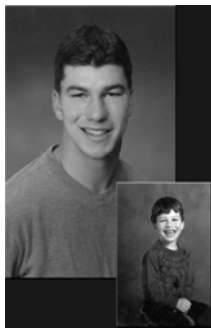


Commentary and Concerns from the Nursing Perspective

Michelle L. Murray, PhD, RNC-OB
© 2009 LRI, Inc.





Tools of the Physician



NICHD 2008
April 2008 2 day workshop to revisit
...**terminology** and **nomenclature**
for the description of fetal heart tracings
and uterine contractions **for**
use in clinical practice
and research.

NICHD 2008
Terms or Nomenclature are Concepts

- **Baseline**
- **Variability**
- **Accelerations**
- **Decelerations**

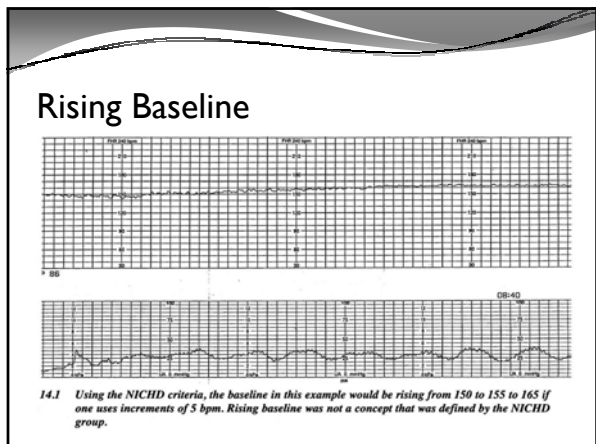
1st Concern
Nomenclature (Concept List) is Incomplete

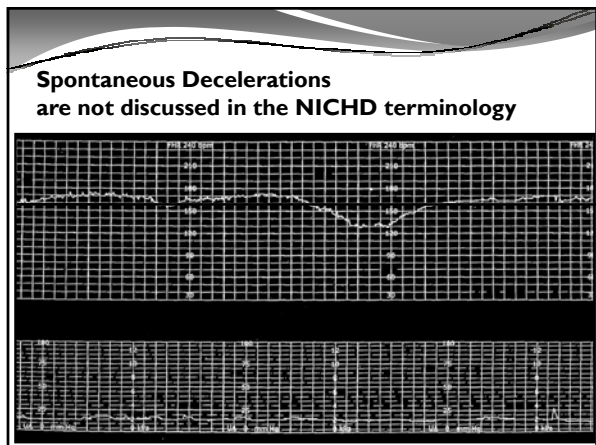
- **Baseline**
Silent, Rising, Falling, Wandering, Sinusoidal
- **Variability**
Short-term Variability, Long-term Variability
- **Accelerations**
Uniform and Spontaneous Accelerations
- **Decelerations**
Early, Variable, Late, Prolonged
Spontaneous Decelerations, Checkmark Pattern
- **Artifact, Arrhythmia, Maternal BL, MH Accels & Decels**

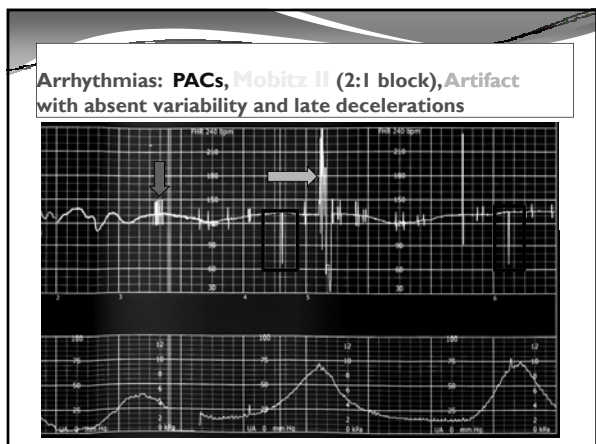
OB/GYN 13 yrs experience (2009)
Short-term Variability
Q: Short-term variability. When you're distinguishing between...minimal, moderate, and marked?
A: I don't know how you count the number of times you see variability on the strip...we're marking short-term variability off as *no longer considered important* in the latest ACOG guideline.

OB/GYN > 20 yrs of experience (3/09)
Q: And what is, like, long-term or short-term?
A: You know, short-term variability is what we are talking about, just like beat-to-beat variability.
Q: Okay. And what would be considered long-term?
A: We don't have that terminology.

RN with 9 years L & D experience
A: "You just look at variability, period.
There is no short-term, there is no long-term.
It's just is there variability."
Q: Is there significance given to decreased LTV?
A: I don't know how to answer that question,
since they've changed the parameters of how they judge it."
Concerns:
▪ Short-term variability is an important concept that some believe has now disappeared
▪ Provider confusion and knowledge deficits





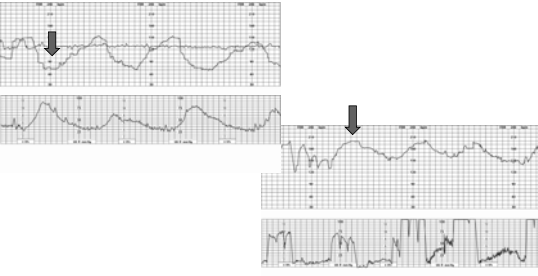


2nd Concern
The *definitions* apply to terms used for the *images* that make up the visualized pattern of the heart rate *printout*.

The heart rate pattern may be fetal or maternal.

Missing from the NICHD nomenclature: “definitions” of MHR patterns.

Maternal Heart Rate Patterns



3rd Concern:
Critical Attributes are Missing

To learn a concept:
Multiple common and uncommon examples of each image must be identified and the *critical attributes* must be determined based on careful analysis of images.

“Definitions” or Critical Attributes

- Bandwidth, amplitude
- Cycles, complexes, sine waves
- Onset, nadir, offset
- Onset, peak, offset
- Lag time (contraction peak-decel nadir)
- Onset timing in relation to contractions
- Size/duration: shoulders vs. overshoots
- Duration of mild-moderate-severe decels
- Typical vs. atypical variable decel features
- Shapes of accelerations, decelerations

3 “Definitions” Limit Identification

12.4 012751.123 012761.122 012771

acceleration using NICHD criteria

not an acceleration using NICHD criteria

not an acceleration using NICHD criteria

14.4 The NICHD criteria for an acceleration excludes some accelerations that also have meaning.

Early Deceleration

Onset to nadir greater than or equal to 30 seconds.
The nadir occurs at the same time as the peak of the contraction.

FHR 240 HR 47925 FHR 240 HR 47926

late deceleration using NICHD criteria

early deceleration using NICHD criteria

14.5 Late deceleration followed by early deceleration.

Image Misidentification if One Ignores Lag Time Research

14.8 The first deceleration would be classified as a late deceleration if you strictly apply the NICHD definitions since the onset to nadir is 30 seconds and the nadir occurs after the peak of the contraction. However, using the peak-to-nadir research findings, this would best be classified as an early deceleration. The second deceleration would best be classified as a late deceleration. It meets the NICHD criteria for 30 seconds to the nadir and also meets the traditional research finding of a peak-to-nadir lag time of more than 20 seconds.

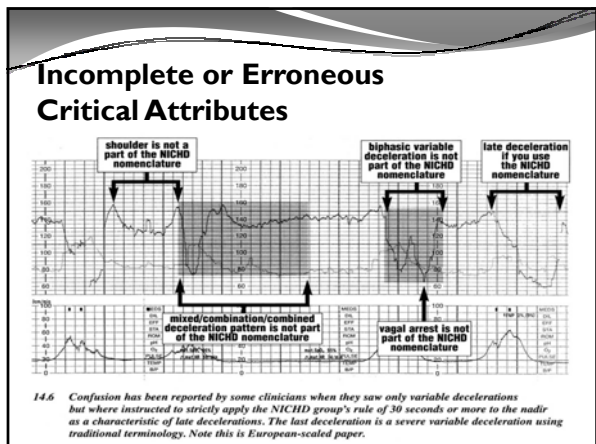
Prolonged Deceleration

Decrease from the baseline of greater than or equal to 15 bpm and greater or equal to 2 minutes but less than 10 minutes.

14.7 If you decide the baseline is 150 bpm, this will not be a prolonged deceleration if you accept the NICHD group's criteria of a drop of at least 15 bpm for 2 or more minutes to call the deceleration prolonged.

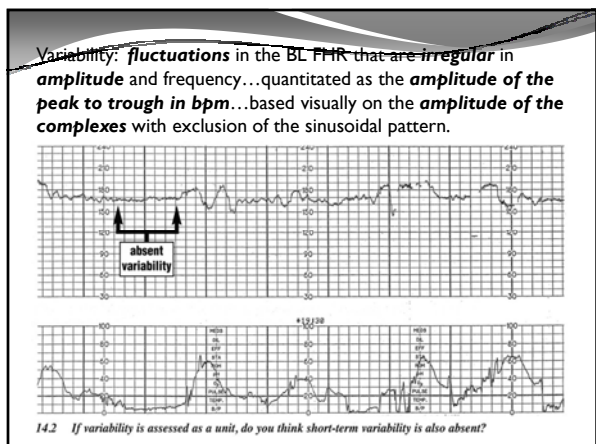
Smooth sine-wave like pattern in the baseline with a cycle frequency of 3 to 5 per minute that persists for 20 minutes or more.

14.3 This sinusoidal pattern was a pathologic pattern and occurred minutes before fetal decompensation to a terminal bradycardic level. The baby was born asphyxiated and has permanent brain damage. Note the tachycardic rate. Would you record "sinusoidal" or a baseline rate of 180 bpm? Recommendations for documentation of a sinusoidal pattern were not provided by the NICHD group.



4th Concern: Teaching for Image Recognition is Artificially Limited by Concept List, Lack of Definitions, and Missing Critical Attributes

- Name the concept (advance organizer)
 - Reference a larger category, e.g., variability is a **BASELINE** characteristic
 - Define distinctive (critical) attributes
- Identify relevant and irrelevant attributes (guided discovery)
- Give examples and nonexamples (elaboration)
- Use inductive and deductive reasoning (tie examples to experiences)



**5 Examples and Nonexamples:
LTV (Variability) v. STV**

Differences not described
cycles per minute, complexes or sine waves
vs.
beat-to-beat differences in milliseconds
creating fine bpm changes on the tracing

6 Concept Confusion

Defense *Expert* OB/GYN
Well, do you know what long-term variability is?
Yeah.
What is it?
Well, it's long--it's variability over, you know, a relatively short period of time, variation in the heartbeat over, you know, three-two or three minutes.
Is that your definition of long-term variability?
Yeah. I mean, I don't use it, I look at the variability.
...constant decelerations in response to pushing?
Yes, what's reassuring is there's variability during the decel. That's good.

Prominent Perinatologist (9/09)

Q: How do you define acceptable variability?
A: It's a visual assessment. It's not a numerical assessment. And so it's the – it's a bit like defining pornography. All right. It is – you can't define it, but you can tell it when you see it. And that expression fits very well for variability, because what we're extremely good at is identifying abnormal variability or absent variability.

7 Response to Images

To respond *appropriately* to the image, one must learn the meaning (physiology) of each image and the impact (risks and benefits) of actions on maternal and fetal physiology.

“Meaning” is derived from research findings.

Expert OB/GYN

Do you know what the potential significance is of sustained tachycardia in the presence of decreased beat-to-beat variability?

In and of itself, none.

Do you have any medical knowledge whatsoever of any potential cause of concern of sustained tachycardia in the presence of decreased beat-to-beat variability?

...In the absence of decelerations, I wouldn't expect that to be a concern.

8 Categories

Category II

“This category is NOT predictive of acid-base status.”

Actions: evaluation (nonspecific), continued surveillance (nonspecific, no timing recommendations), and reevaluation (nonspecific, no timing recommendations).

“Take into account the entire clinical circumstances.”

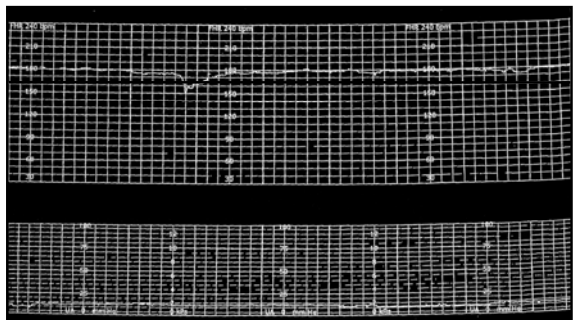
Category II is “Indeterminate”

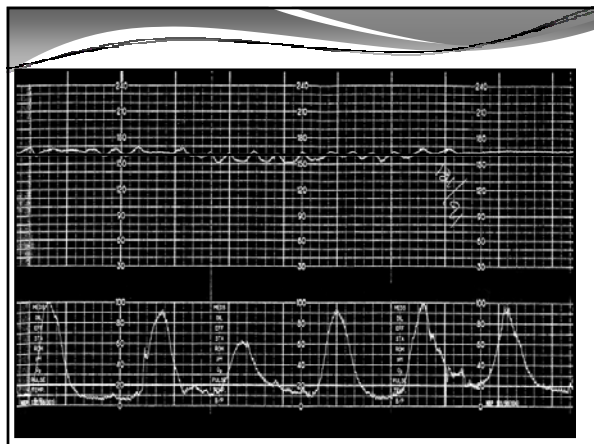
Tachycardia

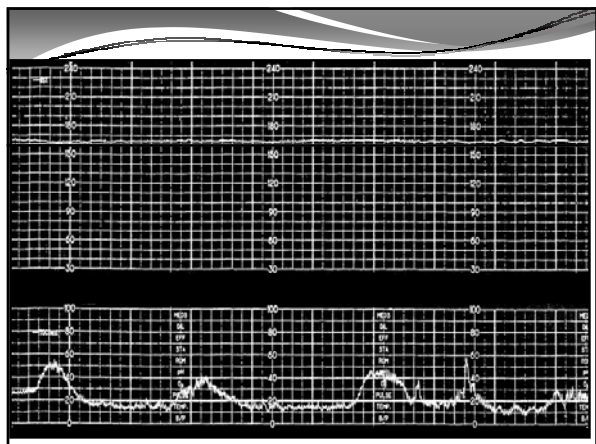
Baseline fetal heart rate greater than 160 bpm.

Baseline: The mean FHR rounded to increments of 5 beats per minute during a 10-minute window, excluding accelerations and decelerations and periods of marked variability.

Is this really “indeterminate”?







Expert OB/GYN

Do you know what the potential risk to the fetus is of a sustained tachycardia in the 180s or greater?

Generally none, no potential risk of tachycardia...it could be normal, it could be maternal fever, it could be medication, it could be maternal hypotension, it could be hypoxemia.

If it is hypoxia...is that potentially troublesome?

If that's what it reflects and there's no variability and there are associated decelerations.

And if variability decreases, does that potentially indicate harm to the fetus?

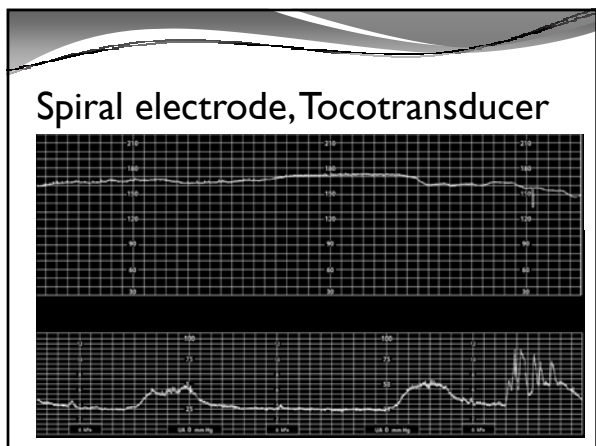
If it decreases to a point of being absent it could indicate harm.

Do you typically wait to deliver until there's absent variability?

Depends on the tracing.

Is it the goal of the obstetrician to try to deliver the baby before there is permanent injury from hypoxia or anoxia?

The goal of the obstetrician is to deliver the baby.



Category III
Abnormal Acid-base Status

Includes: absent BL variability and recurrent late decels, recurrent variable decels, bradycardia, sinusoidal pattern

Requires *prompt* evaluation and efforts to evaluate the pattern; provision of maternal oxygen, change position, discontinue labor stimulation, treat hypotension, treat tachysystole and if the tracing does not resolve, delivery should be undertaken (ACOG, July 2009)

Concern: No time parameters for

- **EVALUATION**
- **RESOLUTION** of tracing
- **RECURRENT** decelerations (50% of contractions)
- **DELIVERY**

Certified Nurse Midwife (7/09)

Q: When do you get concerned?

A: If the majority of your contractions, or 75% of your contractions have late decelerations and I have no variability and I have no way to elicit accelerations, then, yes, I'm very concerned.

Q: So that would be your standpoint for being concerned and stopping Pitocin, those things existing?

A: Yes.

Certified Nurse Midwife (7/09)

TACHYSYSTOLE

Q: If there's tachysystole, you want to take action before there's an effect on the fetus. Isn't that the goal?

A: No...I think that it's very black and white for people to look at a contraction pattern and to assume because there's a contraction there that there's something happening to the fetus. That doesn't always mean there's something happening to the fetus.

Concern:

No recommendations for the "clinical response" to tachysystole

Certified Nurse Midwife (7/09)

Q: If there is tachysystole present, you ought to be told, correct?

A: Yes

Q: Because that is not a reassuring sign...hyperstimulation?

A: ...**that's no longer in existence.** Tachysystole is the word that is now used.

Concern:
Hyperstimulation is a word and continues to exist in the English language and our literature

9 Technology Is Not Addressed

Ultrasound

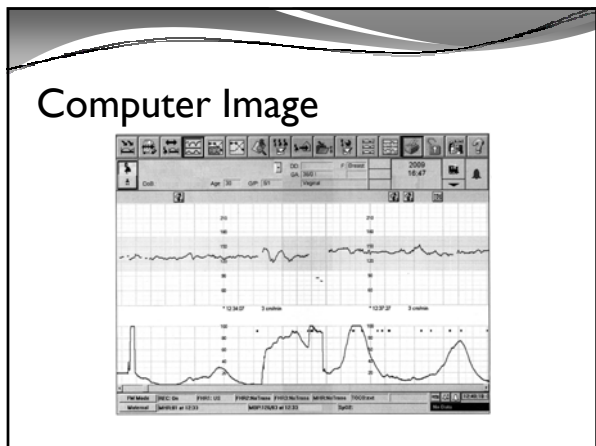
- Maternal rate
- Double counting MHR rate

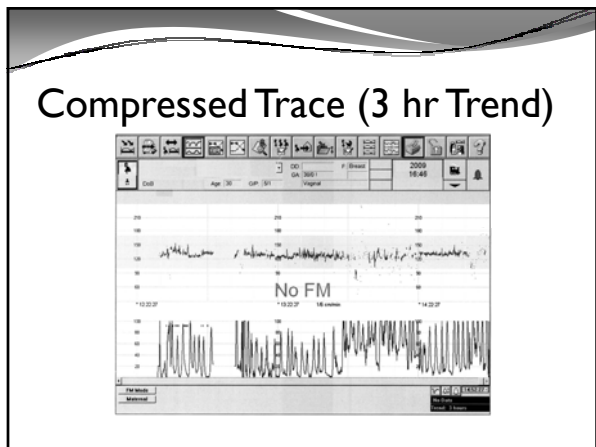
Sounds

- NOT necessarily the FHR
- Can't assume = fetus

Technology: Paperless Systems

- The lack of research does NOT mean something is safe...
- Paperless fetal monitors are unsafe until proven otherwise.
- Paperless decreases awareness of "trends and changes" in the FHR over hours of labor
- Research that showed any benefit of a fetal monitors was done with analysis of paper outputs or computer analysis...not computer print-outs.





10 NICHD Recommendations

The goals of the workshop:

3. Make **recommendations** about **a system for use** in the US.
4. Make **recommendations** for research priorities in the US.

The "system" needs improvement before we should adopt it in a clinical setting.

NICHD 2008 recommendations are a consensus opinion not science

Categories of Evidence

A = randomized, clinical prospective trials, meta-analysis with strong statistical power showing the treatment works (level I)

B = randomized clinical prospective trials, majority show a difference but more studies are needed on different populations to make sure the effects persist across settings (level II)

C = some evidence and anecdotal reports, case studies, retrospective analyses, secondary analyses (level III)

NICHD 2008

This work is a level IV or D:

A **consensus opinion** (with little nursing representation 3 RNs, 32 physicians)

There are **no real data applying the treatment in a properly controlled prospective study** controlling for extraneous variables.

Conclusion

All care providers should be strongly advised to wait until these recommendations are tested in research settings and neonatal and maternal outcomes are measured and these recommendations are found to be safe.
