8th BSH Heart Failure Nurse and Healthcare Professional Study Day 2018

Presentation title: Sepsis in Heart Failure Patients

Speaker: Chris Young - Acting Consultant in Geriatric Medicine

Conflicts of interest: None

Presentation slide distribution:

These presentation slides will be e-mailed upon request (ie will not be added to the BSH website)

Sepsis in Heart Failure Patients

Chris Young

Objectives

- Definition of Sepsis
- Physiology of Sepsis
- Interaction between sepsis and heart failure
- Suggestions on management

- Outside of Scope of talk: Sepsis induced myocardial dysfunction.

Definition of Sepsis

Continuum from…

SEPSIS	‘Sepsis is a clinical syndrome caused by the body's immune and coagulation systems being switched on by the presence of infection (bacteria or viruses) in the blood.’
SEVERE SEPSIS	Severe sepsis is defined as organ dysfunction or tissue hypoperfusion (decreased blood flow) in addition to sepsis, requiring a stay in an intensive care unit (ICU).
SEPTIC SHOCK	Septic shock is a life-threatening condition that is characterised by low blood pressure despite adequate fluid replacement in addition to organ dysfunction and sepsis.

Definition unchanged for 20 years until...

The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3) 2016

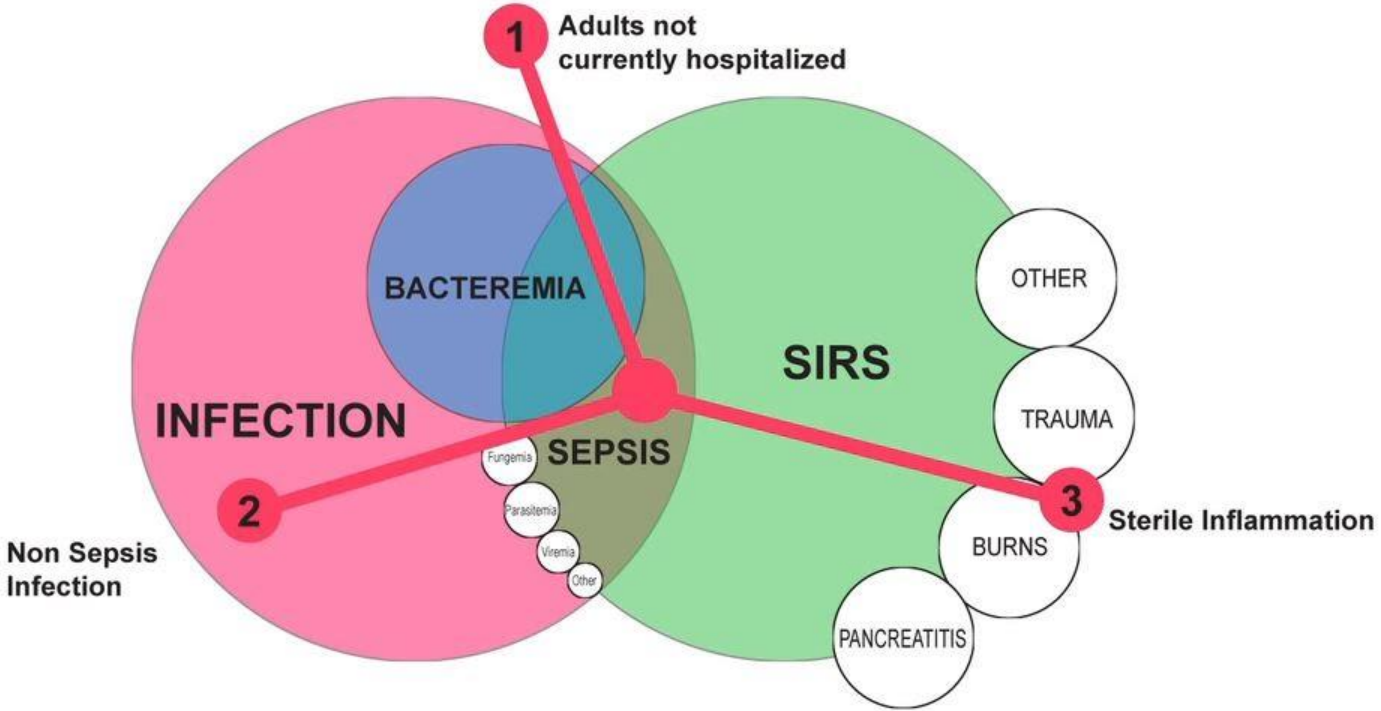
Severe Sepsis - Definition removed

SIRS (Temperature, Heart rate, Respiratory Rate and WCC) has been replaced with qSOFA.

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

Septic shock is defined as a subset of sepsis in which particularly profound circulatory, cellular, and metabolic abnormalities substantially increase mortality

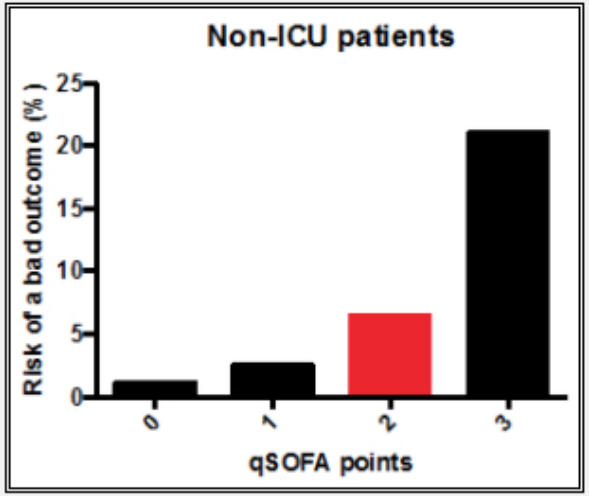
Three Comparisons



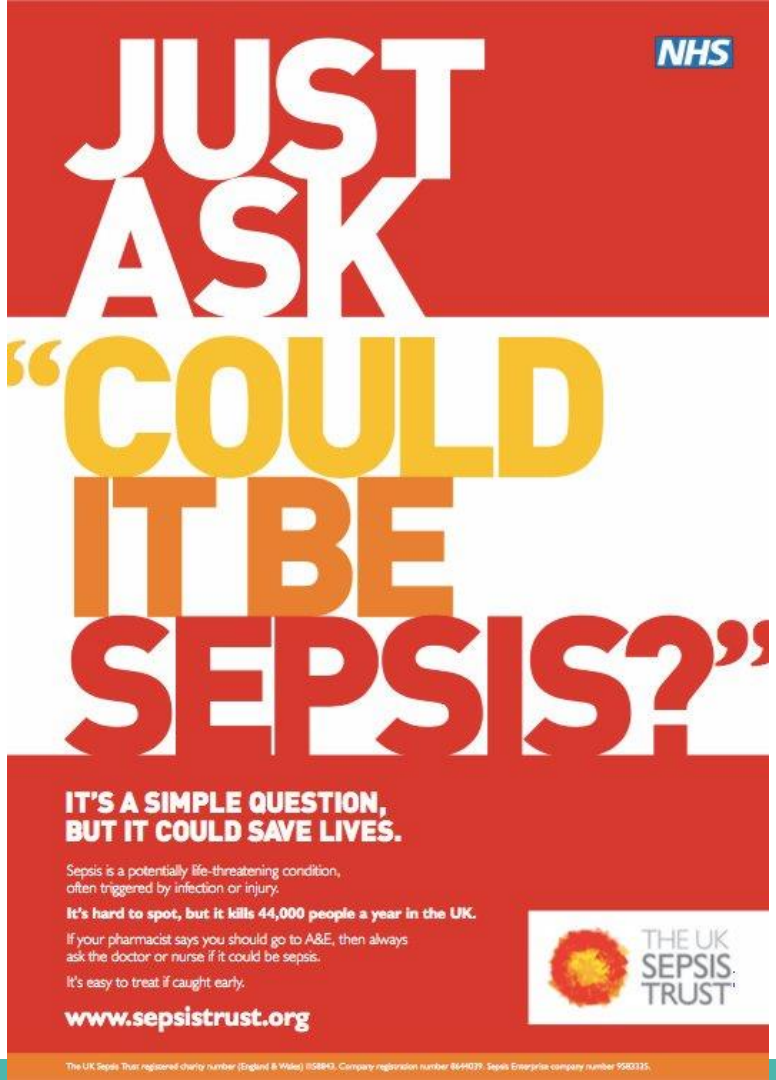
Adapted from Bone, *et al. Chest.* 1992

qSOFA Calculator

Is the patient in the ICU?	No
Altered Mentation	No
Respiratory rate (breaths per minute)	22
Systolic blood pressure (mmHg)	97
Total Score	**2**



Your patient with suspected infection not in the intensive care unit has a 6% risk of a bad outcome.
This is a prompt to consider that sepsis is likely.


NHS
JUST ASK
"COULD IT BE SEPSIS?"
IT'S A SIMPLE QUESTION, BUT IT COULD SAVE LIVES.
Sepsis is a potentially life-threatening condition, often triggered by infection or injury.
It's hard to spot, but it kills 44,000 people a year in the UK.
If your pharmacist says you should go to A&E, then always ask the doctor or nurse if it could be sepsis.
It's easy to treat if caught early.
www.sepsistrust.org
THE UK SEPSIS TRUST
The UK Sepsis Trust registered charity number (England & Wales) 1158843. Company registration number 8644039. Sepsis Enterprise company number 9583325.

Pathophysiology of Sepsis

- Inciting microbe
- Inflammatory immune response
- Tachycardia
- Vasodilation, NO mediated
- Lactate production
- Coagulopathy
- Endothelial dysfunction
- Hypoalbuminaemia
- Hyperglycaemia

Challenge to determine cause of shock

Hemodynamics of Shock

Red arrow indicates primary abnormality	PCWP (preload)	Cardiac Output	SVR (afterload)	Treatment
Hypovolemic shock	↓	↑	↑	IV fluids
Cardiogenic shock	↑	↓	↑	Inotropes Revascularization
Distributive shock (septic, neurogenic)	↓	↑	↓	Pressors IV fluids

PCWP = pulmonary capillary wedge pressure SVR = systemic vascular resistance

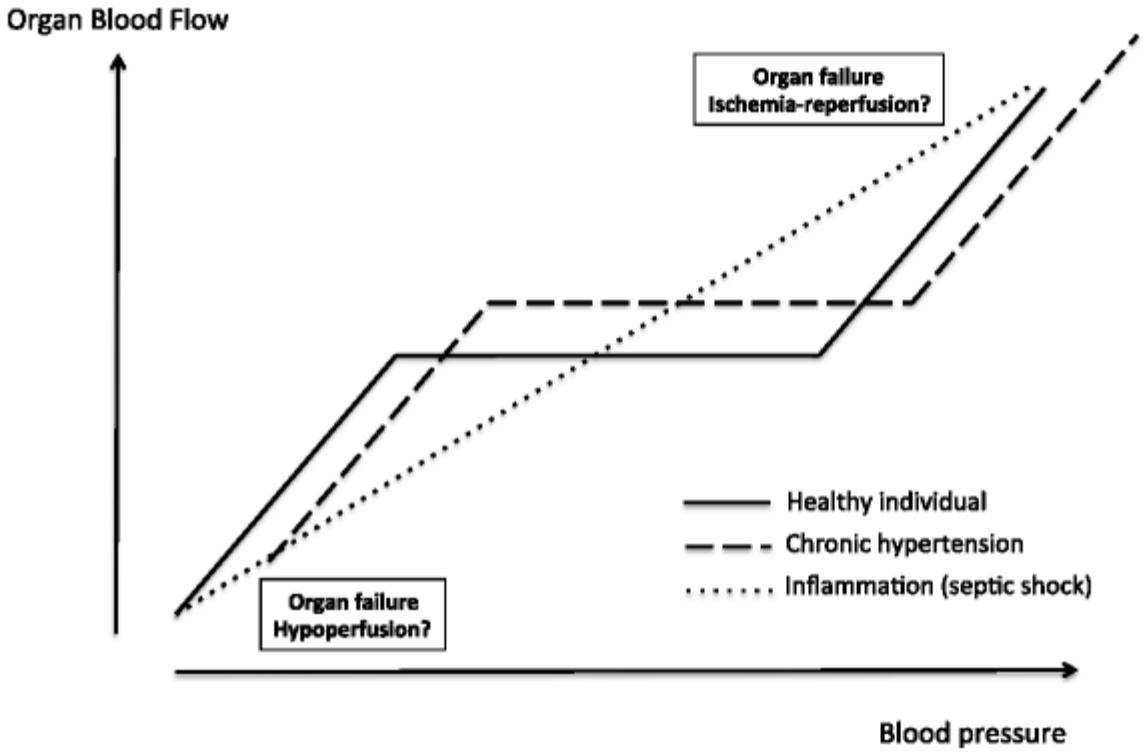


Figure 1

Organ blood flow and blood pressure relationships in healthy individuals, individuals with chronic hypertension, and patients with septic shock. The third linear relationship is theoretical.

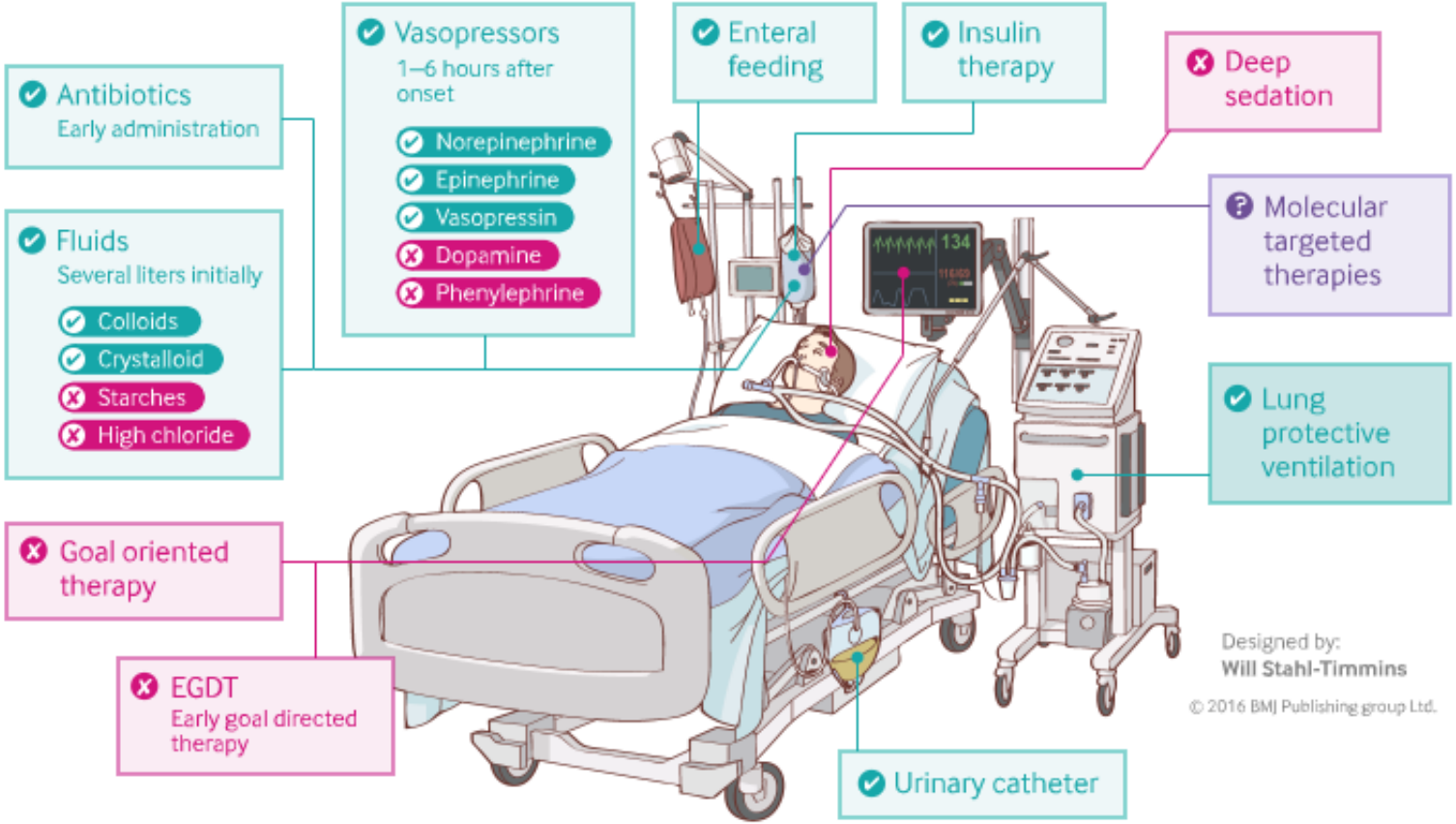
Target BP in Sepsis

MAP 60-65 widely considered minimum to preserve renal and cerebral blood flow.

Below this threshold Vasopressors need to be considered.

A history of longstanding arterial hypertension or advanced age may necessitate a higher MAP of 75-85 mmHG

Treating sepsis: the latest evidence



Crit Care. 2012; 16(Suppl 1): P400.
Published online 2012 Mar 20. doi: 10.1186/cc11007
PMCID: PMC3363818

Impact of congestive heart failure on severe sepsis and septic shock survivors: outcomes and performance status after 1-year hospital discharge

M Alkhalaf,[1] N Abd-Aziz,[2] Y Arabi,[3] and B Tangiisuran[1]

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Reterospective cohort study of 195 **survivors**

Headline: 70% mortality at 1 year

70% of deaths within 3 months.

Weakness: Definition of CHF unclear

Published in final edited form as:
Shock. 2015 January ; 43(1): 68–73. doi:10.1097/SHK.0000000000000268.

Fluid Overload in Patients with Severe Sepsis and Septic Shock Treated with Early-Goal Directed Therapy is Associated with Increased Acute Need for Fluid-Related Medical Interventions and Hospital Death

Diana J. Kelm, MD[1,2], **Jared T. Perrin, MD**[1], **Rodrigo Cartin-Ceba, MD**[1,2], **Ognjen Gajic, MD**[1,2], **Louis Schenck, MS**[3], and **Cassie C. Kennedy, MD**[1,2]

Reterospective cohort study

Clinical or radiological evidence of fluid overload on Day 1 of EGDT doubles in hospital mortality

Fluid Resuscitation Dilemma In Patients With Congestive Heart Failure Presenting With Severe Sepsis/septic Shock

M. Duttuluri[1], K. Rose[1], J. Shapiro[1], J. Mathew[1], R. Jean[1], S. Kurtz[1], K. Mckenna[1], J. Salonia[1], H. Khouli[1]
[1]Mount Sinai St. Luke's and Mount Sinai Roosevelt, New York, NY

Severe Sepsis / Shock - Limits Generalisability

Reterospective cohort study of 1010 Patients (333 with Heart Failure)

Increased mortality in patients who received <30ml/kg and were hypotensive. (43% vs 23%), less likely to be intubated.

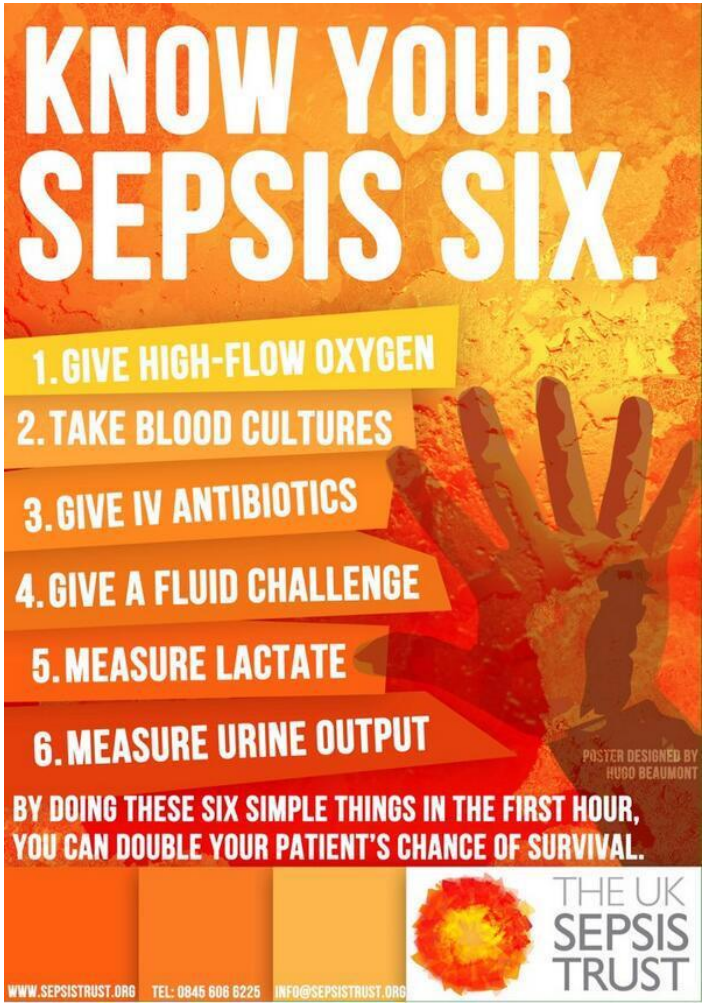
No difference in normotensive patients.

Summary

Cardiac failure increases mortality from sepsis 2-3 fold

Heart failure should not be a barrier to 30mls/kg of fluid resuscitation if hypotensive with severe sepsis.

Prompt recognition and accurate diagnosis critical.



Final Thoughts

Assess physiological response following fluid challenge

Consider early discussion with intensive care for vasopressors

Patients are likely to leave the ITU fluid overloaded and ‘not out of the woods’

Remember to restart prognostically important drugs

Any Questions?