Multisystem

PCCN/CCRN Review

Systemic Inflammatory Response Syndrome

SIRS is a clinical syndrome of dysregulated inflammation associated with both infectious and non-infectious processes.

– SIRS
  • Core temp >38° C or <36° C (>100.4° F or <96° F)
  • Increased HR
  • Increased RR: >20BPM or PaCo2 <32 mmHg
  • WBC count >12,000 or <4,000 or >10% immature neutrophils
  • Altered mental status

Sepsis Cascade

• Systemic response to infection
• Inflammatory response
• Sepsis is a presumed or confirmed infection
• Severe Sepsis is sepsis plus a sepsis-induced organ dysfunction or tissue hypoperfusion.
• Septic Shock is sepsis induced hypotension despite adequate fluid resuscitation.

Distributive Shock

• Distributive or Vasodilatory Shock is where there is a severe decrease is System Vascular Resistance (SVR).

Etiologies

– Septic Shock
– Toxic Shock Syndrome
– Anaphylaxis or anaphylactoid response
– Drug or Toxin reactions
– Addisonian crisis
– Myxedema coma
– Neurogenic shock

Test

• PCCN Multi-system disorders = approximately 5% of the exam
• Possible topics:
  – Infectious diseases
  – Shock States
  – SIRS
  – Sepsis/Severe Sepsis/Septic Shock
  – MODS
  – Wounds
  – Pain

• CCRN Multi-system disorders = 8% of the exam
• Possible topics:
  – Asphyxia
  – Multi-system trauma
  – Septic shock/Multi-system organ dysfunction syndrome (MODS)
  – SIRS
  – Toxic exposure [chemicals, radiation, etc…]
  – Toxic ingestions [poisoning, overdose, etc…]

www.aacn.org

Dellinger et al. (2013)
Early Goal Directed Therapy

• Fluids
• Vasopressors
• Cultures
• Appropriate Antibiotics

Supportive Therapy

• Blood Product Administration
• Mechanical Ventilation
• Sedation, Analgesia, and Neuromuscular Blockade use
• Glucose Control
• Renal Replacement Therapy
• Bicarbonate Therapy
• DVT and SUP Prophylaxis
• Nutrition
• Setting Goals of Care

Asphyxia

• Condition where one is unable to breathe, or exchange oxygen & carbon monoxide normally.
  – Choking (foreign body)
  – Asthma/restricted airway
  – Drowning or smoke inhalation

Toxic Emergencies

• Top 12
• Assessment
• Treatment

Top 12

1. Antidepressants
2. Analgesics
3. Illicit drugs
4. Cardiovascular drugs
5. Alcohol
6. Gases and fumes
7. Asthma therapies
8. Industrial chemicals
9. Pesticides
10. Household cleaning products
11. Anticonvulsant medications
12. Foods, plants, and insects

Assessment

– History and Physical
– Poison Control
– Head to Toe

**Treatment**

- Removal
  - Decontamination
  - Emesis
  - Gastric Lavage
  - Cathartics


**Infectious Diseases & Healthcare Acquired Infections**

**Influenza**

- A respiratory illness with s/s of fever, headache, myalgia, and weakness.
- Transmitted through coughing and sneezing up to two days before onset of symptoms and five days total
- Complications include:
  - Pneumonia
  - Rhabdomyalysis
  - Toxic Shock Syndrome

Uptodate.com

**Multi-drug resistant organisms**

- Each year roughly 2 million people become infected with bacteria resistant to antibiotics
- 23,000 die as a result
  - Many more die as a complication of these infections
- This can happen anywhere, however, most deaths occur in a healthcare setting.

CDC

**Multi-drug resistant organisms**

- MRSA: Methicillin-resistant *Staphylococcus aureus*
  - MRSA causes life-threatening bloodstream infections, pneumonia and surgical site infections.
  - Resistant to first line antibiotics
  - Transmitted primarily through direct and indirect contact
  - Poor adherence to standard infection prevention can lead to transfer to patients and lead to outbreaks
  - Adherence to infection control measures are critical to preventing the spread of MRSA.

www.cdc.gov

**Multi-drug resistant organisms**

- VRE: Vancomycin Resistant Enterococcus
  - Enterococcus bacteria usually causes infections in the very sick patients in healthcare facilities
  - Roughly 20,000 or 30% of Enterococcus healthcare-associated infections are Vancomycin resistant leading to an average of 1,300 deaths annually.
  - Good adherence to infection control measures
  - Remove temporary medical devices as soon as able
  - Promote wise antibiotic use

www.cdc.gov
Multi-drug resistant organisms

- Clostridium Difficile (C-Diff): Causes life-threatening diarrhea.
  - 250,000 infections per year with 14,000 deaths.
  - A stronger bacteria strain has emerged since 2000 increasing deaths by 400% by 2007.
- Usually seen in hospitalized patients requiring antibiotics.
  - Adherence to infection control measures
  - Promote wise antibiotic use
  - Clean area with sporidical cleaners

Catheter associated urinary tract infections

- Prevention:
  - Good adherence to infection control measures
  - On placement and ongoing maintenance
  - Remove catheter as soon as possible, and within 24 hours post op.
  - Use alternative measures
    - Condom cath
    - Frequent bathroom/bedpan offerings
    - Intermittent catheterization

Central Line associated bloodstream infections

- CLABSI infections occur when either bacteria or viruses enter the blood stream through a central line catheter.
- Prevention
  - Adherence with sterile technique when placing central line
  - Adherence to infection control measures
  - Assessment of line and site
  - Remove as soon as possible

References