



CPC Core Module Submission Guidelines and Handbook

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Core Module Submission Guidelines and Handbook

Overview

The mission of the NBCRNA is to promote patient safety through credentialing programs that support lifelong learning. Toward that end, the NBCRNA certifies registered nurse anesthetists who meet all the criteria for entry into practice as a Certified Registered Nurse Anesthetist (CRNA). In order to become certified, a candidate must pass an initial certification examination after successful graduation from an accredited nurse anesthesia education program and be licensed to practice in at least one state.

Beginning in 2016, the NBCRNA initiated the Continued Professional Certification (CPC) program, which replaced the previous recertification that was in force for more than 30 years. One of the requirements for the new CPC program is the completion of educational Core Modules, which have been developed based on established goals & objectives identified by the NBCRNA. The modules will be a learning activity that include an assessment to evaluate the learner's comprehension of the taught material/learning engagement.

The National Board of Certification and Recertification for Nurse Anesthetists (NBCRNA) is providing the following information for CE vendors that are interested in preparing Continued Professional Certification (CPC) Core Modules that have the potential to be recognized by the NBCRNA. These modules are defined as:

Electronically delivered enduring Class A continuing educational vehicles that may be presented via distance education through an internet platform or to a live audience. They are a defined fund of current evidence-based information related to a circumscribed aspect of practice in one or more area of practice-related knowledge (i.e. Pharmacology, Airway, Equipment/Technology & Physiology/Pathophysiology).

Recognized CPC Core Modules will be used by nurse anesthetists to meet one of the required components of the new CPC program. The NBCRNA seeks vendor interest and information that addresses the vendor's ability to comply with the module specifications that will include:

- A written response to CPC module requirements, as defined in this Recognition Specification document. Specifically, interested vendors should address:
 - Module Development
 - Module Delivery
 - Module Assessment
 - Transfer of Participant Data
 - Module Updates and Maintenance
 - Module Evaluation and Security

1. In addition to any materials submitted for recognition consideration, all inquiries and correspondence regarding the project should be directed to:

John C. Preston, DNSc, CRNA, FNAP, APN
Chief Credentialing Officer
NBCRNA
8725 W. Higgins Rd, Suite 525
Chicago, IL 60631
Phone: 708-667-0107, Fax: 708-669-7522
E-mail: jpreston@nbcrna.com

2. NBCRNA reserves the sole right to accept or reject any core module submitted for recognition consideration without the assignment of reasons for so doing.
3. NBCRNA will not reimburse costs incurred by the potential vendor in responding to this Recognition Specification document.
4. The potential module vendor must acknowledge that if recognized to offer modules, they will:
 - a. Function as an independent contractor in the conduct of these services, and assume full responsibility for all actions, damages, injuries, etc.
 - b. At all times comply with all applicable federal, state and local laws, rules, and regulations.
5. The Recognition Specification document must be prepared in conformance with the guidelines listed in “Section 3: Recognition Specification document Guidelines, Instructions, and Selection Events” (page 4 of this document).
6. Upon the recognition of a module, the vendor will enter into a contractual obligation with the NBCRNA to provide information as required by the conditions of recognition.

Recognition Specifications

Description of the CPC Core Modules

Every four years, each nurse anesthetist will be required to complete four Core Modules that cover content in the areas of:

- Airway Management Techniques
- Applied Clinical Pharmacology
- Human Physiology and Pathophysiology
- Anesthesia Technology and Equipment

The intent of the CPC Core Modules is to review the most current evidence based knowledge relative to nurse anesthesia practice for each of the four content areas (airway management, pharmacology, physiology/pathophysiology and technology/equipment). The modules are not intended to provide a comprehensive review of basic information. The vendor creating the module will be responsible for determining (selecting) the specific NBCRNA identified objectives upon which their educational materials will be based. In making their selections for content development, vendors should focus heavily on content from the recent literature, being sure to include suitable content published in the immediate 5 year period prior to the date of module development that demonstrates a change in current practice is warranted. The educational content should specifically address those NBCRNA identified objectives.

The modules will present educational content in an audio-visual format and must be delivered through one or more various electronic media (e.g. World Wide Web access, DVD and/or flash drive). This content may also be delivered at a live (face-to-face synchronous) event, but in this event the content still has to be available to participants in some retrievable electronic media. (e.g. World Wide Web access, DVD and/or flash drive). The knowledge acquired by each participant, following their engagement with the CPC module(s), must be evaluated by an objective assessment that is delivered and recorded in an online format, regardless of the method (electronic vs live) for the module content delivery. This evaluation may occur at any time following the participant's successful completion of the module(s) content.

These modules must qualify for Class A Credits as continuing education. Please recognize that vendors must go through a prior approval process with an accredited CE approval agency before NBCRNA recognition can be awarded (although CE prior approval can be sought/obtained in parallel to the NBCRNA content review process).

Submission Parameters

To submit CPC Module Content for recognition consideration vendors must:

1. Submit a letter of intent to develop CPC Modules and identify the specific module(s) the developer intends to produce including a proposed timeline for content completion.
2. Submit the module(s) content based on NBCRNA's requirements, which includes the specific NBCRNA identified objectives. The submission must include the assessment(s) and all other requested materials for review by the identified deadline. Vendors may submit an application for one or more of the four modules.
3. Submit all materials for NBCRNA recognition. Be aware, vendors are not required to develop all four modules to obtain NBCRNA recognition, but should be clear as to exactly which modules they are developing.
4. Submit the fee of \$2,500 per module for initial review and recognition
5. Beginning on August 1, 2017, submit an annual module review fee of \$500 per module per year, following the first 12 months of module recognition.

All fees must be paid electronically and are nonrefundable. All fees are subject to change based on actual costs at time of implementation and any variation will be disclosed to vendors.

Vendor submitted materials must address the following areas:

1. Module Development

For each module the vendor is seeking recognition, the vendor must:

- a. Document the process (e.g., evidence-based approach, included/excluded content, use of subject matter experts (SME)/peer-reviewed) used in developing the module content. The content must be consistent with the NBCRNA established instructional goals, instructional objectives and performance objectives (Refer to CPC Core Module Objectives Document).
- b. Submit a reference list for the resources used in module development according to AMA guidelines. Resources cited must be current and relevant to the module topic.
- c. Describe the process for providing evidence of content validity based upon NBCRNA's established instructional goals, instructional objectives and performance objectives.
- d. Avoid the introduction of commercial bias.
- e. Disclose any conflict of interests to the NBCRNA for module developers, SMEs, or beta testers.

2. Module Delivery:

The vendor must:

- a. Describe the plans to offer the module during the recognized cycle.
- b. Describe methods to be used for verifying identity of the individual completing the module and assessment.
- c. Describe a planned method for delivery of modules to ensure access for all interested certificants.
- d. If the module is presented at a face to face meeting, describe how participants will be provided with access to a complete electronic version of the module content (such as web based, DVD or Flash drive media).
- e. Publish the reference list in AMA format citing resources used in developing the module for module users.
- f. Describe plans to address and resolve technology-related issues experienced by the users (e.g., technical support, issues, questions, guidance).
- g. Describe plans for providing any additional support for module users.
- h. Describe methods to ensure ADA-compliance for module delivery.

Filetype Requirements

Due to the requirements of the LMS system used to distribute module content to reviewers, presentation content should be delivered to the NBCRNA in one of the following video formats: .3GP, .AVI, .DIVX, .DV, .FLV, .MOV, .M4V, .MP4, .MPEG, .MPG, .RAM, .RM, .RMM, .RMVB, .RV, .WMV. Additionally, file sizes must not exceed 1GB, and clip lengths must not exceed 60 minutes. Interactive e-learning presentations, such as SCORM packages, should be screen captured into one of these formats. If file size exceeds 1GB, it can be broken-up into smaller “chunks.” These filetype requirements are only for purposes of the NBCRNA review.

If there are any questions or concerns regarding these filetype requirements, please contact NBCRNA for further assistance.

Module Assessment

For the purposes of satisfying CPC Module requirements for individual CRNAs, NBCRNA will only accept an individual module performance score that is equal to, or greater than, 80% of the assessment items answered correctly.

For each module the vendor is seeking recognition, the vendor must:

- a. Adhere to best practices for item writing.
- b. Provide some form of mapping of the educational content to the module assessment, for the purpose of demonstrating the assessment (e.g. end of activity test) is aligned and supported by the content of the module and NBCRNA mandated objective(s).
- c. Provide evidence of the reliability of the assessment.
- d. Describe the process to validate the final educational product assessment prior to release (e.g. focus groups, pilot testing, peer review committee etc.).
- e. Provide a description of any changes made to module assessment based on your selected validation process.
- f. Allow for three testing attempts maximal per module, with no more than 50% of identical questions delivered across attempts.
- g. Describe parameters for length of time users will have access to modules once started, number of attempts allowed to access the module, number of assessed CEs earned and pass rate for success.
- h. Describe method/process that will be used to review item statistics for the assessment and what findings will trigger the implementation of item changes.
- i. Provide semi-annual reporting of assessment statistics/findings and module usage/purchase to the NBCRNA.
- j. Describe mechanism you will employ to allow the NBCRNA to review the module(s) and assessment(s) upon request by the NBCRNA at any time during the period of recognition.

Transfer of Participant Data

The vendor must:

- a. Describe the planned process for electronically transferring individual module completion records to the NBCRNA, on a monthly basis.
- b. Include, at a minimum: participant name, participant identification number, module topic area, module start date, module completion date, number of assessed CEs earned and results of module assessment scores on each attempt.
- c. Describe planned methods for ensuring accuracy of module completion record tracking and transfer of data.
- d. Describe methods to protect the security of all transferred data.

Module Maintenance

The vendor must:

- a. Provide documentation regarding the planned process and frequency for updating the module to ensure continued availability of the current version of the same module.
- b. Update modules at least every four years and the revised module replaces the previous corresponding module (or more frequently if required by the CE approval organization).
- c. Ensure that all users actively engaged in the module have adequate time to complete prior to removing or inactivating the module.
- d. Notify NBCRNA one year in advance of the vendor's intent to remove the module from the marketplace.
- e. If substantive practice changes occur in the environment such that the NBCRNA deems edits to the current module are warranted, the vendor must be able to demonstrate a mechanism to update the module prior to the four-year time frame described above.

Module Evaluation and Security

The vendor must:

- a. Provide examples of a program evaluation that will be used upon completion of the module.
- b. Describe plans to review module content and implement changes supported by program evaluation results at least every three (3) years or more frequently if determined necessary by the NBCRNA.
- c. Provide semi-annual summary program evaluation results electronically to the NBCRNA.
- d. Describe planned methods for ensuring security of module content and module assessment(s).
- e. Describe mechanism for identity validation of the module user.

Guidelines, Instructions and Selection Events

Your submitted material should be organized, formatted and submitted as follows:

Format and General Requirements. Finalized modules, and supporting documentation must be submitted in the format specified in the table below. Submissions must adhere to the format and section numbering as shown in the following table. (Note: The table below also can be used as a checklist regarding all components of your submission that need to be completed.)

Format For Material Submission For Recognition			
SECTION	TITLE	MANDATORY	OPTIONAL
1.	Letter of Intent	Yes	No
2.	Executive Summary	Yes	No
3.	Written Response to Module Vendor Requirements		
	Module Development		
	Airway Management Techniques (if selected for development)	Yes	No
	Applied Clinical Pharmacology (if selected for development)	Yes	No
	Human Physiology and Pathophysiology (if selected for	Yes	No
	Anesthesia Technology and Equipment (if selected for	Yes	No
	Module Delivery	Yes	No
	Module Assessment		
	Airway Management Techniques (if selected for development)	Yes	No
	Applied Clinical Pharmacology (if selected for development)	Yes	No
	Human Physiology and Pathophysiology (if selected for	Yes	No
	Anesthesia Technology and Equipment (if selected for	Yes	No
	Transfer of Participant Data	Yes	No
	Module Maintenance	Yes	No
	Module Evaluation and Security	Yes	No
	Module Fees	Yes	No

All materials shall include a transmittal letter that lists the following:

- Contact person for submittal
- Mailing address of contact person
- Telephone number of contact person
- Fax number of contact person
- Email address of contact person

Core Module Instructional Design

Airway Management Techniques

Course Goal

To enhance professional competence through an ongoing, multimodal, and progressive process that maintains and enhances proficiency in nurse anesthesia practice and is a concept that ranges on a continuum from entry-level proficiency to complete mastery. The determination of what knowledge and skill equate to proficiency at the level required for continued professional certification requires judgment about the needs of patients and the range of services that experienced nurse anesthetists provide. The knowledge base and skill set for nurse anesthetists include (but are not limited to) patient-centered care, work in interprofessional teams, evidence-based practice, quality improvement, and informatics. The goals of the CPC program for nurse anesthetists are to maintain core competence and to enhance competence beyond the expectations of the initially certified nurse anesthetist.

1.1 Instructional Goals: To enhance knowledge and skills in basic and advanced airway management instrumentation and techniques.

1.1.1 Instructional Objectives: The Learner will be able to recognize and respond with the appropriate instrumentation and technique with regard to airway management in accordance with evidence-based practices.

Performance Objectives

1.1.1.1 - The Learner will demonstrate the appropriate steps in assessing an airway to develop the appropriate patient-specific plan that ensures safe management of the airway and facilitates continuity of care.

1.1.1.2 - The Learner will identify the indications and contraindications associated with the use of airway equipment.

1.1.1.3 - The Learner will understand the associated malpractice claims arising from the management of the airway, using a closed claims analysis.

1.1.1.4 - The Learner will identify the complications associated with airway equipment.

1.2 Instructional Goals: To enhance in-depth understanding of and provide learning experiences in the difficult airway algorithm as a standard of care.

1.2.1 Instructional Objectives: The Learner will be able to anticipate, identify, and manage patients with a potentially difficult airway in accordance with the difficult airway algorithm.

Performance Objectives

1.2.1.1 - When challenged with a difficult ventilation, the Learner will be able to demonstrate the appropriate steps outlined in the difficult airway algorithm.

1.2.1.2 - When challenged with a known difficult airway, the Learner will be able to demonstrate the appropriate steps outlined in the difficult airway algorithm.

1.2.1.3 - When challenged with a "cannot ventilate, cannot intubate" incident, the Learner will be able to demonstrate the appropriate steps outlined in the difficult airway algorithm.

1.3 Instructional Goals: To enhance in-depth understanding of and provide learning experiences in airway management complications.

1.3.1 Instructional Objectives: The Learner will be able to recognize and respond to airway management complications in accordance with evidence-based practices.

Performance Objectives

1.3.1.1 - When challenged with a laryngospasm, the Learner will be able to respond with the appropriate treatment in accordance with evidence-based practices.

1.3.1.2 - When challenged with an airway fire, the Learner will be able to respond with the appropriate treatment in accordance with evidence-based practices.

1.3.1.3 - When challenged with recurrent laryngeal nerve damage, the Learner will be able to respond with the appropriate treatment in accordance with evidence-based practices.

1.3.1.4 - When challenged with a pulmonary aspiration, the Learner will be able to respond with the appropriate treatment in accordance with evidence-based practice.

Applied Clinical Pharmacology

Course Goal

To enhance professional competence through an ongoing, multimodal, and progressive process that maintains and enhances proficiency in nurse anesthesia practice and is a concept that ranges on a continuum from entry-level proficiency to complete mastery. The determination of what knowledge and skill equate to proficiency at the level required for continued professional certification requires judgment about the needs of patients and the range of services that experienced nurse anesthetists provide. The knowledge base and skill set for nurse anesthetists include (but are not limited to) patient-centered care, work in interprofessional teams, evidence-based practice, quality improvement, and informatics. The goals of the CPC program for nurse anesthetists are to maintain core competence and to enhance competence beyond the expectations of the initially certified nurse anesthetist.

2.1 Instructional Goals: To enhance in-depth understanding of and provide learning experiences in the utilization, actions, interactions, and adverse effects of anesthetics and adjuvant medications.

2.1.1 Instructional Objectives: The Learner will be able to recognize and respond to normal and abnormal pharmacological actions, interactions, and adverse effects of medications.

Performance Objectives

2.1.1.1 - When challenged with recurarization or inadequate reversal of muscle relaxation, the Learner will identify symptoms, causes, and treatment in accordance with evidence-based practices.

2.1.1.2 - When challenged with anaphylaxis, the Learner will identify symptoms, causes, and treatment in accordance with evidence-based practices.

2.1.1.3 - When challenged with local anesthetic (LA) toxicity, the Learner will identify symptoms, causes, and treatment in accordance with evidence-based practices.

2.1.1.4 - The Learner will be able to identify anesthesia implications and treat adverse effects related to beta blockers in accordance with evidence-based practices.

2.1.1.5 - The Learner will be able to identify anesthesia implications and treat adverse effects related to anxiolytics in accordance with evidence-based practices.

2.1.1.6 - The Learner will be able to identify anesthesia implications and treat adverse effects related to insulin and oral hypoglycemic agents in accordance with evidence-based practices.

2.1.1.7 - The Learner will be able to identify anesthesia implications and treat adverse effects related to opioids in accordance with evidence-based practices.

2.1.1.8 - The Learner will be able to identify anesthesia implications and treat adverse effects related to induction agents in accordance with evidence-based practices.

2.1.1.9 - The Learner will be able to identify anesthesia implications and treat adverse effects related to local anesthetics in accordance with evidence-based practices.

2.1.1.10 - The Learner will be able to identify anesthesia implications and treat adverse effects related to antiemetics in accordance with evidence-based practices.

2.1.1.11 - The Learner will be able to identify anesthesia implications and treat adverse effects related to muscle relaxants in accordance with evidence-based practices.

2.1.1.12 - The Learner will be able to identify anesthesia implications and treat adverse effects related to inhaled anesthetics in accordance with evidence-based practices.

2.1.1.13 - The Learner will be able to identify anesthesia implications and treat adverse effects related to non-opioid pain management in accordance with evidence-based practices.

2.1.1.14 - The Learner will be able to identify anesthesia implications and treat adverse effects related to anticholinergics in accordance with evidence-based practices.

2.1.1.15 - The Learner will be able to identify anesthesia implications and treat adverse effects related to fluid, electrolyte, and blood component therapy in accordance with evidence-based practices.

2.1.1.16 - The Learner will be able to identify anesthesia implications and treat adverse effects related to self-administered medications (e.g., OTC, herbal agents, illicit drugs) in accordance with evidence-based practices.

2.1.1.17 - The Learner will be able to identify anesthesia implications and treat adverse effects related to psychiatric medications in accordance with evidence-based practices.

2.1.1.18 - The Learner will be able to identify anesthesia implications and treat adverse effects related to antihypertensive medications in accordance with evidence-based practices.

2.1.1.19 - The Learner will be able to identify anesthesia implications and treat adverse effects related to inotropic agents in accordance with evidence-based practices.

2.1.1.20 - The Learner will be able to identify anesthesia implications and treat adverse effects related to diuretics in accordance with evidence-based practices.

2.1.1.21 - The Learner will be able to identify anesthesia implications and treat adverse effects related to anticoagulants in accordance with evidence-based practices.

2.1.1.22 - The Learner will be able to identify anesthesia implications and treat adverse effects related to bronchodilators in accordance with evidence-based practices.

2.1.1.23 - The Learner will be able to identify anesthesia implications and treat adverse effects related to vasoconstrictors in accordance with evidence-based practices.

Human Physiology and Pathophysiology

Course Goal

To enhance professional competence through an ongoing, multimodal, and progressive process that maintains and enhances proficiency in nurse anesthesia practice and is a concept that ranges on a continuum from entry-level proficiency to complete mastery. The determination of what knowledge and skill equate to proficiency at the level required for continued professional certification requires judgment about the needs of patients and the range of services that experienced nurse anesthetists

provide. The knowledge base and skill set for nurse anesthetists include (but are not limited to) patient-centered care, work in interprofessional teams, evidence-based practice, quality improvement, and informatics. The goals of the CPC program for nurse anesthetists are (1) to maintain core competence and (2) to enhance competence beyond the expectations of the initially certified nurse anesthetist.

3.1 Instructional Goal: To enhance in-depth understanding of the physiological differences across the lifespan as well as the function of and interaction between organ systems and their associated disorders to ensure the safe and effective administration of anesthesia.

3.1.1 Instructional Objectives: The Learner will be able to recognize physiological and pathophysiological Cardiovascular events and manage the anesthetic in accordance with evidence-based practices.

Performance Objectives

3.1.1.1 The Learner will be able to recognize congestive heart failure and manage the anesthetic in accordance with evidence-based practices.

3.1.1.2 The Learner will be able to recognize a cardiovascular collapse and manage the anesthetic in accordance with evidence-based practices.

3.1.1.3 The Learner will be able to recognize events related to valvular disorders and manage the anesthetic in accordance with evidence-based practices.

3.1.1.4 The Learner will be able to recognize events related to peripheral vascular disease and manage the anesthetic in accordance with evidence-based practices.

3.1.1.5 The Learner will be able to recognize events related to hypertension and manage the anesthetic in accordance with evidence-based practices.

3.1.1.6 The Learner will be able to recognize cardiac dysrhythmias and manage the anesthetic in accordance with evidence-based practices.

3.1.1.7 The Learner will be able to recognize cardiac tamponade and manage the anesthetic in accordance with evidence-based practices.

3.1.1.8 The Learner will be able to recognize shock and manage the anesthetic in accordance with evidence-based practices.

3.1.1.8.1 - The Learner will be able to recognize hypovolemic shock and manage the anesthetic in accordance with evidence-based practices.

3.1.1.8.2 - The Learner will be able to recognize cardiogenic shock and manage the anesthetic in accordance with evidence-based practices.

3.1.1.8.3 - The Learner will be able to recognize cardiac compressive shock and manage the anesthetic in accordance with evidence-based practices.

3.1.1.8.4 - The Learner will be able to recognize septic shock and manage the anesthetic in accordance with evidence-based practices.

3.1.1.8.5 - The Learner will be able to recognize neurogenic shock and manage the anesthetic in accordance with evidence-based practices.

3.1.1.8.6 - The Learner will be able to recognize anaphylactic shock and manage the anesthetic in accordance with evidence-based practices.

3.1.1.9 The Learner will be able to recognize abdominal aortic aneurysms and manage the anesthetic in accordance with evidence-based practices.

3.1.1.10 The Learner will be able to recognize events related to pacemakers, stents, and automatic implantable cardioverter-defibrillators and manage the anesthetic in accordance with evidence-based practices.

3.1.1.11 The Learner will be able to recognize events related to carotid artery stenosis and manage the anesthetic in accordance with evidence-based practices.

3.1.1.12 The Learner will be able to recognize myocardial ischemia and infarction and manage the anesthetic in accordance with evidence-based practices.

3.1.1.13 The Learner will be able to recognize events related to hypotension and manage the anesthetic in accordance with evidence-based practices.

3.1.2 Instructional Objectives: The Learner will be able to recognize physiological and pathophysiological Respiratory events and manage the anesthetic in accordance with evidence-based practices.

Performance Objectives

3.1.2.1 - The Learner will be able to recognize events related to obstructive lung disease and manage the anesthetic in accordance with evidence-based practices.

3.1.2.2 - The Learner will be able to recognize events related to restrictive lung disease and manage the anesthetic in accordance with evidence-based practices.

3.1.2.3 - The Learner will be able to recognize events related to upper respiratory infections and manage the anesthetic in accordance with evidence-based practices.

3.1.2.4 - The Learner will be able to recognize events related to embolisms and manage the anesthetic in accordance with evidence-based practices.

3.1.2.5 - The Learner will be able to recognize events related to mediastinal masses and manage the anesthetic in accordance with evidence-based practices.

3.1.2.6 - The Learner will be able to recognize acute respiratory distress syndrome and manage the anesthetic in accordance with evidence-based practices.

3.1.2.7 - The Learner will be able to recognize bronchospasm and manage the anesthetic in accordance with evidence-based practices.

3.1.2.8 - The Learner will be able to recognize events related to tension pneumothorax and manage the anesthetic in accordance with evidence-based practices.

3.1.3 Instructional Objectives: The Learner will be able to recognize physiological and pathophysiological Neurologic events and manage the anesthetic in accordance with evidence-based practices.

Performance Objectives

3.1.3.1 - The Learner will be able to recognize events related to a brain AVM and manage the anesthetic in accordance with evidence-based practices.

3.1.3.2 - The Learner will be able to recognize events related to substance abuse and manage the anesthetic in accordance with evidence-based practices.

3.1.3.3 - The Learner will be able to recognize events related to dementia and manage the anesthetic in accordance with evidence-based practices.

3.1.3.4 - The Learner will be able to recognize events related to a spinal cord injury and manage the anesthetic in accordance with evidence-based practices.

3.1.3.5 - The Learner will be able to recognize events related to intracranial masses and manage the anesthetic in accordance with evidence-based practices.

3.1.3.6 - The Learner will be able to recognize events related to aneurysms and manage the anesthetic in accordance with evidence-based practices.

3.1.3.7 - The Learner will be able to recognize events related to seizures and manage the anesthetic in accordance with evidence-based practices.

3.1.3.8 - The Learner will be able to recognize events related to a stroke and manage the anesthetic in accordance with evidence-based practices.

3.1.3.9 - The Learner will be able to recognize events related to a traumatic brain injury and manage the anesthetic in accordance with evidence-based practices.

3.1.3.10 - The Learner will be able to recognize events related to neuromuscular disorders and manage the anesthetic in accordance with evidence-based practices.

3.1.3.11 - The Learner will be able to recognize events related to increased intracranial pressure and manage the anesthetic in accordance with evidence-based practices.

3.1.3.12 - The Learner will be able to recognize events related to congenital anomalies and manage the anesthetic in accordance with evidence-based practices.

3.1.3.13 - The Learner will be able to recognize the events related to post-operative visual loss in accordance with evidence-based practices.

3.1.3.14 - The Learner will be able to recognize and manage emergence delirium in accordance with evidence-based practices.

3.1.3.15 - The Learner will be able to recognize events related to peripheral nerve injury and manage the anesthetic in accordance with evidence-based practices.

3.1.3.16 - The Learner will be able to recognize events related to cauda equina syndrome and manage the anesthetic in accordance with evidence-based practices.

3.1.3.17 - The Learner will be able to recognize a myasthenic crisis and manage the anesthetic in accordance with evidence-based practices.

3.1.4 Instructional Objectives: The Learner will be able to recognize physiological and pathophysiological Renal events and manage the anesthetic in accordance with evidence-based practices.

Performance Objectives

3.1.4.1 - The Learner will be able to recognize events related to acute renal failure and manage the anesthetic in accordance with evidence-based practices.

3.1.4.2 - The Learner will be able to recognize events related to chronic renal failure and manage the anesthetic in accordance with evidence-based practices.

3.1.4.3 - The Learner will be able to recognize events related to fluid and electrolyte abnormalities and manage the anesthetic in accordance with evidence-based practices.

3.1.5 Instructional Objectives: The Learner will be able to recognize physiological and pathophysiological Gastrointestinal events and manage the anesthetic in accordance with evidence-based practices.

Performance Objectives

3.1.5.1 - The Learner will be able to recognize events related to obesity and manage the anesthetic in accordance with evidence-based practices.

3.1.5.2 - The Learner will be able to recognize events related to gastro esophageal reflux disease and manage the anesthetic in accordance with evidence-based practices.

3.1.5.3 - The Learner will be able to recognize events related to small-bowel obstruction and manage the anesthetic in accordance with evidence-based practices.

3.1.5.4 - The Learner will be able to recognize events related to pancreatitis and manage the anesthetic in accordance with evidence-based practices.

3.1.5.5 - The Learner will be able to recognize events related to liver failure and manage the anesthetic in accordance with evidence-based practices.

3.1.5.6 - The Learner will be able to recognize events related to an acute abdomen and manage the anesthetic in accordance with evidence-based practices.

3.1.6 Instructional Objectives: The Learner will be able to recognize physiological and pathophysiological Hematological events and manage the anesthetic in accordance with evidence-based practices.

Performance Objectives

3.1.6.1 - The Learner will be able to recognize events related to disseminated intravascular coagulation and manage the anesthetic in accordance with evidence-based practices.

3.1.6.2 - The Learner will be able to recognize events related to anemias and manage the anesthetic in accordance with evidence-based practices.

3.1.6.3 - The Learner will be able to recognize events related to transfusion reaction and manage the anesthetic in accordance with evidence-based practices.

3.1.6.4 - The Learner will be able to recognize events related to Coagulopathies and manage the anesthetic in accordance with evidence-based practices.

3.1.7 Instructional Objectives: The Learner will be able to recognize physiological and pathophysiological Endocrine events and manage the anesthetic in accordance with evidence-based practices.

Performance Objectives

3.1.7.1 - The Learner will be able to recognize events related to a pheochromocytoma and manage the anesthetic in accordance with evidence-based practices.

3.1.7.2 - The Learner will be able to recognize events related to diabetes mellitus and manage the anesthetic in accordance with evidence-based practices.

3.1.7.3 - The Learner will be able to recognize thyroid related events and manage the anesthetic in accordance with evidence-based practices.

3.1.7.4 - The Learner will be able to recognize pituitary related events and manage the anesthetic in accordance with evidence-based practices.

3.1.7.5 - The Learner will be able to recognize SIADH related events and manage the anesthetic in accordance with evidence-based practices.

3.1.7.6 - The Learner will be able to recognize events related to multiple endocrine neoplasia and manage the anesthetic in accordance with evidence-based practices.

3.1.7.7 - The Learner will be able to recognize parathyroid- related events and manage the anesthetic in accordance with evidence-based practices.

3.1.8 Instructional Objectives: The Learner will be able to recognize physiological and pathophysiological Musculoskeletal events and manage the anesthetic in accordance with evidence-based practices.

Performance Objectives

3.1.8.1 - The Learner will be able to recognize events related to rheumatoid disease and manage the anesthetic in accordance with evidence-based practices.

3.1.8.2 - The Learner will be able to recognize events related to ankylosing spondylitis and manage the anesthetic in accordance with evidence-based practices.

3.1.8.3 - The Learner will be able to recognize events related to scoliosis and manage the anesthetic in accordance with evidence-based practices.

3.1.8.4 - The Learner will be able to recognize events related to muscular dystrophy and manage the anesthetic in accordance with evidence-based practices.

Anesthesia Equipment and Technology

Course Goal

To enhance professional competence through an ongoing, multimodal, and progressive process that maintains and enhances proficiency in nurse anesthesia practice and is a concept that ranges on a

continuum from entry-level proficiency to complete mastery. The determination of what knowledge and skill equate to proficiency at the level required for continued professional certification requires judgment about the needs of patients and the range of services that experienced nurse anesthetists provide. The knowledge base and skill set for nurse anesthetists include (but are not limited to) patient-centered care, work in interprofessional teams, evidence-based practice, quality improvement, and informatics.

4.1 Instructional Goal: To provide information on current anesthesia equipment, technology, and informatics.

4.1.1 Instructional Objectives: The Learner will select and utilize appropriate anesthesia equipment to facilitate the safe and effective care of the patient.

Performance Objectives

4.1.1.1 - The Learner will select and utilize the most appropriate anesthesia equipment and monitoring modalities.

4.1.1.2 - The Learner will demonstrate infection prevention, disinfection, and sterilization of equipment (e.g., fiber optics, POC testing devices).

4.1.1.3 - When challenged with an equipment malfunction, the Learner will take the appropriate action for resolution to facilitate the safe and effective care of the patient.

4.1.1.4 - When challenged with an anesthesia gas machine malfunction, the Learner will take the appropriate action for resolution to facilitate the safe and effective care of the patient.

4.1.1.5 - When challenged with an electrical malfunction, the Learner will take the appropriate action for resolution to facilitate the safe and effective care of the patient.

4.1.2 Instructional Objectives: The Learner will demonstrate current principles of patient care documentation.

Performance Objectives

4.1.2.1 - The Learner will conduct and document a preanesthesia evaluation and informed consent in accordance with current standards and guidelines.

4.1.2.2 - The Learner will recognize effective communication and indicate proper documentation of key perioperative events to the essential members of the perioperative team.

4.1.3 Instructional Objectives: The Learner will demonstrate understanding of quality assurance and informatics.

Performance Objectives

4.1.3.1 - The Learner will recognize the importance and benefits of information management systems to anesthesia.

4.1.3.2 - The Learner will appropriately utilize informatics and media technology within their practice in accordance with current standards and guidelines.

4.1.3.3 - The Learner will utilize, synthesize, and apply quality assurance data and risk management in accordance to current standards and guidelines in order to effect the safe management of patient care.

Description and Examples of Assessment Evaluation

The CPC core modules recognized by the NBCRNA will feature assessments of certificants' learning of the provided material. The adequacy of these assessments to measure learning should be evaluated by the vendors recognized to deliver the modules. The purpose of this document is to provide guidance for and examples of classical outcome measures of examination quality. NBCRNA expects that vendors will submit module-specific summary measures and item statistics (see tables at the end of the document) at the time of module submission for recognition and in semi-annual reports to the NBCRNA. These requirements represent testing industry best-practices for development and maintenance of tests. The requirement for data reporting does not go into effect until August 1, 2017.

Assessment summary measures

- Aggregates / Descriptive statistics of (% correct and raw) scores
 - Mean
 - Median
 - Standard Deviation (SD)
 - Minimum (lowest) and maximum (highest) scores
- Reliability estimate (r): Reliability coefficients are measures of the precision and reproducibility of test scores. The most convenient measures of reliability are coefficients of internal consistency. Common, widely-used examples include the Kuder-Richardson coefficient (KR-20), Cronbach alpha, and split-half reliability. Like all correlations, reliability coefficients range from -1 to +1. As a rule of thumb, mid-stakes assessments should have a reliability of +0.6 or higher.
- Standard error of measurement (SEM): conceptualized as the standard deviation of errors of measurement associated with examinee scores. Can be derived from the equation, $SEM = SD \sqrt{1 - r}$, where SD is the standard deviation of scores, and r is the reliability coefficient.
- Pass rate, % of examinees successfully completing the assessment (reaching a score of 80% or higher)
- Sample size expectation:
 - $N \geq 50$ for pilot;
 - $N \geq 250$ for live implementation and maintenance.

Item (question) statistics

In addition to summary measures of assessment quality, core module vendors should also track performance indicators of individual test questions. These include

- Sample size (N): total number of examinees answered the question.
- P-value (p): Proportion or percentage of examinees answering the question correctly. Expected values of p for core module assessments would be between 0.50 and 0.95 (50%-95% correct).
- Stratified p-values: The p-value should be reported for the entire examinee group (as described above), and for each of the following quantiles:
 - P-value for the upper 27% of examinees, p27+
 - P-value for the lower 27% of examinees, p27-
 - It is desirable that p27+ > p27-
- Corrected point-biserial correlation coefficient (rpb): a correlation coefficient between the examinees' item responses (dichotomous, or binary, correct/incorrect) and the examinees' total scores (continuous). A point-biserial is "corrected" by correlating the examinee's response for an item j with the examinee's total score on the exam subtracting out item j. Again, like all correlations, rpb ranges from -1 to +1. Positive values are desirable and indicate that the item is good at differentiating between high ability and low ability examinees. As a rule of thumb, an item-level rpb $\geq +0.1$ is desirable.

Acceptable performance for an assessment item will be determined by the following criteria:

- $N \geq 50$ (pilot); $N \geq 250$ (subsequent)
- $0.50 \leq p \leq 0.95$
- $p27+ > p27-$
- $rpb \geq +0.1$

Questions that do not exhibit acceptable performance indicators should be revisited by vendors and revised or removed from the assessment and replaced with other questions.

Sample Assessment Summary

Title	Airway Management
Form or Version of Assessment	2014 Form A
Total Number of questions on assessment	50
Sample Size (number of examinees)	250
Mean Raw Score (Percentage Score)	43 (86%)
Median Raw Score (Percentage Score)	42 (84%)
Standard Deviation of Raw Scores	5.5
Minimum (Lowest) Raw Score (Percentage Score)	20 (40%)
Maximum (Highest) Raw Score (Percentage Score)	50 (100%)
Reliability Coefficient (indicate which type of coefficient was calculated)	0.75 (KR-20)
Standard Error of Measurement	2.75
Pass rate	90%

Sample Item Analysis

Item ID	N	p	p27+	p27-	rpb	Flag	Comment
0001	100	0.85	0.95	0.75	0.15		
0002	100	0.30	0.50	0.10	0.20	*	Too difficult, $p < .5$
0003	100	0.65	0.75	0.55	0.20		
0004	100	0.75	0.80	0.67	0.23		
0005	100	0.88	0.82	0.95	-0.05	*	negative rpb ; $p27+ < p27-$
0006	100	0.93	1.00	0.85	0.05	*	$rpb < .1$
0007	100	0.74	0.85	0.70	0.31		
0008	100	0.81	0.89	0.72	0.15		
0009	100	0.99	1.00	0.95	0.01	*	$p > .95$; $rpb < .1$
0010	100	0.84	0.90	0.78	0.25		

Sample feedback / taken in response to summary measures or item statistics

NBCRNA expects that vendors will take appropriate action to identify and replace problematic elements of assessments. For instance, based on the sample evaluation of the semi-annual module summary measures and item statistics, the vendor would be expected to remove items # 0002, 0005, 0006, 0009 from the assessment form, and to replace them with new questions.

More holistic changes may be required if the tests summary measures exhibit non-optimal values. Here are a few examples of problematic summary measures that may be observed, and possible interventions:

Observed summary metric	Corrective action
Low reliability estimate biserials	Add to total number of questions; replace questions with poor point-biserials
Low mean raw score	Items may be too difficult for module participants; remove some difficult questions (e.g., low p-value)
Low pass rate	Items may be too difficult for module participants (e.g., low p-value)

Help and Support

Questions

All questions pertaining to this submission and/or content development should be directed to: jpreston@nbcrna.com or 708-667-0107.

Submission Instructions

Interested module developers should email one electronic copy (in PDF format) of their completed/finalized modules and supporting materials (i.e. copies of DVD or flash drive) to the address below. All required fees must be paid before the module recognition review can begin.

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NOTE: NBCRNA will review the materials in the order received, and publish on the NBCRNA website in the order recognized. Recognized modules will not be published until notification of CE prior approval is received by the NBCRNA.