Intermittent Auscultation: How do You Monitor The Lady in the Bath?

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Intermittent auscultation is as effective in detecting category III FHR patterns as continuous electronic FHR monitoring

A. Yes
B. No

Why talk about Intermittent Auscultation (IA)?

- Many women enter labor with a plan for intermittent FHR monitoring, frequent ambulation, and laboring in the tub
- 94% of the women who give birth in the US have continuous EFM as the method of fetal surveillance
- Randomized trials that compared EFM to IA found them equal with regard to newborn outcome
- What is the deal here?

ChildbirthConnections, Listening to Mothers Survey 2006
Disclaimer

I do not have any financial or other personal gain related to the content of this presentation

Objectives

- Definition of Intermittent Auscultation (IA)
- History of Fetal Heart Rate Auscultation
- Intrapartum Monitoring with IA: Standards for Frequency of Assessment
- Interpretation: What FHR Characteristics are Detectable with IA?
- Methods of FHR Monitoring via IA
- Reliability and Efficacy of IA
- Benefits, Limitations and Recommendations for Use of IA

Definition of Intermittent Auscultation

- Intermittent Auscultation is a method of assessing the fetal heart rate and rhythm via use of a hand-held Doppler or Pinard stethoscope
- When IA is used to monitor a fetus during the intrapartum period, the fetal heart rate is determined at set intervals
- Today Intermittent auscultation is often best described in contrast to continuous electronic fetal monitoring wherein a continuous record of the fetal heart rate characteristics are documented

1975-1994: RCTs of IA vs Continuous EFM

- 12 Randomized trials of EFM vs Intermittent monitoring that included N = 18,761 births
- EFM associated with:
  - ↑ C/S
  - ↑ operative deliveries
  - Fewer neonatal seizures, no long-term adverse neurologic consequences from seizures
- No change in incidence of:
  - Cerebral palsy
  - Neonatal neurologic impairment in babies whose mothers had EFM during labor
  - No ↓ in perinatal death rates

Should we throw the baby out with the bath and not use EFM?

A. Yes
B. No

However... The Conclusion that EFM is Associated with more Cesareans May be Deceiving.....

- The RCTS conducted before 1985 all had higher cesarean section rates in the EFM group but
- The RCTS conducted after 1985 had almost the same number of cesarean sections in both groups

Summary of RCTS

On the basis of this body of evidence, ACOG, AWHONN and ACNM all state that either intermittent auscultation (IA) with 1:1 nursing care, or continuous electronic fetal monitoring (EFM) are acceptable methods of monitoring the fetus in active labor, in women who are “low risk.”

ACOG 2009, AWHONN 2009, ACNM 2009

Alfirevic Z et al 2006
What Can We Conclude about EFM vs IA?

- Intrapartum auscultation using a Pinard or Hand-held Doppler is at best equal to EFM with regard to cesarean birth and perinatal outcomes.

- However, cesarean birth rates have increased significantly in the last several years and today the cesarean birth rate might be more strongly related to factors other than FHR characteristics.

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Intermittent Auscultation vs Continuous Electronic Fetal Monitoring

- Protocol for IA in RCTs
  - Every 15 minutes in active labor for 30-60 sec after a UC and every 5 minutes in the second stage of labor
  - 1:1 nursing

- Nonreassuring FHR characteristics for IA cohort:
  - < 120 bpm or >160 bpm
  - < 100 bpm after 3 UCs or "persistent < 100 bpm
  - < 100 bpm immediately after UC. Had definition of moderate or severe deceleration
  - Irregular FHR
  - Clinician judgement

- Fetal scalp sampling used to verify "nonreassuring FHR"

Standards for Frequency of FHR Assessment

<table>
<thead>
<tr>
<th></th>
<th>AWHONN</th>
<th>ACOG</th>
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<tbody>
<tr>
<td>Protocol for IA in RCTs</td>
<td>Every 15-30 minutes in active labor and every 5-15 minutes in the second stage of labor for &quot;low risk&quot; women</td>
<td>Every 15 minutes in active labor and every 5 minutes in the second stage of labor for &quot;low risk women&quot;</td>
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<tr>
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<td>Begin listening immediately after a contraction</td>
<td>Begin listening immediately after a contraction</td>
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<td>1:1 nursing ratio</td>
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<td>Periodic competence validation</td>
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<td>Unit policies that describe when IA is appropriate, when EFM should be used and when IA should be replaced with EFM</td>
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AWHONN 2008, ACOG 2009
AWHONN Recommends

- Assess FHR Before:
  - Initiation of labor enhancing procedures
  - Ambulation
  - Administration of medications
  - Administration of analgesia or anesthesia
  - Patient transferred or discharged

- Assess FHR After:
  - Patient admitted
  - Rupture of membranes
  - Vaginal examination
  - Ambulation
  - Tachysystole
  - Administration of medication

AWHONN 2005

Interpretation: What FHR Characteristics Can Be Detected?

<table>
<thead>
<tr>
<th>Pinard Stethoscope</th>
<th>Hand-held Doppler</th>
<th>Electronic Monitor</th>
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<tbody>
<tr>
<td>Bradycardia</td>
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<td>Bradycardia</td>
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<td>Tachycardia</td>
<td>Tachycardia</td>
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<td>Rhythm</td>
<td>Rhythm?</td>
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<td>Accelerations</td>
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<td>Decelerations</td>
<td>Decelerations</td>
<td>Variable decels</td>
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<td>Maternal HR</td>
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<td>Late decels</td>
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<td>Irregular rhythm</td>
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<td>Early decels</td>
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<tr>
<td>Clarify double or half counting</td>
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<td>Prolonged decels</td>
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<td></td>
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<td>Variability</td>
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Do We Really Need to Assess Variability?

- The purpose of fetal surveillance in labor is to identify the fetus who is at risk for having clinically significant metabolic acidemia
- Metabolic acidemia is a rare occurrence
- The vast majority of women who are low-risk for fetal acidemia have good outcomes
- 1:1 Nursing care is independently associated with improved labor outcomes

Do We Really Need to Assess Variability?

- Most Category III FHR patterns develop over time which gives the provider ample time to detect a deceleration, change to continuous EFM and determine time for intervention if needed
- Category III FHR patterns are all associated with recurrent decelerations that can be detected via IA.
  - Exception is sinusoidal pattern which is associated with abruptio placentae and maternal-fetal hemorrhage
Interpretation of Auscultated FHR

**Category 1** includes all of the following:
- Normal FHR baseline between 110 and 160 bpm
- Regular rhythm
- Presence of FHR increases or accelerations from the baseline
- Absence of FHR decreases of decelerations from the baseline

**Category II** includes any of the following:
- Irregular rhythm
- Presence of gradual or abrupt recurrent decreases from the baseline
- Tachycardia (baseline >160 bpm >10 minutes in duration)
- Bradycardia (baseline <110 bpm >10 minutes in duration)

There is no **Category III** as auscultation cannot reliably detect variability.

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Multiple Methods, All Start With..

- Obtain and document maternal pulse
- Leopold's maneuver to determine position of fetal back and point of maximal sound intensity
- Palpate uterine contractions
- Auscultate over the fetal back at pre-determined intervals
Methods of Auscultating FHR

- **How to Auscultate:**
  - Count for a full minute
  - Count for 30 seconds and multiply x 2
  - Count for 15 seconds and multiply x 4
  - Count for 10 seconds and multiply x 6

- **When to Auscultate:**
  - For 60 seconds starting at the beginning of a contraction
  - For 30-60 seconds after a contraction
  - For 30-60 seconds starting with the peak of the contraction

- Let's look at which works the best.....

Protocol #5: Intermittent EFM

- Intermittent Auscultation has evolved into intermittent EFM in many hospitals
- This "hybrid" has not been evaluated in any studies
- Recorded EFM tracings will be subject to the requirements for assessing and documenting the FHR via continuous EFM

When to Auscultate: Should We Count for 30 Seconds After a Contraction is Over?

- Single count strategy
- Multiple count strategy:
  - Three 10 second counts separated by 5 second breaks
  - Identified 93% of late decelerations
  - Accuracy better as the deceleration got deeper

Schifrin BS 1992, Harrison J 2004
Reliability of IA

- Multi-count strategy that assesses the fetal heart rate during and after a contraction reliably detects:
  - Fetal heart rate
  - Rhythm
  - Accelerations
  - Presence of decelerations
- Multi-count strategy using 6-10 second timeframes accurately detects and characterizes accelerations in women who are not in labor
- Does not differentiate types of decelerations or determine baseline variability with accuracy


Efficacy of IA

- IA for FHR assessment in women who are undergoing a trial of labor after a cesarean section:
  - 100 women randomly assigned to IA vs EFM
  - IA conducted q 15 min in first stage and q 5 min in second stage, single count strategy for 60 second following a contraction
  - Nonreassuring FHR patterns in IA group were tachycardia, bradycardia, irregular rhythm, FHR < 100 bpm following a UC.
  - Cesarean rate in IA group was 22% and 34% in EFM group
  - No differences in maternal or neonatal adverse outcomes

Maadon M 2006

Reliability Summary: How Should the FHR be Auscultated?

- Use a multi-count strategy
- Start at the peak of a contraction or before a contraction starts
- Continue counting for 30 seconds after the contraction is over
- Frequency should increase during rapid descent, following SROM and at the onset of maternal pushing
- Listen every other or every third contraction during pushing expulsive stage

Efficacy of IA

- Multiple large studies and a Cochrane meta-analysis have documented positive outcomes in women who given birth at home or in free-standing birth centers give us indirect evidence that IA is both efficacious and safe
- Positive outcomes are dependent on appropriate risk screening and appropriate transfer to a hospital setting when needed

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Benefits, Limitations and Recommendations for Use of IA

Benefits of Intermittent Auscultation

- Free mobility
- Allows FHR assessment of “the lady in the bath”
- EFM requires attention to monitor which takes time away from attention and support provided to the patient directly
- 1:1 support associated with better outcomes

Limitations to Use of IA

- Patient characteristics
  - Obesity or polyhydramnios may preclude use of IA
  - Lack of patient knowledge about IA vs EMF
  - Some women prefer EFM
- IA does not allow detection of variability or allow determination of the type of deceleration that is heard

Benefits of Intermittent Auscultation

- Possible lower cesarean birth rates
- Will not detect maternal heart rate and record it as the fetal heart rate
- Some authors say the lack of a continuous documented FHR is a medical-legal advantage
Limitations to Use of IA

- Individual provider characteristics
  - Lack of training or education
  - Inability to provide 1:1 nursing

- More research is needed to determine the best method for how to auscultate and when to auscultate in each stage of labor

Unresolved Issues and Controversies

- Who is low risk?: No standard definition or list of criteria
- Do you need 1:1 staffing ratio?
  - One institution found auscultation q 15 min in first stage and q 5 min in second stage possible in 8% of cases (Morrison JC 1993)
  - Another institution found IA 1 30 min in the first stage and q 5 minutes in the second stage easy to implement without 1:1 staffing (Sandmire HF 1995)
- What is the best protocol for how and when to auscultate?
  Morrison JC 1993, Sandmire HF 1995

..If you want to emulate our current cultural idols, give birth in a bathtub…

THANK YOU