2020 Candidate Guide
Low Risk Neonatal Intensive Care Nursing

Congratulations on taking the next step in your career
– earning your RNC-LRN certification!

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About this Guide
This guide lists fees, general policies and provides information that will help you prepare for the examination including sample questions to familiarize you with question format, competency statements and examination content in outline form. Study resources are also suggested for your review. It is recommended that you familiarize yourself with the information in this guide.

NCC examinations are offered in several different test administrations options. The NCC publication Guide to Testing Methods will explain the different rules and policies based on how you are taking the examination. Please download this publication from the NCC website and review the exam administration options. It should answer your questions about the NCC examination process.

If you have other questions, please feel free to contact NCC through the NCC website at NCCwebsite.org.

NCC’s Philosophy of Testing
Certification is an evaluative process that provides the opportunity for nurses in the obstetric, gynecologic and/or neonatal specialty to demonstrate publicly what they know and to be recognized for the special knowledge they possess. The NCC certification carries no licensing authority. The ability to practice as a nurse is regulated by the state boards of nursing, and while certification may be required in some states for advanced practice roles, NCC has no regulatory power to require states to recognize NCC certification for this purpose. Practice and educational standards are reflected in the certification process, but the responsibility for development of such standards rests with the professional nursing specialty organizations and the nursing educational community. NCC encourages individual nurses to seek out information about how certification relates to state licensure requirements, program accreditation of the educational institutions attended, the educational and practice standards of national nursing specialty organizations, and employment expectations.

NCC core and subspecialty programs are accredited by the National Commission for Certifying Agencies

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FEES & GENERAL POLICIES

EXAMINATION AND RELATED FEES

EXAMINATION FEES*
Computer Exam Fees are $325 which includes the non-refundable $50 application fee.

Professional Education Center (PEC) Exam Fees are $275 which includes the non-refundable $50 application fee.

Institutional Certification Program (ICP) Exam Fees are pre-paid by your institution.

*Examination fees are subject to change.

CHANGE REQUEST
Candidates who cannot take their currently scheduled examination, have missed their testing date or need to take a different exam - can request a change for a fee of $125. Details are on the NCC website.

WITHDRAWAL FEE
A computer testing candidate who withdraws from testing is subject to a $165 withdrawal fee. The candidate will receive $160 of their $325 payment, minus any outstanding charges. PEC and ICP candidates cannot withdraw.

RETEST FEE
Retest candidates must pay full application and examination fees. There are no discounts and they must complete a 90-day wait period* before resubmitting an application for testing. (*see Retest Policy page 4). Certifications exams of the same specialty can only be taken TWICE in a calendar year for the same candidate.

SUBSTITUTION FEE
Candidate substitutions are not allowed for any reason.

THIRD PARTY PAYMENTS
Applicant fees paid by third parties will be reimbursed to the third party in the event the applicant is determined ineligible or withdraws within the specified time. Reimbursement will be in accordance with stated refund policies.

NO REFUNDS WILL BE CONSIDERED FOR ANY CANDIDATE

- who has taken an examination
- who is not successful in achieving certification
- who failed to take the exam via computer within the 90-day testing window and did not submit a change request within stated time frames
- who is unable to schedule their exam and is beyond the first 30 days of their eligibility window
FEES & GENERAL POLICIES

PAYMENT INFORMATION

• All applications are subject to a nonrefundable application fee.
• All fees are nonrefundable except where otherwise noted.
• Payments can be made by credit card (Visa, American Express and MasterCard only).
• Payments can be made by check: bank routing number and account number required.
• For payments made by third parties, any refund reimbursement will be issued to the third party and not to the applicant.
• All payments must be in US funds.
• NCC does not accept debit cards or split payments (part check and part credit card).
• Exam fees can only be submitted online at the NCC website. Applications will not be accepted by mail, phone or fax.
• NCC will accept group payments for certification exams from institutions. Details are on the NCC website.

OTHER NON-REFUNDABLE PAYMENT RELATED FEES

INCOMPLETE APPLICATION FEE
All incomplete applications (those applications submitted with missing information, containing incomplete or incorrect information, missing required licensure information and upload, or do not include full fee payment) are subject to a non-refundable $30 reprocessing fee upon the submission of proper documentation.

LICENSE VERIFICATION FEE
If licensure information is requested requiring an additional submission the candidate will have 2 weeks to provide the license with all the correct information and pay the non-refundable $30 reprocessing fee. If this is not provided within the two weeks, NCC will attempt to verify the license and a $50 verification fee will be added to your account as arrears. If the candidate is deemed eligible at that point, they may schedule and sit for the exam. However, the exam will not be scored until such arrears are resolved. If NCC is unable to verify the license, you will be found ineligible and you will be refunded your registration fee minus $100 ($50 non-refundable application fee and $50 non-refundable license verification fee).

RETURNED CHECKS AND CREDIT CARD CHARGEBACK FEE
A $30 fee will be assessed for any check or e-check returned or a credit card payment disputed for any reason. Remittance thereafter of all fees and applications must be in the form requested by NCC.

Certification will be revoked or withheld if a returned check or a chargeback request on a credit card payment results in loss of income to NCC and the monies are not recovered in an alternate payment. Fees received at any time will first be applied to any unpaid prior certification/special fees.
GENERAL POLICIES

UNSUCCESSFUL CANDIDATES
A candidate who sits for the examination and does not receive a passing score is not eligible for any refund nor for any credit on any later NCC exam.

EXAM CATEGORY CHANGES
You can only request an exam category change by completing a Change Request Form on the NCC website and submitting with non-refundable payment of $125. Candidates are only allowed one change option (e.g. if you reschedule your exam date, you will not be able to change your exam category). All change requests must be approved by NCC. There will be no refund of original or Change Request fees. Eligibility must be re-established for the new exam category, and additional documentation and fees may be required. The time to consider eligibility for the new category will count toward the original 90-day window assigned to take the examination. Examinees must take the exam for which they have been determined eligible. No changes will be permitted on examination day. If a candidate knowingly or unknowingly takes an examination other than the one she/he was found eligible to take, the examination will not be scored. No refunds will be allowed, and all fee policies will apply if the candidate reapplies for an examination.

RETEST POLICY
You may retake the examination if you do not pass. You must reapply, submit all applicable fees and documentation, and re-establish eligibility according to the appropriate deadlines. There is no limit to the number of times you may retake the examination. However, the maximum number of times a candidate can take the same NCC test in a calendar year is two.

All retest candidates must complete a 90-day wait period before they can submit a new application to retest.
- computer examinees 90-day wait period starts from the date they took the exam.
- paper/pencil examinees 90-day wait period starts from the date they received their official results.

All submission deadlines for application for paper and pencil testing must be met. No accommodation will be given to those who are retesting via paper and pencil mode if they cannot meet the application deadline because of the 90-day wait rule.

AMERICANS WITH DISABILITIES ACT
Special testing accommodations will be provided pursuant to the Americans with Disabilities Act. Download the special accommodations request form from the website. The request must be signed by a clinician, physician, or another qualified specialist with training and experience appropriate to diagnose and treat the specified disability. The completed form must be submitted with your online certification application.
GENERAL POLICIES (continued)

TEST DISCLOSURE
NCC does not make test questions available for review. Because test questions may be used for more than one examination administration, distributing this information would compromise the security of the test questions and would increase the cost of certification if the questions had to be replaced each year.

APPEALS PROCEDURE
Any request to waive any policy of the NCC Board of Directors relative to eligibility, administration, examination content issues, or certification maintenance must be received in writing within 60 days of the dispute. All requests should be sent to the attention of the NCC President at nccpresident@nccnet.org. The correspondence should contain a detailed account as to why the NCC policy should be waived or the candidate’s status should be changed. Such requests are referred to the NCC Policy Review Committee of the Board of Directors. All decisions will be provided in writing. Cases not resolved by the Policy Review Committee will be referred to the full Board of Directors.

NONDISCRIMINATION
It is the policy of NCC that no individual will be excluded from the examinations as a result of age, sex, race, religion, national origin, ethnicity, disability, marital status, sexual orientation, military status or gender identity.

REVOCATION
Your certification may be revoked for falsifying any information submitted to determine eligibility to take the certification examination or for maintaining certification, for losing your license to practice nursing, or for failing to pay designated certification or maintenance fees.

ANSWER SHEET REVIEW OF PAPER AND PENCIL EXAMINATIONS
All answer sheets are scored electronically. If you believe there might be a discrepancy in your results, you may request a Hand Score (a review of your answer sheet) for a fee of $55. This request must be submitted online at the NCC website within 60 days of the exam date. The “Submit Hand Scoring Request” link can be found in your account under “failed certification”. You will be notified of the results by email.

RETENTION OF ANSWER SHEETS AND EXAMINATION BOOKLETS
All answer sheets are kept for one year from the date of the examination. Examination booklets used by the candidates are kept for six months from the date of the examination. Computer answer strings are kept for at least one year from the date of the examination.
ABOUT THE EXAM

TIMED EXAMINATION
Three (3) hours are allotted to complete the examination.

EXAM FORMAT
The Low Risk Neonatal Intensive Care Nursing examination consists of up to 175 test questions. 150 are scored and the remainder are embedded in the exam as pretest items. The pretest items do not count toward the examinee’s final results.

- There is one question format used for all NCC examinations.
- Each question has a premise (stem) and three alternative answers.
- The answer options are alphabetized by the first word in each answer option to randomize the answers.
- Computer tests are delivered in a different random order for each candidate.
- Questions will test both basic knowledge and application of knowledge.
- Questions that contain laboratory data will show results in conventional units of measure with international units in parentheses.
- Drugs are listed in both generic and trade names where appropriate.

EXAMINATION CONTENT DEVELOPMENT
The development of NCC certification involves many individuals and involves a meticulous process of review. There are three major groups that contribute to the test development process:

ITEM WRITERS:
RNCs and others identified with special expertise have the responsibility of drafting test items per designated assignment for review by the content team and expert reviewers. Item writers are solicited from the NCC certified population, by recommendations or through the volunteer portal.

REVIEWERS:
Reviewers are RNCs or other designated experts who assist the content teams in review of test items developed by the item writers. Reviewers are responsible for reviewing items for content relevance and confirming that references cited for the questions support the items as written.

CONTENT TEAMS:
Content team members are experienced practitioners and are appointed on an annual basis by the NCC President. Content teams are solicited from the NCC certified population, by recommendations or through the volunteer portal. To see the current membership composition of the Content Team responsible for the Low Risk Neonatal Intensive Care Nursing examination, please visit the NCC website under the section on NCC Leadership.

Content team members are RNCs or other identified experts who:
- develop and update the test outline and competency statements
- review test items developed by item writers
- review item statistics from exam administrations and pretest examinations
- approve the exam forms to be administered
- review item banks

In addition, NCC uses volunteers for standard setting and content validation studies.
The above chart shows the percentage distribution of questions on the Low Risk Neonatal Intensive Care Nursing exam across the major content categories covered on the examination. The major focus of the examination is the General Management, and Assessment and Management of Pathophysiologic Conditions with the most emphasis in these sections. Lesser emphasis is on General Assessment with Professional Issues having the least number of questions assigned to these content categories.
**EXAM OUTLINE**

This is an outline of topics and areas which may be included in the Low Risk Neonatal Intensive Care Nursing examination. It should be noted that the emphasis of the examination is on the newborn (birth to one month) and family components.

Content of the examination will cover assessment of all body systems and knowledge of normal and deviations from normal.

<table>
<thead>
<tr>
<th>Section</th>
<th>Topics</th>
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<tbody>
<tr>
<td>10.00</td>
<td>General Assessment (14%)</td>
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<tr>
<td></td>
<td>Maternal risk factors and birth history</td>
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<td>Physical and gestational age assessment</td>
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<td>Laboratory and diagnostic data</td>
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<td>11.00</td>
<td>Assessment and Management of Pathophysiologic Conditions (39%)</td>
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<td>Cardiovascular</td>
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<td>Respiratory</td>
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<td>Gastrointestinal and genitourinary</td>
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<td>Musculoskeletal and integumentary</td>
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<td>Neurological</td>
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<td>Hematology</td>
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<td></td>
<td>Genetic, metabolic and endocrine</td>
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<tr>
<td>12.00</td>
<td>General Management (44%)</td>
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<td>Resuscitation &amp; Stabilization</td>
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<td>Nutrition and feeding</td>
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<td></td>
<td>Pharmacology, pharmacokinetics and pharmacodynamics</td>
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<td></td>
<td>Fluid, electrolytes and glucose homeostasis</td>
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<td></td>
<td>Oxygenation, non-invasive ventilation and acid-base balance</td>
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<td>Thermoregulation</td>
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<td></td>
<td>Neurodevelopmental Care</td>
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<td>Infection and immunology</td>
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<td></td>
<td>Psychosocial support, grieving and discharge planning</td>
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<tr>
<td>14.00</td>
<td>Professional Issues (3%)</td>
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<td><em>including: Legal, Ethical, Safety and Quality Improvement</em></td>
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EXAMINATION CONTENT

ASSOCIATED COMPETENCIES

- Demonstrate knowledge of maternal/fetal and neonatal anatomy, physiology, pharmacology and pathophysiology
- Identify antepartal, intrapartal and postpartal risk factors related to the mother and fetus that impact the neonate
- Systematically assess the neonate, the family and their environment
- Interpret assessment data to determine health status of the neonate based on maternal history, gestation age examination and neurobehavioral assessment
- Develop, implement and evaluate an individualized plan of care, in collaboration with other health care providers to facilitate the neonate’s adaptation to extrauterine life and to provide care to the low risk neonate and the family.
- Apply knowledge of anatomy, physiology and pathophysiology to assess and care for the neonate, differentiating abnormal from normal
- Identify life-threatening states and initiate appropriate interventions
- Apply knowledge of general concepts of care that determine and promote the health of the postpartal family in the hospital, in ambulatory settings and in the home environment
- Educate families about the biophysical, psychosocial and environmental needs of the neonate
- Demonstrate knowledge of factors that influence the integration of the neonate into the family and community
- Demonstrate knowledge of professional issues relative to the role of the level II Nurse
GENERAL ASSESSMENT

I. Maternal risk factors and birth history

• Fetal Anatomy and Physiology
• Fetal Assessment
• GBS screening
• Nonstress testing
• Biophysical profile
• Antepartal screening
• Cord gases
• Maternal age
• Medical Conditions
  - Maternal age
  - Diabetes
  - Blood disorders
  - Infectious diseases (CMV, Toxoplasmosis, syphilis, herpes, hepatitis HIV, gonorrhea, Chlamydia, GBS)
  - Maternal depression
• Pregnancy Related
  - Hypertensive Disorders
    - Eclampsia
    - HELLP syndrome
  - Amniotic fluid disorders (Amniotic bands, Polyhydramnios, Oligohydramnios)
  - Maternal hemorrhage
  - Placental abruption
  - Placenta previa
  - Multiple gestations
  - Chorioamnionitis
  - Cord Accidents
• Maternal medications during labor and delivery (tocolytics, analgesia, anesthesia)

• Complications of Labor
  - Abnormal labor patterns
  - Abnormal fetal heart rate patterns (altered variability, decelerations [early, late, variable]; tachycardia, bradycardia (category I, II and III fetal heart rate tracings)
  - Operative/instrument assisted birth
  - Preterm/postterm
  - Meconium
  - Breech and other malpresentation

• Life-style and Environmental Conditions
  - Substance use
  - Teratogen exposure
  - Medication use

II. Physical and gestational age assessment

Gestational Age

• Physical Characteristics, Etiologies and/or Risks and Complications of
  - Preterm
  - Term
  - Post-term
  - Late preterm
  - AGA
  - SGA
  - LGA

• Intrauterine growth restriction
  - Symmetrical
  - Asymmetrical

Physical Assessment

• Cardiac examination findings
  - Heart rate, rhythms and sounds
  - Point of maximal intensity
  - Blood pressure
  - Peripheral pulses
  - Perfusion
  - Color
• Respiratory Physical Assessment
  - Respiratory rate and breath sounds
  - Respiratory patterns
  - Thorax and Chest
  - Abdominal examination findings
  - Stooling patterns

• Neonatal skin assessment
  Characteristics of normal neonatal skin

• Musculoskeletal assessment

• Neurological assessment

• Reflexes
  - Moro
  - Rooting and sucking
  - Palmar grasp
  - Plantar grasp
  - Stepping
  - Babinski
  - Tonic neck
  - Gag
  - Anal wink reflex
  - Tone

• Techniques
  - Pull to sit
  - Truncal tone assessment

• Head, ear, eyes, nose, mouth assessment
  - Fontanelles and cranial sutures
  - Neck appearance
  - Ear appearance, shape and placement
  - Hearing
  - Nasal patency
  - Symmetry of the mouth
  - Evaluation of pigmentation and movement
  - Evaluation of cornea/sclera
  - Eye prophylaxis

- Complications/Variations
  Skull/neck variations & abnormalities
  Molding
  Cephalhematoma
  Caput succedaneum
  Craniosynostosis
  Craniotabes
  Cystic hygroma
  Pierre Robin

- Variations & abnormalities
  Conjunctivitis
  Cleft lip and palate
  Epstein’s pearls
  Natal teeth
  Choanal atresia
  Retinopathy of prematurity
  Tracheomalacia
  Micronathia

III. Laboratory and Diagnostic Data
• Blood
• Glucose
• Complete blood count with differential
• Cultures
• Rh (Coombs)
• Blood gases
• Bilirubin
• Electrolytes
• Newborn screening
STUDY GUIDE

ASSESSMENT AND MANAGEMENT OF PATHOPHYSIOLOGIC CONDITIONS

I. Cardiovascular
- Basic physiology and anatomy
- Adaptation to extrauterine life
- Complications/Variations
  - Pulmonary vascular resistance
  - Abnormal rhythms
  - Congenital heart disease
    - Patent ductus arteriosus
    - Coarctation of the aorta
    - Septal defects
    - Tetralogy of Fallot
    - Transposition of the great vessels
- Congestive heart failure
- Hypertension/Hypotension
- Shock
- Patent ductus arteriosus
- Coarctation of the aorta
- Septal defects
- Tetralogy of Fallot
- Transposition of the great vessels
- Congestive heart failure
- Hypertension/Hypotension
- Shock

II. Respiratory
- Basic physiology and anatomy
- Adaptation to extrauterine life
- Complications/Variations
  - Air leaks
  - Apnea of prematurity
  - Chronic lung disease
  - Pneumothorax
  - Pneumomediastinum
  - Pneumonia
  - Respiratory distress syndrome
  - Transient tachypnea of the newborn
  - Persistent pulmonary hypertension
  - Meconium aspiration syndrome
  - Diaphragmatic hernia

III. Gastrointestinal and Genitourinary
- Basic physiology and anatomy
- Complications/Variations
  - Diastasis of recti muscles
  - Duodenal atresia
  - Bowel obstruction
  - Esophageal atresia/tracheoesophageal fistula
  - Imperforate anus
  - Omphalocele/gastroschisis
  - Umbilical hernia
  - Meconium ileus/plug
  - GE reflux
- Necrotizing enterocolitis
- Short gut syndrome
- Malrotation/Volvulus
- Renal function/urinary output
- Complications
  - Hypospadias
  - Undescended testes
  - Testicular abnormalities
  - Hydrocele
  - Inguinal hernia
  - Vaginal discharge/abnormalities
  - Renal abnormalities
  - Circumcision
  - Postoperative care

IV. Musculoskeletal and Integumentary
- Musculoskeletal Complications
  - Congenital hip dysplasia
  - Metatarsus adductus
  - Polydactyly and syndactyly
  - Torticollis
  - Talipes equinovarus
  - Fracture
- Physiologic basis for general skin care
- Variations
  - Erythema toxicum
  - Mili
  - Hyperpigmented skin lesions
  - Hemangiomas/birth marks
  - Petechiae
  - Cafe au lait spots
  - Other skin lesions, e.g. pustules, vesicles
  - Umbilical cord
  - Fat necrosis
  - Diaper Dermatitis

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V. Neurological
- Basic physiology
- Motor function
- Complications/Variations
  - Seizures
  - Jitteriness
  - Intracranial hemorrhage (subdural)
  - Intraventricular hemorrhages
  - Periventricular leukomalacia
  - Hydrocephalus
  - Neuromuscular birth Injuries
  - Brachial plexus injuries
  - Facial nerve injuries
  - Neural tube defects
  - Therapeutic hypothermia

VI. Hematopoietic
- Basic physiology
- Interpret lab values (CBC; hematocrit, hemoglobin, retic, platelets, total and direct serum bilirubin, direct and indirect antibody tests)
- Complications
  - Anemia (Physiologic and non-physiologic)
  - Bleeding disorders
  - ABO/Rh incompatibility
  - Polycythemia/hyperviscosity
  - Sickle Cell
  - Administration of blood and blood products

- Hyperbilirubinemia
  - Basic physiology
  - Complications
    - Jaundice
      - Physiologic jaundice
      - Pathologic jaundice
      - Breast feeding and jaundice
    - Kernicterus
    - Phototherapy
    - G6PD

VII. Genetic, Metabolic and Endocrine

Genetic Disorders
- Patterns of Inheritance
- Autosomal recessive, autosomal dominant, sex linked
- Complications
  - Common chromosomal abnormalities (trisomy 21, 18 & 13)
  - Birth defects/congenital anomalies
  - Skeletal dysplasia
  - Cystic Fibrosis
  - DiGeorge
  - Turner's

Endocrine/Metabolic
- Interpreting lab values (Calcium, phosphorus, magnesium, glucose)
- Metabolic Disorders (PKU, Thyroid, CAH, Galactosemia)
- Complications
  - Hypoglycemia
  - Hypocalcemia
  - Rickets/metabolic bone disease
  - Infant of a diabetic mother
GENERAL MANAGEMENT

I. Resuscitation and Stabilization
- General assessment of status and need for resuscitation
- Management of resuscitation
  - Airway
  - Breathing
  - Circulation
- Drug Therapy
- Evaluation of effectiveness of interventions
- Apgar scores
- CHD Screening

II. Nutrition and Feeding
- Growth patterns (Growth curves)
- Fluid/Calorie requirements
- CHO, Fats, Proteins
- Lactation
  - Anatomy and physiology of lactation
  - Composition of breast milk
  - Maternal nutritional needs
  - Normal breastfeeding process
  - Positioning
  - Latch On
  - Suck/swallow/sequence
  - Timing (frequency and duration)
  - Feeding cues
  - Contraindications to breastfeeding
- Maternal Complications
  - Latch on problems
  - Nipple problems
  - Breast engorgement
  - Insufficient milk supply
  - Medication effects
  - Therapeutic medications
  - Infection/Mastitis
  - Maternal illness
  - Perinatal substance abuse (TCN)
  - Maternal/newborn separation
  - Breast reduction/augmentation
- Newborn complications

- Drug screening
- Multiple births
- Prematurity
- Patient Education
  - Breast/nipple care
  - Use of supplementary/complementary feedings
  - Use of breastfeeding devices
  - Expressing and storing breast milk
  - Colostrum
- Complications/Contraindications
  - Donor milk
- Formula feeding
  - Composition of formula
  - Techniques
  - Special needs (e.g. cleft palate, PKU)
- Dietary Supplements (Iron, MCT, Vitamins, probiotics, Fortifiers)
- Feeding techniques
- Tube feedings
- Feeding cues
- Special Nutritional considerations
  - Chronic Lung Disease (CLD)
  - Prematurity
  - Short Gut syndrome
- Donor milk
- Formula feeding
  - Composition of formula
  - Techniques
  - Special needs (e.g. cleft palate, PKU)
- Dietary Supplements (Iron, MCT, Vitamins, probiotics, Fortifiers)
- Feeding techniques
- Tube feedings
- Feeding cues
- Special Nutritional considerations
  - Chronic Lung Disease (CLD)
  - Prematurity
  - Short Gut syndrome
- Newborn complications
III. Pharmacology, Pharmacokinetics and Pharmacodynamics

- Principles of administration
  - Dosage
  - Route
  - 5 rights of medication administration
  - Blood drug levels (toxic vs therapeutic)

- Common drugs used in neonates
  - Vitamin K
  - Antibiotics
  - Anticonvulsants
  - Antimicrobials
  - Antiretroviral
  - Immunologic agents
  - Bronchodilators
  - CNS stimulants (Caffeine, etc)
  - Diuretics
  - Drugs for NAS
  - Eye prophylaxis
  - Vaccines

- Pain Assessment and Management
  - Signs and symptoms
  - Nonpharmacological interventions
  - Pharmacological interventions

IV Fluid, Electrolytes and Glucose Homeostasis

- Normal fluid and electrolyte requirements
- Monitoring fluid and electrolyte status
  - Electrolytes
  - Urine output
- Parenteral nutrition (indication, composition, complications)
- Lipids
- Metabolic panel
- PICC lines or midlines
- Umbilical lines
- Hypoglycemia

V. Oxygenation, non-invasive ventilation and Acid-base balance

- Oxygenation: interpretation and management
  - Hypoxia/hypoxemia
  - Oxygen saturation (SaO2)
- Methods of oxygenation/ventilation
  - Non-invasive ventilation (high flow NC, CPAP, Nasal cannula, hood)
- Blood gas: interpretation and management
  - Metabolic acidosis/alkalosis
  - Respiratory acidosis/alkalosis
  - Mixed

VI. Thermoregulation

- Mechanisms of Thermoregulation
  - Heat production
  - Temperature maintenance
- Complications
- Temperature assessment and interpretation
- Equipment (e.g. infant warmers, incubators, servocontrol)
- Mechanisms of Heat Loss
  - Insensible water loss
  - Evaporation
  - Conduction
  - Convection
  - Radiation
VII. Neurodevelopmental Care
- Neurobehavioral development
  - habituation
- Motor organization
  - sensory/interaction capabilities
  - state/sleep cycles
- Environmental impact on development
  - Interventions (Reducing noise, light level, diurnal patterns, handling, positioning, kangaroo care/skin to skin)
  - Nonnutritive sucking
- Complications of Substance Exposure in Utero
  - Alcohol
  - Heroin
  - Methadone
  - Cocaine
  - Nicotine
  - Subutex
  - Cannabis (marijuana)
  - Prescription drug abuse
- Neonatal Abstinence Syndrome (NAS)
  - Methadone
  - Cocaine
  - Nicotine
  - Subutex
  - Cannabis (marijuana)
  - Prescription drug abuse

VIII. Infection and Immunology

Immune System
- Basic physiology
- Interpret laboratory values
- WBC and differential
- CRP
- Antibody function
  - IgA
  - IgG
  - IgM
- Infection Control
  - Handwashing
  - Visitation
  - Standards precautions
- Complications/Variations
  - Neonatal sepsis
  - Septic shock
  - Viral and fungal infections
    - AIDS/HIV
    - Cytomegalovirus
    - Rubella
    - Hepatitis B
    - Varicella
    - Toxoplasmosis
    - Herpes
    - Human papilloma virus
    - Enterovirus
    - Bacterial infections
      - Group B streptococcus
      - Staphylococcus
      - E. coli
    - Sexually Transmitted infections
      - Gonorrhea
      - Chlamydia
      - Syphilis
    - Early and late onset infections
IX. Psychosocial support, grieving and discharge planning

Psychosocial support
- Parent-infant interaction/attachment – normal characteristics
- Family response to stress and crisis
- Barriers to parent infant interaction
- Non-traditional parents
- Sibling response and interventions
- Principles of culturally sensitive care
- Recognizing post-partum depression
- Foster and Adoptive Issue

Grieving
- Grieving process
  - Stages of grieving, common behaviors and intervention
  - Factors which impede or enhance grief process
  - Pathologic responses
  - Maternal/paternal differences
  - Chronic sorrow
  - Repeat obstetric loss/infertility

Discharge Planning/Home Care (Hospital, Ambulatory Settings, Home)
- Follow up Care
  - Apnea monitoring
  - Oxygen therapy
- Screening
  - Car Seat Challenge
  - CCHD screening
  - Visual/ROP screening/follow-up
  - Hearing screening
- Parent education
  - Cord care
  - Circumcision
  - Bathing
  - Genital care
  - Feeding/elimination
  - Immunizations
  - Assessment of problems
  - CPR for neonates and infants
  - Signs and symptoms of illness
  - RSV eligibility and concerns
  - Safety Issues
  - Plagiocephaly
  - Medication
  - Special care needs
  - Special equipment
  - Motor delays and developmental follow up
  - Follow up care/referrals
  - Shaken Baby
  - Safe sleep
PROFESSIONAL ISSUES

Ethical Principles
• Autonomy
• Beneficence
• Non-maleficence
• Justice

Professional/Legal Issues
• Professional
  - Regulation
  - Practice
• Staffing issues
• Legal liability
  - Consent
  - Documentation/medical records
  - Negligence/malpractice

Patient Safety
• Communication
• Interprofessional practice

Quality Improvement
STUDY RESOURCES

- Snell, et al., Care of the Well Newborn, Jones & Bartlett, 2017.
SAMPLE QUESTIONS

LOW RISK NEONATAL INTENSIVE CARE NURSING SAMPLE QUESTIONS

Listed below are sample questions to acquaint you with the test question format. These questions do not reflect the scope or the difficulty level of the questions on the actual examination. The reference from which each question is derived is also cited. However, other references might substantiate a different answer, and the answer shown here might be substantiated by other references. The rigorous review to which actual test questions are subject is not applied to these sample questions. The focus that should be attended to in reviewing these items is format, not content.

1. A two day old neonate has been experiencing diarrhea for the last 24 hours. The neonate is irritable and tremors have recently developed. Feeding is poor. There are no other signs or symptoms except for episodes of sneezing. This neonate should be further evaluated for

   A. heroin withdrawal
   B. hypoglycemia
   C. viral infection

Answer: A


2. A normal finding of male genitalia in the term neonate is

   A. retractable prepuce
   B. rugated scrotum
   C. testes in the inguinal canal

Answer: B

Tappero, et al., Physical Assessment of the Newborn, Springer, 2019, p. 131

3. A physiologic change that occurs with the onset of breathing is

   A. decreased pulmonary blood flow
   B. decreased pulmonary vascular resistance
   C. reversal of shunt via the patent ductus arteriosus

Answer: B


4. The goal of treatment of gastroesophageal reflux in the neonate is to

   A. achieve normal gastric emptying
   B. decrease lower esophageal sphincter pressure
   C. increase gastric pH

Answer: A


5. Removing a neonate from an incubator for procedures without use of an overhead warmer will result in heat loss by

   A. convection
   B. evaporation
   C. radiation

Answer: A

SCORING & TEST REPORT

HOW EXAMS ARE SCORED

NCC examinations are criterion-referenced. This means the passing score is based on a predetermined criterion. This criterion is a statistical ability level established by the Content Team based on evaluation of criticality of content and the test questions’ past statistical performance. Questions used to determine pass/fail have proven statistical history that demonstrates the question is appropriate for use to measure an individual’s ability level.

There is no set percentage passing level. An ability level for each candidate is calculated based on the number of questions they answer correctly (there is no penalty for wrong answers). Pass/fail is determined based on this ability level as compared to pass/fail standard which is a predetermined ability criterion. When different forms of the examination are used, a process called equating is initiated. This procedure converts all results to a common scale. So someone who takes a slightly more difficult form of the exam will need to answer fewer questions correctly than someone who takes a slightly easier form of the exam.

NCC utilizes the item response theory of psychometrics for the analysis of its examinations. Item response theory (Rasch analysis) is the study of test and item scores based on assumptions concerning the mathematical relationship between abilities and item responses. This is a commonly used system, and such examinations as the NCLEX and other health related certification examinations utilize this type of psychometric analysis.

Test reports identify pass/fail status, and they give feedback on the various content areas of the examination in the form of word descriptors: very weak, weak, average, strong and very strong. No percentages or standard scores are given. These descriptors are based on the items within a given subtest. The overall pass/fail decisions are based on the full test, and the verbal descriptors are intended to provide suggested feedback on strengths and weaknesses in various content areas. Since this feedback is based on relatively few items, general verbal descriptions are given instead of subtest scores. These word descriptors are for information only, and they should be interpreted cautiously due to the small number of items included in each content area.
SAMPLE TEST REPORT

Whether you take the computer or paper and pencil version of the examination, you will receive an official test results report from NCC. Shown below is a sample test result report for a candidate who has passed the examination.

LOW RISK NEONATAL INTENSIVE CARE NURSING EXAMINATION

Test Results

<table>
<thead>
<tr>
<th>NAME</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pass/Fail: PASS

EXAM CONTENT REPORT

The following provides information regarding your performance on the different content areas tested on the examination.

Test reports identify pass/fail status, and they give feedback on the various content areas of the examination in the form of word descriptors: Very weak, weak, average, strong and very strong. No percentages or standard scores are given. These descriptors are based on the items within a given subtest. The overall pass/fail decisions are based on the full test, and the verbal descriptors are intended to provide suggested feedback on strengths and weaknesses in various content areas. Since this feedback is based on relatively few items, general verbal descriptions are given instead of subtest scores. These word descriptors are for information only, and they should be interpreted cautiously due to the small number of items included in each content area.

<table>
<thead>
<tr>
<th>Content Area &amp; Percentage</th>
<th>Your Results:</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Assessment; Professional Issues (17%)</td>
<td>WEAK</td>
</tr>
<tr>
<td>Assessment and Management of Pathophysiologic Conditions (39%)</td>
<td>VERY STRONG</td>
</tr>
<tr>
<td>General Management (44%)</td>
<td>AVERAGE</td>
</tr>
</tbody>
</table>
TERMS OF CERTIFICATION AND CERTIFICATION MAINTENANCE

WHEN YOU PASS THE EXAM

CREDENTIAL
Your NCC certification status entitles you to use the credential RNC-LRN (Registered Nurse Certified – Low Risk Neonatal Intensive Care Nursing)

TERMS OF CERTIFICATION
NCC certification is awarded for a period of three years.

The effective date for certification is the date on the official NCC letter that tells you that you have successfully completed the certification process.

MAINTAINING YOUR CERTIFICATION

- NCC certification must be maintained every three years.
- Certification that is not maintained will expire
- The NCC certification maintenance program allows you to continue your certification status by obtaining specific hours of continuing education credit as defined in your Education Plan, which is generated by your Continuing Competency Assessment (CCA).
- For continuing education credit to be used for certification maintenance it must be earned AFTER you have taken your Assessment and in the areas defined by your Education Plan before your maintenance is due.
- The maintenance process includes submitting a maintenance application prior to your maintenance due date with appropriate fees and requested documentation. Using NCC CE modules does NOT automatically maintain your certification. You must submit a maintenance application and pay a maintenance fee in addition to any CE fees.
- Maintenance applications are subject to random audit. If you are chosen for audit, you will be required to upload CE certificates and course descriptions. These records should be maintained during each maintenance cycle, until your maintenance application has been approved. You can upload these documents in your maintenance application throughout your maintenance cycle.

You may apply for maintenance up to 1 year before your maintenance date. As long as you have obtained the required contact hours of continuing education credit—**you do not need to wait until your maintenance deadline to apply.** Maintenance will be due in the quarter in which you were notified of your certification (**not the date on which you took the examination**). Your maintenance due date can be found by signing into your NCC account. Sign into your account using your email and password.

The NCC website has more detailed information
For more information about the certification maintenance program and the Continuing Competency Assessment (CCA), click the purple "Maintain your Certification" box.
CONTINUING COMPETENCY ASSESSMENT (CCA)

NCC views certification as a process that functions throughout an individual nurse or nurse practitioner's career. It reflects life-long learning, ongoing professional development and is supported by maintaining specialty knowledge competencies.

The standard process for the NCC Certification Maintenance Program makes use of an assessment tool and resulting personal education plan:

• Complete the continuing competency assessment (CCA) that reflects the current knowledge competencies aligned with your certification specialty at the beginning of each new certification maintenance cycle.

• Earn CE as specified by the education plan developed from your assessment. Your education plan outlines the CE needed to maintain your NCC certification. Only CE earned after you have taken your assessment can be used to maintain your certification. It must address the CE needs as outlined by your educational plan.

This program provides continuing validation that NCC certified nurses and nurse practitioners are maintaining their specialty knowledge competencies based on current practice and examination content.

Download Continuing Competency Assessment brochures for details by clicking the links below.

Four Steps to Continuing Competency
https://www.nccwebsite.org/content/documents/cms/cca-steps.pdf

Continuing Competency Assessment - Education Plan Examples
https://www.nccwebsite.org/content/documents/cms/cca-education-plans.pdf