38 Sepsis

Situation

Sepsis is a toxic response to infection that affects 20-30 million people annually making it one of the most common deadly diseases worldwide. It is one of the few conditions to strike with equal ferocity in the developed world and in resource-poor areas. Sepsis is the leading cause of death in U.S. hospitals with 750,000 patients affected and over 250,000 deaths each year.[1] In the United Kingdom, it is conservatively estimated that 102,000 cases of sepsis arise annually, with 36,800 deaths as a result.[2] More than 3,000 people die of sepsis in Australia each year, with more than 15,700 new cases treated in an ICU/year at an estimated cost per episode of AUD 39,300.[3] Despite vaccines, antibiotics, and advances in intensive care, incidence of sepsis is on the rise. Worldwide hospitalizations have more than doubled over the last 10 years. In many countries, more people are hospitalized each year for sepsis than for heart attack.[4] The *aging population*, increasing use of high-risk interventions and the advent of drug-resistant infections are contributing factors.

The financial burden of sepsis is equally staggering. In the United States, total hospital costs associated with the care of severely septic patients is USD 16.7 billion annually. Length of stay is, on average, 75 percent longer putting tremendous pressure on health systems and resources. In Germany, the cost of a typical episode of sepsis has more than doubled over the last decade, from approximately EUR 25,000 to 55,000.

Sepsis arises when the body's response to an infection injures its own tissues and organs. It is a rapidly progressing disease that leads to shock, multiple organ failure, and death, if not recognized early and treated promptly.[5]It is also a complex and multi-factorial syndrome that can be challenging to detect, particularly at an early stage.

Current Policy

Over the last decade an increasing number of public health, professional societies and advocacy organizations have created guidelines and recommendations focused on improving survival rates. The most well-recognized clinical practice guidance, *International Guidelines for Management of Severe Sepsis and Septic Shock: 2012 were* developed by the Surviving Sepsis Campaign (SSC), a joint collaboration of the Society of Critical Care Medicine and the European Society of Intensive Care Medicine. The U.S. Centers for Disease Control and Prevention (CDC) has not promulgated guidance on sepsis, but rather references the SSC's guidelines. The SSC also partnered with the Institute for Healthcare Improvement (IHI) to develop a sepsis *bundle* which was recently updated to align with the 2012 SSC guidelines.

The Japanese Ministry of Health, Labour, and Welfare (MHLW) established the Japanese Nosocomial Infection Surveillance (JANIS) system in July 2000, when participating hospitals routinely started to report their nosocomial infection surveillance data for a national database. In the ICU component of the JANIS system, all the patients admitted to the participating ICUs are enrolled in the survey. Data is collected by trained physicians and nurses in each ICU using a specific database oriented software, and reported to the data management office via the Internet on a monthly basis. Results of the survey indicated that:

- Overall incidence of sepsis was 1.02/100 admissions; and
- Mortality of septic patients was 39.3/100 admissions compared to 5.3/100 admissions without infections.

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Recommendations

- Sepsis is a complex and multi-factorial syndrome wherein the first six hours are critical to survival. Diagnosis, however, is often delayed because the clinical symptoms are not specific enough and can be attributed to other factors. In line with global best practices, sepsis management should aim for early diagnosis and timely delivery of appropriate therapy. As outlined in the *International Guidelines for Management of Severe Sepsis and Septic Shock: 2012,*[6] *the following measures should be taken:*

  WITHIN 3 HOURS
  1) Measurement of lactate level
  2) Blood culture (prior to administration of antibiotics)
  3) Administration of broad spectrum antibiotics
  4) Administration of 30 ml/kg crystalloid for hypotension or lactate ≥4mmol/L

  WITHIN 6 HOURS:
  5) Application of vasopressors (for hypotension that does not respond to initial fluid resuscitation). Maintenance of a mean arterial pressure (MAP) ≥65 mm Hg.
  6) In the event of persistent arterial hypotension despite volume resuscitation (septic shock) or initial lactate ≥4 mmol/L (36 mg/dL):
  - Measurement of central venous pressure (CVP)
  - Measurement of central venous oxygen saturation ($ScvO_2$)
  7) Re-measurement of lactate if initial lactate was elevated

- There is a growing body of evidence that demonstrates the success of the measures outlined above when performed reliably and consistently. In one Spanish before-and-after study, delivery of the Surviving Sepsis guidelines was associated with six fewer days in hospital and 2.5 fewer ICU days per patient.[7] In a U.S. study, the failure to administer antibiotics or administration of inappropriate antibiotics in severe sepsis was shown to be associated with a two-day increase in length of hospital stay.[8] Upon review of implementation of the guidelines in the U.K., the National Health Service determined that achieving 80 percent reliability in the delivery of the basic standards of care would save at least 10,000 lives and GBP 170,000,000 annually.[9]
- Importance of blood culture: Although sampling should not delay timely administration of antimicrobial agents in patients with severe sepsis (e.g., lumbar puncture in suspected meningitis), obtaining appropriate cultures before administration of antimicrobials is essential to confirm infection and the responsible pathogens, and to allow de-esca lation of antimicrobial therapy after receipt of the susceptibility profile. Samples can be refrigerated or frozen if processing cannot be performed immediately. Because rapid sterilization of blood cultures can occur within a few hours after the first antimicrobial dose, obtaining those cultures before therapy is essential if the causative organism is to be identified. Two or more blood culture sets are recommended.[10-11]

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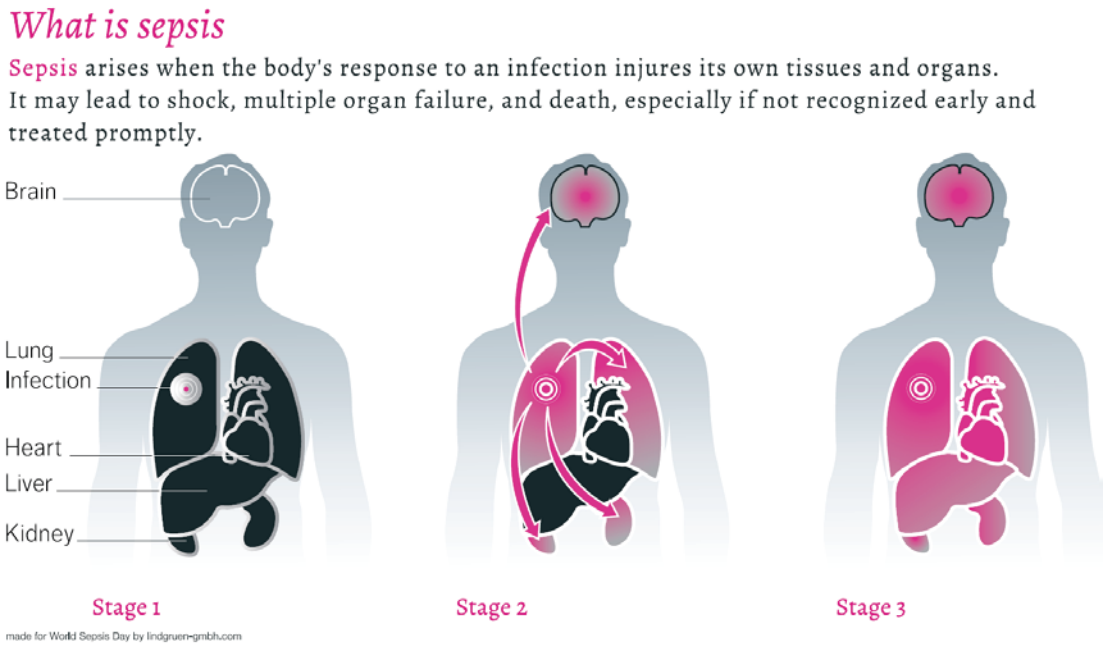
38. World Sepsis Day – September 13th



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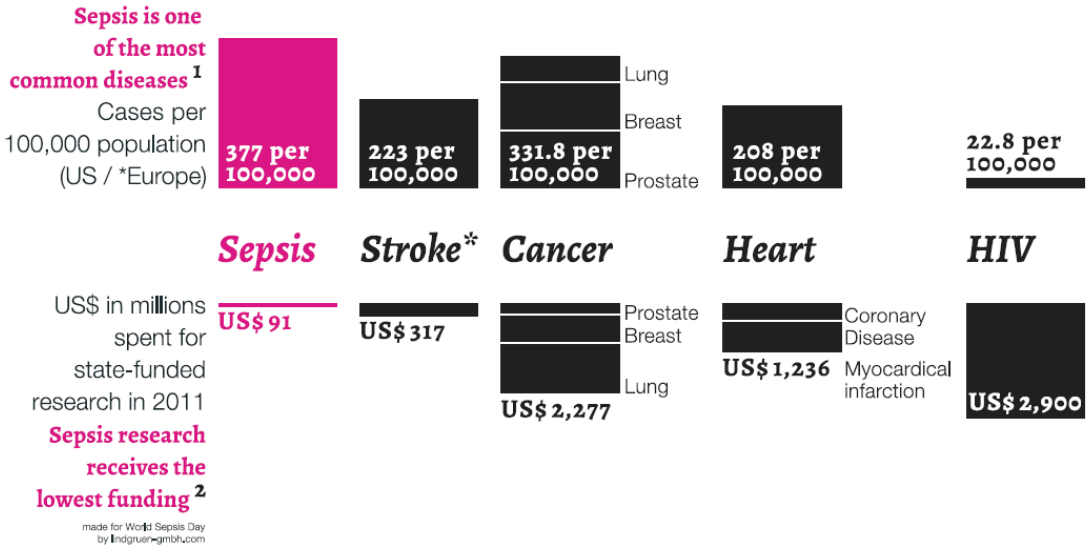

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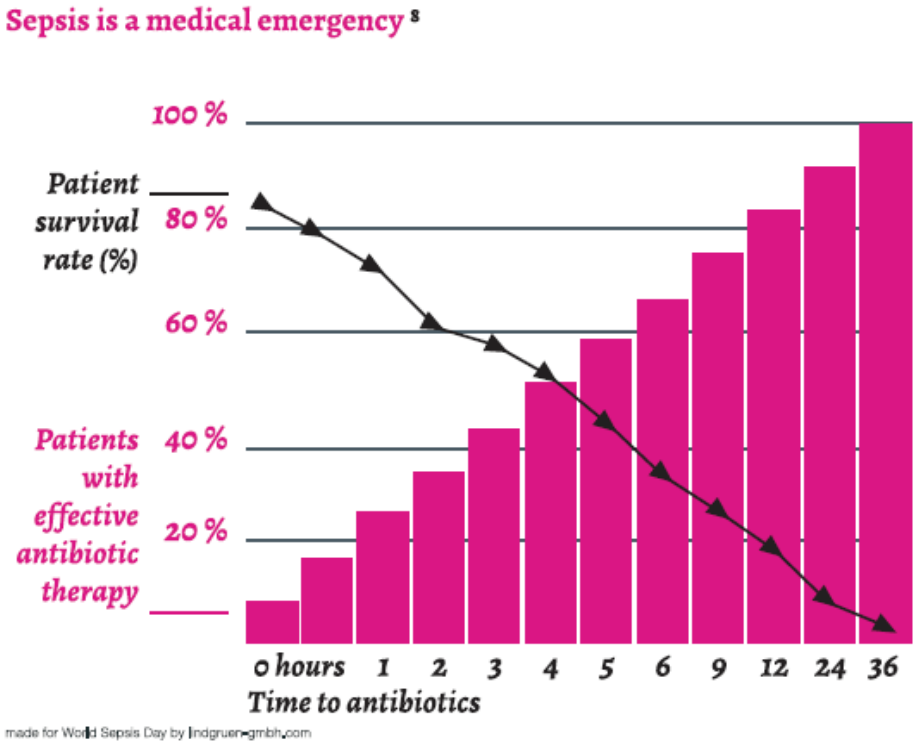

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