Statistics

- More than 1.5 million people get sepsis each year in the U.S.
- About 250,000 Americans die from sepsis each year.
- One in three patients who die in a hospital have sepsis.
- Worldwide, approximately 6 million deaths from sepsis.
- Sepsis cases have been increasing dramatically.
Sepsis is among the leading causes of death
What is sepsis/septic shock?

**Sepsis:**
- Life-threatening organ dysfunction caused by a dysregulated host response to infection.
- Mortality rate > 10%

**Septic Shock:**
- Subset of sepsis in which particularly profound circulatory, cellular, and metabolic abnormalities are associated with a greater risk of mortality than with sepsis alone.
- Mortality rate > 40%
- Patients with septic shock can be clinically identified by a vasopressor requirement to maintain a mean arterial pressure of 65 mm Hg or greater and serum lactate level greater than 2 mmol/L (>18 mg/dL) in the absence of hypovolemia.
What is the culprit?

- Bacterial infections are the most common cause of sepsis but can also be caused by fungal, viral and parasitic infections.
- The source of infection can be from any organ.
Most common sources

- 35% respiratory system
- 25% urinary tract
- 11% gastrointestinal
- 11% skin infection
- 18% other sources
Prevention is the best treatment!

- Rigorous handwashing and application of hand sanitizers
- Vaccination of personnel
- Wear gloves
- Use of aseptic technique for procedures
- Disinfection of equipment
- Techniques to prevent VAP
- Reduction in over prescription of antibiotics
How do you recognize potential sepsis?

- SIRS (Systemic Inflammatory Response Syndrome) + Infection:
  - Criteria:
    - Temp >100.5 °F or <96.8 °F
    - HR>90 bpm
    - RR>20 or PaCO2<32 mmHg
    - WBC>12k or <4k or >10% bands
  - Two or more of these parameters could indicate sepsis
  - Low specificity

- qSOFA (quick Sepsis related Organ dysfunction Assessment) score:
  - Low blood pressure: SBP≤100 mmHg
  - High respiratory rate: RR≥22 bpm
  - Altered mental status: GCS<15
What happens when sepsis occurs - Pathophysiology
Assessment on scene:

- Obtain history
  - Ask about comorbidities – possible source of infection?
- Assess mental status
  - Obtain BGL: Hyperglycemia?
- Assess circulation/skin signs – warm/flushed vs. cold/clammy
- Place on monitor:
  - NIBP – hypotension?
  - HR – tachycardia?
  - SpO2 – hypoxia?
  - Temperature: hyper- or hypothermia?
  - EtCO2 – hypocapnia?
- Get the big picture! Don’t focus on the tree, rather the forest!
Treatment

- Know your protocol!
- Aggressive fluid resuscitation at 30ml/kg of total body weight over the first 3 hours
- **DESTINATION DECISION!**
  - The quicker antibiotics can be administered the higher the survival rates
  - If unresponsive to fluid resuscitation, use pressor per protocol. Pressor of choice is norepinephrine.
- Radio report: Use the word “Sepsis” or “Septic Shock”
Protocol Example
NorCal protocol to come...
Care Flight Protocol
In-Hospital Care

- Most hospitals have a “Code Sepsis” protocol
- Often critical care ventilation (ARDS tx., Nitric Oxide, Nitric Oxide, Nitric Oxide)
- Fluid resuscitation continued
- Arterial Line placement
- Blood Cultures
- Broad spectrum antibiosis
- Serial lab test, emphasis on WBC, platelets, Lactate
- Pressors:
  - Norepinephrine
  - Epinephrine
  - Posibly Angiotensin II
- Etc...
Case Study 1

- 911 call for 59 year old female with ALOC in Junction City, Trinity County
- On arrival you find patient in bed with daughter at bedside
- Daughter states that mother has had a UTI for the last three days and last evening started shivering. This morning, she was hard to arouse and is now confused
- Your initial vital signs are:
  - HR 133
  - NIBP 76/35
  - RR 26
  - SpO2 89%
- Patient feels clammy to touch: Temperature 96.2 °F
- What is patient’s qSOFA score? Any other parameters you’d like to obtain? How are you going to treat? Destination/Resources?
Case Study 2

- 911 call in Greenville, Plumas County, for 23 yr. old female with generalized weakness.
- On arrival you find patient sitting in recliner, nursing her new born child.
- Mom and baby were discharged 3 days ago after 2 days in hospital post c-section.
- Patient states: “I am so weak, I can barely get up and my wound’s throbbing and red”.
- You perform an assessment and inspect the c-section suture. The wound is reddened and you notice some pus draining from the lateral side of the surgical scar.
- Initial vital signs are as follows:
  - NIBP 90/35
  - HR 115
  - RR 18
  - SaO2 92%
  - BGL 155 mg/dl
  - Temp: 101.3
- How are you going to treat? qSOFA score? Destination?
Questions?
Test Review Question 1

- The most common source for sepsis is skin infections.
  - True
  - False
Test Review Question 1

The most common source for sepsis is skin infections.

- True
- False
Test Review Question 2

- qSOFA score includes:
  - The patient’s age
  - The color of the patient’s pet
  - The patient’s respiratory rate
  - The distance from the hospital
Test Review Question 2

- qSOFA score includes:
  - The patient’s age
  - The color of the patient’s pet
  - The patient’s respiratory rate
  - The distance from the hospital
Test Review Question 3

DIC stands for Disseminated Intravascular Coagulation.

- True
- False
Test Review Question 3

▲ DIC stands for Disseminated Intravascular Coagulation.

▲ True

▲ False
Test Review Question 4

- Early administration of antibiotics greatly increases the septic patient’s mortality.
  - True
  - False
Test Review Question 4

- Early administration of antibiotics greatly increases the septic patient’s mortality.
  - True
  - False
Test Review Question 5

The preferred pressor utilized for septic patients is.
- Norepinephrine
- Dopamine
- Neosynephrine
- Epinephrine
Test Review Question 5

- The preferred pressor utilized for septic patients is.
  - Norepinephrine
  - Dopamine
  - Neosynephrine
  - Epinephrine
Thank you very much!

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