

2012
NBCRNA
CANDIDATE HANDBOOK
FOR THE 119TH NCE

NBCRNA
National Board of Certification & Recertification for Nurse Anesthetists

2012 CANDIDATE HANDBOOK

119TH NATIONAL CERTIFICATION EXAMINATION (NCE) FOR NURSE ANESTHETISTS

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This handbook contains information about the National Certification Examination (NCE) administered by the NBCRNA. It is essential that candidates keep it readily available for reference until they are notified of their performance on the examination. **Candidates are responsible for knowing the contents of this handbook.** All correspondence and requests for information concerning the NCE should be sent by e-mail to the NBCRNA at certification@nbcna.com.

The NBCRNA does not discriminate on the basis of race, color, religion,

marital status, age, gender, ancestry, physical or mental disability, medical condition or sexual orientation.

NBCRNA credentialing programs are accredited and recognized by the following organizations:



Introduction – NBCR NA

The National Board of Certification and Recertification for Nurse Anesthetists (NBCR NA) is a not-for-profit corporation organized under the laws of the state of Illinois. It consists of two councils — the Council on Certification of Nurse Anesthetists (CCNA) and the Council on Recertification of Nurse Anesthetists (COR) — who have the authority to carry out their credentialing functions.

NBCR NA credentialing provides assurances to the public that certified individuals have met objective, predetermined qualifications for providing nurse anesthesia services. While state licensure provides the legal credential for the practice of professional nursing, private voluntary certification indicates compliance with the professional standards for practice in this clinical nursing specialty. The certification credential for nurse anesthetists has been institutionalized in many position descriptions as a practice requirement or as the standard for demonstrating equivalency. It has been recognized through malpractice litigation, state nurse practice acts, and state rules and regulations.

Vision

The NBCR NA is the recognized leader in nurse anesthesia credentialing.

Mission

The mission of the NBCR NA is to promote patient health and safety through credentialing programs that support lifelong learning.

History

The certification program for nurse anesthetists was introduced by the American Association of Nurse Anesthetists (AANA) in 1945. It was initially administered by the Credentials Committee of the AANA. In 1975, the AANA approved the establishment of Councils for the accreditation and certification processes, and the Council on Certification of Nurse Anesthetists (CCNA) assumed the responsibility for the National Certification Examination (NCE). By this action, the profession recognized that credentialing mechanisms, which include examination and certification, function to protect and benefit the public. It is accepted that the profession, with broad input from the community of interest, has the expertise to set standards. In 2007, the CCNA and the COR became independent of the AANA, and together they incorporated as the NBCR NA.

Purpose

The NBCR NA is charged with protecting and serving the public by assuring that individuals who are credentialed have met predetermined qualifications or standards for providing nurse anesthesia services. As such, it is responsible for the following:

1. Formulating and adopting requirements for eligibility for admission to the NCE and for certification of registered nurse anesthetists;
2. Formulating, adopting and administering the NCE to registered nurse anesthetists who have met all requirements for examination and have been found eligible by the NBCR NA;
3. Evaluating candidates' performance on the NCE; and
4. Granting initial certification to candidates who pass the NCE and fulfill all other requirements for certification.

Structure

The NBCR NA is composed of certified registered nurse anesthetists who are actively engaged in clinical practice or in teaching or administration of a nurse anesthesia educational program; a board certified physician who has a current working relationship with nurse anesthetists; and a representative of the public at large.

NCCA Accreditation

The credentialing programs of the NBCRNA are accredited by the National Commission for Certifying Agencies (NCCA) a private not-for-profit organization. The NCCA is the accrediting branch of the Institute for Credentialing Excellence (ICE) (formerly the National Organization for Competency Assurance — NOCA) which is the national standard setting organization for credentialing groups including certification boards, licensing boards and associations. The NBCRNA (and before it, the CCNA) has been continuously accredited by the NCCA since 1980.

NCCA accreditation means that NBCRNA credentialing programs meet the highest national voluntary standards for private certification. It indicates that the program has been reviewed by an impartial commission and deemed to have met the nationally accepted criteria and guidelines of the NCCA.

ABNS Recognition

The NBCRNA (and before it, the CCNA) was one of the first national credentialing organizations to be recognized and approved by the Accreditation Board for Speciality Nursing Certification (ABSNC) of the American Board of Nursing Specialties (ABNS). The ABNS, established in 1991, is the national peer review program for specialty nursing credentialing organizations.

ABNS serves as the national umbrella organization for nursing specialty certification boards authorized and recognized to certify nurse specialists in the United States. It promotes the highest quality of specialty nursing practice through the establishment of standards of professional specialty nursing certification.

General Information

Eligibility Requirements for the National Certification Examination (NCE)

In order to be eligible to apply to take the NCE for registered nurse anesthetists and to receive a certification eligibility notification, a candidate must:

1. Comply with all state requirements for current and unrestricted licensure as a registered professional nurse;
2. Complete a nurse anesthesia educational program accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs (“accredited program”) within the previous 2 calendar years;
3. Submit:
 - a. A complete and accurate examination application form signed by the candidate, including the NBCRNA Waiver of Liability and Agreement of Authorization, Confidentiality and Nondisclosure Statement.
 - b. An electronically prepared transcript of the candidate’s record of performance in an accredited program, on an official transcript form prescribed by the NBCRNA, notarized or containing the school seal, signed by the program director and by the candidate, accurately documenting the candidate’s academic and clinical experiences, and his or her completion of the accredited program.

If transcripts are submitted prior to completion of the program, a Program Completion Verification Form verifying that the candidate has in fact completed the program must be signed and submitted by the candidate’s program director after the program has been completed;
 - c. The candidate’s valid RN license to practice as a registered professional nurse — one that is current on the candidate’s requested examination date in at least one state.
 - d. A copy of the payment receipt for the current application fee and any other applicable fees paid electronically through the NBCRNA’s Online Certification Portal;
 - e. A signed Authentication of Applicant Identity Form with a passport photo or digital photo taken within the previous 6 months attached;

4. Make the following eligibility certifications:
 - a. that his or her license has never been revoked, restricted, suspended or limited by any state; has never been surrendered; and is not the subject of a pending action or investigation;
 - b. that he or she does not currently suffer from a mental or physical condition that might interfere with the practice of nurse anesthesia;
 - c. that he or she does not currently suffer from drug or alcohol addiction or abuse;
 - d. that he or she has not been convicted of and is not currently under indictment for any felony;
 - e. that, except for incidents occurring during the nurse anesthesia educational program which were thereafter satisfactorily resolved, he or she has not been the subject of any documented allegations of misconduct, incompetent practice or unethical behavior; and
 - f. that he or she has never been the subject of disciplinary action, placed on probation, suspended, or dismissed from a nurse anesthesia educational program for unethical behavior, questions of academic integrity or documented evidence of cheating.

If the candidate does not so certify, he or she must provide full documentation of the reasons therefore with sufficient specificity to allow the NBCRNA to evaluate the possible impact of the problem on the candidate's current ability to take the NCE or practice nurse anesthesia and to resolve the issue to the NBCRNA's satisfaction; and

5. Sign the Waiver of Liability and Agreement of Authorization, Confidentiality and Nondisclosure Statement clarifying that the individual has read, understands and intends to be legally bound by the following statements:
 - a. that he or she understands that the content of the NCE, and each of its items, is proprietary, copyrighted and strictly confidential, and that the unauthorized retention, possession, copying, distribution, disclosure, discussion or receipt of any NCE question, in whole or in part, by written, electronic, oral or other form of communication, including but not limited to e-mailing, copying or printing of electronic files, and reconstruction through memorization and/or dictation, before, during or after the NCE, is strictly prohibited, and that, in addition to constituting irregular behavior subject to disciplinary action (such as denial of eligibility to take the NCE now or in the future, or revocation of certification), such activities violate the NBCRNA's proprietary rights, including copyrights, and may subject him or her to legal action resulting in monetary damages;
 - b. that he or she understands that he or she can be disqualified from taking or continuing to sit for the NCE, or from receiving NCE scores, and may be required to retake the NCE if the NBCRNA determines, at its discretion, through proctor observation, statistical analysis or any other means, that he or she was engaged in collaborative, disruptive or other irregular behavior before, during the administration of or following the NCE, or that the integrity or validity of the NCE is in question;
 - c. that he or she has not been the recipient of any NCE question; that he or she has not been involved in any disclosure, distribution or discussion of any NCE questions; and that, following this examination, he or she will not disclose, distribute or discuss any NCE questions;
 - d. that he or she will inform the NBCRNA if he or she is aware of anyone who discloses any NCE question(s) or asks him or her to disclose any NCE question(s); and
 - e. that he or she understands that evidence of unethical or inappropriate behavior may result in revocation or permanent denial of certification.

Significance of Eligibility Status

A candidate who holds "certification eligible" status with the NBCRNA has successfully completed an accredited nurse anesthesia educational program and has been granted eligibility status to take the NCE by the NBCRNA. The candidate with certification eligible status has **not** passed the NCE required for Certified Registered Nurse Anesthetist (CRNA) status, is **not certified** by the NBCRNA, and may **not** use the designation "CRNA" after his or her name.

Candidates should be aware of state laws governing nurse anesthesia practice prior to certification. It is recommended that the NCE be taken as soon after graduation as possible.

Ineligibility to Take the National Certification Examination (NCE)

Candidates will be found ineligible to take the NCE for any one or more of the following reasons:

1. If the transcript does not show that the minimum academic and clinical requirements have been met and that the candidate has completed an accredited program;
2. If the transcript is not on an official transcript form prescribed by the NBCRNA, or is not completed accurately. The use of correction fluid, pencil corrections or erasures is prohibited;
3. If, in the determination by the NBCRNA, the candidate is guilty of cheating on the NCE;
4. Failure to make the required eligibility certifications and to provide sufficient documentation to resolve the issue to the satisfaction of the NBCRNA;
5. Failure to meet any of the other eligibility requirements, including failure to sign or accept the Waiver of Liability and Agreement of Authorization, Confidentiality and Nondisclosure Statement; or
6. Failure to pass the NCE within 2 years following graduation from an accredited nurse anesthesia program.

Conditional Eligibility

1. Grant of Conditional Eligibility

Candidates who hold a restricted license to practice as a registered professional nurse or who are required to participate in a recovery program or other non-disciplinary monitoring program, may, at the discretion of the NBCRNA, be granted conditional eligibility to take the NCE, provided that all other certification eligibility requirements have been fulfilled.

Examples of conditions include requirements for supervision and requirements that a candidate remain in a drug or alcohol abuse or recovery program for a specified period of time.

2. Conditional Eligibility Period

Conditional eligibility shall remain in effect for the eligibility period described below, as long as the candidate complies with all terms of the conditions on his or her license. It shall be revoked for failure to comply.

Expiration of Eligibility Status

Eligibility to sit for the NCE lasts for a period of 90 days, or until the candidate takes the NCE, whichever occurs first. Eligibility will expire 90 days from the date of issue of the certification eligibility notification or on the date that the candidate takes the NCE.

If a candidate does not take the NCE within the 90-day eligibility period, or takes and fails the NCE, he or she will be required to reapply for admission to the NCE and resubmit the full \$725 application fee.

Revocation of Eligibility Status

The NBCRNA will automatically revoke a candidate's eligibility to take the NCE in the following circumstances:

1. Failure by the candidate to maintain licensure as a registered nurse in at least one state;
2. Withdrawal by a school official of his or her affirmation signature from the candidate's official transcript;
3. Failure by the candidate to complete an accredited nurse anesthesia educational program;
4. Adjudication by a court that the candidate is mentally incompetent;
5. Conviction of or pleading no contest to a felony that is, in the view of the NBCRNA, related to the practice of nursing or nurse anesthesia; or
6. Failure by the candidate to successfully pass the NCE within 2 years after graduation.

The NBCRNA may, at its discretion, deny, revoke or suspend a candidate's eligibility to take the NCE for any of the following reasons:

1. Circumstances change so as to render one of the eligibility certifications made by the candidate invalid;
2. Falsification of the NCE application, intentional misstatement of material fact or deliberate failure to provide relevant information on the examination application or to the NBCRNA at any time, or assisting another person to do any of the above;
3. Failure by the candidate to maintain current and unrestricted licensure as a registered professional nurse in every state of practice;
4. Cheating or assisting another person to cheat on the NCE, or otherwise engaging in dishonest or other improper behavior at any time in connection with the NCE;
5. Documented evidence of gross incompetence, unethical conduct or moral turpitude which, in the opinion of the NBCRNA, represents a significant threat to patient well-being;
6. Conviction of or pleading no contest to a felony; or
7. Documented evidence of unauthorized retention, possession, copying, distribution, disclosure, discussion, or receipt of any NCE question, in whole or in part, by written, electronic, oral or other form of communication, including but not limited to e-mailing, copying or printing of electronic files, and reconstruction through memorization and/or dictation, before, during or after the NCE.

Requirements for Certification

The NBCRNA has established the following requirements for certification. The candidate must:

1. Fulfill all eligibility requirements for admission to the NCE; and
2. Pass the NCE.

Denial of Certification

The NBCRNA will automatically deny a candidate's certification for any of the following reasons:

1. Failure by the candidate to maintain licensure as a registered nurse;
2. Failure by the candidate to pass the NCE;
3. Adjudication by a court that the candidate is mentally incompetent; or
4. Conviction of or pleading no contest to a felony that is, in the view of the NBCRNA, related to the practice of nursing or nurse anesthesia.

The NBCRNA may, at its discretion, deny a candidate's certification for any of the following reasons:

1. Circumstances change so as to render one of the eligibility certifications made by the candidate invalid;
2. Falsification of the NCE application, intentional misstatement of material fact or deliberate failure to provide relevant information on the examination application or to the NBCRNA at any time, or assisting another person to do any of the above;
3. Failure by the candidate to maintain current and unrestricted licensure as a registered professional nurse in every state of practice;
4. Cheating or assisting another person to cheat on the NCE, or otherwise engaging in dishonest or other improper behavior at any time in connection with the NCE;
5. Conviction or pleading no contest to a felony;
6. Documented evidence of unauthorized retention, possession, copying, distribution, disclosure, discussion or receipt of any examination question, in whole or in part, by written, electronic, oral or other form of communication, including but not limited to e-mailing, copying or printing of electronic files, and reconstruction through memorization and/or dictation, before, during or after the NCE; or
7. Documented evidence of gross incompetence, unethical conduct or moral turpitude which, in the opinion of the NBCRNA, represents a significant threat to patient well-being.

Conditional Certification

1. Grant of Conditional Certification

Nurse anesthetists who have a restricted license to practice as a registered professional nurse and, where applicable, as a nurse anesthetist, or who are required to participate in a recovery program or other non-disciplinary monitoring program, may be granted conditional certification, provided that all other certification requirements have been fulfilled. The conditional certification will reflect any conditions imposed by the appropriate state licensure authority.

Examples of conditions include requirements for supervision and requirements that the anesthetist remain in a drug or alcohol abuse or recovery program for a stated period of time. The conditional certification card and certificate shall state that certification is conditioned on the anesthetist's compliance with the terms of his or her license conditions.

2. Conditional Certification Period

Conditional certification shall remain in effect as long as the anesthetist complies with all terms of the conditions on his or her license. It shall be revoked for failure to comply. The anesthetist shall be responsible for providing the NBCRNA with adequate documentation that he or she has complied with all licensure conditions for the requisite period of time. A request to change Conditional Certification to Full Certification must be accompanied by written documentation sufficient to demonstrate to the NBCRNA that all conditions have been removed.

Recognition of Certification by the NBCRNA

Each nurse anesthetist who passes the NCE and fulfills the requirements for certification by the NBCRNA may use "CRNA" after his or her name. The term stands for Certified Registered Nurse Anesthetist. CRNA is not punctuated with periods.

Certified Registered Nurse Anesthetists receive an initial certification card and a wall certificate with their official notification of certification by the NBCRNA.

A list of Certified Registered Nurse Anesthetists who are newly certified by the NBCRNA is posted monthly on the NBCRNA website.

Revocation of Certification

The NBCRNA will automatically revoke an anesthetist's certification for any of the following reasons:

1. Failure by the anesthetist to maintain current licensure as a registered nurse;
2. Adjudication by a court that the anesthetist is mentally incompetent; or
3. Conviction of or pleading no contest to a felony that is, in the view of the NBCRNA, related to the practice of nursing or nurse anesthesia.

The NBCRNA may, at its discretion, after due and thorough deliberation, revoke an anesthetist's certification for any of the following reasons:

1. Circumstances change so as to render one of the eligibility certifications made by the anesthetist invalid;
2. Falsification of the NCE application, intentional misstatement of material fact or deliberate failure to provide relevant information on the examination application or to the NBCRNA at any time, or assisting another person to do any of the above;
3. Failure by the anesthetist to maintain current and unrestricted licensure as a registered professional nurse and, where applicable, authorization to practice nurse anesthesia, in all states in which the candidate practices. Anesthetists employed by the United States government must maintain licensure in one state or territory of the United States;
4. Cheating or assisting another person to cheat on the NCE, or otherwise engaging in dishonest or other improper behavior at any time in connection with any NCE;
5. Conviction of or pleading no contest to a felony;

6. Documented evidence of unauthorized retention, possession, copying, distribution, disclosure, discussion or receipt of any NCE question, in whole or in part, by written, electronic, oral or other form of communication, including but not limited to e-mailing, copying or printing of electronic files, and reconstruction through memorization and/or dictation, before, during or after the NCE; or
7. Documented evidence of gross incompetence, unethical conduct or moral turpitude which, in the opinion of the NBCR NA, represents a significant threat to patient well-being.

Review and Appeal Process for Adverse Decisions

1. Adverse Decisions Subject to Review or Appeal:

Adverse Administrative Decisions

- » Denial of a request for extension of an established deadline or for exception to other administrative requirements
- » Denial of a grievance regarding examination administration

Adverse Substantive Decisions

- » Denial of eligibility, certification or recertification for nondisciplinary reasons
- » Revocation of eligibility, certification or recertification for nondisciplinary reasons
- » Reportable disciplinary actions based on:
 - Irregular behavior before, during or after an NBCR NA examination
 - Manufacture or use of fraudulent NBCR NA credentials
 - Legal, regulatory or credentialing action

No appeal may be taken from an adverse decision based on an individual's failure to meet eligibility requirements for any NBCR NA examination, receipt of a failing score on any NBCR NA examination, or imposition of a fee based on a final adverse decision.

2. Process for Review and Appeal

Adverse actions subject to review and appeal will be handled pursuant to the NBCR NA Review and Appeal Process for Adverse Decisions. A copy of this document is contained in the NBCR NA Discipline and Appeals Policy and Procedures located on the Resources page of the NBCR NA website.

Recertification

Graduates of nurse anesthesia educational programs accredited by the Council on Accreditation of Nurse Anesthesia Programs who achieve a passing score on the NCE are granted initial certification by the NBCR NA. A new Certified Registered Nurse Anesthetist is eligible to apply for recertification 2 years after initial certification. Certified Registered Nurse Anesthetists must meet the requirements for recertification as specified in the NBCR NA Criteria for Recertification (which is available on the Recertification page of the NBCR NA website).

Examination Information

Purpose of the National Certification Examination (NCE)

The NBCRNA administers the NCE to measure the knowledge, skills and abilities necessary for entry-level nurse anesthesia practitioners.

Description of the Examination

The NCE for registered nurse anesthetists is a variable-length, computerized adaptive, multiple-choice test. The examination is for entry into nurse anesthesia practice. Each candidate will take a minimum of 100 test questions — 70 questions representing the NCE content outline and 30 pretest questions. The maximum number of questions is 170 questions, which includes 30 pretest questions. A maximum of three hours is allowed for the test period.

In 2009, in addition to multiple-choice question formats (consisting of a stem and four response options), the NCE began featuring alternative question formats, which consist of the following:

Multiple Correct Response (MCR): This question format is similar to a multiple-choice (MC) question. However, MCR questions consist of a stem and four to eight response options, and more than just one option is a correct response. The examinee must select all of the correct responses in order to be awarded credit. The question stem will indicate how many responses are correct.

Calculation: Examinees are asked to respond by typing in a numerical response, typically a whole number (no decimals) or a number consisting of 1-2 decimal places. It is very important that the response to calculation questions be entered in the form of a number (e.g., 2 or 2.11), and NOT the word form of a number (e.g., “two” or “two point one-one”).

Example: What is 2+2?

Correct: 4

Incorrect: Four

A calculator application will be available for calculation items that may be computationally complex.

Drag and Drop: These questions involve clicking and dragging objects to corresponding targets, and may take the form of matching or placing objects in order.

Hotspot: Examinees indicate their answer by using their mouse to click on a region of a presented image or figure. When a region is selected, an “X” appears on the selected region. Examinees can change their answer (before moving to the next question) simply by clicking on another region in the image.

Graphics/Video: Any of the question formats described above may be augmented with multimedia as stimuli for the question.

The questions are presented one at a time on a computer screen. Each question may be viewed as long as the candidate wishes, but the candidate cannot go back to previous questions once an answer choice has been recorded; nor can the candidate leave a question unanswered.

An important principle of test construction is that only questions that demonstrate acceptable performance are used to compute examinee scores. Questions that have never been used before have unknown performance characteristics and it would be unfair to use such questions in computing examinee scores. Therefore, it is necessary to pretest these questions and evaluate their performance. There are 30 such questions on the NCE. They appear throughout the examination and are not necessarily the first 30 or last 30 questions. Those questions that survive the complex evaluation process are retained for use on future examinations. The pretest questions are not used to score the examination.

Certified Registered Nurse Anesthetists from the NBCRNA, an anesthesiologist and an elected representative group of Certified Registered Nurse Anesthetists serve on the Certification Examination Subcommittee. This subcommittee meets annually to write and review test questions for the approved item bank and to update the item bank each year. Performance statistics for questions are continually monitored by the NBCRNA.

Computerized Adaptive Testing

The NCE is administered by computer using a methodology called computerized adaptive testing (CAT). CAT is a method of administering tests that uses current technology and is based on the psychometric framework of Item Response Theory (IRT). With CAT, each candidate's test is individualized; it is assembled interactively as the candidate is taking the test. Test questions are stored in a large item bank and classified by content category and level of difficulty. After a candidate answers a question, the computer calculates an estimate of competence and chooses a question of appropriate content and difficulty next. This process is repeated for each question, thus creating an examination that both fulfills the test plan requirements and is tailored to each individual's knowledge and skills.

Each test conforms to the content outline, which assures inclusion of test questions in all of the major content areas. All questions are chosen from the same item bank. The passing point is identical for all candidates, assuring that the difficulty level to pass the NCE is consistent for all candidates. All candidates have the opportunity to demonstrate their ability level, as the NCE will not end until a pass or fail decision is determined.

Administration

The NBCRNA contracts with Pearson VUE to administer the NCE at test centers located in major cities throughout the United States.

Examination Content

The NBCRNA maintains responsibility for the examination content outline and test specifications, maintains an item bank of approved test questions, and sets the passing score. In addition, the NBCRNA determines individual eligibility for admission to the NCE.

Content validity for the NCE has been documented through a job analysis performed by the CCNA in 1987, a professional practice analysis (PPA) in 1992 in collaboration with American College Testing (ACT), repeated in collaboration with Computer Adaptive Technologies, Inc., in 1996, and in collaboration with Promissor in 2001 and 2006. The PPA ensures that the NCE reflects the knowledge of an entry-level nurse anesthesia practitioner. Content validation is provided by linkages between the PPA, knowledge and skill statements, and the test items. The job analysis is essential to the continued accreditation of the certification program and validation that the NCE is fair, job-related, and legally defensible.

The following outline, developed from responses to the 2006 PPA and a review by the NBCRNA, is provided to assist candidates in preparing for the NCE. The test content outline is only a guide which suggests topics and topical areas used to generate and categorize examination questions. It is not all-inclusive, as some elements apply to more than one area. This means that not only must candidates validate their knowledge of a subject, but they also must be able to integrate this knowledge across the spectrum of anesthesia practice. Candidates should be aware that anesthetics and anesthesia adjuncts are constantly evolving. It may be appropriate for the content to include older agents as a mechanism to compare and contrast with new agents. Drug dosing is, of course, an essential part of pharmacologic knowledge and application.

The NBCRNA reserves the right to determine examination content, to classify examination questions and to determine the percentage of test questions from each topical area. The approximate percentages of questions in each major content area are provided in the Content Online, which starts on the next page.

Content Outline

I. Basic Sciences

(Percentage of Questions: 25%)

A. Anatomy, physiology and pathophysiology

1. Cardiovascular
 - a. Dysrhythmias
 - b. Ischemic heart disease/angina
 - c. Myocardial infarction
 - d. Hypertension
 - e. Congestive heart failure
 - f. Endocarditis
 - g. Valvular heart disease
 - h. Cardiomyopathy
 - i. Peripheral vascular disease
 - j. Congenital heart disease
 - k. Pacemaker
 - l. AICD
2. Respiratory
 - a. Bronchitis
 - b. COPD/emphysema
 - c. Asthma
 - d. Pneumonia
 - e. Tuberculosis
 - f. Pulmonary embolism
 - g. COR pulmonale
 - h. Pulmonary hypertension
 - i. Upper respiratory tract infection
 - j. Acidosis
 - k. Adult respiratory distress syndrome
 - l. Epiglottitis
 - m. Sleep apnea
3. Central nervous system
 - a. Seizures
 - b. CVA
 - c. Hydrocephalus
 - d. Parkinson's
 - e. Multiple sclerosis
 - f. Myasthenia gravis
 - g. Alzheimer's/dementia
 - h. Huntington's chorea
 - i. Demyelinating disease
 - j. Intracranial hypertension
 - k. Intracranial tumor
 - l. Intracranial aneurysm
 - m. Autonomic hyperreflexia
 - n. Neuropathy/myopathy
 - o. Psychiatric disorders
 - p. Cerebral palsy
4. Musculoskeletal
 - a. Fractures
 - b. Rheumatoid arthritis
 - c. Lupus erythematosus
 - d. Muscular dystrophy
 - e. Scoliosis
 - f. Malignant hyperthermia
5. Endocrine
 - a. Diabetes mellitus
 - b. Diabetes insipidus
 - c. Hypo/hyperthyroidism
 - d. Cushing's disease
 - e. Addison's disease
 - f. Pituitary dysfunction
 - g. Parathyroid dysfunction
 - h. Pheochromocytoma
 - i. Insulinoma
 - j. Acromegaly
 - k. Hypo/hyperaldosteronism
 - l. Thymus
6. Hepatic
 - a. Hepatitis
 - b. Cirrhosis
 - c. Hepatic failure
 - d. Porphyria
7. Renal
 - a. Kidney stones
 - b. Acute renal failure
 - c. Chronic renal failure
 - d. Uremia
 - e. Nephritis
8. Hematologic
 - a. Anemia
 - b. Sickle cell/hemoglobinopathies
 - c. Polycythemia
 - d. Platelet disorders
 - e. Hemophilia
 - f. von Willebrand disease
 - g. Disseminated intravascular coagulation
9. Gastrointestinal
 - a. Peptic ulcer disease
 - b. Ulcerative colitis
 - c. Diaphragmatic hernia
 - d. Hiatal hernia
 - e. Gastroesophageal reflux disorder (GERD)
 - f. Gallstones/gall bladder disease
 - g. Pancreatitis

Content Outline *continued*

- h. Splenic disorders
- i. Carcinoid syndrome
- j. Pyloric stenosis
- k. Bowel obstruction
- 10. Immune
 - a. Allergic responses and anaphylaxis
 - b. AIDS/HIV
 - c. Immunosuppression
 - d. Latex allergy
 - e. Sepsis
- 11. Other
 - a. Abnormal lab tests
 - b. Cancer
 - c. Glaucoma
 - d. Thermoregulation
 - e. Trauma
 - f. Shock
 - g. Substance abuse (Alcohol, Tobacco, Other)
 - h. Airway difficulties
 - i. Diagnostic data
 - (1) Chest x-ray
 - (2) Pulmonary function tests
 - (3) Echocardiogram
 - (4) Cardiac catheterization
 - (5) CAT/MRI
 - (6) Electrocardiogram
 - (7) Arteriogram/vessel studies
 - (8) Stress tests
 - j. Burns

B. Pharmacology

- 1. General principles
 - a. Pharmacodynamics
 - b. Pharmacokinetics
 - c. Anaphylaxis
 - d. Drug interactions
- 2. Inhalation anesthetics
 - a. Nitrous oxide
 - b. Isoflurane
 - c. Desflurane
 - d. Sevoflurane
- 3. Intravenous agents
 - a. Barbiturates
 - (1) Thiopental
 - (2) Methohexital
 - b. Opioid agonists
 - (1) Morphine
 - (2) Fentanyl
 - (3) Alfentanil

- (4) Sufentanil
- (5) Meperidine
- (6) Remifentanil
- (7) Hydromorphone
- c. Opioid agonist-antagonists
 - (1) Nalbuphine
 - (2) Butorphanol
- d. Benzodiazepines
 - (1) Diazepam
 - (2) Midazolam
 - (3) Lorazepam
- e. Other sedative/hypnotics
 - (1) Propofol
 - (2) Ketamine
 - (3) Etomidate
- 4. Local anesthetics
 - a. Procaine
 - b. Chlorprocaine
 - c. Tetracaine
 - d. Cocaine
 - e. Benzocaine
 - f. EMLA
 - g. Bupivacaine
 - h. Lidocaine
 - i. Etidocaine
 - j. Mepivacaine
 - k. Ropivacaine
 - l. Levobupivacaine
- 5. Muscle relaxants
 - a. Succinylcholine
 - b. Pancuronium
 - c. Vecuronium
 - d. Atracurium
 - e. Rocuronium
 - f. Cisatracurium
- 6. Antagonists
 - a. Edrophonium
 - b. Neostigmine
 - c. Naloxone
 - d. Flumazenil
 - e. Pyridostigmine
 - f. Physostigmine
- 7. Neuraxial analgesics
 - a. Opioids
 - b. Clonidine
- 8. Anticholinergics/Cholinergic agonists
- 9. Cyclooxygenase inhibitors
 - a. Acetylsalicylic acid

Content Outline *continued*

- b. Acetaminophen
- 10. Sympathomimetics
- 11. Digitalis and related drugs
- 12. Alpha and beta receptor antagonists
- 13. Antihypertensives
 - a. Sympatholytics
 - (1) Dexmedetomidine
 - (2) Clonidine
 - b. ACE inhibitors
 - c. Angiotensin II receptor inhibitors
 - d. Nitrovasodilators
 - e. Nitric oxide
- 14. Antidysrhythmics
- 15. Calcium channel blockers
- 16. Bronchodilators
- 17. Psychopharmacologic therapy
 - a. Selective serotonin reuptake inhibitors
 - b. Tricyclic antidepressants
 - c. MAO inhibitors
 - d. Lithium
- 18. Prostaglandins
- 19. Histamine receptor antagonists
- 20. Serotonin antagonists
- 21. Insulin
- 22. Oral hypoglycemics
- 23. Diuretics
- 24. Antacids
- 25. Gastrointestinal prokinetic medications
 - a. Metoclopramide
- 26. Anticoagulants
 - a. Heparin
 - b. Heparin reversal (Protamine)
 - c. Low molecular weight heparins
 - d. Oral anticoagulants
 - e. Oral anticoagulant reversal
 - f. Thrombolytics
 - g. Thrombin inhibitors
- 27. Antimicrobials
- 28. Chemotherapeutics
- 29. Antiepileptic drugs
- 30. Antiparkinsonian drugs
- 31. Drugs used to treat lipid disorders
- 32. Herbal remedies and dietary supplements
- 33. Minerals and electrolytes
- 34. Dantrolene
- 35. Corticosteroids
- 36. Tocolytics

- 37. Uterotonics

C. Applied chemistry, biochemistry, physics

- 1. Chemistry
 - a. Aqueous solutions and concentrations
 - b. Acids, bases and salts
- 2. Biochemistry
 - a. Hepatic metabolism
 - b. Cellular mechanisms for action
 - c. Drug Receptor interaction
- 3. Physics
 - a. Units of measurement
 - b. Gases and gas laws
 - c. Solubility, diffusion and osmosis
 - d. Pressure and fluid flow
 - e. Electricity and electrical safety
 - f. Vaporization and humidification
 - g. Measurement of oxygen, carbon dioxide and hydrogen ion

II. Equipment, Instrumentation and Technology *(Percentage of Questions: 10%)*

A. Anesthetic delivery systems

- 1. High/low pressure gas sources
- 2. Regulators/manifolds
- 3. Flowmeters, valves, floats
- 4. Vaporizers
- 5. Proportioning systems
- 6. Pressure failure safety devices
- 7. "Fail-safe" devices
- 8. Ventilator
- 9. Carbon dioxide absorbent
- 10. Anesthetic circuits
 - a. Rebreathing, circle system
 - b. Non-rebreathing
 - c. Modified non-rebreathing
- 11. Pneumatic and electronic alarm devices

B. Airway devices

- 1. Face masks
- 2. Laryngoscope
 - a. Rigid
 - b. Flexible/Fiberoptic
 - c. Videoscope
- 3. Endotracheal tube
- 4. Endobronchial tube
- 5. Airways
 - a. Oral
 - b. Nasal

Content Outline *continued*

6. Tracheostomy tubes
7. Laryngeal mask airway
8. Intubating laryngeal mask airway
9. Jet ventilation
10. Lighted stylet
11. Other
 - a. Retrograde wire
 - b. Eschmann catheter
 - c. Combitube
 - d. Cook exchange catheter

C. Monitoring devices

1. Central nervous system
 - a. Electroencephalogram
 - b. Evoked potential
 - c. Intracranial pressure
 - d. Modified EEG monitor (e.g., BIS, etc.)
2. Cardiovascular
 - a. Electrocardiogram
 - b. Arterial pressure monitoring
 - c. Noninvasive blood pressure monitoring
 - d. Transesophageal echocardiography
 - e. Central venous pressure monitoring
 - f. Pulmonary artery pressure monitoring/SVO2
 - g. Cardiac output
 - h. Precordial/esophageal stethoscope/doppler
3. Pulmonary/airway monitoring
 - a. Capnography
 - b. Airway gas analysis
 - c. Pulse oximetry
 - d. Airway pressure
 - e. Blood gas analysis
4. Peripheral nerve stimulator
5. Urinary output monitoring
6. Temperature monitoring
7. Maternal/fetal monitoring devices
8. Others
 - a. Fluid/blood warmers
 - b. Forced air warming blanket
 - c. Heat and moisture exchanger (HME)
 - d. Blood salvage (cell saver)

III. Basic Principles of Anesthesia

(Percentage of Questions: 30%)

A. Preoperative assessment and preparation of patient

B. Fluid/blood replacement

1. Fluid therapy

2. Hemotherapy
 - a. Blood component therapy
 - b. Blood substitutes
 - c. Colloids

C. Positioning (technique, physiologic alterations, complications)

1. Prone
2. Supine
3. Lithotomy
4. Lateral
5. Sitting
6. Beach chair
7. Trendelenburg
8. Reverse trendelenburg

D. Interpretation of data

1. Lab tests
2. Diagnostic data
3. Intraoperative monitoring data

E. Airway management

1. Mask
2. Intubation
3. Cricothyrotomy
4. Fiberoptics

F. Local/regional anesthesia

1. Infiltration
2. Topical
3. Regional blocks (Technique, Physiologic alterations, Complications)
 - a. Subarachnoid block
 - b. Epidural block
 - c. Combined spinal/epidural
 - d. Caudal block
 - e. Brachial plexus block
 - f. Airway blocks
 - g. IV regional block (Bier)
 - h. Retrobulbar/peribulbar block
 - i. Ankle block
 - j. Digital block
 - k. Wrist block
 - l. Sciatic block
 - m. Femoral block
 - n. Popliteal block

G. Monitored anesthesia care/conscious sedation

H. Post-operative pain management

1. Epidural analgesia
2. Infiltration nerve blocks
3. Intrathecal narcotics

Content Outline *continued*

4. PCA management
5. Epidural steroids

I. Others

1. Hypotensive
2. Hypothermia

J. Postanesthesia care/respiratory therapy

IV. Advanced Principles of Anesthesia

(Percentage of Questions: 30%)

A. Surgical procedures and procedures related to organ systems

1. Intra-abdominal
 - a. Gall bladder
 - b. Liver
 - c. Pancreas
 - d. Spleen
 - e. Stomach
 - f. Renal
 - g. Diaphragm
 - h. Intestine
 - i. Herniorrhaphy
 - j. Bladder
 - k. Abdominal/gyn
 - l. Prostatectomy
 - m. Laparoscopy
 - n. Bariatrics
2. Extrathoracic
 - a. Breast biopsy
 - b. Mastectomy
 - c. Plastic and/or reconstructive
3. Extremities
 - a. Lower
 - b. Upper
 - c. Total joint replacements
 - d. Vein stripping
 - e. Hemipelvectomy
 - f. Pelvic exenteration
4. Genital and urologic
 - a. Transurethral resection
 - b. Cystoscopy
 - c. D and C
 - d. Hysterectomy
 - e. Hysteroscopy
 - f. Anal/rectal
 - g. Penis/testes
5. Head
 - a. Extracranial
 - (1) Cranioplasty
 - (2) Rhizotomy
 - (3) Ear
 - (4) Eye
 - (5) Face
 - (6) Nose
 - b. Intracranial
 - (1) Decompression (burr holes)
 - (2) Space-occupying lesion
 - (3) Vascular
 - (4) Transsphenoidal hypophysectomy
 - (5) Transorbital approach
 - (6) Stereotactic procedures
 - c. Oropharyngeal
 - (1) Esophagoscopy/gastroscopy
 - (2) Bronchoscopy
 - (3) Fractures
 - (4) Reconstructive
 - (5) T&A
 - (6) Orthodontic/dental
 - (7) Pharynx
 - (8) Reconstructive and/or plastic surgery
 - (9) Rigid laryngoscopy
6. Intrathoracic
 - a. Heart
 - b. Lung
 - c. Thymus
 - d. Diaphragm
 - e. Esophagus
 - f. Thoraco-abdominal
7. Neck
 - a. Larynx/trachea
 - b. Parathyroid/thyroid
 - c. Radical neck
 - d. Neck tumors
 - e. Cervical spine (anterior and posterior approach)
 - f. Lymph node biopsies
 - g. Tracheotomy
8. Neuroskeletal
 - a. Laminectomy
 - b. Fusions
 - c. Spinal cord procedures
 - d. Surgical sympathectomy
 - e. Vertebroplasty
9. Vascular
 - a. Carotid
 - b. Thoracic

Content Outline *continued*

- c. Abdominal
- d. Upper extremity
- e. Lower extremity
- f. Porto-systemic shunts
- g. Renal artery
- h. Aortic stents
- i. Vena cava filter
- j. Endovascular procedures
- 10. Diagnostic/therapeutic
 - a. Venous/arterial catheterization
 - b. Cardioversion
 - c. CAT scan
 - d. MRI
 - e. Electroconvulsive therapy
 - f. Interventional radiology
 - g. Electrophysiology
 - h. Steroid therapy
 - i. Radiation therapy
 - j. Endoscopy
- 11. Management of complications
 - a. Anesthetic
 - b. Surgical
- 12. Other
 - a. Trauma
 - b. Burns
 - c. Resuscitation
 - d. Pacemakers
 - e. Lithotripsy
 - f. Organ transplants
 - g. Organ harvest
 - (1) Living donor
 - (2) Cadaver
 - h. Laser

B. Pediatrics

- 1. Anatomy, physiology, pathophysiology
 - a. Prematurity
 - b. Congenital anomalies
- 2. Pharmacology
- 3. Anesthesia techniques/procedures
- 4. Management of complications

C. Obstetrics

- 1. Anatomy, physiology, pathophysiology
- 2. Pharmacology
- 3. Anesthesia techniques/procedures
 - a. Caesarean section
 - b. Vaginal delivery
 - c. Labor epidurals
 - d. Intrathecal
 - e. Postpartum tubal ligation
 - f. Vaginal birth after caesarean section
 - g. High risk
 - h. Non-obstetric surgery in the parturient
- 4. Management of complications

D. Geriatrics

- 1. Anatomy, physiology, pathophysiology
- 2. Pharmacology
- 3. Anesthesia techniques/procedures
- 4. Management of complications

E. Obesity

- 1. Anatomy, physiology, pathophysiology
- 2. Pharmacology
- 3. Anesthesia techniques/procedures
- 4. Management of complications

F. Chronic pain management

- 1. Anatomy, physiology, pathophysiology
- 2. Pharmacology
- 3. Anesthesia techniques/procedures
- 4. Management of complications

V. Professional Issues

(Percentage of Questions: 5%)

A. Legal

B. Research and quality improvement

C. Professional practice standards

D. Patient safety

Sample questions appear on pages 25-27 of this Candidate Handbook.

References for Review

The principal anesthesia textbooks used in nurse anesthesia educational programs should provide information related to all the major content areas on the NCE. Research articles and review books are not used as references. The NBCRNA does not sponsor or endorse any review courses, review manuals or particular texts that can be used in preparation for the NCE. The NBCRNA does not make old tests or retired questions available to anyone.

Registration Information

Examination Dates

The NCE may be taken after the candidate has been deemed eligible by the NBCRNA and has scheduled an appointment with Pearson VUE to take the test. Candidates may schedule an appointment to take the NCE on any date that space is available at any Pearson test center of their choice. Attention should be paid to the fact that not all test centers are open seven days a week or operate on the same schedule. Immediate scheduling is not guaranteed by either NBCRNA or Pearson VUE.

Fees

The NCE application fee (\$725) and any other applicable fees must be paid electronically through the NBCRNA Online Certification Portal. All fees must accompany the online application form. Institutional checks, personal checks or money orders will not be processed. The NBCRNA does not directly invoice individuals or institutions for payment of any examination fees.

Application Process

For an applicant to be considered for eligibility to take the NCE, all of the following materials must be submitted to the NBCRNA by the director of the nurse anesthesia educational program:

1. A completed application electronically signed through the Online Certification Portal. This document is permanently retained by the NBCRNA.
All candidates must sign the Waiver of Liability and Agreement of Authorization, Confidentiality and Nondisclosure Statement on the application form.
2. A copy of the receipt of payment of all applicable fees paid electronically.
3. A copy of the candidate's valid license (RN license number, issuing state and expiration date) to practice as a registered professional nurse. The license must be current on the date the candidate takes the NCE.
 - a. If the nursing license expires between the date the candidate officially completes the nurse anesthesia educational program and the date the NCE is taken, the candidate will be found eligible, provided all of the other requirements for eligibility have been met. However, official NCE results will NOT be released until the NBCRNA has received a copy of the nursing license that was current on the date of the NCE, or a written statement from the state nursing board attesting to the candidate's valid licensure on that date.
4. An original 2012 NBCRNA Transcript of Student Record, that is not handwritten or hand-printed, which documents the candidate's educational and clinical experiences. This document is permanently retained by the NBCRNA. The transcript must be submitted directly by the program director within 30 days of completion of the program. It may be printed and mailed or scanned and attached to the candidate's electronic application. The transcript must:
 - a. be signed by both the program director and the candidate;
 - b. accurately show that all the minimum requirements have been met, and that the candidate completed the program; and
 - c. have the official seal of the program affixed or be properly notarized.

If the candidate attended more than one nurse anesthesia educational program, only one transcript should be submitted, clearly showing the academic and clinical information from both programs.

5. An Authentication of Applicant Identity Form signed by the program director, including a passport photo or digital photo of the applicant taken within the previous 6 months.
6. Written requests for special services, if applicable.

For immediate confirmation that the NCE materials not submitted electronically were received in the NBCRNA office, overnight mail should be used. Acknowledgement of receipt of materials will be sent to program directors via e-mail within 24 hours of receipt in the NBCRNA office.

Application Procedure – Program Directors

The program director must submit all the necessary materials, including the original 2012 NBCRNA Transcript of Student Record, to the NBCRNA office. The transcripts and materials may be submitted in one of two ways: 1) up to 4 weeks prior to the official completion date of the nurse anesthesia program; or 2) upon official completion of the program. The completion date is the date that the student has completely finished the anesthesia program and degree requirements — i.e., there are no make-up days, hours, classes, comprehensive exams or thesis for which the student is responsible.

The decision on when to submit completed transcripts is at the discretion of the program director. Regardless of when a transcript is submitted, it must document that the candidate has met the minimum academic and clinical requirements necessary to complete an accredited program.

These requirements are set by the Council on Accreditation of Nurse Anesthesia Educational Programs (COA) and published in the Council on Accreditation's Standards and Guidelines.

If the transcripts have been submitted prior to the program completion date, the program director must sign and submit, **on or after** the students' official completion date, a Program Completion Verification Form verifying that the candidate has in fact completed the program. Certification eligibility notifications will not be sent until the Program Completion Verification Form is received in the NBCRNA office. A PDF file of the Program Completion Verification Form is available to program directors in the Special Resources section of the Certification page on the NBCRNA website.

Application Procedure – Candidates

An application that is incomplete, incorrectly filled out, or without the correct fee and current RN license information (valid within 90 days of completion of the anesthesia program) will not be processed. **All application materials must be submitted by the program director.** No application materials may be submitted directly by the applicant.

The NBCRNA office processes the applications and, where appropriate, grants "certification eligible" status and sends a certification eligibility notification via e-mail to each applicant, including the candidate's test taker ID and password. Upon receipt of notification of certification eligibility, the candidate must contact Pearson VUE to schedule an appointment to take the NCE. **All scheduling must be done by the candidate directly with Pearson VUE** either via its website or its Candidate Call Center. The toll-free telephone number for Pearson VUE's Candidate Call Center will be included in the candidate's certification eligibility notification.

Notification of Eligibility

Notification of eligibility or ineligibility is sent to candidates after their application has been reviewed and verification of completion of a program has been received. This process should be completed within 4 weeks after receipt of the official notification of program completion at the NBCRNA office.

Eligible candidates will receive an official NBCRNA certification eligibility notification. The information in the notification is used to schedule an appointment to take the examination with Pearson VUE, either via its website or its Candidate Call Center. The certification eligibility notification expires 90 days from the date of issue **or** the date on which the candidate takes the NCE, whichever comes first.

Requests for Confirmation of Eligibility

The NBCRNA does not automatically notify state boards of nursing of candidates' eligibility to take the NCE. Any requests candidates may have, such as verification letters to state boards of nursing, must be submitted in writing with the application. Candidates should not make commitments to prospective employers that depend on immediate verification of eligibility.

Candidates can expect all requests for notifications to state boards to be processed within 4 weeks from the time the official verification of completion of a program has been received in the NBCRNA office. However, if the official completed transcript has to be returned to the program director for corrections, this time may be longer.

The candidate is expected to be familiar with the state board of nursing requirements for licensure to practice as a Certified Registered Nurse Anesthetist in the state where he or she intends to practice. Therefore, candidates are responsible for submitting the correct forms or requests for verification to the NBCRNA so they can be completed at the time the application for the NCE is processed.

Acknowledgment of Receipt of Materials or Confirmation of Eligibility

Due to the large volume of correspondence the NBCRNA receives, e-mail and telephone confirmation of receipt of transcripts, eligibility status, and when letters to state boards of nursing regarding eligibility status were sent cannot be acknowledged. Program directors should note that if verification of receipt of materials that were printed and mailed to the NBCRNA is needed, overnight or certified mail service should be used. This will provide a record that the materials were delivered to the NBCRNA office.

Applicants who have not received eligibility notification within 4 weeks of their program completion date are requested to contact the NBCRNA either by e-mail at certification@nbcna.com or by fax at (847) 825-2762.

Change of Name and Address

Candidates will not be able to request a name change after the certification eligibility notification to take the NCE has been sent. The name that the candidate used on the official NBCRNA application form is the name that is submitted to Pearson VUE on the eligibility file.

Therefore, when a candidate appears at the test center, the first and last name as they appear on the original NBCRNA certification eligibility notification **and** 2 pieces of identification (both bearing a signature and one bearing a photo) must all match. Candidates will not be allowed to take the test if their ID does not bear the same first and last name as their eligibility file.

Name or address changes are not accepted at the test centers. If a candidate changes his or her name and/or address after the certification eligibility notification has been sent, the NBCRNA should be notified by e-mail or fax of the change.

Special Services for Persons with Documented Disabilities

A candidate with a documented disability may request a reasonable accommodation for the NCE by submitting his or her request and supporting documentation in writing to the NBCRNA with his or her completed application, or as soon thereafter as the candidate learns of the need for the accommodation. In addition to documentation of the reason for the request from a recognized health care provider, an official letter from the program director documenting the types of accommodation provided during the nurse anesthesia educational program is required.

The NBCRNA will work directly with the candidate and Pearson VUE to attempt to make reasonable modifications in the testing environment and procedures to make it possible for a candidate with a documented disability to take the NCE under conditions that will accurately reflect the candidate's aptitude or achievement level. The inability to read English is not considered a disability and does not make a candidate eligible for special services.

Scheduling Information

When a candidate has been determined eligible to take the NCE, he or she will receive a certification eligibility notification from the NBCRNA via e-mail. The notification contains detailed information about scheduling an appointment to take the test with Pearson VUE. Appointments cannot be scheduled prior to receipt of this e-mail notification. The certification eligibility notification is important because it shows the identification information that is needed in order to schedule an appointment with Pearson VUE and the expiration date of the candidate's eligibility for the NCE.

It is strongly recommended that candidates contact Pearson VUE to make an appointment for the NCE as soon as possible **after** receipt of the NBCRNA certification eligibility notification. Candidates may schedule an appointment to take the NCE on any day that space is available at a test center. When making an appointment, candidates should take into account that not all test centers are open seven days a week, operate on the same schedule or have the same seating capacity. Scheduling an appointment to take the NCE is between the candidate and Pearson VUE directly; the NBCRNA will not intervene in these arrangements.

If the candidate does not take the NCE within the 90-day eligibility period, or takes the NCE and fails it, he or she will have to reapply, pay the full application fee and complete the registration process.

Refunds for Cancellations and No-Shows

If a candidate cancels or reschedules his or her scheduled appointment no later than 48 hours before the examination, a 50% refund of the application fee can be returned. Requests for refunds due to cancellations must be submitted in writing to the NBCRNA. Cancellations of appointments must be made directly with Pearson VUE.

A candidate who fails to appear for the scheduled test, arrives more than 15 minutes after the scheduled start time for taking the test, or changes or cancels a test within 48 hours before the scheduled appointment will not receive any refund of his or her application fee, nor can the fee be applied to another examination. The candidate will have to reapply to the NBCRNA to take the NCE and will have to submit the full fee again.

Examination Administration

Admission to the Test Center

Candidates arriving at the test center will be asked for the following before admission to the test: presentation of 2 separate forms of **current** valid ID, both of which must bear a signature and one of which must bear a photo (e.g., driver's license, passport, nursing license, student ID or credit card). Both pieces of ID must have the same first and last name that appears on the certification eligibility notification sent via e-mail by the NBCRNA. Candidates who appear without the specified identification will not be permitted to take the NCE and will be required to pay the \$75 reauthorization fee in order to receive a new eligibility notice. The candidate will also be required to place both hands on the palm vein scanner and have their photograph taken.

Cell phones, PDAs, reference books, notes or other study materials may not be brought into the test center. Erasable note boards are provided at the test center for use during the NCE. Personal belongings (including wristwatches) may not be taken into the testing room; they must be stored in designated areas at the test center.

Test Center Environment

It is likely that a certification candidate will not be the only person taking an examination in the test room. Individuals taking other examinations may be present. Some examinations may require full use of the computer keyboard and there will be accompanying keyboard noise. In addition, Pearson VUE personnel and other individuals may leave and enter the test room during the certification candidate's test period.

Test centers will make every effort to keep movement of personnel and noise levels to a minimum during examination administrations. However, if a certification candidate believes that noise may be a distraction, he or she should request earplugs at the test center to use during the NCE. Individual test rooms are not available at test centers.

Candidates with a documented disability shown to require special testing services should refer to the "Special Services for Persons with Documented Disabilities" section on the previous page.

Taking the Test

At the beginning of the NCE, a Statement of Confidentiality and Nondisclosure Agreement will appear that candidates must read, acknowledge and agree to before directions for entering responses will appear. Candidates should read these directions carefully before beginning the test. **There is no tutorial and there are no practice questions.** The NCE begins with the appearance of the first exam question. There is a “help” screen, which may be referred to at any time during the examination to refresh a candidate’s memory as to how to enter responses. At any time before or during the NCE, candidates may request help regarding the use of the computer.

Questions are presented one at a time on the computer screen. Each question must be answered as it is presented. The question on the screen must be answered before the candidate can move on to the next screen. Candidates should consider each answer carefully and make their best choice.

Once a candidate confirms an answer and goes on to the next question, he or she is not allowed to go back to any previous questions. Psychometric research has shown that, in general, candidates do not significantly improve their scores by reviewing and changing answers.

Examination Length

Each candidate must answer a minimum of 100 questions. As a candidate takes the NCE, questions are selected based on his or her responses to previous questions. Once 100 questions have been answered, the test will continue, if necessary, until the candidate’s performance is estimated as being either above or below the passing standard with a predetermined level of certainty. Thus, different candidates will have to answer varying numbers of questions and use varying amounts of time. The maximum number of questions is 170 during a three-hour maximum testing period.

Improper Behavior in Connection with the Examination

Each candidate must sign the NBCRNA Waiver of Liability and Agreement of Authorization, Confidentiality and Nondisclosure Statement on the application to take the NCE (which is also affirmed prior to beginning the examination on the computer). In doing so, candidates certify agreement to the following:

- a. that he or she understands that the content of the NCE, and each of its items, is proprietary, copyrighted and strictly confidential, and that the unauthorized retention, possession, copying, distribution, disclosure, discussion or receipt of any NCE question, in whole or in part, by written, electronic, oral or other form of communication, including but not limited to e-mailing, copying or printing of electronic files, and reconstruction through memorization and/or dictation, before, during or after the NCE, is strictly prohibited, and that, in addition to constituting irregular behavior subject to disciplinary action such as denial of eligibility to take the NCE now or in the future, or revocation of certification, such activities violate the NBCRNA’s proprietary rights, including copyrights, and may subject him or her to legal action resulting in monetary damages;
- b. that he or she understands that he or she can be disqualified from taking or continuing to sit for the NCE, or from receiving NCE scores, and may be required to retake the NCE if the NBCRNA determines, at its discretion, through proctor observation, statistical analysis or any other means, that he or she was engaged in collaborative, disruptive or other irregular behavior before, during the administration of, or following the NCE, or that the integrity or validity of the NCE is in question;
- c. that he or she has not been the recipient of any NCE questions, that he or she has not been involved in any disclosure, distribution or discussion of any NCE questions, and that, following this examination, he or she will not disclose, distribute, or discuss any NCE questions;
- d. that he or she will inform the NBCRNA if he or she is aware of anyone who discloses any NCE question(s) or asks him or her to disclose any NCE question(s); and
- e. that he or she understands that evidence of unethical or inappropriate behavior may result in revocation or permanent denial of certification.

The consequences of violating this agreement may include, but are not limited to, the following:

- a. loss of eligibility to take the NCE now and in the future;
- b. invalidation of NCE results;
- c. revocation of certification;
- d. assessment of monetary damages.

During the NCE, the performance of all candidates will be monitored. Any candidate who gives or receives assistance, or otherwise engages in dishonest or improper behavior during the NCE, will be required to cease taking the examination and leave the test center. Test center personnel will notify the NBCRNA office of any improper behavior during the NCE.

After reviewing a reported incident, the NBCRNA will determine whether there is reason to believe that a candidate has engaged in cheating or other improper behavior, or has otherwise violated the security of the examination. If the NBCRNA determines that there is reason to so believe, it may, at its discretion, take any of the following actions:

1. order the candidate to retake the NCE at a time and place to be determined by the NBCRNA;
2. refuse to release the test results of the candidate and, thereby, deny his or her current application for certification;
3. require the candidate to wait a specified period of time before reapplying to take the NCE;
4. revoke the candidate's eligibility to sit for the NCE in the future; or
5. take a combination of any of the above actions or such other action that the NBCRNA may deem appropriate in the particular circumstances before it.

Post-Examination

Improper Behavior After the Examination

Any individual who removes or attempts to remove materials from the test center, or who receives, discusses, discloses, reproduces, distributes, displays or otherwise misuses a test question or any part of a test question from the NCE by written, electronic, oral or other form of communication, including but not limited to e-mailing, copying or printing of electronic files, and reconstruction through memorization and/or dictation, will be subject to legal action and monetary damages. Any nurse anesthetist who engages in such improper behavior also may face denial or revocation of eligibility for certification, or denial or revocation of certification.

Problems with Test Centers

Candidates will have access to a proctor at the test center. As a rule, if a problem occurs with the computer and a candidate has to restart his or her test on the scheduled test day, the test will be resumed at the point of interruption since the questions and answers are saved. However, if the test cannot be resumed on the same day and the candidate has to reschedule his or her test, a new NCE will be administered. There will be no charge to the candidate for rescheduling if the problem was caused by circumstances at the Pearson VUE Test Center.

Problems related to admission or administration of the NCE, including any problems relating to conditions at a test center, should be documented as soon as possible, **but no later than 3 days after the examination**, by e-mail or fax to the NBCRNA office.

Reports should include the candidate's full name, address and signature, as well as a description of the conditions that caused the problem(s) at the test center. After reviewing a report of a problem at a test center, the NBCRNA may, at its discretion, determine whether a new NCE should be administered or another action should be taken. Reports submitted from a program director will be considered only if they are accompanied by the candidate's report. The NBCRNA will not consider notice of test administration problems that are received later than 3 days after the examination.

Report of Examination Results

The NCE is scored based on candidate performance in the form of a correct/incorrect response to each question and the difficulty of the questions that an examinee is administered. A numerical estimate of the taker's ability is determined using Item Response Theory (IRT). A candidate's ability estimate is calculated after each item, and is used to determine when the NCE will stop and the pass/fail decision for the candidate. A candidate must obtain a minimum ability estimate, determined by the NBCRNA in order to pass the examination. A pass/fail decision is made when ONE of the following conditions has been met:

1. The candidate has clearly demonstrated competence. This decision may be reached at any point between 100 and 170 items.
2. The candidate has clearly demonstrated incompetence. This decision may be reached at any point between 100 and 170 items.
3. The maximum number of questions (170) has been administered. The pass/fail decision is based on whether the candidate's ability level is above or below the pass/fail point.
4. The maximum amount of time (3 hours) is reached. A fail decision is made if the candidate has not completed the minimum 100 questions in this time period. If the candidate has completed more than 100 questions, the pass/fail decision is based on whether the candidate's ability level is above or below the pass/fail point.

Notification of Examination Results

Candidates. Candidates will receive a preliminary pass/fail report when they check out of the test center. **This is preliminary only.**

Validated, official results will be sent by the NBCRNA via first-class mail within 2-4 weeks after the test date. The pass/fail test results will be sent to the name and address listed on the candidate's NCE application form unless the candidate has notified the NBCRNA, within 2 business days after taking the test, of a different name or address.

Passing candidates will receive notification only of passing the NCE; they will not receive score information. Pass score data is not available to candidates because that information is often misused by employers and other parties to distinguish among applicants.

Failing candidates will receive notification of failing the NCE. They will also receive their total scaled score and diagnostic scaled scores for the five content areas of the NCE — not the actual number of questions answered correctly. The total scaled score reflects the candidate's performance with respect to the content standard (passing score) that has been established by the NBCRNA. The content area scores reflect relative performance compared to other content areas.

The only information available to candidates regarding the results of the NCE will be the information provided on the test results report. Because of the need to maintain test security, test questions cannot be made available for review. Neither the NBCRNA nor Pearson VUE provides a list of the questions.

Not everyone who tests on the same day at the same center will receive their official validated results at the same time because results are sent via USPS and may take differing amounts of time.

Any candidate who does not receive the pass/fail test results within 4 weeks after taking the NCE should contact the NBCRNA either by e-mail at certification@nbcna.com or by fax at (847) 825-2762.

Program Directors. Reports of candidates' test results are prepared and released to their respective nurse anesthesia educational program directors twice a year. Results will not be released to any other persons without written authorization from a candidate.

State Boards of Nursing. State boards of nursing verification forms are routinely processed with candidates' results and are sent to the boards electronically following results processing.

Confidentiality

Except as noted above, any information or material that is received or generated by the NBCRNA in connection with the certification of a candidate will be kept confidential and will not be released except as noted above or where release is authorized by a candidate or required by law. However, the following information may be disclosed: the nurse anesthesia program attended, dates of attendance, completion date, certification eligible status and certification status.

Verification of Examination Results

Because of the sophistication of computerized online scoring and extensive quality-control procedures, errors in scoring are virtually nonexistent. However, candidates who receive a failing score may request that their NCE results be verified.

Requests for verification of NCE results must be made in writing within 6 months after the test date and must include the following information: candidate's name, AANA ID #, social security number, date of birth, test date and signature.

Requests should be sent to **certification@nbcna.com**.

Reapplication Procedures

The NCE for registered nurse anesthetists must be taken and passed within 2 years of official completion of a nurse anesthesia educational program as documented on the NBCRNA Transcript of Student Record submitted by the program director. The NCE may be taken up to 4 times within each of the 2 years following the official completion date of a nurse anesthesia educational program. The full \$725 application fee will be required each time a candidate reapplies for the NCE.

Candidates who fail the NCE must reapply for eligibility to take the examination. The following materials must be submitted to the NBCRNA to retake the NCE: 1) the NCE Retake Application Form; 2) proof of current licensure; 3) a copy of the receipt of payment made electronically for the current application fee; and 4) if it has been one year or more since the last examination, a signed and notarized Authentication of Applicant Identity Form with a passport or digital photo taken within the last 6 months attached.

Candidates granted eligibility will receive a new certification eligibility notification which must be used to schedule an appointment with Pearson VUE to take the test.

Candidates who do not take and pass the NCE within 2 years of completion of their nurse anesthesia educational program will not be eligible to apply to take the NCE unless they enter and complete another unabridged accredited nurse anesthesia program.

Sample Questions

The following questions are examples of the type of multiple-choice (MC) questions that appear on the NCE. An answer key is provided on page 27. **For samples of the alternative question format types — multiple correct response (MCR), calculation, hotspot, drag and drop questions — go to the NBCRNA website (www.nbcna.com) and click on the Resources tab.**

- In the elderly, the time needed for clinical recovery from neuromuscular blockade is significantly increased for:**
 - cisatracurium.
 - vecuronium.
 - pipecuronium.
 - mivacurium.
- Considerations for the management of a patient with myotonic dystrophy under general anesthesia should include a(an):**
 - anticholinesterase reversal.
 - midazolam premedication.
 - short-acting nondepolarizer.
 - succinylcholine infusion.
- Which drug would have a normal pharmacokinetic profile in a patient with severe liver disease?**
 - Pancuronium
 - Succinylcholine
 - Mivacurium
 - Atracurium
- Which of the following neuromuscular blocking agents is a benzyisoquinoline compound?**
 - Vecuronium
 - Succinylcholine
 - Pancuronium
 - Mivacurium

Sample Questions *continued*

- 5. When providing positive pressure ventilation via a bag-valve-mask device, inspiratory pressure should be limited to:**
- A. 15 cm H₂O
 - B. 25 cm H₂O
 - C. 40 cm H₂O
 - D. 50 cm H₂O
- 6. What is the first sign of magnesium toxicity when used for seizure prophylaxis in preeclampsia?**
- A. Respiratory depression
 - B. Hypotension
 - C. Cardiac conduction defects
 - D. Loss of deep tendon reflexes
- 7. In the hypothermic patient undergoing left atrial to femoral bypass for repair of a thoracolumbar aneurysm, the most common dysrhythmia encountered with atrial cannulation is:**
- A. atrial fibrillation.
 - B. bradycardia.
 - C. junctional rhythm.
 - D. ventricular tachycardia.
- 8. Intrathecal narcotic administration is associated with:**
- A. loss of proprioception.
 - B. skeletal muscle weakness.
 - C. selective sensory blockade.
 - D. sympathetic nervous system denervation.
- 9. A mass spectrometer measures the concentrations of inhaled agents by measuring:**
- A. intensity of transmitted light.
 - B. paramagnetism.
 - C. molecular weight.
 - D. pH sensitivity.
- 10. The best indicator for CAD in the pre-operative assessment for vascular surgery patients is:**
- A. electrocardiogram.
 - B. history and physical.
 - C. presence of S3 gallop.
 - D. exercise tolerance.
- 11. An increase in the drug half-life in the geriatric population is usually due to:**
- A. age-associated induction of cytochrome P450 activity.
 - B. a shift from first-order to zero-order kinetics.
 - C. reduced liver blood flow.
 - D. increased volume of distribution.
- 12. What is the most likely complication of combined spinal/epidural analgesia during labor and delivery?**
- A. Higher than anticipated dermatome level of analgesia.
 - B. Epidural catheter insertion into the intrathecal space.
 - C. Epidurally administered drug leakage into the intrathecal space.
 - D. Higher incidence of fetal bradycardia.
- 13. Which agent is MOST likely to maintain renal blood flow during periods of induced hypotension?**
- A. Nitroglycerin
 - B. Nitroprusside
 - C. Fenoldopam
 - D. Trimethaphan
- 14. What is the threshold pressure (psi) for a primary pressure fail-safe device on an anesthesia machine?**
- A. 10
 - B. 20
 - C. 30
 - D. 40

Sample Questions *continued*

- 15. Radial nerve block often can be determined by the patient's inability to perform which of the following actions of the arm?**
- A. Flexion
 - B. Extension
 - C. Pronation
 - D. Adduction
- 16. The check valve in the low pressure system is designed to:**
- A. prevent excessive airway pressures.
 - B. prevent scavenged gases from reentering the circuit.
 - C. facilitate equipment testing before induction of anesthesia.
 - D. minimize the pumping effect associated with positive-pressure ventilation.
- 17. Autonomic hyperreflexia can:**
- A. develop immediately after spinal cord injury.
 - B. result in hypotension and tachycardia.
 - C. be prevented by "light" anesthesia.
 - D. be treated with vasodilators or alpha blockers.
- 18. The most common preventable critical incident associated with anesthesia equipment is:**
- A. failure to ventilate caused by circuit disconnection.
 - B. barotrauma caused by excessive positive pressures.
 - C. hypoxia caused by a delivery piping misconnection.
 - D. overdose due to vaporizer cross fill contamination.
- 19. A patient in the PACU is found to have residual neuromuscular blockade despite reversal with neostigmine and glycopyrrolate. Which of the following would further impair reversal?**
- A. Hyperkalemia
 - B. Hypoalbuminemia
 - C. Respiratory acidosis due to hypoventilation
 - D. Residual synthetic opioids
- 20. Which of the following patients is considered an emancipated minor?**
- A. A 20-year-old with Down syndrome
 - B. A 10-year-old whose parents refuse permission
 - C. A 16-year-old mother of a child
 - D. A 17-year-old requiring emergency surgery for lifesaving medical care

Answers to Sample Questions

- | | | |
|--------|---------|---------|
| 1. (b) | 8. (c) | 15. (b) |
| 2. (c) | 9. (c) | 16. (d) |
| 3. (d) | 10. (d) | 17. (d) |
| 4. (d) | 11. (d) | 18. (a) |
| 5. (b) | 12. (c) | 19. (c) |
| 6. (d) | 13. (c) | 20. (c) |
| 7. (a) | 14. (b) | |