Hamilton Health Sciences

Sepsis

RACE: We're here to help

McMaster University

Outline

- Why this in service?
- What is sepsis?
- Sepsis pathophysiology
- Sepsis epidemiology
- Sepsis recognition
- Early treatment of sepsis

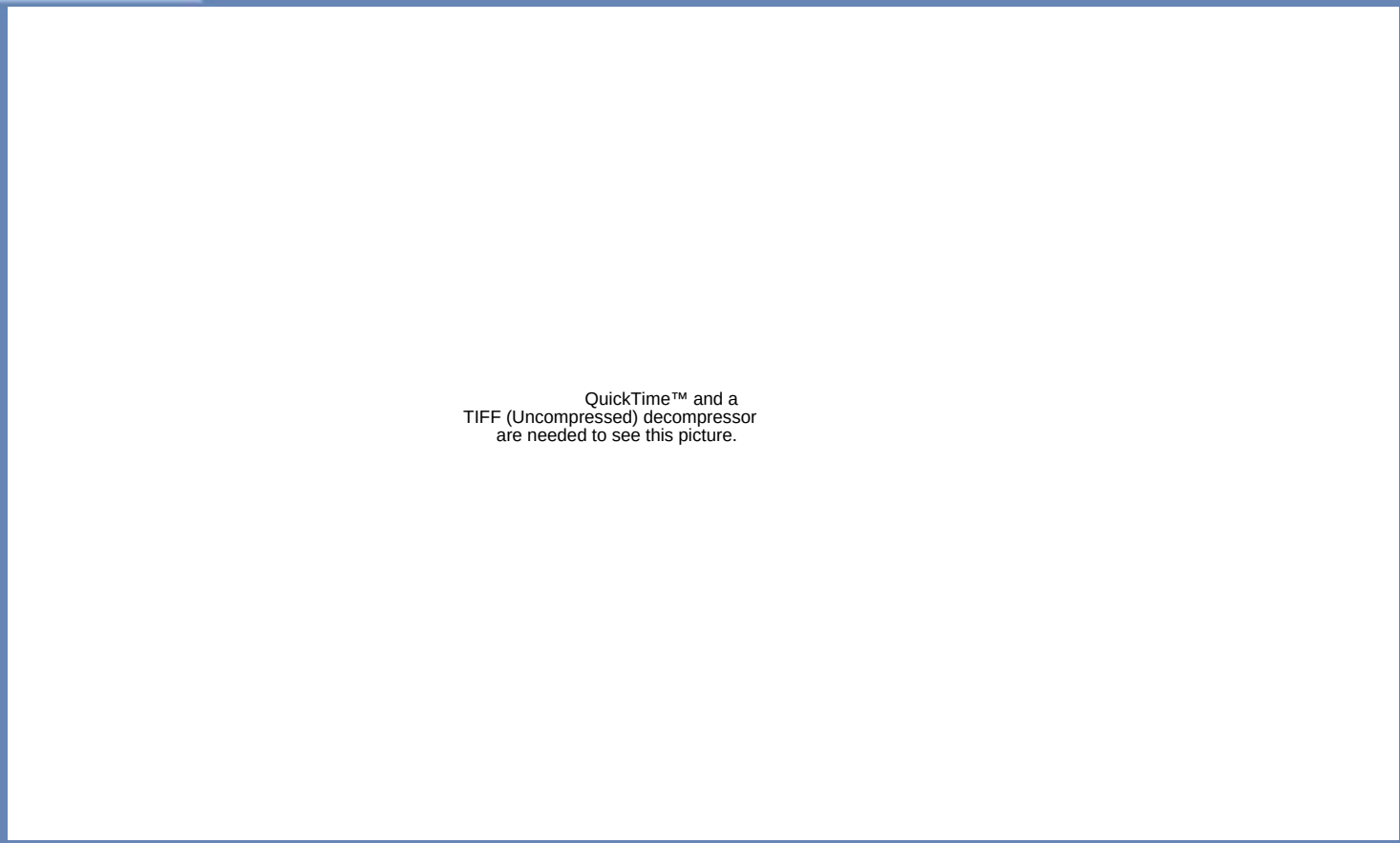
Why this in service?

- Sepsis was identified by **YOU** as an important area for education.
- Many of the consults seen by RACE are determined to be septic.
- Sepsis education, recognition and treatment has been identified as a priority for the next hospital accreditation.

What is Sepsis?

- Definition: Infection with signs of systemic inflammation.
- We call it severe sepsis if there is evidence of organ dysfunction or septic shock if fluids are inadequate to improve organ perfusion.
- Sepsis is a disease of the microcirculation in which there is inflammation and activation of coagulation in previously normal organs

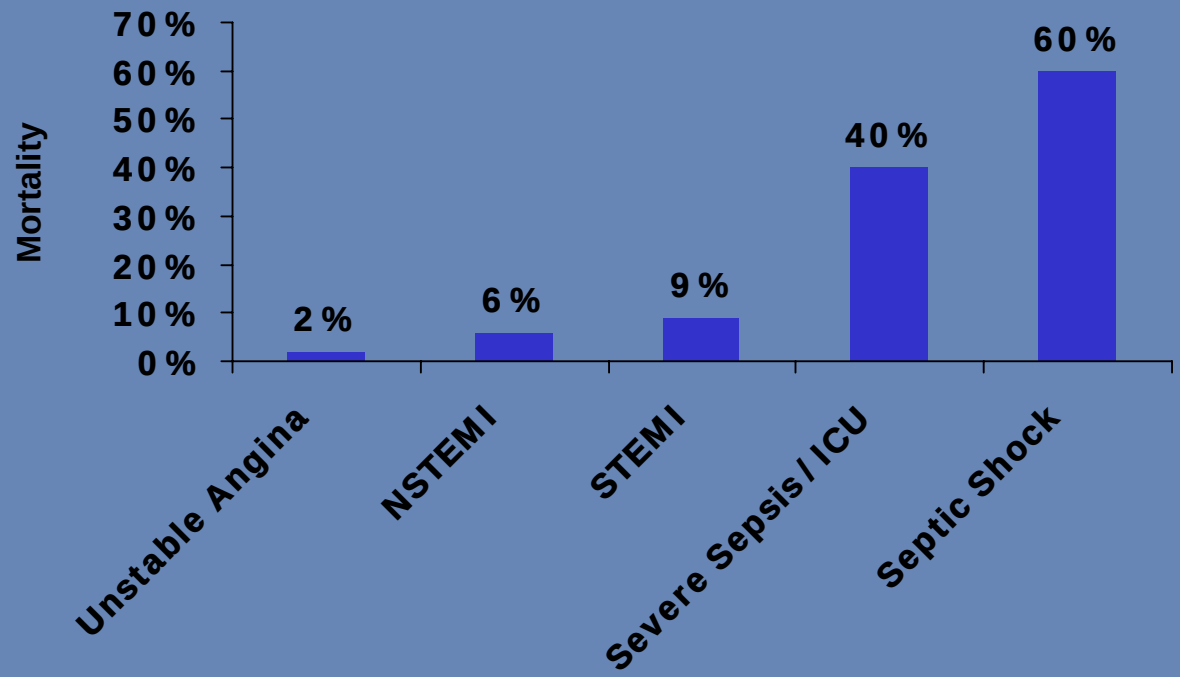
Sepsis Pathophysiology



From Prowess, NEJM, 2001

Sepsis statistics

- Based on US data it is estimated that there are 75, 000 cases of sepsis in Canada annually, with a mortality around 30%. Compare this to coronary disease:



Signs of Systemic Inflammation

- Increased heart rate
- Increased respiratory rate
- Fever or low temperature

- Elevated leukocytes (wbcs) or low wbcs
- Presence of immature neutrophils (bands)

Signs of Organ Dysfunction

- Altered mentation or level of consciousness
- Dyspnea, hypoxia
- Hypotension, arrhythmias, chest pain
- Nausea, ileus
- Low urine output (N>0.5 ml/kg/hr)

- Production of lactate (N<2.0)
- Reduced central venous O_2 saturation (N>70%)
- Rising creatinine
- Elevated bilirubin (N<30)
- Hyperglycemia

Early Treatment - 1

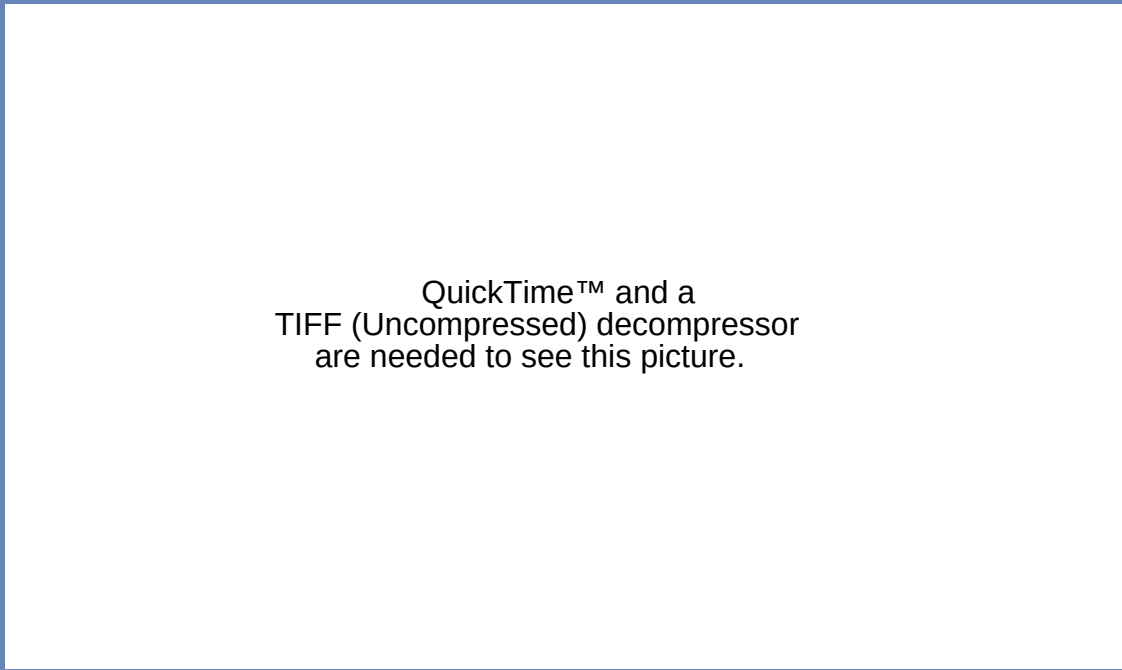
- Fluids, Fluids, Fluids
  - **Goal: improve intravascular volume and blood pressure**
  - **Use IV fluids that will stay intravascular**
    - Normal Saline or Ringer's Lactate or Colloid
    - Give through large bore peripheral IV (not triple lumen)
    - Use large volume boluses (500-1000ml wide open or even under pressure) **NOT THROUGH A PUMP**
  - **Look for: improved blood pressure, improved organ dysfunction**

Early Treatment - 2

- Antibiotics
  - Broad spectrum/maximum dosing based on potential source
  - If there has been an episode of hypotension then this should be a priority
    - **Don't wait for the regularly scheduled time**

- Source Control
  - Drainage or surgery may be necessary to control the infection.

Why is early recognition and treatment so important?



Odds ratio for death for time from documented hypotension (MAP<65 or Sys BP <90 or sys BP fall by 40 from usual) to infusion of first antibiotic. From Kumar et al CCM, 2006

Conclusions

- Sepsis is a common problem in hospitals
- Early recognition of sepsis is important to initiate treatment.

Time is Tissue