Transforming the Morbidity and Mortality Conference into an Instrument for Systemwide Improvement

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Abstract

Objective: The morbidity and mortality conference (M&MC) is a traditional forum that provides clinicians with an opportunity to discuss medical error and adverse events. In an effort to promote patient safety at our institution, we implemented a monthly interdisciplinary morbidity, mortality, and improvement (MM&I) conference, which focused on systemwide problems. The participants included physicians, nursing staff, pharmacy, and other clinical departments, as well as senior hospital administrators. **Methods:** A Mortality Review Task Force selects cases for presentation at the monthly MM&I. A resident representative presents the case, and a designated senior faculty member facilitates a discussion of the case with audience participation. Key issues that contributed to the undesired outcome of the case are identified and outlined on a cause-and-effect diagram (Ichikawa diagram). Workgroups are created to target systems-based problems. At the end of the conference, attendees are asked to complete an evaluation and provide feedback for subsequent consideration by the task force. **Results:** Twenty-one cases (12 medical, 9 surgical) representing adverse events were presented at the MM&I conference from January 2005 to February 2007. The mean number of participants per session was 88 (range, 62-115). Adverse events triggering case selection included unexpected deaths (six), unplanned intubations (two), prolonged medical care in the setting of poor prognosis (one), delay in care (nine), and procedural complications (three). The most common factors contributing to adverse or "near-miss" outcomes in these cases were communication failures and inadequate coordination of care. In all, 33 action items were created, and 23 (70 percent) have been completed to date. **Conclusion:** A structured hospital-wide MM&I conference is an effective means of engaging physicians, nurses, and key administrative leaders in the discussion of adverse events. The identification of potential system failures and the creation of workgroups to address specific systems-based problems can promote initiatives to improve patient care and safety.

Background

In order to provide high quality patient care, members of a multidisciplinary health care team must engage in objective, nonjudgmental review of adverse outcomes and commit to systematic process change. The morbidity and mortality conference (M&MC) is one forum that provides clinicians with an opportunity to discuss medical error and adverse events. The M&MC became a major part of physician education in the early 20th century, following the publication of the Flexner report on medical education in 1910 and the creation of the American College of

Surgeons in 1912.[1, 2] These early conferences were attended primarily by surgeons and anesthesiologists and were used to examine medical errors and adverse outcomes in an attempt to improve surgical practice.

Over the years, the M&MC has evolved into a forum for resident education. The conference is now a required component of surgical resident training, mandated by the Accreditation Council for Graduate Medical Education (ACGME),[3] and it is also widespread among internal medicine and pediatric training programs. Despite the extensive presence of the M&MC, the format of the conference varies tremendously among academic programs, and the goals of the conference often are not clearly defined.[4] Many of the cases presented for discussion are selected because of their educational interest or potential teaching value and often lack identification and discussion of adverse outcomes.[5, 6, 7] Biddle reviewed cases presented at the anesthesia M&MC at his institution and found that 72 percent involved neither morbidity nor mortality.[6] In a cross-sectional review of the medicine M&MC at four major hospitals in California, Pierluissi found that most of the allotted time was spent on case presentation and guest speaker commentary, with very little audience participation or discussion of error.[7]

When error is discussed in the M&MC, the focus is often on an unexpected adverse outcome instead of events related to processes of care that might have contributed to the error.[5] Physician trainees attending the M&MC often feel that the purpose of the discussion is to assign blame for an error rather than to improve patient safety.[5, 8] Systems-based issues are rarely identified, and often there is not enough time to discuss specific interventions to improve patient care across systems of care.

In an effort to promote patient safety at our institution, we implemented a monthly hospital-wide morbidity, mortality, and improvement (MM&I) conference, which focused on systems-based problems at our hospital and included representation from multiple clinical departments, as well as from senior hospital administrators. Here, we describe our first 2 years' experience with the MM&I conference and discuss the lessons learned.

Process and Methodology

The Monroe Carell, Jr. Children's Hospital at Vanderbilt (MCJCHV) is a 222-bed tertiary care children's hospital that is part of a large academic medical center. The MM&I is part of our formal peer review and quality improvement processes sponsored by the offices of Performance Management and Improvement (PMI) and Risk Management.

Case selection. A Mortality Review Task Force reviews potential cases and selects cases to be presented at each conference. Eligible cases include all deaths, significant patient injuries, and near-miss situations that could have resulted in death or patient harm. Any member of the health care team at any level or location in the institution can recommend specific cases to the Mortality Review Task Force. The referral remains anonymous in order to encourage submissions of cases that might involve emotionally charged or difficult situations. Other sources of potential cases include departmental or unit-based M&MC and the office of Risk Management.

The Task Force is composed of senior attending physicians and residents from pediatric surgery and pediatric medicine, community pediatricians, hospital administrators, and leaders in nursing, pharmacy, and radiology. Two pediatric resident volunteers serve as conference coordinators

each academic year. Rather than focusing on individual caregiver errors, the Task Force selects cases that potentially involve systemwide problems or issues that affect more than one patient care population or single hospital unit. The case selection is made by consensus of the Task Force.

Case preparation and presentation. A core team—consisting of senior quality consultants from PMI, the resident coordinators, and a senior attending facilitator—is responsible for preparing the case for presentation. In the month preceding the MM&I conference, the core team meets to gather and review pertinent documents from the patient's hospitalization from the initial encounter until disposition from the hospital or clinic. In order to highlight specific systems issues that might have contributed to the adverse event, the case details are then summarized in a time series flow diagram. This process generally requires two to three 60-minute meetings. The resident coordinators also spend an additional 2 to 3 hours preparing a brief literature review of the disease or illness specific to the case.

All clinical faculty and staff are invited to attend the conference. Health care providers involved with the case receive a special invitation to participate in the conference. In addition, subspecialists are invited to comment on specific aspects of the case. For example, pediatric radiologists are asked to review the appropriate imaging studies related to the case. The presentation is organized in slide format for presentation with Microsoft PowerPoint®.

Conference. Attendance at the MM&I is encouraged for all hospital physicians, residents, nursing staff, and clinical support staff, regardless of level of training or provider status. As part of the institution's peer review and quality improvement processes, the MM&I discussion is considered privileged and confidential.

Table 1 shows the conference outline. Every conference begins with a reminder of the systems-based approach to identifying problems and the confidentiality of the discussion. One of the pediatric resident coordinators presents the patient's management and hospital course in a timeline format. Appropriate data are reviewed, including vital signs measurements, nursing

Table 1. Conference outline

MM&I conference outline	Time allotted	Participants
• Opening: Reminder of systems-based approach and confidentiality	5 min	Leader
• Review of task force progress from prior conferences	10 min	MMI task force
• Case presentation (timeline format)	10 min	Resident leaders
• Brief literature review relevant to case in question	5 min	Resident leaders
• Identification of key issues leading to undesired outcome	25 min	All participants
• Identification of workgroups to address the key issues	10 min	MMI task force
• Reminder of confidentiality	5 min	Leader
• Evaluation of conference	5 min	Leader

assessments, laboratory and radiographic data, and physician physical examinations. Deidentified records from the patient's chart are used throughout the presentation as appropriate. A computerized system (Turningpoint, Turning Tech, LLC) prompts the audience to consider which management decisions they would have made at key points in the patient's clinical course. The system provides an immediate summary of their responses, encouraging further discussion.

Throughout the discussion, a cause-and-effect diagram (Ichikawa diagram[9]; Figure 1) is used to identify specific factors that might have contributed to the adverse outcome in the case. The cause-and-effect diagram is a standard process improvement tool for facilitating identification of potential failure points.

These factors are assigned to one of six broad categories: (1) procedure, (2) environment, (3) equipment, (4) people, (5) policy, or (6) other. All participants have an opportunity to identify systems-based issues and recommend potential solutions. After these issues are identified, the discussion leader selects the key contributing factors that need to be addressed. "Action plans" are created, and specific workgroups are assigned to implement the corrective actions. The action plan identifies a concise intervention, assigns accountability (including completion target timeframes), and tracks the status of implementation. The Task Force is responsible for assisting the workgroups in completing the assigned tasks, and the progress of each workgroup is presented at subsequent conferences.

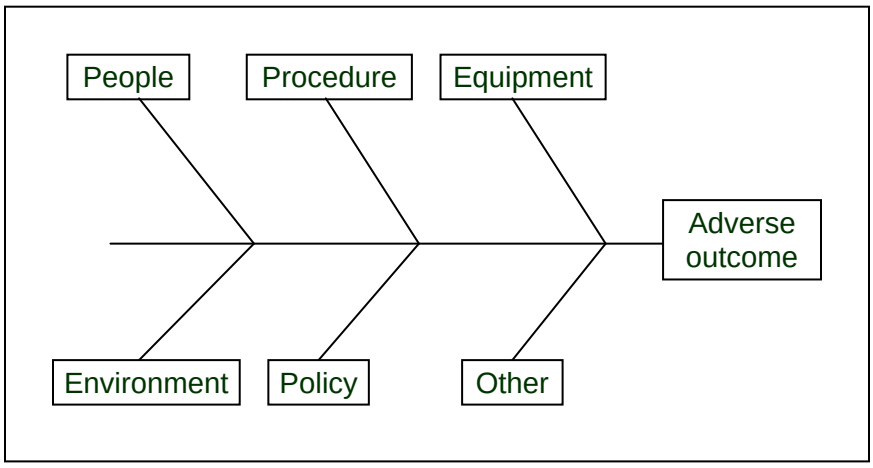

Figure 1. Ichikawa ("fishbone") cause-and-effect diagram.

As the conference is adjourned, the confidential nature of the proceedings is again reinforced. Attendees are asked to complete an evaluation and to provide feedback for subsequent consideration by the Task Force. Evaluations consist of eight questions using a 5-point Likert scale, ranging from "Excellent" to "Poor," with space available for free-text comments. Completion of the evaluations is voluntary and is done anonymously.

MM&I Results

Twenty-one cases representing adverse events were presented in the MM&I conference series between January 2005 and February 2007. Both medical (N = 12) and surgical (N = 9) cases were represented. Adverse events triggering case selection are listed in Table 2. An unexpected death, as identified through root cause analysis (RCA), was the most common reason for case selection. At our hospital, the RCA process is multidisciplinary and interdisciplinary and draws on the expertise and clinical opinion of all participants. Other cases were selected based on

undesirable outcomes not typically addressed in traditional M&MCs, such as prolonged medical care with poor prognosis.

The presentations also included cases from multiple care sites, including the emergency department, outpatient clinics, inpatient wards, and the operating room.

Table 2. Adverse events triggering case presentations

Case	N
Unexpected deaths	6
Unplanned intubation	2
Prolonged medical care in setting of poor prognosis	1
Delay in care or diagnosis	9
Procedural complication	3
Total	21

Conference participants identified the leading contributors to adverse or "near-miss" outcomes. These contributing factors were categorized by the core team and are summarized in Table 3. Inadequate or incomplete communication among members of the health care team was the most common contributing factor, cited in over 60 percent of the cases.

Attendance. In all, 1,323 participants attended 19 conferences during the 2 year period. The average number of participants per session was 88 (range, 62-115). Attendees included faculty and resident physicians, community physicians, medical students, nurses, pharmacists, case managers, social workers, and senior hospital administrators.

Impact of the conference. The MM&I conference represents an ongoing commitment of The Monroe Carell, Jr. Children's Hospital at Vanderbilt to improving patient care and safety. During the 2-year period, 33 action items were created to address specific systems-based issues; 23 action items (70 percent) have been completed to date. The action plans developed in the MM&I conferences and the subsequent activities of the workgroup are among the mechanisms by which process improvement occurs.

Table 3. Factors contributing to adverse outcome

Factor	% Cases
Communication: e.g., inadequate handoffs; incomplete clinical information	64
Coordination of care: e.g., involving multiple services and/or care sites	36
Volume of activity/workload: e.g., increased clinical volume and/or perception of workload	18
Escalation of care: e.g., delay or failure to involve more senior physician or nurse	14
Recognition of change in clinical status: e.g., delay or failure to recognize changing clinical signs and/or symptoms	14

Example case and action plan. In April 2005, the MM&I conference presented a case in which a postoperative patient experienced respiratory failure on the acute care floor. Excerpts from the

patient's medical record—including vital signs, nursing care notes, and physician's progress notes—were presented and demonstrated a continued decline in the patient's clinical condition throughout the day, with increased respiratory rate, increased work of breathing, and persistent hypoxia, despite supplemental oxygen. The patient subsequently required emergency intubation and was resuscitated before being transferred to the critical care unit.

After reviewing the available records, the MM&I conference attendees identified multiple contributing factors. From an "environment" standpoint, attendees noted that the timing of the patient's deterioration occurred at nursing shift change, and that likely was a contributing factor. From a "people" standpoint, conference attendees also noted that there was a delay in recognition of changing vitals signs by multiple members of the health care team. The attendees identified additional issues under "communication," including incomplete exchange of key clinical information (i.e., vital signs) between nursing staff and resident physicians and inadequate communication between multiple services involved in the patient's care.

Because of these concerns, an action plan was created to implement the SBAR communication model within our hospital. SBAR (Situation, Background, Assessment, and Recommendation)[10] is a structured communication technique that allows for concise but thorough communication among members of the health care team. The pediatric chief resident and a member of the PM&I office were initially assigned to execute the implementation of SBAR. Ultimately, numerous staff members contributed to this action plan, including members of hospital administration and nursing leaders. This action plan has led to hospital-wide implementation of SBAR as the standard mode of communication among members of the health care team. The SBAR model has been promoted during orientation for new residents and nurses and reinforced during resident didactic conferences and subsequent MM&I conferences.

Limitations

While the MM&I has led to several process improvements at our institution, these process changes have not yet been rigorously evaluated to determine their effects on patient safety, morbidity, and mortality. Our current study is largely a qualitative study that focuses on the MM&I process at our institution. Future research is needed to provide quantitative data on the impact of MM&I-based initiatives. Another limitation of our current study is the low percentage of evaluations completed by conference attendees. While these evaluations provided valuable feedback to the Task Force, the paper forms were completed by only 28 percent of attendees during the first 2 years of the MM&I. In order to elicit more feedback from conference attendees, a new approach to the evaluation process was initiated in May 2007. Conference attendees now utilize the audience response system (Turningpoint, Turning Tech, LLC) to evaluate the conference before the conference is adjourned. This new strategy has resulted in a dramatic increase in the number of evaluations completed by attendees.

Conclusion

The structured hospital-wide MM&I conference is an effective way to engage multiple members of the health care team in a discussion of adverse outcomes, while collaboratively focusing on potential systems-based improvements in patient care and safety. Nonjudgmental case discussion

helps overcome the individual's fear of accusation and criticism, which can stifle honest exchange of information and hinder improvement initiatives. Identification of potential system failures by participants, empowerment of workgroups to address specific systems-based problems, and transparent accountability for regular followup can lead to improved patient safety.

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