



# 2023 CANDIDATE GUIDE

## NEONATAL INTENSIVE CARE NURSING

### RNC-NIC®

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

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#### THIS EXAM'S PURPOSE

The purpose of the Neonatal Intensive Care 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 critical ill neonatal patients and their families within an intensive care environment.

**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

### 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.)

### 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. After the six hours they have to 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.

### 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-NIC®", 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 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.
- 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 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

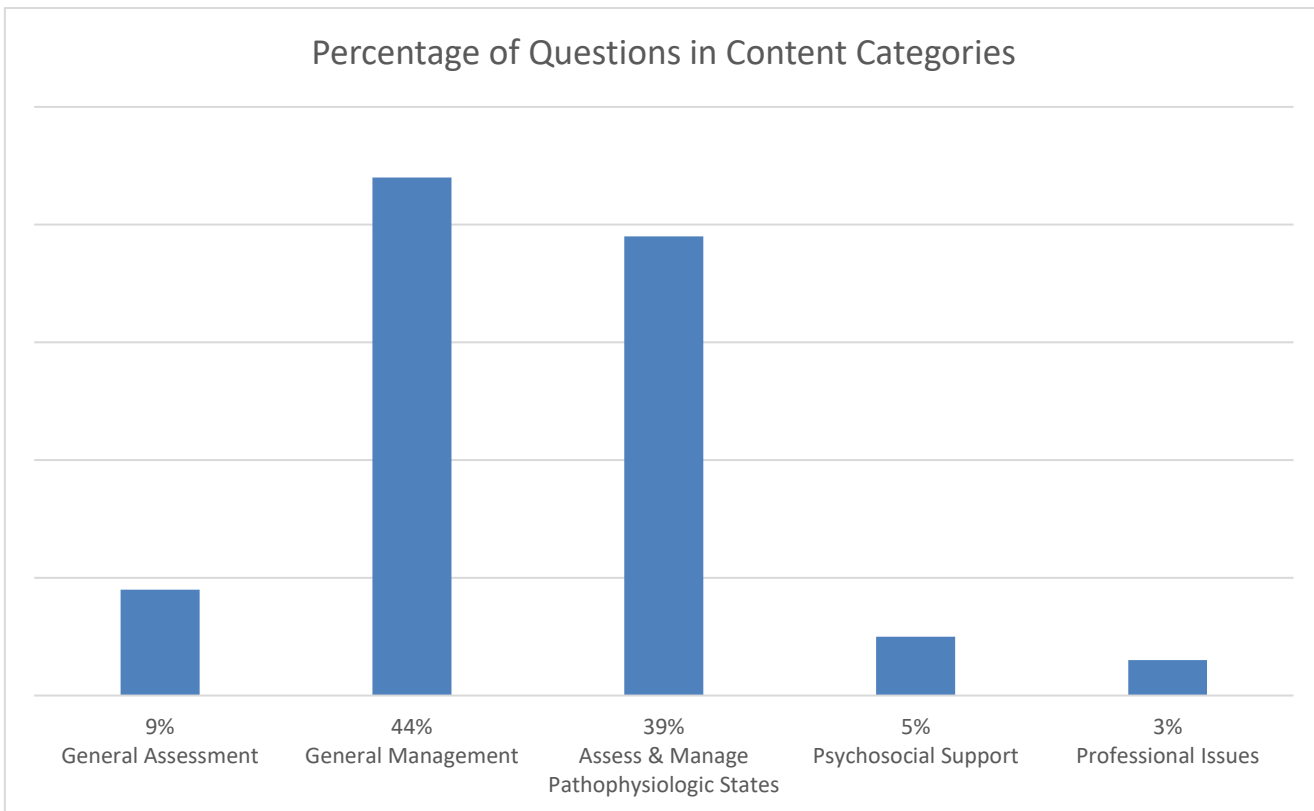
In addition, NCC uses volunteers for standard setting and content validation studies/job analysis studies.



# EXAMINATION CONTENT



## Neonatal Intensive Care Nursing exam



The above chart shows the percentage distribution of questions on the Neonatal Intensive Care Nursing exam across the major content categories covered on the examination. The major focus of the examination is on General Management and Assess & Manage Pathophysiologic States. Lesser emphasis is on General Assessment and Psychosocial Support with Professional Issues having the least number of questions assigned to this content category.

# EXAMINATION CONTENT

## EXAM OUTLINE

This is an outline of topics and areas which may be included in the Neonatal Intensive Care Nursing examination

10.00	General Assessment (9%)
	Maternal Risk Factors and Birth History
	Physical and Gestational Age Assessment
11.00	General Management (44%)
	Resuscitation and Stabilization
	Fluids and Electrolytes and Glucose Homeostasis
	Nutrition and Feeding
	Oxygenation, Ventilation and Acid Base Homeostasis
	Thermoregulation and Integumentary
	Pharmacology, Pharmacokinetics and Pharmacodynamics
	Neuroprotective and Neurodevelopmental Care
	Infection and Immunology
12.00	Assess & Manage Pathophysiologic States (39%)
	Cardiovascular
	Respiratory
	Gastrointestinal and Gastrourinate
	Hematopoietic
	Neurological/Neuromuscular
	Genetic, Metabolic and Endocrine
	Head, Eye, Ear, Nose Throat
13.00	Psychosocial Support (5%)
	Discharge Management, Family Centered Care, Grieving, Palliative Care, Mental Health
14.00	Professional Issues (3%)
	<i>including: Evidence Based Practice, Legal/Ethical, Patient Safety, Quality Improvement</i>



# EXAMINATION CONTENT

## ASSOCIATED COMPETENCIES

- Identify antepartal and intrapartal indicators of neonatal risk and their potential significance
- Systematically assess all body systems utilizing physical examination, gestational age assessment and neurobehavioral assessment
- Apply knowledge of anatomy and physiology (maternal, fetal, transitional, newborn), pathophysiology, pharmacology, nutrition, and behavioral psychology to assess the neonate and differentiate abnormal from normal
- Recognize normal values and deviations in clinical laboratory and diagnostic data and identify potential significance
- Utilize biophysical monitoring techniques to identify body system alterations
- Develop an individualized plan of care for the restoration, maintenance and promotion of health for the high-risk neonate and family unit during hospitalization and following discharge
- Implement diagnostic, therapeutic and educational plans in collaboration with other health care providers to provide direct care for the high-risk neonate and family
- Assess the neonate's family, community, and environment to identify areas of risk
- Identify life-threatening states and initiate appropriate interventions
- Evaluate the plan of care in collaboration with other health care providers and the family and modify the plan of care as indicated
- Identify professional nursing issues which impact on the role of the neonatal nurse

# STUDY GUIDE

## GENERAL ASSESSMENT

### **I. Maternal Risk Factors and Birth History**

- Effects of maternal medical complications
  - hematologic
    - thrombocytopenia
  - hypertension
    - chronic, gestational hypertension, HELLP Syndrome
  - infections
    - CMV, Toxoplasmosis, syphilis, herpes, hepatitis, HIV, gonorrhea, chlamydia
  - renal disease
- Problems associated with amniotic fluid and membranes
  - amniotic bands
  - oligohydramnios
  - polyhydramnios
  - PROM and chorioamnionitis
- Significance of findings:
  - alpha-fetoprotein/triple quad/screen
  - biophysical profile
  - diagnostic ultrasound
- Recognize neonatal significance of fetal heart rate patterns
  - altered variability
  - decelerations
    - early, late, variable
  - tachycardia, bradycardia
- Effects of maternal medications on the neonate
  - tocolytics
  - analgesia, anesthesia
- Problems in labor - impact on the neonate
  - breech and other malpresentation
  - maternal hemorrhage
  - meconium
- Obstetric emergencies (impact on the neonate)
  - abruptio placenta
  - cord prolapse
  - placenta previa
- Impact of methods of delivery on the neonate
  - forceps, vacuum, cesarean

### **II. Physical and Gestational Age Assessment**

- Interpretation of growth curves
  - weight, length and head circumference
- Physical and neuromuscular characteristics
  - preterm
  - term
  - post-term
  - AGA
  - SGA
  - LGA
- Associated risks with
  - Preterm
  - post-term
  - SGA/IUGR
  - LGA
- Normal/abnormal findings regarding:
  - general appearance
  - head, eyes, ears, nose & throat
  - neck
  - chest
  - cardiovascular
  - respiratory
  - abdomen
  - genitalia
  - extremities
  - spine/back
  - skin
  - maintaining skin integrity
  - neuromuscular and reflexes

# STUDY GUIDE

## GENERAL MANAGEMENT

### I. Resuscitation and Stabilization

- Neonatal Cardiopulmonary Resuscitation  
(Per the American Heart Association & the American Academy of Pediatrics)
  - initial evaluation (ABC)
  - indications for ventilation
  - indications for intubation
  - indications for cardiac compressions
  - medications
- Use of drugs
  - epinephrine
  - volume expanders
- Resuscitation and stabilization of the neonate with
  - diaphragmatic hernia
  - hydrops fetalis
  - perinatal asphyxia
  - upper airway obstruction

### II. Fluids and Electrolytes and Glucose Homeostasis

- Normal fluid and electrolyte requirements
- Monitoring fluid and electrolyte status
  - electrolytes
  - urine output
- Effects of
  - humidity
  - maturity
  - temperature
- Specific problems
  - dehydration and overhydration
  - gastrointestinal abnormalities
  - insensible water loss
  - patent ductus arteriosus
  - post-asphyxia
  - third spacing
- Parenteral fluid therapy

### III. Nutrition and Feeding

- Nutritional requirements and effects of excess & deficiency
  - calories
  - carbohydrates
  - fat
  - minerals
  - protein
  - vitamins
- Enteral feeding
  - minimal enteral feedings (gut priming)
- gavage feeding
- bolus vs continuous feedings
- feeding cues
- feeding techniques
- bottle feeding
  - formula composition
- breast feeding
  - stimulating production
  - composition of breast milk
  - donor milk
- Parenteral nutrition
  - indications
  - composition
  - complications
- Dietary supplements
  - breast milk fortifiers
  - glucose polymers
  - iron
  - MCT
  - Vitamins
  - probiotics
- Nutritional management for
  - bronchopulmonary dysplasia
  - prematurity
  - short gut syndrome
  - short gut syndrome

# STUDY GUIDE

## **IV. Oxygenation, Ventilation and Acid Base**

### **Homeostasis**

- Oxygenation: interpretation and management
  - hypoxia/hypoxemia
  - oxygen saturation
  - principles re: increasing/ decreasing FiO<sub>2</sub> levels
  - pulse oximeter
- Methods of oxygenation/ ventilation
  - indications, complications
  - noninvasive ventilation
  - extracorporeal membrane oxygenation (ECMO)
  - high flow nasal cannula
- Mechanical ventilation
  - conventional
  - high frequency
  - other methods of oxygen delivery (hood, nasal cannula)
- Blood gases: interpretation and management
  - metabolic acidosis (compensated & uncompensated)
  - metabolic alkalosis (compensated & uncompensated)
  - respiratory acidosis (compensated & uncompensated)
  - respiratory alkalosis (compensated & uncompensated)
  - mixed
  - serum lactate

## **V. Thermoregulation and Integumentary**

- Mechanisms of heat loss and production
  - assessment of thermal state
  - responses to hypothermia and cold stress
  - responses to hyperthermia
- Maintaining a neutral thermal environment
- Management of thermoregulation problems
  - evaporation
  - conduction
  - convection
  - radiation
  - hypothermia and cold stress
  - hyperthermia

- Equipment
  - Incubators and radiant warmers
  - Heat mattresses and wraps

- Skin Care

## **VI. Pharmacology, Pharmacokinetics and Pharmacodynamics**

- Principles of neonatal pharmacology
  - administration methods/issues
  - absorption from GI tract, skin and muscle
  - blood drug levels (toxic vs therapeutic)
  - drug distribution in the body
  - drug excretion
  - drug incompatibilities
  - drug withdrawal (therapeutic drugs)
  - drug resistance
- Dosage calculations
- Common drugs
  - anesthetics and analgesia (sedatives)
  - antibiotics
  - anticonvulsants
  - antiviral drugs
  - bronchodilators
  - cardiovascular agents
  - CNS stimulants (caffeine, etc)
  - Diuretics
  - muscle relaxants
- Management of the drug exposed neonate
  - Fetal alcohol syndrome
  - Neonatal abstinence syndrome and scoring
  - Substance use and abuse
- Laboratory drug testing

# STUDY GUIDE

## **VII. Neuroprotective and Neurodevelopmental Care**

- Neurobehavioral development
  - Habituation
  - motor organization
  - state organization
  - sensory/interaction capabilities
- Self-regulatory (stability) and stress responses
  - autonomic
  - motoric
  - state/sleep cycles
  - attentional
- Impact of the NICU environment
  - physical
  - light
  - sound
  - social
  - caregiver-infants interactions
  - patterns of caregiving
- Intervention strategies
  - reducing noise levels
  - reducing light levels/diurnal patterns
  - altering care patterns
  - handling/positioning
  - kangaroo care/skin-to-skin
  - nonnutritive sucking
- Provision of sensory experiences
  - auditory
  - tactile
  - visual
  - vestibular and proprioceptive
- Pain
  - assessment
  - non-pharmacologic interventions

## **VIII. Infection and Immunology**

- Interpret laboratory values
  - WBC and differential
  - cerebrospinal fluid
- Immature host defenses
- Neonatal sepsis/meningitis
- Viral and fungal infections
  - candidiasis
  - cytomegalovirus
  - hepatitis B
  - herpes
  - HIV/AIDS
  - toxoplasmosis
  - varicella
- Specific bacterial infections such as
  - E coli infection
  - Group B Streptococcal infection
  - Early/late onset
  - staphylococcal infection
  - syphilis
  - enterovirus
- Infection control procedures
  - nosocomial infection

# STUDY GUIDE

## ASSESS AND MANAGE PATHOPHYSIOLOGIC STATES

### **I. Cardiovascular**

- Transition to Extrauterine Life
- Cyanosis
  - central vs peripheral
  - cardiac vs pulmonary
- **Specific Problems**

*For all problems: presentation/ assessment causes, management, complications, outcome*

- arrhythmias
- cardiac tamponade
- congestive heart failure
- congenital heart defects
  - AV canal
  - coarctation of the aorta
  - hypoplastic left heart
  - pulmonary stenosis and atresia
  - tetralogy of fallot
  - transposition of the great vessels
  - total anomalous pulmonary venous return
  - ventricular septal defect
- cyanotic vs acyanotic disease
- hypertension
- patent ductus arteriosus
- shock
- Cardiovascular assessment
  - blood pressure
  - EKG
  - cardiopulmonary monitoring
  - indwelling lines

### **II. Respiratory**

- Normal pulmonary function, surfactant
  - Specific respiratory problems
- For all problems: presentation/ assessment causes, management, complications, outcome*
- apnea of prematurity
  - bronchopulmonary dysplasia
  - diaphragmatic hernia/paralysis
  - hypoplastic lungs
  - meconium aspiration
  - persistent pulmonary hypertension
  - pneumothorax/air leaks
  - pulmonary hemorrhage
  - respiratory distress syndrome
  - transient tachypnea of the newborn

- Specific therapies
- For all problems: presentation/ assessment causes, management, complications, outcome*
- endotracheal intubation
  - suctioning
  - surfactant replacement therapy
  - chest tubes and drainage systems

### **III. Gastrointestinal and Genitourinary**

- Normal gastrointestinal function
  - Maturation of GI tract
  - Specific GI problems
- For all problems: presentation/ assessment, causes, management, complications, outcome*
- GE reflux
  - GI bleeds perforation/peritonitis
  - Hirschsprung's disease
  - intestinal obstructions (duodenal, jejunal, ileal, imperforate anus)
  - meconium ileus/plug
  - malrotation/volvulus
  - necrotizing enterocolitis
  - omphalocele/gastroschisis
  - short gut syndrome
  - ostomy care
  - colitis
  - bloody stools
  - protein allergies
- Renal function/urinary output
  - Specific genitourinary problems
- For all problems: presentation/ assessment, causes, management, complications, outcome*
- Genital
    - ambiguous genitalia
    - inguinal hernia
    - testicular torsion
  - Urinary tract
    - asphyxial renal damage
    - renal abnormalities
    - renal failure
    - renal vein thrombosis

# STUDY GUIDE

## **IV. Hematopoietic**

- Interpret laboratory values
  - CBC
  - hematocrit, hemoglobin
  - platelets
  - total and direct serum bilirubin
  - direct and indirect antibody test
  - Kleihauer Betke test
- Developmental differences
  - fetal vs adult hemoglobin
  - RBC differences
- Administration of blood and blood products
  - techniques
  - risks
- Hyperbilirubinemia
  - physiologic jaundice
  - causes of direct hyperbilirubinemia
  - causes of indirect hyperbilirubinemia
  - phototherapy
- Specific hematologic problems
  - anemia
  - coagulopathies/DIC
  - polycythemia and hyperviscosity
  - Rh and ABO incompatibility/ hydrops fetalis
  - Thrombocytopenia

## **V. Neurological/ Neuromuscular**

*For all problems: presentation/ assessment, causes, management, complications, outcome*

- Birth injuries (neuromuscular)
- Hydrocephalus
- Hypoxic ischemic encephalopathy
- Neural tube defects
- Germinal matrix hemorrhage
- Intraventricular hemorrhage
- Periventricular leukomalacia
- Seizures
- Subdural hemorrhage

## **VI. Genetic, Metabolic and Endocrine**

- Interpret laboratory values
  - calcium, phosphorus magnesium
  - glucose

- Metabolic screening
  - PKU
  - Thyroid
  - CAH
  - Sickle cell
  - Galactosemia
- Glucose homeostasis
- Specific metabolic/endocrine problems
  - For all problems: presentation/ assessment, causes, management, complications, outcome*
  - hypocalcemia and hypercalcemia
    - rickets
  - hypoglycemia and hyperglycemia
    - infant of diabetic mother
  - thyroid disorders
  - adrenal disorders
- Mendelian inheritance patterns
  - autosomal recessive
  - autosomal dominant
  - sex-linked
- Chromosomal anomalies and diseases
  - Trisomy 13
  - Trisomy 18
  - Trisomy 21
  - Multifactorial diseases
  - DiGeorge
  - Turners

## **VII. Head, Eyes, Ears, Nose and Throat**

- Eye prophylaxis
- Specific problems
  - For all problems: presentation/ assessment, causes, management, complications, outcome*
  - cephalhematoma
  - choanal atresia
  - cleft palate/lip
  - retinopathy of prematurity
  - tracheal stenosis/atresia
  - tracheomalacia
  - tracheostomy
  - vocal cord paralysis
  - subgaleal
  - trachea-esophageal atresia (TEF)
  - esophageal atresia
  - micrognathia



# STUDY GUIDE

## PSYCHOSOCIAL SUPPORT

### I. Discharge Management, Family-Centered Care, Grieving, Palliative Care, Mental Health

- General discharge planning and parent teaching
  - car seats
  - CPR
  - CCHD screening
  - feeding
  - immunizations
  - SIDS/safe sleep/plagiocephaly
  - Visitors
  - Shaken baby
- Discharge planning and parent teaching for infants with special needs
  - nutrition
  - medications
  - special equipment needs
  - special care needs
  - developmental follow up
  - visual screening
  - hearing screening
  - motor delay (including cerebral palsy)
  - cognitive/language delay
- Anticipatory grief
- Stages of grieving and common behaviors and interventions
- Factors which impede/enhance grief process
- Pathologic responses
- Maternal/paternal differences (incongruent grieving)
- Specific circumstances
  - chronic sorrow
  - death of a twin (triplets, etc)
  - repeated obstetric loss (recurrent abortion, stillbirth, preterm delivery)
  - sibling responses
- Support systems and referrals
  - bereavement groups
  - parent support groups
  - palliative care
- Parent-infant attachment behaviors
- Parental stress responses
  - high risk birth
  - changes in status
  - transfer
- Barriers to parent infant interaction
- Specific circumstances
  - adolescent parents
  - grandparents and other extended family
  - long distance nurturing of parent/ infant attachment
  - sibling responses and interventions
- Specific interventions with parents and extended family
  - counseling techniques
  - parent teaching
- Shared decision making
  - parent-staff disagreements
  - regarding treatment
- Principles of culturally sensitive care
- Maternal psychiatric issues
  - Post-traumatic stress disorder
  - Post-partum depression

# 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

### Evidence based practice

- Terminology
  - Reliability
  - Validity
  - Significance
  - Levels of Evidence
- Quality Improvement
- Research utilization

### Patient Safety

- Communication
- Interprofessional practice

# STUDY RESOURCES

- Bissinger, et al., Golden Hours, NCC, 2019.
- Blackburn, Maternal, Fetal, & Neonatal Physiology, Elsevier, 2018.
- Fanaroff, et al., Klaus & Fanaroff's Care of the High-Risk Neonate, Elsevier-Saunders, 2019.
- Gardner, et al., Handbook of Neonatal Intensive Care: An Interprofessional Approach, Elsevier, 2021.
- Gleason, et al., Avery's Diseases of the Newborn, Elsevier, 2018.
- Goldsmith, et al., Assisted Ventilation of the Neonate: An Evidence-Based Approach to Newborn Respiratory Care Elsevier, 2022.
- Gomella, Neonatology, 8th ed., Lange, 2020.
- Guido, Legal & Ethical Issues in Nursing, Pearson, 2019
- Martin, et al. Fanaroff and Martin's Neonatal-Perinatal Medicine: Diseases of the Fetus and Infant, Elsevier, 2020.
- Polit, et al., Essentials of Nursing Research: Appraising Evidence for Nursing Practice, LWW, 2021.
- Resnik, et al., Creasy & Resnik's Maternal Fetal Medicine Principles and Practice, Elsevier, 2019.
- Simpson, et al., AWHONN's Perinatal Nursing, 5<sup>th</sup> ed, Wolters Kluwer, 2021.
- Stark, et al., Cloherty and Stark's Manual of Neonatal Care 8<sup>th</sup> ed., Wolters Kluwer, 2017.
- Taketomo, Pediatric and Neonatal Dosage Handbook, 28<sup>th</sup> ed, Lexi-comp, 2021
- Tappero, et al., Physical Assessment of the Newborn, Springer, 2019.
- Verklan, et al., Core Curriculum for Neonatal Intensive Care Nursing, Elsevier, 2021.
- Volpe, et. al., Neurology of the Newborn, Elsevier, 2018.
- Walsh, et al., Neonatal and Pediatric Respiratory Care, Elsevier, 2019.

# SAMPLE QUESTIONS

## NEONATAL INTENSIVE CARE NURSING SAMPLE QUESTIONS

Listed below are five 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. Functional closure of the ductus arteriosus occurs as a result of

- A. fibrosis of the ductal muscle
- B. increased arterial oxygen tension
- C. increased left atrial pressure

Answer: B

Martin, et al. Fanaroff and Martin's Neonatal-Perinatal Medicine: Diseases of the Fetus and Infant, Elsevier, 2020, p. 1333

2. A premature neonate has been consistently engaging in hand-to-mouth movements. The nurse should

- A. provide a time out for care giving activities
- B. recognize these behaviors as a form of self-consolation
- C. swaddle and hold the infant for awhile

Answer: B

Gardner, et al., Handbook of Neonatal Intensive Care: An Interprofessional Approach, Elsevier, 2021, p. 367

3. After six hours of IV calcium replacement, the serum calcium level of a neonate remains below normal. Which of the following laboratory values should be obtained as the next step in evaluating the neonate's condition?

- A. Serum magnesium
- B. Serum phosphorus
- C. Urine calcium

Answer: A

Gleason, et al., *Avery's Diseases of the Newborn*, Elsevier, 2018, p. 1337.

4. The primary etiology of transient tachypnea of the newborn is thought to be

- A. asphyxia at birth
- B. retained lung fluid
- C. surfactant deficiency

Answer: B

Verklan, et al., Core Curriculum for Neonatal Intensive Care Nursing, Saunders Elsevier, 2021, p. 401.

5. A 1300 g neonate wearing only a diaper is placed in a single walled incubator with an inside temperature of 35°C (95°F). By what method is the neonate most likely to experience heat loss?

- A. Convection
- B. Evaporation
- C. Radiation

Answer: C

Gardner, et al., Handbook of Neonatal Intensive Care: An Interprofessional Approach, Elsevier, 2021, p. 141

# 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) 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.

### NEONATAL INTENSIVE CARE NURSING EXAMINATION

#### Test Results

NAME

DATE:

ADDRESS

Pass/Fail: PASS

Maintenance Due Date:

Your credential is designated as: RNC-NIC® (Registered Nurse Certified - 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 (9%)

AVERAGE

General Management (44%)

AVERAGE

Assess & Manage Pathophysiologic States (39%)

VERY STRONG

Psychosocial Support; Professional Issues (8%)

WEAK

# TERMS OF CERTIFICATION AND CERTIFICATION MAINTENANCE

## AFTER PASSING THE EXAM

### CREDENTIAL

Successfully completing the Neonatal Intensive Care Nursing exam entitles the newly certified candidate to use the credential RNC-NIC® (Registered Nurse Certified – 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 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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