**Fetal Heart Rate Patterns**

National Midwifery Institute, Inc.

Study Group Coursework

*Syllabus*

Description:

This module explores an overviewof issues related to intrapartumfetal heart rate characteristics and patterns including assessment, documentation and when to transport*.* It includes recommended reading materials in print and online, and asks students to complete short answer questions for assessment, long answer questions for deeper reflection, and learning activities/projects to deepen your hands-on direct application of key concepts.

Learning Objectives:

* Review Fetal/Newborn Circulation module.
* Identify normal fetal heart rate activity.
* Demonstrate counting and assessing normal and abnormal FHR.
* Understand the relationship between oxygenation and baby’s well being as assessed through the monitoring of fetal heart rate patterns.
* Understand how to auscultate FHR and translate what you hear to the commonly understood visual printout of the electronic fetal monitor.
* Identify the basic fetal heart rate patterns involving decelerations: variable decelerations, early decelerations, late decelerations, and what these indicate about a baby’s wellbeing.
* Understand the implications of bradycardia and tachycardia.
* Identify the sinusoidal pattern and its implications.
* Identify head compression decelerations and understand monitoring for normal resolution of head compression decelerations.
* Understand how the change of maternal position can impact fetal heart rate patterns.
* Identify how the midwife may hear maternal circulatory sounds and mistake them for FHR.
* Identify when applying oxygen therapy to the mother is appropriate response to the baby’s fetal heart rate patterns.
* Understand the technology of continuous electronic fetal monitoring.
* Understand the concept of, and how to perform, a non-stress test
* Review Genetic and Prenatal Screening module.
* Review Newborn Apnea/Hypoxia/Respiratory Distress module.
* Create Practice Guidelines for the monitoring of fetal heart rate during pregnancy and labor, and for response to indications of fetal distress.
* Understand basic doppler technology.
* Understand how auscultation with a fetoscope works.

Learning Activities:

* Research and read appropriate study sources, seeking out additional study sources where needed
* Complete short answer questions in attached module document for assessment
* Complete long answer questions for deeper reflection in attached module document for assessment
* Complete learning activities listed in attached module document for assessment
  + Practice counting fetal heart tones with a metronome
  + Create Practice Guidelines for the monitoring of fetal heart tones
  + Create Practice Guidelines for responding to indications of fetal distress
* Submit work to Study Group Course Coordinator
* Reflect on feedback from Study Group Course Coordinator and re-submit work as needed

Study Sources (print):

The following texts are recommended for completion of this module. Use them to cross reference and build a more comprehensive understanding.

Using keywords from the Learning Objectives, search the index. Read those pages listed, and read the chapter in which they are found. Establish a context for the information so that you understand how other topics are related. In addition, read the chapter headings in the Table of Contents, and flip through each text to familiarize yourself with the content of chapters. As you work through Study Group modules, you will eventually read each text in its entirety.

* Varney’s Midwifery
* Myles Textbook for Midwives
* Human Labor and Birth, Oxorne and Foote
* Holistic Midwifery, Vol. I, II, Frye
* Birth Emergency Skills Training, Gruenberg
* Assessment and Care of the Well Newborn, Thureen, Deacon, O’Neill, Hernandez
* *Optional*
* Fundamentals of Fetal Health Surveillance, Canadian Perinatal Programs Coalition

Study Sources (online):

See NMI website Fetal Heart Rate Patterns module web resources section for current online study sources for this module.

Related Modules:

* Newborn Apnea/Hypoxia/Respiratory Distress
* Transporting
* Postdates and Postmaturity Syndrome
* Fetal/Newborn Circulation
* Genetic and Prenatal Screening

Submitting Module for Assessment:

Study Group modules are accepted electronically in PDF format *only*. We encourage you to submit modules as you complete them throughout each quarter of enrollment.

Please e-mail your completed Study Group module to:

Study Group Course Work Instructor nmistudygroup@nationalmidwiferyinstitute.com

Once your module has been e-mailed to us, you will receive an e-mail confirmation that we have received it. Study Group modules are reviewed and returned in digital format as PDF documents. Modules can take up to 1 month from submission to be reviewed and returned to you. We will return your module as an e-mail attachment. Each module includes an Evaluation Sheet at the end of the pdf. The module’s page on the student portal also includes a link to a fillable online module evaluation sheet. Please take the time to fill out the module evaluation sheet and return it to us for each module, it helps us to improve our course work.

Please follow these formatting guidelines when submitting modules:

* Your first initial and last name in title of PDF, along with name of module. Example: “ERyanFirstStage.pdf”
* Title of module on the document’s front page
* Your name on the document’s front page
* Provide the text of each question, followed by a blank line and then your thoughtful answer (without the question, you have commentary without context)
* Blank line between the answer for a question and the next question: question, blank line, answer, blank line, question, blank line, answer…
* Please leave margin space for our comments!
* Don’t use script or cursive writing style text
* Font size not smaller than 12
* Credit sources of direct quotes

Completion Requirements and Feedback:

In order to complete this module for graduation purposes from National Midwifery Institute you must review all resources, complete the attached short answer questions for assessment, long answer questions for deeper reflection, and learning activities/projects, and submit them as detailed above. Upon return to you, your coursework may have feedback or ask for additional information or exploration on certain topics. Your work will be evaluated n the following Rubric (pasted below). You must achieve a minimum score of **7.5** in order to move on to your next module, though we encourage all students to strive for a **10.**

|  | **Level 1**  **(0 Points)**  **Not Adequate** | **Level 2**  **(1 Point) Developing Adequacy** | **Level 3**  **(1.5 points)**  **Meets Basic Expectations** | **Level 3**  **(2 points) Exceeds Expectations** | **Student Score** |
| --- | --- | --- | --- | --- | --- |
| **Completion of module prompts and elements** | -Module not completed | -Major Elements of module are missing | -All aspects of module elements present, with some minor questions unanswered or missing | -All aspects of module elements present and answered completely |  |
| **Demonstrates Comprehension of module content and concepts** | - Lack of comprehension | - Responses are unclear and do not reflect basic comprehension of module concepts | - Responses are clear and reflect basic comprehension of module content and concepts | - Responses are clear, well written, and reflect in-depth comprehension of module content and concepts. Added subpoints and additional reflections demonstrate a deeper knowledge and curiosity. |  |
| **Analysis** | - Key terms not defined | -Inaccurate definitions of key items  -Limited connections made between evidence, subtopics and clinical experience | -Accurate definitions of key items  -Connections made between evidence, subtopics and clinical experience -Incorporation of original ideas and incorporates some clinical experience  in responses where possible | - Accurate definitions of key items  -Strong connections made between evidence, subtopics and clinical experience |  |
| **Evidence** | - No research evidence used | -Research not used  -Research not clearly connected to questions asked in module | -Research is present but limited -Research presented is weak or not relevant to communities served by midwives | -Research is abundant -Research is compelling and relevant to communities served by midwives |  |
| **Engagement with Learning Resources** | -Evident study sources were not utilized | -Evident study sources were partially utilized | -Evident that study sources were fully utilized | -Evident that study sources were fully utilized and independent research was undertaken -Full incorporation of original ideas, personal analysis and incorporates relevant clinical experience in all areas possible |  |

Skills

Following are excerpts from the NMI forms for assessment of midwifery skills, which include all skills identified and required by NARM. Review the following skills and consider how they each relate to the content of this module. If you are currently working with a preceptor, take this opportunity to focus on these areas. During Supervised Primary Care you will formally evaluate these skills together using the NMI forms *Form 52 - Assessment of Student’s Midwifery Skills* and *Form 53 - Student Self-Assessment of Midwifery Skills.*

2. General Health care Skills:

D. Demonstrates the use of instruments and equipment including:

8. Doppler

9. Fetoscope

I. Administers Oxygen

K. Administers the following pharmacologic (prescriptive) agents:

2. Medical oxygen

3. Maternal Health Assessment:

K. Recognizes and responds to potential prenatal complications by

15. Managing premature rupture of the membranes in a full-term pregnancy by: a) monitoring fetal movement,

b) monitoring vital signs signs for signs of infection,

c) encouraging increased fluid intake,

d) inducing labor,

e) consult after 24 hours without labor progression

16.Consulting and referring premature rupture of the membranes in pre-term

labor

4. Labor, Birth and Immediate Postpartum

B. Evaluates and supports a laboring mother during the first stage of labor by assessing : 1. Maternal physical and emotional condition based upon assessment of:

a) vital signs,

b) food and fluid intake/output,

c) dipstick urinalysis for ketones,

d) status of membranes,

e) uterine contractions for frequency, duration and intensity with a basic

intrapartum examination,

f) fetal heart tones,

g) fetal lie, presentation, position and descent with:

1) visual observation,

2) abdominal palpation,

3) vaginal examination,

h) effacement, dilation of cervix and station of

presenting part,

i) maternal hydration and/or vomiting by administering 1) fluids by mouth,

2) ice chips,

3) oral herbal/homeopathic remedies,

4) deep immersion in warm water

C. Demonstrates the ability to evaluate and support a laboring woman during the second stage of labor by:

1. Demonstrating the ability to recognize and respond to labor and birth complications such as:

a) Cord prolapse by

1) changing maternal position to:

a) knee-chest,

b) Trendelenberg

2) activating emergency medical services/medical backup plan,

3) applying counter-pressure to the presenting part,

4) placing cord back into vagina

5) keeping the presenting cord warm, moist and protected, 6) monitoring FHT and cord for pulsation,

7) increasing mother’s oxygen supply,

8) facilitating immediate delivery, if birth is imminent,

9) preparing to resuscitate the newborn

b) Management of meconium stained fluids by:

1) eliciting the mother’s cooperation to deliver head quickly,

2) instructing the mother to stop pushing,

3) wiping out the inside of the baby’s mouth,

4) clearing the airway with suction of mouth and nose,

5) preparing to resuscitate the baby

c) Management of maternal exhaustion by:

1) providing nutritional support,

2) ensuring adequate hydration,

3) providing non-allopathic treatments,

4) evaluating the mother’s psychological condition,

5) encouraging rest,

6) monitoring vital signs,

7) monitoring fetal well-being,

8) evaluating urine for ketones,

9) evaluating for consultation and/or referral

d). Demonstrates the ability to recognize and respond to labor and birth

complications such as:

1. Abnormal fetal heart tones and patterns

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Study Group Coursework

*Short Answer Questions*

Short Answer Questions:

1. What is fetal heart rate monitoring?

2. Why do we listen to fetal heart rates?

3. Describe how you count fetal heart rates at a prenatal visit. How many seconds do you listen for?

4. For each of the following tools (numbered below) for monitoring fetal heart rate patterns, answer each of the following:

1. describe what it is and how it functions
2. risks and benefits
3. personal experience with using (or receiving) this technology
4. personal bias

you may also consider reflections clients have shared when using each technology:

1. Pinard horn
2. Fetoscope
3. Leff fetoscope
4. Hand-held doppler
5. Non-Stress Test
6. Continuous Electronic Fetal Monitoring with ultrasonagraphic transducer
7. Internal Scalp Electrode

5. When listening to fetal heart rates, what other sounds might you hear? How do you differentiate these sounds?

6. How do you determine where to listen to the fetal heart rate?

7. Describe in detail the method you prefer to use to evaluate fetal heart rate patterns in pregnancy.

8. Is your method described above evidence based? How does it differ and how could you improve your fetal heart rate evaluations?

9. How do the evaluations you make during pregnancy effect your evaluations during labor?

10. Describe in detail what a Non-Stress Test measures

1. what are the elements of a non-stress test?
2. how long are the conducted for?
3. what equipment is needed for an NST?
4. what readings would classify an NST as “reactive” or “non-reactive”?
5. what would you do if a client had a non-reactive NST after 20 minutes?
6. have you ever performed an NST? Do the homebirth midwives in your area offer NSTs?
7. when may an NST be indicated?
8. how long can you consider NST results valid for?

11. Describe in detail the method you prefer to use to evaluate fetal heart rate patterns in labor.

12. Describe normal fetal heart rate pattern values (or range) in terms of:

1. fetal heart rate (baseline)
2. fetal heart rhythm
3. variability
4. beat to beat variability
5. presence/absence of accelerations
6. presence/absence of decelerations

13. Define fetal tachycardia.

14. Create a list of what fetal tachycardia can indicate.

15. Define fetal bradycardia.

16. Describe what a regular and irregular heart rate sound like.

17. What may an irregular heart rate indicate?

18. Why is variability so important when listening to fetal heart rates? Can it be assessed with all the tools listed above in Question 3?

19. Define an acceleration of a fetal heart rate. How many points must it rise from baseline and how long must it be sustained in order for it to “count”?

20. For each of the following deceleration patterns (numbered below)

1. describe the pattern and what you might hear when listening
2. what is the most likely cause?
3. what is your concern?
4. what is your first reaction to try to resolve it?

be sure to also reflect on the client’s reaction if they are also able to hear the pattern

1. variable decelerations (uncomplicated)
2. variable decelerations (complicated)
3. early decelerations
4. late decelerations
5. prolonged deceleration

21. Describe the steps of “intrauterine resuscitation” you would take to respond to abnormal decelerations.

22. What is the current evidence on the effectiveness of oxygen administration to the mother/parent in correcting abnormal fetal heart rate patterns?

23. What is a sinusoidal heart rate pattern? What does it sound like? What might it indicate?

24. How is a typical fetal sleep cycle reflected in the FHR?

25. Identify the effects of the following on fetal heart rate patterns:

1. maternal/parental use of caffeine and other stimulants
2. maternal/parental exercise
3. narcotics or epidural analgesia for pain relief
4. maternal/parental exhaustion or dehydration
5. maternal/parental or fetal infection

26. How do you chart FHR patterns? Do you have a systematic way of evaluation and documentation?

1. in pregnancy
2. in labor

27. Based on the information you can gather from FHR patterns, list 4 signs that would tell you the baby’s condition is worsening.

28. Define hypoxia. Define hypoxemia.

29. Describe the physiologic process that a fetus undergoes when faced with decreasing levels of oxygen, including how this is reflected in the FHR.

30. Explain, as you would to clients, what the baby undergoes during the development of fetal distress.

31. In terms of monitoring fetal well being during labor, what medical intervention gives more reliable information than evaluation of FHT?

Contiued…..

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Study Group Coursework

*Long Answer Questions for Deeper Reflection*

Questions Requiring Longer, More Thoughtful Answers:

(number continued from previous section).

32. Your client has been laboring hard for several hours. They are comfortable, for now, lying on their left side and resting deeply between intense contractions. You can easily hear the baby’s heart rate with a fetoscope in this position, and the baby has been doing well. As you listen routinely for heart tones, you hear a single deceleration from 140 to 100.

1. what do you do?
2. If this happened during a contraction, what would you suspect?
3. If this happened between contractions, what would you suspect?

33. You have just arrived at your client’s home. You suspect she is in early labor and called you when she felt her water break. She shows you her underwear and pad, they are wet with clear fluid. You listen to the baby and hear heart tones in the range of 80 to 90.

1. what do you do?
2. how can you be certain the heart tones you are monitoring are those of the baby?
3. you determine they are maternal heart tones: now what?
4. you determine they are fetal heart tones: now what?

34. Discuss Continuous Electronic Fetal Heart Rate Monitoring

1. as you understand it, explain the history of the development and widespread adoption of continuous electronic fetal heart rate monitoring in hospital settings.
2. what else in our changing health outcomes has changed drastically alongside the adoption of continuous electronic fetal heart monitoring?
3. what does the evidence say about continuous fetal heart rate monitoring and its reduction in interventions or improvement of fetal outcomes?
4. how does continuous fetal heart rate monitoring compare in intervention rate and outcomes to intermittent auscultation?
5. list 5 conditions, pre-existing or developed in pregnancy, that might make continuous monitoring recommended for a client?

35. In a homebirth setting, why might some clients or midwives decline use of a doppler at any point? How comfortable are you using only a fetoscope in labor?

Continued…..

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Study Group Coursework

*Projects/Learning Activities*

Projects(send completed projects with the rest of your course work for this module)

(number continued from previous section).

36. Download a metronome app from your appstore for a smartphone. A metronome will keep a steady beat and can be set for any rate you like. You will not be able to practice hearing decels or accels with a metronome, but you can get used to counting quickly and accurately. Set the metronome for a rate between 120-160 and then count for 5 seconds, 6 seconds and 15 seconds. Which was the most accurate?

37. Create Practice Guidelines for the monitoring of fetal heart tones during pregnancy and labor. Submit this draft and include it later in your Practice Guidelines projects (in the Charting and Practice Guidelines Module.

38. Create Practice Guidelines for responding to indications of fetal distress. Include when intrauterine resuscitation measures are indicated, when transport is indicated and transport plans. Submit this draft and include it later in your Practice Guidelines projects (in the Charting and Practice Guidelines Module.