Utilizing the Fish-Bone Model to Identify Systems Errors During Pediatric Morbidity and Mortality Conference

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Background

“End Result Card”

Ernest Amory Codman
Background

Morbidity and Mortality (M&M) conference = venue to discuss medical errors and/or adverse outcomes.

Heterogeneous focus:

- Unexpected morbidity and mortality
- Suspected medical error
- Teaching value

The risks of traditional M&M:

- Perception of “blame”
- Perception of emphasizing individual error
Background

Gaps:

- Lack of standardized case discussion process
- Emphasis on unexpected adverse outcomes
- Emphasis on individual rather than potential system errors
Fish-Bone Model

Rationale

- Realign and Focus Discussion
- Non-Punitive Environment
- Recognize System Strengths & Shortcomings
- Engender Change
M&M Conference Format

- Pediatric Chief Residents conduct quarterly M&M Conferences per academic year.

- The Fish-Bone Model implemented in 2015-2016.

- Prompt audience to dissect case via Fish-Bone Model.
  - Identify components that contributed to the adverse outcome
- Patient and family
- ED attending
- Pediatric intern and senior
- Surgery intern and senior
- Surgery and Ward Attendings
- Radiologist

- Transfer from outside hospital
- Hand-overs
- Review of records by:
  - Surgery
  - Pediatrics
  - Radiology
  - Transferring ED physician

- Electronic Health Record
- Health record from outside institution
- CT abdomen/pelvis
- X-ray

- Outside ED (Secondary Center)
- VMC ED + VMC (Tertiary Center)
- Pediatric Ward
- Time: Late at night
- Face to face vs. phone

- Transfer between services:
  - Who should be informed?

- Resident knowledge and comfort
- Hierarchy of communication

- Poor communication
- Delayed patient care
- Parent anxiety
- False assurance
M&M Conference Format Continued

- After dissection of a case via the Fish-Bone Model, 1-2 components were emphasized for learning.

- Literature presented to:
  - Address medical and/or policy knowledge gaps
  - Explore how systems-based errors were corrected at other institutions
Outcomes Assessments

- Standard evaluations were reviewed
- M&M Specific Evaluation form was created
Results

- Summary of M&M Content
- Standard Pediatric Grand Rounds Evaluations
- Pilot Data from MM Specific Evaluation
## Summary of Cases

### Table 1: Clinical Areas Represented

<table>
<thead>
<tr>
<th>Clinical Area</th>
<th>Number of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient</td>
<td>3</td>
</tr>
<tr>
<td>Outpatient</td>
<td>1</td>
</tr>
<tr>
<td>PICU</td>
<td>1</td>
</tr>
<tr>
<td>Newborn Nursery</td>
<td>1</td>
</tr>
</tbody>
</table>

### Table 2: Summary of Adverse Events

<table>
<thead>
<tr>
<th>Adverse Outcome</th>
<th>Number of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedural complication</td>
<td>1</td>
</tr>
<tr>
<td>Delay in diagnosis</td>
<td>3</td>
</tr>
<tr>
<td>Loss of laboratory sample</td>
<td>1</td>
</tr>
<tr>
<td>Prolonged length of stay</td>
<td>1</td>
</tr>
</tbody>
</table>
Results: Standard Evaluation Forms (2015-2016)

- Total of 118 attendees were present at three pediatric M&M Conferences for the 2015-2016 academic year.

- Total of 60 attendees (~50%) completed evaluations.

| Table 3: Summary of Standard Evaluation Responses (2015-2016) |
|----------------------------------|--------|-----|-----|-----|
|                                 | Excellent | Good | Fair | Poor |
| Content                         | 95%     | 5%   | 0%   | 0%   |
| Relevance to Practice           | 87%     | 13%  | 0%   | 0%   |
| Opportunities for Questions     | 86%     | 12%  | 1%   | 0%   |
| Faculty Teaching Skill          | 85%     | 15%  | 0%   | 0%   |

- Total of 159 attendees were present at four pediatric M&M Conferences for the 2014-2015 academic year.

- Total of 88 attendees (~55%) completed evaluations.

<table>
<thead>
<tr>
<th>Table 4: Summary of Standard Evaluation Responses (2014-2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Excellent</strong></td>
</tr>
<tr>
<td>Content</td>
</tr>
<tr>
<td>Relevance to Practice</td>
</tr>
<tr>
<td>Opportunities for Questions</td>
</tr>
<tr>
<td>Faculty Teaching Skill</td>
</tr>
</tbody>
</table>
Results: Standard Evaluation Forms (2015-2016)

- “Very well done! I like the literature based approach (fishbone).”

- “This was by far one of the best M&M conferences. It was interactive and was great as it required audience participation.”

- “Excellent cases and excellent use of the fish bone model for both of them.”

- “Very good and well organized presentation of case, easy to follow along details and timing which helped set the stage and important in this case. Good identification of factors included.”
Results: Standard Evaluation Forms (2015-2016)

- Did you learn something that could warrant a change in your practice.
  - “Yes as always improving communication between providers and other team members is very important.”
  - “Systematic process for error/event evaluation.”
M&M Conference Specific Evaluation

- 11 question survey
  - Familiarity of respondents with Fish-bone model prior to use in Pediatric M&M Conferences
  - Impact of use of the Fish-bone model on improving ability to identify systems errors
  - Creation of a non-threatening environment to discuss cases

- Pilot Survey Sent to Pediatric Faculty (10 Responses)
Use of the Fish-Bone Model During Pediatric MMC Has Improved My Ability to Identify System-Based Errors

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
Use of the Fish-Bone Model During Pediatric MMC Has Improved Discussion Of Cases Presented During the Conference.

- **Strongly Agree**
- **Agree**
- **Neutral**
- **Disagree**
- **Strongly Disagree**
M&M Conference Specific Evaluation: Pilot Data

Use of the Fish-Bone Model During Pediatric MMC Creates a Non-Threatening Environment for Discussing Patient Cases

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree
M&M Conference Specific Evaluation: Pilot Data

What did you like best about the format of the Pediatric Morbidity and Mortality Conference this academic year?

- "The format and the approach to the cases and the fact that it goes straight to root causes of the problems"
- "I liked the focus on systems of care rather than finger pointing"
- "Good review, better audience participation this year (due to fish-bone). This is not the only tool of its type out there but is useful."
What changes would you like to make to the Pediatric Morbidity and Mortality Conference?

- “More time for discussion; inclusion of a 'going forward' plan (what changes should be made as a result of this discussion?).”

- “No need to shy away from individual errors - while the system can help us avoid errors, not all mistakes are the system's "fault" - people make mistakes, too, and we need to acknowledge that before we can fix it”
Challenges and Lessons Learned

- Challenges:
  - Resident Surveys
  - Time management

- Lessons Learned:
  - Benefit of creating a multi-disciplinary environment
Next Steps

- Obtaining survey data
- Analyzing comparison between resident and faculty responses
- Collaborating with other departments and medical providers to enhance discussions:
  - Emergency Medicine
  - Pediatric Surgery
  - Nursing
  - Medical School and Hospital Leadership
- Create a plan to bring about more meaningful change
Conclusions

- The Pediatric Morbidity and Mortality Conference remains a valuable educational forum.

- Use of the Fish-Bone Model:
  - Enhanced case discussions
  - Encouraged participants to analyze system strengths and shortcomings

- This format promotes a culture of safety.

- Next Steps: Explore how these discussions lead to improved patient safety.
Team Leaders

- Inga Aikman, MD and Elizabeth Ward MD
  - Pediatric Chief Residents
  - Changed format of the MM Conference
  - Formulated resident and faculty survey
  - Reviewed qualitative and quantitative data

- John Olsson MD
  - ECU Brody School of Medicine Department of Pediatrics
  - Faculty advisor
References


Questions/Comments