



# 2024 CANDIDATE GUIDE

## LOW RISK NEONATAL INTENSIVE CARE NURSING

### RNC-LRN®

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

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#### THIS EXAM'S PURPOSE

The purpose of the Low Risk Nursing Core Certification is to provide a competency-based examination that tests specialty knowledge and the application of that knowledge for licensed registered nurses in the US and Canada with a minimum of two years specialty experience in providing care to acutely and chronically ill neonatal patients and their families within level II, chronic care or step-down unit.

**IT IS IMPORTANT TO READ THE INFORMATION IN THIS GUIDE. IT EXPLAINS ALL POLICIES TO WHICH CANDIDATES WILL BE SUBJECT.**

#### ABOUT THIS GUIDE

This guide lists fees and provides information that will help candidates prepare for the examination. It includes the exam content in outline form, competency statements and study guide. It also provides sample exam questions to familiarize the test taker with question format, study resources and lists some of NCC administrative policies & procedures. It is recommended that candidates familiarize themselves 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 the candidate is taking the examination. Please download this publication from the NCC website and review the exam administration options. It will answer any questions about the NCC examination process.

If there are other questions, please feel free to contact NCC through the [“Contact Us”](#) page at [NCCwebsite.org](http://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.

# FEES & GENERAL POLICIES

## EXAMINATION AND RELATED FEES

### EXAMINATION FEES\*

Test Center and Live Remote Proctoring (LRP) Computer Exam Fees are \$325 which includes the non-refundable \$50 application fee.

*\*Examination fees are subject to change.*

### CANCELLATION: 6 HOUR WINDOW

Candidates have six hours from the time they submit an exam application to cancel the exam. The order can be canceled by logging into the account and clicking on "Cancel Application" found under the new certification. Only the candidate can cancel the application and they must meet the 6-hour window. After the six hours they must withdraw or pay for a 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 Testing Center or LRP 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. Bulk Purchase Voucher 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). Certification exams of the same specialty can only be taken TWICE in a calendar year for the same candidate. Candidates must submit a new application and again demonstrate eligibility and licensure.

### SUBSTITUTION FEE

Candidate substitutions are not allowed for any reason.

### THIRD PARTY PAYMENTS

Applicant fees paid by third parties will be refunded to the third party in accordance with stated refund policies, in the event the applicant is determined ineligible or withdraws within the specified time. Vouchers are nonrefundable.

## 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 at a Test Center or via Live Remote Proctoring (LRP) within the 90-day testing window and did not submit a change request within stated time frames
- who failed to schedule an appointment to test within the first 30 days of their 90-day eligibility window and is unable to schedule their exam within their eligibility window.
- who failed to have proper ID or meet any required rules
- who failed to login to the test portal or appear at the test center (no-show) or who signed in late to the test portal or arrived late to the test center
- who failed to take a scheduled exam for any reason (illness, quarantine, accident, death, etc.)

### Test Date Change

Test Center and Live Remote Proctoring (LRP) exam candidates can change their scheduled testing date to another date within their window *once for free*.

Candidates must handle this directly with PSI/AMP.

**Refer to the NCC testing guide for details.**

# 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). NCC does not accept debit cards or split payments (part check and part credit card).
- Payments can be made by e-check: bank routing number and account number required.
- For payments made by third parties, any refund will be issued to the third party and not to the applicant. Vouchers are nonrefundable.
- All payments must be in US funds.
- 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 under Bulk Purchases.

## OTHER NON-REFUNDABLE PAYMENT RELATED FEES

### INCOMPLETE APPLICATION FEE

All incomplete applications are subject to a non-refundable \$30 reprocessing fee upon the submission of proper documentation. Incomplete applications are those submitted with missing information, (e.g. required licensure information and corroborating uploaded documentation; containing incomplete or incorrect information; or do not include full fee payment).

### 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.

### LICENSE VERIFICATION

If licensure information is requested requiring an additional submission, the candidate will have two 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, the application will be marked ineligible. Ineligible applicants will receive a refund minus the \$50.00 non-refundable application fee. There are no refunds or withdrawals for applications using a bulk code.

### VERIFICATION OF CERTIFICATION

Third party notification of status will NOT be released without authorization from the RNC. A \$30 fee is required for any third-party notification or issuance of duplicates of test results reports. Verification requests can only be submitted after official results with score report have been uploaded to the candidate's NCC account.

Verification requests can only be made via the online verification system on the NCC website. NCC does not issue verifications via the mail or fax.

***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.***

# FEES & GENERAL POLICIES

## 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.

### 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.

### AMERICANS WITH DISABILITIES ACT

Special testing accommodations will be provided pursuant to the Americans with Disabilities Act. Any requests for special testing accommodations must be made in writing and submitted with the application. The accommodation request form can be downloaded from the NCC website. Upon receipt of a request for special accommodations, NCC will contact the applicant. Such requests must be signed by a clinician, physician, or other qualified specialist with training and experience appropriate to diagnose and treat the specified disability.

### EXAM CATEGORY CHANGES

Candidates 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 request** (e.g. After a change request is submitted no other change request can be submitted). 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 assigned 90-day testing window. **Examination category cannot be changed from a subspecialty or RN Core application to a NNP or WHNP certification.** *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 they were 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. See website for complete details.

### RETEST POLICY

Candidates may retake the examination if they do not pass. They must reapply 90 days after the test was taken, submit all applicable fees and documentation, and re-establish eligibility according to the appropriate deadlines. There is no limit to the number of times a candidate 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 wait 90 days from the date their exam was taken before they can submit a new application to retest.**

- this date is provided in the candidate's results notification
- this 90-day wait period affects all modes of testing

Any loss of power or internet during an exam in which there was more than 15 minutes of testing with exposure to more than 10% of the exam requires a retest at a Test Center. Candidates will have to wait 90-days before they can reschedule and they must follow NCC's retest policy. A decision on the timing of a second attempt will be made after NCC reviews the test exposure. There is no need to complete a new application, **but candidates MUST notify NCC of the internet disconnection issue as soon as computer access is available.**

If a retest application is submitted prior to the 90-day wait period, the application will be returned as ineligible. The applicant will be subject to the \$50 non-refundable application fee.

# FEES & GENERAL POLICIES

## REVIEW COURSES AND MATERIALS

NCC does not offer or sponsor review courses or review materials for its certification examinations. Examination candidates should view any course of study as being independent of NCC. Candidates should carefully examine the merits of any individual exam preparation offering before participating.

## 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.

## REVOCAION

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.

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**POLICIES ARE SUBJECT  
TO CHANGE  
WITHOUT NOTICE.**

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## GENERAL POLICIES (CONTINUED)

### INTERNET DISCONNECTIONS

If the candidate has started the exam and is disconnected, please use the PSI tech lines if testing with LRP or if at a Test Center discuss immediately with the proctor to attempt to get reconnected and continue testing.

If the candidate is unable to get reconnected after starting the exam, the timing for a second attempt to take the exam will be based on how much time and how many questions they were exposed to. If a candidate is disconnected and cannot be reconnected and has tested for under 15 minutes and were exposed to less than 10% of the exam they may be able to reschedule within their current eligibility window. **Candidates must work directly with PSI that day to reschedule and if they run into any issues they must notify NCC within 3 days of testing.** If a candidate tests for longer than 15 minutes and/or saw more than 10% of the questions on the exam they will have to wait 90 days before they can reschedule, and they must follow NCC's retest policy. A decision on the timing of a second attempt will be made after NCC reviews the test exposure. Please note, candidates will need to retest at a Test Center. Please notify NCC of the internet disconnection issue as soon as computer access is available.

### 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](mailto: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.

### DESIGNATION AUTHORIZATION

Certification is a non-transferable, revocable, limited, non-exclusive license to use the certification designation "RNC-LRN®", subject to compliance with the policies and procedures, as may be revised from time to time.

Any use or display of NCC certification marks and/or logos without the prior written permission of the NCC is prohibited. Any candidate or certificant who manufacturers, modifies, reproduces, distributes or uses a fraudulent or otherwise unauthorized NCC certificate, NCC designation or other credential may be subject to disciplinary action, including denial or revocation of eligibility or certification. Any individual who engages in such behavior also may be subject to legal action.

# ABOUT THE EXAM

## 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 possible answers, two distractors and only one correct answer.
- The answer options are alphabetized by the first word in each answer option to randomize the answers.
- 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:

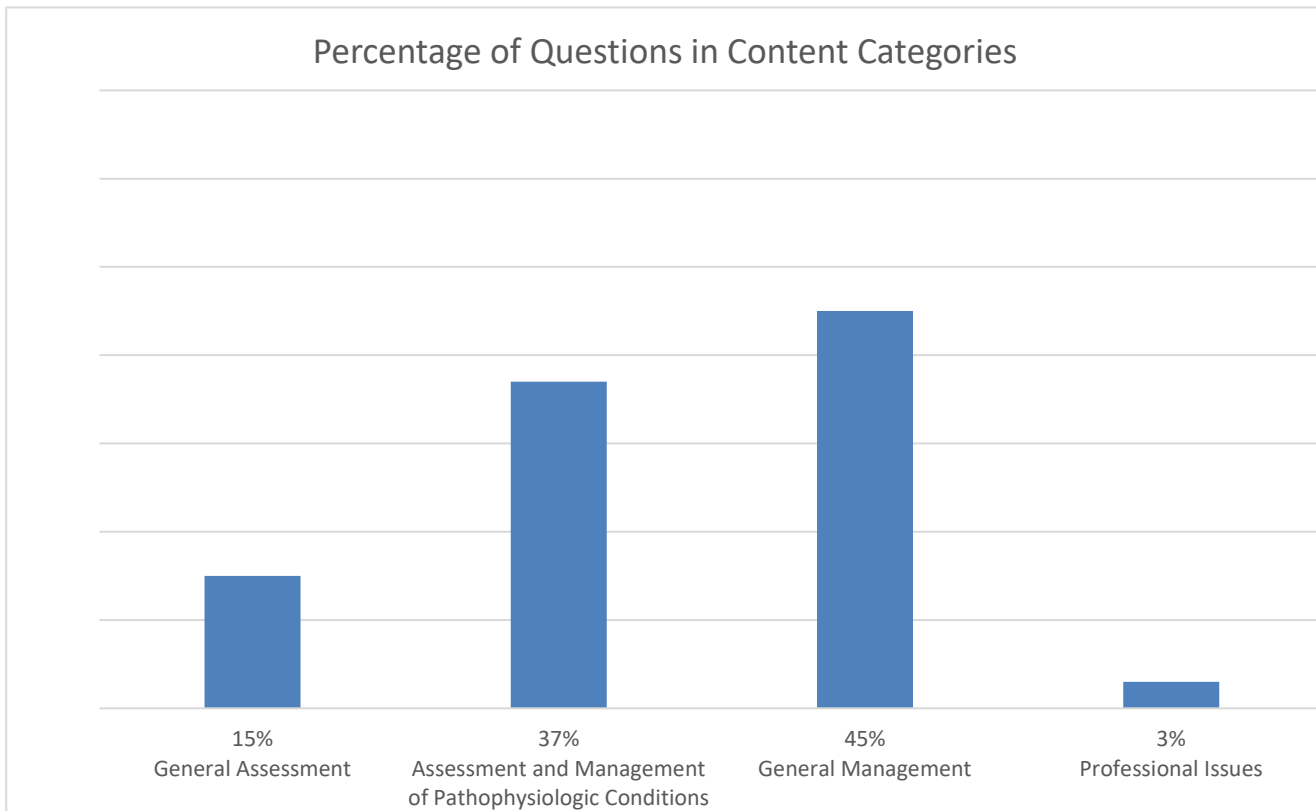
- develop and update the test outline and competency statements
- review test items developed by item writers
- review item statistics from exam administrations and pretest examinations
- approve the exam forms to be administered
- review item banks

In addition, NCC uses volunteers for standard setting and content validation studies/job analysis studies.

# EXAMINATION CONTENT



## Low Risk Neonatal Intensive Care Nursing exam



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 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.

# EXAMINATION CONTENT

## 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.

### 10.00 General Assessment (15%)

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Maternal risk factors and birth history  
Physical and gestational age assessment  
Laboratory and diagnostic data

### 11.00 Assessment and Management of Pathophysiologic Conditions (37%)

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Cardiovascular  
Respiratory  
Gastrointestinal and genitourinary  
Musculoskeletal and integumentary  
Neurological  
Hematology and hyperbilirubinemia  
Genetic, metabolic and endocrine

### 12.00 General Management (45%)

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Resuscitation & Stabilization  
Nutrition and feeding  
Pharmacology, pharmacokinetics and pharmacodynamics  
Fluid, electrolytes and glucose homeostasis  
Oxygenation, non-invasive ventilation and acid-base balance  
Thermoregulation  
Neurodevelopmental care  
Infection and immunology  
Psychosocial support, grieving, family education and discharge planning

### 14.00 Professional Issues (3%)

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*including: Legal, Ethical, Safety and Quality Improvement*



# 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

# STUDY GUIDE

## 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

# STUDY GUIDE

- 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

### 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
  - Milia
  - hyperpigmented skin lesions
  - Hemangiomas/birth marks
  - Petechiae
  - Cafe au lait spots
  - Other skin lesions, e.g. pustules, vesicles
  - Umbilical cord
  - Fat necrosis
  - Diaper Dermatitis

# STUDY GUIDE

## 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. Hematology and hyperbilirubinemia

- 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 (22q11.2 deletion syndrome)
  - Turners

### 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

# STUDY GUIDE

## 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

# STUDY GUIDE

## III. Pharmacology, Pharmacokinetics and Pharmacodynamics

- Principles of administration
  - Dosage
  - Route
  - 5 rights of medication administration
  - Blood drug levels (toxic vs therapeutic)
- Pharmacokinetics
- Common drugs used in neonates
  - Vitamin K
  - Antibiotics
  - 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 (SaO<sub>2</sub>)
- 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

# STUDY GUIDE

## 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



# STUDY GUIDE

## **IX. Psychosocial support, grieving, family education 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

### **Family 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

# STUDY GUIDE

## 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

- Cunningham, et al., Williams Obstetrics, McGraw-Hill, 2022
- Davidson, et al, Old's Maternal Newborn Nursing & Women's Health Care Across the Life Span, Pearson, 2020.
- Gardner, et al. Handbook of Neonatal Intensive Care: An Interprofessional Approach, Elsevier, 2021.
- Goldsmith, et al., Assisted Ventilation of the Neonate: An Evidence-Based Approach to Newborn Respiratory Care, Elsevier, 2022.
- Lowdermilk et al. Maternity and Women's Health Care 13<sup>th</sup> ed. 2023, Elsevier
- Lawrence, et al., Breastfeeding: A Guide for the Medical Profession, 9<sup>th</sup> ed., Elsevier, 2021.
- Polit, et al., Essentials of Nursing Research: Appraising Evidence for Nursing Practice, LWW, 2021.
- Taketomo, Pediatric and Neonatal Dosage Handbook, 28<sup>th</sup> ed, Lexi-comp, 2022.
- Tappero, et. al., Physical Assessment of the Newborn, Springer, 2019.
- Verklan, et al., Core Curriculum for Neonatal Intensive Care, Elsevier, 2021.

# SAMPLE QUESTIONS

## LOW RISK NEONATAL INTENSIVE CARE NURSING SAMPLE QUESTIONS

Listed below are sample questions to acquaint the candidate 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

Gardner, et al., *Handbook of Neonatal Intensive Care: An Interprofessional Approach*, Elsevier, 2021, p. 253

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

Gardner, et al. *Handbook of Neonatal Intensive Care: An Interprofessional Approach*, Elsevier, 2021, pgs. 67-68.

4. The goal of treatment of gastroesophageal reflux in the neonate is to
- A. decrease lower esophageal sphincter pressure
  - B. increase gastric pH
  - C. minimize simple regurgitation

Answer: C

Verklan, et al, *Core Curriculum for Neonatal Intensive Care Nursing*, Saunders, Elsevier, St. Louis, 2021, p. 529

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

Gardner, et al. *Handbook of Neonatal Intensive Care: An Interprofessional Approach*, Elsevier, 2021, pg. 95

# 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.

### HAND SCORING YOUR EXAMINATION

If you believe there might be a discrepancy in your test results, you may request a hand score for a fee of \$55.

You must make this request via the NCC website within 60 days of receiving the pass/fail report by selecting that option from your NCC profile at [NCCwebsite.org](https://www.nccwebsite.org/certification-exams) or go to the certification tab <https://www.nccwebsite.org/certification-exams>, scroll down to "Other helpful information" and click "Exam hand score request" to submit your request.

# SCORING & TEST REPORT

## SAMPLE TEST REPORT

Candidates will receive an official test results report from NCC. It will be located in your NCC account. 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

NAME

DATE:

ADDRESS

Pass/Fail:

PASS

Maintenance Due Date:

Your credential is designated as: RNC-LRN® (Registered Nurse Certified - Low Risk Neonatal Intensive Care Nursing)

#### EXAM CONTENT REPORT

Overall pass/fail decisions are based on your overall exam performance. A candidate must obtain a score equal to or higher than the “passing score” to pass the exam. A candidate’s performance on the examination is not compared to the performance of others taking the examination.

In addition, the test report provides you with 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 items within a given subtest and 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. Word descriptors for scoring are set using these ability levels and utilize equal intervals of scale above and below the pass point to provide additional feedback. See the Important Facts and Information on Test Results and Scores page for more detail. 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.

#### Content Area (Percentage of Questions on Exam)

#### Your Results:

General Assessment; Professional Issues (17%)

WEAK

Assessment and Management of  
Pathophysiologic Conditions (39%)

VERY STRONG

General Management (44%)  
(44%)

AVERAGE

# TERMS OF CERTIFICATION AND CERTIFICATION MAINTENANCE

## AFTER PASSING THE EXAM

### CREDENTIAL

Successfully completing the Low Risk Neonatal Intensive Care Nursing exam entitles the newly certified candidate 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 score report letter that shows a passed examination.

### MAINTENANCE AUDITS

Certificants must maintain the conference/CE description and/or objectives, along with the CE certificate which are required to be uploaded if chosen for random audit. Pre-approval of CE does not exempt a certificant from random audit.

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**NO CONTINUING EDUCATION IS ISSUED FOR TAKING THE LOW RISK NEONATAL INTENSIVE CARE NURSING EXAM.**

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## MAINTAINING CERTIFICATION

- NCC certification must be maintained every three years.
- Certification that is not maintained will expire
- The NCC certification maintenance program allows certified nurses to continue their certification status by obtaining specific hours of continuing education credit as defined in their Education Plan, which is generated by their Continuing Competency Assessment (CCA).
- For continuing education credit to be used for certification maintenance it must be earned **AFTER the certified nurse has taken the CAA and in the areas defined by the new Education Plan** before their maintenance is due.
- The maintenance process includes submitting a maintenance application prior to the maintenance due date with appropriate fees and requested documentation. Using NCC CE modules does NOT automatically maintain your certification. Individuals must submit a maintenance application and pay a maintenance fee in addition to any CE fees.
- Maintenance applications are subject to random audit. If an individual is chosen for audit, they will be required to upload CE certificates and course descriptions. These records should be maintained during each maintenance cycle, until the maintenance application has been approved. Individuals can upload these documents in their maintenance application throughout their maintenance cycle. *Documents from NCC modules are already on file with NCC and therefore are not requested or audited.*
- The maintenance due date is the last day the certification is active. **NCC Certified professionals do not need to wait until their maintenance deadline to apply.** As long as they have obtained the required contact hours of continuing education credit - maintenance applications can be submitted up to 12 months before this date to avoid a lapsed certification while the maintenance application is in review. Maintenance will be due in the quarter in which they were notified of their certification (*not the date on which they took the examination*). Maintenance due dates can be found by signing into the certified professional's NCC account. Sign into the account using the associated 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.

# TERMS OF CERTIFICATION AND CERTIFICATION MAINTENANCE

## 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 the certified nurse's certification specialty at the beginning of each new certification maintenance cycle.
- Individuals earn CE as specified by the education plan developed from their assessment. Their education plan outlines the CE needed to maintain their NCC certification. ***Only CE earned after they have taken their assessment can be used to maintain their certification. It must address the CE needs as outlined by their 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>

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VISIT THE NCC WEBSITE  
AND DOWNLOAD THE  
CONTINUING  
COMPETENCY  
ASSESSMENT BROCHURE  
FOR COMPLETE DETAILS!

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