2023 AWHONN WA SPRING CONFERENCE "FAST TRACK YOUR OB KNOWLEDGE"

Antenatal Testing
Intermittent Auscultation and Palpation

Kathy Spring, RNC-OB

AWHONN
PROMOTING THE HEALTH OF WOMEN AND NEWBORNS

Objectives:

- Review types of prenatal tests done on parent(s) and fetus
- Describe indications of and how antenatal testing is conducted and clinical significance of findings
- Discuss coordination of care to improve outcomes with non-reactive findings
- Review IA: Intermittent Auscultation/Palpation benefits, eligibility, technique, equipment and documentation

Maternal Fetal Testing

AWHONN
PROMOTING THE HEALTH OF WOMEN AND NEWBORNS

Maternal-Fetal Testing

- Cell Free DNA, genetic testing on maternal blood> 10 weeks (Trisomy 13, 18, 21, sex chromosomes and gender)
- AFP/Quad Screen 15-18 weeks- to detect neural tube defects/Trisomy 21
- Ultrasound- determine amniotic fluid volume, detect anomalies/abnormalities of fetus, placenta, document fetal presentation
- Amniocentesis or Chorionic Villi Sampling- genetic testing, lung maturity, reduce amniotic fluid volume
- Cordocentesis/PUBS (percutaneous umbilical blood sampling) >18 weeks, detect abnormalities, correct abnormalities, deliver medications, transfuse in case of fetal anemia

Antenatal Testing

AWHONN
PROMOTING THE HEALTH OF WOMEN AND NEWBORNS

Benefits of Testing

- Patients whose pregnancies have gone beyond their due date
- Patients who have diabetes, chronic hypertension or pre-eclampsia
- Patients whose pregnancies demonstrate intrauterine growth restriction
- Patients with a multiple pregnancy
- Patients with bleeding during pregnancy
- Patients who have too much (polyhydramnios) or too little (oligohydramnios) amniotic fluid
- Patients who currently have children with congenital anomalies

Testing Guidelines

	KPWA Antepartum Testing Guidelines	
Condition	Gestational Age to Start	Frequency
AMA 35-39	N/A	N/A
AMA 40+	37 weeks	NST 2x/wk
Arrhythmia (fetal)	At diagnosis	NST 1-2 x/wk
Oligohydramnios	At diagnosis	NST/MVP 2x wk until resolves
Polyhydramnios	32-34 wk	NST/MVP 2x wk until resolves
Asthma (mod/severe)	32 wk	NST 2x wk/weekly MVP
Cholestasis	At diagnosis	NST 2x/wk
Decreased fetal movement	At diagnosis/occurrence	NST/MVP or BPP if indicated
GDM A1	N/A	N/A
GDM A2-D (well controlled)	32 wk	NST 2x wk/weekly MVP
GDM (uncontrolled)	32 wk	NST 2x wk/weekly MVP
cHTN (no meds)	36 wk	NST weekly
cHTN, well controlled (on meds)	32-34 wk	NST 2x wk/weekly MVP
cHTN (uncontrolled)	Per MFM recommendation	
GHTN	28-30 wk	NST 1-2 x/wk
Pre-eclampsia	At diagnosis	NST 2x wk/weekly MVP
Hyperthyroidism (controlled)	36 wk	NST weekly
Hyperthyroidism (poor control)	32-34 wk	NST 1-2 x/wk
Post-term	41 wk	NST 2x wk/weekly MVP
Twins Di-Di	N/A	N/A
Previous Fetal Demise	32 wk or prior to previous demise	NST weekly
Velamentous Cord insertion	36 wk or earlier if concerns	NST weekly
Thrombophilia	32-36 wk	NST weekly
Other Maternal/Fetal/Cord/Placental conditions (i.e. Covid, 2 VC, prior myomectomy, previa, other multiples, isoimmunization)	Per MFM recommendation	

Non-Stress Test

AWHONN
PROMOTING THE HEALTH OF WOMEN AND NEWBORNS

Non-Stress Test

- Antepartum fetal surveillance technique
- A test of fetal wellbeing and oxygenation prior to labor onset
- Measurement of FHR (fetal heart rate) during fetal activity
- Adequate oxygenation is required for FHR and activity to be normal
- Loss of FHR variability may be an indication of sleep pattern or stress
- The test is either reactive or non-reactive
- The test has no predictive value

Equipment-

Electronic Fetal Monitor w/BP cuff/cable and tracing paper

Ultrasound/Tocotransducer and cables

Monitor belts/band

Ultrasonic gel

Towel

Facility approved disinfectant

Procedure for NST

- Verify order and patient identity using at least two identifiers. Place patient adhesive ID sticker on paper tracing
- Perform hand hygiene
- Provide privacy and offer drink/snack
- Explain procedure
- Raise bed/chair to ergonomic advantage to prevent provider injury
- Perform Limited Third Trimester Ultrasound in reclining position if indicated (for institutions where MVP/AFI in RN scope)
- Assist patient into comfortable position that allows for optimal tracing of FHR (side-lying for anterior placenta)
- Locate the fetal back, place the TOCO/US transducers in optimal position using transducer straps/belly band
- Turn on EFM. Perform T/BP (delay BP 10 min optimal), pre-eclampsia assessment as indicated. Serial BP as needed.
- Observe for frequency/duration of contractions, palpate for intensity
- Identify baseline FHR and variability, observing for accelerations and late/early/variable/prolonged decelerations
- Determine reactivity and necessary further testing/evaluation (consider music to stimulate sleeping baby to elicit reactivity)
- Reactive- fetus moves two times with accelerations of FHR within a 20-minute testing period
- Nonreactive- no accelerations, the FHR doesn't increase with movement or fetus doesn't move at all
- Complete the procedure: Remove and clean equipment, document procedure, report findings as needed and route tracing and images to responsible provider to review

Indications for Ultrasound for MVP/AFI/BPP

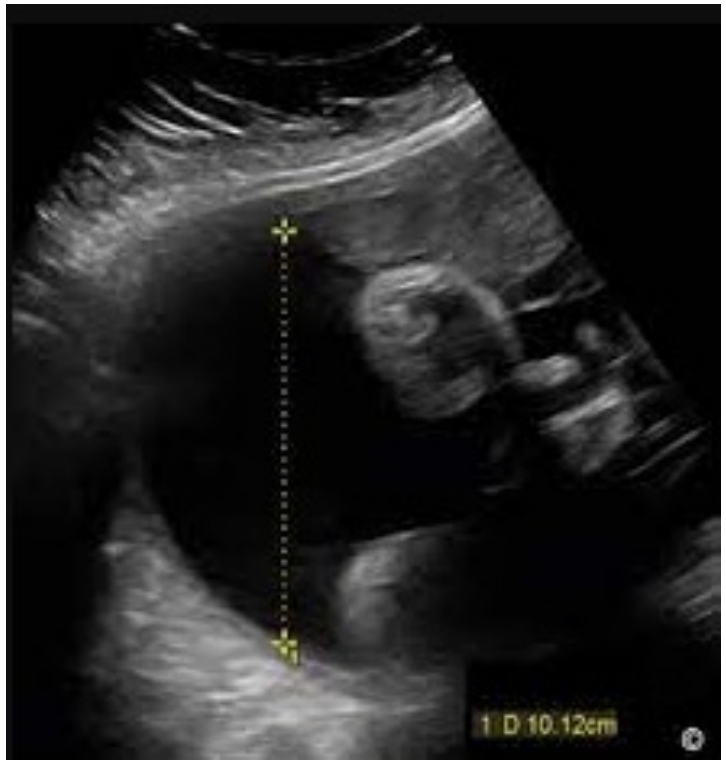
- Certain health conditions require weekly MVP (decreased FM, post-term, severe asthma, oligo, poly, GDM, HTN/Pre-Eclampsia). Growth US may be done in Radiology for certain conditions.
- Non-reactive NST *</2 -15 x 15 bpm accelerations within 20 minutes* (**32+ weeks** to post-term)
- Non-reactive NST *</2 - 10 x 10 bpm accelerations within 20 minutes* (**24-32 weeks**)
- Prolonged monitoring past 40 minutes
- Any periodic/episodic changes that are concerning
- Contraction Stress Test is available in hospital however less common today

Limited Ultrasound

AWHONN

PROMOTING THE HEALTH OF WOMEN AND NEWBORNS

Limited Third Trimester Ultrasound-MVP



BPP (Biophysical Profile)

- The criteria to earn two points for each component are:
- Fetal gross body movement: Three or more separate movements of the fetus's body or limbs in 30 minutes
- Fetal muscle tone: One or more episodes of active extension and flexion of an arm or leg, or the opening and closing of a hand, in 30 minutes
- Fetal breathing movements: At least one episode of continuous breathing that lasts at least 30 seconds during the 30-minute test
- Amniotic fluid volume: At least one pocket of amniotic fluid that measures 1 centimeter across and 2 centimeters vertically

Documentation of NST/Limited Third Trimester Ultrasound

- Patient HR/BP, pre-eclampsia assessment
- Interpretation of EFM tracing and FHR data
- Fetal position, activity
- Uterine activity, intensity
- Interventions (position change, audio stimulation)
- Education provided (appointments, prenatal reminders, warning signs, labor signs, anticipatory guidance, classes)
- Plan of care, route to appropriate OB provider

AWHONN

PROMOTING THE HEALTH OF WOMEN AND NEWBORNS

Intermittent Auscultation: IA

History of Fetal Monitoring

Two main methods of monitoring the fetal heart rate: intermittent auscultation (IA) and continuous electronic fetal monitoring (cEFM)

Over time, the increasing availability of EFM resulted in decreased use or elimination of IA for fetal surveillance (McCartney, 2015) and thus decline in familiarity with IA technique which marginalized IA as a method of EFM.

Routine use of EFM has been linked to increases in operative vaginal birth and cesarean birth rates without an accompanying decrease in perinatal mortality or the incidence of childhood morbidity.

Intermittent Auscultation (IA) and Palpation

SWEDISH
HEALTH FOR GOOD

"IA is the preferred method for monitoring the FHR during labor of women at term who at the onset of labor are at low risk for developing fetal acidemia."

IA is an evidence-based standard of care for fetal assessment in low-risk labor. Using IA, the care provider can assess baseline, rhythm, accelerations, and decelerations and interpret fetal wellbeing.

Benefits of IA

- Increases unrestricted mobility
- Allow providers to auscultate in various positions/locations
- Increases hands on care between laboring person and provider
- Inexpensive
- Decreases risk of unnecessary surgical and operative deliveries

Who is eligible for IA?

- Category 1 FHR on admission after 20 minute EFM tracing
- 37-42 weeks gestation with singleton pregnancy
- Vertex presentation
- No high-risk conditions or using epidural analgesia
- Not on or having had misoprostol within 2 hours (25mcg oral) or 4 hours (50mcg oral/25 mcg vaginal)

Some Examples of High Risk Conditions that Require Continuous EFM

- Preterm <37 weeks gestation
- Multiple gestation
- Maternal hypertension
- Diabetes requiring insulin (IDDM)
- Fetal growth restriction (IUGR)
- Thick/particulate meconium
- Oxytocin, misoprostol use
- Placental abruption
- Intraamniotic infection (IAI)
- Pre-Eclampsia

How Often to Auscultate

Latent Phase (<4 cm)	Latent Phase (4-5 cm)	Active Phase (6+ cm)	Second Stage (passive descent)	Second Stage (active pushing)	Med Admin, SROM/AROM, etc.
At least hourly	Every 15 - 30 minutes	Every 15 - 30 minutes	Every 15 minutes	Every 5 - 15 minutes	After

What to Document:

- ☑ Uterine activity
- ☑ Counted FHR
- ☑ Rhythm
- ☑ Presence/absence of increases or decreases
- ☑ If decel detected, document nadir rate, recurrent or not, intervention

Category I:

- Normal FHR between 110-160 and
- Regular rhythm
- Absence of FHR decreases or decelerations from baseline

Category II:

- Irregular rhythm
- Presence of FHR decreases or decelerations from baseline
- Tachycardia >160 for 10 minutes duration
- Bradycardia baseline < 110 for 10 min duration

Key Points:

- Place fetoscope or Doppler over the fetal thorax or back.
- Determine baseline FHR by listening between contractions & when the baby isn't active (min 30 sec).
- Count the FHR starting at the peak of the contraction and for a short period of time after the contraction (15-30 sec).

12/2/21 V.5

Category II FHR identified:

Increase surveillance

- Position change
- Assess maternal HR
- Increase frequency of IA or consider 20 minute EFM tracing

Recommended by:

ACNM: “IA is the preferred method for monitoring the FHR during labor for women at term who at the onset of labor are at low risk for developing fetal acidemia.”

ACOG: “…the widespread use of continuous EFM has not been shown to significantly affect such outcomes as perinatal death and cerebral palsy when used for women with low-risk pregnancies.”

AWHONN: “A woman’s preferences and clinical presentation should guide selection of FHM techniques. In general, the least invasive method of monitoring is preferred to promote physiologic labor and birth.”

Limitations of Continuous EFM

- Continuous EFM is associated with reduced rates of neonatal seizures, but no clear differences are noted in occurrence of cerebral palsy, infant mortality or other standard measures of neonatal wellbeing.
- Patients placed on continuous EFM on admission had higher probability of continued use during entire labor but no difference in birth outcomes
- Continuous EFM increases the rate of cesarean deliveries and operative vaginal births with forceps/vacuum.

Benefits of IA/Palpation

- Increases unrestricted mobility
- Allows providers to auscultate/palpate in various positions and locations (i.e. birthing tubs)
- Increases contact between the healthcare provider and laboring person and family
- Inexpensive
- Decreases risk of unnecessary surgical and operative deliveries
- Should be the default monitoring method in low risk birthing persons

Low-risk pregnancy – candidate for IA

- ☐ Category I FHR strip on admission
- ☐ 37-42 weeks gestation
- ☐ Vertex presentation
- ☐ Singleton pregnancy
- ☐ No high-risk conditions (see adjacent column)
- ☐ Not on Pitocin
- ☐ No misoprostol within 2 hours (25 mcg oral) or 4 hours (50 mcg oral or 25 mcg vaginal)
- ☐ No epidural

High-risk conditions – requires continuous EFM

- ☐ Multiple gestation
- ☐ <37 weeks gestation
- ☐ Hypertensive disorder (chronic htn, preeclampsia)
- ☐ Diabetes requiring insulin
- ☐ Fetal growth restriction
- ☐ Thick or particulate meconium
- ☐ Oxytocin use
- ☐ Placental abruption
- ☐ Intraamniotic infection

Equipment

1. Handheld Doppler
2. Ultrasound gel
3. Clock with second hand
4. Cloth to remove gel

How to Perform IA

1. Upon admission, initiate a 20-minute EFM tracing. Verify that the tracing is normal (Category I), and the patient is low-risk. Obtain order for IA.
2. Gather equipment –Handheld Doppler, ultrasound gel, cloth and watch/clock with second hand.
3. Perform Leopold's maneuvers to identify the fetal presentation and position.
4. Assist the laboring person into a position that maximizes staff ability to hear FHR (fetal heart rate) and preserves patient comfort.
5. Assess frequency and duration of uterine contractions. Note intensity (mild, moderate, strong) and resting tone.
6. Determine the maternal pulse rate.
7. Place the fetoscope or Doppler over the fetal back.
8. Determine the baseline FHR by listening between contractions and when the fetus is not moving. Verify maternal pulse rate if necessary at any time during procedure.
9. Subsequently, count the FHR starting at the peak of the uterine contraction and for a short period of time (30 seconds) after the contraction resolves. Baseline FHR norm 110-160.
10. Note increases (accelerations) or decreases (decelerations) from the baseline rate by counting and recording the FHR using a multiple-count strategy* agreed upon by practice protocol.

When to Count

Latent phase (< 4cm)	Latent phase (4-5 cm)	Active phase (6+ cm)	Second stage (passive fetal descent)	Second stage (active pushing)
At least hourly	Every 15-30 minutes	Every 15-30 minutes	Every 15 minutes	Every 5-15 minutes

Other times to listen: SROM/AROM, medication administration, abnormal contraction pattern, change in pain

What to document

1. Uterine activity (*Contracting every 2-3 mins x 60-90 s, palpate strong, soft resting tone*)
2. Counted FHR (*145 bpm)*
3. Rhythm: regular or irregular
4. Presence or absence of increases or decreases (from baseline) (*accels present, no decels)*
5. If deceleration is detected, document nadir rate (recurrent or not ?) and intervention applied

Category I

Category I FHR characteristics by auscultation include the following:

- Normal FHR baseline between 110 and 160 bpm and,
- Regular rhythm and,
- Absence of FHR decreases or decelerations from the baseline

Note: Presence of FHR increases or accelerations from the baseline may or may not be present in a FHR auscultated and determined to be Category I.

Category II

Category II FHR characteristics by auscultation include any of the following:

- 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)

Note: Anything in the category II strip requires a switch to continuous EFM for 20 minute tracing.

Summary

- Intermittent auscultation should be used for low-risk laboring patients
- IA use in low-risk laboring patients may decrease unnecessary operative vaginal and cesarean deliveries
- There are many benefits to IA, including increased patient mobility, increased contact between RN and laboring patient and family, improved patient satisfaction, and low cost
- Patients should be involved in shared decision making about fetal monitoring
- Follow hospital Intermittent Auscultation Policy and Procedure

AWHONN
PROMOTING THE HEALTH OF WOMEN AND NEWBORNS

Knowledge Check

QUESTION: What is the benefit of early genetic testing?

QUESTION: Has Continuous EFM has been shown to increase the rate of cesarean deliveries and operative vaginal deliveries?

QUESTION: The Non-Stress test can predict a fetus at risk of intrauterine death or neonatal complications within the next week

QUESTION: Which patient is a good candidate for IA?
1. Angie, a 32 year old G2P1 at 37 weeks with singleton fetus in vertex presentation, presenting for induction for gestational hypertension.
2. Danni, a 28 year old G1P0 at 41 weeks with singleton fetus, in vertex presentation and an uncomplicated pregnancy, presenting in spontaneous labor and SROM.
3. Megan, a 30 year old G4P2 at 41 weeks with A2GDM, in labor with an epidural.

AWHONN
PROMOTING THE HEALTH OF WOMEN AND NEWBORNS

1. Devane D, Lalor JG, Daly S, McGuire W, Cuthbert A, Smith V. Cardiotocography versus intermittent auscultation of fetal heart on admission to labour ward for assessment of fetal wellbeing. *Cochrane Database Syst Rev*. 2017;1(1):CD005122. Published 2017 Jan 26. doi:10.1002/14651858.CD005122.pub5
2. American College of Obstetricians and Gynecologists. ACOG Practice Bulletin No. 106: Intrapartum fetal heart rate monitoring: nomenclature, interpretation, and general management principles. Obstet Gynecol. 2009 Jul;114(1):192-202. doi: 10.1097/AOG.0b013e3181aef106. PMID: 19546798.
3. Intermittent Auscultation for Intrapartum Fetal Heart Rate Surveillance: American College of Nurse-Midwives [published correction appears in J Midwifery Womens Health. 2016 Jan-Feb;61(1):134]. *J Midwifery Womens Health*. 2015;60(5):626-632. doi:10.1111/jmwh.12372
4. WHO recommendation on intermittent fetal heart rate auscultation during labour | RHL. Extranet.who.int. https://extranet.who.int/rhl/topics/preconception-pregnancy-childbirth-and-postpartum-care/care-during-childbirth/care-during-labour-1st-stage/who-recommendation-intermittent-fetal-heart-rate-auscultation-during-labour. Published 2018. Accessed November 12, 2020.
5. Ayres-de-Campos D, Arulkumaran S; FIGO Intrapartum Fetal Monitoring Expert Consensus Panel. FIGO consensus guidelines on intrapartum fetal monitoring: Physiology of fetal oxygenation and the main goals of intrapartum fetal monitoring. *Int J Gynaecol Obstet*. 2015;131(1):5-8. doi:10.1016/j.ijgo.2015.06.018
6. Lewis D, Downe S; FIGO Intrapartum Fetal Monitoring Expert Consensus Panel. FIGO consensus guidelines on intrapartum fetal monitoring: Intermittent auscultation. *Int J Gynaecol Obstet*. 2015;131(1):9-12. doi:10.1016/j.ijgo.2015.06.019
7. Heelan L. Fetal monitoring: creating a culture of safety with informed choice. *J Perinat Educ*. 2013;22(3):156-165. doi:10.1891/1058-1243.22.3.156
8. Martis R, Emilia O, Nurdiati DS, Brown J. Intermittent auscultation (IA) of fetal heart rate in labour for fetal well-being. *Cochrane Database Syst Rev*. 2017;2(2):CD008680. Published 2017 Feb 13. doi:10.1002/14651858.CD008680.pub2
9. Herbst A, Ingemarsson I. Intermittent versus continuous electronic monitoring in labour: a randomised study. *Br J Obstet Gynaecol*. 1994;101(8):663-668. doi:10.1111/j.1471-0528.1994.tb13181.x
10. Mahomed K, Nyoni R, Mlambo T, Jacobus E, Kasule J. Intrapartum foetal heart rate monitoring--continuous electronic versus intermittent Doppler--a randomised controlled trial. *Cent Afr J Med*. 1992;38(12):458-462
11. Alfirevic Z, Devane D, Gyte GM. Continuous cardiotocography (CTG) as a form of electronic fetal monitoring (EFM) for fetal assessment during labour. *Cochrane Database Syst Rev*. 2013;(5):CD006066. Published 2013 May 31. doi:10.1002/14651858.CD006066.pub2
12. Patey AM, Curran JA, Sprague AE, et al. Intermittent auscultation versus continuous fetal monitoring: exploring factors that influence birthing unit nurses' fetal surveillance practice using theoretical domains framework. *BMC Pregnancy Childbirth*. 2017;17(1):320. Published 2017 Sep 25. doi:10.1186/s12884-017-1517-z
13. Maude RM, Skinner JP, Foureur MJ. Intelligent Structured Intermittent Auscultation (ISIA): evaluation of a decision-making framework for fetal heart monitoring of low-risk women. BMC Pregnancy Childbirth. 2014 May 31;14:184. doi: 10.1186/1471-2393-14-184. PMID: 24884597; PMCID: PMC4070350.
14. Romano AM, Buxton M. A Multimethod Improvement Project to Strengthen Intermittent Auscultation Practice Among Nurse-Midwives and Nurses. *J Midwifery Womens Health*. 2020;65(3):362-369. doi:10.1111/jmwh.13113
15. Miller LA. Listen Carefully: Implementing Intermittent Auscultation Into Routine Practice. *J Perinat Neonatal Nurs*. 2015;29(3):197-199. doi:10.1097/JPN.0000000000000117
16. Field B, Booth A, Ilott I, Gerrish K. Using the Knowledge to Action Framework in practice: a citation analysis and systematic review. *Implementation Science*. 2014;9(1). doi:10.1186/s13012-014-0172-2
17. Recommendations | Intrapartum care for healthy women and babies | Guidance | NICE. Nice.org.uk. https://www.nice.org.uk/guidance/cg190/chapter/Recommendations#monitoring-during-labour. Published 2014. Accessed October 20, 2020.
18. Fetal Heart Monitoring. *Journal of Obstetric, Gynecologic & Neonatal Nursing*. 2015;44(5):683-686. doi:10.1111/1552-6909.12743
19. Transforming Maternity Care Vision Team, Carter MC, Corry M, et al. 2020 vision for a high-quality, high-value maternity care system. *Womens Health Issues*. 2010;20(1 Suppl):S7-S17. doi:10.1016/j.whi.2009.11.006
20. https://www.ncbi.nlm.nih.gov/books/NBK537123/
21. Lippincott Procedures-Fetal Monitoring, external (lww.com)
22. Kaiser Permanente Medicine: KPWA Antepartum Testing Guidelines- March 2021
23. Kaiser Permanente Fetal Assessment Monitoring (Antepartum)
24. Katherine Winters, DNP, CNM, ARNP –NeighbocareHealth and Ashley Skluzacek, DNP, ND, CNM, ARNP-Providence Women's Health Services for their work with Swedish Medical Center L&D Shared Leadership on Intermittent Auscultation and Palpation-2021
25. AWHONN Ultrasound Examinations Performed by RN in OB/GYN/Reproductive Medicine Settings: Clinical Competencies and Education Guide, Fifth Edition- and AWHONN Clinical Practice Brief on Fetal Heart Rate Auscultation, 3rd Edition