



Who/where

Children's Hospital of Georgia,
Augusta, Georgia

Challenge

Manually calculated Pediatric Early Warning Scores (PEWS) can be difficult to calculate, subjective, and may not be entered into the electronic medical record in a timely and accurate manner, slowing the care team's awareness of – and response to – patient deterioration. Response times and the use of PEWS has several benefits including possibly reducing ward cardiac arrests and mortality.¹

Solution

Philips Patient Deterioration Solution with automated Early Warning Scoring identifies significant deviations in a patient's vital signs at the bedside, automatically verifies the accuracy of the trend to reduce false alerts, and notifies caregivers for early intervention.

Results

Using the Philips solution, Children's achieved a 100% PEWS accuracy rate on the pediatric surgery floor.² The solution identifies early signs of deterioration for timely response and supports appropriate use of the Pediatric Evaluation Team (PET).

Support patient care through automating bedside clinical decision support

In 2012, Children's Hospital of Georgia, part of Augusta University Health System, implemented a manual Pediatric Early Warning Scoring (PEWS) protocol to identify patients at risk of deterioration. The protocol established a basis for nurses to detect abnormal vital signs and trends so they knew when to call their rapid response Pediatric Evaluation Team (PET).

While the protocol was helpful, the hospital found that manual documentation sometimes led to incorrect PEWS, because of the complex manual algorithm and data input errors. Also, vital signs collection and documentation took up to one hour for ten patients, which delayed conveying results to care providers and decreased face-to-face time with patients.

Leveraging technology

In 2013, Philips and Augusta University Health System entered into an industry-defining, long-term partnership to support clinical growth, increase patient throughput, improve operational performance, and reduce costs. One goal of the partnership was to leverage technology like intelligent algorithms and predictive trend analytics to aid clinicians in identifying patients at risk, optimize rapid response escalations, and potentially provide better patient care.

To help meet this goal, Children's implemented the Philips Patient Deterioration Solution, which consists of Philips IntelliVue MP5SC vital signs monitors, IntelliVue GuardianSoftware, and Philips Professional Services. The vital signs monitor calculates PEWS, while the caregiver is with the patient, according to each hospital's protocol and sends it to IntelliVue GuardianSoftware, which analyzes trends and alerts caregivers of patients at risk of deterioration.

"Automatic calculation gives caregivers support to call for the additional resources that their patients may need," says Kim

Basso, Director of Women and Children's Services. "It is important to get results in the record in a timely manner, and to have the data at our fingertips to be able to make decisions proactively rather than reactively."

"The implementation of the Philips system has made nursing documentation very easy," adds Dr. Renuka Mehta, professor, Department of Pediatrics at the Medical College of Georgia at Augusta University and medical director of the CPR committee.

"The staff spends less time working in the electronic medical record system because PEWS

are available at the bedside immediately when the vital signs have been taken. This has also increased staff satisfaction because they don't have to spend time remembering all the elements of PEWS scoring."

Eliminates human error

The Philips Patient Deterioration Solution also eliminates the potential for human error in recording vital signs. After implementing automatic PEWS, inaccuracies were reduced by 75% on the medical floor³ and 100% on the surgical floor.²

Amy Bales, nurse manager in the pediatric ICU, points out, "With (the solution), you scan the patient and the vital signs go directly from the monitor to (IntelliVue GuardianSoftware). There's no chance that you assigned the data to the wrong patient or wrote the numbers down wrong."

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Automatic calculation gives caregivers support to call for the additional resources that their patients may need. ”

Kim Basso, Director of Women and Children's Services



Variations in vital signs ranges make manual PEWS challenging

In addition to entry error, determining if vital signs are normal for pediatric patients is challenging because of the wide variation in normal ranges depending on the patient's age. "Vital signs changes with age, and we take care of patients between the age of zero to 21 years," Dr. Mehta says. "It isn't easy to remember the values for different ages, especially for inexperienced nurses. There are also many elements in the calculation of PEWS scoring, and that also is not easy for the nurses to remember all the time."

Susan Hood, R.N., notes that in past audits of the manual PEWS protocol, heart rate scoring posed a significant risk of error. "Heart rate is your objective data of perfusion. Because of the wide variety of ages, which in pediatrics can range from

60 to as high as 200," she explains. "A patient can be pink and warm and well-perfused, but with an elevated heart rate. And that is your first sign that something is wrong."

"Because nurses are used to seeing high heart rates, they sometimes scored them manually as normal

in the teenage population, and didn't initiate a PET call," she adds. "But the Philips system automatically compares the heart rate to the correct age parameters, and scores it appropriately."

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The Philips system automatically compares the heart rate to the correct age parameters, and scores it appropriately. ”

Susan Hood, R.N.



PET escalations increase

The pediatric medicine floor saw an 80% increase in PET escalations after the Philips solution was implemented.³ “The PET escalation is actually a good outcome,” Dr. Mehta explains. “Because we have more accurate PEWS scoring, the nurses have been able to make a PET call so that patients are getting appropriate management in a timely fashion.”

Solution provides confidence for less experienced staff

Like many hospitals, Children’s faces staff shortages and turnover, and uses floating staff as part of its staffing strategy. The Patient Deterioration Solution has helped Children’s mitigate the challenges of using caregivers who are not experienced with the PEWS protocol.

“We’re always getting new nurses in, and they may not have used PEWS in another hospital,” Hood says. “However, when you have a system that has PEWS already built in, it helps them understand it better.”

“One of the key components to being able to support staff is giving them the confidence to know that they’re making good decisions when they’re at the bedside,” Basso adds. “Especially for night shift staff when there are fewer people around, having technology that supports them in being able to make decisions in really tenuous situations is critically important.”

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**Dr. Renuka Mehta, Professor,
Department of Pediatrics,
Medical College of Georgia**



Provides nursing support

The Philips solution supports good nursing. Dr. Mehta says, “I feel confident that we have had patients on the floor who were becoming critically ill and having subtle changes that might not be picked up on, and trends that might not otherwise have been noticed as quickly – but have been detected quicker due to the use of the (Philips) system.”

Looking forward

Augusta University Health Systems and Philips will continue their partnership dedicated to providing breakthrough family-centered care, while ensuring the best possible working environment for staff.

Results at a glance



80% increase in PET escalations on the pediatric medicine floor.³



75% reduction in inaccuracies on the medical floor.³



100% reduction in inaccuracies on the surgical floor.²

1. Bonafide CP, Localio AR, Roberts KE, Nadkarni VM, Weirich CM, Keren R. Impact of rapid response system implementation on critical deterioration events in children. *JAMA Pediatr.* 2014 Jan;168(1):25–33.
2. Customer data over 7 month period in 2019 in unit 5CMC – Pediatrics Surgery.
3. Customer data over 7 month period in 2019 in unit 4CMC –Pediatrics Medicine.

