Mortality meetings: ethical considerations and adherence to evidence-based practice from 6 years of experience in a mixed cardiac department

Fabrice Larrazet \(^a,^b,^c,^d,^*\), Thierry Folliguet \(^b\), François Laborde \(^b\), Jean Bachet \(^c\), Christian Hervé \(^d\)

\(^a\) Hôpital Saint Camille, 2 rue des Pères Camilliens, 94366 Bry sur Marne, France
\(^b\) Institut Mutualiste Montsouris, Paris, France
\(^c\) Zayed Military Hospital, Abu Dhabi, United Arab Emirates
\(^d\) Laboratoire d’étique médicale et de médecine légale, INSERM, Université Paris-Descartes, Paris, France

Received 6 January 2011; received in revised form 17 February 2011; accepted 21 February 2011; Available online 29 March 2011

Abstract

Objective: Most patients die unexpectedly in cardiac departments. We analyzed the ethical issues raised by poor outcomes and the leading causes of hospital deaths including organic causes of deaths, system failures, and questionable caregivers’ attitudes. Method: We analyzed reports from 99 mortality conferences in a mixed cardiac department (surgery and interventional cardiology) where 146 patients died from 2002 to 2008. Results: Patients were referred for cardiac surgery \((n = 115)\), interventional cardiology \((n = 25)\), or medical therapy \((n = 11)\). Highly recommended class I interventions were performed in most patients \((n = 120, 82\%)\). A history of renal failure \((25\%)\), peripheral artery disease \((21\%)\), diabetes \((18\%)\), cancer \((16\%)\), or respiratory disease \((16\%)\) was frequently noticed. The areas most frequently identified as potentially problematic were preoperative strategy \((58\%)\), surgical technique \((50\%)\), monitoring \((47\%)\), reactivity \((43\%)\), drug prescription \((32\%)\), difficulties or delays in diagnosis \((27\%)\), and transfer \((21\%)\). At least one transgression from routine medical practice was identified in 66 \((45\%)\) patients, and a causal relationship between this transgression and the patient’s death was suggested in 33 cases \((23\%)\). Serious errors were identified for five patients \((3\%)\), with a suggested causal relationship to death in two cases. Ethical discussions focused on alternatives in treatment \((73\%)\), good medical practice \((44\%)\), secondary recommendations \((18\%)\), information \((12\%)\), consent \((12\%)\), non-malfeasance \((7\%)\), and equity \((6\%)\).

Conclusions: Mortality conferences provide an opportunity to identify many system failures. Poor outcome is multifactorial. Technical and ethical aspects should be considered for quality care improvement.

© 2011 European Association for Cardio-Thoracic Surgery. Published by Elsevier B.V. All rights reserved.

Keywords: Mortality; Ethics; Errors; Cardiac surgery; Valve surgery

1. Introduction

The need and demand for high-quality care is increasing and there is evidence to suggest that the quality of patient-centered care in hospitals could be improved \(^{[1—3]}\). Improvements in outcomes for patients in the next few years will probably depend not only on the discovery and development of new treatments, but also on improvements in the delivery of existing effective therapies, based on what we can learn from current practice \(^{[4]}\). Changes in practice begin with an awareness of identifiable causes of poor outcome \(^{[5]}\). Mortality and morbidity conferences (MMCs) are the cornerstone of such assessments \(^{[6,7]}\). We present our experience and methodology of mortality meetings in a mixed cardiac department and finally propose a checklist to improve our current practices at the conclusion of this cyanide/risk approach and ethical analysis.

2. Materials and methods

Since January 2002, mortality and morbidity meetings have been organized in the Cardiology Department of Institut Mutualiste Montsouris. At each of these sessions, one or two cases of patients with a fatal outcome or near-miss events were analyzed. An analysis of the MMCS held between January 2002 and January 2008 was then carried out. We consider only deaths in this study. A representative from the institutional mortality and morbidity committee was always present and was responsible for organizing the meeting, ensuring that the MMC checklist of the cardiac department was followed and harmonizing the discussion \(^{[8]}\). Each meeting was scheduled to take place at the same time in the week and lasted at least 1 h. All potential participants were contacted via intranet 48 h before the session, with a...
message indicating the patient’s name and/or the principal disease to be discussed. All those present at the meeting were asked to sign in and participation was open to all care providers, from any department or institution.

The case was presented by the surgeon or practitioner principally responsible for patient management. Complete patient records were available. Each case was related chronologically, with participants being allowed to interrupt at any stage of the presentation, if an important detail was omitted. There was then a discussion of the case, with a consensus reached in most cases concerning the response to the question ‘What should we do next time to avoid the events described in this case?’ The cardiologist and the clinical research assistant in charge of the MMCs input all the information into a data model. Action plans were formalized and anonymous conclusions were addressed to all members of the medical and paramedical staff. All action plans were accessible via intranet, and all the information collected was recorded prospectively for subsequent statistical analysis.

Two aspects of the cause of death were considered. First, the events occurring in hospital that might have hastened the patient’s death were considered. The ultimate organic cause of death was then considered.

2.1. Statistical analysis

Statistical analysis was performed with Statistical Package for Social Sciences (SPSS) (IBM, Chicago, IL, USA). Values of \( p < 0.05 \) were considered significant. Data are expressed as medians and interquartile ranges.

3. Results

In total, 146 cases with a fatal outcome (accounting for 70% of all in-hospital deaths within the Cardiology Department) were analyzed during 99 MMCs. During this period, 3276 patients underwent cardiac surgery (2587 on-pump), whereas 2799 had percutaneous coronary intervention (PCI) and 1830 had a medical therapy. Most of the cases presented for discussion concerned patients referred for cardiac surgery (\( n = 115 \), EuroSCORE (European System for Cardiac Operative Risk Evaluation) predicted mortality = 14% with quartiles 6% and 27%, extreme values 1% to 88%), with smaller numbers of patients referred for interventional cardiology (\( n = 25 \)) and medical therapy (\( n = 11 \)) [9]. We selected 115 out of 140 patients (82%) who died after surgery and 25 out of 27 patients (92%) who died after PCI. Some patients underwent both cardiac surgery and interventional cardiology (\( n = 5 \)). The characteristics of the patients are listed in Table 1. We recorded a high frequency of history of cancer, diabetes, renal failure, respiratory disease, or peripheral artery disease. Coronary artery disease and aortic valve stenosis were the most frequent diseases (\( n = 31, 21.3\% \)).

3.1. Participants at the meetings

The median number of participants was seven (inter-quartile range: 4–9, extreme values: 3 and 48). The participants were mostly physicians and the clinical research assistant, with nurses also present at eight sessions. Most of

<table>
<thead>
<tr>
<th>Table 1. Patients characteristics (( n = 146 )).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean, quartiles, extreme values)</td>
</tr>
<tr>
<td>Sex (M/F)</td>
</tr>
<tr>
<td>Diabetes</td>
</tr>
<tr>
<td>Renal failure(^a)</td>
</tr>
<tr>
<td>Chronic obstructive disease</td>
</tr>
<tr>
<td>Pulmonary disease</td>
</tr>
<tr>
<td>Distal arteriopathy</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
</tr>
<tr>
<td>History of cancer</td>
</tr>
<tr>
<td>Immune deficiency(^b)</td>
</tr>
<tr>
<td>NYHA(^c) (I/II/III/IV)</td>
</tr>
<tr>
<td>LVEF(^d) mean % (quartiles)</td>
</tr>
<tr>
<td>Coronary disease</td>
</tr>
<tr>
<td>Cardiogenic shock</td>
</tr>
<tr>
<td>Valvular disease</td>
</tr>
<tr>
<td>Thoracic aorta disease</td>
</tr>
</tbody>
</table>

\(^a\) Defined as a creatinine clearance level <30 ml/min.  
\(^b\) Long-term corticotherapy or immunosuppressive drugs, neoplasia.  
\(^c\) NYHA: New York Heart Association cardiac failure classification.  
\(^d\) LVEF: Left ventricular ejection fraction.

the meetings concerned the Cardiology and Critical Care departments. Some meetings were organized with the Thoracic (\( n = 2 \)) or Vascular (\( n = 3 \)) Medicine departments. Institutional meetings (involving more than two departments) occurred twice. All but two (98%) of the meetings progressed smoothly.

3.2. Distribution of cardiac interventions

The distribution of cardiac interventions is shown in Table 2. Aortic clamp time was 63 min (42–105) and bypass time was 91 min (57–140). Blood cell transfusion was necessary for 42 (29%) patients. The most frequent intervention was valve surgery, with or without coronary artery bypass graft (CABG). Most patients were intubated at the time of death (\( n = 112, 77% \)) and 30 (21%) had an intra-aortic counterpulsation balloon pump (IABP). Body temperature ranged between 34 and 39 °C (median: 37 °C, interquartile range: 35–38 °C). Median time to notification

<table>
<thead>
<tr>
<th>Table 2. Cardiac Interventions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valvular surgery</td>
</tr>
<tr>
<td>Aortic replacement</td>
</tr>
<tr>
<td>Mitral replacement</td>
</tr>
<tr>
<td>Mitral annuloplasty</td>
</tr>
<tr>
<td>Coronary artery bypass surgery (CABG)</td>
</tr>
<tr>
<td>CABG with valvular surgery</td>
</tr>
<tr>
<td>Aortic</td>
</tr>
<tr>
<td>Mitral</td>
</tr>
<tr>
<td>Aortic and mitral</td>
</tr>
<tr>
<td>Mitral annuloplasty</td>
</tr>
<tr>
<td>Percutaneous coronary intervention</td>
</tr>
<tr>
<td>Other interventions or act</td>
</tr>
<tr>
<td>Aorta replacement</td>
</tr>
<tr>
<td>Bentall</td>
</tr>
<tr>
<td>Robotically assisted surgery</td>
</tr>
<tr>
<td>Congenital disease</td>
</tr>
<tr>
<td>Coronary angiogram</td>
</tr>
<tr>
<td>Percut cardiac intervention</td>
</tr>
</tbody>
</table>
of death was 12 h (6–18 h). The median time interval between intervention and death was 8 days (interquartile range: 3–21 days; extreme values: 0 and 120 days). Only 11 patients (8%) died without having undergone surgery of any kind (drug treatment alone). In the patients in this group, most had pulmonary edema (n = 3), mixed respiratory disease (n = 2), acute myocardial infarction (n = 3), conductive disturbances (n = 1), hyperkalemia (n = 1), and acute lower limb ischemia (n = 1).

3.3. Classification of recommendations

Classifications of recommendations are listed in Table 3. We retrospectively assigned a classification grade, with an evidence level, to each available case, according to American College of Cardiology/American Heart Association (ACC/AHA) and European Society of Cardiology (ESC) recommendations. The distribution of indications is shown in Table 4. Most of the indications were considered to be class I (n = 120, 82%). No class III indications for the main treatment were identified. We list as 'NA' in the table those patients treated only with drugs or with rare diseases for which no ACC/AHA or ESC guidelines are currently available (n = 18, 12%).

3.4. End-of-life blood test results

We report the median, maximum or minimum measurements obtained in blood tests carried out during the last 6 h of life, in Table 4. The patients were found to have acidosis, inflammatory syndromes with hyperleukocyturia and cytolsis.

3.5. Nosocomial infections

The frequency of nosocomial infections was 35% (50/146). Pathogenic microbes were found in blood, urine and deep tissues. We detected the presence of Staphylococcus (S. aureus, n = 14; S. epidermidis, n = 3), Pseudomonas aerugi-nosa (n = 12), Escherichia coli (n = 10), Enterobacter cloacae (n = 4), Enterococcus (n = 3), Haemophilus (n = 2), Citrobacter (n = 2), Candida (n = 2), Klebsiella (n = 1), Morganella morganii, Streptococcus bovis, Serratia, Proteus, and Pneumococcus. More than one microbe was isolated from eight patients.

3.6. Identification of system failures or questionable attitudes

Multiple system failures or questionable attitudes were identified in all cases, and their frequencies are represented in Fig. 1. The leading questionable attitude or error was a weak preoperative strategy, including inadequate risk evaluation, followed by failure in surgical technique, monitoring, drug prescription, inappropriate transfer, difficulties or delays in diagnosis, and insufficient reactivity. 'Strategy' concerned the evaluation of the patient and his or her disease, the presentation of the case to the medical staff or the lack of such a presentation, and the optimal benefit-risk ratio estimated a posteriori during the MMC. Technical failures consisted of interventions with longer aortic clamp times than usually observed and perioperative mechanical complications necessitating repeat surgery or in relation to death (aorta, atrium or mitral annulus rupture, stent thrombosis after suboptimal deployment, etc.). Supervision

<p>| Table 3. Distribution of classification and level of evidence of cardiac intervention indications according to ACC/AHA and ESC recommendations* (n = 146 patients). |</p>
<table>
<thead>
<tr>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td>82</td>
</tr>
<tr>
<td>IB</td>
<td>32</td>
</tr>
<tr>
<td>IC</td>
<td>6</td>
</tr>
<tr>
<td>IIIa</td>
<td>1</td>
</tr>
<tr>
<td>IIIb</td>
<td>2</td>
</tr>
<tr>
<td>IIIc</td>
<td>3</td>
</tr>
<tr>
<td>NA</td>
<td>18</td>
</tr>
</tbody>
</table>

*Classification of recommendations. Class I Conditions for which there is evidence for and/or general agreement that the procedure or treatment is beneficial, useful, and effective. Class II Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure or treatment. Class IIa Weight of evidence/opinion is in favor of usefulness/efficacy. Class IIb Usefulness/efficacy is less well established by evidence/opinion. Class III Conditions for which there is evidence and/or general agreement that the procedure/treatment is not useful/effective and in some cases may be harmful. Level of Evidence A Data derived from multiple randomized clinical trials. Level of Evidence B Data derived from a single randomized trial or nonrandomized studies. Level of Evidence C Only consensus opinion of experts, case studies, or standard-of-care.

| Table 4. End of life blood test values (median, quartiles and extreme). |
|-----------------|-----------------|
| Hemoglobin (g/l) | 98 (89—113) 47—176 |
| Leukocyte (x10^12/l) | 18 400 (13 250—21 500) 5700—48 600 |
| Creatinine (µmol/l) | 187 (144—251) 73—351 |
| Creatinine kinase (UI/l) | 1172 (375—3100) 34—92 000 |
| Troponin I (ng/ml) | 5.1 (1.4—19) 0—1059 |
| C-reactive protein | 141 (38—200) 6—386 |
| pH | 7.29 (7.1—7.4) 7—7.5 |
| Potassium (mM) | 4.8 (3.9—5.7) 2.5—8.7 |
| Sodium (mM) | 145 (138—155) 128—168 |

Fig. 1. Distribution of system failures and questionable attitudes (the scale represents the number of patients).
failures concerned patients who were not hospitalized in the
most appropriate ward (patients with hemodynamic instabil-
ity not in a critical care department or treated for arrhythmia
without scope monitoring). We focused our attention on
anticoagulant treatment (precautions concerning the use of
low-molecular-weight heparin during the perioperative
period), anti-hypertensive drugs (prolonged effects of
angiotensin-converting enzyme inhibitors), and anti-platelet
drugs (risk of bleeding in the perioperative period and risk of
stent thrombosis, if not optimally prescribed for patients
undergoing PCI). Transfer failures related to events that
occurred during transfers within or between hospitals
without adequate monitoring. Organizational failures
included the non-respect of essential rest periods after
duty, a lack of staff meetings, and a lack of resources during
holiday periods or the summer. Expertise failure was defined
as the operator not being skilled enough to perform the
intervention. At the time of the study, major care improve-
ment concerned the organization of the critical care unit, the
preoperative patient management and, particularly, the
preoperative skin preparation to avoid mediastinitis, anti-
coagulation protocol to avoid perioperative hemorrhage, the
preventive methods to avoid periprosthetic valve leaks, or
tamponade after removal of epicardial electrodes, or
complications with robotically assisted surgery, and the
prevention and management of acute stent thrombosis.

3.7. Causes of death

The leading cause of death was cardiogenic shock (n = 41,
28%), followed by hemorrhage (n = 22, 15%), multiple organ
failure (n = 18, 13%), and stroke (n = 10, 7%). The pre-
supposed cause of death was not determined in five cases
(3%). Other causes of death are listed and represented in
Fig. 2. Many patients (n = 51) underwent repeat interventions
due to hemorrhage in the pleural as well as those caused by
tissue rupture or incomplete hemostasis (n = 33, 63%), sepsis
(n = 5, 10%), digestive disorders (n = 4, 8%), severe myocar-
dial dysfunction (n = 3, 6%), stent thrombosis (n = 2, 4%), or
another cause (n = 4).

3.8. Autopsy

Autopsy was rarely performed (n = 4), but made it possible
to determine the cause of death accurately in two cases. All
the autopsies carried out were performed at the request of
the physician. In one case, a massive pulmonary embolism
was found to have occurred 3 months after valve replace-
ment. The premortem diagnosis was acute coronary syn-
drome without ST segment elevation with no signs of gravity.
For this reason, and because the coronary care unit was full,
this patient was hospitalized in a conventional medical
department. In the second case, the patient was found to
have suffered early constrictive pericarditis following
cardiac valve and coronary surgery complicated by perio-
perative myocardial infarction and mild pericardial effusion.
The cases in which autopsy should theoretically have been
requested to clarify the cause of death were frequent (n = 29,
20%) and included asystole, tamponade, cerebral anoxia,
prosthetic valve regurgitation, electromechanical dissocia-
tion, perioperative hemorrhage, perioperative myocardial
infarction, graft patency, stent patency, or septicemia.

3.9. Mortality rates

During this period, the surgical on- and off-pump mortality
rate was 4.3% (140/3276) and decreased slightly over time
with the highest peak in 2003 (5.2%, 28/534) and the lowest
in 2006 (3.2%, 17/528). The highest peak for on-pump surgery
was 6% (28/534) in 2003 and the lowest was 4.3% (17/393) in
2006 (p < 0.05). Mortality rates were more variable in the
PCI group. The global mortality rate was 0.9% (27/2799) with
a peak of 1.7% (8/453) in 2004 and the lowest rate was
observed in 2007 (0.2%, 1/441) coinciding with the applica-
tion of action plans concerning preventive action against
stent thrombosis (p < 0.05 in comparison with 2004).

3.10. Ethical questions

The most frequent ethical issues identified during MMCs
concerned alternative forms of treatments (n = 106), good
medical practice (n = 65), and recommendations (n = 26).
Other issues were information (n = 18), consent (n = 17), non-
malfeasance (n = 10), equity (n = 9), the appeal to reason-
ableness (n = 6), medical network (n = 4), limits of therapeu-
tics/invasive tests (n = 4), collegiality (n = 2), therapeu-
tic deadlock (n = 2), aporia or ‘impasse’ (n = 1), and
limits between palliative and acute care (n = 1). Non-
malfeasance (avoiding evil) included cases in which innova-
tive methods or techniques were used (n = 6); cases in which
rare, critical diseases were managed; and cases in which
questions could be raised about carelessness, the skill of the
doctor (n = 2), and the doctor’s obstinacy (n = 3). Questions
concerning equity and the fairness of treatment focused on
the difficulties of estimating the severity of illness in a young
adult, a case of acute myocardial infarction and end-stage
cancer, the frontiers between fairness and adaptability –
particularly in an aging population, foreigners or patients

Fig. 2. Distribution of the ultimate cause of death among 146 patients hospitalized in the Cardiology Department (number of cases in abscissa). * corresponds, in most cases, to mesenteric ischemia, ** indicates heparin-
induced thrombocytopenia.
with psychiatric disease — and the reasons for a patient being hospitalized in an unsuitable ward or inadequately monitored. The question of autonomy was not considered in detail because we had no information about the patients’ opinions at the time of hospitalization, other than the signed informed consents.

Except for patients with a predictive mortality >50% (expected deaths), we considered that all other patients had a medical accident. Hazard-related events, such as nosocomial diseases, unexplained sudden death, or hemorrhage, were observed in 80 patients (55%). At least one incidence of medical practice not conforming to norms was identified in 66 (45%) patients. A causal relationship between these transgressive attitudes and death was suggested a posteriori in 33 cases (50% from all errors and 23% from the study group). Serious errors were identified for five patients (3%), but it was not possible to establish a causal relationship between these errors and death in two cases.

3.11. Cyndinic and ethical checklist

Table 5 is a compendium of this global mortality analysis and summarizes in 10 items the main issues affecting a high-risk population. Fig. 3 shows the complexity and limitations of the system encountered during hospital stay in cardiac surgery.

4. Discussion

We reported for the first time in detail the mechanisms leading to death in patients referred to a mixed (surgical and non-surgical) cardiology department. The data were obtained from MMCs. As the deaths of most of these patients were unexpected, the study focused on possible failures of the system and of care providers and their possible interaction with the underlying disease. We also considered ethical issues.

Most of the patients had a high risk of death due to their age, low left ventricular ejection fraction, high risk score, and co-morbidities, such as cancer and renal failure. The mean duration of cardiopulmonary bypass and aortic clamp time were longer than usually observed. A high proportion of the patients with aortic stenosis or mitral regurgitation had another concomitant disease (half had coronary disease or another significant valvular disease) and the patients referred for PCI suffered from acute coronary syndrome and cardiogenic shock. The mean results of laboratory tests for these patients were all outside the normal range, with some so extreme as to be incompatible with life. Inflammatory disorders frequently occur after cardiac surgery. However, our results suggest that severe, uncontrolled inflammatory syndrome (high C-reactive protein level and hyperleukocytosis) is indicative of a poor prognosis. Values of biomarkers predictive of death have been widely studied in epidemiologic studies, but few studies have considered biological disorders occurring just before death and their pathophysiologic role in the process of death [10,11].

Poor outcomes were not related to weak indications because most of the indications for surgery/PCI were class I or IIa. This finding raises important questions. Should we necessarily follow class I and IIa recommendations? Should we use less invasive treatment alternatives in critically ill patients? Can we identify cases of failure that might account for the poor outcome despite an appropriate indication?

We identified many system failures and medical errors, but a causal link with death was suspected for only 23% of all errors and in only half the cases involving a serious error.

During MMC sessions, criticisms of surgical strategy, technical aspects, reactivity, patient monitoring, and drug prescriptions were voiced. Rogers et al. have studied the causes of technical errors [12]. They found that the principal system factors contributing to error were inexperience/lack of technical competence and breakdowns in communication. Inadequate monitoring and poor reactivity, which may also result from the absence of an accurate diagnosis, were often observed. Poor supervision may also lead to patients being hospitalized in an inappropriate ward [13]. It is essential for all patients to be located in the right place for optimal monitoring and care, and patients should be hospitalized in the ward giving them the best chances of survival, with short transfer times to the critical care unit in cases of life-threatening complications. The factors influencing the attitude of care providers are complex and may be extrinsic, such as a lack of space in the coronary or critical care unit, or intrinsic, such as carelessness or poor appreciation of the
severity of the disease. Misdiagnosis is multifactorial and is influenced by incompetence, the characteristics of the patient (elderly, communication difficulties, psychiatric disorders, etc.), and system/organization failure [14–16]. An exhaustive report of the mechanism leading to 1198 deaths after CABG in UK during a 3-year study period is available at http://www.ncepod.org.uk/2008cabc.htm. We can learn from errors analyzed during MMCs [17]. However, many questions remain unanswered, and our analysis suggests that autopsy should be carried out more frequently, to improve our understanding of the cause of death in patients dying in hospital. Autopsy findings may also ease feelings of guilt, in cases in which the cause of an unexpected death is found not to be related to a medical accident [18]. Post-mortem examinations are rarely carried out for a number of reasons. Families rarely ask for an autopsy because they find it unpleasant or awkward (for either the physician or for family members) to do so and also, possibly, because they do not necessarily consider death in an adult cardiology department to be particularly unexpected, contrasting with the situation for the families of children dying in hospital [19]. Pathologists also have little time to devote to autopsies and physicians often, probably mistakenly, feel that they are unlikely to learn much from autopsies on patients hospitalized in adult cardiology wards [20].

A limitation of behavior analyses during some MMCs is that the responses obtained may be derived from a priori concepts established by the physicians present at the MMC, with empirical statements or synthetic questions being neglected [21]. For this reason, all caregivers previously involved in management of the patient should be present at the meetings. The time interval between the patient’s death and the meeting at which they were discussed probably also made it difficult to capture the thought processes about the management of the patients. The practitioner principally responsible for patient management presented the case. This introduces a risk of bias regarding the details presented.

Alternative treatments are rarely proposed in the current guidelines, but this analysis of MMCs suggests that it might be useful to propose reasonable, less invasive therapeutic approaches for critically ill patients. A number of unanswered questions remain concerning the extent to which current evidence-based guidelines can be applied and the populations to which they should be applied, particularly as critically ill patients are rarely included in multicentre randomized trials [22]. An attitude could be proposed in which alternative strategies are sought for high-risk patients, even if the guidelines recommend class I or IIa interventions. Theoretically, an alternative form of treatment could have been proposed for each case in which unexpected death occurred. However, this does not necessarily mean that the alternative treatment would offer the patient a better chance of survival. Only prospective randomized studies could address this question, on the basis of evidence, which is considered an essential condition for progress in health care. It should be borne in mind that the most important limitation of interventional trial methods is that it is often not possible for patients to remain blind to the treatment to which they have been allocated. Furthermore, investigators often find it difficult to carry out trials in critically ill or very old patients, who may have limited decision-making capacities [23,24].

Crucial conditions relating to ethical considerations may not come to the fore in MMCs. Little or no information is collected about the feelings of the patient, unless that patient has a specific consultation with an ethics expert, and physicians rarely express their thoughts in medical records. However, in some cases, questions of autonomy and possible malpractice may be discussed. Surgical acts may be influenced by justifiable considerations, such as the need to operate on a sufficiently large number of patients to ensure efficiency, or less noble considerations, such as cost-effectiveness, the need to prove capabilities in the use of rare techniques, and unwillingness to seek advice from other colleagues. It has never been determined whether the feelings of the patient or the care-providers’ considerations affect the outcome of hospitalized cardiology patients. This issue could be investigated by means of interviews. Regardless of what the physician thinks before he or she proposes a recommended intervention, MMC analysis clearly reveals that the key item of missing data is any written information about the patient’s wishes and a comparison between those wishes and the treatments proposed following collegial discussion. A paternalistic attitude has been replaced by a normative behavior (supported by evidence-based medicine). However, negotiations are still limited by the capacity of the patient to understand therapeutic challenges in severe cardiac diseases.

We have reported here an analysis of MMCs relating to patients dying in a cardiology department. Poor outcome was found to be multifactorial. The concept of ‘medical error’ is not particularly meaningful in a cardiology department. Instead, it might be more appropriate to consider question-able attitudes and attitudes not conforming to norms. Evidence-based medicine should probably be complemented with analyses of MMCs and medicine based on the patient’s wishes.

References

It is human nature to seek to blame others. My memory of 'mortality meetings' when I first came into the speciality as a young trainee is that it was rare to identify any aspect of care to be improved — apportioning blame seemed to be the philosophy. Indeed, I remember a cynic referring to them as the 'who killed my patient' meetings. This is what makes the linked article by Larrazet and colleagues (Ref. [1], in this issue) so remarkable.

Mortality meetings have long been a feature of cardiac surgical practice in most countries. Yet, how many of us could produce a record of the discussions, and, more importantly, the constructive criticisms and recommendations for change shown by these authors? I would congratulate Larrazet and colleagues on their organisation and the inclusiveness and openness of their meetings. Not only have they looked at the clinical and organisational aspects of care but they have also assessed the ethical issues. They have been remarkably honest and have been prepared to discuss both institutional and individual failures in a constructive manner. They have set a challenge to us all.

Cardiac surgery is one of the great success stories of modern medicine. We have seen a steady decline in operative mortality over the years. However, in view of the complexity of the surgery and the increasing age and co-morbidity of our patients, it is an inescapable fact that there will always be patients who die in the postoperative period.

As mortality falls, improvements in outcome will only be achieved by eliminating anything which can impact on performance and patient safety. Important lessons may be learned from analysing the care of our patients and being prepared to be constructively critical of our own performance and that of our team.

The authors refer to the independent national audit group in the UK, which undertakes large-scale audits in all specialties (NCEPOD: National Confidential Enquiry into Patient Outcome and Death: http://www.ncepod.org.uk/). They recommend that, at the end of the case discussion at the mortality meeting, the care received by the patient should be graded as:

- **Good practice:** a standard that you would accept for yourself, your trainees and your institution.
- **Room for improvement:**
  - aspects of clinical care that could have been better;
  - aspects of organisational care that could have been better;
  - aspects of clinical and organisational care that could have been better.
- **Less than satisfactory:** several aspects of clinical and organisational care that could have been better.

If the decision of the meeting is to allocate either the second or third category, then recommendations for improvement should be made formally and action taken.

---

**Editorial comment**

**Improving the quality of care in cardiac surgery — the role of the 'mortality' meeting**

**Keywords:** Mortality meetings; Institutional failures; Individual failures; Quality of care