From the NICU to Primary Care: The Potential of HFMEA

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Objectives

• Describe a prospective risk assessment using Health Care Failure Modes and Effects Analysis™ (HFMEA) around care transition from neonatal intensive and intermediate care nurseries to ambulatory follow-up

• Describe a retrospective risk assessment to add to and to corroborate HFMEA findings

• Describe a qualitative assessment of the process of conducting the HFMEA in a pediatric setting
Overview

• Care transitions
  ▪ Patient safety challenge
  ▪ Literature

• HFMEA™
  ▪ Definition
  ▪ Description

• AHRQ Planning Grant
  ▪ NICU to ambulatory follow-up
  ▪ Process
  ▪ Results
    □ HFMEA™
    □ Qualitative

• Next steps
Background

- Patient Safety literature increasingly acknowledges potential risks of care transitions
- Adult literature reveals significant vulnerabilities
- Proactive evaluation of error-prone health care processes can inform interventions to prevent adverse patient outcomes before they occur
- HFMEA has been used to improve patient safety in adult settings

Care Transitions

Definition:

• Refers to movement of patients between providers and settings as the patients’ conditions and care needs change over time

• Typically within institutions, “handoffs”

• JCAHO estimates that communication failure occurs in approximately 60% of sentinel events

The Care Transitions ProgramSM www.caretransitions.org


Care Transitions

• Handoffs from inpatient to ambulatory setting are
  - Prolonged
  - Unclear in terms of interim provider responsibility
  - Dependent on patients who may not understand their conditions

• Errors are common
  - 19% of patients had adverse event within 3 weeks
  - On average, one medication error per discharge summary

• Most errors involve communication lapses


Pediatric Care Transitions

- Inpatient to ambulatory setting

  - Pediatric literature relatively silent except for measuring follow-up appointments
  - Focus has been on “lack of compliance” by caregivers rather than on systematic issues around discharge
  - 28% of children discharged from a pediatric ICU (not a NICU) did not receive timely medical follow-up
  - No studies related to NICU discharges

HFMEA™

Health Care Failure Modes and Effects Analysis™

• Team generates a flow diagram of main process and sub-processes
• Team brainstorms about all potential errors at each step (failure modes)
  ■ Each is scored for probability it will occur (frequency) and potential severity if it did occur (severity)
  ■ Frequency score x severity score = hazard score
  ■ High-risk failure modes identified as well as related causes or contributory factors

AHRQ Planning Grant

- Conduct HFMEA on NICU to ambulatory care transitions
- Conduct retrospective review to confirm or modify HFMEA findings
- Conduct qualitative assessment of the process to accomplish the HFMEA
Framework: Care Transitions and Communications

- NICU provider
- Parent/Caregiver factors
- F/U provider factors
- Organizational factors

Fragile Infant → Transition to Ambulatory Setting → Errors/Adverse Events

* Arrows include communication factors
Process Flow for Discharge

NICU to Ambulatory Care
HIGH LEVEL FLOW
with Sub-Steps
(Updated from 02/27/08 meeting)

1. Patient identified for potential discharge
   A) Attending physician decides time for discharge
   B) Attending discusses decision with rest of care team
   C) Caregiver identified & notified

2. Discharge needs identified
   A) Caregiver teaching initiated

3A. Patient discharged from NICU 3 or 2
   A) Conduct weekly discharge planning rounds (NICU 2 only)
   B) Discharge orders are written by licensed care provider
   C) Baylor Clinical RN prepares discharge packet
   D) Discharge packet given to caregiver by Baylor Clinical RN
   E) TCH discharge instructions completed and given to caregiver by bedside RN
   F) Newborn state screening performed per state requirements or at discharge
   G) For all Baylor patients, discharge data form is faxed to primary care pediatrician on next business day after discharge
   H) Hard copy of discharge data form is mailed to PCP
   I) Copy of discharge summary is faxed to PCP
   J) Caregiver acquires medications

4. Interim Support
   A) Home Health Care
   B) Primary Care Pediatrician
   C) TCH Emergency Dept.
   D) NICU staff
   E) Neo Attending
   F) Specialists
   G) Vendors
   H) Community Emergency Depts.
   I) CPS
   J) Community Pharmacist
   K) Caregivers

5. Follow up appointment occurs
   A) Patient is seen by primary care pediatrician
   B) Primary care pediatrician follows through on no show patients

This information is privileged and confidential pursuant to Texas Health and Safety Code 161.031-161.033 and Texas Occupations Code section 160.007 and/or TRCP 1925
<table>
<thead>
<tr>
<th>High-level Process</th>
<th>Substeps</th>
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| 1. Patient identified for discharge | A) Attending physician decides time for discharge  
B) Attending discusses decision with rest of care staff  
C) Caregiver identified and notified |
| 2. Discharge needs identified | A) Caregiver teaching initiated  
B) Consulting services contacted for follow-up recommendations  
C) Consulting services document recommendations for follow-up in medical record  
D) Baylor Clinical RN attempts to schedule appointments  
E) PCP is identified and contacted by licensed care provider (NNP, resident, fellow)  
F) Baylor Clinical RN ensures appropriate home care orders are written  
G) Care coordinators arrange for home care and equipment needs  
H) Discharge prescriptions are written and given to caregiver  
I) Caregiver acquires medications  
J) Discharge formula orders given to caregiver |
### High Level Process Map with Substeps

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<td></td>
<td>B) Primary care pediatrician</td>
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<tr>
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<td>patients</td>
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HFMEA™ Results

- Team identified 114 potential failure modes within the discharge process
- Final model included 40 high-failure modes and 75 high-risk causes
HFMEA™ Results

• Common issues present across most failure modes and causes:
  - Clinicians act in isolation resulting in lack of
    standardized, coordinated, comprehensive plan of
    care
  - Parents/caregivers inadequately prepared for home
    care and management of fragile infants
  - Community providers lack required knowledge and
    skills to manage medically complex infants
Scoring Challenge

• Team found the original HFMEA scoring system unsuitable to grade events in NICU care transitions

• By consensus, modifications made to frequency and severity scoring
  ▪ Comparisons done to determine effect of making this change from original design

• Team recognized problems with scoring frequency and severity at the same time
  ▪ Comparison of “open” with “blind” scoring
## Revised Scoring Definitions for Severity and Frequency

<table>
<thead>
<tr>
<th>Severity Category</th>
<th>Catastrophic</th>
<th>Major</th>
<th>Moderate</th>
<th>Minor</th>
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</thead>
<tbody>
<tr>
<td>VA Definition</td>
<td>Death or major permanent loss of function; Rape; Transfusion Rxn; Wrong site surgery</td>
<td>Permanent decrease of function; disfigurement; increased LOS for &gt;2 patients</td>
<td>Increased LOS for 1 or 2 patients</td>
<td>No injury or increased LOS</td>
</tr>
<tr>
<td>TCH Definition</td>
<td>Could realistically result in death or serious disability</td>
<td>Could, but is not likely to, really hurt someone or result in a much longer LOS</td>
<td>Could extend LOS but not likely to kill anyone; could adversely affect health but not severely</td>
<td>Slight increase in LOS, no effect on health outcomes</td>
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<table>
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<tr>
<th>Frequency Category</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>VA Definition</td>
<td>NA</td>
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<td>NA</td>
<td>“Frequent” Immediately or soon, &gt;1/yr</td>
<td>“Occasional” several times in 1-2 yrs</td>
<td>“Uncommon” once in 2-5 yrs</td>
<td>“Remote” once in 5-30 yrs</td>
</tr>
<tr>
<td>TCH Definition</td>
<td>Daily</td>
<td>&gt; 1/ wk</td>
<td>&gt; 1/ mo</td>
<td>&gt; 1/ yr</td>
<td>&gt; 1/ 2yrs</td>
<td>1/ 2-5 yrs</td>
<td>1/ 5-30yrs</td>
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# Example of Open vs. Blind Scoring

Caregiver identified and notified about potential discharge

| Failure Mode: First Evaluate failure mode before determining potential causes | FMEA Step 4 – Hazard Analysis |
|---|---|---|
| | Open Scoring | Blind Scoring |
| Severity | Probability | Hazard Score | Severity | Probability | Hazard Score |
| 1C(1) There is no caregiver identified | 3 | 5 | 15 | 3 | 1 | 3 |
| 1C(2) Caregiver is not notified | 2 | 2 | 4 | 2 | 2 | 4 |
Retrospective Review

• Charts reviewed using a trigger methodology to confirm or add to HFMEA findings (N=88)
  ■ Failures documented for 14 of 35 sub-steps predicted to have errors, in 1-10 cases each
• Documentation in current medical records system inadequate to systematically collect reliable data
  ■ Documentation unavailable for majority of patients for 19 of the 35 sub-steps.
• A pediatric-adapted “care transitions measure” developed and pilot tested, validation under way
Qualitative Assessment

Method
• Debriefing session held with entire team to determine general perceptions around HFMEA process
• Interviews with key informants to expand upon issues identified in debriefing session
• Content analysis of agendas, meeting minutes, and other documents related to project

Results
• List of themes developed
## Process Related Themes

<table>
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<tr>
<th>Positives</th>
<th>Negatives</th>
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<tr>
<td>• Important Patient Safety Issue to address</td>
<td>• HFMEA took “huge” amount of time (230 hours of professional time)</td>
</tr>
<tr>
<td>• Successful transition is essential</td>
<td>• The HFMEA scoring system may not be fully applicable to NICU</td>
</tr>
<tr>
<td>• Solid team participation (median number of meetings attended was 16)</td>
<td>• Transition is a complex process so HFMEA may not be ideal tool</td>
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<td>• New insights emerged from hearing others’ experiences</td>
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Next Steps

• Move from planning stage to implementation of mitigation plans to decrease potential for errors identified

• Practical step of implementing a discharge planning process for neonates that utilizes a highly skilled “discharge coach”

• Continued assessment of the utility of HFMEA in examining complex care transition issues within Patient Safety Program
References


