Increased situational awareness to reduce undetected deterioration

SPSP Paediatric Care WebEx
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Objectives

• Understand the concept of Situation Awareness and its application in health care
• Describe how huddles, proactive risk assessment and mitigation plans are used to improve patient safety
• Share ideas and ongoing work to further leverage patients, families, care teams and big data to improve situation awareness and patient safety
Clinical Example

• 6 month old is admitted to floor with acute gastroenteritis is initially improved after 2 fluid boluses in ED
• Begun on maintenance fluids but diarrhea increases
• Overnight parents note he is less playful
• Later heart rate rises from 120 to 170
• On morning pre-rounds he is difficult to awake
• Pulses difficult to palpate and code called
Outcome of In-Hospital Arrest

- Pediatric patients that suffer a cardiopulmonary arrest have a dismal prognosis
  - 50-67% mortality
  - Many others with long-term neurologic morbidity
- Many of these arrests are preventable if we can identify patients as they begin to deteriorate
“Patients don’t suddenly deteriorate. Healthcare professionals suddenly notice.”
Inattentional blindness in vigilance tasks

Simons and Chabris 1999

Drew, Vo, and Wolfe 2013
Situation Awareness

1. Gather Information “Perception”
2. Recognize & Understand “Comprehension”
3. Anticipate “Projection”

What?
So What?
What Now?

Decide
Act

Brady Hospital Pediatrics 2014
What is Situation Awareness (SA)?

• Simple Definition:
  • Knowing what is going on around you
  • Having a notion of what is important
  • Anticipation of possible future consequences of the current situation

  Dr. Mica Endsley (1995)

• Shared situation awareness:
  • The degree to which team members have the same SA in important areas
So is SA a problem in healthcare?

• In studies looking at agreement among team members (shared SA):
  • In a Scottish ICU, when physicians on same team predicted likelihood of deterioration, they agreed on 45% of patients\textsuperscript{1}
  • In a US hospital, nurses and physicians caring for the same patients agreed on 42% of medication changes and 11% of planned procedures\textsuperscript{2}

\textsuperscript{1} Reader BMJ Quality and Safety 2011
\textsuperscript{2} O’Leary BMJ Quality and Safety 2010
System that improved situation awareness and reduced untreated clinical deterioration would reliably:

- Proactively **identify** patients at risk
  - Through PEWS, gut feeling (“watchers”), high-risk therapies, etc.
- **Mitigate** risk on the unit through primary team
  - With specific, time-bound plans and predictions
- **Escalate** risk that is not fully addressed
  - Through rapid response teams and scheduled huddles
Tacit knowledge: Watchers

Crandall et al 1993
Patient List Screen

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<tr>
<th>MBN</th>
<th>Unit</th>
<th>Room</th>
<th>Patient Name</th>
<th>Age/SEX</th>
<th>Attending</th>
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<th>Resident Team</th>
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Huddles

- Short, structured briefings designed to:
  - look back on recent events
  - look forward to upcoming events/emerging threats

- We integrate 3 tiers of huddles:
  - Microsystem (e.g. general pediatric unit)
  - Mesosystem (e.g. inpatient system)
  - Macrosystem (organizational)
MICRO LEVEL (Unit Huddle)
Look back: individual providers report on unexpected events, medical response team calls
Look forward: individual providers report on individual patients at risk for safety events
Integration: charge nurse considers overall unit status, planned discharges, staffing needs

MESO LEVEL (Inpatient Huddle)
Look back: charge nurses from each microsystem report on unexpected events, transfers to higher levels of care
Look forward: individual microsystems report on higher risk patients in mesosystem, overall unit status
Integration: Manager of Patient Services (MPS) works with charge nurses to develop plans and predictions for highest risk patients, develop capacity plan through system, predict and mitigate experience failures

MACRO LEVEL (Daily Operations Brief)
Look back: mesosystem leaders report on unexpected outcomes over last 24 hours, resolution of concerns raised at previous brief
Look forward: mesosystem leaders predict and plan for big issues of day with focus on problems at intersections of mesosystems
Integration: administrator of the day identifies responsible party(ies) for each concerns and sets clear follow-up

Goldenhar BMJ Quality and Safety 2013
Proactive escalation through mesosystem huddle

• Three times daily discussion of any concerns not fully addressed and any *predicted* MRTs

• Includes:
  • Charge nurse from each unit
  • Nurse manager
  • Senior attending Safety Officer

• Nurse manager and safety officer coach charge nurses
Safety officer of the day (SOD)

• Attending-level physician with:
  • “gray hair”
  • Clinical expertise
  • Organizational expertise
  • Gravitas
  • Skilled communicator and teacher

OR maybe?

• More junior physician with clear access to and authority given from senior leader (e.g., Chief of Staff, CMO)
Our first year: identifying is only a start

• First year of journey moved from relying on individual clinicians to a **system** that identified >90% of patients who had UNSAFE transfers
  • BUT in many cases risk was not successfully mitigated/reversed
  • AND risk was not escalated even when patient was not improving
• Watching the “watchers”
SMART Aim

- Specific
- Measurable
- Actionable
- Relevant
- Time bound

“Some is not a number. Soon is not a time.”

- Don Berwick
Robust Planning Tool

- Identifying the problem or concern
- Making responsible parties aware
- Forming a plan
- Predicting an expected outcome
- Setting a deadline
- Deciding on an escalation plan if outcome is not met

<table>
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<tr>
<th>Patient Initials</th>
<th>Situation Awareness Planning Tool</th>
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<tr>
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<td>Escalation Plan</td>
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<td>Contingency Plan</td>
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Notes and Heightened Awareness Patients (those without risk that can be acted on, but still of concern):
Cincinnati Children's Hospital Medical Center

Situation Awareness Concern Note

Concern Category: {CONCERN:304610178}

Clinical Concern Details: ***

Vital Signs: Patient Vitals in the past 8 hrs:

<table>
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<tr>
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PEWS: Pews Total Score 1

Problem-focused Physical Exam: ***

Assessment: ***

Plan: ***

Expected Outcome: ***

Outcome Deadline: {DEADLINE:304610179}

Escalation Plan: If expected outcome not met, {ESCALATION:304610180}.

Discussed with nurses, RT, and family. Everyone is in agreement with the plan.

PATRICK W. BRADY, MD
Defined as any patient that is transferred from unit to ICU and within 1 hour is:

– Intubated
– Placed on inotropes OR
– Given 3 or more fluid boluses
March 2010: Huddles/Inpatient SA work spread

Serious Safety Events per 10,000 Adjusted Patient Days Rolling 12-Month Average CCHMC System
Proposed model

- Implementation of HRO-SA Huddles
- Accountability
- Empowerment
- Sense of Community
- Improved efficiencies and quality of information sharing
- Culture of Collaboration and Collegiality
- Increased quality of collective awareness leading to enhanced capacity to reduce failures and eliminate patient harm
Huddle results

**Improved efficiencies and quality of information sharing**

“We learned the new terminology. ….We learned what a watcher was, we learned what high risk therapy was, and then in practice continued to report these concerns, we began to…identify who was at risk on your unit, and who wasn’t.” (Bedside nurse)
Huddle results

Culture of collaboration/collegiality

“Anti-competition, consideration, compassion – don’t assume that the unit is saying no because they don’t want to help, all have a better idea of what’s going on other units and know that everyone is busy!” (Nurse manager)
Improvement learnings—Cincinnati

- Need a multidisciplinary team
  - Nurses, doctors, improvement experts
  - Intensivists and non-intensivists (hospitalists are often great partners)
- Need senior leadership support
- Need outcome metrics (emergency transfers, critical deterioration, etc.)
- Start with the willing and design healthy competition
- Tell stories loudly and often
- Even in sustain needs continued check-in points and coaching (e.g., at huddles)
Spread across Ohio children’s hospitals
Ohio Children's Hospitals' Solutions for Patient Safety
Serious Safety Event Rate (SSER)
SSER is expressed as a Rolling 12 Month Average per 10,000 Adjusted Patient Days (APD)

Jan 2014: SA work began

Dec 2016: 67% reduction from end of 2014

Legend:
- Gray: Number of Serious Safety Events not including UCD
- Orange: Number of SSEs resulting from UCD
- Blue: SSER
- Green: Goal Line (0.17)
- Red: Baseline (0.9)
Context, context, context

- Organizational structure differs greatly and is tremendously important
  - Need to find the right “boots on the ground” leaders as well as senior leader support
- Mature safety culture is needed
  - Cannot argue about preventability for months
  - Front-line needs some empowerment
- Process metric (reliability of SA bundle) is labor-intensive without an EHR
Take home: doing QI well, with discipline, is really hard
And this is what is published!
Improvement learnings—spread

• Fail often and small: 2-3 PDSAs per week, n of 1 testing
  • It is impossible to get this right the first time or to plan it perfectly

• Understand your system quantitatively and qualitatively before you start
  • What are the most common failures? When do they occur? Does a busy resident or nurse think unrecognized deterioration/situation awareness is an important challenge?

• Have a theory or framework connecting your intervention(s) to your specific and global aims
  • Focus on drivers, not roles or exact processes

• Understand education and communication are likely necessary but not sufficient for reliable improvement
OHIO CHILDREN’S HOSPITALS SOLUTIONS FOR PT. SAFETY (OCHSPS)
OHIO NETWORK Situation Awareness KDD

AIM

Reduce the Ohio Network’s Emergency Transfer (ET) Rate per 10,000 APD from 4.4 to 2.2 by 12/31/17

KEY DRIVERS

Effective Learning Structure

Senior Leaders Engagement & Support

Unit Leaders Engagement & Support

Situation Awareness Bundle: **ID, Mitigate, Escalate Unit Risk**
(Process Measure: %Reliability to SA Bundle)

Culture of RESPECT

INTERVENTIONS

1. QTLY OCHA Board Meetings
2. Other CEO communications
3. Resource allocation
4. Accountability of leaders to uphold hospital respect standards
5. CEO’s assign Sr. Leader Champions of SSE events
6. OTHER?

1. Unit Leader Rounding to Influence
2. Unit Daily Huddles
3. Unit Top 10 Problem List

1. **Identify** patient-level risk factors such as
   - PEWS
   - Watcher/gut feeling
   - High-risk therapies
   - Family concerns
2. OTHER??

1. **Mitigation** of pt. level risk factors such as:
   - Unit huddles
   - Planning tools such as checklists, templates, and - - EHR tools
2. OTHER??

1. **Escalation** of pt. level risk factors such as:
   - Inpatient huddles
   - Safety officer of the day
   - Safety rounds
   - Family-activation of rapid response team
2. OTHER??

Reduce the Ohio Network’s Emergency Transfer (ET) Rate per 10,000 APD from 4.4 to 2.2 by 12/31/17
Leadership Methods for SA

• Daily Organizational Safety Brief
  • Share if you had an Emergency Transfer (formerly UNSAFE transfer) during brief
  • Follow up on a future brief re: results of lessons learned from Emergency Transfer

• Senior Leader Walkaround
  - Senior Leaders focus (with script) on progress with SA Bundle and key lessons learned by bedside and unit leaders

• Unit Leaders utilize structured tools such as an Apparent Cause Analysis for each transfer
Leadership Methods for SA

• Daily Rounding to Influence at Unit Level
  • Unit leaders round to identify barriers with the SA Bundle
  • Talk with staff about any events and lessons learned
  • Reinforce significance of SA work

• Daily Unit Huddles
  • Review last 24 hours SA Bundle reliability, events, etc.
  • Predict for next 24 hours

• Top 10 Problem List
  • Barriers identified with implementation are placed on list
  • Process issues from events placed on list
Abundance

• “We should work not from an assumption of scarcity, but from an assumption of abundance.”
  - Paul Batalden

• We have abundant & underused:
  • Patient/family expertise
  • Clinician expertise
  • Data

• SA provides a framework to better leverage these to improve safety and quality of care
Questions?