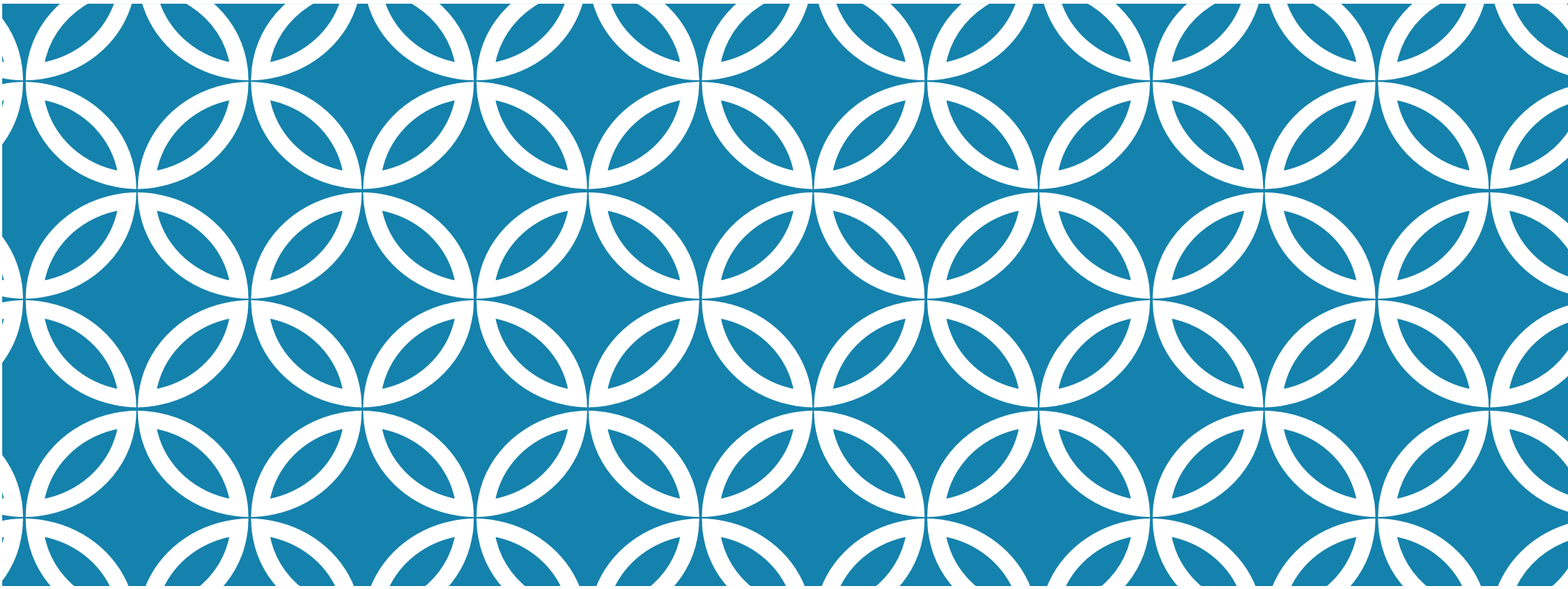

INTERMITTENT AUSCULTATION: CONSIDERATIONS FOR PRACTICE IMPLEMENTATION

With Lisa A. Miller, CNM, JD

What hospitals don't want you to know about C-sections

The procedures drive up costs and increase risks for mothers and babies, a Consumer Reports' investigation finds

Published: May 2014

THE BASIS FROM WHICH WE BEGIN

con·scious

/ˈkän(t)SHəs/

adjective

aware of and responding to one's surroundings; awake.
synonyms: aware, awake, alert, responsive, sentient, compos mentis
"the patient was conscious"

- having knowledge of something; aware.
  "we are **conscious of** the extent of the problem"
  synonyms: aware, mindful, sensible; More
- painfully aware of; sensitive to.
  "he was very conscious of his appearance"

OUR OBJECTIVES

- Review the evidence on EFM versus IA
- Discuss a variety of recommendations for IA
- Identify the components of informed consent
- List steps hospitals should take to incorporate IA
- Describe the role of future research

Continuous cardiotocography (CTG) as a form of electronic fetal monitoring (EFM) for fetal assessment during labour (Review)

Alfirevic Z, Devane D, Gyte GML

THE COCHRANE COLLABORATION®

AUSCULTATION FREQUENCIES

Intermittent auscultation was the predominant method of monitoring during labour until CTGs became widely used in the latter part of the twentieth century (Enkin 2000). Although there is a lack of empirical evidence on the optimal frequency of intermittent auscultation, there is a consensus in the guidelines from professional bodies that the fetal heart should be auscultated at least every 15 minutes in the first stage of labour and at least every five minutes in the second stage of labour (ACOG 1995; Liston 2002; NCCWCH 2008; RANZCOG 2002) with each auscultation lasting at least 60 seconds (Liston 2002; NCCWCH 2008). It appears that these auscultation protocols were developed initially in the context of clinical trials and were based on 'common sense' rather than research evidence. Compliance with these guidelines, whilst maintaining contemporaneous records, poses a significant challenge for caregivers during labour who usually have multiple tasks to fulfil simultaneously.

QUALITY OF THE INCLUDED STUDIES

Continuous CTG versus IA (Subgroup: high/low/unclear quality of studies - Comparison 8)

Of the 12 studies that compared continuous CTG with intermittent auscultation, two were considered to be of high methodological quality (Dublin 1985; Melbourne 1976), four studies where considered to be of low methodological quality (Athens 1993; Dallas 1986; Melbourne 1981; Pakistan 1989) and for six studies the methodological quality was unclear (Copenhagen 1985; Denver 1976; Denver 1979; New Delhi 2006; Seattle 1987; Sheffield 1978).

PLAIN LANGUAGE SUMMARY

This review included 13 trials involving over 37,000 women that compared continuous CTG monitoring with intermittent auscultation (listening). Most studies were not of high quality and the review is dominated by one large, well-conducted trial of almost 13,000 women who received one-to-one care throughout labour. In this trial, the membranes were ruptured artificially (amniotomy) as early as possible and oxytocin stimulation of contractions was used in about a quarter of the women.

Overall, there was no difference in the number of babies who died during or shortly after labour (about one in 300). Fits (neonatal seizures) in babies were rare (about one in 500 births), but they occurred significantly less often when continuous CTG was used to monitor the fetal heart rate. There was no difference in the incidence of cerebral palsy, however, other possible long-term effects have not been fully assessed and need further study. Continuous monitoring was associated with a significant increase in caesarean section and instrumental vaginal births. Both procedures are known to carry the risks for mothers although the specific adverse outcomes were not assessed in the included studies.

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SUMMARY OF FINDINGS FOR THE MAIN COMPARISON *[Explanation]*

Continuous CTG versus intermittent auscultation for fetal assessment during labour

Patient or population: Women undergoing fetal assessment during labour
Settings:
Intervention: Continuous CTG versus intermittent auscultation

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Continuous CTG versus intermittent auscultation				
Perinatal mortality (primary outcome)	Study population		RR 0.86 (0.59 to 1.24)	33513 (11 studies)	⊕⊕◯◯ low[1,2]	
	3 per 1000	3 per 1000 (2 to 4)				
	Moderate					
	4 per 1000	3 per 1000 (2 to 5)				
Neonatal seizures (primary outcome)	Study population		RR 0.5 (0.31 to 0.8)	32386 (9 studies)	⊕⊕⊕◯ moderate[3]	
	3 per 1000	1 per 1000 (1 to 2)				
	Moderate					
	4 per 1000	2 per 1000 (1 to 3)				
Cerebral palsy (primary outcome)	Study population		RR 1.75 (0.84 to 3.63)	13252 (2 studies)	⊕⊕◯◯ low[4,5]	

	3 per 1000	4 per 1000 (2 to 9)			
	Moderate				
	39 per 1000	68 per 1000 (33 to 142)			
Caesarean section (primary outcome)	Study population		RR 1.63 (1.29 to 2.07)	18861 (11 studies)	⊕⊕◯◯ low[6,7]
	36 per 1000	59 per 1000 (47 to 75)			
	Moderate				
	66 per 1000	108 per 1000 (85 to 137)			
Instrumental vaginal birth (primary outcome)	Study population		RR 1.15 (1.01 to 1.33)	18615 (10 studies)	⊕⊕◯◯ low[8,9]
	102 per 1000	118 per 1000 (103 to 136)			
	Moderate				
	222 per 1000	255 per 1000 (224 to 295)			
Cord blood acidosis (primary outcome)	Study population		RR 0.92 (0.27 to 3.11)	2494 (2 studies)	⊕◯◯◯ very low[10,11,12]
	24 per 1000	22 per 1000 (6 to 74)			
	Moderate				
	24 per 1000	22 per 1000 (6 to 75)			

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Overall completeness and applicability of evidence

Clearly, the lack of long-term follow-up data and inadequate re porting of the data according to the clinically important subgroup is regrettable and limits the applicability of the evidence.

- The single largest trial, the Dublin trial, provides even more interesting data, here are a few things to think about from the Dublin trial…

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

Panteghini, 30 September 2013

COMMENTARY IS ALSO KEY

Summary

I have two comments about this review:

1) In the continuously monitored group the relative risk of perinatal mortality is lower rather than in the intermittently monitored group (RR 0.86). This result may be important for women when they choose which method of fetal monitoring to adopt during labour. Is it not more useful to present the absolute and relative risk, so the woman, her midwife and doctor can decide if these are significant to them or not? To consider a result significant only if it is statistically significant (and only if statistically significant at a given level of significance, such as 5%) is an arbitrary decision that needs to be shared with the woman and her clinical team.

2) An interesting question raised by this review is which method of intermittent auscultation is best. The review lumps together different types of intermittent auscultation; for example, auscultation during and after a contraction, and auscultation only after a contraction. The review assesses the relationship between pH at birth and the method of foetal heart monitoring rate (intermittent or continuous) in two studies (Athens 1993, Dublin 1985), and does not find any difference between the two methods as regards neonatal pH at birth. It is interesting to note that in the Dublin trial, which used intermittent auscultation only after a contraction, the pH at birth was worse for woman allocated intermittent auscultation rather than continuous monitoring (RR 0.45, 95% CI 0.16 - 1.29). In contrast, in the Athens trial, which used intermittent auscultation during and after the contraction, pH at birth was better for woman allocated intermittent auscultation (RR 1.58, 95% CI 0.89 - 2.81).

The importance of decelerations during the contraction and their impact on foetal wellbeing is now well known. Therefore the National Institute for Clinical Excellence (NICE) (1) considers monitoring to be reassuring only if there are no decelerations. Some guidelines advise monitoring the foetal heart after a contraction (2), others during and after (3), and others again do not specify the timing of auscultation in relation to contraction (4). The review is appropriate in not drawing any conclusions about what is the best method of intermittent monitoring. We think that guidelines should state both that the mode of intermittent monitoring and the choice of one method rather than another is a grade C recommendation (personal opinion) (5) as, in the light of this review, we do not know which method of intermittent monitoring is best (although we could suppose that intermittent auscultation during and after a contraction may be better than auscultation only after a contraction for preventing low pH at birth).

References

(1) NICE. Intrapartum care, 2008; p219-220 Tables 13.1, 13.2.

(2) Royal College of Midwives. Evidence based guidelines for midwifery-led care in labour,2012.

(3) American College of Nurse and Midwives. Intermittent Auscultation for Intrapartum Fetal Heart Rate Surveillance. Journal of Midwifery and Women's Health, 2010; 55: 397-403.

(4) Association of Women's Health Obstetric and Neonatal Nurses. Fetal Heart Monitoring, 2008

(5) Danti L, Di Tommaso MR, Maffetti G, Carfagna M. Cardiotocografia. Milano 2010, Piccin editore.

Comment submitted by Marco Panteghini, September 2013

DUBLIN RCT 1985

EFM group

IFE & Toco, doppler only if IFE not feasible

Fetal scalp sampling as back-up, delivery for pH <7.2, possible delivery for 7.2-7.25

IA group

IA with a Pinard for 60 seconds following a contraction "*at least every 15 minutes in first stage* and during *every interval* between contractions in the second stage

Fetal scalp sampling or delivery for FHT's >160 or <100 for 3 contractions

DUBLIN RCT 1985

- No significant difference in C-section (2.4 EFM vs. 2.2 IA) against a background rate of less than 3%
- Both groups had the backup test of fetal scalp pH, at that time no one differentiated between respiratory versus metabolic acidemia
- Biggest difference between the two groups was a reduction in neonatal seizures in the EFM group, but follow-up did not reveal any long-term significance.

BASED ON THIS REVIEW OF THE EVIDENCE, WHAT SHOULD WE BE TELLING OUR PATIENTS…

About the evidence regarding EFM versus IA?

About making informed choices?

About using one over the other, or both?

About how much we know versus how much we don't know?

AWHONN 2015

Table 2: Recommendations for Assessment of Fetal Status during Labor

When Using Electronic Fetal Monitoring[a,b]

	Latent phase (<4 cm)	Latent phase (4-5 cm)	Active phase (≥6cm)	Second stage (passive fetal descent)	Second stage (active pushing)
Low-risk without oxytocin	At least hourly	Every 30 minutes	Every 30 minutes	Every 15 minutes	Every 15 minutes
With oxytocin or risk factors	Every 15 minutes with oxytocin; every 30 minutes without	Every 15 minutes	Every 15 minutes	Every 15 minutes	Every 5 minutes

Note. [a]Frequency of assessment should always take into consideration maternal-fetal condition and at times will need to occur more often based on maternal-fetal clinical needs, for example a temporary or on-going change in maternal or fetal status.
[b]Summary documentation is acceptable and individual hospital policy should be followed.

AWHONN 2015

Table 1: Recommendations for Assessment and Documentation of Fetal Status during Labor

When Using Intermittent Auscultation[a,b]

	Latent phase (<4 cm)	Latent phase (4-5 cm)	Active phase (≥6cm)	Second stage (passive fetal descent)	Second stage (active pushing)
Low-risk without oxytocin	At least hourly	Every 15–30 minutes	Every 15–30 minutes	Every 15 minutes	Every 5–15 minutes

Note. [a]Frequency of assessment should always take into consideration maternal-fetal condition and at times will need to occur more often based on maternal-fetal clinical needs, for example a temporary or on-going change in maternal or fetal status.
[b]Summary documentation is acceptable and individual hospital policy should be followed.

AWHONN FHMPP 5TH EDITION

Identify a baseline rate by auscultating between contractions when the fetus is not moving for at least 30-60 seconds

Then auscultate while palpating maternal pulse for 15-60 seconds in between contractions in the absence of FM to monitor baseline rate as labor progresses

To check for increases and decreases, auscultate during a contraction and after (or use a consecutive series of 6-second intervals and multiply the number by 10 for each interval)

AWHONN FHMPP 5TH EDITION

Category I – all of the following:

- Normal baseline 110-160
- Regular rhythm
- Presence or absence of FHR increases or accelerations from the baseline rate
- Absence of FHR decreases or decelerations from the baseline

Category II – any of the following:

- Irregular rhythm
- Presence of FHR decreases or decelerations from the baseline rate
- Tachycardia (baseline >160 >10 minutes in duration)
- Bradycardia (baseline <110 >10 minutes in duration)

RANZCOG GUIDELINES

Accordingly, it is recommended that IA should be undertaken and documented:

- Every 15-30 minutes in the active phase of the first stage of labour.
- After each contraction or at least every five minutes in the active second stage of labour.

Recommendation 6	Grade and supporting references
When using intermittent auscultation, it should be performed according to a standardised protocol:	
1. Intermittent auscultation must be performed with a technique that can accurately measure the fetal heart rate in the individual woman.	B [43] (Level II)
2. Each auscultation episode should commence toward the end of a contraction and be continued for at least 30-60 seconds after the contraction has finished.	Consensus-based recommendation
3. Auscultation in labour should be undertaken and documented: • Every 15-30 minutes in the active phase of the first stage of labour. • After each contraction or at least every five minutes in the active second stage of labour.	Consensus-based recommendation

Measuring fetal heart rate as part of initial assessment

1.4.6 Auscultate the fetal heart rate at first contact with the woman in labour, and at each further assessment. **[new 2014]**

1.4.7 Auscultate the fetal heart rate for a minimum of 1 minute immediately after a contraction and record it as a single rate. **[new 2014]**

1.4.8 Palpate the maternal pulse to differentiate between maternal heart rate and fetal heart rate. **[new 2014]**

1.4.9 Record accelerations and decelerations if heard. **[new 2014]**

1.4.10 Do not perform cardiotocography on admission for low-risk women in suspected or established labour in any birth setting as part of the initial assessment. **[new 2014]**

1.4.11 Offer continuous cardiotocography if any of the risk factors listed in recommendation 1.4.3 are identified on initial assessment, and explain to the woman why this is necessary. (See also section 1.10 on fetal monitoring.) **[new 2014]**

1.4.12 Offer cardiotocography if intermittent auscultation indicates possible fetal heart rate abnormalities, and explain to the woman why this is necessary. Remove the cardiotocograph if the trace is normal after 20 minutes. (See also section 1.10 on fetal monitoring.) **[new 2014]**

1.4.13 If fetal death is suspected despite the presence of an apparently recorded fetal heart rate, offer real-time ultrasound assessment to check fetal viability. **[new 2014]**

NICE guidelines

1.10 Monitoring during labour

Measuring fetal heart rate

1.10.1 Offer intermittent auscultation of the fetal heart rate to low-risk women in established first stage of labour in all birth settings:

- Use either a Pinard stethoscope or Doppler ultrasound.
- Carry out intermittent auscultation immediately after a contraction for at least 1 minute, at least every 15 minutes, and record it as a single rate.
- Record accelerations and decelerations if heard.
- Palpate the maternal pulse if a fetal heart rate abnormality is suspected, to differentiate between the two heart rates. **[new 2014]**

1.10.2 Do not perform cardiotocography for low-risk women in established labour. **[new 2014]**

1.10.3 Advise continuous cardiotocography if any of the following risk factors are present or arise during labour:

- suspected chorioamnionitis or sepsis, or a temperature of 38°C or above
- severe hypertension (160/110 mmHg or above [see the NICE guideline on hypertension in pregnancy]).
- oxytocin use
- the presence of significant meconium (see recommendation 1.5.2)
- fresh vaginal bleeding that develops in labour. **[new 2014]**

1.10.4 If any one of the following risk factors is present or arises during labour, perform a full assessment of all factors listed in recommendation 1.5.1:

- prolonged period since rupture of membranes (24 hours or more) (see also section 1.11)
- moderate hypertension (150/100 to 159/109 mmHg [see the NICE guideline on hypertension in pregnancy])
- confirmed delay in the first or second stage of labour (see recommendations 1.12.13, 1.13.24 and 1.13.25)
- the presence of non-significant meconium.

Advise continuous cardiotocography if 2 or more of the above risk factors are present, or any other risk factor in recommendation 1.5.1 is present with 1 of these. **[new 2014]**

NICE guidelines

INFORMED CONSENT

A legal concept that has several requirements:

1. A discussion about what the procedure entails;
2. Must include risks, benefits, alternatives and future implications;
3. Should include an opportunity to ask questions;
4. Does not require a signed paper, but some documentation is prudent.