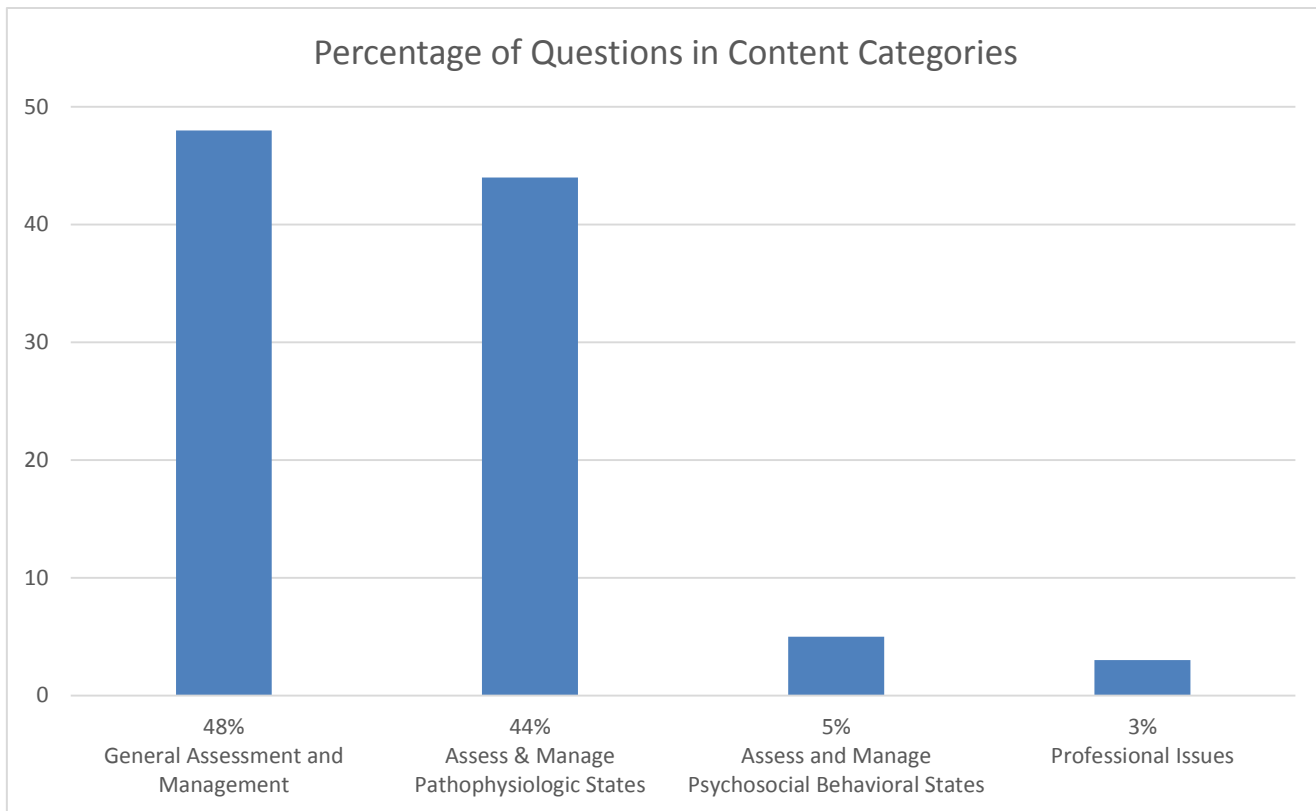


EXAMINATION CONTENT  
CONDENSED EXAM OUTLINE



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 Assessment and Management and Assess & Manage Pathophysiologic States having the most emphasis. Lesser emphasis is on Psychosocial Behavioral States and Professional Issues having the least number of questions assigned to this content category

# EXAMINATION CONTENT

## CONDENSED EXAM OUTLINE

### CONDENSED EXAM OUTLINE

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

- 11.00 General Assessment and Management (48%)

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- 11.01 Maternal History and Risk Factor
- 11.02 Gestational Age (At Birth)
- 11.03 Physical Assessment
- 11.04 Resuscitation and Stabilization
- 11.05 Fluids and Electrolytes
- 11.06 Nutrition and Feeding
- 11.07 Oxygenation and Acid Base Homeostasis
- 11.08 Thermoregulation
- 11.09 Pharmacology
- 11.10 Developmental Care
  
- 12.00 Assess & Manage Pathophysiologic States (44%)

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- 12.01 Cardiac
- 12.02 Respiratory
- 12.03 Gastrointestinal
- 12.04 Genitourinary
- 12.05 Hematopoietic
- 12.06 Neurological/Neuromuscular
- 12.07 Infectious Diseases
- 12.08 Metabolic/Endocrine
- 12.09 Genetic Disorders
- 12.10 Head, Eye, Ear, Nose Throat
  
- 13.00 Assess and Manage Psychosocial/ Behavioral States (5%)

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- 13.01 Discharge Planning and Follow up
- 13.02 Grieving Process
- 13.03 Family Integration
  
- 14.00 Professional Issues (3%)

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- including: Evidence Based Practice, Legal/Ethical/Communication Issues, Research, Patient Safety

# EXAMINATION CONTENT

## TEST CONTENT OUTLINE & ASSOCIATED COMPETENCIES

### 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

# EXAMINATION CONTENT

## TEST CONTENT OUTLINE & ASSOCIATED COMPETENCIES

### GENERAL ASSESSMENT AND MANAGEMENT

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

- 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. Gestational Age (At Birth)**

- 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

#### **III. Physical Assessment**

- 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

#### **IV. 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

# EXAMINATION CONTENT

## TEST CONTENT OUTLINE & ASSOCIATED COMPETENCIES

- Use of drugs
  - epinephrine
  - volume expanders
- Resuscitation and stabilization of the neonate with
  - diaphragmatic hernia
  - hydrops fetalis
  - perinatal asphyxia
  - upper airway obstruction

### **V. Fluids and Electrolytes**

- 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**

### **VI. 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

### **VII. 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

# EXAMINATION CONTENT

## TEST CONTENT OUTLINE & ASSOCIATED COMPETENCIES

### **VIII. Thermoregulation**

- 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

### **IX. Pharmacology**

- 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

### **X. Developmental 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
  - positioning
  - kangaroo care/skin-to-skin
  - nonnutritive sucking
- provision of sensory experiences
  - auditory
  - tactile
  - visual
  - vestibular and proprioceptive
- Pain
  - assessment
  - non-pharmacologic interventions

# EXAMINATION CONTENT

## TEST CONTENT OUTLINE & ASSOCIATED COMPETENCIES

### ASSESS AND MANAGE PATHOPHYSIOLOGIC STATES

#### **I. Cardiac**

- 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**

- 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

# EXAMINATION CONTENT

## TEST CONTENT OUTLINE & ASSOCIATED COMPETENCIES

### **IV. Genitourinary**

- 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

### **V. 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

### **VI. 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

### **VII. Infectious Diseases**

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

- 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
  - infection control procedures



# EXAMINATION CONTENT

## TEST CONTENT OUTLINE & ASSOCIATED COMPETENCIES

### **VIII. Metabolic/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

### **IX. Genetic Disorders**

- Mendelian inheritance patterns
  - autosomal recessive
  - autosomal dominant
  - sex-linked
- Chromosomal anomalies and diseases
  - Trisomy 13
  - Trisomy 18
  - Trisomy 21
  - Multifactorial diseases
  - DeGeorge
  - Turners

### **X. 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
  - micronathia

# EXAMINATION CONTENT

## TEST CONTENT OUTLINE & ASSOCIATED COMPETENCIES

### ASSESS AND MANAGE PSYCHOSOCIAL/BEHAVIORAL ADJUSTMENT

#### **I. Discharge Planning and Follow-Up**

- General discharge planning and parent teaching
  - car seats
  - CPR
  - CCHD screening
  - feeding
  - immunizations
  - SIDS/safe sleep/plageocephaly
  - 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

#### **II. Grieving Process**

- 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

#### **III. Family Integration**

- 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

# EXAMINATION CONTENT

## TEST CONTENT OUTLINE & ASSOCIATED COMPETENCIES

### 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

# EXAMINATION CONTENT

## STUDY RESOURCES

### STUDY RESOURCES

- Blackburn, Maternal, Fetal, & Neonatal Physiology, Elsevier, 2013
- Fanaroff, et al., Klaus & Fanaroff's Care of the High-Risk Neonate, Elsevier-Saunders, 2015.
- Fraser, Acute Respiratory Care, NICU, Ink, 2012.
- Gardner, et al., Neonatal Intensive Care, Mosby Elsevier, 2016.
- Gleason, et al., Avery's Diseases of the Newborn, Elsevier Saunders, 2012.
- Goldsmith, et al., Assisted Ventilation of the Neonate, 6<sup>th</sup> ed., Saunders Elsevier, 2017.
- Gomella, Neonatology, 7th Ed., Lange, 2013.
- Guido, Legal and Ethical Issues in Nursing, Pearson, 2014.
- Orkin, et al., Hematology of Infancy and Childhood, Saunders, Elsevier, 2015.
- Polit, et al., Essentials of Nursing Research: Appraising Evidence for Nursing Practice, LWW, 2013.
- Remington, et al., Infectious Diseases of the Fetus and Newborn Infant, Saunders, Elsevier, 2016.
- Simpson, et al., Perinatal Nursing, LWW, Philadelphia, 2014.
- Stark, et al., Cloherty and Stark's Manual of Neonatal Care 8<sup>th</sup> ed., Lippincott, Williams & Wilkins, Philadelphia, 2017.
- Tappero, et al., Physical Assessment of the Newborn, NICU, Ink, 2015.
- Verklan, et al., Core Curriculum for Neonatal Intensive Care Nursing, Saunders Elsevier, 2015.
- Walsh, et al., Perinatal and Pediatric Respiratory Care, Saunders, Elsevier, 2010.
- Yaffe, et al. Neonatal and Pediatric Pharmacology, Therapeutic Principles in Practice, LWW, 2011.