EXAMINATION CONTENT
FOR TESTS TAKEN BEFORE APRIL 1, 2020

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.
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%)
- Maternal History and Risk Factor
- Gestational Age (At Birth)
- Physical Assessment
- Resuscitation and Stabilization
- Fluids and Electrolytes
- Nutrition and Feeding
- Oxygenation and Acid Base Homeostasis
- Thermoregulation
- Pharmacology
- Developmental Care

12.00 Assess & Manage Pathophysiologic States (44%)
- Cardiac
- Respiratory
- Gastrointestinal
- Genitourinary
- Hematopoietic
- Neurological/Neuromuscular
- Infectious Diseases
- Metabolic/Endocrine
- Genetic Disorders
- Head, Eye, Ear, Nose Throat

13.00 Assess and Manage Psychosocial/Behavioral States (5%)
- Discharge Planning and Follow up
- Grieving Process
- Family Integration

14.00 Professional Issues (3%)

including: Evidence Based Practice, Legal/Ethical, Patient Safety
EXAMINATION CONTENT
FOR TESTS TAKEN BEFORE APRIL 1, 2020

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
For Tests Taken Before April 1, 2020

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
- Use of drugs
  - epinephrine
  - volume expanders
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- 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 \( \text{FiO}_2 \) 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
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
  kangaroo care/skin-to-skin
  nonnutritive sucking
  provision of sensory experiences
    auditory
    tactile
    visual
    vestibular and proprioceptive
• Pain
  assessment
  non-pharmacologic interventions
Assess and Manage Pathophysiologic States

I. 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
  - 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/gastrochisis
  - short gut syndrome
  - ostomy care
  - colitis
  - bloody stools
  - protein allergies
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
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
DiGeorge
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
I. Discharge Planning and Follow-Up

• 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

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)

• 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

• 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
FOR TESTS TAKEN BEFORE APRIL 1, 2020

PROFESSIONAL PRACTICE 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

Evidence based practice
• Terminology
  Reliability
  Validity
  Significance
  Levels of Evidence
• Quality Improvement
• Research utilization

Patient Safety
• Communication
• Interprofessional practice
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
FOR TESTS TAKEN ON/AFTER APRIL 1, 2020

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%)
- including: Evidence Based Practice, Legal/Ethical, Patient Safety, Quality Improvement
EXAMINATION CONTENT
FOR TESTS TAKEN ON/AFTER APRIL 1, 2020

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
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
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
IV. 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
  - 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

- Skin Care

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

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
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
FOR TESTS TAKEN ON/AFTER APRIL 1, 2020

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 Gastrourinate
- 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
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
  tracheo-esophageal atresia (TEF)
  esophageal atresia
  micronathia
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
**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.
- Snell, et al., Care of the Well Newborn, Jones & Bartlett, 2017.