

SEPSIS

IN 5 SLIDES!
Well maybe a few more than five...
I really like pictures, they hog slides 😊

Table 1
SIRS and sepsis definition
(ACCP/SCCM-criteria)

SIRS (Systemic Inflammatory Response Syndrome)	2 or more of the following criteria: • Temperature > 38°C, or < 36°C • Heart rate > 90 beats/min • Respiratory rate > 20 breaths/min, or Pao2/FiO2 < 32 mm Hg (< 4.3 kPa) • WBC > 12 000 cells/μL, or < 4 000 cells/μL, or > 10% immature (band) forms
Sepsis	Documented infection together with 2 or more SIRS criteria
Severe Sepsis	Sepsis associated with organ dysfunction, including, but not limited to, lactic acidosis, oliguria, hypoxemia, coagulation disorders, or an acute alteration in mental status.
Septic Shock	Sepsis with hypotension, despite adequate fluid resuscitation, along with the presence of perfusion abnormalities. Patients who are on inotropic or vasopressor agents may not be hypotensive at the time when perfusion abnormalities are detected.

SEPSIS

- Sepsis is a serious medical condition characterized by a whole-body inflammatory state (called a systemic inflammatory response syndrome or SIRS) and the presence of a known or suspected infection. The body may develop this inflammatory response to microbes in the blood, urine, lungs, skin, or other tissues
- Septicemia is a related but deprecated term referring to the presence of pathogenic organisms in the blood-stream, leading to sepsis. The term has not been sharply defined. It has been inconsistently used in the past by medical professionals, for example as a synonym of bacteremia, causing some confusion. The present medical consensus is therefore that the term "septicemia" is problematic and should be avoided.
- Sepsis is usually treated in the ICU with IV and antibiotics. If fluid replacement is insufficient to maintain blood pressure, specific vasopressor drugs can be used. Artificial ventilation and dialysis may be needed to support the function of the lungs and kidneys, respectively. Sepsis patients require preventive measures for DVT, stress ulcer (our favorite PPI) and pressure ulcers, unless other conditions prevent this. Some patients might benefit from tight control of blood glucose with insulin, low-dose corticosteroids, and in cases of severe coagulopathy treatment with an activated protein C.

Pathophysiology

- Two major injuries occur in sepsis
 - Widespread release of cytokines and cytotoxic enzymes that damages the endothelium, the lining of blood vessels, turning water tight blood vessels into sieves – allowing large amounts of protein rich fluid to leak into the lax subcutaneous tissues, causing tissue edema and intravascular dehydration.
 - Damage to the lining of blood vessels causes activation of the coagulation cascade and initial intravascular deposition of thrombus (before clotting factors are used up and the patient bleeds). The result of intravascular thrombosis and hypotension is ischemic injury to many of the body's organs.
 - * Significant alterations occur at multiple levels within the clotting cascade. Sepsis patients frequently manifest disseminated intravascular coagulation (DIC), in addition, the altered hemostasis allows blood to clot when it should not, clogging blood vessels and reducing blood flow.
- Septic patients frequently have poor tissue perfusion in addition to inappropriate use of oxygen with resulting cytopathic hypoxia
- There must be a port of entry for bacteria, most commonly:
 - Central Venous lines, usually lines used for a prolonged period.
 - Post surgical patients, specifically abdominal surgeries
 - Urinary tract

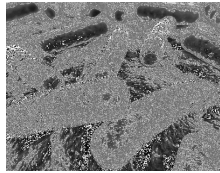
Physical Assessment

- Fever
 - >100.5
- Hypotension
 - $SBP < 90$
 - Vasodilatation, Reduced stroke volume, & Microcirculatory failure
- Tachycardia
 - >90 beats/minute
- Edema
 - Generalized edema
- Tachypnea
 - >20 resp/minute



Evaluation of labs /microbiology

- Elevated WBC
- Abnormal ABG
 - Metabolic acidosis
- Elevated Lactic Acid
- Positive blood, urine or sputum cultures
 - Do not forget to follow up on the sensitivity portion of the C&S!



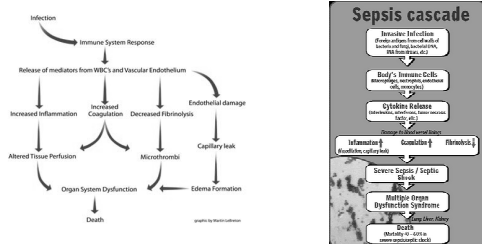
Treatment

- Fluids
 - Secondary to the overwhelming immune response intravascular fluid leaks out into the interstitial space resulting in hypotension. Supporting the blood pressure maintains adequate perfusion to the vital organs.
- Antibiotics
 - Unfortunately bacteria never wants to leave the party gracefully...
- Vassopressors
 - When aggressive IVF resuscitation fails to support the blood pressure, vassopressive medications are given IV.
- Tight glycemic control (BS 80–110 mg/dl) has been proven to decrease:
 - Bloodstream infections
 - Prolonged inflammation
 - ARF requiring dialysis or hemofiltration
 - Critical illness polyneuropathy
 - Transfusion requirements

Now you're Talking...

- A recent review estimated the 1995 incidence of sepsis in the United States to be 751,000 cases, resulting in 215,000 deaths. The average cost per case of sepsis was \$22,100 with total costs of \$16.7 billion nationally.
- As nurses, what simple steps can we take to protect out patients from sepsis?
 - HANDWASHING!!! (are you tired of hearing about good hand washing yet???)
 - Maintain your sterile fields when inserting foley catheters
 - Review literature concerning CAUTI. What's that you say??? Catheter Acquired UTI!
 - Know the early signs and symptoms of sepsis, you are the physicians first line of defense. Your patients are depending on you!
 - Properly access central lines.
- Rigorous insulin treatment reduced the number of deaths from multiple-organ failure with sepsis, regardless of whether there was a history of diabetes or hyperglycemia.

For the visual learners out there...



POSSIBLE SEPSIS

AN OVERVIEW OF SEPSIS

SEPSIS MAY OCCUR WHEN BACTERIA INVADES THE BODY AND SETS OFF AN INFLAMMATORY RESPONSE. THIS MAY OCCUR INSIDE OR OUTSIDE OF A HEALTH CARE FACILITY. SEPSIS CARRIES A HIGH MORTALITY RATE AND REQUIRES IMMEDIATE TREATMENT.

THERE ARE DIFFERENT ORGANISMS THAT MAY CAUSE SEPSIS. HOWEVER, THE MOST COMMON IS GRAM-NEGATIVE BACTERIA.

SIGNS AND SYMPTOMS :

SEPSIS HAS A WARM AND A COLD PHASE.

WARM PHASE (EARLY SEPSIS) :

- ALTERED MENTAL STATUS
- HIGH FEVER, TACHYCARDIA, FLUSHING
- INCREASED RESPIRATIONS
- ELEVATED WBCs, CLOUDY URINE

COLD PHASE (LATE SEPSIS) :

- DECREASED MENTAL STATUS
- HYPOTENSION, DECREASED OR NO URINARY OUTPUT
- COOL, CLAMMY SKIN, DECREASED RESPIRATIONS

IF YOU SUSPECT SEPSIS:

- ASSESS AND DOCUMENT FINDINGS.
- NOTIFY MD

CAUSES OF SEPSIS INCLUDE

- ABDOMINAL SURGERY
- LUNG OR URINARY INFECTION AND TRAUMA.

TREATMENT INCLUDES:

- ANTIBIOTIC THERAPY
- ANTI-PYRETTICS FOR FEVER,
- DOPAMINE FOR HYPOTENSION

SEPSIS MAY OCCUR IN THE ICU PATIENT. SUSPECT SEPSIS IF THE PATIENT SUDDENLY HAS HIGH FEVER AND TACHYCARDIA, FOLLOWING TRAUMA OR ABDOMINAL SURGERY
