



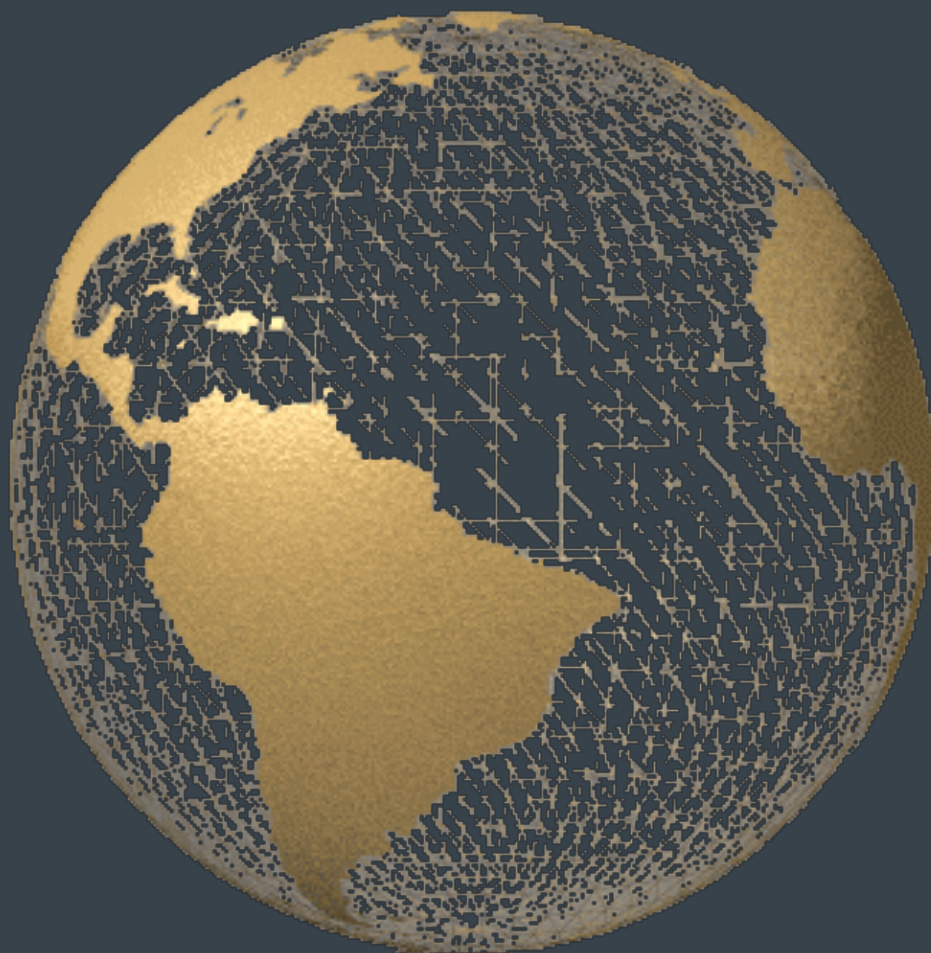
Global Updates on Sepsis

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The global picture

- Sepsis affects approx. 30 million people worldwide every year¹
- It is one of the most common causes of maternal death²
- Many people who suffer from sepsis will die or have permanent residual health issues
- In most developing health services, sepsis remains a leading cause of death
- The incidence of sepsis can be dramatically reduced by simple preventative measures such as vaccination, improved adherence to hygiene standards, early recognition & optimised treatment²

Sepsis History

- ▶ Descriptions of sepsis have been present in medical literature for many hundreds of years and the word itself was first introduced by Hippocrates.
- ▶ **Ignaz Semmelweis** was the first researcher who developed a modern view of sepsis⁶
- ▶ An obstetrician, his department had an especially high mortality rate → he discovered it was common for medical students to examine pregnant women directly after pathology lessons.
- ▶ After introducing hand washing pre & post gynaecological examinations he lowered the mortality rate from 18% to 2.5%
- ▶ However the new practice was not accepted – he was harassed so badly by colleagues he was forced to leave the city

Other influential people...

- ▶ **Louis Pasteur** – discovered single cell organisms (bacteria or microbes) and hypothesized that these could cause disease. Also discovered that heating fluids could kill any bacteria present
- ▶ **Joseph Lister** – reduced post amputation mortality by introducing sterilisation techniques on surgical instruments after correlating the work done previously
- ▶ **Hugo Schottmüller** in 1914 paved the way for a modern definition of sepsis...

“ Sepsis is present if a focus has developed from which pathogenic bacteria, constantly or periodically, invade the blood stream in such a way that this causes subjective and objective symptoms. ”



ACCP-SCCM Consensus Conference 1991

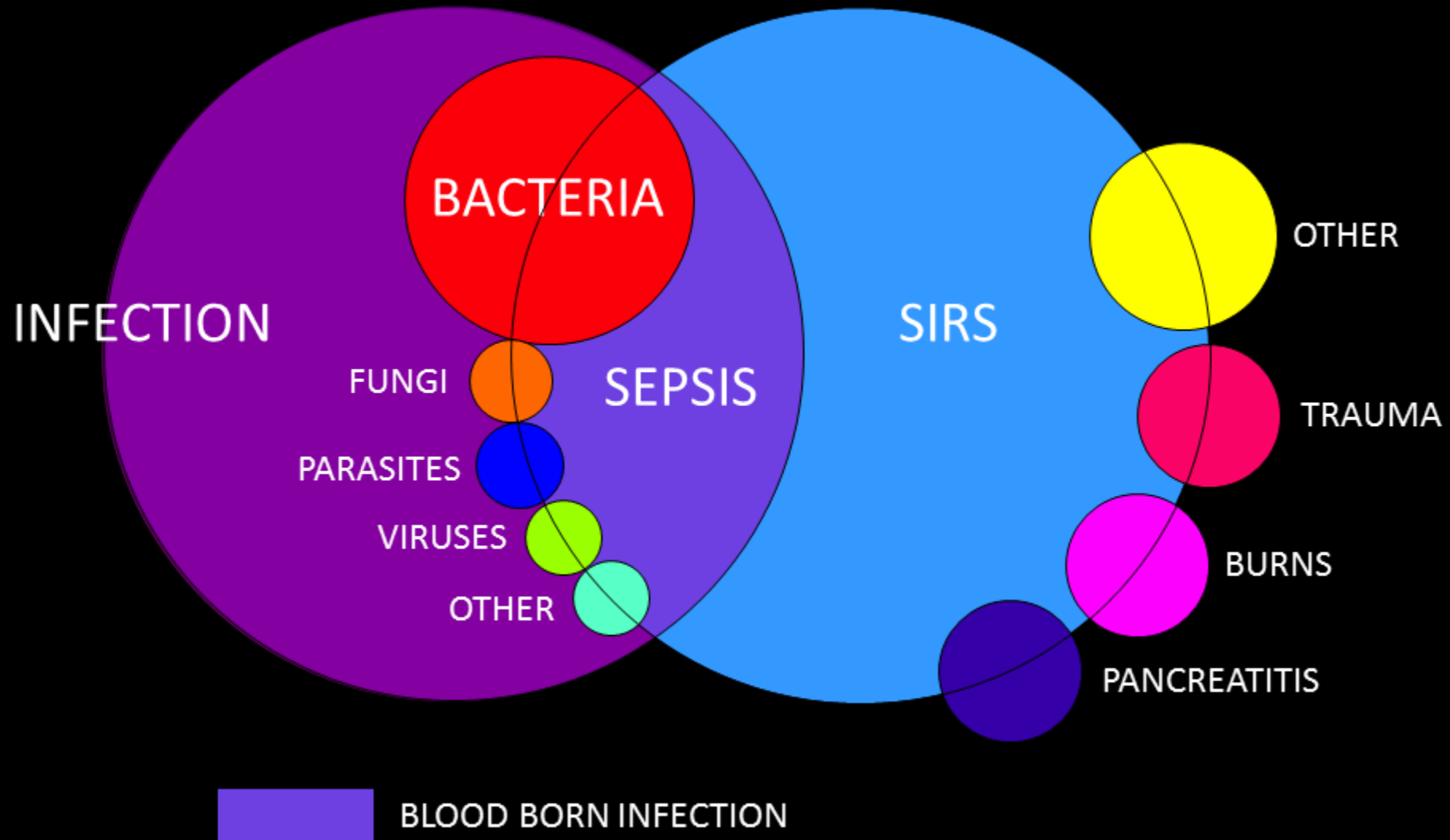
- ▶ American college of Chest Physicians & Society of Critical Care Medicine met in August 1991 with a goal of agreeing on a set of definitions that could be applied to patients with sepsis and its sequelae⁷
- ▶ They introduced the term 'Systemic Inflammatory Response Syndrome' or SIRS to describe the inflammatory response process that occurs due to a range of insults (including, but not limited to, overwhelming infection)



SIRS

MORE THAN ONE OF THE FOLLOWING:

1. Body temperature $> 38^{\circ}\text{C}$ or $< 36^{\circ}\text{C}$
2. A heart rate of greater than 90bpm
3. Tachypnoea – RR > 20 bpm or a $\text{PaCO}_2 < 32\text{mmHg}$
4. An elevated WBC > 12





INFECTION

- Bacterial
- Viral
- Fungal
- Parasites



SIRS

- More than 1:
- Temp: >38 or <36
 - Tachycardic: >90 bpm
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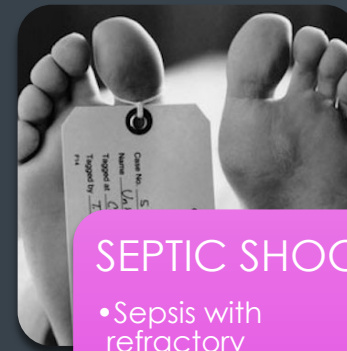
SEPSIS

- Sepsis is the systemic inflammatory response to infection



SEVERE SEPSIS

- Sepsis associated with organ dysfunction, hypo-perfusion or hypotension.
- Lactic acidosis
 - Oliguria
 - Acute alteration in mental status



SEPTIC SHOCK

- Sepsis with refractory hypotension + hypo-perfusion abnormalities or organ dysfunction





SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definitions Conference - 2001

- Society of Critical Care Medicine/The European Society of Intensive Care Medicine/ American College of Chest Physicians/ The American Thoracic Society/The Surgical Infection Society

“...found that apart from expanding the list of signs and symptoms of sepsis to reflect clinical bedside experience, no evidence exists to support a change to the definitions.”⁸



Sepsis 3.0

- ▶ A panel of 19 specialists were convened by the ESICM and SCCM. This panel included specialists in critical care, surgery and infectious disease.
- ▶ They reviewed the existing sepsis definitions between 2014-2015.
- ▶ They came up with several changes that were published earlier this year.
- ▶ There is some debate in the literature regarding the changes.
 - ▶ The panel didn't involve low/ middle income countries, where raising awareness and early detection are priorities. Access to scoring systems/data collection services may be very different in these locations.
 - ▶ Not all critical care areas utilise the SOFA score, or any scoring system at all
 - ▶ Issues with endorsement from Emergency Medicine bodies → a vital area where identifying and treating sepsis is key




SEPSIS DEFINITION

PAST

- Sepsis is a systemic inflammatory response to infection

PRESENT

- Sepsis is life-threatening organ dysfunction due to a dysregulated host response to infection



Sepsis is a systemic inflammatory response to infection

- SIRS criteria was a key part in identifying sepsis
 - Worth noting that particularly in Australasia SIRS criteria was not explicitly used to diagnose.

Sepsis is life-threatening organ dysfunction due to a dysregulated host response to infection

- ? How to measure organ dysfunction
 - SOFA score (sequential organ failure assessment score)
 - Based on 6 different scores
 - Respiratory
 - Cardiovascular
 - Hepatic
 - Coagulation
 - Renal
 - Neurological
 - An increase of at least 2 on the SOFA score = organ dysfunction
 - The quick bedside version qSOFA
 - H- HYPOTENSION = $SBP \leq 100\text{mmHg}$
 - A- ALTERED MENTAL STATUS
 - T- TACHYPNEIC = $RR \geq 22$

SIRS IS OUT

&

SOFA IS IN



Progression of Sepsis

- Sepsis was originally defined as an illness that followed a continuum

SEPSIS → SEVERE SEPSIS → SEPTIC SHOCK

- Now – severe sepsis has been deemed redundant and the term septic shock refers to a subset of patients who develop particularly profound circulatory, cellular and metabolic abnormalities characterised by:
 - Vasopressor requirement to maintain MAP >65mmHg
 - Serum lactate level >2mmol/L (without hypovolaemia)



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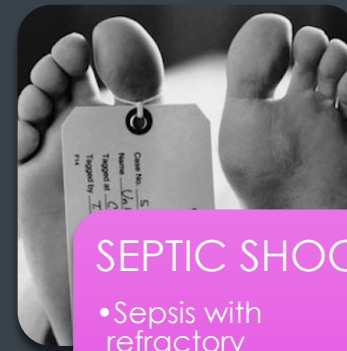
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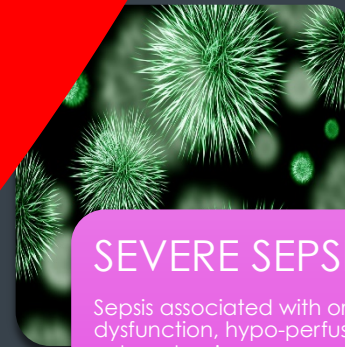


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Suspected
or
confirmed
infection



Increase in
SOFA score
of ≥ 2 or
qSOFA of ≥ 2



SEPSIS

Septic
shock



Key take home messages

- ▶ Be aware that language regarding sepsis is evolving as our understanding of it develops. There is yet much to learn!
- ▶ Remember – there's not a standard diagnostic test – there a number of factors to look at to recognise that a patient has sepsis. This will vary from site to site – local guidelines will help you
- ▶ It is all about early identification & treatment – your assessment and how you escalate your concerns is imperative

RECOGNISE | RESUSCITATE | REFER

References & Resources

1. World Sepsis Day - www.world-sepsis-day.org
2. Global Sepsis Alliance - <http://global-sepsis-alliance.org>
3. Sepsis Kills program - <http://www.cec.health.nsw.gov.au/programs/sepsis>
4. The UK Sepsis Trust - <http://sepsistrust.org>
5. Surviving Sepsis Campaign - www.survivingsepsis.org
6. German Sepsis Society - www.sepsis-gesellschaft.de
7. Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. The ACCP/SCCM consensus conference committee. American College Of Chest Physicians/Society of Critical Care Medicine. Bone R, Balk R, Cerra F, et al. *Chest*. 1992;101(6):1644-1655.
8. 2001 SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definition