How a Pediatric Early Warning System (PEWS), Simulation, and High Reliability Units are leading the Journey towards Zero Harm

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Objectives

■ Integrate an early warning system to improve patient outcomes
■ Simulation to promote your patient safety program, it’s more than just mock codes
■ Engage High Reliability Units to improve processes and implement change
Hospital Information

- 14 floors
- 234 bed private and semi-private rooms
- 150 pediatric physician specialists, representing >50 pediatric specialties
- Member of Spectrum Health System
- Magnet recognition since 2009
- Partners with HPI since 2007
Hospital Information…

Each year:
- 7,700 children admitted for inpatient care
- 7,500 surgeries
- 50,000 children treated in the ED
- 95,000 ambulatory visits to pediatric specialists
Pediatric Early Warning System (PEWS)
Background

- 2006-2010 Pediatric Urgent Response Team (PURRT)
- 2010 implemented AWARE team
- Goal:
  - Prevent codes outside of the PICU
  - Decrease number of unplanned admissions to the PICU
  - Early recognition and response
- Why:
  - 50% of PURRT events resulted in code interventions
  - Little differentiation between PURRT and Code Team
  - Unclear when to call a PURRT vs Code
  - Early warning system was non-existent
Background Data

Graph showing the trend of Codes and PURTS from 2005 to 2009.

Bar chart comparing Code Intervention and No Code Intervention with Code frequencies of 13 and 39, and PURT frequencies of 18 and 1.
PEWS

- Pediatric
- Early
- Warning
- System
PEWS

- Scoring system to quantify risk of future code events
- Studies have shown use of an early warning system in pediatrics has decreased “code blue” events
- Gives an objective score with defined criteria on when to call for assistance, based on patient age
- PEWS score evaluates:
  - Behavior/Cognition
  - Respiratory status
  - Cardiovascular status
  - Vital Signs
PEWS

- Automatically fires as a nursing task minimally every 4 hours
- There is defined responses based on the score
  - Higher PEWS score = more frequent evaluation
  - Pre-set level that prompts RN to call AWARE team
- Color coded results
  - Automatic display on electronic white boards
PEWS

**Score 0-2 = GREEN**
- Reassess PEWS every 4 hours

**Score 3 or 4 = YELLOW**
- Consult with another RN on the floor
- Reassess PEWS every 2 hours

**Score ≥ 5 = RED**
- AWARE team activation
- Reassess PEWS every 1 hour

An individual score of 3 in any category activates the AWARE team.
# Pediatric Early Warning System

## Respiratory Assessment
- **RR 20-40**
  - Unlabored
- **RR 18-19**
  - RR 41-53
  - FiO2 30 to < 40%
  - Oxygen 1 to 2 lpm
- **RR 14-17**
  - RR 54-58
  - Retractions
  - FiO2 40 to < 50%
  - Oxygen > 2 to 4 lpm
- **RR < 14**
  - RR > 58
  - Grunting
  - FiO2 equal or > 50%
  - Oxygen > 4 lpm

### Respiratory Score

## Behavior Assessment
- **Appropriate**
  - At baseline
- **Sleepy but arousable**
  - Irritable and consolable
- **Irritable or agitated**
  - Not consolable
- **Lethargic or confused**
  - Reduced pain response

### Behavior Score

## Cardiovascular Assessment
- **Pink**
  - Capillary refill equal or < 2 sec
  - HR 90-150
- **Pale**
  - Capillary refill equal to 3 sec
  - HR 81-89
  - HR 151-164
- **Grey**
  - Capillary refill equal to 4 sec
  - HR 69-80
  - HR 165-179
- **Grey/Mottled**
  - Capillary refill equal or > 5 sec
  - HR equal to or < 68
  - HR equal to or > 180

### Cardiovascular Score

## High Risk Considerations
- **None**
- **Tracheostomy**
- **Nebulizer Q2 hours**

### PEWS Total Score
- **Reassess PEWS in 4 hours per protocol**

### PEWS Score 0-2 Click Here
- **Reassess PEWS in 2 hours per protocol**
- **Per physician order reassess in 4 hours**

### PEWS Score 3 or 4 Click Here
- **Per physician order reassess in 2 hours**
- **Per physician order reassess in 4 hours**
- **Reassess PEWS in 1 hour per protocol**

## Temp in Celsius
- **DegC**

## Temp Route
- **bpm**

## Pulse Type
- **breaths/min**

## Resp Rate
- **mm Hg**

## Blood Pressure
- **mm Hg**

## NIBP Mean

## BP Method
- **Pulse Oximetry**

## Pulse Oximetry Device
- **Oxygen Percent**

## Oxygen Device
- **Oxygen Flow Rate**

## Oxygen
- **L/min**
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**Resident Schedule**

- **8am - 3pm:**
  - **Miguel Rodriguez:** 267-5555
  - **Miguel Martinez:** 267-5555

- **3pm - 8am:**
  - **Miguel Rodriguez:** 267-5555
  - **Miguel Martinez:** 267-5555

**On-Call Schedule**

- **8am - 3pm:**
  - **Miguel Rodriguez:** 267-5555
  - **Miguel Martinez:** 267-5555

- **3pm - 8am:**
  - **Miguel Rodriguez:** 267-5555
  - **Miguel Martinez:** 267-5555
Response to PEWS Score 0-2 (Green)

Patient on General Pediatric Unit at HDVCH

PEWS criterion documented by RN:
- Upon Admission
- At ordered vital sign frequency
- If clinically indicated

PEWS score assigned

PEWS Score 0-2

Patient RN documents score.

Patient RN reassesses patient in four hours.

Validate and verify any clinical disparities. Examples could include:
- Parent vs. Clinician
- Clinician vs. Clinician
- Assessment tool (PEWS) vs. Clinician

An assessment should be completed by an additional healthcare partner.
Response to PEWS Score 3-4 (Yellow)

PEWS criterion documented by RN
• Upon Admission
• AI ordered vital sign frequency
• If clinically indicated

PEWS assigned

PEWS Score 3-4

Patient RN documents score.

Patient RN contacts the Primary service provider to come and assess the patient.

Is the PEWS score of 3-4 a result of a score of 3 in any one category?

Patient RN contacts Charge Nurse who assesses the patient.

Are interventions necessary?

No

Per physician judgment, is it necessary to reassess in two hours?

Yes

Patient RN reassesses patient in two hours.

No

Resident physician reviews reassessment frequency with Attending physician.

Reassessment frequency reduced to every 4 hours with Resident documentation regarding reasoning why.

Patient RN reassess every 4 hours and assign PEWS score.
Advanced Warning And Response Event

Responders:
- PICU Charge Nurse
- Unit Charge Nurse
- Respiratory Therapist
- Senior Resident
- Floor Intern
- Hospital Supervisor
When do I active an AWARE?

- Sudden change in VS
- Sudden change in patient condition
- Anytime a provider has a concern about the patient's status
- Anytime a provider feels that they are not receiving an appropriate response to a voiced concern
- PEWS score of “5” or greater or a “3” in any category
Other Considerations

- The AWARE team can be called anytime there is a concern about a patient or anytime the patient has a sudden change in their status.
- You need a physician’s order to deviate from the PEWS reassessment protocol:
  - Only after the patient has been evaluated by the AWARE team.
  - Should be the exception, not the rule!
- Anytime a “red” patient’s clinical condition changes, the AWARE team needs to be activated again.
Evaluation

- If an AWARE is called the team will come back after an hour to check on that patient
- There will also be an electronic evaluation form to fill out to assist in tracking data
  - Intimidating behaviors
  - Equipment issues
- Rescue Committee reviews each event (AWARE or Code)
Pediatric Early Warning System (PEWS) Score Break-Down:
  Respiratory (0-3): 2
  Behavior (0-3): 0
    High risk considerations (+1 for each)
      Tracheostomy: _
      High flow nasal cannula: _
      Every 2 hour nebulized treatments: _
  Cardiovascular (0-3): 3

Total Score: 5

Update from Nursing:
Febrile to 38.3 with tachycardia

Vital Signs:
Temperature 37.6 (14:57)
Systolic Blood Pressure 132 (14:57)
Diastolic Blood Pressure 86 (14:57)
Pulse 96 (14:57)
SpO2 No result
Respiratory Rate 16 (14:57)

Pertinent Physical Examination Information:
C/o of headache, no abdominal pain, no guarding or rigidity

Initial Interventions:
Tylenol for fever. 20 cc/kg NS bolus.

Communicated with AWARE Team: Yes

Attending Physician notified (name): Veenema
RN NAME,

Since the inception of the PEWS, the Children’s Hospital has significantly decreased the number of Code Events outside of the ICUs and decreased the number of unplanned transfers to the ICU. Early recognition and intervention clearly makes a difference – Thank You!

You were caring for a PATIENT NAME who had an AWARE called on (MM/DD/YYYY). Please take a moment to give us feedback regarding your recent AWARE event by clicking on the link below.

AWARETeamEvaluation

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**AWARE Team Evaluation**

To ensure that all bedside caregivers feel supported in escalating patient care concerns and to make the AWARE Team response as effective as possible, the HDVCH Rescue Committee reviews all AWAREs. Please take a moment to provide feedback regarding your recent AWARE event.

Please provide your name.

[Input field]

Please provide the date that the AWARE was called.

[Input field]

Please provide the initials of the patient who had the AWARE Team Activation.

[Input field]
Did you feel that any of the AWARE Team responders refused to answer any questions?
- No
- Yes

Did you feel that any of the AWARE Team responders used condescending language or tone of voice to you during the event?
- No
- Yes

Did you feel that any of the AWARE responders exhibited impatience during the event?
- No
- Yes

Did you feel that any of the AWARE responders exhibited verbal abuse during the event?
- No
- Yes

Did you feel that any of the AWARE Team responders exhibited negative or threatening body language during the event?
- No
- Yes

Did you feel that any of the AWARE Team responders threatened to report you to an upline during the event?
- No
- Yes

Did you have all of the equipment and supplies to complete necessary interventions? If 'No', please explain.
- Yes
- No

Were the roles of the responders clearly defined? If 'No', please explain.
- Yes
- No

Did you feel that anyone discouraged or deferred you from alling the AWARE Team? If 'Yes', please explain.
- No
- Yes

Did you receive any negative feedback after calling the AWARE Team? If 'Yes', please explain.
- No
- Yes

Please share any additional comments regarding the AWARE Team activation or response.

Thank you for your participation. Please click 'NEXT' to submit your responses.
AWAREs – Urgent Transfers – Codes
PEWS in the ED

0-2 = Green
- Give score to receiving RN and proceed with admission as planned

3-4 = Yellow
- Give score to receiving RN and proceed with admission as planned

>5 = Red
- ED attending to re-evaluate patient before report is called

Note: a Red patient may still be admitted to the Acute Care Floors
Computer downtime experience from ____ (time) to ____ (time). Data was collected by ____ (care giver name).
Data was entered from downtime documentation into the computer by ____ (name of individual entering data).

<table>
<thead>
<tr>
<th>0-&lt;3 months</th>
<th>Respiratory</th>
<th>Behavior Score</th>
<th>CV</th>
<th>Extra Points</th>
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<td>RR 25-60</td>
<td>Appropriate</td>
<td>Pink</td>
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<td>Unlabored</td>
<td>At baseline</td>
<td>CR ≤ 2sec</td>
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<td>___</td>
<td>HR 115-169</td>
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<td>RR 20 – 24 OR</td>
<td>Sleepy but arousable</td>
<td>Pale</td>
<td>1</td>
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<td>RR 61 – 72 OR</td>
<td>Irritable &amp; consolable</td>
<td>CR = 3 sec</td>
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<td>FiO₂ 30-&lt;40% OR</td>
<td>Not consolable</td>
<td>HR 105-114 OR</td>
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<td>Oxygen 1&lt;2 lpm</td>
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<td>HR 170-183</td>
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<td>RR 17 – 19 OR</td>
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<td>Grey</td>
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<td>RR 73 – 78 OR</td>
<td>Not consolable</td>
<td>CR = 4 sec OR</td>
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<td>Retractions OR</td>
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<td>HR 86-104 OR</td>
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<td>FiO₂ 40%-&lt;50% OR</td>
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<td></td>
<td>Oxygen 2&lt;4 lpm</td>
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<tr>
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<td>RR &lt;17 OR</td>
<td>Lethargic or confused</td>
<td>Grey/Mottled</td>
<td>3</td>
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<tr>
<td></td>
<td>RR &gt;78 OR</td>
<td>Reduced pain response</td>
<td>CR ≥ 5 sec OR</td>
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<td>Grunting OR</td>
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<td>HR ≤85 OR</td>
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<tr>
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<td>FiO₂ ≥ 50% or</td>
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<td>HR &gt;200</td>
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<tr>
<td></td>
<td>Oxygen &gt; 4 lpm</td>
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**Extra Points**
- Tracheostomy
- Nebulizer q2h

**TOTAL PEWS SCORE:**
Using Simulation to Reach your Goal of Becoming a High Reliability Organization (HRO)
Simulation Program
Just in Time—What you need, When and Where you need it

■ Using Current Information
  ■ Current patient with high risk for decompensation
  ■ An issue that was discussed in your daily check-in
  ■ A recent safety event
■ Don’t wait, disseminate information and act on it
■ Execute using high or low fidelity simulations (active learning)
Overview: Just in Time Simulation

- Identify a *current* patient on the floor that is high risk or potential for deterioration in clinical status
- Execute a high fidelity simulation of this “possible event/deterioration” with the patient’s care team (e.g., nurses, residents, attendings, RT’s, pharmacy)
- Use the patient’s real weight-based dosing
- Focus on only a few specific objectives
- Debrief on scenario: objectives of case, communication, lessons learned
Incorporate the need to knows

- Safety behaviors
- Time outs
- Brief-execute-debrief
- Recognition of illness
- Existing protocols
- Proper handoffs
- Interdisciplinary teamwork
- Role definition
Lessons learned and accountability

Lessons learned from simulations need to filter back to appropriate committees to adopt change or institute further curriculums

- Safety Team
- High Reliability Team
- Pharmacy Manager
- Nursing Educator
- Residency Director/Chiefs
How to start on your units

High Fidelity:
- Recruit champions that will brief and debrief
- Nurse manager to cover nurses while they are participating
- Pick a time and do it!!
  - Logistics: run scenario a few times to include all nurses
- Always brief prior
- Have medical and safety staff there for most effective feedback
High Reliability Units
MDI board

- Visual display of daily improvements
- Kamishibai Rounding
  - Hospital Acquired Conditions (HACs)
  - Relationship Based Care (RBC)
  - Nursing Sensitive Indicators (NSI)
- Safety & Quality Swim Lane
  - Incident reporting
  - SSE, PSE, NME data
  - “Days Since Last…”
- Golden Tickets
- Communication
  - “Watcher” Patients

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** Improvement Opportunity **

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<tr>
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<td>Why is it happening?</td>
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<td>Potential Solution:</td>
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<td>Impact: (Circle one) Safety &amp; Quality, Pt Experience, Strategic Growth, Financial Stewardship, Developing Talent &amp; Performance</td>
<td>Quantify:</td>
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MDI boards
Kamishibai Cards
### Card Attributes

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<td>Please check for all of following:</td>
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<td>• Are the date, nurse, and NT updated?</td>
<td>• Are the date, nurse, and NT updated?</td>
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<td>• Is the activity up to date?</td>
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<td>• Is diet up to date?</td>
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<td>• Does the patient have a meaningful goal?</td>
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<tr>
<td>• Round in one patient room</td>
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**Pass Criteria:**
- The whiteboard has the correct documentation as identified above
- Goal towards D/C identified

**Fail Criteria:**
- The whiteboard does not have the correct documentation as identified above
- Goal towards D/C is not identified

**Follow-Up:**
Discuss concerns about whiteboard accuracy with the nurse and NT

---

**Instructions**
Each Audit Should Take Less than 5 Minutes to Complete!

---

**Name of Audit**
**Area**
**Audit Question**
**Audit Details**
**Follow Up Details**
**Instructions**
**Card #8: HDVCH Fall Risk**

**NSI**

**Drive Exceptional Value/Accountability**

Identify an RN who is caring for a patient; together go into the patient's room.

Verify that the:
- JACCK AND JILL Fall Risk Assessment tool is completed appropriately.
- If the patient is at risk for falling (score of 5-13), check that:
  - Ask the RN if patient's fall risk status was communicated in handoffs and huddles.
  - Fall risk door signage.
  - Patient yellow fall wristband.
  - Parent education is documented.
  - Appropriate interventions have been documented.

**Pass Criteria:**
- All items are in compliance

**Follow-Up:**
- Give in the moment praise for keeping the patient safe.

**Fail Criteria:**
- One or more listed items are non-compliant.

**Follow-Up:**
- In the moment, educate as appropriate for fall prevention.
- Ensure nurse addresses non-compliant item(s).
Leadership rounding
Apparent Cause Analysis (ACA)

- Department focused approach to evaluating an event
- Focus on PSE and NME
- Detection of inappropriate acts (What happened)
- Detection of weakness in the system (Why it happened)
- Identify action items and assign ownership
Cause Analysis Teams

- High Reliability Mentor
- Bedside Nurses
- Quality Improvement Specialist
- CNS
- Unit Leadership Representative (Manager/Supervisor)
ACA Toolkit

- Standard work for ACA’s throughout the system
- Event summary provided to the executive, risk, and safety lead
- Ability to track and trend data for Common Cause Analysis
Questions?

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Helen DeVos Children’s Hospital of Spectrum Health