Prehospital Sepsis Alert in New Brunswick

December 11, 2017
Sepsis...what’s the big deal?
THE SHOCKING REALITY OF SEPSIS

More common than a heart attack

Claims more lives than cancer

Largest killer of children and newborn infants in the world

Yet only 55% of American adults have heard of SEPSIS

Mortality from sepsis increases 8% every hour that treatment is delayed

EARLY DETECTION IS CRITICAL

As many as 80% of sepsis deaths could be prevented with rapid diagnosis and treatment
What is Sepsis?

• Sepsis-3 (2016):

“life-threatening organ dysfunction caused by a dysregulated host response to infection”
Surviving Sepsis Campaign 2016

- Early antibiotics
  - Within 1 hour of identification
- Early fluids for patients with hypoperfusion
  - Within the first 3 hours
- Additional fluids for fluid responsive patients
“The cornerstone of initial resuscitation is the rapid restoration of perfusion and the early administration of antibiotics”
In order to treat early, you must identify early…
Sepsis and EMS

- EMS transports more sepsis patients than MI/stroke combined.
- US data - 50% of all septic patients come by ambulance
- Low rates of IV access in these patients
### Sepsis - Inpatient Cases Admitted by Ambulance - 2014

<table>
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<th>Master Institution Name</th>
<th>Admit by Ambulance</th>
<th>NO AMBULANCE</th>
<th>Total</th>
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Source: CIHI Portal - DAD (Acute care) - 2014 Calendar year
Sepsis cases included ICD-10-CM codes A40-, A41-, R851, R572, A021, A327, A392, A427 and B377. Dx types M or 1 excluding 2
MISSED OPPORTUNITY
Prehospital Sepsis Alert...What is the Evidence?

• There are no studies that have shown a hard mortality benefit.

• Some studies have shown trends/associations between EMS recognition of sepsis and improved patient outcomes.

• In general, there is a paucity of high quality prehospital research/data on all topics

• Hard to make conclusions
What evidence do we have?
EMS providers are able to correctly identify sepsis patients using screening tools.

Emergency Medicine International
Volume 2016 (2016), Article ID 6717261, 5 pages
http://dx.doi.org/10.1155/2016/6717261

Research Article

Paramedic Recognition of Sepsis in the Prehospital Setting: A Prospective Observational Study

Robert S. Green,¹,² Andrew H. Travers,³,⁴ Edward Cain,³ Samuel G. Campbell,³ Jan L. Jensen,³,⁴ David A. Petrie,³ Mete Erdogan,² Gredi Patrick,⁵ and Ward Patrick¹
More Evidence...

• 30-120 minute decreased in time to

  • Antibiotics

  • Initiation of IV fluids

  • Note - in one study, simple insertion of IV was associated with decreased odds of mortality.

• Greatest benefit seen when EMS providers used the term “sepsis” in their report

2. Prehospital IV access and fluid resuscitation in severe sepsis: an observational cohort study. Critical Care 2014
recognition is the key thing EMS can contribute to sepsis care
ANB Prehospital Sepsis Alert Protocol
SCREENING TOOL
(not diagnostic)
Assessment

Sepsis Suspected

Airway / Ventilation adequate

No
See airway management protocol 1000

Yes

O₂ 100%

Must meet the following 3 criteria:

1. Suspected infection

2. Two or more of the following:
   - Temperature >38°C (100.4°F) OR <36°C (96.8°F)
   - Respiratory rate > 20 breaths/min
   - Heart rate > 90 beats/min

3. EtCO₂ ≤ 25 mmHg

IV x 2* NS bolus
500 mL – 1 L**
(adult only)
See Note****

Transport
Provide early pre-arrival sepsis alert

*18 ga or larger caliper as long as patient veins are adequate
**Assess between boluses for signs of fluid overload, repeat bolus to max of 2 L,
***Maintain systolic SP > 100 mmHg
ANB Sepsis Alert Protocol

ETCO2 ≤ 25 mmHg

Two or more of the following:
- Temperature > 38°C (100.4°F) OR < 36°C (96.8°F)
- Respiratory Rate > 20 breaths/min
- Heart Rate > 90 beats/min

Suspected Infection
Why EtCO2?

Non-invasive
Performs as well as serum lactate in predicting mortality in septic patients
Earlier identification of patients with suspected sepsis
SEPSIS

↓ Hypoperfusion

↓

↑ Lactate

↓ Metabolic Acidosis

↑ Minute Ventilation (Compensatory)

↓ PaCO2/EtCO2

Low EtCO2 $\approx$ High Lactate*
Why EtCO2?

Of all vital signs, low EtCO2 has the best predictive value for sepsis, lactic acidosis, organ dysfunction and mortality in the ED.
Fig. 2  Receiver operating characteristic curves for predicting mortality in all patients.

New to ANB... Temporal Artery Thermometers
back to the SJRH ED...
HELLO? CAN ANYBODY HEAR ME?
Summary
Questions?

You don’t need to do a whole lot of

You just need to give a
suspect sepsis?
think BUFALO

BLOOD CULTURES
URINE OUTPUT
FLUIDS
ANTIBIOTICS
LACTATE
OXYGEN

act fast

Sepsis causes 37,000 deaths and 100,000 hospital admissions in the UK each year

Treatment is time critical -
- Sepsis responds well to early intervention
- But every hour’s delay raises mortality by 8%

act fast

search "sepsis" on 111.nhs.uk