



Piloting a Pediatric Early Warning System (PEWS) for Emergency Departments in BC:

Results of the Richmond Hospital Research Study



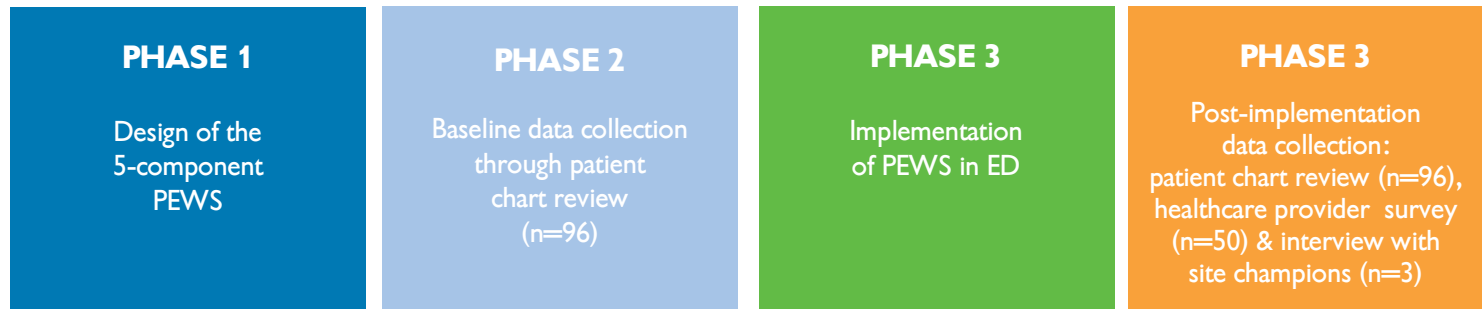
OVERVIEW

Pediatric Early Warning System (PEWS)

Global research has shown that failure to recognize and treat deteriorating hospitalized patients is a source of substantive unintended harm, including death, disability, and prolonged stay or readmission. Pediatric Early Warning Systems (PEWS) are used internationally to promote early identification and mitigation of deterioration in hospitalized pediatric patients.

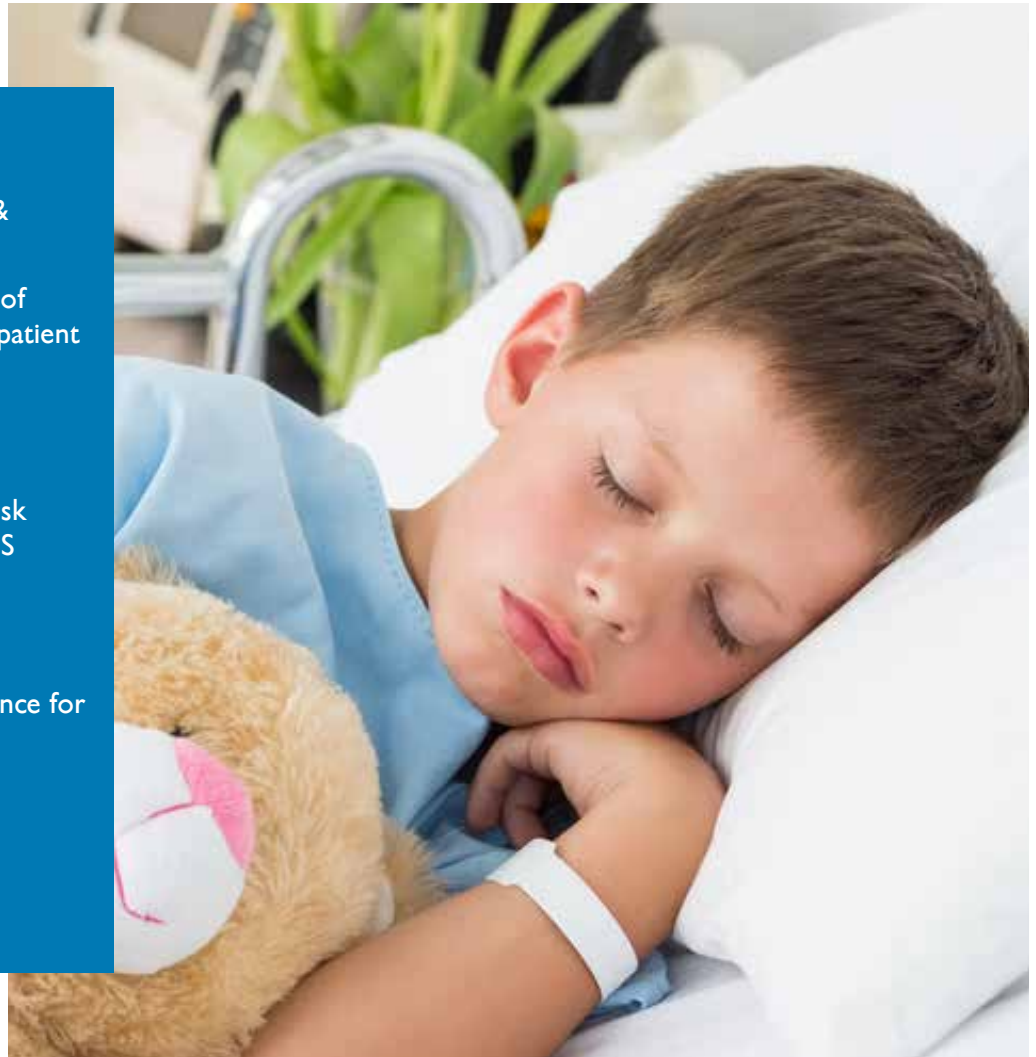
Richmond Hospital Implementation Pilot

Richmond Hospital, with a general ED serving approximately 6800 pediatric patients per year (roughly 12% of all patient visits) was out pilot site for PEWS in ED in British Columbia. The study was carried out in four phases in 2015-2017.



BOTTOM LINE FINDINGS

- Cumulative benefit from both CTAS & PEWS at triage
- Significant increase in documentation of physiological parameters throughout patient stay
- Elevated Situational awareness (with opportunity further improvement)
- “Watcher patient” useful to elevate risk profile & document risk beyond PEWS scoring
- Some challenges with false positives in scoring, time pressures in ED and adaptations needed to increase relevance for ED
- Pediatric knowledge and inter-team communication improved
- PEWS valued and useful in ED



What was the 5-component PEWS implemented in ED?

PEWS SCORE

The Brighton PEWS score is the most widely used and validated PEWS score for inpatient care.

It is a 13-point score based on behavioural, cardiovascular and respiratory status with extra points for frequent bronchodilator use or persistent vomiting following surgery. The PEWS scoring section is embedded in the flowsheet and is colour coded to provide a clear visual when vital signs are outside of the normal range.

PEDIATRIC ASSESSMENT FLOWSHEET

The double-sided flowsheet comprehensively outlines 24 hours of nursing assessment, including PEWS scoring, full head-to-toe assessment and documentation of routine nursing care such as fluid balance monitoring and safety checks. The flow sheets are available in six age grouping (0-3 months; 4-11 months; 1-3 years; 4-6 years; 7-11 years and 12+ years) based on naturally-occurring variations in Canadian Triage Acuity Scale (CTAS) vital signs norms.



SITUATIONAL AWARENESS

Situational awareness is an approach to identifying, predicting and addressing risk for patients. Tools to promote situational awareness were used within the unit including posters for visual cueing, staff reporting and flowsheet documentation of situational awareness factors: caregiver concern, watcher patient, unusual therapy and communication breakdown. The situational awareness factors are not included in the total PEWS score but elevate a child's risk profile and influence the escalation of care process.



ESCALATION GUIDE

The escalation guide outlines actions to support clinical decision making following assessment. Recommended mitigation actions (e.g. notification, reassessment, consultation) correspond to pediatric early warning scores and situational awareness factors. A quick-view of the escalation guide was embedded in the flowsheet.



COMMUNICATION FRAMEWORK

The SBAR (situation, background, assessment, recommendation) toolkit was used to improve communication between team members on the patient status.

S B A R

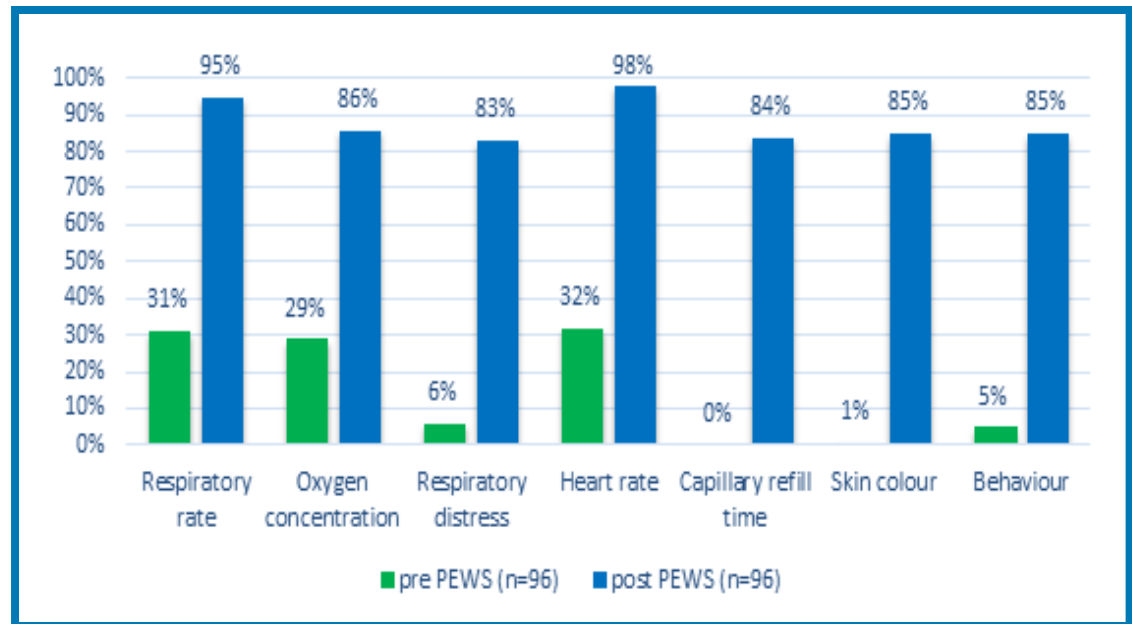
HIGHLIGHTS OF FINDINGS FROM THE STUDY

How did PEWS change pediatric assessment and documentation in ED?

With the introduction of PEWS scoring at triage, there was a 75% increase in rates of documentation of PEWS components (cardiovascular parameters, respiratory parameters and behavioural parameters).

Site champions and triage nurses reported that the thoroughness required for PEWS scoring assisted with the assignment of CTAS scoring.

Rates of consistent documentation (with every assessment) of physiologic parameters throughout patient stay pre & post PEWS



Do PEWS scores capture risk (deterioration) for pediatric patients?

Rates of documentation of situational awareness factors before and after PEWS

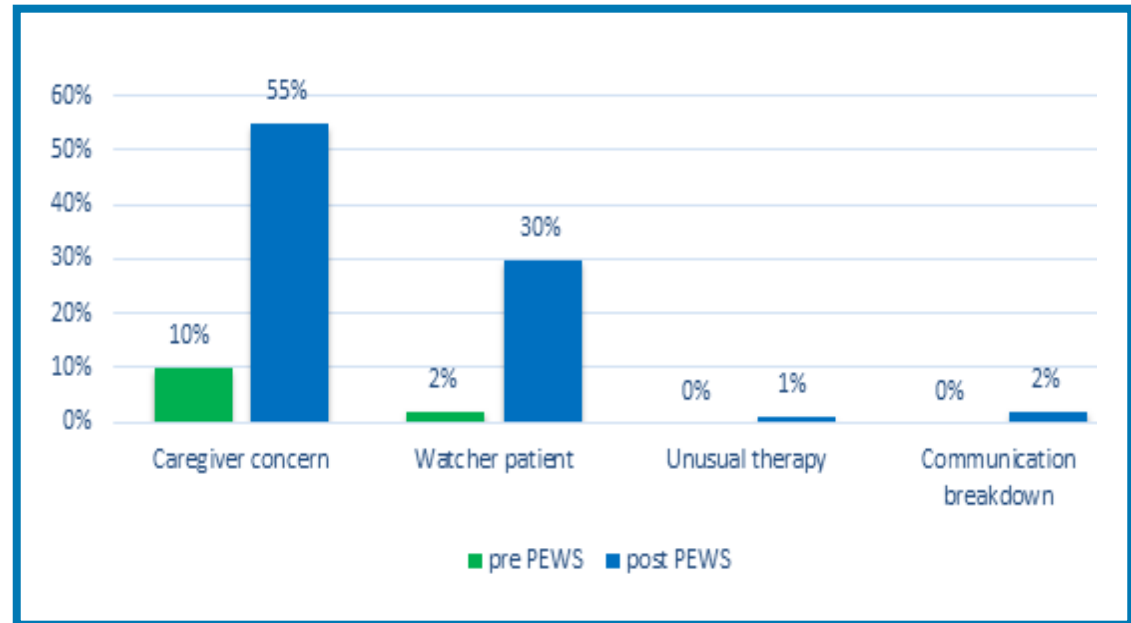
YES:

In 71% of records, the PEWS scores reflected the risk and in an additional 25% of cases the scores somewhat reflected the risk.

BUT:

PEWS score did not capture the risk for pain, surgery risk, self-harm, abnormal lab values, changes in neuro-vital signs.

It is important to note that PEWS scoring is only designed to capture early warning of physiologic deterioration. "Watcher patient" is an appropriate way to elevate a child's risk profile under these conditions.



What do ED nurses and physicians think of PEWS? (n=43)

HEALTH PROVIDER SURVEY RESULTS	Not at all/ to a slight extent	To a moderate extent	To a great/ very great extent
Change in knowledge			
Identification of abnormal clinical signs in pediatric patients	26%	16%	58%
Identification of situational awareness factors that increase risk to pediatric patients	35%	21%	44%
Mitigation of deterioration for a pediatric patient	23%	35%	42%
Escalation of care for a pediatric patient	25%	26%	49%
Influence on verbal communication			
Frequency of verbal communication	18%	31%	51%
Timing of verbal communication	21%	21%	58%
Enhanced clarity of verbal communication	23%	26%	51%
Outcomes of verbal communication	18%	36%	46%
Usefulness			
Pediatric assessment flowsheet	26%	32%	42%
PEWS score	21%	23%	56%
Situational awareness	38%	31%	31%
Escalation guide	19%	28%	54%
Communication framework	30%	33%	37%
Overall value to pediatric care in the ED	5%	16%	79%

What are some of the reported positive and negative changes with the introduction of PEWS in ED?



- Guides decisions on triage, escalation and supports earlier response as notification occurs faster
- Aids identification of abnormality and deterioration as well as prompts earlier identification
- Provides a standardized approach to assessment and escalation
- Provides a baseline and improves ability to trend and monitor across patient stay
- Improves ease, thoroughness and comprehensiveness of assessment
- Increases staff comfort with standardized vital signs norms and assessing pediatric patients
- Aids communication & notification between professionals
- Promotes better overall care for pediatric patients



- Some PEWS scores at triage are false positive, e.g. when a child is upset or has been given a medication of symptom relief
- Increases time and paperwork at triage (note: reported to improve with repeat usage)
- Duplication and redundancy with current ED paperwork (tools need tailoring to ED)
- Might be unnecessary for minor treatment patients
- Perception that it supersedes clinical judgement



KEY MESSAGES

- *The introduction of PEWS significantly increased documentation of physiological parameters at triage and throughout the patient stay. As these parameters are important for determining early risk, this represents a big gain in assessment practice.*
- Improvements in documentation of situational awareness factors post PEWS were noted; however there remains some opportunity to further increase consistent usage to elevate risk profile of pediatric patients.
- PEWS scores reflected the clinical picture of risk (deterioration) in the majority of cases but did not capture risk for some components such as pain, surgical risk, etc. These risks go beyond what the PEWS score was designed for and can be captured with situational awareness e.g. “watcher patient”.
- Physicians and nurses found benefit from using PEWS in ED because it enhances knowledge and confidence in providing pediatric care and improves communication. The PEWS score and the escalation guide was perceived to be most useful, whilst the situational awareness factors were reported as least useful. Overall value of PEWS was perceived to be high.

Using the evaluation results for planning and scale up, dissemination and practice change

Influencing provincial scale-up!

- On June 14, 2017 the Richmond evaluation results were presented at a provincial working group. The decision was made to move forward with a phased provincial implementation of PEWS in ED beginning in February 2018.

Informing re-design of a new PEWS for ED!

- Results informed the planning and redesign of a new system and strategy for ED. BC PEWS ED will include: 1) new ED-focused tools such as the Pediatric Emergency Nursing Assessment Record with PEWS scoring inserts; and 2) a targeted provincial education strategy including online training modules and regional trainer workshops that address issues highlighted by the Richmond team.

Sharing with the world!

- To share learnings with the broader international healthcare community, manuscripts and abstracts are being developed for peer review journals and conference.

Receiving national recognition!

- The pilot study was shared in a poster at the annual CAPHC (Canadian Association of Pediatric Health Centres) conference in Montreal in October 2017 where it won the award for systems innovation.





We acknowledge the Richmond Hospital Emergency Department in their dedication to innovation that promotes better care for children.

Thank you to BC Children's Hospital Foundation for their support of Child Health BC.

