

# Improving Pediatric Emergency Vital Sign Monitoring Using an Early Warning Score-based Protocol

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## Problem Statement

In the past two years, U.S. Pediatric Emergency Department's (PED) have seen a 25.4% in patient acuity. A lack of frequent and accurate vital sign (VS) monitoring is a significant clinical problem that can lead to poor patient outcomes such as missed clinical deterioration, patient transfer, and failure to rescue.

### Local Problem:

- Currently, only **45%** of high acuity patients (ESI 1-3) presenting to a 13- bed community PED are receiving VS monitoring per the standard of care (every 2 hours).
- Poor VS monitoring has resulted in delay in treatment, missed clinical deterioration, and necessary patient transfer to higher level of care at this PED.

## Purpose and Goals

The **purpose** of this Quality Improvement (QI) project was to implement a Pediatric Early Warning Score (PEWS)-based VS protocol to improve VS documentation adherence, staff satisfaction, number of patients transferred to higher level of care, and frequency of provider reassessment.

### Process Goals:

- 100% of PED providers will place PEWS-based VS orders for patients given an ESI score of 1-3 in triage.
- 100% of PED nurses will obtain, document and review the VS and PEWS Q 2 hours.

### Outcome Goals:

- Increase number of Provider reassessments while in the PED.
- Decrease number of outside transfers for higher level of care.
- Increase staff satisfaction with VS monitoring process in the PED.

## Methods

**Setting:** A 13-bed community Pediatric Emergency Department with no onsite Pediatric Intensive Care Unit.

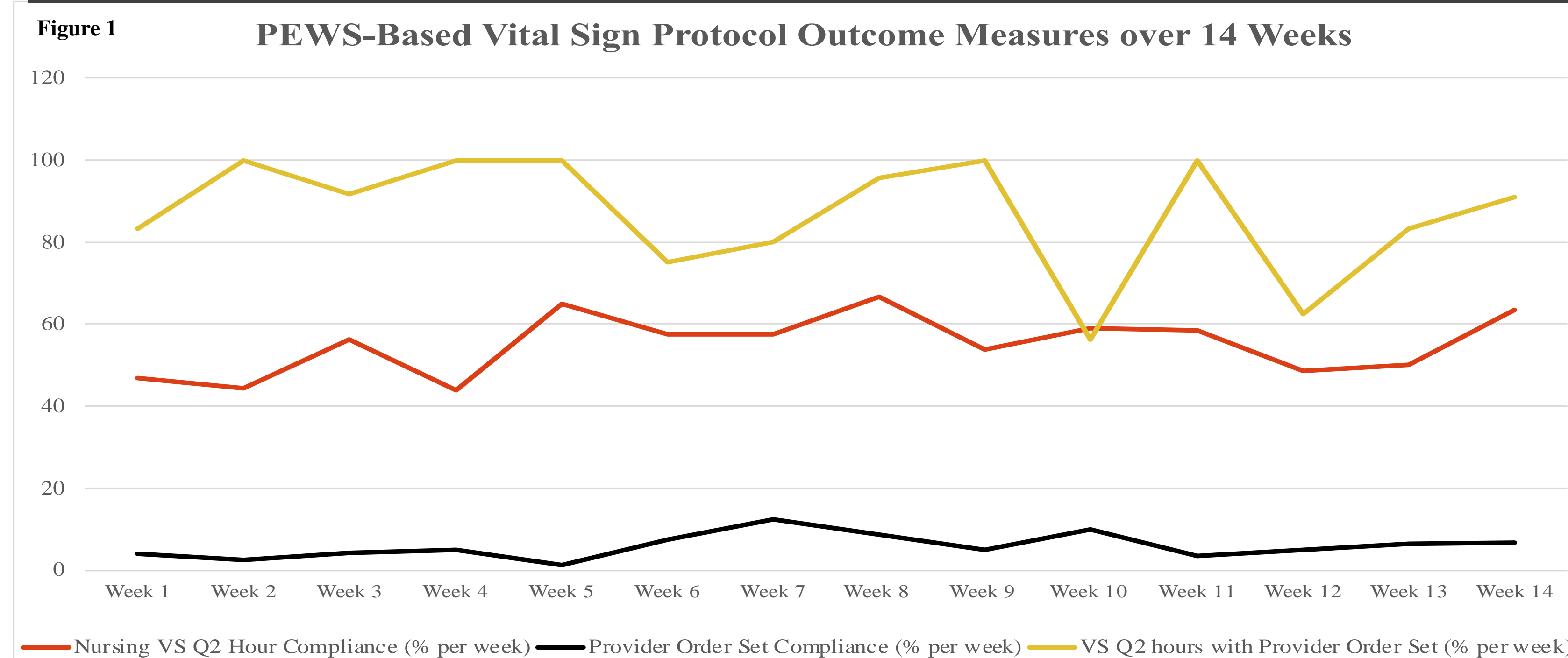
**Population:** All pediatric patient (age 1 day- 18 years old) admitted to the PED with an Emergency Severity Index (ESI) score of 1-3 at triage.

**Interventions:** A pre- and post- implementation design was utilized over a 14-week period. Pre- implementation data was collected retrospectively between the months of September and December 2021.

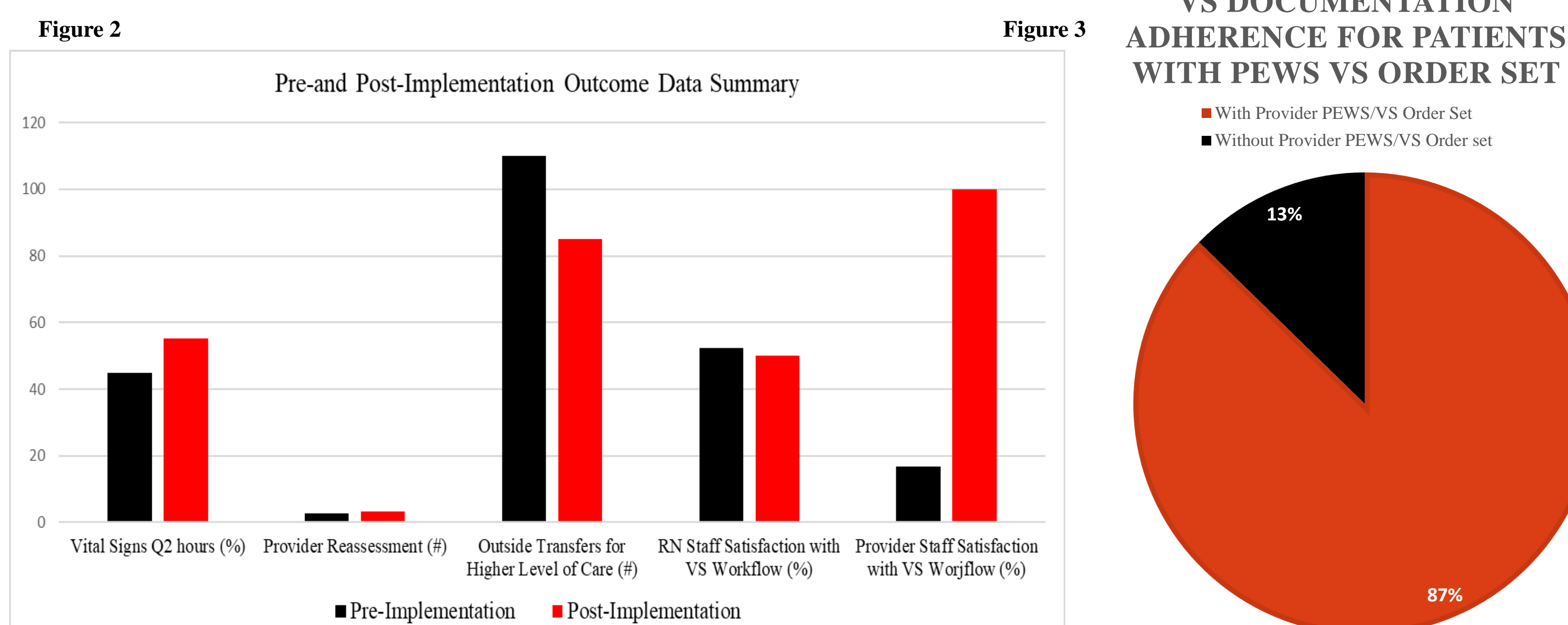
The **PEWS- based VS Protocol** included:

- Policy and procedure
- VS workflow
- PEWS-based VS order sets
- Changes to the electronic health record (EHR)
- PEWS Response Algorithm to guide interventions.

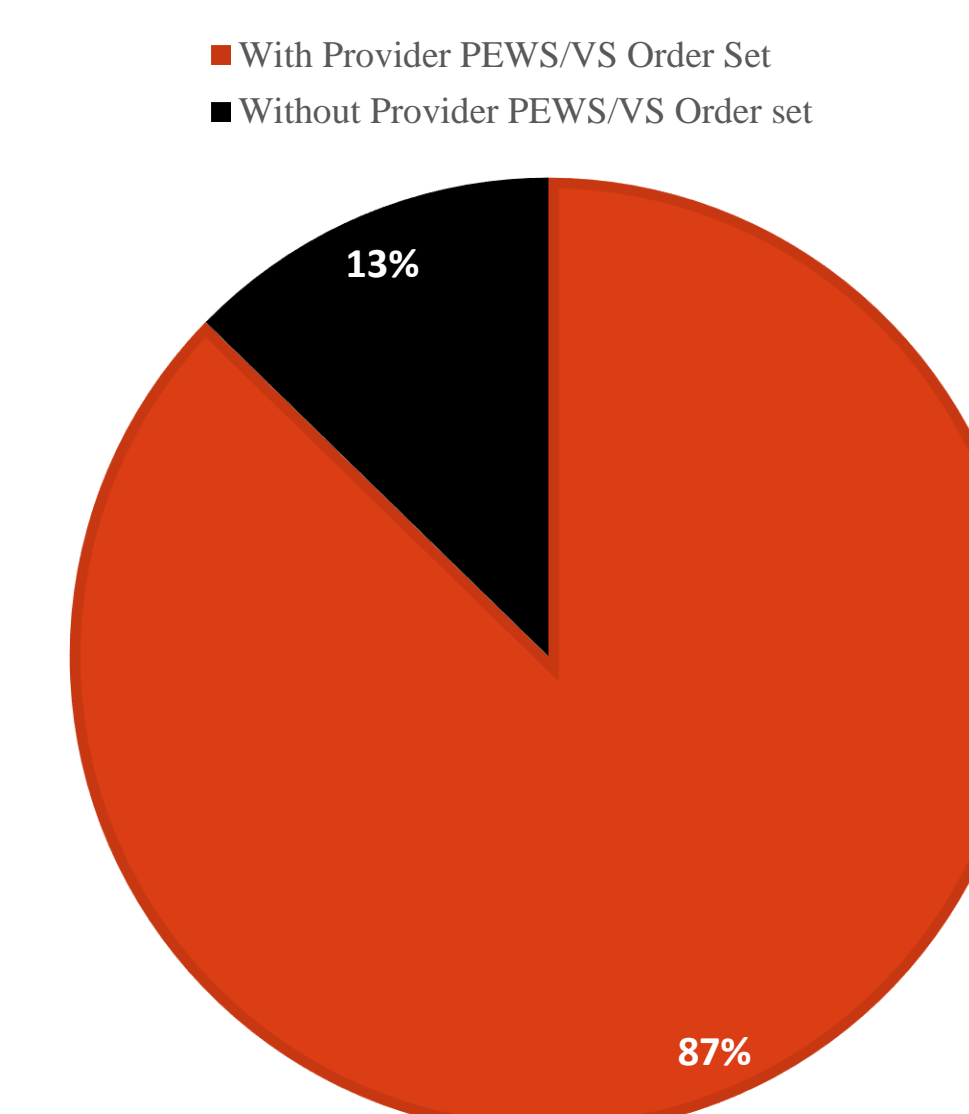
## Figures



Note: All values plotted are % of compliance each week of implementation; N= 1416



### VS DOCUMENTATION ADHERENCE FOR PATIENTS WITH PEWS VS ORDER SET



## Results

### Process Goals:

- Average VS documentation adherence was 55.1%, which demonstrates a 10.1 % increase from pre-implementation (45%)
- PEWS-based VS order set adherence increased by 5.9% from pre-implementation (0%).
- Adherence to VS documentation was 87% for patients with a PEWS-based VS order set placed.

### Outcome Goals:

- Number of provider reassessments increased from and average of 2.1 to 3.3.
- Number of transfers for higher level of care decreased from 110 (3.5%) to 85 (2.3%).
- Staff satisfaction scores for VS workflow were unchanged for nurses but increased by 84% for providers.

## The PEWS-based VS Monitoring Protocol

Please scan the QR code for access to the workflow, EHR changes and Algorithm used for this PEWS-Based VS Monitoring Protocol.



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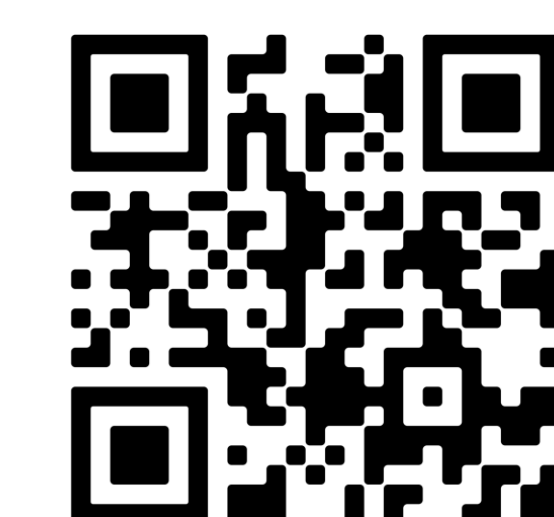
## Discussion

- While order set adherence only increased by 5.9%, it was discovered that 87% of patients with a PEWS VS order set were adherent to VS monitoring guidelines. This suggests that the PEWS VS order sets increase VS monitoring and documentation adherence.
- High acuity medical transfers were reduced from 3.5% to 2.3%. However, other unforeseen variables such as the RSV Crisis and lack of PICU bed availability could also attribute to this finding.
- Despite high interest in the project there were numerous barriers that affected implementation including high patient volume, increased acuity, a national RSV surge, and staffing challenges.
- **Recommendations and Sustainability:**
  - Introduce one piece of the workflow at a time.
  - Longer education period with more face-to-face instruction.
  - Modifications to order sets for infant population.
  - Increase buy-in from staff nurses and Quality Improvement team on unit.
  - Quality improvement team and nursing leaders to oversee further development of project.

## Conclusions

**Practice Implications:** Overall, VS documentation adherence increased after implementation of the PEWS-based VS Protocol. The findings suggest that the utilization of PEWS VS order sets increase adherence with VS monitoring and documentation.

## References and Acknowledgments



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This project was completed in partial fulfilment of the requirements for successful completion of the Doctor of Nursing Practice degree. This project would not have been possible without the incredible contributions of the medical and nursing staff at this Mid-Atlantic Magnet Hospital. Thank you for your hard work and dedication to the pediatric population!