Sepsis

Setting: **Inpatient** Population: **Newborn, NICU** Keywords: **hypotension, septicemia, infection**

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Clinical Description

Care of the hospitalized infant experiencing systemic signs of infection and physiologic dysregulation caused by an infectious agent originating anywhere in the body.

Key Information

- Early-onset sepsis presents at less than 72 hours of life. Late-onset sepsis presents as early as 72 hours of life, but more commonly after the first week of life.
- The evaluation and treatment of hypotension in the neonate should be based on the cardiovascular assessment and not the blood pressure alone.
- Symptoms of septic shock should be differentiated from other potential causes, such as inborn errors of metabolism, persistent pulmonary hypertension or cardiogenic shock associated with the closure of a ductus arteriosus in ductal-dependent congenital heart disease.
- If antibiotic therapy was initiated for risk or suspected infection, consider stopping at 36 hours if no source found and infant's clinical condition is stable.
- The administration of hydrocortisone for refractory hypotension is controversial and is not recommended for routine use in the neonate.

Clinical Goals

By transition of care

A. The patient will demonstrate achievement of the following goals:

- Absence of Infection Signs and Symptoms

B. Patient, family or significant other will teach back or demonstrate education topics and points:

- Education: Overview
- Education: Self Management
- Education: When to Seek Medical Attention

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Correlate Health Status

Correlate health status to:

- prenatal and birth history, comorbidity, congenital anomaly
- gestational age, corrected age, day of life
- sex
- baseline assessment data
- physiologic status
- response to medication and interventions
- barriers to accessing care and services
- family/caregiver:
  - developmental level
  - health literacy
  - cultural and spiritual preferences
- safety risks
- social determinants of health
- family interaction
- plan for transition of care

Infection (Sepsis)

Signs/Symptoms/Presentation

- apnea
- behavioral status change
- breath sounds change
- capillary refill delayed
- feeding intolerance
- fluid balance altered
- fontanel appearance
- heart sounds change

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- irritability
- listless
- muscle tone change
- peripheral perfusion altered
- respiratory pattern change
- responsiveness altered
- seizure activity
- skin color change
- skin cool, clammy
- unexplained jaundice
- urinary output decreased

Vital Signs

- heart rate increased or decreased
- respiratory rate increased
- blood pressure increased or decreased
- SpO2 (peripheral oxygen saturation) decreased
- temperature instability

Hemodynamic Values

- MAP (mean arterial pressure) decreased
- CVP (central venous pressure) increased or decreased

Laboratory Values

- ABG (arterial blood gas) abnormal
- blood glucose level instability
- coagulation studies abnormal
- CRP (C-reactive protein) elevated
- CSF (cerebrospinal fluid) evaluation abnormal
- culture positive (urine, wound, blood)
- procalcitonin increased

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- serum bilirubin increased
- serum lactate elevated
- WBC (white blood cell) count change

Diagnostic Results

- radiologic evaluation abnormal
- ultrasound of superior vena cava blood flow abnormal

Problem Intervention(s)

Initiate Sepsis Management

- Determine and address source of infection aggressively; implement isolation precautions as indicated.
- Provide respiratory support, such as oxygen therapy, noninvasive or invasive positive pressure ventilation to achieve oxygenation goal; avoid hyperoxemia.
- Provide fluid therapy to improve blood flow, oxygen delivery and tissue perfusion; repeat hemodynamic assessments frequently.
- Monitor for signs of fluid overload, such as increased work of breathing and hepatomegaly.
- Obtain cultures prior to initiating antimicrobial therapy when possible. Do not delay treatment for laboratory results in the presence of high suspicion or clinical indicators.
- Administer ordered antimicrobial therapy promptly.
- Anticipate the need for vasoactive therapy (e.g., vasopressor, inotrope, vasodilator).

Promote Stabilization and Recovery

- Anticipate fluid adjustment and diuretic administration once hemodynamically stable; minimize fluctuation in fluid balance to reduce the risk of neurologic and cardiorespiratory complications.
- Utilize lung-protective ventilation strategies, such as low volume, pressure and inspiratory time, to minimize risk of ventilator-induced lung injury; apply PEEP (positive end-expiratory pressure) to improve oxygenation and lung compliance.
- Maintain developmentally-appropriate positioning to maximize blood pressure and perfusion.
- Monitor for bleeding, maintain bleeding precautions and minimize invasive procedures.

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- Monitor laboratory value, diagnostic test and clinical status trends for signs of infection progression and multiple organ failure.
- Assess daily the effectiveness and need for antimicrobial agents.
- Prepare for supportive therapy, such as coagulopathy management, blood transfusion, high frequency ventilation, surfactant therapy, hemofiltration and ECLS (extracorporeal life support).
- Optimize fluid balance, nutrition intake, sleep and glycemic control to maintain tissue perfusion and enhance immune response

Associated Documentation

- Infection Management
- Isolation Precautions
- Stabilization Measures

Associated Documentation

- Airway/Ventilation Management (Infant)
- Bleeding Management
- Bleeding Precautions
- Fever Reduction/Comfort Measures
- Fluid/Electrolyte Management
- Lung Protection Measures
- Sleep/Rest Enhancement (Infant)

General Education

- admission, transition of care
- orientation to care setting, routine
- advance care planning
- diagnostic tests/procedures
- opioid medication management
- oral health

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- medication management
- pain assessment process
- safe medication disposal
- tobacco use, smoke exposure
- treatment plan

Safety Education

- call light use
- equipment/home supplies
- fall prevention
- harm prevention
- infection prevention
- MDRO (multidrug-resistant organism) care
- personal health information
- resources for support

Education: Overview

- description
- signs/symptoms

Education: Self Management

- activity
- fluid/food intake
- immunizations
- infection prevention
- provider follow-up

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Education: When to Seek Medical Attention

- unresolved/worsening symptoms

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