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 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.
CONDENSED EXAM OUTLINE
FOR NEONATAL INTENSIVE CARE NURSING EXAMINATION

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 (45-55%)
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 (45-55%)
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 Adjustments (5-10%)
13.01 Discharge Planning and Follow up
13.02 Grieving Process
13.03 Family Integration

14.00 Professional Issues (Less than 5%)
MATERNAL HISTORY AND RISK FACTORS

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

— Assess the neonate's family, community and environment to identify areas of risk

MATERNAL HISTORY AND RISK FACTORS

Effects of maternal medical complications
hematologic (anemia, thrombocytopenia)
hypertension (chronic, PIH, HELLP Syndrome)
infections (CMV, Toxoplasmosis, syphilis, herpes, hepatitis, AIDS, gonorrhea, chlamydia)
renal disease

Problems associated with amniotic fluid and membranes:
amniotic bands
oligohydramnios
polyhydramnios
PROM and chorioamnionitis

Significance of findings:
alpha-fetoprotein/triple screen
biophysical profile
diagnostic ultrasound
lung maturation studies (L:S ratio, lung profile, PG)

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)

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

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
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 massage

Use of drugs
epinephrine
Narcan
sodium bicarbonate
volume expanders

Resuscitation and stabilization of the neonate with
diaphragmatic hernia
hydrops fetalis
perinatal asphyxia
upper airway obstruction

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

NUTRITION AND FEEDING

Nutritional requirements and effects of excess and deficiency
calories
carbohydrates
fat
minerals
protein
vitamins

Enteral feeding
minimal enteral feedings (gut priming)
gavage feeding
bolus vs continuous feedings
bottle feeding
feeding techniques
formula composition
breast feeding
stimulating production
composition of breast milk

Parenteral nutrition
indications
composition
complications

Dietary supplements
breast milk fortifiers
glucose polymers
iron
MCT
vitamins

Nutritional management for bronchopulmonary dysplasia
prematurity
short gut syndrome

OXYGENATION/VENTILATION AND ACID BASE HOMEOSTASIS

Oxygenation: interpretation and management
hypoxia/hypoxemia
oxygen saturation
principles re: increasing/decreasing FiO₂ levels
pulse oximeter

Methods of oxygenation/ventilation (indications, complications)
CPAP
extracorporeal membrane oxygenation (ECMO)

Mechanical ventilation
conventional
high frequency
other methods of oxygen delivery (hood, nasal cannula, face mask)

Blood gases: interpretation and management
metabolic acidosis (compensated & uncompensated)
metabolic alkalosis (compensated & uncompensated)
respiratory acidosis (compensated & uncompensated)
respiratory alkalosis (compensated & uncompensated)
mixed

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
radiant warmers
servo-controlled incubator
EXAMINATION CONTENT
CONDENSED EXAM OUTLINE

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)

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
Cocaine

Laboratory Testing
urine
meconium

Equipment
Infusion pumps

DEVELOPMENTAL CARE
Neurobehavioral development
habitation
motor organization
state organization
sensory/interaction capabilities

Self regulatory (stability) and stress responses
autonomic
motoric
state
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
musculoskeletal integrity
kangaroo care
nonnutritive sucking
 provision of sensory experiences
auditory
tactile
visual
vestibular and proprioceptive

Pain
assessment
non-pharmacologic interventions

STUDY RESOURCES
- Tappero, et. al., Physical Assessment of the Newborn, NICU, Ink, 2009
EXAMINATION CONTENT
COMPETENCY STATEMENTS, TEST CONTENT OUTLINE & STUDY RESOURCES

ASSESS AND MANAGE PATHOPHYSIOLOGIC STATES

ASSOCIATED COMPETENCIES

— Recognize normal values and deviations in clinical laboratory and diagnostic data and identify potential significance

— Utilize biophysical monitoring techniques to identify body system alterations

— Assess the neonate’s family, community and environment to identify areas of risk

— 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

— 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

CARDIAC

Transition to Extraterine 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
central venous pressure
EKG
blood pressure monitors
cardiopulmonary monitors
indwelling lines

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
EXAMINATION CONTENT
COMPETENCY STATEMENTS, TEST CONTENT OUTLINE & STUDY RESOURCES

GASTROINTESTINAL
Normal gastrointestinal function
Maturation of GI tract
Specific GI problems  
For all problems: presentation/assessment, causes, management, complications, outcome
- esophageal atresia/
  tracheoesophageal atresia
- 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

GENITOURINARY
Renal function/urinary output
Specific genitourinary problems  
For all problems: presentation/assessment causes, management, complications, outcome
- Genital
  - ambiguous genitalia
  - adrenogenital syndrome
  - inguinal hernia
  - hydrocele
- Urinary tract
  - asphyxial renal damage
  - renal abnormalities
  - renal failure
  - renal vein thrombosis

HEMATOPOIETIC
Interpret laboratory values
- CBC
- hematocrit, hemoglobin
- platelets
- total and direct serum bilirubin
- direct and indirect Coomb’s test
- Kleihauer Betke test
Developmental differences
- fetal vs adult hemoglobin
- RBC differences

INFECTIONOUS 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
- chlamydia
- E coli infection
- Group B Streptococcal infection
- early onset
- late onset
- staphylococcal infection
- syphilis
Infection control procedures
- nosocomial infection
- infection control procedures

METABOLIC/ENDOCRINE
Interpret laboratory values
- calcium, phosphorus magnesium glucose
Newborn screening
- PKU
- T assay
Glucose homeostasis

For all problems: presentation/assessment causes, management, complications, outcome
Birth injuries (neuromuscular)
- Hydrocephalus/V-P shunts
- Hypoxic ischemic encephalopathy
- Neural tube defects
- Periventricular/intraventricular hemorrhage
  - periventricular
  - leukomalacia
  - Seizures
  - Subdural hemorrhage

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**Examination Content**

**Competency Statements, Test Content Outline & Study Resources**

**Specific metabolic/endocrine problems**

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

- hypocalcemia and hypercalcemia
- rickets
- hypoglycemia and hyperglycemia
- infant of diabetic mother
- hyperthyroidism and hypothyroidism

**Genetic Disorders**

**Mendelian inheritance patterns**

- autosomal recessive
- autosomal dominant
- sex-linked

**Chromosomal anomalies and diseases**

- Trisomy
- Trisomy 1
- Trisomy 21
- Multifactorial diseases

**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/atroresia
- tracheomalacia
- tracheostomy

**Study Resources**

- Walsh, et al., Perinatal and Pediatric Respiratory Care, Saunders, Elsevier, 2010
- Remington, et al., Infectious Diseases of the Fetus and Newborn Infant, Saunders, Elsevier, 2011
- Orkin, et al., Hematology of Infancy and Childhood, Saunders, Elsevier, 2009
EXAMINATION CONTENT
COMPETENCY STATEMENTS, TEST CONTENT OUTLINE & STUDY RESOURCES

ASSESS AND MANAGE PSYCHOSOCIAL/BEHAVIORAL ADJUSTMENT

ASSOCIATED COMPETENCIES

— Recognize normal values and deviations in clinical laboratory and diagnostic data and identify potential significance

— Implement diagnostic, therapeutic and educational plans in collaboration with other health care providers to provide direct care for the high risk neonate and family

— Evaluate the plan of care in collaboration with other health care providers and the family and modify the plan of care as indicated

DISCHARGE PLANNING AND FOLLOW-UP

General discharge planning and parent teaching
- car seats
- CPR
- feeding
- immunizations
- SIDS
- visitors

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

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

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

STUDY RESOURCES

EXAMINATION CONTENT
COMPETENCY STATEMENTS, TEST CONTENT OUTLINE & STUDY RESOURCES

ASSOCIATED COMPETENCIES

— Identify professional nursing issues which impact on the role of the neonatal nurse

PROFESSIONAL ISSUES

Quality assessment/improvement

Ethical issues and dilemmas
process of bioethical decision making
role of nurse in ethical decision making situations in regard to colleagues, patients, parents

Legal issues
documentation
informed consent
standard of care
Security/Abduction Precautions

Research
Understanding/using research findings in clinical practice
randomization
significance of research findings
generalization

Patient Safety

STUDY RESOURCES

- Polit, et al., Essentials of Nursing Research, LWW, 2009
- Guido, Legal and Ethical Issues in Nursing, Prentice Hall, 2009