

Promoting patient safety by enhancing provider quality.

CPC Examination Professional Practice Analysis

Executive Summary - 2015

The National Board of Certification and Recertification for Nurse Anesthetists (NBCRNA) is an autonomous body, with multidisciplinary and public representation, that is responsible for specifying the requirements for earning and maintaining the Certified Registered Nurse Anesthetist credential. In 2015, the NBCRNA conducted a national professional practice analysis (PPA) study of the knowledge, skills, and abilities required of nurse anesthetists at the level of practice expected for continued professional certification. The purpose of the practice analysis was to define a logical, practice-related, and evidence-based content framework to support the development of the examination component of NBCRNA's Continued Professional Certification (CPC) Program.

Key to this effort, NBCRNA convened a panel of subject matter experts (SMEs, see Appendix A) in nurse anesthesia, who were representative of the profession with respect to geography (from across the United States) and practice setting among other demographic variables, and reflective of those nurse anesthetists who would be participating in the CPC Program long-term. The PPA Panel was charged with analyzing the practice of nurse anesthesia at a level that is more advanced than that expected for initial certification, and to review, evaluate, and revise the knowledge elements included in the proposed CPC Examination (CPCE) content outline (originally published December 2014).

The practice analysis study consisted of the following four major phases:

1. **Initial Development and Validation.** The PPA panel reviewed and proposed revisions to the domains, tasks, knowledge, and skills specified in the proposed content outline for the CPCE. These revisions included the deletion and re-wording of some headings, and adding specificity for others. The goal of this stage was to further evaluate the knowledge essential to the proficient practice of nurse anesthesia by nurse anesthetists beyond the point of initial certification. After several small adjustments to the knowledge elements of the proposed content outline, the updated outline was converted into an online questionnaire format in order to collect validity ratings.
2. **Pilot Survey.** A sample of 60 individuals, including the PPA Panel, reviewed the online survey, which included as survey items the domains, tasks, knowledge, and skills, of the CPCE content outline, as well as questions pertaining to the domain weightings of the outline (test blueprint) and demographics relevant to the anesthesia profession. This pilot stage brought about refinements to the survey.
3. **Validation Study.** A random sample (N = 12,000) of nurse anesthetists was invited to review and validate the work of the PPA panel by completing the online survey. A qualified and representative sample of nurse anesthetists provided data in this phase. Of the 12,000 e-mail invitations, just over half (6,048, or 50.4%) of the recipients actually opened the e-mail, and 2,184 clicked the link to the survey. Of these, 726 provided valid, usable responses, completing at least half of the survey. With respect to the 6,048 people who opened and presumably read the e-mail invitation, the sample

going forward to analysis represented a 12% response rate. The survey was open and available for responses from May 12 – June 8, 2015.

Respondents were asked to evaluate each knowledge element in the content outline, rating them using 5-point scales for criticality and frequency, as well as whether the knowledge element was required of a nurse anesthetist. *Criticality* was defined as the degree that inability to perform duties related to each knowledge element could be seen as causing harm to stakeholders. *Frequency* was defined as how often the nurse anesthetist performs duties that require proficiency in each of the knowledge elements.

On June 18-19, 2015, the CPC PPA Panel met in Chicago, IL, to review the results of the PPA survey and to make recommendations for the CPCE content outline. The majority of the meeting was devoted to reviewing summaries of ratings of the survey respondents and making decisions about what knowledge statements should be included in the CPCE content outline. Generally speaking, high levels of endorsement were observed on almost all elements of the CPCE content outline.

Tables 1-3 contain summaries of “required of nurse anesthetists,” criticality, and frequency ratings for the four core domains of the CPCE, as well as the “Additional Topics”. As can be seen in these summaries, there were high levels of endorsement across the four domains. While Tables 1-3 only summarize ratings for the primary domain headings, similar levels of support were observed for almost all knowledge elements in the outline.

Table 1. Summaries of Responses for Core Domains and Additional Topics, Required of All Nurse Anesthetists

Knowledge Statement	Required
I. Airway Management	99.7%
II. Applied Clinical Pharmacology	98.4%
III. Human Physiology and Pathophysiology	97.4%
IV. Anesthesia Equipment and Technology	97.8%
Additional Topics	88.7%

Table 2. Summaries of Domain Criticality Ratings

Knowledge Statement	Criticality						
	Mean	SD	Count 5	Count 4	Count 3	Count 2	Count 1
I. Airway Management	4.5	0.8	420	184	61	15	4
II. Applied Clinical Pharmacology	4.1	0.9	276	267	104	25	9
III. Human Physiology and Pathophysiology	3.9	1.0	212	273	150	33	16
IV. Anesthesia Equipment and Technology	3.9	1.0	229	246	145	48	14
Additional Topics	2.8	1.2	76	118	201	179	105

Table 3. Summaries of Domain Frequency Ratings

Knowledge Statement	Frequency						
	Mean	SD	Count 5	Count 4	Count 3	Count 2	Count 1
I. Airway Management	4.7	0.7	578	56	21	22	3
II. Applied Clinical Pharmacology	4.7	0.8	551	65	32	25	7
III. Human Physiology and Pathophysiology	4.6	0.9	511	85	37	34	10
IV. Anesthesia Equipment and Technology	4.5	0.9	513	79	38	38	9
Additional Topics	4.1	1.3	376	105	73	87	28

Based on the ensuing discussion, and the generally high levels of endorsement on almost all elements of the CPCE content outline, only minor changes to the outline were recommended as a result of the review:

- Element “Laboratory and/or diagnostic studies” deleted from outline (subtopic under Domain 1, Airway Management)
- Element “Clinical indications, uses, interpretations, limitations of airway laboratory or diagnostic studies related to airway management” deleted from outline (tertiary topic under subtopic 1.E.)
- Element “Interpret laboratory and/or diagnostic studies” deleted from outline (subtopic under Domain 2, Applied Clinical Pharmacology)
- Element “Intraoperative monitoring techniques” retained, but moved up a level to II.C.
- Elements listed under “Additional topics” heading deleted

The rest of the knowledge statements on the outline were retained.

4. Development of Specifications for Assessment. A statistical analysis and subsequent review of the survey ratings of the respondent sample of nurse anesthetists formed the basis for a test blueprint for the CPCE. The test blueprint indicates relative emphasis that each domain will receive on the examination and translates into the number of questions an examinee will receive from each core domain. The domain percentages recommended by the PPA Panel were updated from the original proposed blueprint.

Table 4. Proposed and Updated Domain Weights

Domain	Original	Updated
I. Airway management	28%	34%
II. Applied clinical pharmacology	28%	24%
III. Human physiology and pathophysiology	28%	24%
IV. Anesthesia equipment and technology	16%	18%

Conclusion

In September 2015, the NBCRNA Board reviewed the work of the PPA Panel and approved the modifications to the CPCE content outline, as well as the updated domain percentages. The full, updated content outline can be found [here](#).

As the primary process for identifying the competency areas and knowledge needed for proficient performance in a profession, PPA studies offer a clear and useful basis for defining the essential components of credentialing programs, especially assessments. This is because PPA studies, as the most commonly applied and accepted validation strategy for establishing certification programs, provide the basis for content validity. Validation through systematic practice analysis studies helps to document that the competence to be inferred when a candidate has achieved a credential bears a sound link to the significant elements of practice that characterize the profession. This was the underlying intent of this study.

NBCRNA's practice analysis study is an integral part of ensuring that the examination component of the CPC Program has practice-related validity and that the aspects of nurse anesthesia addressed by the program reflect the requirements of practice settings, patient groups, and conditions.

Appendix A

Roster of PPA Panel Members

Name	Position Description	State	Certification Year (Yrs. Exp.)
Mary M. Wojnakowski, PhD, CRNA, <i>Chair</i>	Educator/Practitioner	AZ	1992 (22)
Scott Beede, MSN, CRNA	Practitioner	IL	2009 (6)
Sarah Bellenger, MSN, CRNA	Practitioner	TX	2011 (4)
Angela Cooney, MSNA, CRNA	Practitioner	TX	2009 (6)
Brian Del Grosso, MS, CRNA	Practitioner	NC	2010 (5)
Emily Funk, DNP, CRNA	Practitioner	NC	2010 (5)
Marjorie Geisz-Everson, PhD, CRNA	Educator/Practitioner	LA	1995 (20)
Christopher Gill, MS, CRNA	Practitioner	IL	2013 (2)
Mario Grasso, DNP, CRNA	Practitioner	VA	1994 (21)
Mary Ann Krogh, PhD, CRNA	Educator/Practitioner	SD	1995 (19)
Eric David McNaughton, MSN, CRNA	Practitioner	ME	2009 (6)
Jessica Poole, MSN, CRNA	Practitioner	PA	2012 (3)
Eleanor Rawson, DNP, CRNA	Practitioner	CA	2010 (5)
Bruce Schoneboom, PhD, CRNA	Administrator	IL	1992 (23)
Jennifer Thompson, DNP, CRNA	Practitioner	CA	2004 (11)
Tiffany Ann Uranga, DNP, CRNA	Practitioner	CA	2009 (6)