SEPSIS PROTOCOL DESIGN

ED Recognition and Risk-stratification

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• Deputy Editor, Annals of Emergency Medicine
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• Expert consulting
• Unpaid role on steering committee for Ferring International (selepressin in septic shock)
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Why are we here?

• You’ve heard the sepsis definitions and burden

• The ED is the initial site of hospital based care for @75-80% who ultimately are diagnosed with sepsis in any form
  • EMS brings about 75% of those suffering from sepsis to hospital

• Concentration of providers and resources
  • NQF 0-500 and CMS Sep-1 measure

• Early care matters
What do the new trials show

- All *built* on early recognition – Rivers et al EGDT; Jones et al lactate clearance; ProCESS/ARISE/ProMISE
  - We know that earlier matters in ‘real life’ – Kaukonen *JAMA* 2014
- Once recognized, prompt ED-based “aggressive” (sic) therapy is key step
- Reassessment and titration
- There is no one-best way
  - Fluid
  - Source control (ATB)
  - Respiratory and cardiovascular support
  - Surveil and limit other organ failure
The Challenge in the ED

- Signal: Noise (CDC and NHACMS)
  - 140 million ED visits 2014; 5-6:1 discharged : admitted

- ED presenting complaints: Fever #1 in children, # 3 in adults; some form of infection is # 5, 7, 9 in adults – diagnosis pattern similar

- Across U.S., @ 5 million have fever on ED presentation, with @ 450k having non-exposure hypothermia

- But, 550-600k will have sepsis, with death happening 15-35% of the time
The Challenge in the ED

• Tools
  • Vital signs – best availability at start, vary widely after; age issues
    • BP – what cut point?
    • RR – accuracy?
    • Shock Index (HR/SBP; >0.8 bad)
    • Temp measurements
  • Complaints – see before.
    • Sick and not so sick look the same often
  • Testing – no one ‘test’ exists
    • Easy things – CBC, basic labs, source testing – help with infection detection but not sensitive or specific alone
    • Who needs more testing? What – lactate? Others? Invasive?
Two Bedside Data Approaches

- Oldest school – gestalt. Not well examined.

- Older school - SIRS (variable performance, low specificity for sepsis).
  - Variables: T > 38 or < 36; HR > 90/min; RR > 20/min; WBC > 14k
  - 2 or more = likely but misses 15%  (Kaukonen et al NEJM 2015)
  - Only 1 means many/most won’t have sepsis
  - Mortality goes up with more but ? transition point

- New school – qSOFA (SEP-3, JAMA 2016). Specific for poor outcomes
  - Variables: SBP 100 or lower; RR 22/min or more; altered mental status
  - Two or more – if infected, get busy with resuscitation and assessing organ function
Potential Solutions

• Recognize that two subgroups exist, and require approaches for each with some overlap
  • **Obvious** infection with organ dysfunction – AMS, hypotension, tachycardia, resp distress (qSOFA or multiple SIRS)
    • Right into care path – Fluid bolus, ATB, source specimens, resp/circulatory support
      • New “septic shock” group (SEP-3) – ongoing hypotension requiring VP after volume infusions with lactate elevation = highest mortality – most aggressive approaches

• **Not so obvious** –
  • Two or more looks, triggered off presence or history of fever/low temp
  • Additive over time
  • Test – **esp. lactate** – when unsure or if one other ‘sign”
  • Pediatric accommodations
  • Protocolize
    • Triage/order sheet/e-surveillance all options
Potential Solutions

• Require **assessment** impact
  • Processes – data integrity, tool use, time of events
  • Outcomes – hit target or hit improvement
    • Diagnosed with a some form of sepsis
    • Mortality and non-mortal outcomes

• Require attack **gaps**
  • Plans
  • Trends
  • Reports