The following Pediatric Learning Solutions courses align to focus areas of the Neonatal CCRN® Exam Content Outline. These courses equip candidates with the foundational knowledge necessary to approach the Neonatal CCRN® exam with confidence. Go to the Association of Critical-Care Nurses site for more information on the CCRN Exam.

Pediatric Learning Solutions' course alignment with Neonatal CCRN® Exam Content Outline. (Note: PLS Courses are in italics under topic area)

I. **Clinical Judgment**

   A. **Cardiovascular**
      1. **Cardiac Surgery**
         - Congenital Heart Disease: Overview
         - Congenital Heart Disease: Acyanotic Defects
         - Congenital Heart Disease: Cyanotic Defects
         - Introduction to Hemodynamic Monitoring
         - Vasoactive Medications
         - Introduction to ECMO
         - Nursing Management of Chest Tubes
         - Cardiovascular Laboratory Procedures: Diagnostic & Interventional
         - Preventing Surgical Site Infections

      2. **Dysrhythmias**
         - Structure and Function of the Heart
         - Electrophysiology
         - The Cardiac Monitor
         - Lines, Waves and Segments
         - Analyzing the ECG Rhythm Strip
         - Sinus Rhythms
         - Atrial Arrhythmias
         - Junctional Arrhythmias
         - Ventricular Arrhythmias
         - Atrioventricular Arrhythmias
         - Channelopathies
         - Temporary Pacemakers
         - Permanent Pacemakers and ICDs

      3. **Structural Heart Defects**
         - Congenital Heart Disease: Overview
         - Congenital Heart Disease: Acyanotic Defects
         - Congenital Heart Disease: Cyanotic Defects
         - Extraterine Life: Assessment of the Neonate’s Transition
         - Extraterine Life: Fetal to Neonatal Circulation
         - Maternal Factors Affecting the Newborn
         - Congestive Heart Failure
         - Introduction to Hemodynamic Monitoring
         - Vasoactive Medications
         - Introduction to ECMO
         - Cardiovascular Laboratory Procedures: Diagnostic & Interventional
         - Persistent Pulmonary Hypertension of the Newborn (PPHN)
B. **Pulmonary**

1. **Acute Respiratory Distress Syndrome**
   - *Introduction to Arterial Blood Gas Interpretation*
   - *Understanding Abnormal Blood Gases*
   - *Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation*
   - *Management of the Difficult Airway*
   - *Advanced Concepts in Respiratory Physiology*
   - *Mechanical Ventilation: Introduction to Pediatric Practices*
   - *High-Frequency Ventilation*
   - *Preventing Ventilator-Associated Pneumonia*
   - *Caring for a Child with a Tracheostomy*
   - *Neonatal Respiratory Distress Syndrome*

2. **Acute Respiratory Failure**
   - *Introduction to Arterial Blood Gas Interpretation*
   - *Understanding Abnormal Blood Gases*
   - *Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation*
   - *Management of the Difficult Airway*
   - *Advanced Concepts in Respiratory Physiology*
   - *Mechanical Ventilation: Introduction to Pediatric Practices*
   - *High-Frequency Ventilation*
   - *Neonatal Respiratory Distress Syndrome*
   - *Introduction to ECMO*
   - *Caring for a Child with a Tracheostomy*

3. **Acute Respiratory Infection (e.g., pneumonia)**
   - *Neonatal Sepsis*
   - *Meconium Aspiration Syndrome*
   - *Mechanical Ventilation: Introduction to Pediatric Practices*
   - *High-Frequency Ventilation*
   - *Preventing Ventilator-Associated Pneumonia*

4. **Air-leak Syndromes**
   - *Neonatal Respiratory Distress Syndrome*
   - *Pneumothorax in the Neonate*
   - *Meconium Aspiration Syndrome*
   - *Nursing Management of Chest Tubes*

5. **Apnea of Prematurity**
   - *Apnea of Prematurity*
   - *Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation*

6. **Aspiration**
   - *Meconium Aspiration Syndrome*
   - *Neonatal Sepsis*

7. **Bronchopulmonary Dysplasia**
   - *Bronchopulmonary Dysplasia*
   - *Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation*
   - *Neonatal Nutrition*
8. Congenital Anomalies
   - Comprehensive Assessment of the Neonate
   - Congenital Diaphragmatic Hernia
   - Esophageal Atresia and TE Fistula
   - Gastrochisis and Omphalocele
   - Management of the Difficult Airway
   - Maternal Factors Affecting the Newborn
   - Esophageal Atresia and TE Fistula

9. Failure to Wean from Mechanical Ventilation
   - Advanced Concepts in Respiratory Physiology
   - Mechanical Ventilation: Introduction to Pediatric Practices
   - High-Frequency Ventilation
   - Preventing Ventilator-Associated Pneumonia
   - Caring for a Child with a Tracheostomy
   - Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation

10. Meconium Aspiration Syndrome (MAS)
    - Meconium Aspiration Syndrome
    - Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation
    - Mechanical Ventilation: Introduction to Pediatric Practices
    - High-Frequency Ventilation
    - Introduction to ECMO
    - Vasoactive Medications

11. Persistent Pulmonary Hypertension of the Newborn (PPHN)
    - Persistent Pulmonary Hypertension of the Newborn (PPHN)
    - Extrauterine Life: Assessment of the Neonate’s Transition
    - Extrauterine Life: Fetal to Neonatal Circulation
    - High-Frequency Ventilation
    - Advanced Concepts in Respiratory Physiology
    - Mechanical Ventilation: Introduction to Pediatric Practices
    - High-Frequency Ventilation
    - Introduction to ECMO
    - Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation
    - Vasoactive Medications

12. Pulmonary Hypertension
    - Persistent Pulmonary Hypertension of the Newborn (PPHN)
    - Extrauterine Life: Assessment of the Neonate’s Transition
    - Extrauterine Life: Fetal to Neonatal Circulation
    - Maternal Factors Affecting the Newborn
    - Advanced Concepts in Respiratory Physiology
    - Mechanical Ventilation: Introduction to Pediatric Practices
    - High-Frequency Ventilation
    - Introduction to ECMO
    - Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation
    - Vasoactive Medications

13. Thoracic Surgery
    - Congenital Heart Disease: Acyanotic Defects
    - Congenital Heart Disease: Cyanotic Defects
Congenital Diaphragmatic Hernia
Esophageal Atresia and TE Fistula
Nursing Management of Chest Tubes
Preventing Surgical Site Infections

14. Transient Tachypnea of the Newborn (TTN)
   Transient Tachypnea of the Newborn
   Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation
   Comprehensive Assessment of the Neonate
   Extrauterine Life: Assessment of the Neonate’s Transition
   Extrauterine Life: Fetal to Neonatal Circulation
   Maternal Factors Affecting the Newborn

C. **Endocrine/Hematology/Gastrointestinal/Renal/Integumentary**
   1. Endocrine
      a. Hyperglycemia
         Glucose Homeostasis in the Neonate
         Diabetes Insipidus and SIADH
         Maternal Factors Affecting the Newborn
      b. Inborn Errors of Metabolism
         Metabolic Disorders of the Newborn
         Comprehensive Assessment of the Neonate
      c. Neonatal Hypoglycemia
         Metabolic Disorders of the Newborn
         Glucose Homeostasis in the Neonate
         Maternal Factors Affecting the Newborn
   2. Hematology/Immunology
      a. Anemia/Anemia of Prematurity
         Anemia and Polycythemia in the Neonate *(Coming 2017)*
         Disseminated Intravascular Coagulation
      b. Coagulopathies (e.g., ITP, DIC, HIT)
         Disseminated Intravascular Coagulation
         Thrombocytopenia: ITP and HIT/T *(Coming 2017)*
      c. Immune Deficiencies
         Neonatal Sepsis
      d. Hyperbilirubinemia
         Hyperbilirubinemia
         Anemia and Polycythemia in the Neonate *(Coming 2017)*
         Blood Administration: Exchange Transfusion
      e. Leukopenia
         Neonatal Sepsis
      f. Rh/ABO incompatibilities, hydrops fetalis
         Anemia and Polycythemia in the Neonate *(Coming 2017)*
         Maternal Factors Affecting the Neonate
Hyperbilirubinemia
Blood Administration: Exchange Transfusion
Congestive Heart Failure

g. Thrombocytopenia
Disseminated Intravascular Coagulation
Neonatal Sepsis
Blood Administration: Exchange Transfusion
Thrombocytopenia: ITP and HIT/T (Coming 2017)

3. Gastrointestinal
   a. Bowel Infarction/Obstruction/Perforation
      Necrotizing Enterocolitis
      Gastrochisis and Omphalocele
      Neonatal Sepsis

   b. Gastroesophageal reflux
      Neonatal Nutrition
      Nutrition in the Critically Ill Child
      Esophageal Atresia and TE Fistula

   c. GI Abnormalities (e.g., omphalocele; gastroschisis, volvulus, imperforate anus, Hirschsprung disease, malrotation, intussusception)
      Comprehensive Assessment of the Neonate
      Gastrochisis and Omphalocele
      Congenital Diaphragmatic Hernia
      Necrotizing Enterocolitis

   d. GI Surgeries
      Gastrochisis and Omphalocele
      Congenital Diaphragmatic Hernia
      Esophageal Atresia and TE Fistula
      General Post-Op Care of the Transplant Patient
      Preventing Surgical Site Infections

   e. Malnutrition and Malabsorption
      Neonatal Nutrition
      Nutrition in the Critically Ill Child
      Necrotizing Enterocolitis

   f. Necrotizing Enterocolitis
      Necrotizing Enterocolitis
      Neonatal Nutrition
      Disseminated Intravascular Coagulation
      Neonatal Sepsis

4. Renal/Genitourinary
   a. Acute Kidney Injury, Failure, Acute Tubular Necrosis
      Renal Failure in the Pediatric Patient
      Hemodialysis
      Continuous Renal Replacement Therapy
      Neonatal Pharmacokinetics
b. Renal/GI Infections
   Neonatal Sepsis
   Comprehensive Assessment of the Neonate

c. Life-threatening Electrolyte Imbalances
   Neonatal Nutrition
   Fluids and Electrolytes: Laboratory Assessment
   Fluids and Electrolytes: Physical Assessment
   Fluids and Electrolytes: Physiological Differences
   Fluids and Electrolytes: Replacement Therapy
   Fluids and Electrolytes: Water Intoxication and Fluid Shift

d. Polycystic Kidney Disease
   Renal Failure in the Pediatric Patient

5. Integumentary
   a. IV Infiltration
      Neonatal Skin Care
      Pediatric Peripheral IV Care & Management
      Management of PIV Complications in the Pediatric Patient

   b. Wounds (surgical)
      Neonatal Skin Care
      Preventing Surgical Site Infections
      Introduction to Pediatric Pressure Injuries
      Pressure Injuries in the Pediatric Population: Staging and Care
      Pressure Injuries Staging Assessment

D. Musculoskeletal/Neurology/Psychosocial
1. Musculoskeletal
   a. Infections
      Comprehensive Assessment of the Neonate
      Neonatal Sepsis

   b. Osteopenia
      Neonatal Nutrition

2. Neurology
   a. Birth Injuries
      Maternal Factors Affecting the Neonate
      Intracranial Pressure Monitoring
      Hypoxic Ischemic Encephalopathy

   b. Brain Death
      Hypoxic Ischemic Encephalopathy
      Organ and Tissue Donation: The Gift of Life
      Intracranial Pressure Monitoring

   c. Congenital Neurologic Abnormalities (e.g., AV malformation, myelomeningocele, encephalocele)
      Neonatal Cranial Hemorrhage
Hydrocephalus
Maternal Factors Affecting the Neonate
Craniotomy
d. Encephalopathy
Neonatal Sepsis
Meningitis and Encephalitis
Intracranial Pressure Monitoring
e. Hemorrhage (ICH, IVH, subarachnoid)
Neonatal Cranial Hemorrhage
Intracranial Pressure Monitoring
Craniotomy
f. Hydrocephalus
Hydrocephalus
Intracranial Pressure Monitoring
Craniotomy
g. Neurologic Infectious Disease (e.g., viral, bacterial, fungal)
Neonatal Sepsis
Meningitis and Encephalitis
h. Neurosurgery
Hydrocephalus
Intracranial Pressure Monitoring
Craniotomy
i. Seizure Disorders
Status Epilepticus
Neonatal Seizures
3. Behavioral/Psychosocial
a. Agitation
Maternal Factors Affecting the Neonate
Pediatric Restraint and Seclusion
Neonatal Pain Assessment and Management
b. Developmental Delays
Developmental Care of the Newborn
c. Failure to Thrive
Nutrition in the Critically Ill Child
Neonatal Nutrition
Pediatric Nutritional Overview
Congestive Heart Failure
e. Stress in Extremely Low Birth Weight Infants
Developmental Care of the Newborn
Neonatal Pain Assessment and Management
f. Substance Dependence or Abuse
   Maternal Factors Affecting the Neonate

E. Multisystem
1. Asphyxia
   Acute Respiratory Distress Syndrome
   Hypoxic Ischemic Encephalopathy
   Maternal Factors Affecting the Newborn

2. End of Life
   Care of the Dying Child: Care Issues
   Care of the Dying Child: Grief
   Care of the Dying Child: The Dying Process
   Health Care Advance Directives: Communicating Wishes
   Organ and Tissue Donation: The Gift of Life

3. Healthcare-associated Infections (CLABSI, CAUTI, VAP)
   Preventing Catheter-Associated Urinary Tract Infection (CAUTI)
   Preventing Central Line-Associated Bloodstream Infections (CLABSI)
   Preventing Surgical Site Infections
   Preventing Ventilator-Associated Infections
   Central Lines in the Neonate

4. Hypotension
   Vasoactive Medications

5. Infectious Diseases (MDROs; influenza)
   Management of MDROs in the Health Care Setting (Clinical)
   Tuberculosis

6. Life-threatening Maternal-Fetal Complications
   Maternal Factors Affecting the Newborn
   Anemia and Polycythemia in the Neonate (Coming 2017)

7. Low Birth Weight/Prematurity
   Comprehensive Assessment of the Neonate
   Retinopathy of Prematurity
   Neonatal Nutrition

8. Multi-organ Dysfunction Syndrome (MODS)
   Neonatal Sepsis

9. Pain
   Neonatal Pain Assessment and Management
   Pain Management: Assessment of Pain
   Pain Management: Non-Pharmacological Therapies in the Management of Pediatric Pain
   Pain Management: Pain Pathophysiology
   Pain Management: Pharmacological Management of Pediatric Pain
10. Palliative Care
   Care of the Dying Child: Care Issues
   Care of the Dying Child: Grief
   Care of the Dying Child: The Dying Process
   Family-Centered Care in the NICU

11. Sepsis Continuum (SIRS, sepsis, severe sepsis, septic shock)
   Neonatal Sepsis
   Pediatric Sepsis
   Care of the Pediatric Patient in Shock
   Blood Administration: Exchange Transfusion

12. Shock States (distributive, hypovolemic)
   Care of the Pediatric Patient in Shock
   Introduction to ECMO

13. Sleep Disruption
   Developmental Care of the Newborn

14. Thermoregulation
   Thermoregulation of the Newborn Infant
   Neonatal Skin Care

15. Toxin/Drug Exposure
   Pediatric Toxicology Exposure
   Neonatal Pharmacokinetics

II. Professional Caring and Ethical Practice
1. Advocacy/Moral Agency
   Introduction to Ethics
   Family-Centered Care in the NICU
   Therapeutic Relationships and Professional Behaviors (Coming 2017)

2. Caring Practices
   Introduction to Ethics
   Family-Centered Care in the NICU

3. Response to Diversity
   Introduction to Workplace Diversity
   Family-Centered Care in the NICU

4. Facilitation of Learning
   Precepting: Adult Learners
   Precepting: Preceptor Roles and Responsibilities

5. Collaboration
   Building Effective Teams
   Clinical Delegation
Coaching
Empowering Teams
Giving and Receiving Feedback
Therapeutic Relationships and Professional Behaviors (Coming 2017)

6. Systems Thinking
   Building Effective Teams
   Empowering Teams

7. Clinical Inquiry
   Introduction to Research Ethics

Other related and supporting PLS content:

Patient Care
   Assessment of the Critically Ill Child
   Blood Administration: Administration of Blood and Blood Components
   Blood Administration: Blood Components
   Blood Administration: Transfusion Reaction
   Caring for the Complex Patient (Coming 2018)