



2009 NCC Task Analysis Content Validation Study

Electronic Fetal Monitoring Subspecialty Examination

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1. Background and Overview

The purpose of the content validation /task analysis study is to describe the domain of practice, knowledge, skills and abilities that are essential to the specialty practice of the health professionals who provide care based on electronic fetal monitoring knowledge.

The application of the data collected is used to identify test content to be included in the NCC subspecialty examination in Electronic Fetal Monitoring and to determine skills, knowledge and abilities of those engaging in EFM interpretation and management.

NCC EFM content team members, a geographically diverse group representing both academic and clinical practice venues, were charged with the development of the tasks as associated with existent test outlines.

2. Development Process

With psychometric consultation, the tasks/skills identified by the content team were formulated into a survey instrument. The domains for query centered on the following:

- Interpretation of specific EFM tracing/patterns
- Management responsibilities for the assessment/management of patients with certain conditions who are being monitoring with electronic fetal monitoring
- Management responsibilities for the assessment/management of patients undergoing adjunct fetal surveillance testing
- Engagement of specific skills relative to electronic fetal monitoring

a. The following documents were reviewed:

- Standards of Practice and Educational Guidelines from American Nurses' Association (ANA), Standards of Maternal & Child Health Practice
- Standards of Practice Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) Standards for Obstetric, Gynecologic and Neonatal Nursing

Practice Guidelines

- Fetal Heart Monitoring Principles and Practices, 2009, AWHONN
- Clinical Guidelines for the Obstetrician/Gynecologists - Intrapartum Fetal Heart Rate Monitoring
- Nomenclature, Interpretation and General Management Principles, Number 106, July 2000
- Professional literature review

- b. Review of current NCC competency statements and general and detailed test outlines for the Electronic Fetal Monitoring subspecialty examination.
- c. Identification of Essential Knowledge, Skills and Abilities
A specified skill list was not developed as EFM competency is a defined skill itself and criticality and frequency questions incorporated the necessary skill set for EFM management.

The EFM Content Team based on the document review identified competencies of the health care professionals performing electronic fetal monitoring. General discussion on how current competency statements and content included in the test outline related to the professional literature was also initiated. After general discussion, the related management and interpretative skills associated with the specific content area were identified and prioritized.

3. Data Collection

The Zoomerang software was used for survey deployment and aggregate data compilation from survey responses. All those holding an NCC certificate of added qualification in EFM with a valid email address (5679) were notified by email contact and a general invitation to participate was posted on the NCC website. 622 participated or 11%.

Detailed summary results are shown later

2009 Electronic Fetal Monitoring Content Validation/Task Analysis Study Survey Map

Instructions to Participants

We need your input to insure that the NCC Electronic Fetal Monitoring examination is reflective of current EFM practice and interpretation. This survey relates to the kinds of EFM tracing you interpret, disposition of care based on fetal monitoring assessment and the nature and frequency of the tracings you see when managing patients with a variety of conditions. The data from this survey will assist the NCC Electronic Fetal Monitoring Content Team to make revisions to the content outline from which questions are derived for assessment of EFM competency in the NCC subspecialty examination. It should take 20 minutes to complete the survey.

The questions on the survey are categorized according to the identified domains above. The following lists only the questions. To review the answer options, refer to Survey Results.

Demographics and Practice Characteristics of EFM Health Care Providers

- What best describes your practice setting?
- If employed by a hospital what is your unit designation (level 1, level 2 or level 3)?
- What type of health care professional are you?
- What is your highest level of education?
- How many hours do you work a week?
- How long have you been working in the obstetric specialty?
- Where do you live?
- Is NCC EFM certificate of added qualification required for your employment?
- How would you best describe the focus of your position - direct patient, administrative, educational or other?
- Based on your practice, indication on a rating scale of 1 to 3 the amount of time you spend each in the management of the following patient populations with 1 representing the patients you spent the most time with , 2 representing the next group and so on.
- For each of the general test content categories, an assigned percentage of questions on the Electronic Fetal Monitoring exam is noted. Based on experience, do these percentages adequately represent the knowledge needed for electronic fetal monitoring in today's health care environment? If no, please indicate if you would increase, decrease or keep the percentage of questions the same for each major content area of the test.

Frequency and Criticality of Patient Care

- In reviewing the following practice knowledge competencies regarding **Electronic Fetal Monitoring Equipment**, please indicate their criticality to fetal assessment with #1 being the most important and #5 not being important at all. Criticality means it is an expected EFM competency that an obstetric health care provider should possess no matter the educational background, practice setting, patient population focus or years of experience.
- In reviewing the following practice knowledge competencies regarding **Maternal/Fetal Physiology**, please indicate their criticality to fetal assessment with #1 being the most important and #5 not being important at all. Criticality means it is an expected EFM competency that an obstetric health care provider should possess no matter the educational background, practice setting, patient population focus or years of experience.
- In reviewing the following practice knowledge competencies regarding **Pattern Recognition, Interpretation and Intervention**, please indicate their criticality to fetal assessment with #1 being the most important and #5 not being important at all. Criticality means it is an expected EFM competency that an obstetric health care provider should possess no matter the educational background, practice setting, patient population focus or years of experience.
- In reviewing the following practice knowledge competencies regarding **Adjunct Fetal Assessment**, please indicate their criticality to fetal assessment with #1 being the most important and #5 not being important at all. Criticality means it is an expected EFM competency that an obstetric health care provider should possess no matter the educational background, practice setting, patient population focus or years of experience.
- In reviewing the following practice knowledge competencies regarding **Legal Aspects of Electronic Fetal Monitoring**, please indicate their criticality to fetal assessment with #1 being the most important and #5 not being important at all. Criticality means it is an expected EFM competency that an obstetric health care provider should possess no matter the educational background, practice setting, patient population focus or years of experience.
- Please indicate the time frequency on average you devote to **EFM Equipment Monitoring Issues** with #1 being every day and #5 being rarely or never.
- Please indicate the time frequency on average you apply **Maternal and Fetal Physiologic Factors in the Management of Women in Labor Being Monitored by EFM** with #1 being every day and #5 being rarely or never.
- Please indicate the time frequency on average you interpret EFM tracing with any of all the following **Baseline Characteristics** with #1 being every day and #5 being rarely or never.

- Please indicate the time frequency on average you interpret **EFM tracings with the Noted Patterns or Characteristics** with #1 being every day and #5 being rarely or never.
- Please indicate the time frequency on average you interpret EFM tracings in the context of common M
- **Maternal and Iatrogenic Complications** with #1 being every day and #5 being rarely or never.
- Please indicate the time frequency on average you manage pregnant women requiring the following **Adjunct Fetal Assessment Testing** with #1 being every day and #5 being rarely or never.

Questions of Interest

- Does your unit advocate the use of the NICHD terminology in the interpretation of FHR patterns and characteristics?
- How do you keep up with the new practice information (Check all that apply)
- Please describe how EFM competencies are maintained in your institution.
- List the last EFM continuing educational activity in which you participated
- Is there any issue or practice competency that you manage in your practice that was not mentioned in the survey?

Electronic Fetal Monitoring Content Validation/Task Analysis Survey Results

1. What best describes your practice setting?

Hospital	526	85%
Office or clinic setting	34	6%
Academic setting	24	4%
Education (not an academic institution)	14	2%
Administration	4	1%
Research	0	0%
Other, please specify	14	2%
Total	616	100%

2. If you work in a hospital, is it designated as

Level 1	99	16%
Level 2	201	33%
Level 3	262	43%
Not applicable	37	6%
Other, please specify	12	2%
Total	611	100%

3. What type of health care professional are you? (Choose the best response).

Nurse	505	83%
Nurse Midwife	30	5%
Nurse Practitioner	23	4%
Physician	31	5%
Physician Assistant	0	0%
Other, please specify	23	4%
Total	612	100%

4. What is your highest level of education?

MD/DO	30	5%
Doctorate - PhD	5	1%
Doctorate - DNP	1	0%
Post Master's	17	3%
Master's	150	24%
Baccalaureate	267	43%
Associate	98	16%
Diploma	38	6%
Other, please specify	9	1%
Total	615	100%

5. How many hours do you work a week? Work is defined as clinical practice, education, research or administration.

35 hours or more	423	69%
20-34 hours	121	20%
Less than 20 hours	17	3%
Not working right now	4	1%
Self Employed	4	1%
Salaried	43	7%
Per Contract	2	0%
Retired	1	0%
Other, please specify	0	0%
Total	615	100%

6. How long have you been working in the obstetric specialty area?

Less than a year	2	0%
1-5 years	55	9%
6-10 years	62	10%
11-15 years	66	11%
16-20 years	93	15%
Over 20 years	337	55%
Total	615	100%

7. Where do you live (applies to the U.S unless otherwise noted)?

North	69	11%
South	122	20%
East	159	26%
West	140	23%
Midwest	125	20%
Outside the U.S.	1	0%
Total	616	100%

8. Is NCC EFM certificate of added qualification required by your employer/institution?

Yes	247	40%
No	364	59%
Not applicable	4	1%
Total	615	100%

9. How would you best describe the focus of your position? (Select the one that is most representative of your position).

Direct patient care	413	67%
Administrative or managerial	91	15%
Education	85	14%
Research	1	0%
Other, please specify	25	4%
Total	615	100%

10. Based on your practice, indicate on a rating scale of 1 to 3 the amount of time you spend each week in management of the following patient populations with 1 representing the patients you spent the most time with, 2 representing the next group and so on. You should use each number only once. Check box 4 if you don't provide care for this category of patients or venue.

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	1	2	3	4
Antepartum patients	114 19%	260 43%	167 28%	63 10%
Intrapartum patients	353 58%	101 17%	69 11%	81 13%
Postpartum patients	94 16%	130 22%	254 43%	119 20%

11. The test content percentages below represent the number of questions on the Electronic Fetal Monitoring exam. Based on your experience, do these percentages adequately represent the knowledge needed for electronic fetal monitoring in today's health care environment?

**Electronic Monitoring Equipment (5-10%)
 Physiology (10-15-%)
 Pattern Recognition, Interpretation and Intervention (60-70%)
 Adjunct Fetal Assessment (5-10%)
 Legal Aspects of Electronic Fetal Monitoring (5% or less)**

Yes	548	89%
No	66	11%
Total	614	100%

12. If you answered no to the previous question about the content outline, please indicate if you would increase, decrease or keep the percentage of questions in each major content area on the exam. If you answered yes, go to the next question.

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Increase	Decrease	Keep the same
The Electronic Monitoring Equipment (5-10%)	4 3%	41 34%	75 62%
Physiology (10-15-%)	50 40%	18 14%	57 46%
Pattern Recognition, Interpretation and Intervention (60-70%)	24 20%	18 15%	76 64%
Adjunct Fetal Assessment (5-10%)	26 22%	14 12%	77 66%
Legal Aspects of Electronic Fetal Monitoring (5% or less)	57 45%	7 6%	62 49%

13. In reviewing the following practice knowledge competencies regarding Electronic Fetal Monitoring Equipment, please indicate their criticality to fetal assessment with #1 being the most important and #5 not being important at all. Criticality means it is an expected EFM competency that an obstetric health care provider should possess no matter the educational background, practice setting, patient population focus or years of experience

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Very Important	Important	Neutral	Some Importance	No Importance
External fetal monitor equipment components	337 55%	191 31%	31 5%	46 8%	7 1%
Internal fetal monitor equipment components	311 51%	204 33%	47 8%	40 7%	7 1%
External uterine monitoring - how it works	338 56%	197 32%	39 6%	29 5%	5 1%
IUPC uterine monitoring - how it works	322 53%	226 37%	30 5%	23 4%	8 1%
Equipment failure and troubleshooting	255 42%	250 41%	58 9%	43 7%	6 1%
Artifact Detection	222 36%	275 45%	67 11%	42 7%	4 1%
Patient Education	346 57%	192 32%	46 8%	19 3%	5 1%

14. In reviewing the following practice knowledge competencies regarding Maternal/Fetal Physiology, please indicate their criticality to fetal assessment with #1 being the most important and #5 not being important at all. Criticality means it is an expected EFM competency that an obstetric health care provider should possess no matter the educational background, practice setting, patient population focus or years of experience

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Very Important	Important	Neutral	Some importance	No importance
Uteroplacental circulation	456 74%	128 21%	19 3%	11 2%	0 0%
Fetal circulation	282 46%	263 43%	42 7%	18 3%	6 1%
Fetal heart regulation	365 60%	212 35%	22 4%	13 2%	1 0%
Uterine activity (resting tone and contractions)	459 75%	140 23%	8 1%	3 0%	2 0%
Factors affecting fetal oxygenation	543 89%	60 10%	4 1%	2 0%	1 0%

15. In reviewing the following practice knowledge competencies regarding Pattern Recognition, Interpretation and Intervention please indicate their criticality to fetal assessment with #1 being the most important and #5 not being important at all. Criticality means it is an expected EFM competency that a obstetric health care provider should possess no matter the educational background, practice setting, patient population focus or years of experience.

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Very Important	Important	Neutral	Some Importance	No Importance
Baseline heart rate	535 88%	67 11%	5 1%	1 0%	0 0%
Fetal heart rate patterns	569 93%	38 6%	2 0%	0 0%	0 0%
Responses to tachysystole	490 80%	105 17%	8 1%	5 1%	1 0%
Dysrhythmias and other variant patterns	290 48%	244 40%	45 7%	27 4%	2 0%
Common maternal or iatrogenic complications affecting EFM	423 70%	165 27%	14 2%	1 0%	2 0%

16. In reviewing the following practice knowledge competencies regarding Adjunct Fetal Assessment , please indicate their criticality to fetal assessment with #1 being the most important and #5 not being important at all. Criticality means it is an expected EFM competency that an obstetric health care provider should possess no matter the educational background, practice setting, patient population focus or years of experience

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Very Important	Important	Neutral	Some Importance	No importance
Auscultation	185 30%	234 38%	113 19%	60 10%	18 3%
Fetal movement counting	188 31%	304 50%	75 12%	41 7%	3 0%
Nonstress testing	406 66%	187 30%	16 3%	5 1%	0 0%
Contraction stress testing	182 30%	233 38%	119 20%	65 11%	10 2%
Fetal acid base interpretation	229 37%	261 43%	81 13%	33 5%	8 1%
Biophysical profile	275 45%	276 46%	44 7%	9 1%	2 0%
Fetal acoustic stimulation	130 21%	282 47%	136 22%	44 7%	14 2%

17. In reviewing the following practice knowledge competencies regarding Legal Aspects of Electronic Fetal Monitoring , please indicate their criticality to fetal assessment with #1 being the most important and #5 not being important at all. Criticality means it is an expected EFM competency that a obstetric health care provider should possess no matter the educational background, practice setting, patient population focus or years of experience

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Every day	Every week	Every month	Within the last year	Rarely or never
Documentation & charting	549 90%	38 6%	8 1%	14 2%	0 0%
Limitations of use	331 55%	197 33%	50 8%	17 3%	6 1%
Chain of command	399 66%	113 19%	53 9%	31 5%	5 1%

18. Listed below are a variety of EFM Equipment Monitoring Issues. Please indicate the time frequency on average you devote to these activities with #1 being every day and #5 being rarely or never. (Select the option closest to your experience.)

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Every day	Every week	Every month	Within the last year	Rarely or never
Placement and management of external EFM	446 73%	92 15%	27 4%	22 4%	23 4%
Placement and management internal EFM	206 34%	201 33%	91 15%	44 7%	68 11%
Uterine monitoring (External or IUPC)	401 66%	115 19%	35 6%	29 5%	29 5%
Equipment troubleshooting	159 26%	212 35%	126 21%	73 12%	38 6%
Artifact detection	112 19%	157 26%	170 28%	115 19%	50 8%
Patient education about how EFM works	369 61%	143 24%	47 8%	24 4%	23 4%

19. Listed below are a variety of maternal or fetal physiologic factors that affect EFM management and interpretation. Please indicate the time frequency on average you apply this knowledge in management of women in labor who are being monitored with EFM with #1 being every day and #5 being rarely or never. (Select the option closest to your experience.)

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Every Day	Every Week	Every Month	Within the last year	Rarely or Never
Uteroplacental circulation	402 66%	131 22%	32 5%	20 3%	22 4%
Fetal circulation	244 40%	193 32%	88 15%	42 7%	37 6%
Fetal heart regulation	331 55%	157 26%	62 10%	22 4%	31 5%
Uterine resting tone	429 71%	112 19%	23 4%	18 3%	23 4%
Uterine contractions (frequency, duration and intensity)	465 77%	90 15%	14 2%	16 3%	20 3%
How uterine activity affects EFM	445 74%	106 18%	17 3%	17 3%	20 3%
How maternal physiologic conditions affect EFM	396 66%	143 24%	23 4%	17 3%	21 4%
How anesthesia affects EFM	357 59%	154 26%	37 6%	20 3%	34 6%
How drugs (therapeutic and recreational) affect EFM	359 59%	167 28%	37 6%	22 4%	21 3%
How placental factors affects EFM	400 66%	140 23%	27 4%	16 3%	20 3%
How umbilical blood flow affects EFM	384 64%	147 25%	29 5%	16 3%	23 4%

20. In regard to baseline fetal heart rate, please indicate the time frequency on average you interpret EFM tracing with any or all these baseline characteristics with #1 being every day and #5 being rarely or never. (Select the option closest to your experience).

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Every day	Every week	Every month	Within the last year	Rarely or never
Bradycardia	154 25%	252 42%	134 22%	55 9%	12 2%
Tachycardia	152 25%	268 44%	143 23%	39 6%	7 1%
Minimal variability	255 42%	256 42%	64 11%	23 4%	6 1%
Moderate variability	469 77%	104 17%	16 3%	11 2%	6 1%
Marked variability	117 19%	219 36%	182 30%	71 12%	19 3%
Sinusoidal	27 4%	47 8%	83 14%	239 40%	207 34%

21. In regard to fetal heart rate patterns, please indicate the time frequency on average you interpret EFM tracings with the noted patterns or characteristics with #1 being every day and #5 being rarely or never. (Select the option closest to your experience).

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Every Day	Every Week	Every Month	Within the Last Year	Rarely or Never
Accelerations	497 81%	86 14%	11 2%	11 2%	6 1%
Early decelerations	347 57%	177 29%	51 8%	18 3%	11 2%
Variable decelerations	426 70%	143 23%	23 4%	11 2%	6 1%
Late decelerations	216 36%	257 42%	97 16%	30 5%	7 1%
Prolonged decelerations	147 24%	227 37%	155 26%	66 11%	11 2%
Reponse to tachysystole	159 26%	224 37%	134 22%	61 10%	27 4%
Supraventricular tachycardia	12 2%	30 5%	94 16%	268 44%	202 33%
Congenital heart block	7 1%	17 3%	55 9%	219 36%	308 51%
Ectopic beats	13 2%	27 4%	104 17%	250 41%	211 35%

22. In regard to common maternal and iatrogenic complications, please indicate the time frequency on average you interpret EFM tracings that are affected by these factors with #1 being every day and #5 being rarely or never. (Select the option closest to your experience).

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Every day	Every week	Every month	Within the last year	Rarely or never
Diabetes	122 20%	269 44%	158 26%	46 8%	14 2%
Epidural anesthesia	397 65%	127 21%	25 4%	22 4%	40 7%
HELLP syndrome	24 4%	119 20%	223 37%	206 34%	35 6%
Hypertension (any)	168 28%	301 50%	110 18%	23 4%	6 1%
Induction of labor	360 59%	161 26%	35 6%	19 3%	34 6%
Infection	58 10%	183 30%	234 38%	116 19%	18 3%
Intrauterine growth restriction	62 10%	174 29%	254 42%	101 17%	14 2%
Medications	371 61%	141 23%	63 10%	20 3%	12 2%
Multiple gestation	53 9%	160 26%	242 40%	123 20%	29 5%
Placental disorders	45 7%	163 27%	219 36%	152 25%	25 4%
Preeclampsia/eclampsia	107 18%	261 43%	179 29%	50 8%	10 2%
Preterm labor	131 22%	293 48%	136 22%	36 6%	9 1%
Prolonged pregnancy	66	184	171	114	68

	11%	31%	28%	19%	11%
Scar dehiscence	4	15	53	187	346
	1%	2%	9%	31%	57%
Uterine rupture	6	14	28	201	360
	1%	2%	5%	33%	59%
VBAC	27	103	194	170	112
	4%	17%	32%	28%	18%

23. In regard to adjunct fetal assessment testing, please indicate the time frequency on average you manage pregnant women requiring such testing with #1 being every day and #5 being rarely or never. (Select the option closest to your experience).

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Every Day	Every Week	Every Month	Within the last year	Rarely or never
Auscultation	129 21%	93 15%	114 19%	76 13%	193 32%
Biophysical profile	115 19%	245 40%	148 24%	47 8%	50 8%
Contraction stress testing	18 3%	31 5%	119 20%	198 33%	239 40%
Fetal acid base interpretation	76 13%	145 24%	126 21%	115 19%	145 24%
Fetal acoustic stimulation	36 6%	117 19%	144 24%	153 25%	156 26%
Fetal movement counting	159 26%	181 30%	150 25%	71 12%	45 7%
Nonstress testing	313 52%	211 35%	45 7%	20 3%	16 3%

24. Does your unit use the NICHD terminology in the interpretation of fetal heart patterns and characteristics?

Yes	595	97%
No	16	3%
Total	611	100%

25. How do you keep up with new practice information? (Check as many as apply)

Attend live presentation continuing education programs	532	87%
Attend online programs like podcasts or webinars	213	35%
Attend institutional inservice programs	439	71%
Downloads to PDA or IPOD	23	4%
Hold membership in a professional organization	411	67%
Pursue academic degree or classes	145	24%
Read research articles or papers	476	77%
Subscribe to a journal or professional resource	414	67%
Use home study continuing education materials/tests	307	50%
Use web-based (online) home study education programs	277	45%
Visit professional websites	321	52%
Participate in research projects	108	18%