Validation of a PEWS for Long-Term Ventilated Patients

Mark Fielding, RN, MN, MOL
Director Quality & Education

AMANA HEALTHCARE
A Mubadala Company

Objectives

- Discuss and debate the background and impact of failure to rescue
- Differentiate between the various types of PEWS
- Discuss and debate the limitations of current PEWS
- Discuss and debate the strengths and weaknesses of the development of a new PEWS tool

Background - Impact

- Research shows that there are signs of deterioration for 6-8 hours before a significant event[1,2,3].
- The 100,000 lives campaign encourages hospitals to utilize rapid response teams at the first sign of decline
- Failure to Rescue is a national concern that affects all types of patients.

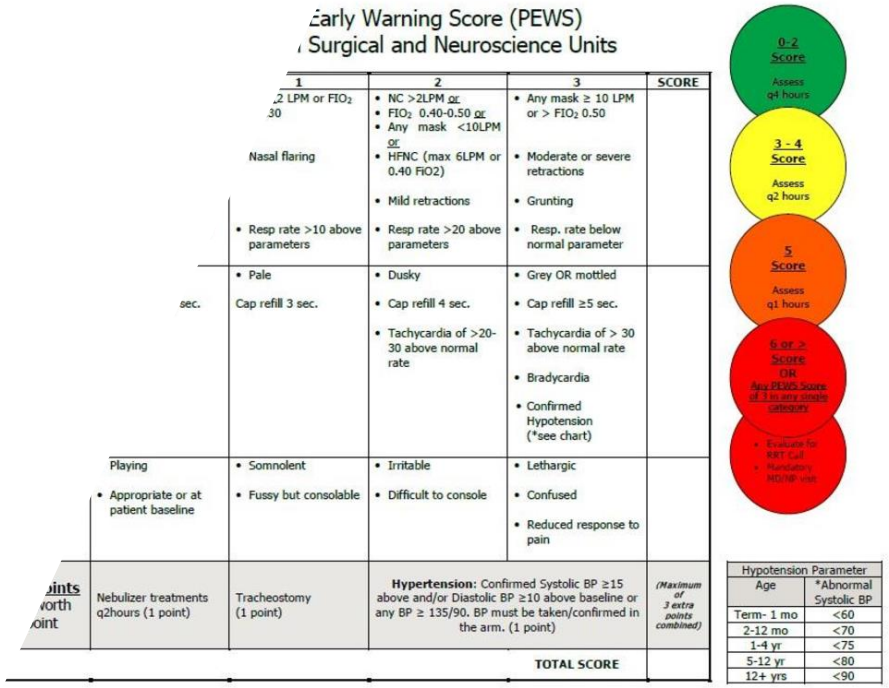
[1] *Subbe C.P., Kruger M., Gemmel L. (2001). "Validation of a modified Early Warning Score in medical admissions". Quarterly Journal of Medicine **94**: 521–6.*
[2] *Morgan R, Williams F, Wright M (1997). "An early warning scoring system for detecting developing critical illness". Clin Intensive Care **8**: 100*
[3] *"A review of rapid response team activation parameters in New Zealand hospitals". Resuscitation **84**: 1040–1044. resuscitation.2013.01.022*

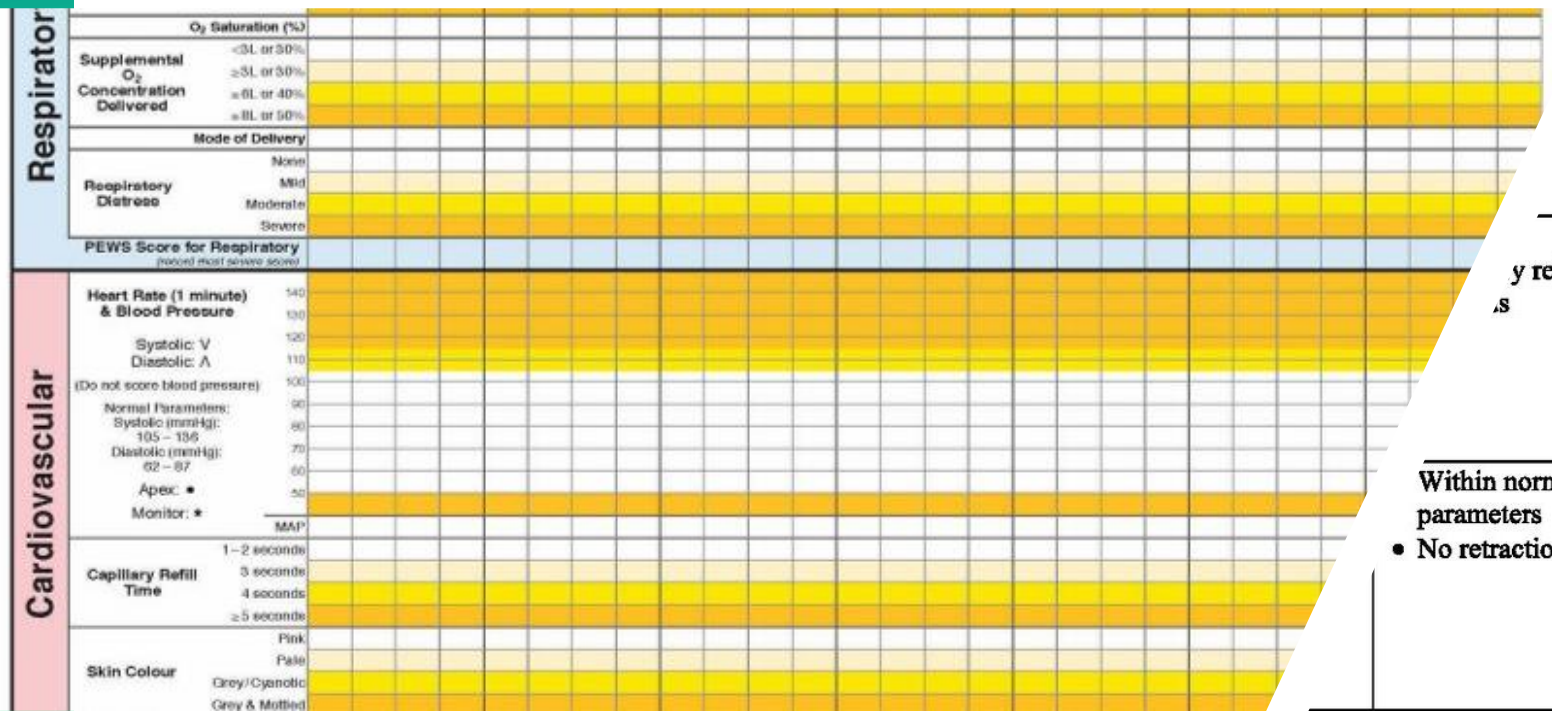
What is PEWS?

- A guide used to quickly determine the degree of illness of a patient.
- Based on a set of fundamental vital signs

SCORE	MET	3	2	1	0	1	2	3	M
ZONE	BLUE	RED	ORANGE	YELLOW	WHITE	YELLOW	ORANGE	RED	
Resp Rate	<5	5-8		9-11	12-20		21-24	25-35	
SpO_2		≤91	92-93	94-95	≥96				
Supplemental O_2			YES		NO				
Temp			<35.0	35.0-35.9	36.0-37.9	38.0-38.9	≥39.0		
Sys BP	<70	70-89	90-99	100-109	110-219				
Heart Rate	<40		40-49		50-89	90-110	11		
Level of Consciousness					Alert				

Examples





	1	2	3
e	• Sleep • Fussy but consolable	Irritable/inconsolable	• Lethargic • Confused • Reduced re pain
y refill 1 to 2 s	• Pale • Capillary refill 3 seconds	• Grey • Capillary refill 4 seconds • Tachycardia of 20 above normal rate	• Mottled • Capillary r seconds • Tachycard above norr bradycardi
Within normal parameters • No retractions	• >10 above normal parameters • Use of accessory muscles •≥30% Fio_2 •≥3 L/min	• >20 above normal parameters • ≥6 L/min • Tracheostomy and ventilator dependent	• Below nor parameters retractions • Grunting • 50% Fio_2 • ≥8 L/min

- A score of five or more is statistically linked to increased likelihood of death or admission to an intensive care unit.[1]
- Used as part of a "track-and-trigger" system whereby an increasing score produces an escalated response
- Varying from increasing the frequency of patient's observations up to urgent review

[1] *Subbe C.P., Kruger M., Gemmel L. (2001). "Validation of a modified Early Warning Score in medical admissions". Quarterly Journal of Medicine **94**: 521–6*

- PEWS helps to identify patients at **risk** for deterioration sooner and save lives![1,2,3]
  - ↓ cardiac arrests/code blue calls (1,3,4)
  - ↑ Increased MET/CCO calls (1,2,3)
  - ↓ unexpected deaths (2)
  - ↓ unplanned admissions to ICU (2)
- PEWS **empowers** nurses[3] to know when to:
  - Continue monitoring and routine care
  - Increase monitoring of VS and when to inform others of subtle changes
  - Notify the physician
  - Contact the MET/CCO team

[1] *Subbe C.P., Kruger M., Gemmel L. (2001). "Validation of a modified Early Warning Score in medical admissions". Quarterly Journal of Medicine **94**: 521–6.*
[2] *Morgan R, Williams F, Wright M (1997). "An early warning scoring system for detecting developing critical illness". Clin Intensive Care **8**: 100*
[3] *"A review of rapid response team activation parameters in New Zealand hospitals". Resuscitation **84**: 1040–1044. resuscitation.2013.01.022*

Limitations

- Based on normal parameters
- Variability of our patient's "normal"
- Difficulty in selecting a consistent tool

Solution?

Development of a New Tool

- Clinical experts familiar with patients
- Adjust parameters to ensure all our patients had the opportunity to escalate and de-escalate
- Developed escalation process
- Escalation based on variations from patient's norm

Methodology

- Retrospective
- Long-term care facility
- 16 Ventilated paediatric patients
- 344 observations

TOTAL EWS SCORE																										
CHANGE IN EWS SCORE																										EWS
Pain Score	Tool Used: N - NRS; F - FLACC; C - Comfort Scale; W - Wong Baker; B - Behavioral Pain Assessment / Activity: R - Rest; M - On Movement																									
	/ 10																									Pain Score
	Tool Used																									
	Activity																									
Staff Initials																										Initials
Staff ID#																										ID#

EWS SCORE INTERVENTIONS		
Increase of EWS Score by:	**Frequency of Vital Signs**	**Escalation/Reporting**
0 - 1	Daily	Shift in Charge
2 - 3 or Cumulative increase of EWS score by 2 or more over a 12hr period	q4hly	Shift in Charge, CC
≥ 4	q1hly	Shift in Charge, CRN, CC, Physician
Decrease of EWS Score by:	**Frequency of Vital Signs**	**Escalation/Reporting**
Any reduction in EWS score	If on q1hly, reduce to q4hly If on q4hly, reduce to Daily	Shift in Charge

If the nurse is at all concerend about their patient, they are to contact the SIC immediately, regardless of the patient's EWS score

Validity

- Clinical expert review
  - Published evidence
  - Should escalation have occurred?
  - Was escalation level appropriate?

Results

Number of Observations	Escalation Recommended by Panel of Experts	Escalation Recommended by PEWS	Correlation
344	25	28	112%

Number of Observations	Level of Escalation Recommended by Panel of Experts	Level of Escalation Recommended by PEWS	Correlation
344	25	26	104%

Reliability

- Inter-rater reliability
- Pilot group – 10 multi-cultural staff
- Repeated 1 week later

Results

Number of Observations	Correlation
10	100%

Conclusion

Given limited breadth of research:

Appropriate for our patient population

Requires further validation

Limitations

- Small sample size
- Unique sample/population size
- Limited number of observations
- Compliance


change
people
things
need
values
see
better
organisation
behaviour
behaviours
management
work
make
way
facts
knowledge
Change
assumptions
thinking
new
culture
Seddon
get
service
without
others
common
business
want
students
may
leaders
might
also
one
Senge
different
good
staff
egg
first
like
helpful
ideas
much
wrong
enough
great
rather
actually
understanding
difference
really
know
trust
Viral
challenges
point
case
often
use
many
changes
important
Deming
research
real
New
Press
Command
suggests
working
obvious
start
improve
right
Control
best
process
Freedom
employees
fear
care
think
improvement
organisations
misconception
system
resistance
integrity
keep
something
always
terms
people's
appear
understand
university
using
either
leaders
fact
influence
ways
key
world
never
meetingminds
conversations
around
happen
conservation
worse
support
although
challenge
Buckingham
viral
UK
impact
least
researchers
decisions
well
approach

Additional References

*Subbe C.P., Kruger M., Gemmel L. (2001). "Validation of a modified Early Warning Score in medical admissions". Quarterly Journal of Medicine **94**: 521–6.*

Morgan RJM, Williams F, Wright MM (1997). "An early warning scoring system for detecting developing critical illness". Clin Intensive Car 100.

*"A review of rapid response team activation parameters in New Zealand hospitals". Resuscitation **84**: 1040–1044.*

*"ViEWS—Towards a national early warning score for detecting adult inpatient deterioration". Resuscitation **81**: 932–937.*

http://www.rcplondon.ac.uk/resources/national-early-warning-score-news

http://www.wellingtonicu.com/Data/NZEWS%20Proposal.pdf

Brown, H. (2010). Graded Response Observation Chart (Leeds Teaching Hospitals Trust - Revision date: November 2012)

http://www.wellingtonicu.com/AboutUs/Services/EWS/

National Early Warning Score Development and Implementation Group (NEWSDIG) (2012). National Early Warning Score (NEWS): standa the assessment of acute-illness severity in the NHS. London: Royal College of Physicians.

National Institute for Health and Clinical Excellence. Clinical guideline 50: Acutely ill patients in hospital. London, 2007

"Acute care toolkit 6: the medical patient at risk: recognition and care of the seriously ill or deteriorating medical patient" (PDF). Royal Col Physicians of London. May 2013.

*Smith GB, Prytherch DR, Meredith P, Schmidt PE, Featherstone PI (Apr 2013). "The ability of the National Early Warning Score (NEWS) to discriminate patients at risk of early cardiac arrest, unanticipated intensive care unit admission, and death". Resuscitation **84** (4): 465–70.*

Modified Early Warning Score MEWS, document by The Management Team for the County Hospital of Sundsvall-Härnösand. 2011-02-07

Thank you