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Implementation of the Morbidity Mortality Review at the Day Hospital of National Institute of Oncology of Rabat

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Abstract

Morbidity and mortality review (MMR) is a collective, retrospective and systemic analysis of cases marked by the occurrence of a death, complication or event that could have caused harm to the patient, with the aim of implementing and monitoring actions to improve patient management and care safety. We selected cases of serious complications occurring in a medical oncology department, at the day hospital, between March 2023 and October 2023, to be presented by a medical oncology resident, and discussed at RMM meetings, following a PowerPoint presentation based on an ALARM analysis method. Among four cases of serious complications during this study period, three were discussed at RMM meetings. The categories most activated in all four cases were patient, caregiver, and team. The "patient" category was activated in all the cases presented. Each morbidity-mortality review issued at least one improvement recommendation. Among the four cases, three recommendations were retained: - No oxaliplatin treatment if the patient does not take premedication. - In young women of childbearing age, BHCG assay is systematically performed at the start of treatment and in the event of amenorrhea under antitumor treatment. - Improve the care pathway and reassess the condition of patients coming from an extra-HDJ circuit. Implementing the RMM in oncology has improved the culture of safety and transparency. This experience has homogenized the team: teamwork, critical thinking, risk control and management, continuous improvement of care quality. And it should also be implemented in other medical oncology departments (inpatient units), and multidisciplinary RMMs set up in collaboration with the corresponding departments, in particular surgery, pharmacy, etc.

Keywords: morbidity-mortality review, implementation, day hospital, oncology, quality improvement, patient safety

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1. Introduction

The morbidity and mortality review (MMR) is a collective, retrospective and systemic analysis of cases marked by the occurrence of a death, complication or event that could have caused harm to the patient, with the aim of implementing and monitoring actions to improve patient management and care safety [1]. This approach makes it possible to learn and understand from the analysis of situations that have occurred, so that we can act together to improve the quality and safety of care, but never to find someone responsible or guilty [1]. The systemic analysis carried out during the RMM is a global analysis of the situation, taking into account all the interacting elements (organizational, technical and human) that have contributed to a patient's care. It enables us to go beyond a single focus on one or more individuals.

At the end of this analysis, lessons can be learned about existing strengths and vulnerabilities, so that actions can be taken to improve the quality and safety of care [2,3]. Historically, MMRs have been commonly conducted in surgical departments as a mode of clinical training and a means of improving the quality of care [4,5]. However, MMRs have been conducted in a variety of settings, including acute care units [6,7], community medical centers [8], emergency departments [9], general medical units [10], intensive care units [11] and palliative care units. In fact, standardized MMRs have been deployed and evaluated in entire hospitals or hospital networks [12,13]. The first MMRs appeared in the United States at the beginning of the 20th century. The success of the method led to its development in other disciplines and other countries [14]. In the United States, MMRs have been part of training programs since

1983, and hospitals are required to organize regular MMRs to maintain their accreditation [15].

In the UK, the Royal College of Surgeons of England has emphasized the central role of MMR in helping services achieve and maintain high standards of care, and in 2015 established guidelines to standardize the procedure [16]. In France, RMMs appeared sporadically in the 1990s, at the initiative of surgical or intensive care teams. Published experiences present RMMs as a means of assessing and improving the quality and safety of care. In 2009, the French National Authority for Health published a methodological guide dedicated to RMMs, and recognized this method for the evaluation of professional practices and the certification of establishments. It has even become mandatory in certain sectors (surgery, intensive care, oncology) to meet certain criteria of the 2010 version of certification [14]. The interest of implementing the morbidity-mortality review at the day hospital is to assess its impact on improving the quality of care, in a medical oncology department. This is the first MMR to be implemented in a medical oncology department, at the National Institute of Oncology of Rabat, Morocco.

The objectives of the RMM are:

- Evaluate and improve professional practices.
- Improve knowledge through feedback.
- Continuous improvement in the quality and safety of care.
- Risk control and management (a posteriori method) [17].

2. Materials and Methods

The implementation of the morbi-mortality review took place at the day hospital in the medical oncology department, at the National Institute of Oncology (INO) in Rabat Morocco. We collaborated with the surgical oncology team, the initiator of RMM implementation at INO, during the period from March 14 to October 13, 2023, with a six-hour schedule. After collecting patient data (clinical and paraclinical signs, treatment and evolution), we prospectively collated four cases discussed during the various RMMs.

2.1. Parameter

The National Institute of Oncology is an academic cancer center that is part of the university hospital Ibn Sina in Rabat, Morocco. Since 1984, INO has been the only national public institution offering medical oncology, radiotherapy and surgery on the same site [15]. In 2018, the digestive surgical oncology department at INO took the initiative to implement a regular morbidity-mortality review to improve quality of care and patient safety. Ten MMR cases were discussed in the surgical department between July 2019 and December 2019 [18]. Following this initiative, we have extrapolated the surgical experience by implementing RMM within HDJ. The RMM method consists in determining, through a systemic analysis, the overall causes that led to the event [19].

Among several existing root cause analysis methods (the ALARM method, ORION and cause tree analysis) [19], we chose the ALARM (Association of Litigation and Risk Management) method. This method was developed by a British research team in the late 90s [20,21], recommended by the HAS and adapted to healthcare establishments. It classifies root causes into 7 categories (patient, strategy and tasks, caregiver, team, work environment, management, constitutional context), each containing a list of contributing factors (table 1). Its aim is to identify the root causes, the factors contributing to the occurrence of errors, in order to correct them by installing defenses or barriers and thus create a safer environment [20]. The aim of this analysis is to draw lessons likely to improve practices and act on the causes that contributed to the appearance of the problems encountered in order to avoid recurrence [22]. The originality of this study is to create a new contextualized adapted form, and have one RMM per month in the objectives for the year 2024.

2.2. Description of the intervention

RMM meetings are held quarterly, planned in advance to enable cases to be discussed in good time, and to allow all participants to join the meeting. Each of the following healthcare professionals was invited: the department head, a senior surgeon, the oncology physicians, the residents, the head nurse, the nurses in charge of patient care during chemotherapy cycles, and a pharmacist in charge of medical devices purchased by the hospital. At the start of the meeting, participants are reminded that all information shared is confidential, and that they should refrain from attributing blame or direct personal criticism to their colleagues.

The RMM procedure was as follows [18]:

1. Case selection: the day hospital team selects, from among the patients who come in each day for chemotherapy treatment, cases presenting adverse events such as a death, a complication or an event that could have caused harm to the patient.

2. Case assignment: the selected case is assigned to the day hospital resident who was involved in the patient's care when the event occurred. The resident who has already completed the e-learning content has one to two weeks before the MMR to prepare for the meeting.

3. Prepare the case according to the following steps

- ***Step 1***

Establishment of a non-interpretive chronological sequence of facts describing: detailed case history, physical examination, results and copies of documented medical imaging, treatment plan decisions. Residents were strongly encouraged to conduct individual interviews with any physician, nurse, patient or family to complete the chronological sequence of events.

- ***Step 2***

Detection of the care-related problem: identification of the adverse event, diagnosis of the complication and its management.

- ***Step 3***

Identification of root causes and contributing factors.

Identification of recovery factors: analysis of all actions taken, voluntarily or otherwise, by medical and paramedical staff to prevent the occurrence of the event or reduce its severity.

4. Case presentation

All these data were presented using the PowerPoint template prepared in advance. All contributing and recovery factors were presented on an Ishikawa diagram designed to assign all identified factors to one of the seven categories of the ALARM framework: patient, strategy and tasks,

caregiver, team, work environment, management, and constitutional context.

The physician, who leads the MMR, encourages participants to discuss and reflect in a blame-free environment.

5. Discussion of the case and the care problem

After the presentation, the multidisciplinary team discussed the case and agreed on the care problem. Based on all the contributing factors identified, the root causes were determined using the 5 Whys technique.

6. A review of possible improvement measures was carried out. A consensus was reached on the measures to be implemented.

7. Declaration of identified factors

The identified health problem, contributing factors and recovery factors were discussed collectively and publicly, and reported directly on the PowerPoint template used for the presentation. All modified presentations were stored in a shared folder, which was used as a database for process evaluation.

8. Protocol proposal

The same resident is tasked with drawing up an action plan to avoid recurrence, proposing improvements in care from an organizational, human or technical point of view [23]. This protocol proposal was presented to the staff at the next MMR, where it was discussed and either accepted or modified. Once these modifications had been made, the protocol was approved for implementation and sharing [18].

After the MMR meeting, it is recommended to:

- draw up anonymous minutes for each meeting
- ensure follow-up and evaluation of the actions implemented
- provide for the drafting of an annual activity report (anonymous)
- ensure team communication and information (feedback) [1].

A procedure, reports and an annual activity report are drawn up and distributed to participants. Documents relating to a RMM (reports and annual activity report) are anonymous and archived with the other quality documents for the activity sector [1]. An annual MMR activity report is drawn up. It may not contain any directly or indirectly nominative information and includes:

- the number of meetings held during the year
- the number and type of cases analyzed during the year
- the number and type of cases that gave rise to improvement actions
- list of improvement actions implemented
- follow-up procedures (table 2: follow-up sheet). This report can be prepared during a dedicated RMM meeting [1].

It is advisable to set aside part of the next meeting to follow up on actions decided at previous meetings [22]. Documents relating to the MMR must not be included in the patient's medical file. The aim of the MMR is to improve the quality of care and practices in general, not to improve a patient's state of health on a case-by-case basis [23].

3. Results

Between March 14, 2023 and October 13, 2023, we collated four MMR cases, three of which were discussed during meetings at the day hospital, medical oncology department, National Institute of Oncology of Rabat. Table 3 describes the cases included and discussed at the meetings.

4. Discussion

We have implemented a morbidity-mortality review in a medical oncology department, at the day hospital, which is a first experience in improving the quality of care. One of the main strengths of this implementation is that the MMRs were organized according to a structured procedure, from the selection criteria to the standardized format and visual aids for case presentation, to the analysis of the root causes of undesirable events and the organization of the implementation and follow-up of improvement measures. The identification of system-related problems enables RMMs to be oriented towards quality improvement [18]. RMMs are therefore a platform for regular patient safety training, enabling lessons learned from errors to be converted into improvement measures [24].

In addition, assigning MMR cases to residents and doctors in training facilitates understanding of the vulnerabilities of systems and processes, and awareness of common adverse events. It is an opportunity to develop their skills in presenting, reflecting on and analyzing serious incidents and, finally, to stimulate ideas for quality improvement projects [25]. The MMR approach erases individual error by analyzing the multifactorial causes of a complication, and instills a positive culture of error with a view to improving practices [23]. The non-blaming of those involved in the management, and the anonymity of both caregivers and patients, are essential to the objectivity and success of the search for causes, as well as to the durability of MMRs [1]. An RMM that meets the stated quality criteria can be promoted as part of continuing professional development (continuing training, assessment of professional practices, accreditation of doctors), the certification of healthcare establishments and an establishment's risk management system [1].

However, MMRs should not just be an opportunity to impart theoretical knowledge; strategies need to be developed to translate error analysis into meaningful quality improvement initiatives [26]. One of the weak points of the RMM is the department's constraints in terms of location and timetable, to ensure that as many professionals as possible are involved [27]. If an RMM is poorly performed, it will be used as a tool to find the culprit. Physicians sometimes have limited enthusiasm for RMMs, seeing them as an opportunity for personal questioning and punishment. This tendency to steer the debate towards blaming the doctors in charge of the case, particularly the juniors, is reported by several authors, who consider it a transgression of the spirit of MMR that can be deleterious [28,29]. A shortcoming reported in the literature is that reviews focus on specific, rare problems [28]. In this way, MMR gradually becomes a traditional clinical pathology conference where debate is centered on clinical reasoning and the resolution of difficult clinical problems [29].

Table 1. ALARM categories and contributing factors

Categories	Contributing factors	
	Factors	**Root causes**
I- Patient	Severity of condition	- Age and history - Comorbidities and medical treatment - General and nutritional status - Handicap
	Severity of indication for care	- Advanced disease - Emergency care - Complex protocol
	Communication barriers	- Language - Sensory status - Psychiatric status - Neurological status
	Social and family factors	- Economic level - Family support - Social support
	Conflicting relationships with caregivers	- Distrust - Disrespect - Aggressiveness - Indifference - Opposition
II- Strategies and tasks	Therapeutic strategy	- Definition of strategy - Planning - Suitability
	Tasks	- Definition - Scheduling - Adequacy - Allocation
	Complementary examinations	- Availability - Indication and timing - Interpretation
	Protocols	- Availability - Suitability - Use of protocols
III- Caregiver	Clinical knowledge and skills	- Suitability - Experience - Novel situation
	Non-technical skills and respect for rules	- Assessment of the situation - Decision-making - Teamwork - Leadership skills
	Physical and mental condition	- Stress - Fatigue - Sleep
IV- Team	Team structure and organization	- Staff numbers - Skills - Functioning - Distribution of tasks
	Professional communication within the department	- Oral communication - Written communication - Critical information

	Inter-department professional communication	- Oral communication - Written communication - Critical information
	Communication with the patient and family	- Nature of care - Risks and prognosis - Aggravation - Consent
	Patient record documentation	- Availability - Quality - Data management
	Support and supervision	- Technical support - Moral support - Supervision
V- Working environment	Physical environment	- Noise - Temperature - Brightness - Ergonomics
	Material and equipment	- Availability - Suitability - Utilization
	Information system	- Availability - Suitability - Utilization
	Workload	- Clinical - Non-clinical
	Turnaround times	- Early and hasty - Delays - Imposed deadlines
VI- Management	Personnel management	- Job assignment - Job descriptions
	Training and integration of personnel	- Training of new arrivals - Ongoing training - Integration
	Subcontracting management	- Service availability - Service quality - Service management
	Purchasing management	- Product availability - Product quality - Scarcity management
	Quality and safety management	- Trade-offs against safety - Failure already reported - Failure already targeted by a measure
	Out-of-hospital context	- Institutional context - Socio-economic context - Regional, national level

Table 2. MMR action follow-up sheet [1]

Mortality and morbidity review **Action follow-up sheet n° /**
RMM meeting of .../ ... / ....
Context and objective(s) (why?) (type of case, factors and causes identified, summary and conclusions of the analysis)
Action implemented (what? where? when? how? by whom?)
Follow-up (implementation deadlines, monitoring and evaluation procedures, possible indicators, communication and information for teams, etc.) Presentation at the RMM meeting on ... / ... / .... (Several dates possible)
Person(s) responsible for monitoring: (who?)

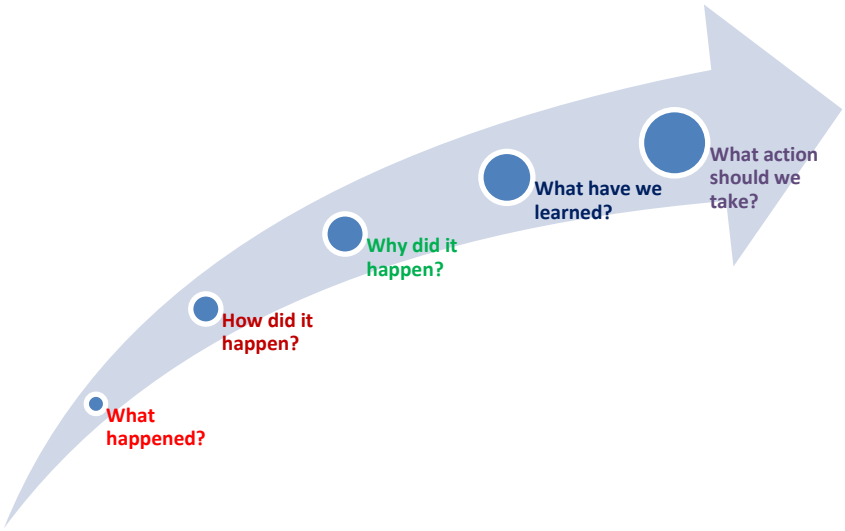

Figure 1. Questioning when faced with an adverse reaction [19]

Table 3. Analysis and improvement of RMM cases

Patient description	Care issues	Contributing factors	Improvement measure
F 52 years old, stage IV colonic ADK	Anaphylactic shock to oxaliplatin	- **Patient:** * Social and family factors: the patient could not afford to buy premedication on the day of treatment. **- Strategy and tasks:** * Protocol adequacy: no premedication prior to chemotherapy treatment. - **Team:** * Patient file documentation: the doctor did not document why the decision was made to reduce chemotherapy doses (history of anaphylaxis?).	No oxaliplatin treatment if patient does not take premedication.
F 36 years old, stage IV breast cancer	Pregnancy in a patient undergoing chemotherapy	- **Patient:** * Social and family factors: the patient was informed through the post-chemotherapy safety prescription that it is strongly advised to avoid pregnancy during antitumor treatments. * Conflicting relationships with carers and care: the patient was unclear about the delay in menstruation, she doubted she was pregnant given that she had unprotected sex with her partner during treatment and she did not inform the doctor leaving him to deduce on his own. **- Caregiver:** * Non-technical skills and compliance: the patient reported the delay in menstruation to the oncologist and gynecologist, but the two doctors did not react because they considered it to be chemo-induced amenorrhea. * Physical and mental state: the day hospital doctor was overworked and had no time to investigate the cause of the amenorrhea.	In young women of childbearing age, the BHCG assay is systematically performed at the start of treatment and in the event of amenorrhea under antitumor therapy.
F 68 years old, stage IV lung ADK	Management of an unstable patient at the day hospital	**- Patient:** * Severity of the patient's condition: hypertensive, diabetic, ischemic heart disease under treatment. * Severity of indication for care: patient presents to day hospital with hemodynamic instability. **- Team:** * Team structure and organization: patients who come from outside the day hospital department have their treatments administered directly, without assessment by day hospital doctors. *Interdepartmental professional communication: the doctor outside the day hospital department wants his unstable patient to spend her treatment at the day hospital department without criticism, considering that the instability is linked to her illness. *Support and supervision: stressful situation for the nursing team to manage an unstable patient who comes from outside day hospital. - **Management:** * Purchasing management: the family was quite aggressive, as they wanted the unstable patient to have her	Improve the care pathway and re-evaluate the condition of patients coming from an extra-day hospital circuit.

		chemotherapy treatment, which they bought because it was not available at the hospital. * Quality and safety management: the safety of the unstable patient is the responsibility of the doctor outside the day hospital department who decided that the patient should have her treatment at the day hospital, and of the day hospital department. →**Recovery factor**: decision made by the day hospital team is to hospitalize the patient and spend the cure under supervision, for lack of space the patient was hospitalized in a nearby clinic.	
F 21 years old, stage IV sigmoid ADK	Anaphylactic shock to oxaliplatin	**- Patient:** * Socioeconomic factors: the patient underestimated the value of premedication before the chemotherapy course despite being alerted by the care team. **- Caregiver:** * Physical and mental state: the nurse who is going to administer the treatment has not rechecked whether the patient has taken her premedication.	No oxaliplatin treatment if patient does not take premedication.

F= Female, ADK: adenocarcinoma

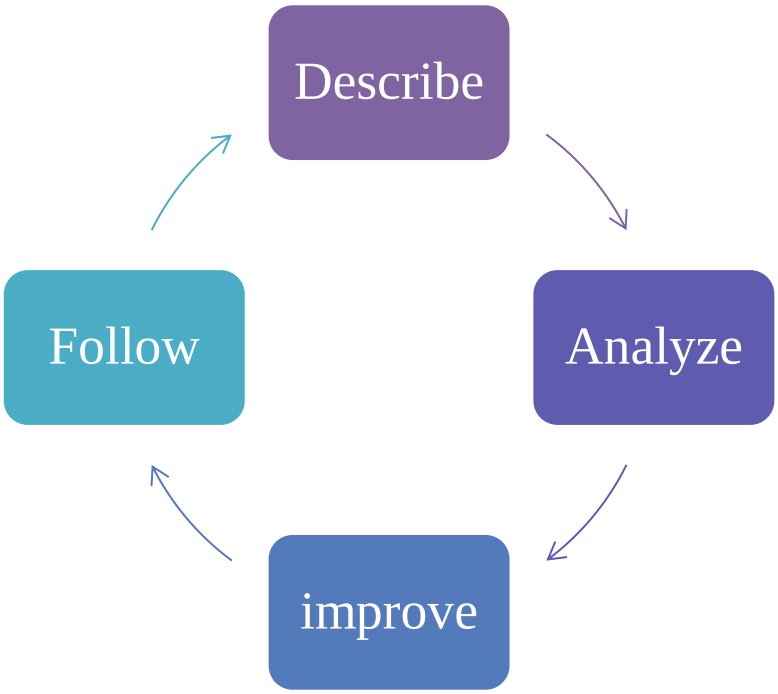

Figure 2. MMR and quality approach [1]

Of the four cases of serious complications selected, three were presented in PowerPoint and discussed at the meetings, following the same structured MMR procedure. The 4th case, anaphylactic shock secondary to oxaliplatin, was not presented at the RMM meetings, as it was the same improvement measure as the 1st case, which concluded that no oxaliplatin treatment should be given if the patient had not taken premedication. However, it was included to emphasize that cases may persist and that eradication of the problem cannot be solved immediately after implementation, but more rigorous follow-up is needed to better judge the effectiveness of this implementation. The categories most activated in the four cases are patient, caregiver and team. The "patient" category was activated in all the cases presented. Each morbidity and mortality review issued at least one improvement measure.

Among the four cases, three recommendations were retained:

- No oxaliplatin treatment if the patient does not take premedication.
- In young women of childbearing age, BHCG assays should be performed systematically at the start of treatment and in the event of amenorrhea under antitumor treatment.
- Improve the care pathway and re-evaluate the condition of patients coming from an extra-day hospital circuit.

Limitations in terms of implementing RMM action plans at the day hospital:

- Firstly, the difficulty of monitoring improvement plans.
- Secondly, the multiplicity of nursing staff (new interns, new residents, etc.), which will require training and information for new arrivals.
- Thirdly, the implementation of the RMM is recent and its participation is not mandatory in medical training.

5. Conclusion

Implementing RMM in oncology has helped to improve the culture of safety and transparency. This experience has only served to homogenize the team: teamwork, critical thinking, risk control and management, continuous improvement in the quality of care. We also need to implement it in other medical oncology departments (inpatient units), and set up multidisciplinary MMRs in collaboration with the corresponding departments, notably surgery, pharmacy, etc. Finally, we hope that further studies will be needed to collect more data and better assess the impact of MMR on improving the quality and safety of care.

Competing interests

The authors declare no conflicts of interest.

Authors' contributions

Data collection and analysis: Fatima-Zahra Kahouadji, Sihame Lkhoyaali, redaction of the article: Fatima-Zahra Kahouadji, revision of the article: Fatima-Zahra Kahouadji, Sihame Lkhoyaali, Saber Boutayeb, Amine Benkabbou, Mohammed Anass Majbar, Oumayma Lahnaoui and Hassan Errihani. All authors have read and approved the final version of the manuscript.

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