

## Morbidity and mortality meetings; a new digital portal to enhance learning and objectivity

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### Abstract

Morbidity and mortality meetings have long been part of surgical education and practice. They have undergone several modifications over time to include improvement in patient safety and outcomes as an essential utility of conducting morbidity and mortality meetings. Time and again, it has been proposed in literature that standardisation of case discussion results in the efficiency of these meetings. Learning opportunities can be compiled for system improvement. The current review article was planned to present a newly implemented digital morbidity and mortality portal at the Aga Khan University Hospital (AKUH), Karachi, aiming at homogenising the discussion and to add objectivity to the outcome. It is believed that this uniform system across all surgical specialties may play a significant role in enhancing surgical trainees' learning experience.

**Keywords:** Morbidity and mortality meeting, Patient safety, Surgical education.

### Introduction

Patient-safety is of utmost importance in any ethical healthcare practice. Over the years, different tools have been described to monitor, predict and improve patient-care quality. Morbidity and mortality (M&M) meetings have been around for more than a century in different forms as a forum for discussing errors, mistakes, adverse events and preventive measures. However, this idea's integration has been relatively slow in surgery, gaining momentum during the last few decades only.<sup>1</sup> Increased public attention and scrutiny by media has led to the trend of reporting and discussing one's outcomes in terms of morbidities and mortalities periodically.<sup>2</sup>

M&M meetings are one of the most crucial aspects of surgical training, and are a mandatory component of residency in most reputed training centres in the world.<sup>3,4</sup> Traditionally, the trainee presents details of the case, including diagnosis, care provided — with a rationale and

details of the adverse event. The presentation is followed by an extensive discussion and scientific argument among the trainees and attending consultants, and learning points are emphasised.<sup>5</sup> Thus, these meetings, in addition to being a tool of quality control and safety, have also become a vital learning apparatus for the residents.

Despite its universally accepted importance and scholastic value, time and again, M&M meetings have been found to lack uniformity and standardisation.<sup>6,7</sup> Often, there is a discussion on the case, but the root-cause analysis is skipped, and the central teaching aspect for residents is compromised. This meeting's format varies from institution to institution, and most training centres do not have any standardised protocol. The current review article was planned to unveil a digital platform recently implemented at the Department of Surgery of a tertiary care centre for streamlining M&M meetings.

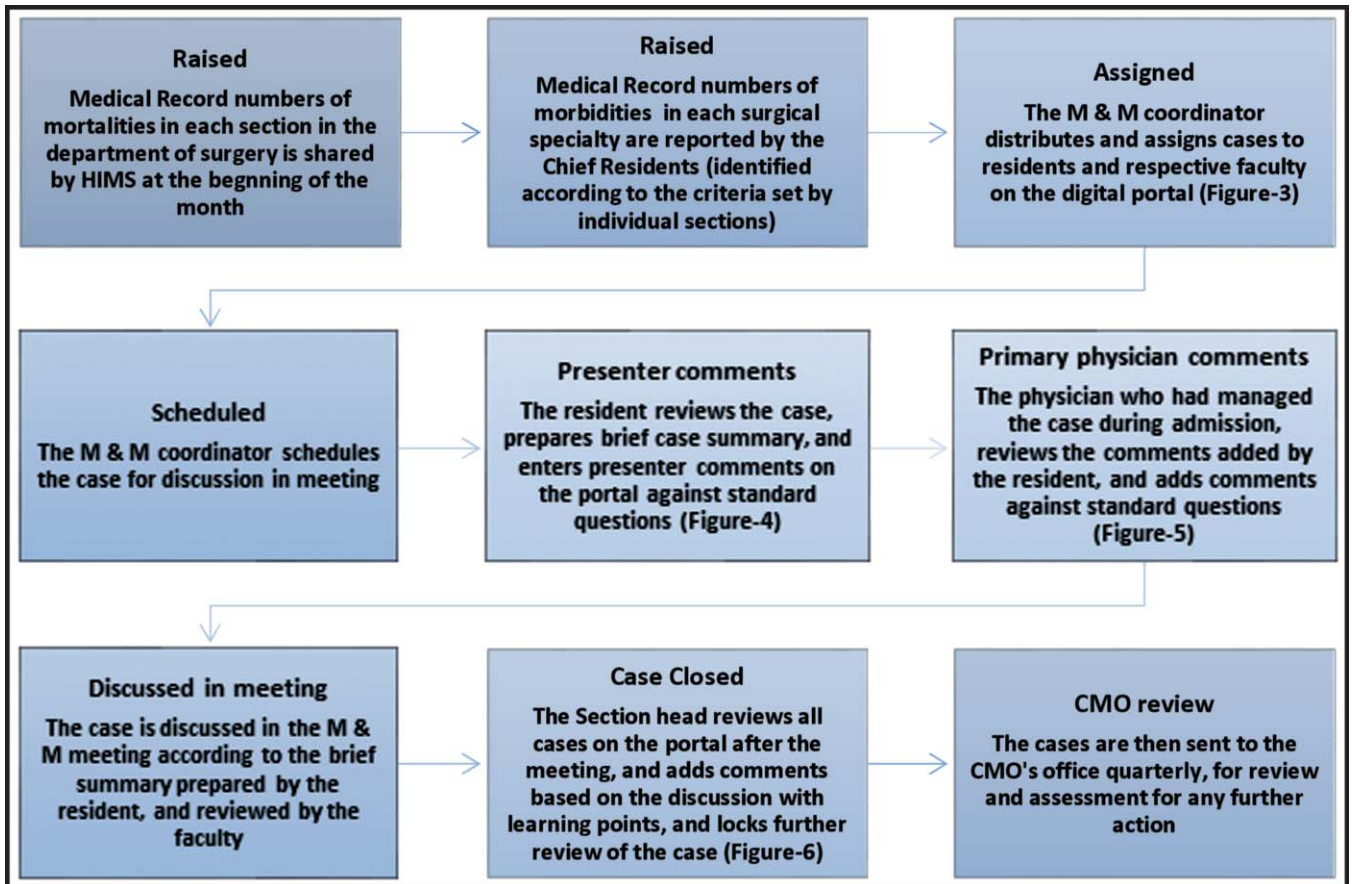
### Digital M&M portal

The Aga Khan University Hospital (AKUH) is a Joint Commission International (JCI) accredited, tertiary care training institution providing a wide array of healthcare services. M&M meetings in clinical services at AKUH have been a consistent feature as part of the hospital policy. All medical and surgical specialties regularly conduct these meetings at different intervals, either weekly or monthly, depending on their working dynamics. The proceedings of these meetings were previously recorded manually in paper form by section heads, a summary of which was later sent to the Chief Medical Officer's (CMO's) office for record. The manual system was often marred by delays in submissions, subjecting the information written to be affected by recall bias. Besides, to retrieve the record, and to ascertain the nature of morbidities and mortalities, were humongous tasks at any point in time.

To add objectivity to the discussion in M&M meetings and its recordings, a new system was launched at the Department of Surgery called the M&M portal. The system was designed by the information technology (IT) department of the hospital, in consultation with the clinical mortality & M coordinator and administration at the Department of Surgery, using the available institutional resources with no additional one-time or

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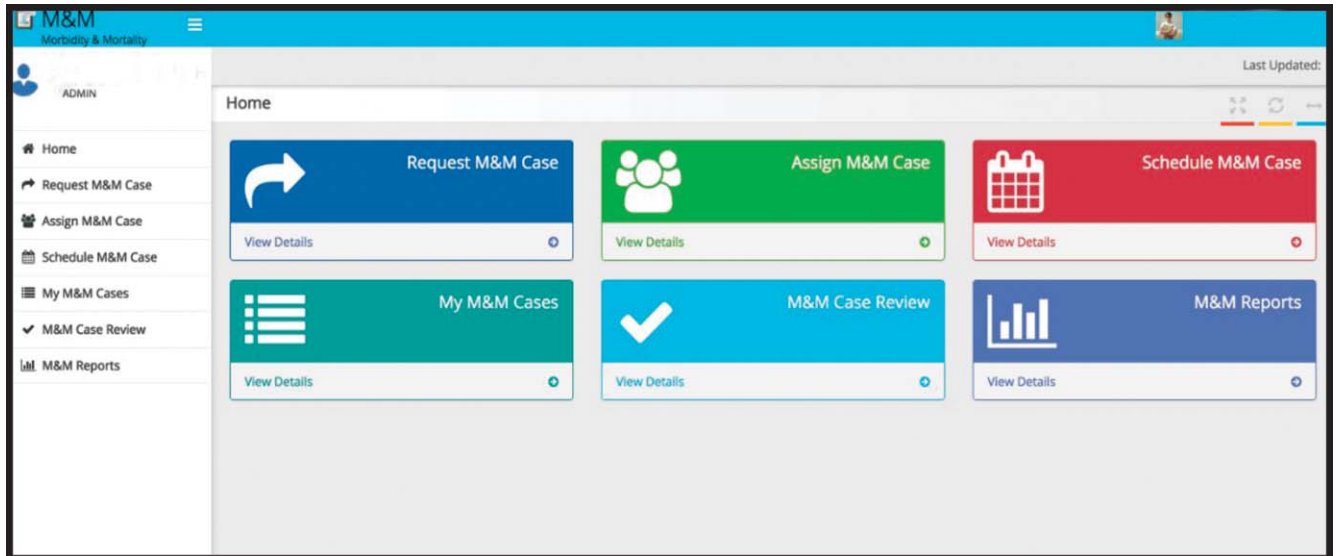
**Figure-1:** Morbidity and mortality (M&M) workflow.

recurring expense. This portal's purpose was to provide easy access to the users, including residents and attending consultants, to enter the relevant case information and keep the data available online for future reference with special permission, to prevent misuse of data, and for confidentiality of this crucial data. All surgery faculty and residents can access the portal on any hospital computer, or on their personal electronic devices when connected to the hospital's Wi-Fi facility.

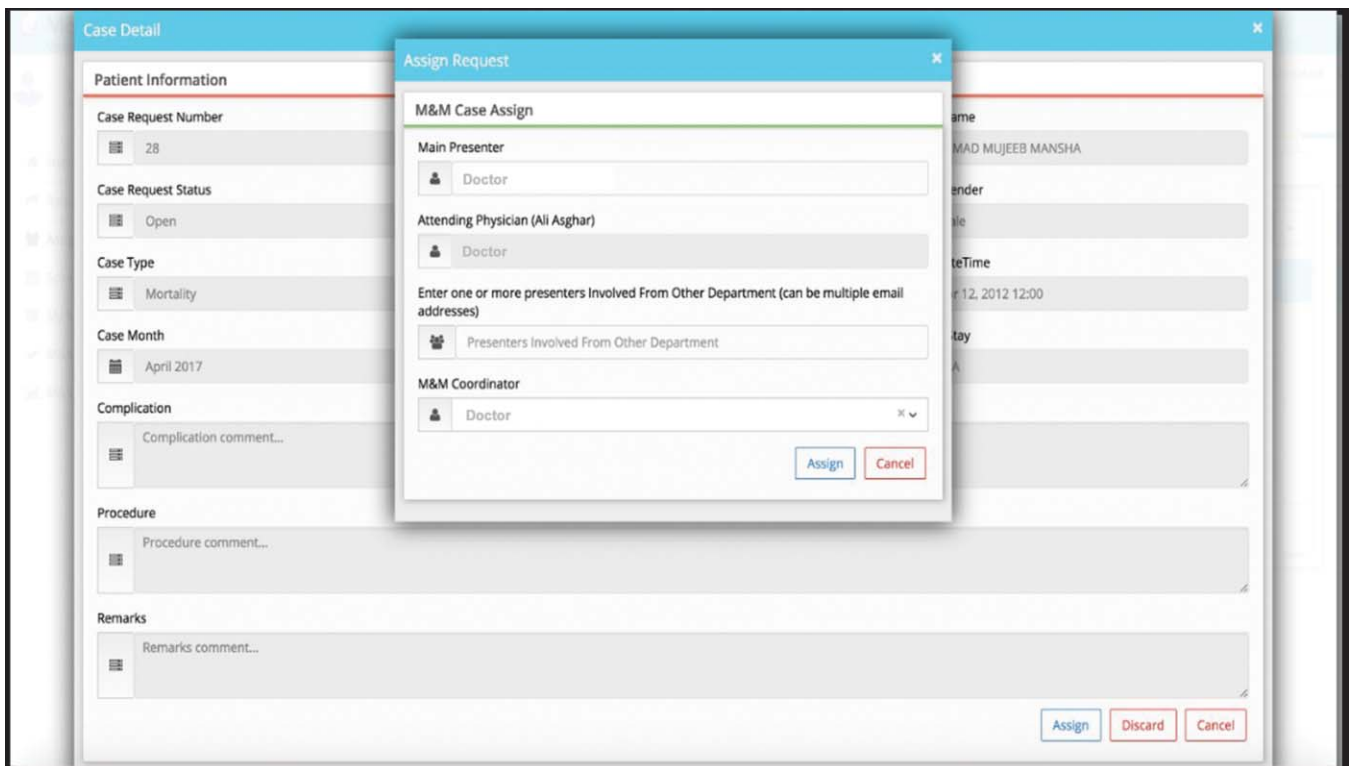
According to the new system, the Health Information Management Services (HIMS) identifies the mortalities. In contrast, Chief Resident/faculty identifies morbidities every month, and shares them with team members of their respective sections (Figure-1). The portal has different interfaces of the portal. Once a case is classified as any one of the three possible categories, including expected death / unexpected death which was not reasonably preventable / unexpected death which was possibly preventable) and is closed by the Section Head, information is then saved, and can be retrieved anonymously to maintain confidentiality of the patient and the physician. The built-in confidentiality process

holds the educational value of the data for improvement in clinical practice or system. To prevent breach of privacy, only the M&M coordinator and Section Head have access to all the cases of their section, and individual residents and faculty can only see the cases that are assigned to them.

It was decided to implement this new system in phases. Since mortalities are less in number than morbidities, in the first phase all specialties were asked to use the portal for adding mortality case data. They could voluntarily add morbidity data online as well, but the practice will be made mandatory in 2021, in the second phase; manual reporting is still being done for morbidities in specialties that have not switched completely to the digital system. In the beginning, a session was arranged for each specialty where the IT team and surgery administration briefed the faculty and residents about this new system. A coordinator was then identified for each specialty, who would later liaison regarding portal usage. During the first 6 months, the specialties continued to use the manual reporting system, and additionally used the digital portal.



**Figure-2:** Home page of morbidity and mortality (M&M) portal.



**Figure-3:** Morbidity and mortality (M&M) case assignment.

Like every new system, there was early difficulty in making the residents and faculty shift to the new domain. Initially residents, and later faculty, were made compliant for entering data. This was done by comparing mortality data received from HIMS, with the cases for which clinical information was entered into the

system. Missing cases were then notified via email, and the resident coordinator was given the task to get the data entered. Once the residents started entering data of all patients regularly, the faculty was then asked to add their comments, followed by case closure by Section Head or Sectional M&M Coordinator with final remarks.

**M&M Presenter Comments**

**Admitting Diagnosis**

**Final Diagnosis**

**Co-Morbid Condition**

**Select Case From CCM System**

|             |                          |                |              |
|-------------|--------------------------|----------------|--------------|
| Location ID | MAIN-OR                  | Case Date      | Aug 28, 2017 |
| Case Number | 2                        | Anesthetist ID | GAFS         |
| Anesthetist | DOCTOR                   | ASA Level      | 2            |
| Anesthesia  | GENERAL ANAESTHESIA(G/A) |                |              |
| Procedure   |                          |                |              |

| Surgeon ID | Name   | Procedure ID | Description                | Specialty |
|------------|--------|--------------|----------------------------|-----------|
| xxxx       | Doctor | ADJ EXT F    | ADJUSTMENT OF EXT.FIXATION | Surgery   |

**Additional Procedure**

Figure-4: Presenter's (Resident's) comments.

**M&M Physician Comments**

**Was the outcome preventable?**

**What might have been done to change the outcome?**

**Is there clinical evidence to support individual practice change that may have altered outcome?**

**Are there any system based changes that may prevent similar future outcomes?**

Figure-5: My morbidity and mortality (M&M) cases (Primary Physician's comment).

From January 2020 onwards, manual reporting was stopped for mortalities, and the portal is being used for the purpose since then. The mortality report submitted to the Chief Medical Officer is also retrieved directly from the system.

An important aim of implementing this digital tool is to

use it for tracking improvement in terms of reduction in morbidities, and preventable causes of mortalities. The first year of this system was spent in improving compliance and acceptability across all surgical specialties. As morbidity case data will regularly start coming up on the M&M portal, the next focus is to gauge and assess changing trends of these cases during the next

**Figure-6:** Morbidity and mortality (M&M) case review and closure by Section Head or Sectional M&M coordinator.

**Table:** Mortality cases for 2019 related to surgical specialties.

| Specialty               | Mortalities | Expected death due to severity of primary illness | Unexpected death which was not reasonably preventable | Unexpected death which was possibly preventable |
|-------------------------|-------------|---|---|---|
| General Surgery         | 26          | 18  | 8   | 0   |
| Cardiothoracic Surgery  | 18          | 10  | 8   | 0   |
| Neurosurgery            | 14          | 9   | 5   | 0   |
| Vascular                | 6           | 0   | 6   | 1   |
| Ear, Nose, Throat (ENT) | 4           | 1   | 3   | 0   |
| Orthopaedics            | 2           | 1   | 1   | 0   |
| Urology                 | 2           | 0   | 2   | 0   |
| Plastic Surgery         | 1           | 1   | 0   | 0   |

one year by generating quarterly and yearly reports of all M&M cases.

During the first 8 months from January to October 2020, 73 mortality cases were entered on the portal. They were discussed in the meetings and then closed by the respective Section Heads (Table).

## Literature Review

M&M meetings' potential to play a role in quality improvement and medical education depends on them being more methodical and systematic.<sup>8</sup> In an observational study, Miller et al. comprehensively studied

morbidities in their patients in a single calendar year and observed substantial limitations in the M&M meetings.<sup>9</sup> They reported that these meetings' goals were often blemished due to a shift of focus from assessing rooms of improvement in the system of care and technique, and surgical education, towards blame-game among the surgeons. This created an environment of defensiveness, which led to underreporting of the complications.<sup>9</sup> Similar findings were reported by Pierluissi et al., who noted frequent ambiguity in the arguments, and inadequate discussions at M&M meetings, thus hindering the role of such meetings in improving patient-safety and reporting adverse events.<sup>10</sup>

It had been long assumed that the discussion and analysis of a case as an aspect of personal failure was a compelling impetus for learning. This is no longer an accepted fact, as many studies have emphasised that individual accountability on the forum of M&M strongly hampers the process of learning and creates a hostile atmosphere with loss of objectivity.<sup>10-12</sup> The digital system implemented at AKUH focuses on a four-point case assessment that includes identifying the problem and its cause, ascertaining how it could have been prevented, supporting arguments with evidence from literature, and recommending any future change in practice. These points help direct the discussion towards a logical conclusion.

Presenting cases in M&M meetings, taking part in the discussion, and supporting arguments with evidence from literature ensures that residents develop into competent and ethical surgeons who believe in evidence-based practice. It also improves their communication skills and analytical thinking. It is a reasonable postulation that if residents encounter a complication or adverse event during training or early practice, and are subjected to academically meaningful discussion, they will be more likely to avoid it in the future. Besides, if they do come across it again, they will manage it in a better way.<sup>11</sup> Evidence suggests that M&M meetings are an essential tool in implementing core competency skills among trainees.<sup>10,13</sup>

Hasan and Brown conducted an observational study and proposed that a highly structured critical appraisal of complications, and comparison of complication rates with those published in literature, leads to improvement in the utility of M&M meetings.<sup>14</sup> Kashiwazaki et al. conducted a prospective study to assess the efficacy and benefit of M&M meetings on the education of neurosurgeons.<sup>15</sup> They reviewed the discussion on 44 mortality and 201 morbidity events in these meetings and found a statistically significant reduction in the avoidable complications among residents and consultants over a five-year period.

At most training centres, M&M meetings or conferences involve the residents summarise a case, followed by discussion among the faculty and senior residents to ascertain the human and system-related factors that led to the morbidity or mortality, and how it could be prevented in future. Most authors have mentioned the M&M platform to be a meeting or conference room, but there is dearth of literature on how these cases are recorded. Laing et al. had proposed a hybrid electronic medical record system for timely recording of M&M cases and their retrieval.<sup>16</sup> They found that this system provided them a platform for benchmarking and analysing the incidence of complications.<sup>16</sup> The digital M&M portal at AKUH enables the resident to save any adverse event at the time of occurrence in the system. This will likely decrease the recall bias associated with the previous system.

An important limitation of the M&M system at AKUH is the absence of the option for independent reviewer's comments. Since the faculty who had managed a mortality or morbidity adds comments, and it is later closed by the Section Head of the same specialty, it may potentially create a bias where important learning points might be overlooked. If the cases are randomly reviewed by an independent reviewer as well from another

specialty in the department, it may add more transparency and accuracy to the system. A limitation of the current review article is the lack of objective data on the actual impact of the digital M&M portal on surgical education. The authors plan to study this aspect in future once the system is fully implemented for morbidities as well.

## Conclusion

A digital tool to record and review morbidities and mortalities objectively can be a good thing. It is believed that the implementation of a digital M&M portal at AKUH will lift the bar of surgical residency training and practice, and as learning from M&M is used to improve clinical care and system, it is likely that a paradigm shift may be seen in terms of reduced rates of avoidable complications.

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