Assessing High Reliability in Inpatient Pediatric Units

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INTRODUCTION

- As a children's hospital we feel it is imperative that we strive for perfection and zero unnecessary harm. Health care is highly complex; risks are high and the pace fast-moving. Despite improvements in technology, errors continue to occur.
- Many have suggested that applying high-reliability principles to health care improves patient safety and other outcomes. High-reliability is achieved when the team or system 1) is preoccupied with failure, 2) is sensitive to operations, 3) defers to front-line experts, 4) is able to contain and bounce back from unexpected events and errors, and 5) is reluctant to oversimplify. It is achieved when the team or system achieves a high level of mindfulness about what has happened, what is happening, and what might happen.
- Our main objective was to assess behaviors and practices that are common in high reliability organizations within inpatient pediatric units at Lehigh Valley Children's Hospital.

METHODS

- Over the past year, the hospital has implemented key High-Reliability practices (figure 1) (ref 1) and Lean Daily Management methods and tools (figure 2) (ref 2) including standard work for huddles and rounds (see below).
- In order to determine whether or not the hospital has achieved a culture of high-reliability, we did the following:
  - Staff Survey using validated questions from Weick and Sutcliffe (ref 1)
  - Structured observations of service line and unit huddles as well as family-centered rounds (collaborative rounding)
  - Staff Interviews

Figure 1.
Components of High Reliability.

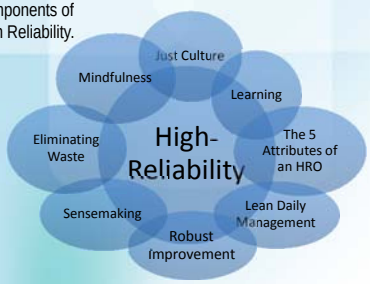


Figure 2.
Lean Daily Management.

Standard Work for Huddles

Information Presented:

- Each Unit:
  - Events in last 24 hours
  - Concerns for Today
  - Daily Metrics
- Whole Group:
  - Follow-ups
  - Announcements

Standard Work for Family-Centered Rounds

- Medical Team and Nursing Participation
- Family and Patient Participation
- Patient Information Presented in SBAR format
- Goals for the Day Discussed
- Discharge Criteria Discussed
- Concerns and Risks Addressed

RESULTS

Staff Survey

	NICU	PICU	Peds	All Units
Mindfulness	75.6%	79.5%	82.3%	78.4%
Preoccupation with failure	67.3%	71.3%	73.6%	70.2%
Reluctance to simplify	65.5%	65.7%	73.7%	69.4%
Sensitivity to operations	69.1%	75.4%	79.2%	73.4%
Resilience	72.7%	75.8%	78.8%	75.9%
Deference to expertise	73.1%	76.9%	79.7%	76.4%
Below Standards (<67%)	Met Standards (>67%)		Above Standards (>82%)	

Table 1: Scores of the Principles of Mindfulness obtained from survey. (N=76)

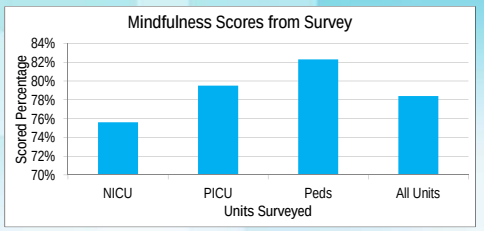
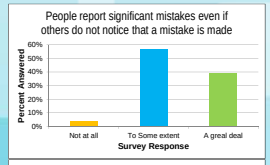
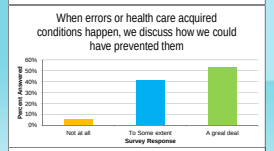


Figure 3: A view of the trends by unit in overall mindfulness.





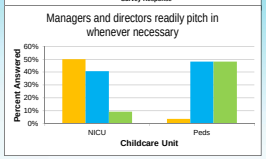


Figure 4: Staff survey responses for selected survey questions.

Service Line Huddle

Information type	% Reported	Analysis & Action	% Discussed
Events in last 24 hours	49%	Cause analysis	74%
Concerns for today	54%	Extent of condition	64%
Daily metrics	83%	Action plan	34%

Table 2: Service Line Huddle Report.
N=13; Units included: Peri-operative, Outpatient Surgery, Labor and Delivery, Prenatal, Mom and Baby, Neonatal Intensive Care, Pediatric Intensive Care, Pediatrics, and the Children's Emergency Room

Unit Huddles

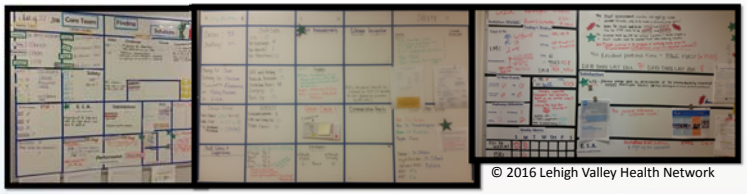


Figure 5: Unit huddle boards that are used to relay information to staff at shift changes (in order from left to right: PICU, NICU, Peds).

Family-Centered Rounds

High-Reliability Element for Family-Centered Rounds	% Present
Nurse Participation	<20%*
Team and Family Learns and Makes Sense of the Information Provided on Rounds	45%
Discussion of What Could Go Wrong	45%
Discharge Criteria	76%

*Difficult to determine level of participation [a nurse was present for part of rounds >80% of the time]

Table 3: Reported Items from Family-Centered Rounds. (N=51)

DISCUSSION

Staff Survey

- All three units had a culture of high-reliability according to published standards.
- The Pediatrics unit had the highest score of high-reliability, followed by the PICU and then the NICU.
- The area with the lowest score for all units was "Reluctance to Simplify."

Service Line Huddle

- There are a lot of discussions and sharing of ideas.
- There were fewer concerns/risks reported than expected with some variability regarding what was considered a concern or risk (i.e. patients with central lines).
- Daily metrics were not always reported because the person who had the information was not present or the information was not passed on.
- Extent of condition was described typically only with a cause analysis, which was not always discussed the first day. Action plans were not always stated.

Unit Huddles

- NICU would provide more detailed discussions about events that occurred and concerns for the day with countermeasures often listed on their huddle board.
- PICU would list more concerns about patients likely due to the higher acuity.
- Peds reviewed all issues that were listed on the huddle board each day whether they had changed or not, which allowed for more staff to be included.

Family-Centered Rounds

- Families were always invited to join in on the rounds and voice their questions, comments, and concerns.
- When families received written reports of labs and written information, in general, they were appreciative.

CONCLUSIONS

- In high-risk, high complexity environments where the unexpected occurs not infrequently, high-reliability principles and practices are critical for ensuring minimal defects/errors in care and for not ignoring ambiguous threats that could result in significant adverse events.
- By implementing a service line huddle, individual unit huddles, daily management visibility boards, and other standard work including bundles and clinical pathways, the Lehigh Valley Children's Hospital has achieved a culture of high-reliability.

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