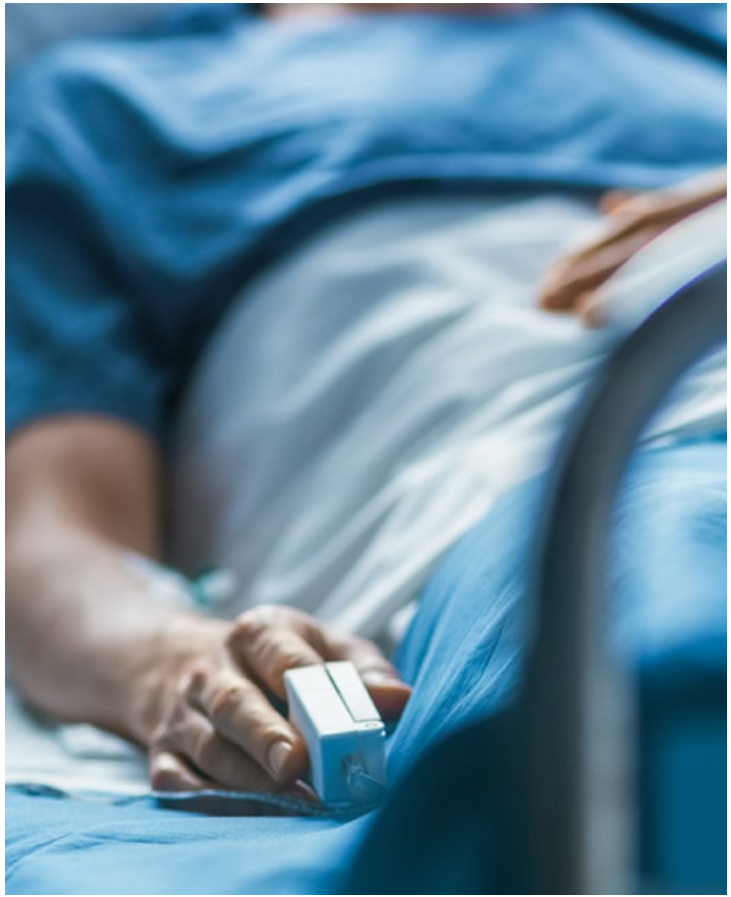


Rapid Response:

The ICU/AC Interface

Kathryn Bolles, MD
2024 Washington ACP Annual Meeting

Learning Objectives

Define

What is a rapid response & what is it meant to address?

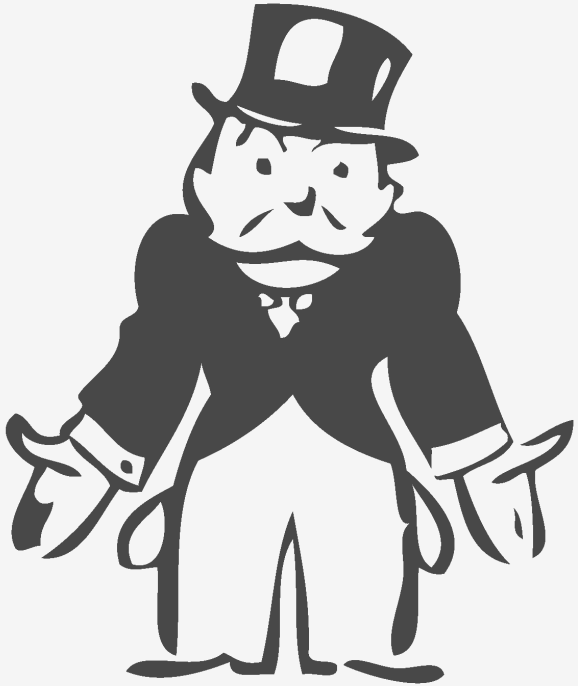
Assess challenges

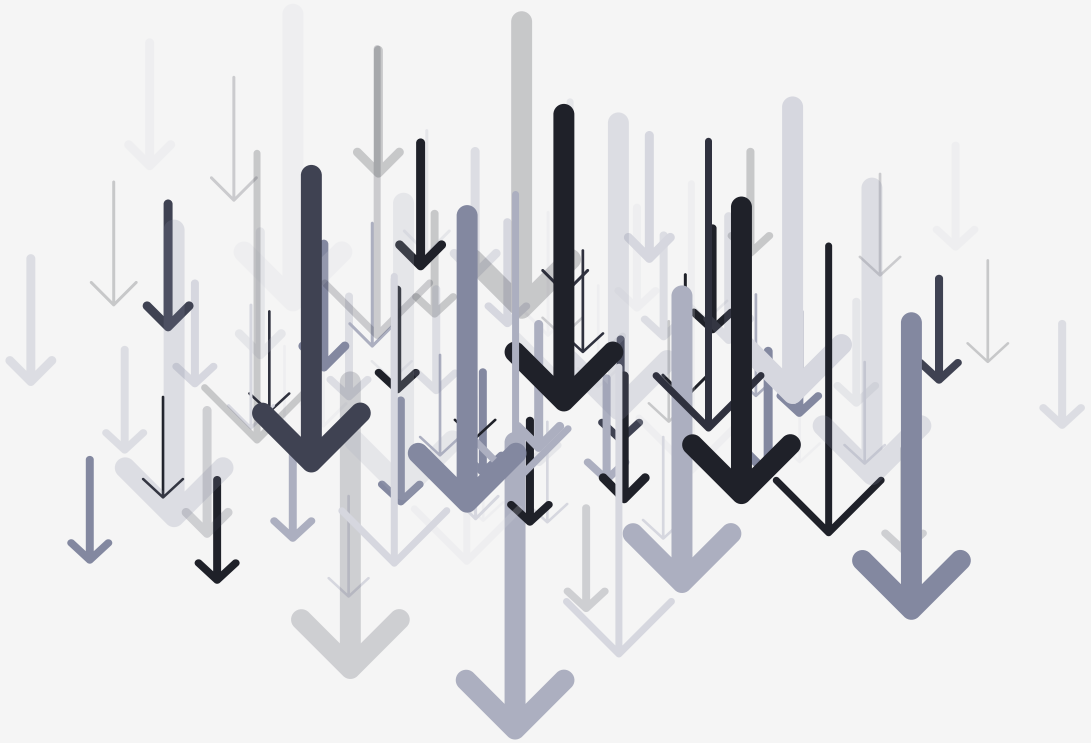
How do we identify clinical decompensation & work together to respond to it?

Move forward

What can we do as individuals & systems to improve our outcomes?

Disclosures





What *is* a rapid response?

A system to quickly address clinical decompensation that aims to prevent progressive deterioration, ICU transfer, cardiac arrest, or death

- Better match needs & resources
- Many forms & names

What *is* a rapid response?

- **Afferent** (event detection, response trigger)
- **Efferent** (crisis response)
- **Patient safety/process improvement**
- **Governance/administration**

Devita et al. Findings of the first consensus conference on medical emergency teams. *Crit Care Med.* 2006;34(9):2463-2478.

Why do we do this?

"Deploy Rapid Response Teams…
Rapid response teams can save lives among patients who would otherwise experience cardiac arrest and die in the hospital… either by initiating changes in care that prevent the arrest or by facilitating transfer to an ICU, where fast resuscitation efforts following a cardiac arrest are more likely to be successful."

Berwick et al. The 100,000 lives campaign: setting a goal and a deadline for improving health care quality: Setting a goal and a deadline for improving health care quality. JAMA. 2006;295(3):324-327.

Why do we do this?

The Joint Commission

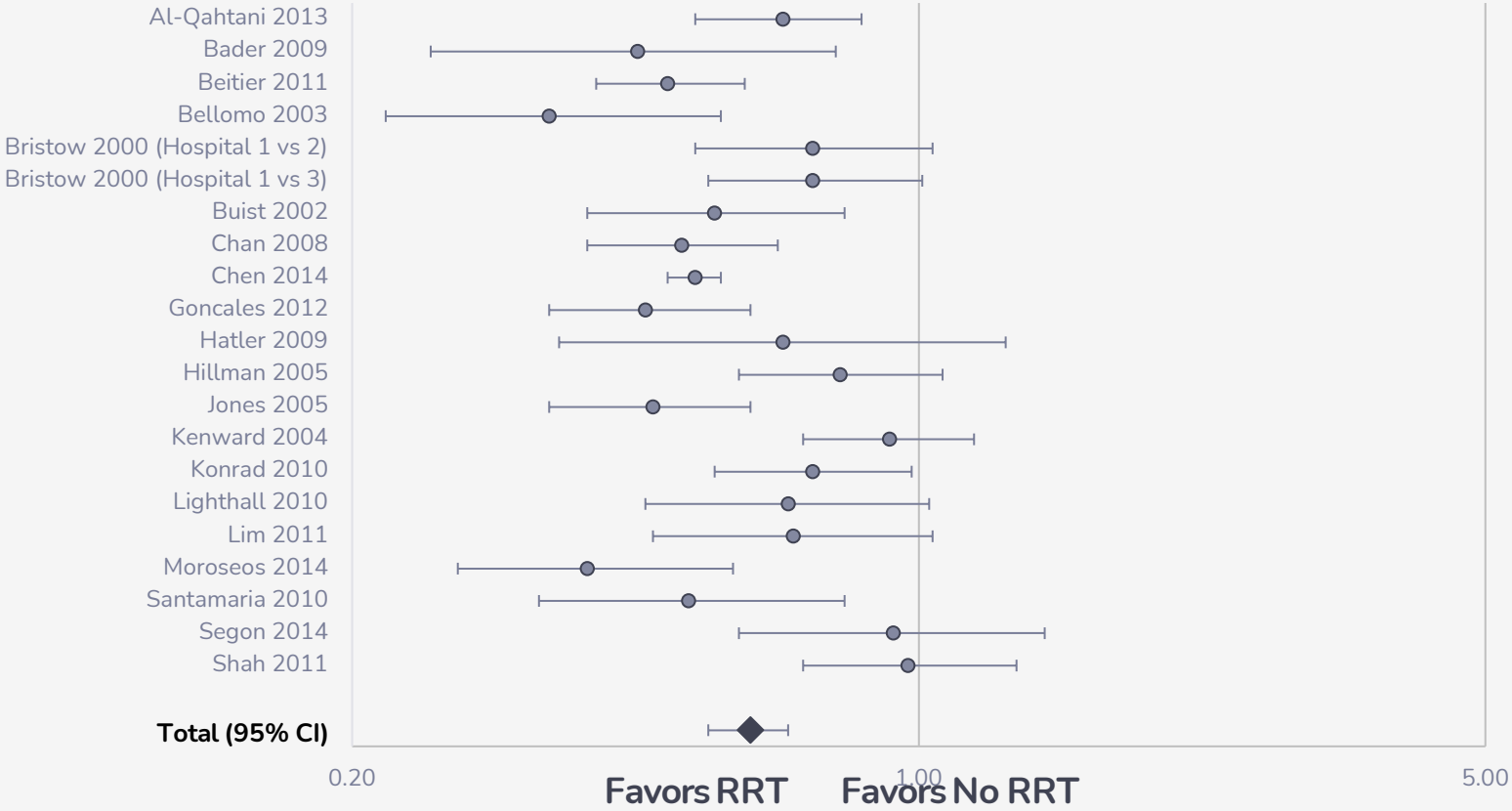
2008 National Patient Safety Goals

Goal 16
Improve recognition and response to changes in a patient's condition.

Requirement 16A
The organization selects a suitable method that enables health care staff members to directly request additional assistance from a specially trained individual(s) when the patient's condition appears to be worsening.

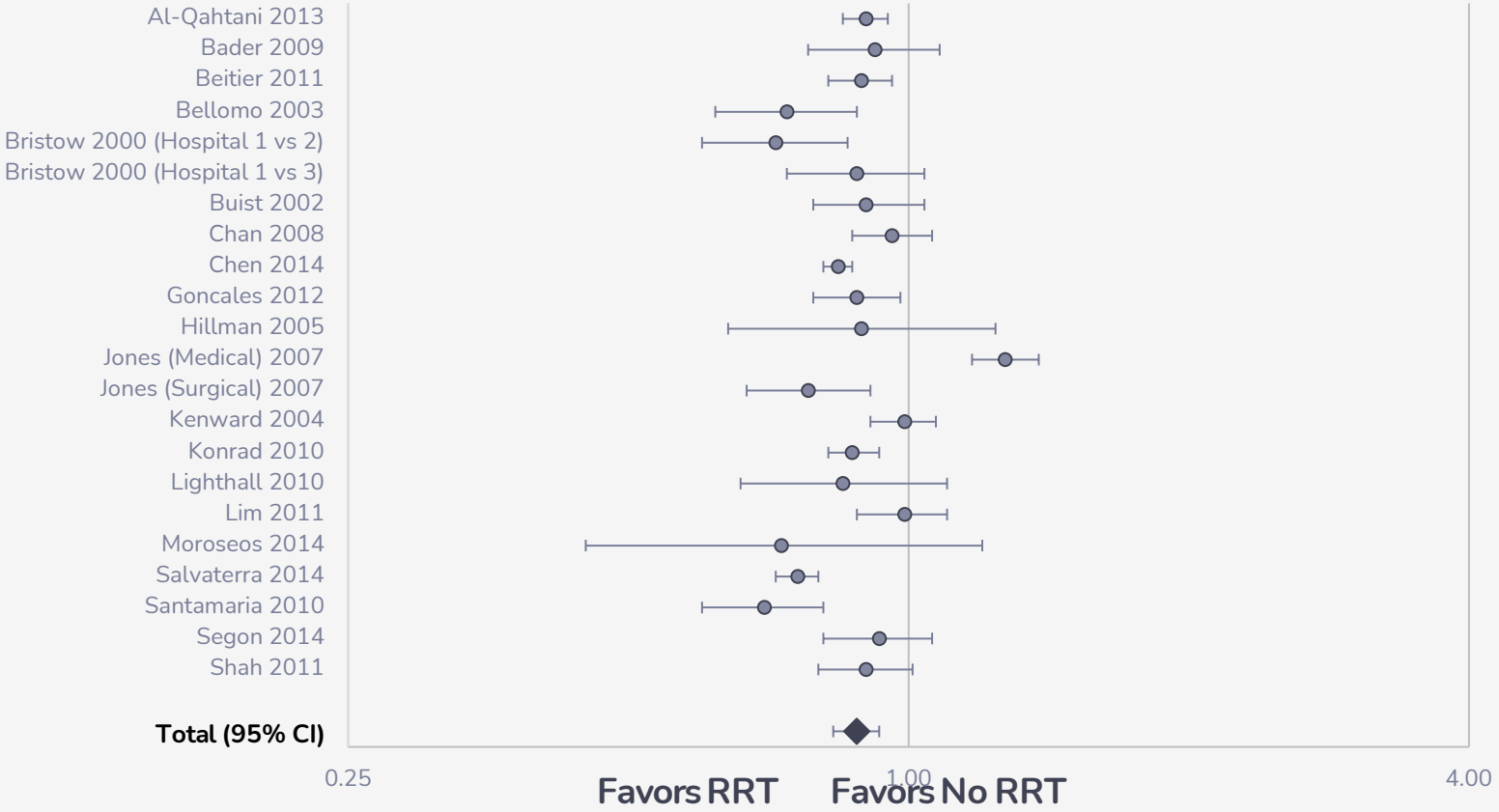
Joint Commission. The Joint Commission announces the 2008 National Patient Safety Goals and Requirements. Jt Comm Perspect. 2007;27(7):1, 9-22.

Rapid Response & Cardiac Arrest



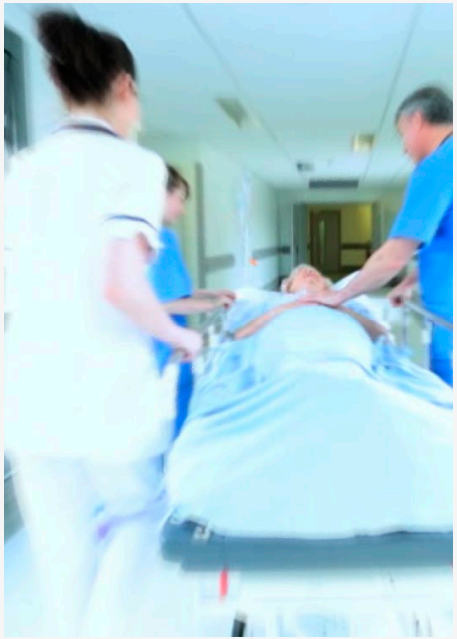
Adapted from Solomon et al. Effectiveness of rapid response teams on rates of in-hospital cardiopulmonary arrest and mortality: A systematic review and meta-analysis. *J Hosp Med.* 2016;11(6):438-445.

Rapid Response & Mortality



Adapted from Solomon et al. Effectiveness of rapid response teams on rates of in-hospital cardiopulmonary arrest and mortality: A systematic review and meta-analysis. *J Hosp Med.* 2016;11(6):438-445.

ICU transfers?



Impact unclear

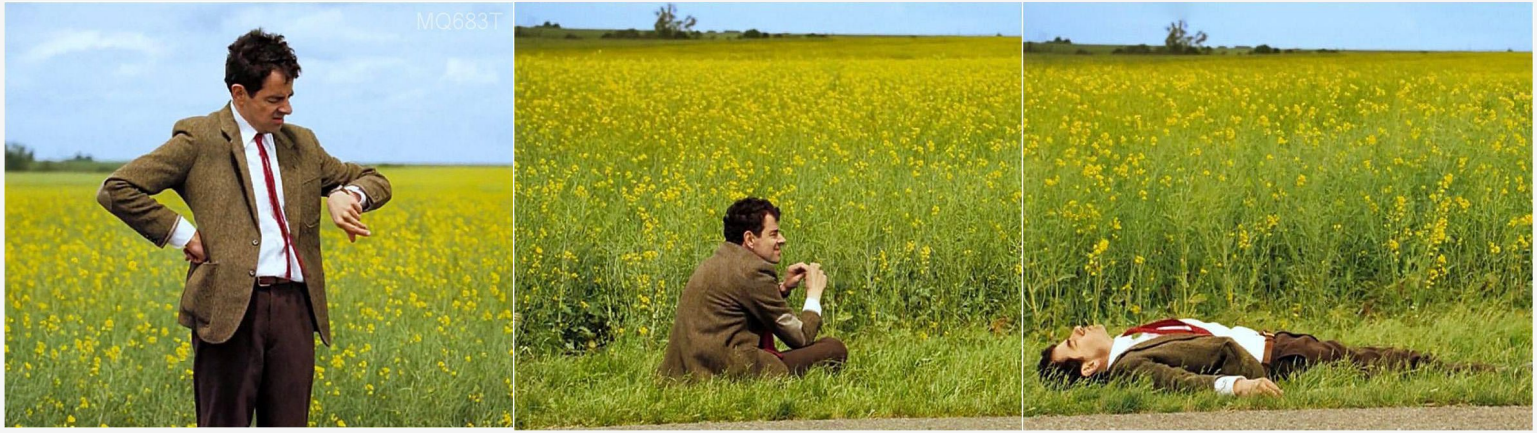
- Only around 1/3 of RRT literature reports on ICU admission rates
- More RRTs may increase detection of decompensation and ICU transfer
- Effective RRT may improve AC treatment and lower ICU transfer
- ICU transfer also impacted by other factors – capacity, criteria, ratios

Zhang et al. Effects of a rapid response team on patient outcomes: A systematic review. *Heart Lung*. 2024;63:51-64.

Length of stay?

Impact unclear

- Only 16% of studies reported on LOS, variable but often no impact
- HUGE number of confounders on LOS beyond acuity itself



Zhang et al. Effects of a rapid response team on patient outcomes: A systematic review. *Heart Lung*. 2024;63:51-64.

A system to quickly address ***clinical decompensation*** that aims to prevent progressive deterioration, ICU transfer, cardiac arrest, or death

What *is* clinical decompensation?

Local RRT Criteria

	Hosp 1	Hosp 2	Hosp 3	Hosp 4	Hosp 5	Hosp 6
Staff Concern	×	×	×	×	×	×
Specific VS	×		×		×	×
CV/Chest Pain	×	×	×	×	×	
Resp Distress	×		×	×	×	×
Neuro/AMS	×	×	×	×	×	×
Lab Abnml	×		×	×	×	×
Sepsis		×		×		
Early Warn Sys		×				

Vital Sign Triggers

Low sensitivity & PPV

Sensitivity 7-54% & positive predictive value 14-26% for single-criteria VS trigger systems, not significantly improved by criteria modification

Respiratory most predictive

Tachypnea, need for 100% FiO2, or need for NRB highly correlated with subsequent IHCA

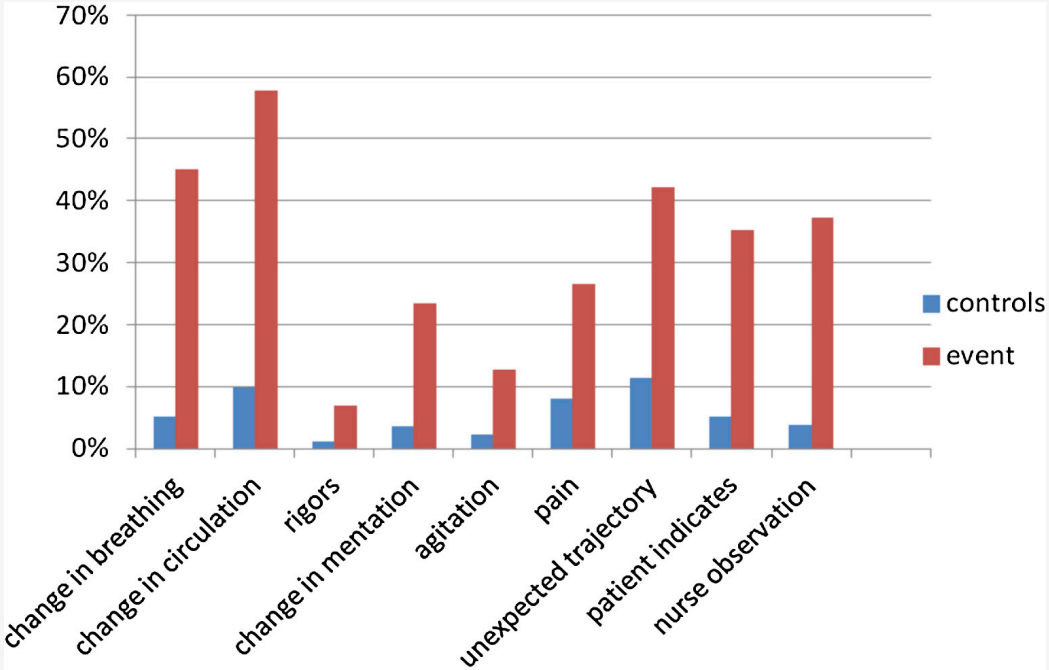
Difficult to balance

Overall low sensitivity for deterioration *and* high false alarms, criteria modification minimally improves

Local RRT Criteria

	Hosp 1	Hosp 2	Hosp 3	Hosp 4	Hosp 5	Hosp 6
Staff Concern	×	×	×	×	×	×
Specific VS	×		×		×	×
CV/Chest Pain	×	×	×	×	×	
Resp Distress	×		×	×	×	×
Neuro/AMS	×	×	×	×	×	×
Lab Abnml	×		×	×	×	×
Sepsis		×		×		
Early Warn Sys		×				

Subjective Worry



- Variety of measures – change in breathing/ circulation, AMS, poor response, intuition
- Cardiac arrest less common after worried calls
- May provide additional sensitivity *in combination* with other criteria

Douw et al. Nurses' "worry" as predictor of deteriorating surgical ward patients: A prospective cohort study of the Dutch-Early-Nurse-Worry-Indicator-Score. *Int J Nurs Stud.* 2016;59:134-140.

What can go **wrong?**

25-57% of patients with significant RRT activation delays

<15 min between activation & IHCA, ICU Tx, or death in large RCT

25% of IHCAs meeting criteria 0-8 hours prior with no RRT called

Why the delays?

Experience

Lack of experience may lead to informal escalation first

Fear of reprimand

Fear of blame, uncertainty, and perception of team irritation slow activation

Lack of monitoring

Calls increase at RN/MD rounding times, especially in morning

Census stress

Bed availability

Admissions to non-ideal sites or units (boarding), leading to inadequate care

Event clustering

Care diversion to one patient impacts others on the same ward

High ICU admissions

Increase downgrading, with increased rates of unplanned ICU readmission

"**A pop-off valve** for workload/workforce/bandwidth issues"

"**An opportunity** to interrupt deterioration and change their trajectory, which is a win."

"**A cry for "help"** from less experienced folks who just need someone experienced nearby"

What *is* a rapid response?

"**An attempt to match up** ICU & acute care standards – even if they don't quite fit"

"**A way to get help** with what were formerly standard hospital tasks (e.g. vascular access)."

Communication & **Conflict**

"**A lot of confusion**... too many people trying to make decisions at the same time."

"**A feeling of disrespect.**"

"Provider **undercut the situational recognition** for severity of the patient condition... **invalidates the acute care concerns**."

"They're **not looking to fix the patient,** just to move them."

"It was **unclear who oversaw the decision-making process** and what the concerns were."

"They **won't be excited to take the patient.**"

"**Not a collaborative discussion**."

Now what?

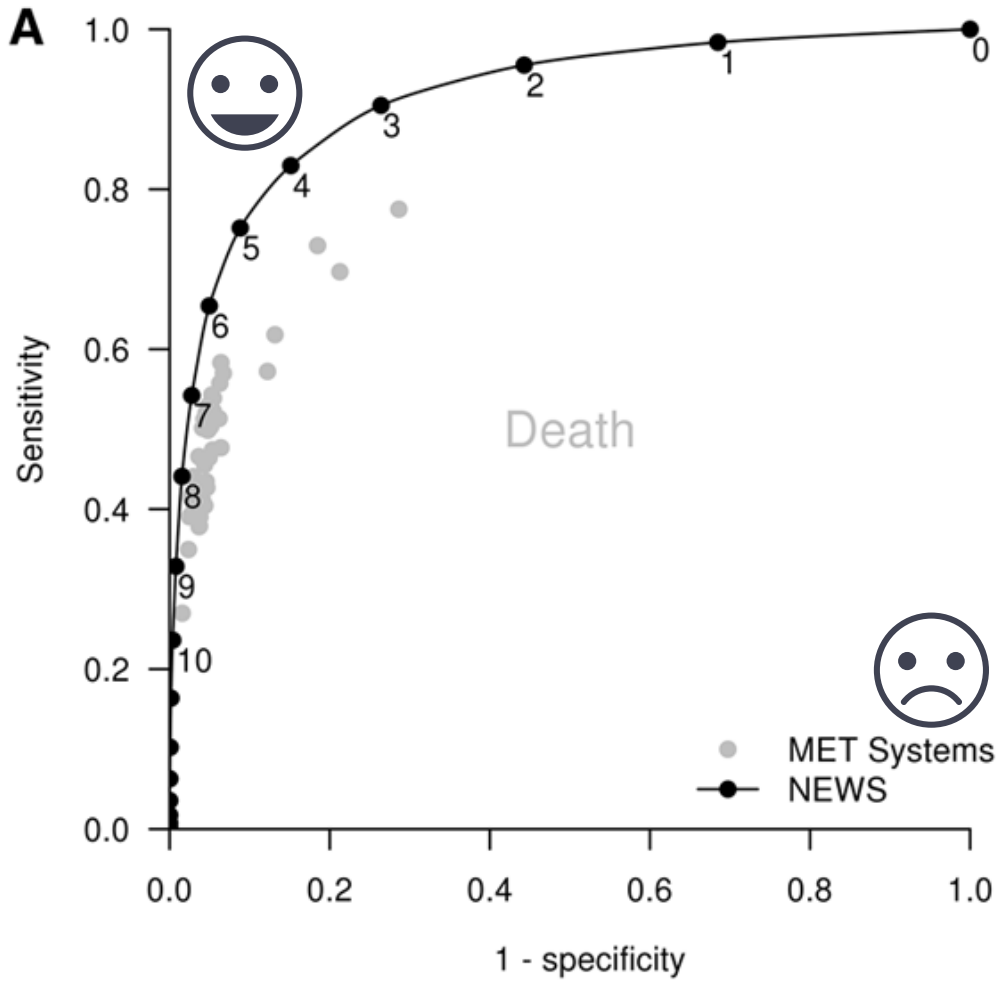
To-Do List

Better identify decompensation

Reduce delays in activation

Improve flexibility & adaptability

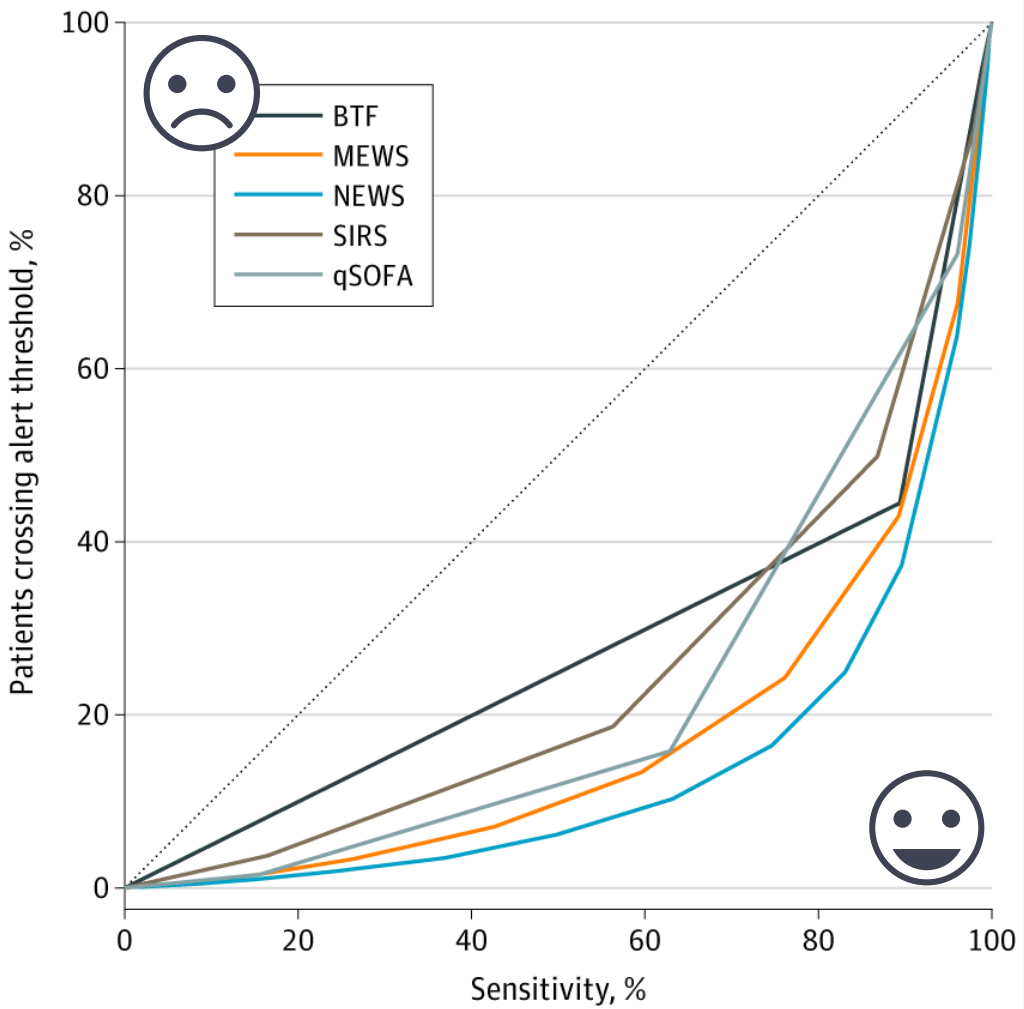
Decrease conflict & confusion



Aggregate Scores

Overall higher sensitivity & specificity than single VS

Smith et al. A comparison of the ability of the physiologic components of medical emergency team criteria and the U.K. national Early Warning Score to discriminate patients at risk of a range of adverse clinical outcomes. *Crit Care Med.* 2016;44(12):2171-2181



Aggregate Scores

Better efficiency & workup to detection ratio

Liu et al. Comparison of early warning scoring systems for hospitalized patients with and without infection at risk for in-hospital mortality and transfer to the intensive care unit. *JAMA Netw Open.* 2020;3(5):e205191.

Automation

- Increase RRT activation but improve mortality
- More RRTs manageable on AC & fewer requiring MD involvement
- False alarms primarily due to human error

Adaptability

Tiered systems

Target deployment of RN, MD, and critical care resources

Revision

Permit individualized changes after attending review

Teamwork training

Communications training improves teamwork, culture of safety, and levels of conflict

Structured teaching

Provide structured frameworks to help trainees respond effectively & work well within the team

Conclusions

- Rapid response is a system to bridge AC & IC, quickly addressing decompensation to prevent progressive deterioration
- Data appear to show benefits in mortality & IHCA
- Clinical decompensation is tough to define
- Delays, high census, & conflict undermine efficacy
- Consider team training, aggregate warning systems, tiers, automation, & revision to improve utility & outcomes
- Different environments may need different systems – flexibility & adaptability are key

Thank you!

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REFERENCES