Intermittent Auscultation of the FHR

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Objectives

- Discuss the evidence supporting IA as the preferred choice for low risk women in labor
- Understand benefits and limitations of CEFM and IA
- Describe how to implement IA as the standard of care for the low risk laboring woman.
- Discuss standards for assessment and interpretation
- Describe how to sustain IA usage
Fetal Heart Rate (FHR) monitoring is a crucial part of monitoring the well-being of the fetus and its’ response to the stress of labor.

Goal of FHR monitoring is to assess fetal well-being and detect any abnormalities which might indicate fetal intolerance of labor in order that interventions to prevent fetal or maternal morbidity or mortality may be preformed in a timely fashion.
**BACKGROUND**

**Intermittent Auscultation**… a systemic method of listening to the fetal heart with an acoustical device at predetermined intervals.
- First described 1800’s
- Pinard horn or fetoscope
- Doppler… fetal heart sound from deflected ultrasound waves

**Continuous Fetal Monitoring**… continuous use of a Doppler device with computerized logic to interpret and record the Doppler signals
- Introduced in the 1950’s
- External and Internal
Pinard Horn
Fetoscope
The Doppler
HISTORY

- The oldest method is Intermittent Auscultation (IA) since 1800’s

- Intermittent auscultation is used with 3% of U.S. women during labor (Declercq, Sakala et al. 2007).

- Electronic Fetal Heart Monitoring developed in 1950’s
  - 1970’s used nation wide in hospitals
  - 1980 nearly 50% of all labors
  - 1990’s 60-75% of all labors
  - 2000’s 85% or more
  - 2007 87% (Declercq, Sakala et al. 2007).
COCHRANE REVIEW

• REVIEW CONTAINED 12 TRIALS INVOLVING >37,000 WOMEN
• MOST TRIALS NOT WELL DONE
• ONE WELL-DESIGNED TRIAL WITH CLOSE TO 13,000 WOMEN
• NO DIFFERENCE IN NUMBER OF BABIES WHO DIED DURING OR SHORTLY AFTER BIRTH
• NEONATAL SEIZURES RARE, BUT SLIGHTLY MORE IN IA GROUP (overall, seizure events were very rare (0.2%))
No difference in incidence of CP between IA and EFM

EFM was associated with a significant increase in C-Sections (1.7 times) and instrumental vaginal deliveries
  • RCTs after 1985 found nearly equivalent C/S rates between groups

Recent review by ACOG (July 2009) comparing EFM and IA
The Haverkamp Trial

- 1976 First RCT
- Denver
- n=483
- High risk patients
- IA vs. CFM
- Increased C/S rate CFM group
- No difference in neonatal death, Apgar scores, blood gasses or neonatal morbidity

The Dublin RCT

- 1981-1983
- n=12,964
- Low and high risk pregnancies
- IA vs. CFM
- Higher C/S and assisted deliveries with CFM
- No differences in low Apgars, need for NRP, or NICU admission.
- Increase rate of neonatal seizures in the IA group

The Leveno Trial

- 1986 A Prospective Comparison
- N=34,995
- Low risk women
- Term babies
- Allocated patients to universal or selective monitoring
- Increase C/S rate
- No difference in perinatal outcomes

Thacker Meta-Analysis
1995

- 1966-1994
- 12 RCTs examining the efficacy of CFM vs. IA
- 58,855 women
- High and low risk
- US, Europe, Australia and Africa
- Increase C/S and associated morbidity
- No significant difference between groups for neonatal outcome
- CFM decreased neonatal seizures compared to auscultation

“...the only clinically significant benefit from the routine use of EFM was the reduction in neonatal seizures. The rates of IP and neonatal deaths, short-term morbidity and long term morbidity including CP were similar whether the FHR had been monitored continuously or intermittently.”

- New England Journal of Medicine, March 7, 1996 Vol-334
- Editorial by Dermot MacDonald of the Dublin Trial
“Despite its widespread use, there is controversy about the efficacy of EFM, inter-observer and intra-observer variability, nomenclature, systems for interpretation, and management algorithms. Moreover, there is evidence that the use of EFM increases the rate of cesarean deliveries and operative vaginal deliveries.”

ACOG National Meeting July 2009
“Given that the available data do not show a clear benefit for the use of EFM over intermittent auscultation, either option is acceptable in a patient without complications. “

ACOG July 2009
“IA is the preferred method of fetal surveillance for healthy low risk women in labor”

**SOGC** (Society of Obstetricians and Gynecologists of Canada)

“The FHR **may** be evaluated by auscultation or by EFM” ACOG PB 2009

IA is an “appropriate and safe alternative to electronic fetal monitoring” ACOG PB, 2010.
The evidence against continuous electronic fetal monitoring is so clear that the U.S. Preventive Services Task Force issued a recommendation in 1996 saying that continuous electronic fetal monitoring should NOT be used in low risk women. (Guide to Clinical Preventative Services 1996)
“The frequency of observations required to monitor labor with IA facilitates other evidence-based labor support practices, and this method of monitoring the FHR should be the preferred method.”
THE PROBLEM WITH EFM IS…

▶ Over use in low-risk women

▶ Over reliance on a poor screening tool
  ▶ 99% false positive rate
  ▶ Low reliability and validity

▶ Increased rate of interventions with significant increase in morbidity and mortality for women and babies

▶ Can contribute to significantly more difficulty in legal cases second to interpretation disputes
CONTINUOUS FETAL MONITORING

Benefits
- Can identify early signs of developing hypoxia
- Allows closer monitoring of high risk patients
- Excellent predictor of a normally oxygenated fetus
- Records FHR and UCs simultaneously

Limitations
- High rate of false positives leading to increased interventions...C/S, etc... without better outcomes
- Restricts maternal mobility unless Tele available
- No agreement regarding timing of intervention
- Expensive
- Poor reliability/validity
INTERMITTENT AUSCULTATION

Benefits

- Evidence-based practice
- Lower rates of C/S, operative delivery and related morbidities/mortalities for mom and baby
- Increased mobility for mother...can ambulate, hydrotherapy, more comfortable
- Decrease use of analgesia/anesthesia
- Fosters more continuous labor support
- Focus on mother not machine
- Facilitates alternative birth positions
INTERMITTENT AUSCULTATION

- Limitations
  - Frequency and timing of auscultation is lacking evidence
  - Difficult to assess variability
  - Periodicity of decelerations cannot be determined
  - Attention to staffing matrix
  - Requires unit education, commitment and support for sustained use
  - No permanent record of FHR
WHAT TO DO?

▶ Use fetal monitoring appropriately.

▶ Intermittent auscultation should be the standard for low-risk women with qualifying fetal status upon admission in labor.

▶ Agreed upon criteria for “low-risk” and the intrapartum risk factors which would require moving from IA to CEFM.

▶ Agreed upon and consistent use of auscultation frequency and timing.

▶ Continue work towards standardization of EFM pattern identification and appropriate responses.
## When: Frequency of IA

<table>
<thead>
<tr>
<th>Professional Organization</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; Stage</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; Stage</th>
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<tr>
<td>ACOG</td>
<td>q15 mins</td>
<td>q5 mins</td>
</tr>
<tr>
<td>ACNM</td>
<td>q15-30 mins</td>
<td>q5-15 mins</td>
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<tr>
<td>AWHONN</td>
<td>q15-30 mins</td>
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</tr>
<tr>
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<td>q5 mins</td>
</tr>
<tr>
<td>NICE</td>
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</table>
Who is the appropriate candidate?

- “Low-Risk” Patient Denver Health
  - Qualifying FHR from triage or admission
  - Gestation 36 weeks or greater
  - Vertex
  - Singleton
  - No maternal/fetal exclusionary factors (per clinical care standard (CCS))
  - No IP risk factors (per CCS)
Inclusion Criteria @ DH

- Normal baseline rate and rhythm
- Moderate variability
- Absence of persistent or severe variable decelerations or late decelerations
- 20 minute CEFM admission strip (Not evidence based (2012 Declan et al. )

**NOTE:** No accelerations required. We do not require a Cat I FHR tracing before initiating IA
How...

- Established guidelines for unit
- Educate staff with yearly competencies or skills day
- Have watch or clock with seconds available
- Obtain qualifying 20 minute strip prior to initiating (unproven benefit)
- Palpate fetal back using Leopold’s
- Place Doppler on maternal abdomen and auscultate between UCs X 60 seconds and then for 60 seconds after a UC
- Palpate UCs for strength, note frequency, and length, beginning and end.
- Count baseline rate, listen for accelerations or decelerations
- Multi Count Method 5secs or 6 sec increments, or continuous for 60 seconds or 15 or 30 seconds
- Always obtain maternal pulse at each auscultation
- Note and document palpable fetal movement
- Document well
Multiple Count Strategy

- Counting of FHR in 5 or 6 second intervals over a 15, 30 or 60 second period
- Allows for more accurate detection of periodic changes: accels and decels than a single count strategy.
  - Shifrin et al. 1992
- DH uses the multi count strategy for teaching IA described in Lisa Paine’s Auscultated Acceleration Test
  - Paine et al. 1986
Interpretation of IA Findings
ACNM CB 11 2010

- **Category I**
  - Category I FHR characteristics by auscultation include 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 or decelerations from the baseline

- **Category II**
  - Irregular rhythm
  - Presence of FHR decreases or decelerations from the baseline
  - Tachycardia (baseline >160 bpm, >10 minutes in duration)
  - Bradycardia (baseline <110 bpm, >10 minutes in duration)
In case of concerning FHTs...

- Same as with EFM
  - Increase frequency of auscultation
  - Initiate CEFM clarify findings
  - Position Change
  - Fluid Bolus
  - Oxygen
  - Notify provider
  - AWHONN clinical decision making algorithm
Continuous monitoring: IP risk factors
- Frank bleeding not bloody show
- Thick meconium
- Maternal fever
- Bradycardia or tachycardia
- Abnormal rhythm
- Persistent decelerations after interventions
- Uterine tachysystole noted
- Acuity of unit
- Persistent hypertension or hypotension
- Desires CLE
- Pitocin use
Nursing Ratios

- 1:1 recommendation extrapolated from presence of a nurse or midwife researcher in most studies
- Denver Health is 2:1 in labor. 1:1 Second Stage
- Question of optimal labor care being 1:1
- Barrier to implementation
Special Cases of IA

- **Misoprostol**: At DH we allow IA 1-2 hours after administration for IOL.
  - Rapid plasma level increase rapidly and peal concentration after 30 minutes with rapid decline after 30 mins very low by 120mins.

- **Meconium**: Allowed if not thick. A non evidence based department compromise.

- **Parenteral Narcotics**: IA or no monitoring during Morphine Sleep and IA as dictated by the phase of labor with IV Fentanyl

- **Oligohydramnios**: Yes after negative CST. Can be spontaneous UCs or initiated by either misoprosol or pitocin
Culture Change and Sustainability

- Need Champion(s), preferably interdisciplinary team
- Identify barriers and make a plan
- Evidence based dialogues
- Stepwise approach
- Unit Education for re-cert and new hires RNs and CNMs
- Grand Rounds
- Faculty Meetings
- Data Collection and Presentation
- Teaching Residents
- Standard for ALL pts not just CNM
- Autonomy for RNs
- Shared Responsibility with CNMs
Culture of Physiologic Birth

- IA is the Gateway to…Optimality in Labor
  - Freedom of Movement
  - Birth Ball
  - Hydrotherapy
  - Alternative Birth Positions
  - Labor support: Focus on woman not machine
  - Increase Coping
  - Decrease Interventions
  - Increase Optimal CC, Skin to Skin & Early BF
Supportive Care During Labor

Continuous Labor Support

Only 3% of women use doulas (LTMSII 2006)

- reduction in the cesarean rate
- shorter labor
- reduction in epidural use
- reduction in oxytocin use
- reduction in analgesia use
- reduction in assisted vaginal deliveries
- Less likely to have low Apgar scores

2012 Hodnett et al.
ACNM Birth Tools

- Tools for Optimizing the Outcomes of Labor Safely
- www.birthtools.org
- Excellent resources for promotion of physiologic birth and unit culture change
- Quality improvement resources
- Evidence based resources for reducing the primary cesarean rate
Ethical Principles

- Autonomy...personal liberty and self determination
- Beneficence...to do good
- Nonmaleficence...to prevent harm
- Justice...fair or equal treatment of individuals
- Veracity...duty to tell the truth
Legal Considerations

- Document Well
- Follow Your Established Guidelines
- Communicate Well
- Numerous Cases Have Upheld IA as an Acceptable Standard
- Use Sound Clinical Decision Making
Denver Health Data
IA Only 2009-2012

- CEFM on admission then IA only for the remainder of the labor
- Q30min active labor Q15 second stage
- N=1,146
- No IP deaths
- NICU admits 2
  - Undiagnosed T21 Apgars 8,8, normal cord gases
  - Apgars 5,7 normal cord gases, 48hour rule out discharged home at 24 hours
Questions...Discussion
Thank You!
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References


References


References


