



JOB ANALYSIS REPORT

NATIONAL CERTIFICATION CORPORATION

ELECTRONIC FETAL MONITORING

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PSI SERVICES

Pamela Ing Stemmer, PhD – Senior Psychometrician

Eric D. Lloyd, MS – Associate Psychometrician

SUBMITTED TO



EXECUTIVE SUMMARY

This report describes the methodology and procedure used to conduct a job analysis and develop the exam specifications for the National Certification Corporation (NCC) Electronic Fetal Monitoring certification examination.

The three major activities that comprise the job analysis process described in this report are as follows:

1. **Job Analysis Committee Meeting** – A gathering of subject matter experts (SMEs) to discuss and develop a description of the scope of practice
2. **Job Analysis Survey** – A large-scale survey of practitioners not involved with the SME panel to validate the task and knowledge statements developed by the panel
3. **Development of Examination Specifications** – The development of Examination Specifications by the panel based on the results of the survey

Several practitioners were assembled by NCC to serve as SMEs. The individuals selected represent a wide variety of work-related characteristics such as years of experience, work setting, geographic location, and areas of specialty. This helps in developing a scope of practice that is reflective of the roles and responsibilities of the job role and is relatively free from bias. By analyzing the experiences and expertise of current practitioners, the results from the job analysis become the basis of a validated assessment that reflects the competencies required for competent job performance.

The job analysis process utilized in this study yields exam specifications that accurately reflect the scope of practice, allowing for the development of fair, accurate, and realistic assessments of candidates' readiness for certification. The resultant Examination Specifications document (Appendix C) indicates a 100-item examination with content distribution requirements at the competency area (content domain) level as well as topic (content subdomain) level. The five competency areas are:

1. Electronic Monitoring Equipment
2. Physiology
3. Pattern Recognition and Management
4. Fetal Assessment Methods
5. Professional Practice Issues

INTRODUCTION

This report describes the methodology and procedure used to conduct a job analysis and develop the exam specifications for the National Certification Corporation (NCC) Electronic Fetal Monitoring (EFM) certification examination.

The procedure was conducted in accordance with principles and practices outlined in the *Standards for Educational and Psychological Testing*¹, which describe principles and guidelines for all aspects of test development, including content validation.

A job analysis (sometimes referred to as a practice analysis, job task analysis, or work analysis) is a scientific inquiry conducted in order to identify the tasks and work activities conducted, the context in which those tasks and activities are carried out, and the competencies (knowledge areas, skills, and abilities) required to perform a job role successfully². Different methods can be used which may differ in the levels of specificity in analyzing and describing different work elements, with the choice of method largely dependent on the intended purpose and use of the results. The methodology of the current analysis was tailored to the creation of exam specifications for test development.

When completed, the job analysis process utilized in this study yields exam specifications that accurately reflect the scope of practice, allowing for the development of fair, accurate, and realistic assessments of candidates' readiness for certification. The job analysis is typically performed every 5 to 7 years so that the content outline represents the current scope of practice. Because it serves as the primary basis for content validity evidence, as required by the aforementioned Standards, the job analysis is a primary mechanism by which a certifying body or regulatory board can ensure the accuracy and defensibility of an exam. It serves as the foundation of the certification exam and is critical to the success of the entire exam development process. All necessary documentation verifying that the validation process has been implemented in accordance with professional standards is included in this report.

This report is divided into three major activities of the job analysis process, which are:

1. **Job Analysis Committee Meeting** – A gathering of subject matter experts (SMEs) to discuss and develop a description of the scope of practice
2. **Job Analysis Survey** – A large-scale survey of practitioners not involved with the SME panel to validate the task and knowledge statements developed by the panel
3. **Development of Examination Specifications** – The development of Examination Specifications by the panel based on the results of the survey

¹ American Educational Research Association, American Psychological Association, National Council on Measurement in Education (2014). *Standards for Educational and Psychological Testing*. Washington, DC: AERA.

² Sackett, P. R. & Laczko, R. M. (2003). *Job and Work Analysis*. Handbook of Psychology. One: 2: 19–37.

JOB ANALYSIS COMMITTEE MEETING

NCC selected subject matter experts (SMEs) to represent a wide variety of work-related characteristics such as years of experience, work setting, geographic location, and areas of specialty to develop a scope of practice that is reflective of the roles and responsibilities of the job and is relatively free from bias. See Appendix A for a complete list of the SMEs and their qualifications.

PSI conducted a job analysis committee meeting on March 11, 2019 with SMEs to discuss the scope of practice and develop a list of tasks and knowledge areas that reflect the job role. PSI led the SMEs in refining task and knowledge statements and organizing them into a domain and subdomain structure. The outgoing NCC EFM exam content outline and candidate handbook were used as resources when developing the knowledge areas and tasks.

The job analysis committee developed 14 task statements.

1. Apply external fetal and uterine monitors.
2. Evaluate fetal heart rate and uterine activity.
3. Interpret fetal heart rate and uterine patterns.
4. Differentiate between normal and abnormal fetal heart rate and uterine activity patterns.
5. Communicate fetal and maternal assessment to healthcare team.
6. Assess for fetal and maternal complications.
7. Perform intrauterine resuscitation.
8. Troubleshoot equipment failure and artifact.
9. Reposition fetal and uterine monitors.
10. Use internal fetal monitor.
11. Use internal uterine monitor.
12. Identify trends or changes in fetal and uterine monitoring.
13. Identify need for emergency delivery.
14. Prepare for emergency delivery.

The job analysis committee developed 15 knowledge statements across five content domains.

1. Electronic Monitoring Equipment
 - A. Electronic monitoring equipment (e.g., external, internal, artifact, failure and troubleshooting)
2. Physiology
 - A. Uteroplacental
 - B. Factors affecting fetal oxygenation
3. Pattern Recognition and Management
 - A. Fetal heart rate baseline
 - B. Fetal heart rate variability
 - C. Fetal heart rate accelerations
 - D. Fetal heart rate decelerations
 - E. Normal uterine activity
 - F. Abnormal uterine activity
 - G. Fetal dysrhythmias
 - H. Maternal complications
 - I. Uteroplacental complications
 - J. Fetal complications
4. Fetal Assessment Methods
 - A. Fetal assessment methods (e.g., auscultation, nonstress test, biophysical profile, fetal movement and stimulation)
5. Professional Practice Issues
 - A. Professional Practice Issues (e.g., legal, ethics, safety, quality improvement)

JOB ANALYSIS SURVEY

PSI developed, administered, and monitored a survey to validate the tasks and knowledge areas developed by the job analysis committee and to help determine content weighting. To this end, the survey collected respondents' ratings of the importance and frequency for each task and knowledge area. Below are the prompts for each rating scale.

What are the importance and performance frequency of each task *in your practice* as a health care professional that uses EFM?

What are the importance and frequency of application of these knowledge areas *in your practice* as a health care professional that uses EFM?

Importance

- 0 – Not Applicable
- 1 - Not Important
- 2 - Minimally Important
- 3 - Moderately Important
- 4 - Very Important
- 5 - Critically Important

Frequency

- 0 - Never
- 1 - Annually
- 2 - Quarterly
- 3 - Monthly
- 4 - Weekly
- 5 - Daily

Between March 25, 2019 and March 28, 2019, a pilot survey was conducted with the job analysis committee and NCC staff members to ensure that the survey was operating correctly. No modifications were made following the pilot survey.

The live survey was sent using online survey software to a list of 20,430 individuals which was obtained from NCC. The list included all individuals who currently hold the NCC Electronic Fetal Monitoring credential. The number of individuals that provided acceptable responses (selected 'Yes' to the first two questions described below and completed at least 50% of the task ratings) was 2,473 (12%). The survey was opened on April 3, 2019 and closed on April 29, 2019. See Appendix B for the email sent to potential respondents.

The first question of the survey read: *Do you agree to take part in this survey?* The second question read: *Do you currently use Electronic Fetal Monitoring (EFM) in your practice?* These questions served as filters to allow only those who indicated "yes" to move forward with the rest of the survey.

Table 1 shows the mean ratings provided by the 2,471 respondents for the task statements. Table 2 shows the mean ratings provided by 2,219 respondents for the knowledge statements.

Table 1.
Task Statement Ratings.

Task Statements	Importance	Frequency
1 Apply external fetal and uterine monitors.	4.50	4.69
2 Evaluate fetal heart rate and uterine activity.	4.83	4.85
3 Interpret fetal heart rate and uterine patterns.	4.86	4.85
4 Differentiate between normal and abnormal fetal heart rate and uterine activity patterns.	4.88	4.86
5 Communicate fetal and maternal assessment to healthcare team.	4.80	4.83
6 Assess for fetal and maternal complications.	4.82	4.83
7 Perform intrauterine resuscitation.	4.71	4.37
8 Troubleshoot equipment failure and artifact.	4.24	4.11
9 Reposition fetal and uterine monitors.	4.47	4.71
10 Use internal fetal monitor.	4.00	3.65
11 Use internal uterine monitor.	3.94	3.60
12 Identify trends or changes in fetal and uterine monitoring.	4.64	4.56
13 Identify need for emergency delivery.	4.82	4.24
14 Prepare for emergency delivery.	4.67	3.90

Table 2.
Knowledge Statement Ratings.

Knowledge Statements	Importance	Frequency
1A Electronic monitoring equipment (e.g., external, internal, artifact, failure and troubleshooting)	4.02	4.61
2A Uteroplacental	4.11	4.76
2B Factors affecting fetal oxygenation	4.91	4.79
3A Fetal heart rate baseline	4.73	4.87
3B Fetal heart rate variability	4.50	4.87
3C Fetal heart rate accelerations	4.84	4.86
3D Fetal heart rate decelerations	4.63	4.85
3E Normal uterine activity	4.54	4.86
3F Abnormal uterine activity	4.58	4.77
3G Fetal dysrhythmias	4.62	3.98
3H Maternal complications	4.68	4.62
3I Uteroplacental complications	4.83	4.58
3J Fetal complications	4.56	4.53
4A Fetal assessment methods (e.g., auscultation, nonstress test, biophysical profile, fetal movement and stimulation)	4.41	4.59
5A Professional Practice Issues (e.g., legal, ethics, safety, quality improvement)	4.46	4.28

The survey included demographic questions regarding professional characteristics relevant to the job role. See Table 3 for a summary of the demographic questions in the survey.

Table 3.
Results of the Demographic Questions in the Job Analysis Survey.

1. Do you agree to take part in this survey?	<i>n</i>	%
Yes	2784	99.61
No	11	0.39

2. Do you currently use Electronic Fetal Monitoring (EFM) in your practice?	<i>n</i>	%
Yes	2651	95.46
No	126	4.54

3. Which of the following best describes your PRIMARY professional role?	<i>n</i>	%
Physician	86	3.48
Nurse Practitioner	43	1.74
Nurse Midwife	110	4.45
Clinical Nurse Specialist	84	3.40
Registered Nurse	2142	86.65
Paramedic	1	0.04
Physician Assistant	6	0.24

4. Are you currently certified by the National Certification Corporation (NCC) in EFM?	<i>n</i>	%
Yes	2465	99.84
No	4	0.16

5. Is NCC's EFM certification REQUIRED for your employment?	<i>n</i>	%
Yes	1274	51.54
No	1198	48.46

6. Which of the following best describes your PRIMARY practice setting when using EFM?	<i>n</i>	%
Hospital	2263	91.62
Ambulatory Clinic	130	5.26
Birthing Center	74	3.00
Emergency Medical Services	3	0.12

7. What is the highest level hospital/unit designation in which you use EFM?	<i>n</i>	%
Birth Center (Peripartum care of low-risk women with uncomplicated singleton term pregnancies with a vertex presentation who expect an uncomplicated birth).	21	0.85
Level I (Basic Care) Uncomplicated pregnancies with ability to detect, stabilize and initiate management of unanticipated maternal-fetal or neonatal problems and transfer as needed.	365	14.78
Level II (Specialty Care) Level I facility plus care of appropriate high-risk antepartum, intrapartum or postpartum conditions both directly admitted or transferred in.	652	26.41
Level III (Subspecialty Care) Level II facility plus care of more complex maternal conditions, obstetric complications and fetal conditions. Advanced imaging.	597	24.18
Level IV (Regional Health Care Centers) Level III facility plus on-site medical and surgical care of the most complex maternal conditions and critically ill pregnant women and fetuses throughout antepartum, intrapartum and postpartum. Onsite ICU care, maternal referral and transport, outreach.	736	29.81
Do not know	76	3.08
Not applicable	22	0.89

8. What is your highest level of education completed?	<i>n</i>	%
Diploma/Certificate	55	2.23
Associate	364	14.75
Baccalaureate	1390	56.34
Masters	518	21.00
Doctorate - DNP/PhD	48	1.95
Doctorate - MD/DO	92	3.73

9. Where is your PRIMARY workplace located?	<i>n</i>	%
Northeast	550	22.79
Midwest	800	33.15
South	509	21.09
West	553	22.92
Territories	1	0.04
Canada	0	0.00

DEVELOPMENT OF EXAMINATION SPECIFICATIONS

The Job Analysis Committee met on July 10, 2019 to review the results of the survey, finalize the tasks and knowledge that would comprise the next exam content outline, establish linkages among the tasks and knowledge areas, and finalize the content weighting for the examination.

The committee reviewed the demographic results and confirmed that the results matched expectations and impressions of the practitioner population, suggesting that the respondent sample is reflective of those currently working as Neonatal Intensive Care Nurses.

All tasks and knowledge statements were retained by the committee. They noted that the survey results conformed to their expectations.

The committee identified linkages between the task and knowledge statements to ensure that each task was covered by at least one relevant knowledge area and that each knowledge area had at least one relevant task identified. See Table 4 for a summary of the knowledge-task linkages identified.

Table 4.
Linkages Among Knowledge and Task Statements.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1														
1A	x	x	x	x				x	x	x	x			
2														
2A		x					x						x	
2B		x					x						x	
3														
3A		x	x	x	x		x					x	x	
3B		x	x	x	x		x					x	x	
3C		x	x	x	x		x					x	x	
3D		x	x	x	x		x					x	x	
3E		x	x	x	x		x					x	x	
3F		x	x	x	x		x					x	x	
3G		x		x	x								x	
3H		x			x	x							x	x
3I		x			x	x							x	x
3J		x			x	x							x	x
4														
4A		x		x										
5														
5A					x									

The committee then reviewed the draft content weighting, discussing any adjustments necessary to align the number of items per content area with adequate content coverage on the examination. The draft content weighting was developed by determining a percentage weight based on the relative weight of the mean importance value for each content area.

The committee agreed to make the following adjustments at the domain level:

- I – Electronic Monitoring Equipment was decreased from 6 to 5.
- II – Physiology was decreased from 14 to 11.
- III – Pattern Recognition and Management was increased from 69 to 70.
- IV – Fetal Assessment Methods was increased from 6 to 9.
- V – Professional Practice Issues was decreased from 6 to 5.

At the subdomain level, adjustments were made to reflect the range in scope of each content area. See Table 5 for a summary of the content weighting determination. The final examination specifications can be found in Appendix C.

Table 5.
Content Weighting Determination.

	Final	Survey
1 Electronic Monitoring Equipment	5	6.50
1A Electronic monitoring equipment (e.g., external, internal, artifact, failure and troubleshooting)	5	6.50
2 Physiology	11	13.45
2A Uteroplacental	6	6.66
2B Factors affecting fetal oxygenation	5	6.80
3 Pattern Recognition and Management	70	67.40
3A Fetal heart rate baseline	12	6.78
3B Fetal heart rate variability	8	6.84
3C Fetal heart rate accelerations	6	6.61
3D Fetal heart rate decelerations	11	6.91
3E Normal uterine activity	3	6.61
3F Abnormal uterine activity	3	6.77
3G Fetal dysrhythmias	5	6.35
3H Maternal complications	8	6.84
3I Uteroplacental complications	8	6.84
3J Fetal complications	6	6.83
4 Fetal Assessment Methods	9	6.45
4A Fetal assessment methods (e.g., auscultation, nonstress test, biophysical profile, fetal movement and stimulation)	9	6.45
5 Professional Practice Issues	5	6.20
5A Professional Practice Issues (e.g., legal, ethics, safety, quality improvement)	5	6.20

APPENDIX A

SUBJECT MATTER EXPERTS

Name	Job Title	Employer	Years Exp.	State
Francisca Fletes	Women's Health Nurse Practitioner	Southwest Contemporary Women's Care	13	AZ
Melissa Kelley	Manager of L&D, OB, Triage, Antepartum	Prentice Women's Hospital, Northwestern	31	IL
Cara Sullivan	Doctor	Family Medicine	5	ID
Nancy Comello	Registered Nurse	Unity Point Health-Meriter Hospital	41	WI
Angela Stanley	Instructor	Medical University of South Carolina	22	SC
Sue Weekly	Clinical Nurse Specialist	Methodist Women's Hospital Outreach	24	NE

APPENDIX B

SURVEY EMAIL

Date: April 3, 2019
From: info@nccnet.org via surveymonkey.com
Subject: EFM 2019 Job Analysis Survey

Body: The National Certification Corporation (NCC) invites you to participate in the Electronic Fetal Monitoring (EFM) Job Analysis Survey. This survey will be used to identify tasks and knowledge reflective of the professional role of a nurse that uses EFM.

The results of the survey will help develop the specifications for the NCC EFM certification exam. This is a great way to contribute to the industry and ensure that a high standard is maintained.

The survey will likely require 15 to 20 minutes to complete. Your individual responses will be kept confidential and will be combined with those of other respondents. The deadline to complete the survey is **April 29, 2019**.

Please note that participation in this survey is voluntary. At the end of the survey you can choose to provide your name and email for a chance to **win a \$100.00 Amazon gift card**.

Please read all questions carefully and select responses that best represent *your practice* as a health care professional that uses **EFM**.

Thank you for your participation. Please direct all inquiries to info@nccnet.org.

APPENDIX C

FINAL EXAMINATION SPECIFICATION

	Content Area	# of Questions
1	Electronic Monitoring Equipment	5
1A	Electronic monitoring equipment (e.g., external, internal, artifact, failure and troubleshooting)	5
2	Physiology	11
2A	Uteroplacental	6
2B	Factors affecting fetal oxygenation	5
3	Pattern Recognition and Management	70
3A	Fetal heart rate baseline	12
3B	Fetal heart rate variability	8
3C	Fetal heart rate accelerations	6
3D	Fetal heart rate decelerations	11
3E	Normal uterine activity	3
3F	Abnormal uterine activity	3
3G	Fetal dysrhythmias	5
3H	Maternal complications	8
3I	Uteroplacental complications	8
3J	Fetal complications	6
4	Fetal Assessment Methods	9
4A	Fetal assessment methods (e.g., auscultation, nonstress test, biophysical profile, fetal movement and stimulation)	9
5	Professional Practice Issues	5
5A	Professional Practice Issues (e.g., legal, ethics, safety, quality improvement)	5

Notes: Each examination form will include one set of 25 unscored pretest items in addition to the 100 scored items. Three hours of testing time. Initial base form passing point will be determined by Angoff method in Q4 of 2019. Future passing points established through pre-equating.