Subtle Signs of Bad $#*!

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Faculty Disclosures

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Evidence of Illness

• Illness should be the assumption
Sick/Not Sick

The Holy Grail of Medicine
- Especially EMS, Emergency and Critical Care Medicine

Sick vs Not Sick
- Minimal to no information
- Physical Exam ± Vitals ± SaO2
Data

Derivation of qSOFA

- 74,453 encounters
- What combination of data most effectively predicts badness? (mortality)

Validation of qSOFA

- Non ICU cohort 66,522
- qSOFA > SOFA > LODS
Evidence

Prognostic Accuracy of Sepsis-3 Criteria for In-Hospital Mortality Among Patients With Suspected Infection Presenting to the Emergency Department. JAMA. 2017 Jan 17;317(3):301-308

Prospective, 1088 pts screened, 879 analyzed. qSofa outperformed SIRS and the old Severe Sepsis criteria in predicting death.

qSOFAs predicts DEATH! Not Sepsis
Truth

qSOFA is a toy, a tool and nothing more

How we USE our tools and toys is what defines us as clinicians

A tool/toy never tells the Truth!

It gives DATA, which combined with EVIDENCE gives a version of TRUTH
Take home qSOFA

- qSOFA is only a tool
- Derived/validated in sepsis
- RR codified as a sign of badness
- qSOFA (>2 findings)
  - New/Worsened
  - Altered Mentation
  - RR≥22
  - SBP≤100
Pulse Pressure

Psyst-Pdiast
normally 30-40

Low pulse
pressure (<30)

\( \downarrow \text{CO, likely from } \downarrow \text{SV} \)

Generally
hypovolemia,
tamponade
Pulse Pressure

Psyst-Pdiast normally 30-40

Elevated Pulse Pressure (>45)

Loss of Vascular Tone

AV Fistula

Data

- Pulse pressure is a data point
- It is a tool
- In context will guide you to the truth
Data

• Early Warning Scores
  – Devised to predict clinical deterioration
  – Usually based on clinical parameters only
  – Many exist
    • MEWS-Modified Early Warning Score
    • NEWS-National Early Warning Score
    • ViEWS
<table>
<thead>
<tr>
<th>Study Country</th>
<th>N parameters; name of scoring system</th>
<th>Heart rate</th>
<th>Resp rate</th>
<th>SBP</th>
<th>Temp</th>
<th>Urine output</th>
<th>O2 Sat</th>
<th>Difficulty breathing</th>
<th>Supp O2</th>
<th>Mental Status (LOC)</th>
<th>Concern</th>
<th>Other, specify</th>
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<td>Rothschild, 2010</td>
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<td>DBP, seizures, uncontrolled bleeding, color change</td>
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<td>WBC; new focal weakness</td>
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</tbody>
</table>
Evidence

**ViEWS score**
- Vitals, No Mental Status
- Validated by Kellett, et al. in multiple studies
- N=>137,000 pts

**Surprises-**
- Changes over time not really predictive
- No one VS stood out much
  - But the range of RR was small
Evidence

- Validation of a modified Early Warning Score in medical admissions
  
  *QJM*. 2001 Oct;94(10):521-6
  
  - Prospective, 709 admitted pts
  - Score > 5 predicted Death (OR 5.4) and ICU admission (OR 10.9)

- The ability of early warning scores (EWS) to detect critical illness in the prehospital setting: A systematic review.
  
  *Resuscitation*. 2016 May;102:35-43
  
  - Metaanalysis of 8 Early Warning Score studies
  - Pooled analysis of EWS showed an OR of 10.9 for critical illness
  - All scores were VS based (some had lactate)
  - Majority from one study (144K pts)- using only vitals + GCS
EWS are tools

They help only when taken in clinical context.

All validated EWS use only clinical variables

AUROC .78 (EWS, qSOFA, SIRS)
Take Home
Early Warning Scores

Again- only a tool

Validated for near term mortality/ICU admit

All include RR
Shock Index

HR/SBP

- >.7 predicts mortality in STEMI
- >1 predicts massive transfusion in Trauma
- >.9 Preintubation predicts hypotension/ICU
- “U” shaped curve in Stroke (high and low bad)

SI>.7 still predictive in the face of

- DM, AGE, β-Blockade, Ca Channel Blockade
Data

• Pediatric Assessment Triangle
  – NO Derivation Study
  – First literature reference:
Pediatric Assessment Triangle

PAT: General Impression

- Appearance
- Work of Breathing
- Circulation to skin

△ = STABLE
△ = RESPIRATORY DISTRESS
△ = RESPIRATORY FAILURE

△ △ = SHOCK
△ △ △ = CNS / METABOLIC
△ △ △ △ = CARDIO-PULMONARY FAILURE
PAT

**Appearance**
- Tone, Interaction, Consolability, Look, Speech

**Work of Breathing**
- Sounds, Position, Retractions/Flaring, Apnea

**Circulation**
- Pallor, Mottling, Cyanosis, Cap Refill
Evidence

The Validity of the Pediatric Assessment Triangle as the First Step in the Triage Process in a Pediatric Emergency Department

302,000+ Patient evaluations

>ONE abnormal finding on the PAT increased

Odds of admission (OR 3.99)
Odds of ICU Admission (OR 4.44)
Pediatr Emerg Care. 2016 May 12
Truth

- PAT is a tool
- Well validated
- Predicts and can categorize badness
### Summary

- "The harder you train, the easier the war"
- Go home and study your patients
- Consider context of the patient’s illness
- Pay attention to subtle things:
  - RR
  - Skin Color
  - Anxiety
  - Mental Status
  - Pulse Pressure
  - Shock Index
  - Work of Breathing
Ultimate Truth
The most powerful tools you have