache, intractable nausea, bleeding)
- Vital signs (temperature, blood pressure, pulse, respiration, pain)
- Prior medical history/prenatal history (GBS status)
- Current medications, allergies, IV fluids, labs and any prior labs
- Fetal and uterine status
  - Baseline fetal heart rate
  - Variability (absent, minimal, moderate, marked)
  - Presence or absence of accelerations/decelerations
  - Uterine activity
- Status of membranes and how determined
- Status of bleeding and if pertinent, EBL
- Physician notification and time
- Narcotic/anesthesia administration
- Length of second stage

# 2008 NICHD Requirements for Description of an EFM Tracing

- A qualitative and quantitative description of:
  - Uterine contractions
  - Baseline fetal heart rate
  - Baseline FHR variability
  - Presence of accelerations
  - Periodic or episodic decelerations
  - ***Changes or trends of FHR patterns over time***

# EFM Case Review

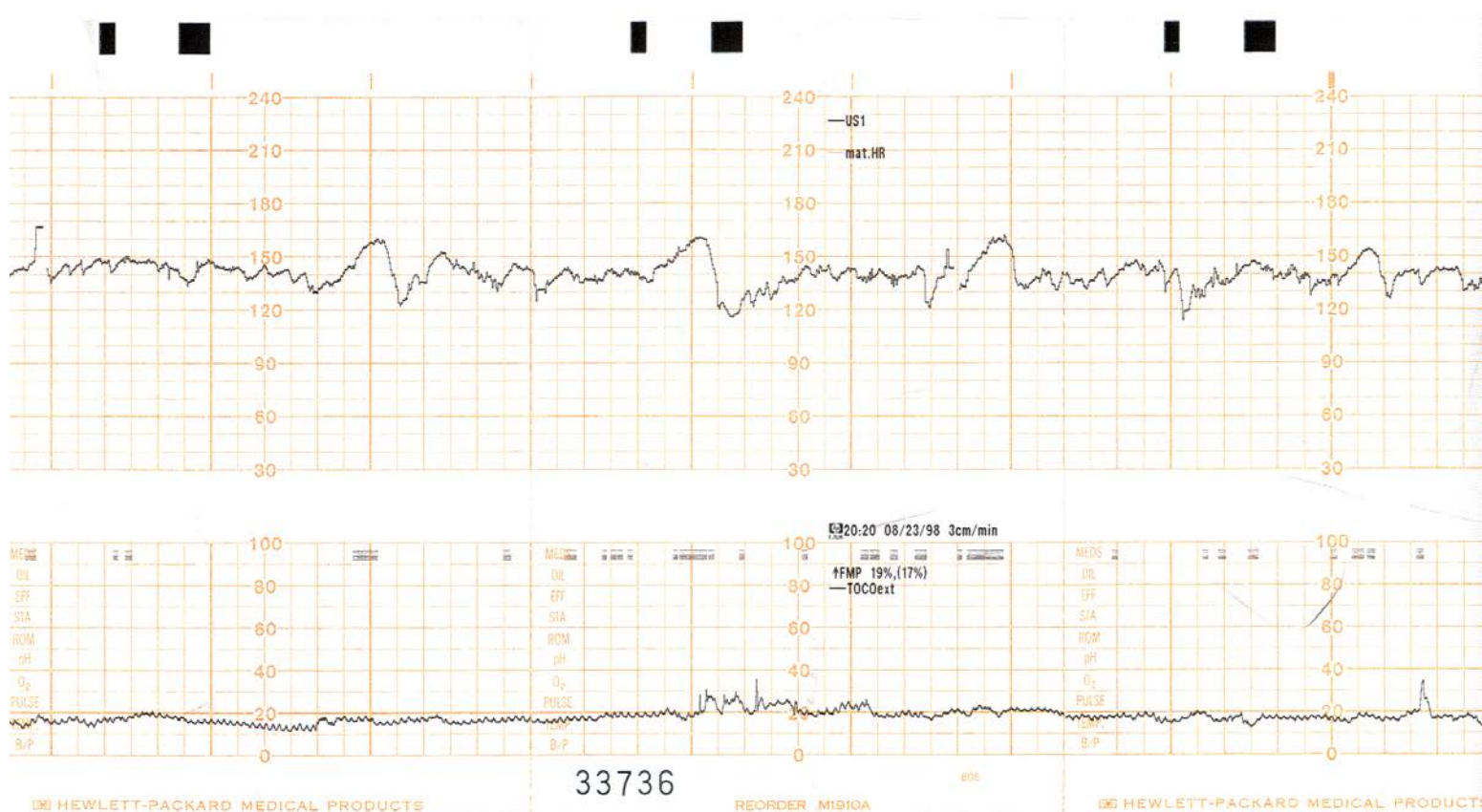
INTRODUCTION
MULTIDISCIPLINARY PROCESS
CASE SELECTION
NICHD RECOMMENDATIONS
<b>EFM CASE REVIEW</b>
CONCLUSION

- 22-year-old G2 P0 at 36 wks EGA presents to the hospital with complaint of decreased fetal movement



# EFM Tracing in Triage

INTRODUCTION  
MULTIDISCIPLINARY PROCESS  
CASE SELECTION  
NICHD RECOMMENDATIONS  
EFM CASE REVIEW  
CONCLUSION



# Questions

- How do you interpret the tracing?
- What types of questions do you want to ask?
- What are your options?
- What would you propose to do?
- Who do you need to communicate with?

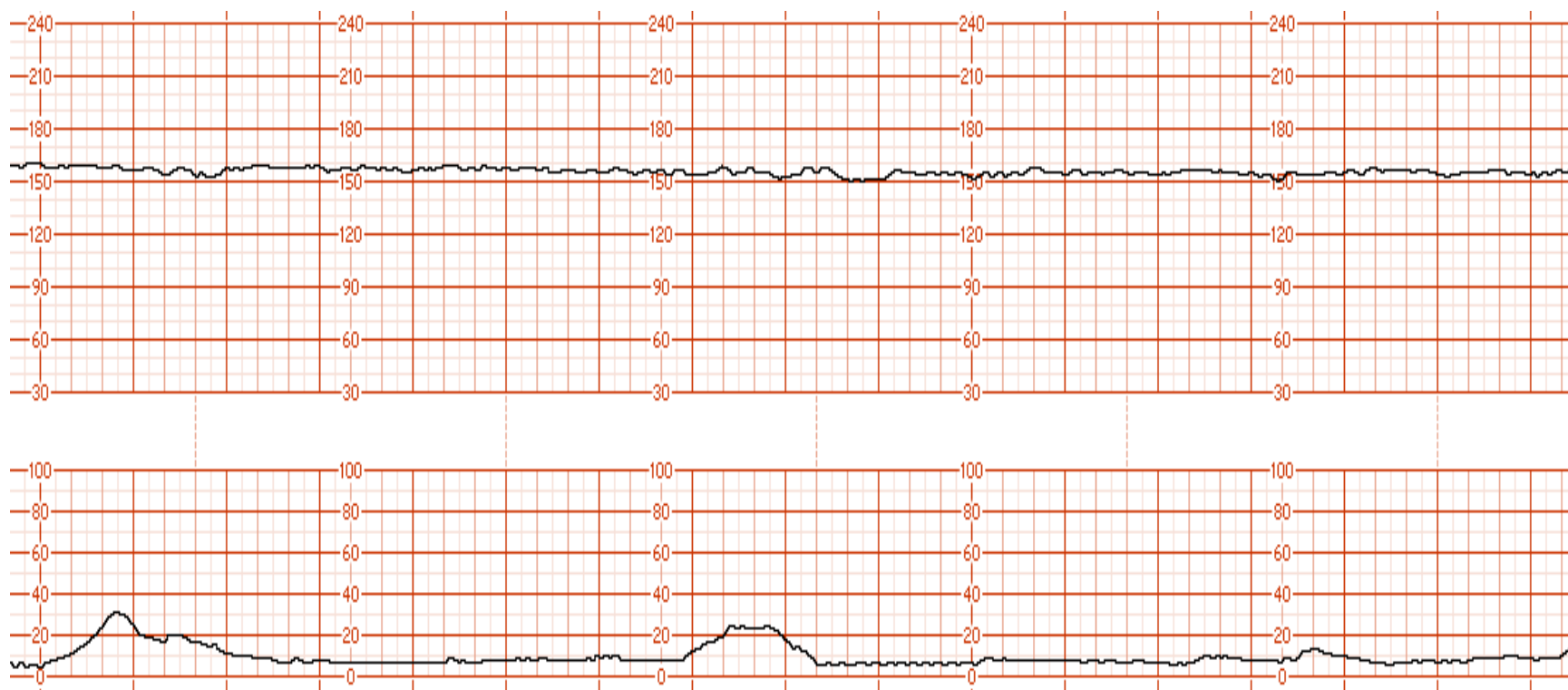
# One week later...

INTRODUCTION
MULTIDISCIPLINARY PROCESS
CASE SELECTION
NICHD RECOMMENDATIONS
<b>EFM CASE REVIEW</b>
CONCLUSION

- The patient presents with no fetal movement for over 8 hours

# Initial EFM Tracing

INTRODUCTION  
MULTIDISCIPLINARY PROCESS  
CASE SELECTION  
NICHD RECOMMENDATIONS  
**EFM CASE REVIEW**  
CONCLUSION

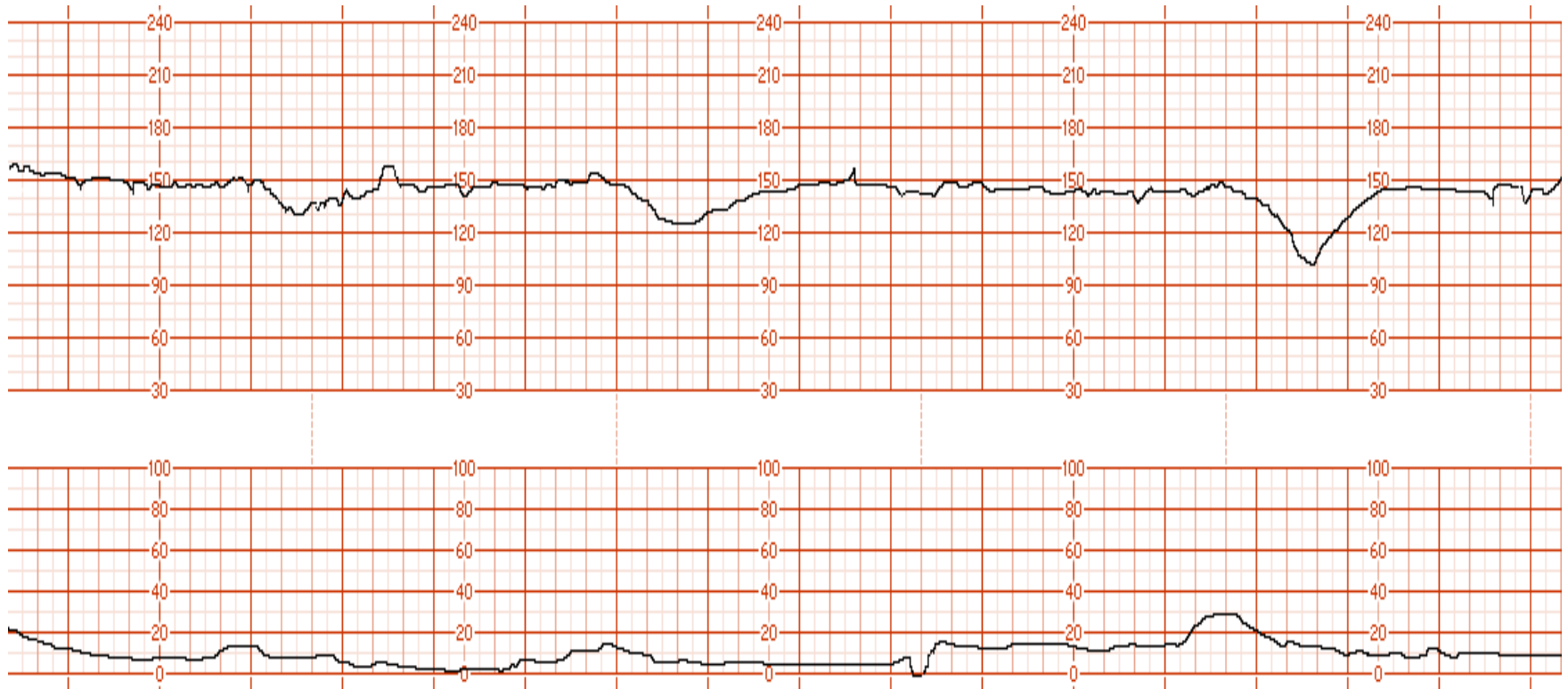


# Questions

- How do you interpret the tracing?
- What types of questions do you want to ask?
- What are your options?
- What would you propose to do?
- Who do you need to communicate with?

# Case (cont)

INTRODUCTION  
MULTIDISCIPLINARY PROCESS  
CASE SELECTION  
NICHD RECOMMENDATIONS  
**EFM CASE REVIEW**  
CONCLUSION

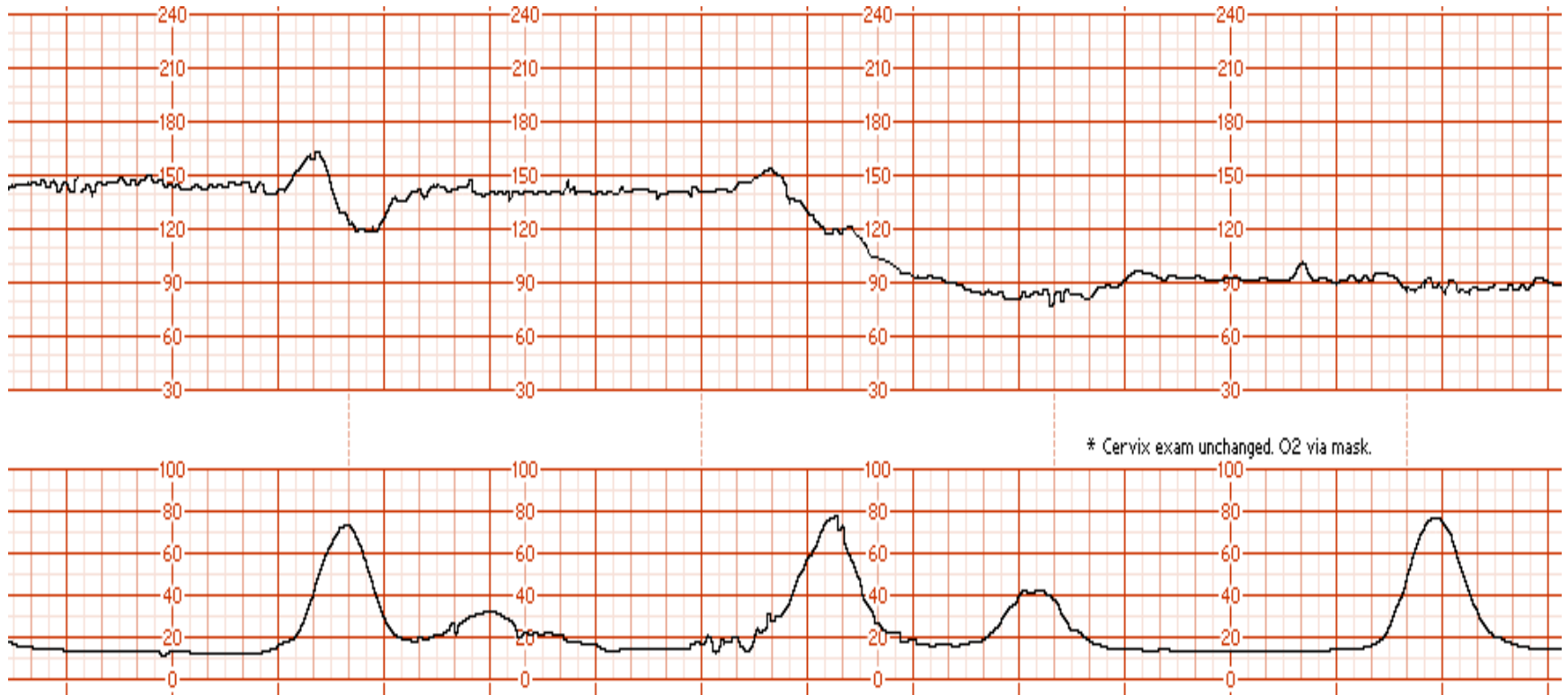


# Questions

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# Case (cont)

INTRODUCTION  
MULTIDISCIPLINARY PROCESS  
CASE SELECTION  
NICHD RECOMMENDATIONS  
EFM CASE REVIEW  
CONCLUSION



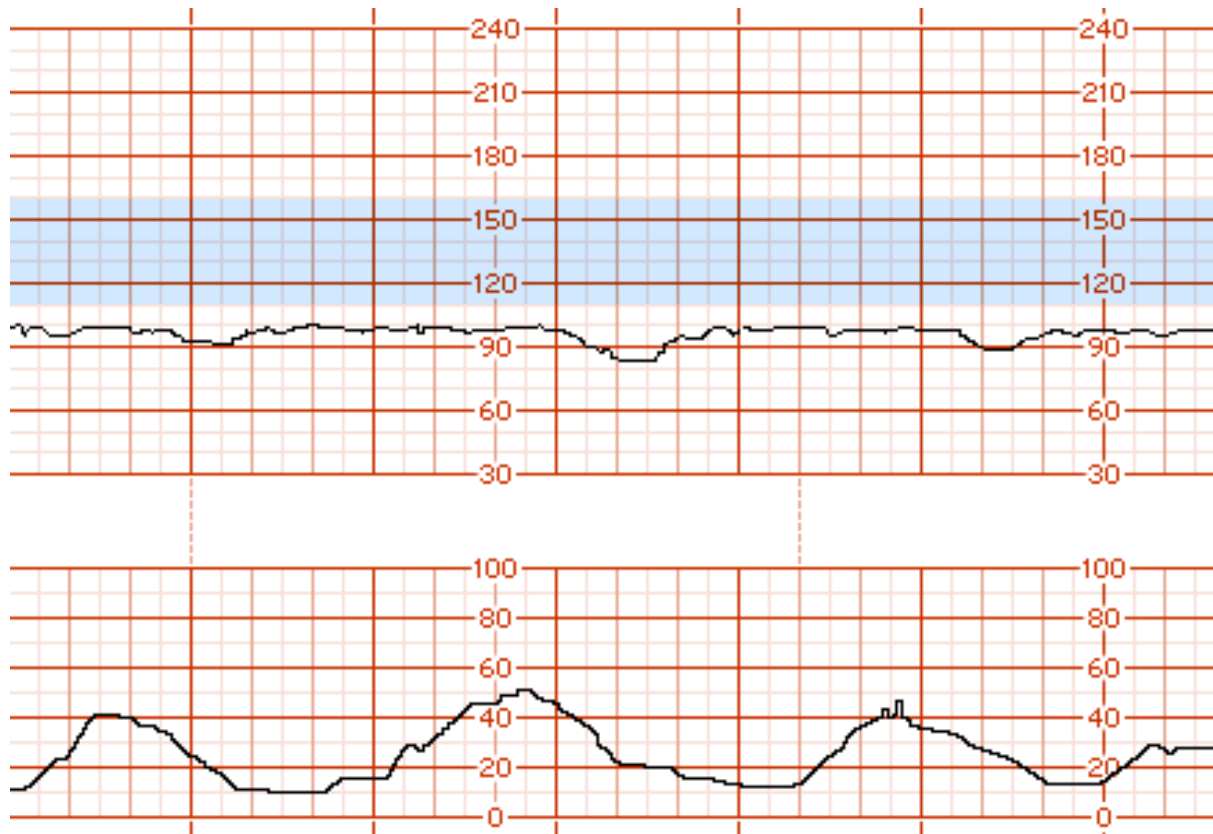


# Questions

- How do you interpret the tracing?
- What types of questions do you want to ask?
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# Case (cont)

INTRODUCTION  
MULTIDISCIPLINARY PROCESS  
CASE SELECTION  
NICHD RECOMMENDATIONS  
EFM CASE REVIEW  
CONCLUSION



# Questions

- How do you interpret the tracing?
- What types of questions do you want to ask?
- What are your options?
- What would you propose to do?
- Who do you need to communicate with?

# Outcome

- Cesarean delivery of baby boy
  - Apgars 5 and 7 at 1 and 5 min respectively
  - pH 6.93 with base excess -19
  - Clinical evidence of maternal abruption
  - Positive Kleihaur-Betke for fetal blood in maternal circulation
  - Baby subsequently diagnosed with cerebral palsy

# Example of Best Practice from Beta Community

INTRODUCTION  
MULTIDISCIPLINARY PROCESS  
CASE SELECTION  
NICHD RECOMMENDATIONS  
**EFM CASE REVIEW**  
CONCLUSION

# EFM Negligence

- Absent or Inadequate Electronic Fetal Monitoring (EFM)
- Incorrect interpretation of EFM
- Delayed timing for consultation with attending

# Strategies for Addressing Areas of Medico-Legal Liability with EFM

## 4 SUGGESTIONS

1. **STANDARDIZE DEFINITIONS**
2. **DEVELOP COMMUNICATION TRIGGERS**
3. **UTILIZE MANAGEMENT PROTOCOLS/GUIDELINES**
4. **REGULAR PRACTICE AND EDUCATION**

- Common Areas of EFM Liability
  - Delay to delivery
  - Decreased fetal movement
  - Oxytocin induced tachysystole with FHR changes
  - Vaginal Bleeding – Abruptio
  - Vaginal Bleeding Vasa-Previa
  - Non-reactive pattern on admission
  - Poor quality recording
  - VBAC
  - Maternal heart rate recording
  - Twins
  - CP without ACOG-AAP criteria for causation
  - Fetal Inflammatory response syndrome
  - Neonatal persistent fetal circulation with meconium aspiration
  - Pre-existing CNS abnormality