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

Toys


Microstream
capnostream 20p
Oridion
EtCO2
39
18
IPI
8
SpO2
100
77
TREND
SYSTEM
PATIENT TYPE
ALARMS
REPORTS
ZOOM IPI


ACCU-CHEK
Aviva
10:38
12-11
104
mg/dL
ACCU-CHEK


UT 100
99
85
Upalm


LIFEPAK 4
Physio-Control


BIS
VISTA
05

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

qSOFA 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

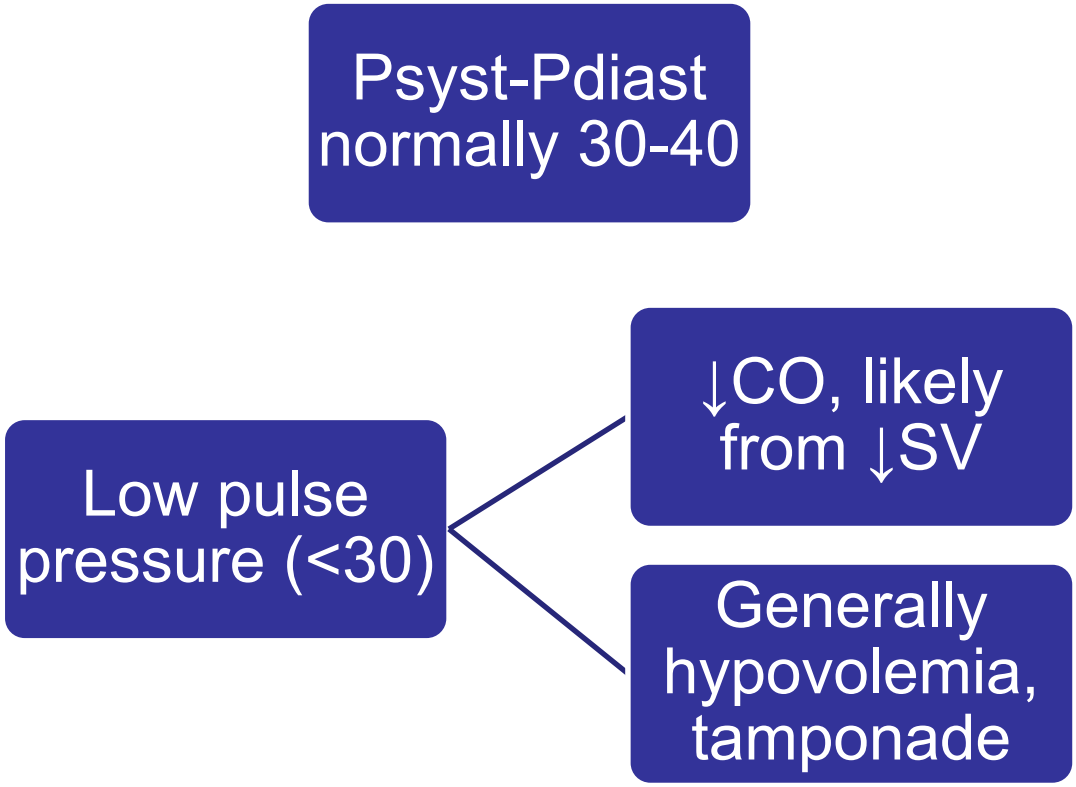
qSOFA (>2 findings)

New/Worsened Altered Mentation

RR≥22

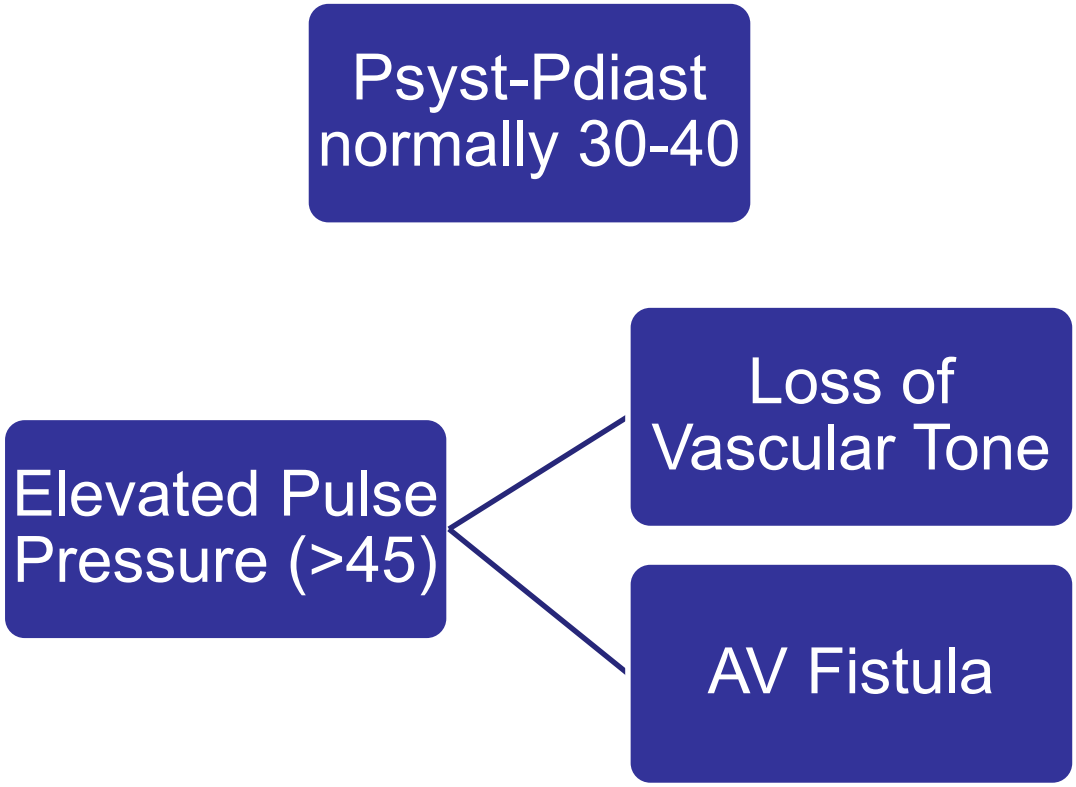
SBP≤100

Pulse Pressure



ATLS - Advanced trauma life support. (2018). Chicago, Ill.: American College of Surgeons, Committee on Trauma.

Pulse Pressure



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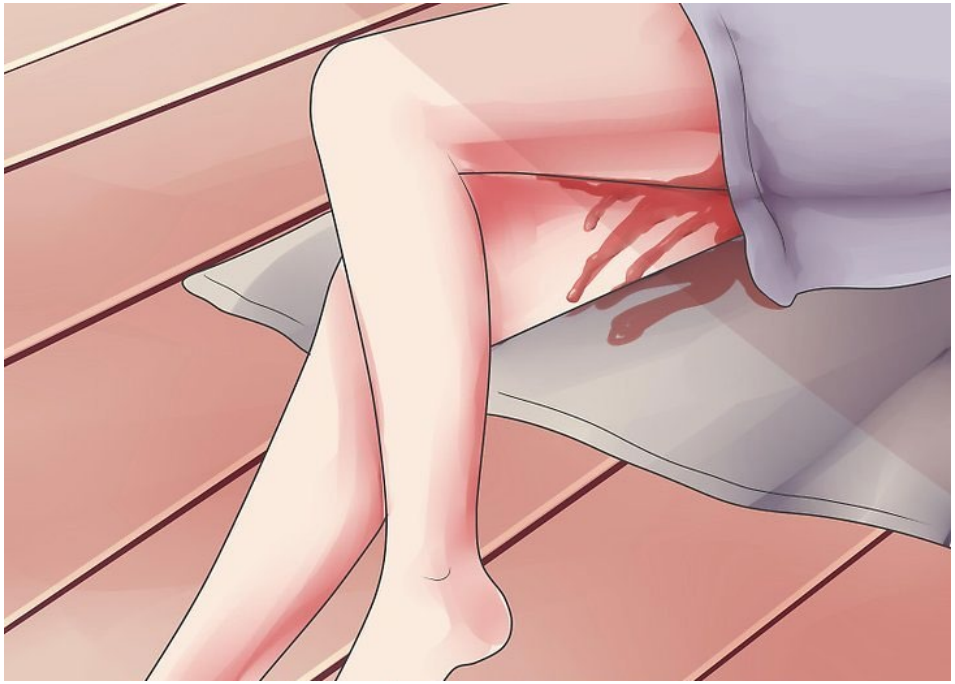
Data

- 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

Study Country	N parameters; name of scoring system	Parameters used in the system scores										
		Heart rate	Resp rate	SBP	Temp	Urine output	O2 Sat	Difficulty breathing	Supp O2	Mental Status (LOC)	Concern	Other, specify
Rothschild, 2010[8] USA	Single items, not combined	X	X	X	X	X	X	---	X	X	X	DBP, seizures, uncontrolled bleeding, color change
Churpek, 2012[9] USA	4-item CART	X	X	---	---	---	---	---	---	---	---	DBP, Age
Maupin, 2009[10] USA	5-item MEWS	X	X	X	X	---	---	---	---	X	---	---
Jones, 2011[11] UK	Patientrack EWS	X	X	X	X	---	---	---	---	X	---	---
Subbe, 2003[12] UK	5-item MEWS	X	X	X	X	---	---	---	---	X	---	---
Churpek, 2012[13] USA	5-item MEWS	X	X	X	X	---	---	---	---	X	---	---
O'Dell, 2002[14] UK	5-item MEWS	X	X	X	---	X	---	---	---	X	---	---
DeMeester, 2012[15] Belgium	6-item MEWS	X	X	X	X	---	X	---	---	X	---	---
Smith, 2006[16] UK	6-item EWS	X	X	X	X	X	---	---	---	X	---	---
Patel, 2011[17] UK	6-item MEWS	X	X	X	X	X	---	---	---	X	---	Catheterized
Kellett, 2012[18] Canada	6-item ViEWS	X	X	X	X	---	X	---	X	---	---	---
Mitchell, 2010[19]	7-item MEWS	X	X	X	X	X	X	---	---	X	---	---
Moon, 2011[20] UK	7-item MEWS	X	X	X	X	X	X	---	---	X	---	---
Green, 2006[21] Australia	7-item clinical marker tool	X	X	X	---	X	X	X	---	---	X	---
Smith, 2013[22] UK	7-item NEWS	X	X	X	X	---	X	---	X	X	---	---
Prytherch, 2010[23] UK	7-item ViEWS	X	X	X	X	---	X	---	X	X	---	---
Albert, 2011[24] USA	12-item MEWS	X	X	X	X	X	X	X	X	X	X	WBC; new focal weakness

Early Warning System Scores: A Systematic Review [Internet].
Editors: Smith MEB, Chiovaro JC, O'Neil M, Kansagara D, Quinones A, Freeman M, Motu'apuaka M, Slatore CG.

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

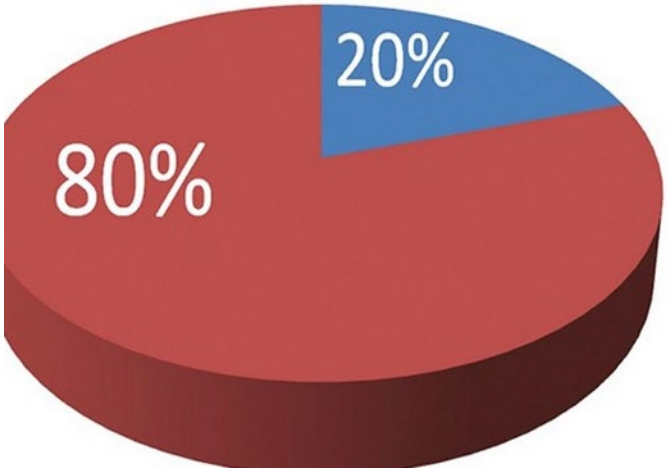
  – Prospective, 709 admitted pts
  – Score>5 predicted Death (OR 5.4) and ICU admission (OR 10.9)

- 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

Truth



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:

    Pediatr Emerg Care. 2010 Apr;26(4):312-5

Pediatric Assesment Triangle

PAT: General Impression

= STABLE

= *SHOCK*

= *RESPIRATORY DISTRESS*

= *CNS / METABOLIC*

= *RESPIRATORY FAILURE*

= *CARDIO-PULMONARY FAILURE*

PAT

Appearance	• Tone, Interaction, Consolabilty, 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 Breathing
- Mental Status

-Pulse Pressure
-Shock Index
-Work of

Ultimate Truth

The most powerful tools you have