INTRAPARTUM FETAL HEART RATE MONITORING
Definition, Interpretation and Management

From confusion to consensus in 40 short years

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for Presenters at Educational Programs

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Mosby’s Pocket Guide Series
Distributed by Mosby-Elsevier
Objectives

At the end of this interactive program, participants will be able to:

1. Discuss the evolution of standardized FHR definitions in the United States
2. Describe 3 essential elements of standardized FHR interpretation
3. Describe a systematic approach to standardized intrapartum fetal heart rate management that is evidence-based, reflects consensus in the literature and is practical and teachable
Intrapartum FHR monitoring is the single most common obstetric procedure in the US, impacting the lives of almost 8 million mothers and babies every year

However, for 4 decades, a lack of standardized training and competency testing in intrapartum FHR monitoring has led to:

Ill-defined, confusing terms

Unsubstantiated theories

Myths, urban legends and folklore passed down from resident to resident and generation to generation

A communication crisis that sometimes jeopardizes the safety of our patients and often jeopardizes the credibility of our profession

How did we get here?
Intrapartum FHR monitoring was introduced with limited prospective evidence of efficacy and no consensus regarding standard definitions, interpretation or management...

It did not come with an instruction manual

Often, the result was a free-for-all of competing, conflicting theories and opinions

However, since 1997 there have been several important consensus reports that have reshaped the fetal monitoring landscape:

- 1997 – First NICHD Consensus Statement
- 1999 – International Cerebral Palsy Task Force Consensus Statement
- 2003 – ACOG-AAP Cerebral Palsy Task Force Consensus Statement
- 2005 – ACOG/AWHONN endorsement
- 2006 – ACNM endorsement
- 2008 – Second NICHD consensus report
- 2009 – ACOG Practice Bulletin 106
So where do we go from here?

How about a brief review of the basics

Starting with the simple exercise of deconstruction fetal heart rate monitoring into its essential components
FHR monitoring consists of three components:

Intrapartum FHR Monitoring

Definition  Interpretation  Management

Or in common terms...

Definition – *What do I call it?*

Interpretation – *What does it mean?*

Management – *What do I do about it?*
Definition

Along with uterine contractions, there are five essential components of a FHR tracing:

- Baseline rate
- Variability
- Accelerations
- Decelerations
- Changes or trends over time

Are we on the same page with standardized definitions?

Do we have a shared mental model?
I use the standardized fetal heart rate definitions proposed by the NICHD and endorsed by ACOG, AWHONN and ACNM

1. Yes
2. No

Variability is defined by the 1997 and 2008 NICHD Consensus statements as

1. Beat-to-beat fetal heart rate oscillations around the baseline
2. Episodic peaks and troughs in the baseline
3. Random variations in rate between beats
4. Fluctuations in the baseline that are irregular in amplitude and frequency
Moderate FHR variability is defined as a range of:

1. 6-15 bpm
2. 5-25 bpm
3. >10 bpm
4. 6-25 bpm

Knowing basic definitions is essential

If two care providers do not agree on basic, published, standard definitions, there are only 3 possibilities

One care provider is wrong
The other care provider is wrong
Both care providers are wrong

This situation always jeopardizes the credibility of the entire health care team
Interpretation

In the next few minutes, 40 years of research in intrapartum FHR interpretation will be distilled into 3 central concepts that are evidence based, reflect consensus in the literature and most importantly are practical and teachable.
Intrapartum FHR monitoring interpretation is intended to assess fetal oxygenation during labor.

Fetal oxygenation involves the transfer of oxygen from the environment to the fetus...
And the subsequent fetal physiologic response if oxygen transfer is interrupted…

What does the fetal heart rate tracing reveal about this pathway?
Where along this pathway can injury occur?

Potential Injury

Environment
- Lungs
- Heart
- Vasculature
- Uterus
- Placenta
- Cord

Oxygen transfer

Fetus
- Hypoxemia
- Hypoxia
- Metabolic acidosis
- Metabolic acidemia

Fetal response

Potential Injury

Is there a point that must be reached before oxygen deprivation can cause injury?

Where is the injury threshold?
In 1999, the International Cerebral Palsy Task Force published a consensus statement defining the relationship between intrapartum events and neurologic injury.


Supporters included:

American College of Obstetricians and Gynecologists
American Gynecological and Obstetrical Society
Australian College of Midwives
Hong Kong Society of Neonatal Medicine
Institute of Obstetrics and Gynaecology of the Royal College of Physicians of Ireland
International Society of Perinatal Obstetricians
New Zealand College of Midwives
Paediatric Society of New Zealand
Perinatal Society of Australia and New Zealand
Royal Australasian College of Physicians, Paediatric Division
Royal Australian College of General Practitioners
Royal Australian College of Obstetricians and Gynaecologists
Royal College of Obstetricians and Gynaecologists
Royal College of Pathologists of Australasia
Royal New Zealand College of Obstetricians and Gynaecologists
Society of Obstetricians and Gynaecologists of Canada
In 2003, ACOG and the American Academy of Pediatrics (AAP) jointly published a monograph summarizing the medical literature regarding the relationship between neonatal encephalopathy and cerebral palsy.

The publication was endorsed by:

American College of Obstetricians and Gynecologists
American Academy of Pediatrics
Centers for Disease Control and Prevention
Child Neurology Society
March of Dimes Birth Defects Foundation
National Institute of Child Health and Human Development
Royal Australian and New Zealand College of Obstetricians and Gynecologists
Society for Maternal-Fetal Medicine
Society of Obstetricians and Gynaecologists of Canada
Consensus...

*Acute intrapartum interruption of fetal oxygenation does not result in neurologic injury unless it progresses to the stage of:*

1. Hypoxemia
2. Hypoxia
3. Metabolic acidosis
4. Metabolic acidemia

STANDARDIZED FHR INTERPRETATION

CONSENSUS

*Intrapartum interruption of fetal oxygenation does not result in neurologic injury (cerebral palsy) unless it progresses to the stage of significant metabolic acidemia (umbilical artery pH < 7.0 and base deficit ≥ 12 mmol/L)*
Acute interruption of oxygen transfer does not cause injury unless the fetal response progresses to the stage of metabolic acidemia.

What information does the FHR tracing provide regarding oxygen transfer?

Potential Injury
Although the underlying *physiologic mechanisms* differ slightly...

ALL clinically significant FHR decelerations (late, variable, prolonged) reflect interruption of oxygen transfer at one or more points along the oxygen pathway.

Labor and Delivery: 3:00 am

*It’s a LATE!!!*

*It’s a VARIABLE!!!*

*It’s a LATE!!!*

*It’s a VARIABLE!!!*
All FHR decelerations that have any potential clinical significance have the same common trigger...

Interruption of oxygen transfer from the environment to the fetus at one or more points along the oxygen pathway

There is nothing inherently “ominous” about a late deceleration and there is nothing inherently “benign” about a variable deceleration
Heart
Lungs
Vasculature
Uterus
Placenta
Cord

Environment

All clinically significant FHR decelerations (late, variable, prolonged) reflect interruption of the pathway of oxygen transfer from the environment to the fetus

Fetus

Hypoxia
Hypoxemia
Metabolic acidosis
Metabolic acidemia

Are there any FHR characteristics that reliably exclude metabolic acidemia?

Potential Injury

Acute interruption of oxygen transfer does not cause injury unless the fetal response progresses to the stage of metabolic acidemia

FHR accelerations reliably predict the absence of fetal metabolic acidemia at the time they are observed

ACOG Practice Bulletin 106 – July 2009
NICHD 2008 Consensus Statement Obstet Gynecol 2008;112:661-6
Clark SL Am J Obstet Gynecol 1982;144:706-8
Elimian A Obstet Gynecol 1997;89:373-6
Skupski DW Obstet Gynecol 2002;99:129-34
Moderate FHR variability reliably predicts the absence of metabolic acidemia at the time it is observed.

Environment

All clinically significant FHR decelerations (late, variable, prolonged) reflect interruption of the pathway of oxygen transfer from the environment to the fetus.

Fetus

Moderate variability and/or accelerations reliably predict the absence of metabolic acidemia at the time they are observed.

Acute interruption of oxygen transfer does not cause injury unless the fetal response progresses to the stage of metabolic acidemia.

Potential Injury
Distilling 40 years of research in FHR interpretation into three central concepts...

Environment
- Lungs
- Heart
- Vasculature
- Uterus
- Placenta
- Cord

Fetus
- Hypoxemia
- Hypoxia
- Metabolic acidosis

Metabolic acidemia

Potential injury

Intrapartum FHR Interpretation
Three Central Concepts

1. Variable, late or prolonged decelerations signal interruption of oxygen transfer at one or more points along this pathway

2. Moderate variability or accelerations reliably predict the absence of metabolic acidemia

3. Injury requires significant metabolic acidemia
A Standardized FHR Instruction Manual

**Definition (Nomenclature)**

Five FHR components

1. Baseline rate
2. Variability
3. Accelerations
4. Decelerations
5. Changes or trends over time

**Interpretation**

Ectoparum FHR Interpretation

Three Central Concepts

1. Variable, late or prolonged decelerations
   signal interruption of oxygen transfer

2. Moderate variability or accelerations
   exclude significant metabolic acidemia

3. Injury requires significant metabolic acidemia

The 2008 NICHD Workshop Report on Electronic Fetal Monitoring

An update

*Obstet Gynecol 2008;112:661-6*
Previous classification system

“Reassuring”

“Non-reassuring”

Reassuring: (adj)

“Restoring confidence and relieving anxiety”

New “Three-Tier” Fetal Heart Rate Classification System

Category I – “Normal”

Category II – “Indeterminate”

Category III – “Abnormal”

Obstet Gynecol 2008;112:661-6
New “Three-Tier” Fetal Heart Rate Classification System

Category I – “Normal”

“Predictive of normal fetal acid-base status at the time of observation”

Baseline rate: 110-160 bpm
Variability: Moderate
Accelerations: Present or absent
Decelerations: No late or variable decelerations (or prolonged)

Absence of decelerations = absence of interruption of oxygen pathway
Moderate variability +/- accelerations = absence of metabolic acidemia
Absence of metabolic acidemia = absence of on-going hypoxic injury

Obstet Gynecol 2008;112:661-6

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New “Three-Tier” Fetal Heart Rate Classification System

Category III – “Abnormal”

Absent variability PLUS:
  - Recurrent late decelerations
  - Recurrent variable decelerations
  - Bradycardia
  - Sinusoidal pattern

Decelerations = interruption of oxygen pathway
Absence of moderate variability and accelerations = cannot exclude metabolic acidemia
Cannot exclude metabolic acidemia = cannot exclude on-going hypoxic injury

Obstet Gynecol 2008;112:661-6
Category II?

Everything Else
New “Three-Tier” Fetal Heart Rate Classification System

Category II... Everything else

“Indeterminate”

CAUTION: The word “indeterminate” does not mean that you are not able to determine the condition of the fetus!

*Indeterminate* means that the tracing *cannot determine* the presence of metabolic acidemia

Obstet Gynecol 2008;112:661-6

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Standardized FHR definitions and interpretation

Practical application?
One end of the FHR spectrum

What do I call it?
- Baseline rate... 130 bpm
- Variability... moderate
- Accelerations... present
- Decelerations... absent
- Changes or trends over time... none

Category?
- Category I

What does it mean?
- “Happy baby”?
- “Baby’s fine”?
- “Looks good”?
- “Reassuring”?
What does it mean?

Environment
- Lungs
- Heart
- Vasculature
- Uterus
- Placenta
- Cord
- Fetus

Intrapartum FHR Interpretation
Three Central Concepts

1. Variable, late or prolonged decelerations
   signal interruption of oxygen transfer

2. Moderate variability or accelerations
   exclude significant metabolic acidemia

3. Injury requires significant metabolic acidemia

Potential injury

What do I do about it?

Standardized management coming up next
1. Definition
2. Interpretation
3. Management

What do I call it?
Baseline rate... 150 bpm
Variability... moderate
Accelerations... absent
Decelerations... present
Changes or trends... yes

Category?
Category II

What does it mean?
“Ominous”?
“Concerning”?
“Reassuring”?
“Non-reassuring”
“Not non-reassuring”

The middle of the FHR spectrum
What does it mean?

Environment
- Lungs
- Heart
- Vasculature
- Uterus
- Placenta
- Cord

Fetus
- Hypoxemia
- Hypoxia
- Metabolic acidosis

Metabolic acidemia

Potential injury

Intrapartum FHR Interpretation
Three Central Concepts

1. Variable, late or prolonged decelerations
   signal interruption of oxygen transfer

2. Moderate variability or accelerations
   exclude significant metabolic acidemia

3. Injury requires significant metabolic acidemia

What do I do about it?

Management coming up next
The far end of the FHR spectrum

What do I call it?
Baseline rate...165
Variability...absent
Accelerations...absent
Deceleration...present, recurrent
Changes or trends...yes

Category?
Category III

What does it mean?
“Anyone who isn’t confused…

…really doesn’t understand the situation.”

- Edward R. Murrow

**Environment**
- Intrapartum FHR Interpretation
  - Three Central Concepts
    1. Variable, late or prolonged decelerations
       signal interruption of oxygen transfer
    2. Moderate variability or accelerations
       exclude significant metabolic acidemia
    3. Injury requires significant metabolic acidemia

**Potential injury**
What do I do about it?

Management coming up

Standard Definitions
  We have achieved consensus in the
  United States on the definitions used to describe
  the five components of a FHR tracing

Standard interpretation
  Three central concepts of FHR interpretation are
evidence-based and reflect consensus in the
literature
A Standardized FHR Instruction Manual

**Definition**

*Five FHR components*

1. Baseline rate
2. Variability
3. Accelerations
4. Decelerations
5. Changes or trends over time

**Interpretation**

- **Environment**
  - Laba
  - Host
  - Vasa Placentae
  - Uterus
  - Placenta
  - Cord

- **Extrapartum FHR Interpretation**
  - **Three Central Concepts**
  - 1. Variable, late or prolonged decelerations signal interruption of oxygen transfer
  - 2. Moderate variability or accelerations exclude significant metabolic acidemia
  - 3. Injury requires significant metabolic acidemia

Standardized management is the next challenge
The objective of a “standardized management” protocol is to minimize the opportunities for preventable error.

One end of the FHR spectrum

What do I call it?
Baseline rate... 130 bpm
Variability... moderate
Accelerations... present
Decelerations... absent
Changes or trends over time... none

Category I
What does it mean?

Intrapartum FHR Interpretation
Three Central Concepts

1. Variable, late or prolonged decelerations
   signal interruption of oxygen transfer

2. Moderate variability or accelerations
   exclude significant metabolic acidemia

3. Injury requires significant metabolic acidemia

What do I do about it?
This intrapartum FHR tracing requires no specific action

1. True
2. False
Routine Intrapartum Surveillance

Review the tracing at least every 30 minutes in the 1st stage of labor and every 15 minutes in the 2nd stage.
1. Definition
2. Interpretation
3. Management

What do I call it?
- Baseline rate...150 bpm
- Variability...moderate
- Accelerations...absent
- Decelerations...present
- Changes or trends...yes

Category II

What does it mean?

Environment
- Lungs
- Heart
- Vasculature
- Uterus
- Placenta
- Cord
- Fetus
- Hypoxemia
- Hypoxia
- Metabolic acidosis
- Metabolic acidemia

Intrapartum FHR Interpretation
Three Central Concepts

1. Variable, late or prolonged decelerations
   signal interruption of oxygen transfer

2. Moderate variability or accelerations
   exclude significant metabolic acidemia

3. Injury requires significant metabolic acidemia
Intrapartum fetal heart rate management decision model

Confirm that the monitor is recording the FHR and uterine activity accurately

FHR Category?

II or III

Is the patient low-risk?

Yes

No

“ABCD”

ROUTINE INTRAPARTUM SURVEILLANCE
Every 30 minutes in the 1st stage of labor
Every 15 minutes in the 2nd stage of labor

HEIGHTENED INTRAPARTUM SURVEILLANCE
Every 15 minutes in the 1st stage of labor
Every 5 minutes in the 2nd stage of labor

What do I do about it?

Is the patient low-risk?

No
Standardized Intrapartum FHR Management

Four Central Concepts

“ABCD”

A – Assess the oxygen pathway
B – Begin corrective measures

Intrapartum fetal heart rate management decision model

1. Confirm that the monitor is recording the FHR and uterine activity accurately
2. FHR Category?
   - II or III
3. Is the patient low-risk?
   - Yes
   - No
4. ROUTINE INTRAPARTUM SURVEILLANCE
   - Every 30 minutes in the 1st stage of labor
   - Every 15 minutes in the 2nd stage of labor
5. HEIGHTENED INTRAPARTUM SURVEILLANCE
   - Every 15 minutes in the 1st stage of labor
   - Every 5 minutes in the 2nd stage of labor

“ABCD”

“A” – Assess oxygen pathway
“B” – Begin corrective measures
### Intrapartum Fetal Heart Rate Management Decision Model

#### Confirm that the monitor is recording the FHR and uterine activity accurately

- **FHR Category?**
  - I
  - II or III

#### Is the patient low-risk?
- Yes
- No

**Routine Intrapartum Surveillance**
- Every 30 minutes in the 1st stage of labor
- Every 15 minutes in the 2nd stage of labor

**Heightened Intrapartum Surveillance**
- Every 15 minutes in the 1st stage of labor
- Every 5 minutes in the 2nd stage of labor

**Offer Operative Delivery**
- Counsel regarding operative delivery
- Proceed with informed consent

### ABCD

- “A” – Assess oxygen pathway
- “B” – Begin corrective measures

#### “A” Assess Oxygen Pathway
- Lungs: Airway and breathing, Pulse oximetry or ABG
- Heart: Heart rate and rhythm, Cardiac output
- Vasculature: Blood pressure, Volume status
- Uterus: Contraction strength, Contraction frequency, Baseline uterine tone, Exclude uterine rupture
- Placenta: Placental separation, Bleeding, vasa previa
- Cord: Vaginal exam, Exclude cord prolapse

#### “B” Begin Corrective Measures if Indicated
- Supplemental oxygen
- Position change, Fluid bolus, Correct hypotension
- Stop or reduce stimulant, Consider uterine relaxant

### FHR Category?
- I
- II or III

### ROUTINE INTRAPARTUM SURVEILLANCE

- Every 30 minutes in the 1st stage of labor
- Every 15 minutes in the 2nd stage of labor

### HEIGHTENED INTRAPARTUM SURVEILLANCE

- Every 15 minutes in the 1st stage of labor
- Every 5 minutes in the 2nd stage of labor

### OFFER OPERATIVE DELIVERY

- Counsel regarding operative delivery
- Proceed with informed consent
Clear obstacles to rapid delivery

If conservative measures do not correct FHR decelerations and improve variability, it is prudent to plan ahead for the possible need for rapid delivery.

This does NOT commit the patient to operative delivery.

There are many common sources of unnecessary delay.

Addressing them in a systematic fashion reduces the likelihood that important factors will be overlooked.

It also demonstrates reasonableness and prudence... two elements that define the standard of care.
Consider individual characteristics of Facility Staff Mother Fetus Labor

<table>
<thead>
<tr>
<th><strong>A</strong></th>
<th><strong>B</strong></th>
<th><strong>C</strong></th>
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<td>Vaginal exam Exclude cord prolapse</td>
<td>Consider amnioinfusion</td>
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Intrapartum fetal heart rate management decision model

**“A”** Assess oxygen pathway
**“B”** Begin corrective measures
**“C”** Clear obstacles to rapid delivery
**“D”** Determine decision to delivery time

**FHR Category?**
- I
- II or III
- III

**Is the patient low-risk?**
- Yes
- No

**Routine Intrapartum Surveillance**
- Every 30 minutes in the 1st stage of labor
- Every 15 minutes in the 2nd stage of labor

**Heightened Intrapartum Surveillance**
- Every 15 minutes in the 1st stage of labor
- Every 5 minutes in the 2nd stage of labor

**Offer Operative Delivery**
- Counsel regarding operative delivery
- Proceed with informed consent

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<td>Heart</td>
<td>Heart rate and rhythm, Cardiac output</td>
<td>IV fluid bolus</td>
<td>Staff: Notify Obstetrician, Surgical assistant, Anesthesiologist, Neonatologist, Pediatrician, Nursing staff</td>
</tr>
<tr>
<td>Vasculature</td>
<td>Blood pressure, Volume status</td>
<td>Maternal position changes, Correct hypotension</td>
<td>Mother: Informed consent, Anesthesia options, Laboratory tests, Blood products, Intravenous access, Urinary catheter, Abdominal prep, Transfer to OR</td>
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<td>Uterus</td>
<td>Contraction strength, Contraction frequency, Baseline uterine tone, Exclude uterine rupture</td>
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<td>Placenta</td>
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<td>Consider factors such as: Estimated fetal weight, Gestational age, Presentation, Position, Infection, Meconium</td>
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<td>Consider factors such as: Arrest disorder, Protracted labor, Remote from delivery, Poor expulsive efforts</td>
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- Confirm that the monitor is recording the FHR and uterine activity accurately
- “ABCD”
Now what?

- √ Assess oxygen pathway
- √ Begin corrective measures
- √ Clear for delivery
- √ Determine decision to delivery time

Intrapartum fetal heart rate management decision model

- Confirm that the monitor is recording the FHR and uterine activity accurately
- FHR Category? II or III
- Is the patient low-risk?
  - Yes
  - No

- “A” – Assess oxygen pathway
- “B” – Begin corrective measures

- FHR Category?
  - I
  - II or III
  - III

- “C” – Clear obstacles to rapid delivery
- “D” – Determine decision to delivery time

Is vaginal delivery likely before the FHR tracing loses the ability to exclude metabolic acidemia? (loses moderate variability and accelerations)

- ROUTINE INTRAPARTUM SURVEILLANCE
  - Every 30 minutes in the 1st stage of labor
  - Every 15 minutes in the 2nd stage of labor

- HEIGHTENED INTRAPARTUM SURVEILLANCE
  - Every 15 minutes in the 1st stage of labor
  - Every 5 minutes in the 2nd stage of labor

- OFFER OPERATIVE DELIVERY
  - Counsel regarding operative delivery
  - Proceed with informed consent
Is vaginal delivery likely to occur before the FHR tracing loses the ability to exclude metabolic acidemia?

This is ALWAYS a prediction of unknown future events.

It ALWAYS involves multiple interacting factors.

It ALWAYS relies on clinical judgment.

There will NEVER be a “cookbook” answer.

If you’re looking for the art of medicine… here it is.
USE INDIVIDUAL CLINICAL JUDGMENT TO ESTIMATE:

Time to vaginal delivery

Consider cervical dilatation, effacement, station, adequacy of uterine activity, past rate of progress and expected rate of progress in the future.

USE INDIVIDUAL CLINICAL JUDGMENT TO ESTIMATE:

Time to onset of metabolic acidemia

How in the world do you do that?
In a study of 121 term fetuses with an initially normal FHR tracing and normal scalp blood pH, but who subsequently developed an abnormal tracing based on a scoring system, Fleischer reported that the fetuses remained non-acidemic (scalp blood pH > 7.25), for at least 90 minutes of the abnormal pattern.

Low and colleagues showed that there was an approximately 60-minute window from the start of FHR patterns containing minimal baseline variability and late or prolonged decelerations, which preceded fetal “asphyxial decompensation” and newborn morbidity.


In a study of 488 term fetuses, Williams and colleagues reported that minimal/absent variability for at least 60 minutes was associated with a pH < 7.0 in 12%-31% of cases

Intrapartum fetal heart rate management decision model

**Confirm that the monitor is recording the FHR and uterine activity accurately**

- **FHR Category?**
  - **II or III**
  - **I**

**Is the patient low-risk?**

- **No**

  - **“ABCD”**
  - “A” – Assess oxygen pathway
  - “B” – Begin corrective measures

  - **FHR Category?**
    - **I II III**
    - **“ABCD”**
      - “C” – Clear obstacles to rapid delivery
      - “D” – Determine decision to delivery time

- **Yes**

  - **Is vaginal delivery likely before the FHR tracing loses the ability to exclude metabolic acidemia? (loses moderate variability and accelerations)**
    - **No**
      - **ROUTINE INTRAPARTUM SURVEILLANCE**
        - Every 30 minutes in the 1st stage of labor
        - Every 15 minutes in the 2nd stage of labor
      - **HEIGHTENED INTRAPARTUM SURVEILLANCE**
        - Every 15 minutes in the 1st stage of labor
        - Every 5 minutes in the 2nd stage of labor
    - **Yes**
      - **OFFER OPERATIVE DELIVERY**
        - Counsel regarding operative delivery
        - Proceed with informed consent

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**Summary**

**Definitions:** Standard FHR definitions = standard of care

**Interpretation:** Simplicity is the key to effective teamwork

**Management:** The vast majority of intrapartum FHR management decisions are amenable to standardization

The most common preventable error is failure to make a plan

“Random recall” is NOT a plan

Algorithms and checklists increase the likelihood that an evidence-based plan will be formulated

Formulating an evidence-based plan demonstrates reasonableness and prudence – two elements that define the standard of care
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<td>Maternal position changes, correct hypotension</td>
<td>Mother</td>
</tr>
<tr>
<td>Uterus</td>
<td>Contraction strength, frequency, baseline uterine tone, exclude uterine rupture</td>
<td>Stop or reduce stimulant, consider uterine relaxant</td>
<td>Fetus</td>
</tr>
<tr>
<td>Placenta</td>
<td>Placental separation, bleeding, vasa previa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cord</td>
<td>Vaginal exam, exclude cord prolapse</td>
<td>Consider amnioinfusion</td>
<td>Labor</td>
</tr>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>