Journal Club
Medical Education Interest Group

Topic:
Format of Morbidity and Mortality Conference to Optimize Learning, Assessment and Patient Safety.

References:

Premise: Based on the Institute of Medicine’s landmark study in 1999, preventable medical errors caused between 48,000 and 98,000 deaths each year. This is estimated to cause 17 to 29 billion dollars in lost income, additional care and disability. As physicians and physician educators we must ask, how we are addressing this problem and its staggering cost.

Trust is an integral component of the physician-patient relationship and unfortunately the trust we once enjoyed is steadily being eroded. This is undoubtedly a multifactorial issue but certainly one component is how we handle errors and what we do to prevent them. As educators it is our responsibility to teach students how to recognize errors and their source, how to rectify and prevent errors in the future, and how to talk about errors with our patients and their families. To err is human and physicians are certainly human; but in order to preserve our professional status and protect our patient’s trust and uphold the Hippocratic Oath we must tirelessly police ourselves and hold our profession to the highest possible standard. This certainly means taking responsibility for our mistakes but it also means helping prevent others from committing the same mistake. Morbidity and Mortality conferences have long been a tradition in the medical establishment that provides an opportunity to achieve this objective. Yet there seems to be great variability in the structure of M&M conferences and there is little guidance in developing the ideal format to maximize the educational impact and improve system processes. The above articles were reviewed to explore the best format for M&M and establish its impact in graduate medical education, they are summarized as follows:

**Background:** M&M is ubiquitous among IM residency programs but most lack explicit methods or formats. Furthermore, most conferences do not address either medical error or adverse events despite this being their stated goal. M&M has the potential to address all 6 of the ACGME core competencies. Authors highlight that in particular the systems-based practice competency can be highlighted by M&M conference in assessing health care systems issues and how they contribute to medical error. The objective of the study was to introduce a “systems audit” and see how it affected resident awareness of systems issues in health care, determine its educational value compared to other educational experiences and see if institutional improvements in patient care resulted from the “systems audit”.

**Methods:** Cross-sectional study of all 144 categorical IM residents (1st, 2nd, 3rd) at Mayo Clinic (Rochester) in 2007 to determine impact of “systems audit”. Traditional weekly M&M conference format was replaced with “systems audit” curriculum characterized by the following objectives: on completion residents will be able to critically review a clinical case involving an adverse event, identify a systems issue that led to the outcome, conduct a root-cause analysis of the event, interview stakeholders and describe their perspective or role in the system, propose interventions to address the problem and calculate costs related to the adverse event.

Each week a 2nd year resident serves as a “systems auditor” who was not involved in the case (so can maintain objectivity) and performs 6 steps.

1. Review all documentation relating to the case and identify all healthcare providers involved
2. Interview stakeholders (patient care and systems level)
3. Use quality improvement tool (fishbone diagram, mind map) to conduct a root-cause analysis
4. Determine overall cost of care and cost of the adverse outcome
5. Identify a systems issue that contributed to the outcome
6. Propose systems-level interventions and prioritize based on effort-yield projections

All 144 categorical IM residents were anonymously surveyed electronically in May 2007, one year after implementation of the “systems audit” all 46 of the 2nd year residents who conducted a systems audit were also surveyed. The systems audit was evaluated according to 3 outcomes:

1. residents’ awareness of systems issues resulting from the audit
2. residents’ views of the educational value of M&M conf. with systems audit compared to other educational experiences
3. institutional improvements in patient care resulting from the systems audits.

Descriptive statistics to summarize responses and Fisher exact test was used to compare proportions.

**Results:** 6 months before initiation of the systems audit only 4 of 23 (17%) of M&Ms addressed adverse events or medical errors compared with 128 of 129 (99%) of subsequent conferences. (P<0.001). And no
conferences addressed systems issues in the preceding 6 months compared with 99% after implementation.

119 of 144 residents completed surveys (83%); 71 (59%) agreed or strongly agreed that the systems audit increased their awareness of pertinent systems issues involved in M&M cases; 91 (76%) reported increased awareness of the variety of health care professionals involved in patient care and 92 (77%) reported increased awareness of costs of care.

Of the 46 residents who conducted the audits 35 (76%) responded and reported that it was a valuable learning experience 26 (74%); 25 (71%) said performing the audit on a case in which they were not involved was useful; 26 (74%) agreed or strongly agreed it increased awareness of opportunities for improvement in the healthcare system; 20 (57%) agreed they would be more likely to notice systems issues affecting their patients; 27 (77%) reported it was an open reflective environment without negative overtones of shame or blame.

Resident views of M&M with systems audit compared with other educational conferences: 95% of residents agreed or strongly agreed that M&M systems audit was a valuable learning experience vs 61% for all other conferences combined, P<0.001.

Improvements in patient care resulting from systems audits: 2 examples provided—delay in recognition of positive C diff. test—resulted in modification of the existing telephone alert system for positive blood cultures whereby health care providers would be contacted regarding positive C. difficile results. Case of post-op chest pain and EKG changes yet delay to cath lab (18 hour delay between EKG with ST elevation and reperfusion therapy) Identified substantially longer “door-to-balloon” times for inpatients compared to ED patients new “in-house” ST segment elevation MI protocol” designed and implemented.

Conclusions: Integration of the structured systems audit into the weekly IM M&M conf increased resident awareness of systems-based practice, enhanced the perceived educational value and lead to meaningful improvements in patient care throughout the institution. This has fostered a cultural change in the residency whereby medical error and adverse events are openly discussed with less stigma or individual “shame and blame”.


Background: A survey revealed considerable disparity of the goals and content of M&M conferences among 12 different departments at Johns Hopkins hospital. Most conferences focused on medical management issues and less than half addressed patient safety or quality issues. The hypothesis of the study was that teaching residents a structured format for analysis and presentation at each surgical M&M conference would improve the consistency of teaching and learning as they related to identifying specific causes of complications and potential methods to avoid them in the future.
Methods: Pre and post-intervention design targeting surgical residents attending M&M conf in 5 different specialty divisions at a large academic center. Measurement of educational effectiveness included 3 different methods:

1. Assessment of process of teaching during the presentations—2 study investigators observed conferences and documented whether resident presenters actually stated the 2 primary learning objectives: specific causes and potential solutions for complications.
2. Assessment of resident knowledge after presentations achieved by resident completion of questionnaires regarding a particular lesson and how it may change their future practice (5-point Likert scale).
3. Anonymous email survey of resident perceptions regarding the effectiveness of the conference. These methods were used 1-month prior to introduction of a structure presentation format and again one month after implementation of the structured format. (Appendix C)

Appendix C: Elements of Structured Presentation Format

1) Case Presentation/Analysis = 5 Minutes
   • State complication/procedure/disease on first slide
   • Pertinent clinical background
   • Describe circumstances/options available at the time of complication by answering key questions:
     • What was the cause of the complication?
     • Was complication avoidable?
     • Could outcome for patient have been altered?
   • Potential Influencing Factors
   • Systems Problems
   • Communication or Interpersonal Issues
   • Technical Skills Problems
   • Decision making

2) Literature Review = 5 Minutes
   • Describe textbook/literature methods of avoiding/managing complication.
   • Does the literature support the decisions made in this case leading to the complication?
   • “Take home” points, ie, what did you learn from this (what to do differently)?
     • Maximum of two specific points
     • Focused areas for intervention at any level of care
     • If one point is an individual lesson, the second should be a systems-level suggestion for change.

3) Moderator-Led Discussion = 5 Minutes

Results: 40 case presentations were observed before implementation of format changes and 35 presentations were observed after the implementation. Pre-intervention assessment revealed no consistent presentation structure between or within the different conferences. Pre-intervention presentations were described as haphazard with frequent interruptions. Review Table 1. And Table 2.
Table 2 reflects resident adherence to format and is based on a rating of 5 as the highest possible score.

Mean rating assessing the specificity of the cause of a complication cited increased significantly from 3.11 (+/-1.48) before intervention to 4.56 (+/-1.03) after implementation of the new format. A similar increase in mean rating of the specificity of a future practice change was also noted from 3.42 (+/-1.50) to 4.31 (+/-1.40). There was a statistically significant increase for both learning objectives (p<0.005).

19 residents completed online surveys before the new format and 18 completed the surveys after instituting the new format. An increase in the prevalence of positive responses was found in every item after format change.
67% of respondents felt the new format improved the M&M learning experience and 22% felt they covered all the necessary information after the change. This is compared to 0% who felt this way before the new format.

Conclusion: The study substantiates the implementation of a structured format increased the educational value and resident teaching of the conference. The overall clarity of the teaching message was shown with the timely statement of the complications before and after the intervention 20% vs 100% and occurring within the first 5 minutes of the presentation. Also there was timely statement of potential causes (10% vs 71% within 10 minutes)


Background: Goal was to create a multidisciplinary Morbidity and Mortality conference (MM&M) to establish a culture of safety while teaching the ACGME general competencies to surgery residents. Authors highlight that practiced-based learning and improvement (PBLI) and systems based practice
are two ACGME competencies that were previously difficult to conceptualize but the MM&M is ideal for identifying systems issues that may adversely affect patient outcomes and allow for the creation of solutions to address these issues.

Methods: Implementation of a 90 minute MM&M conference in 2008 held quarterly and attended by all members of the perioperative enterprise (from environmental services, anesthesiologists, nurses, pharmacists, radiologist, surgeons and administrators). The conference was organized by a committee, cases with adverse patient outcomes where reviewed by risk management on a weekly basis and selected based on educational value. At each conference residents and faculty involved in the case present the patients’ medical history, reason for admission and clinical course. Base on root cause analysis, discussions were focused on understanding the interface between systems and human factors as sources of error. A moderator facilitates group discussions, fields questions and emphasizes learning objectives. At the end an experienced clinician and the institutions safety officer summarize the teaching points and propose changes to prevent a recurrence of the systems issue that precipitated the adverse event. Attendees were to complete evaluations that determine if the learning objectives were met and if they anticipate changes in their practice based on what was learned. All policy changes were approved by the Executive Medical Board and each subsequent conference begins with an update on the changes enacted by the Perioperative Quality Improvement committee.

Results: Over 21 months 11 cases were discussed with 23 proposed initiatives for quality improvement.

(Figure 2 summarizes cases by category).

![FIGURE 2. Presented cases by category.](image-url)
15 of the 23 initiatives have been completed—Table 2 above, gives examples. Authors also state that all cases covered at least 4 of the 6 ACGME competencies with some cases covering all 6.

Example provided: sequential procedures, re-prep using alcohol based skin prep remover was used and Bovie electrocautery resulted in ignition of the solution and second degree burns of the patient. Protocols implemented: 1. Prohibition of use of such products prior to removal of the electrocautery device from the field. 2. More stringent operating room fire drills and mandatory completion of electronic learning modules. 3. Discussions with product manufacture resulted in warning labels being placed on the product nationally.

Conclusions: Authors highlight the need to create a culture of safety and for healthcare to strive to be included in the group of “zero harm” organizations (nuclear power plants, air traffic control systems). They discuss how human error is a symptom of a malfunction within the system and that we must understand how human error is related to how we function within the system. This is why a multidisciplinary approach is so crucial. Furthermore, they highlight that this conference uniquely provides an opportunity to address all of the ACGME competencies.

Discussion: Open to the group

Take Home Points:

1. The cost and impact of errors in healthcare are enormous, aggressive action must be taken to reduce human error and protect patients from harm.
2. Physicians must be trained to accurately detect errors, learn from them and revolutionize the healthcare system to reduce the impact and frequency of human error.
3. M&M conference as a tenant of medical education can be a useful tool in achieving these objectives (#1 and 2)
4. A highly organized, well formatted M&M involving multiple disciplines, analyzing systems issues, and encompassing all ACGME competencies appears to have a more significant educational impact and can more accurately affect a change in the healthcare system than unstructured M&M conferences.