



Pediatric Learning Solutions

A clinical education program exclusively for pediatric professionals

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](http://www.aacn.org) 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. Acute Pulmonary Edema

Acquired Heart Disease
Acute Respiratory Distress Syndrome
Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation
Introduction to Arterial Blood Interpretation
Understanding Abnormal Blood Gases
Advanced Concepts in Respiratory Physiology
Mechanical Ventilation: Introduction to Pediatric Practices
High-Frequency Ventilation
Congestive Heart Failure
Lower Airway Disease
Pediatric Drowning

2. 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 and Interventional
Preventing Surgical Site Infections
General Post-Op Care of the Transplant Patient

3. 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

4. Heart Failure
 - Congestive Heart Failure*
 - Introduction to Hemodynamic Monitoring*
 - Vasoactive Medications*
 - Introduction to ECMO*
5. Hypovolemic Shock
 - Care of the Pediatric Patient in Shock*
6. Structural Heart Defects
 - Congenital Heart Disease: Overview*
 - Congenital Heart Disease: Acyanotic Defects*
 - Congenital Heart Disease: Cyanotic Defects*
 - Extrauterine Life: Assessment of the Neonate's Transition*
 - Extrauterine 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 and Interventional*
 - Persistent Pulmonary Hypertension of the Newborn (PPHN)*

B. Respiratory

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*
 - Care of the Small Baby*
 - Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation*
6. Aspiration
 - Meconium Aspiration Syndrome*
 - Neonatal Sepsis*
7. Chronic Conditions (e.g., chronic lung disease/bpd)
 - 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*
 - Gastroschisis 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 Hemorrhage
- Acute Respiratory Distress Syndrome*
 - Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation*
 - Mechanical Ventilation: Introduction to Pediatric Practices*
 - High-Frequency Ventilation*
 - Congestive Heart Failure*
 - Lower Airway Disease*
 - Meconium Aspiration Syndrome*
 - Congenital Heart Disease: Acyanotic Defects*
 - Introduction to ECMO*
13. 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*
14. Respiratory Distress (RDS)
- Introduction to Arterial Blood Gas Interpretation*
 - Understanding Abnormal Blood Gases*
 - Basic Principles of Oxygen Therapy, Specialty Gases and Noninvasive Ventilation*
 - Advanced Concepts in Respiratory Physiology*
 - Mechanical Ventilation: Introduction to Pediatric Practices*
 - High-Frequency Ventilation*
 - Neonatal Respiratory Distress Syndrome*
 - Care of the Small Baby*
15. 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*
16. 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. Adrenal insufficiency
- b. Hyperbilirubinemia
*Hyperbilirubinemia
Anemia and Polycythemia in the Neonate
Blood Exchange Transfusion*
- c. Hyperglycemia
*Glucose Homeostasis in the Neonate
Diabetes Insipidus and SIADH
Maternal Factors Affecting the Newborn*
- d. Hypoglycemia
*Metabolic Disorders of the Newborn
Glucose Homeostasis in the Neonate
Maternal Factors Affecting the Newborn*
- e. Inborn Errors of Metabolism
*Metabolic Disorders of the Newborn
Comprehensive Assessment of the Neonate*

2. Hematology/Immunology

- a. Anemia
*Anemia and Polycythemia in the Neonate
Disseminated Intravascular Coagulation*
- b. Coagulopathies (e.g., ITP, DIC, HIT)
*Disseminated Intravascular Coagulation
Thrombocytopenia: ITP and HIT/T*
- c. Immune Deficiencies
Neonatal Sepsis
- d. Leukopenia
Neonatal Sepsis
- e. Polycythemia
*Anemia and Polycythemia in the Neonate
Blood Exchange Transfusion
Hyperbilirubinemia*
- f. Rh/ABO incompatibilities, hydrops fetalis
*Anemia and Polycythemia in the Neonate
Maternal Factors Affecting the Neonate
Hyperbilirubinemia*

Blood Exchange Transfusion
Congestive Heart Failure

- g. Thrombocytopenia
Disseminated Intravascular Coagulation
Neonatal Sepsis
Blood Exchange Transfusion
Thrombocytopenia: ITP and HIT/T

3. Gastrointestinal

- a. Bowel Infarction/Obstruction/Perforation
Necrotizing Enterocolitis
Gastroschisis and Omphalocele
Neonatal Sepsis
- b. Feeding Intolerance
Neonatal Nutrition
Esophageal Atresia and TE Fistula
Gastroschisis and Omphalocele
Necrotizing Enterocolitis
Care of the Small Baby
- c. Gastroesophageal reflux
Neonatal Nutrition
Nutrition in the Critically Ill Child
Esophageal Atresia and TE Fistula
Care of the Small Baby
- d. GI Abnormalities (e.g., omphalocele; gastroschisis, volvulus, imperforate anus, Hirschsprung disease, malrotation, intussusception)
Comprehensive Assessment of the Neonate
Gastroschisis and Omphalocele
Congenital Diaphragmatic Hernia
Necrotizing Enterocolitis
- e. GI Surgeries
Gastroschisis and Omphalocele
Congenital Diaphragmatic Hernia
Esophageal Atresia and TE Fistula
General Post-Op Care of the Transplant Patient
Preventing Surgical Site Infections
- f. Hepatic Failure (e.g., biliary atresia, portal hypertension, esophageal varices)
Liver Transplant
General Post-Op Care of the Transplant Patient
- g. Malnutrition and Malabsorption
Neonatal Nutrition
Nutrition in the Critically Ill Child
Necrotizing Enterocolitis

- h. Necrotizing Enterocolitis
Necrotizing Enterocolitis
Neonatal Nutrition
Disseminated Intravascular Coagulation
Neonatal Sepsis
 - i. Pyloric Stenosis
4. Renal/Genitourinary
- a. Acute Kidney Injury
Renal Failure in the Pediatric Patient
Hemodialysis
Continuous Renal Replacement Therapy
Neonatal Pharmacokinetics
 - b. Chronic Kidney Disease
Renal Failure in the Pediatric Patient
Hemodialysis
Continuous Renal Replacement Therapy
 - c. Congenital Genitourinary Conditions (e.g., hypospadias, polycystic kidney disease, hydronephrosis, bladder exstrophy)
Comprehensive Assessment of the Neonate
Renal Failure in the Pediatric Patient
 - d. Genitourinary surgery
 - e. Infections
Neonatal Sepsis
Comprehensive Assessment of the Neonate
 - f. Life-threatening Electrolyte Imbalances
Neonatal Nutrition
Fluid and Electrolyte Management: Laboratory Assessment
Fluid and Electrolyte Management: Physical Assessment
Fluid and Electrolyte Management: Physiological Differences
Fluid and Electrolyte Management: Replacement Therapy
Fluid and Electrolyte Management: Water Intoxication and Fluid Shift
5. Integumentary
- a. Congenital Abnormalities
Comprehensive Assessment of the Neonate
 - b. IV Infiltration
Neonatal Skin Care
Pediatric Peripheral IV Care & Management
Management of PIV Complications in the Pediatric Patient
 - c. Pressure Injury/ulcer (e.g., device, incontinence, immobility)
Neonatal Skin Care

Introduction to Pediatric Pressure Injuries
Pressure Injuries in the Pediatric Population: Staging and Care
Pressure Injury Staging Assessment

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

D. Musculoskeletal/Neurology/Psychosocial

1. Musculoskeletal

- a. Congenital or Acquired Musculoskeletal Conditions
Comprehensive Assessment of the Neonate
- b. Osteopenia
Neonatal Nutrition
Care of the Small Baby

2. Neurological

- a. Agitation
Maternal Factors Affecting the Neonate
Pediatric Restraint and Seclusion
Neonatal Pain Assessment and Management
Neonatal Abstinence Syndrome
- b. Congenital Neurologic Abnormalities (e.g., AV malformation, myelomeningocele, encephalocele)
Neonatal Cranial Hemorrhage
Hydrocephalus
Maternal Factors Affecting the Neonate
Craniotomy
- c. Encephalopathy
Neonatal Sepsis
Meningitis and Encephalitis
Intracranial Pressure Monitoring
- d. Head Trauma (e.g., forceps and/or vacuum injury)
Maternal Factors Affecting the Neonate
Neonatal Cranial Hemorrhage
Intracranial Pressure Monitoring
Craniotomy
- e. Hemorrhage (ICH, IVH, subarachnoid)
Neonatal Cranial Hemorrhage
Intracranial Pressure Monitoring
Craniotomy
Anemia and Polycythemia in the Neonate

- f. Hydrocephalus
Hydrocephalus
Intracranial Pressure Monitoring
Craniotomy
- g. Ischemic Insult
Hypoxic Ischemic Encephalopathy
Maternal Factors Affecting the Newborn
Neonatal Cranial Hemorrhage
Organ and Tissue Donation: The Gift of Life
Intracranial Pressure Monitoring
- h. Neurologic Infectious Disease (e.g., viral, bacterial, fungal)
Neonatal Sepsis
Meningitis and Encephalitis
- i. Neurosurgery
Hydrocephalus
Intracranial Pressure Monitoring
Craniotomy
- j. Pain (acute/chronic)
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
Procedural Sedation in the Pediatric Patient
- j. Seizure Disorders
Status Epilepticus
Neonatal Seizures
- k. Sensory Impairment (e.g., ROP, hearing)
Developmental Care of the Newborn
Retinopathy of Prematurity
Care of the Small Baby
- l. Sensory impairment
Developmental Care of the Newborn
Retinopathy of Prematurity
Care of the Small Baby
- m. Stress (e.g., noise, overstimulation)
Developmental Care of the Newborn
Care of the Small Baby
Neonatal Abstinence Syndrome
Neonatal Pain Assessment and Management

- n. Traumatic Brain Injury (e.g., epidural, physical abuse)
Maternal Factors Affecting the Newborn
Child Abuse and Neglect

3. Behavioral/Psychosocial

- a. Abuse and Neglect
Child Abuse and Neglect
Intimate Partner Violence
Trauma-Informed Practice: Concepts, Goals and Principles
Implementing Trauma-Informed Sensitive Practice
- b. Families in Crisis (e.g., stress, grief, lack of coping)
Intimate Partner Violence
Family-Centered Care in the NICU

E. Multisystem

1. Birth Injuries

Maternal Factors Affecting the Neonate
Intracranial Pressure Monitoring
Hypoxic Ischemic Encephalopathy

2. Developmental Delays

Developmental Care of the Newborn

3. Failure to Thrive

Nutrition in the Critically Ill Child
Neonatal Nutrition
Pediatric Nutritional Overview
Congestive Heart Failure
Bronchopulmonary Dysplasia

4. Healthcare-associated Infections (CLABSI, CAUTI, VAP)

Preventing Catheter-Associated Urinary Tract Infections (CAUTI)
Preventing Central Line-Associated Bloodstream Infections (CLABSI)
Preventing Surgical Site Infections
Preventing Ventilator-Associated Infections
Central Lines in the Neonate

5. Hypotension

Vasoactive Medications

6. Infectious Diseases (MDROs; influenza)

Management of MDROs in the Health Care Setting (Clinical)
Tuberculosis
Neonatal Sepsis

7. Life-threatening Maternal-Fetal Complications

Maternal Factors Affecting the Newborn

Anemia and Polycythemia in the Neonate

8. Low Birth Weight/Prematurity
 - Comprehensive Assessment of the Neonate*
 - Retinopathy of Prematurity*
 - Neonatal Nutrition*
 - Care of the Small Baby*
9. Sepsis
 - Neonatal Sepsis*
 - Pediatric Sepsis*
 - Care of the Pediatric Patient in Shock*
 - Blood Exchange Transfusion*
10. Terminal Conditions (e.g., end of life, 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. Thermoregulation
 - Thermoregulation of the Newborn Infant*
 - Neonatal Skin Care*
17. Toxin/drug exposure (e.g., neonatal abstinence syndrome, fetal alcohol syndrome, maternal or iatrogenic)
 - Maternal Factors Affecting the Neonate*
 - Neonatal Abstinence Syndrome*
 - 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 Behavior*
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 Behavior

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 and Blood Components Administration
Blood Components
Blood Transfusion Reaction
Caring for the Complex Patient