

NC VII: Emergency and Critical Care



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Multisystem Disorders: Systemic Inflammatory Response Syndrome (SIRS) and Multiple Organ Dysfunction Syndrome (MODS)

Systematic Inflammatory Response (SIRS)

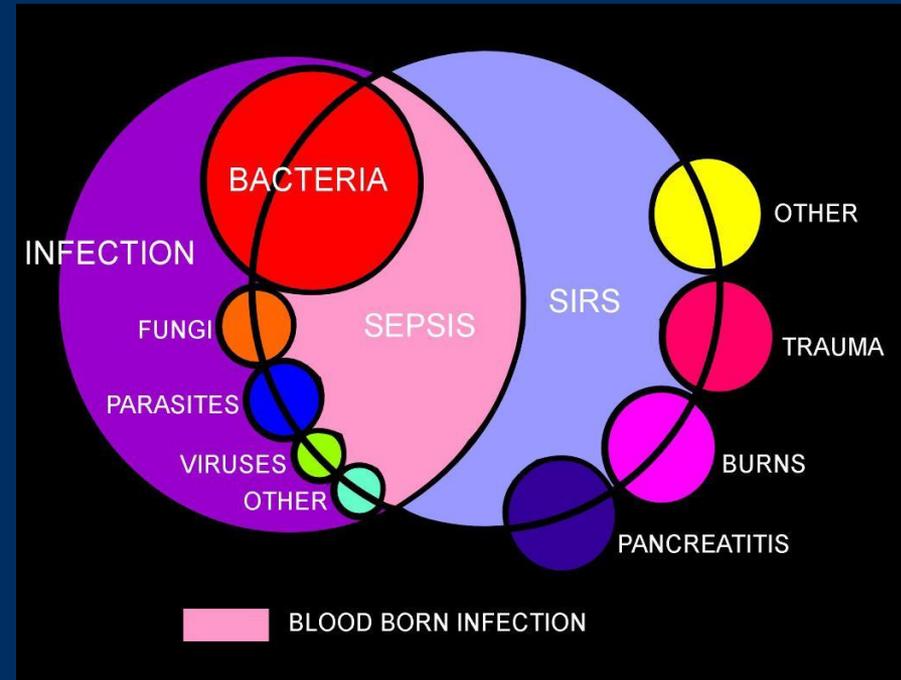


- Whole body inflammatory response
- No proven source
- SIRS with confirmed source of infection is sepsis

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SIRS criteria

- Temperature $> 38^{\circ}\text{C}$ or $< 36^{\circ}\text{C}$
- Heart rate > 90 beats per minute
- Respiratory rate > 20 breaths per minute or a PaCO_2 level of less than 32 mmHg
- Abnormal white blood cell count: $>12,000/\mu\text{l}$ or $< 4,000/\mu\text{l}$



Overlap of infection, bacteremia, sepsis, systemic inflammatory response syndrome (SIRS), and multiorgan dysfunction. From <http://emedicine.medscape.com/article/168943-overview>

Multiple Organ Dysfunction Syndrome (MODS)

- Causes
 - Dead tissue
 - Injured tissue
 - Infection
 - Perfusion Deficits
 - Persistent inflammation such as pancreatitis or pneumonitis
- High Risk
 - Impaired immune responses
 - Older adults
 - Chronic illness
 - Malnutrition
 - Cancer
 - Severe trauma
 - Sepsis

- Best therapy
- Removing potential source of sepsis or inflammation
 - For example, removing an infected central line
 - For example, excising and draining an infected wound
- When not possible, use of empirical antimicrobial therapy.
- Increased surveillance by nursing of patients at high risk

- Prolonged inflammatory response
- Mediators cause a systemic response, resulting in cell destruction
- Decreased tissue perfusion to organs and tissues
- Increased metabolism
- Organ failure
 - Lungs
 - GI tract
- Classification
 - Primary
 - Secondary

- Early
 - Hypotension
 - Low grade fever
 - Tachycardia
 - Increase in neutrophils
 - Dyspnea
 - Some decrease in LOC
- Later
 - Increased dyspnea
 - Renal and hepatic failure
 - Elevated glucose
 - Failure of wounds to heal
 - Require fluids and inotropic medication
- End stage
 - Unstable
 - Unresponsive
 - Edema
 - Need dialysis
 - Coagulation disorders

- Failure to reverse MODS in three weeks, usually results in death
- Mortality rates are 50-90%
- For those that survive, rehabilitation lasts about 10 months

- Restrain the activators
 - Antibiotics
 - Treat any source of infection
 - Prevent infection
 - Early enteral feeding
- Control the mediators
 - General
 - Specific
- Protect affected organs
 - Mechanical ventilation
 - Treat fever and shivering
 - Treat seizures
 - Support hemodynamics
 - Dialysis
 - Nutritional support

- Close surveillance/monitoring of patients
- Aggressive pulmonary care
- Assisting patient and family with coping