Briefing and debriefing in the cardiac operating room. Analysis of impact on theatre team attitude and patient safety

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Abstract

Error in health services delivery has long been recognised as a significant cause of inpatient morbidity and mortality. Root-cause analyses have cited communication failure as one of the contributing factors in adverse events. The formalised fighter pilot mission brief and debrief formed the basis of the National Aeronautics and Space Administration (NASA) crew resource management (CRM) concept produced in 1979. This is a qualitative analysis of our experience with the briefing–debriefing process applied to cardiac theatres. We instituted a policy of formal operating room (OR) briefing and debriefing in all cardiac theatre sessions. The first 118 cases were reviewed. A trouble-free operation was noted in only 28 (23.7%) cases. We experienced multiple problems in 38 (32.2%) cases. A gap was identified in the second order problem solving in relation to instrument repair and maintenance. Theatre team members were interviewed and their comments were subjected to qualitative analysis. The collaborative feeling is that communication has improved. The health industry may benefit from embracing the briefing–debriefing technique as an adjunct to continuous improvement through reflective learning, deliberate practice and immediate feedback. This may be the initial step toward a substantive and sustainable organisational transformation.

Keywords: Briefing–debriefing; Crew resource management; Communication; Patient safety; Team attitude

1. Introduction

Error in the delivery of health services has long been recognised as a significant cause of inpatient morbidity and mortality. The Institute of Medicine’s (IOM) report in 1999 suggests that medical errors result in up to 100,000 deaths annually in the United States [1]. They advocate utilisation of appropriately adjusted aviation team training and crew resource management (CRM) concepts to the health care sector in order to improve patient safety [1].

Furthermore, the Agency for Healthcare Research and Quality echoing the IOM’s position designated CRM as a high priority research area [2].

Originally, CRM was conceived in response to commercial aviation mishaps and was applied to the process of training crews to reduce pilot error by making better use of the human resources on the flight deck [3]. The formalised and detailed fighter pilot mission brief and debrief had been in use for many years when the National Aeronautics and Space Administration (NASA) produced the CRM concept in 1979 [4].

Data from the Veterans Association (VA) National Centre for Patient Safety identified that the majority of root-cause analyses cited communication failure as at least one of the contributing factors in an adverse event or close-call report. Communication weaknesses in the operating room (OR) may derive from lack of standardization and team integration [5].

Probably, the biggest challenge in moving toward a safer health system is cultural. A culture of blame, in which errors are seen as personal failures, should ideally be replaced by a culture in which errors are seen as opportunities to improve the system [6].

In cardiac surgery, outcomes of high-risk patients depend on high level of cognitive and technical performance and sophisticated team coordination [7].

The consultant author introduced a policy of formal OR briefing and debriefing. This study sought to evaluate the effect on theatre team attitude and patient safety. It is the initial step to explore the impact of CRM philosophy on our institution’s cardiac surgery unit.

2. Methods

We have been using the briefing–debriefing process (Table 1) since 23 October 2008.

2.1. Overview

The surgeon arrives in the OR before the patient is on the table and greets the team. Punctuality sets a tone of professionalism and purposefulness for the mission ahead. It also demonstrates respect for the rest of the team [8]. Briefing begins with all team members inside the OR.
Table 1
The briefing-debriefing checklist adapted for cardiac theatres

**YORKSHIRE HEART CENTRE - OPERATING ROOM**

**BRIEFING/DEBRIEFING TOOL**

<table>
<thead>
<tr>
<th>Name:</th>
<th>Unit No:</th>
<th>Dob:</th>
<th>Operation:</th>
<th>Date:</th>
<th>Time:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>General Step Process</th>
<th>Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Does everyone know each other? Anything to celebrate? Anything troubling anybody?</td>
<td>Delete as appropriate Yes / No</td>
</tr>
<tr>
<td>2. Is everyone familiar with theatres/equipment?</td>
<td>Yes / No</td>
</tr>
<tr>
<td>3. Do we anticipate problems?</td>
<td>Yes / No</td>
</tr>
<tr>
<td>4. Does everyone understand the procedure/critical steps?</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Reinforce to stop process ‘I am not happy’ is the trigger</td>
<td>Yes / No</td>
</tr>
</tbody>
</table>

**Briefing – Before every procedure**

| 1. First names and roles to be written on board | Yes / No |
| 2. Do the following match:- Patient ID band, informed consent (read out loud), site marking, OR posting, patient’s verbalization of procedure (if patient awake), other clinically relevant documentation (H&P, clinic note) | Yes / No |
| 3. Have antibiotics been given, what are the anticipated times of antibiotic redosing? | Yes / No |
| 4. Is glycaemic control/beta blockers indicated? | Yes / No |
| 5. Is the patient positioned to minimise injury? | Yes / No |
| 6. Has the prep been applied properly, without pooling and allowed to dry? | Yes / No |
| 7. Is the appropriate amount of blood available? | Yes / No |
| 8. Is DVT prophylaxis indicated? | Yes / No |
| 9. Any special precautions? If yes, describe | Yes / No |
| 10. Are warmers on the patient? | Yes / No |
| 11. Is the time allotted for this procedure an accurate estimate? | Yes / No |

**Debriefing – After every procedure**

| 1. Are there any concerns – communication/safety | Yes / No |
| 2. Could anything have been done to make this case safer or more efficient? | Yes / No |
| 3. Where can we improve? | |
| 4. Are the patient’s name, history, number and the surgical specimen name and laterality on the paperwork? (Specimen paperwork/labelling to be independently verified by Surgeon) | Yes / No |
| 5. Did we have problems with instruments? | Yes / No |
| 6. Plan for transition of care to post op unit discussed? To include: Fluid management/blood (all slips in chart), Antibiotics – continue post op (dose interval), PACU tests/X-rays, Pain/PCA plan, New meds needed (immediate periop), Beta blockers (as required), Glycaemic control (as required, DVT prophylaxis) | Yes / No |

**Documentation stop events: Reasons/Concerns:**

<table>
<thead>
<tr>
<th>Consultant Anaesthetist</th>
<th>Consultant Surgeon</th>
<th>Circulating ODP</th>
<th>Perfusionist</th>
</tr>
</thead>
</table>

| Time: |

Once the patient is on the operating table and all team members are inside the OR, the surgeon goes through the briefing checklist. Debriefing occurs when the procedure is completed and prior to the patient being moved. All team members participate and are given the opportunity to comment.
Newcomers are introduced and all team members take turns announcing their first name and role.

The question ‘anything to celebrate’ usually ‘breaks the ice’ and upcoming social events are mentioned and their anticipation shared. If anyone is troubled by anything they have the opportunity to disclose it and this translates into ‘watch my back today please’.

The trigger phrase ‘I am not happy’ is reinforced as a stop process. Anyone can use it anytime during the procedure when they perceive a problem or potential error.

The surgeon then summarises the procedure, giving background on this particular patient, thus making him a real individual with children or grand children and not just the next coronary artery bypass grafts (CABG) or valve case.

2.2. Briefing

The surgeon uses a briefing checklist.

Patient identification band, consent form and other relevant documentation is verified. Use of prophylactic antibiotics, glycaemic control, deep vein thrombosis prophylaxis is confirmed. Blood availability, patient warmer application and correct positioning are checked. The surgeon reinforces the need for special precautions applicable to the particular patient (allergies, coagulation pathology, intra-aortic balloon pump). Relevant time allocated is confirmed and skin antiseptic is applied and allowed to dry.

On completion of briefing the actual operation commences.

2.3. Debriefing

Social scientists claim that surgeons are stereotypically owners of significant egos. Good surgeons are good learners and treat debriefing as an opportunity to learn and improve [8].

Debriefing gives an opportunity for reflection on the procedure. There is no observation of ‘rank’ and first names only are used thus reducing power distances. The surgeon reconstructs the events with emphasis on safety, communication, efficiency, improvement potential. He then addresses the more serious negative events and asks the OR team for suggestions.

Even if this debrief is as simple as a positive comment to the scrub nurse about something done well, it becomes powerful when repeated after each case [9].

Any stop events are recorded with the relevant explanations and the plan for transition of care to the cardiac intensive care unit is confirmed.

3. Results

We reviewed the first 118 cases. Problems identified are shown on Table 2.

A trouble-free operation was noted in only 23.7% of cases. We experienced multiple problems in 32.2% of cases. In 45.7% of cases, at least one surgical instrument problem was encountered. Even though relevant forms were filled in order to report and repair faulty instruments, we found that this was a recurring issue. The consultant surgeon discussed this with theatre management and a gap was identified in the second order problem solving system in relation to surgical instrument maintenance and repair/replacement. The hospital management have addressed this and we expect to see an improvement in the future.

Most communication issues were of minor significance relating to personality mismatch between team members. However, on one occasion, misunderstanding between surgeon and perfusionist during weaning off cardiopulmonary bypass (CPB) led to incomplete heart deairing. During debriefing, the team acknowledged that two background conversations prevented surgeon and perfusionist from communicating clearly. The team agreed to discontinue conversations during institution and weaning from CPB and to use ‘play back’ on all intraoperative communications. This is similar to air industry policy, which dictates that conversations are banned in the cockpit during take-off and landing.

Problems with stocking and maintenance of anaesthetic equipment-drugs constitute part of an ongoing resolution process with theatre management.

Debriefing enabled us to quantify the problem of ‘casual’ theatre traffic. In 8.4% of cases the number of people in theatre exceeded 15. The team acknowledged that this may increase infection risk, interfere with surgeon’s concentration and prevent clear communication. We agreed that main theatre doors will remain locked during procedures. Only personnel who can name the patient and type of operation are allowed entry. We believe this will reduce unnecessary traffic but clearly further measures are required.

Delays in starting the operation and staff shortages are interrelated issues. The debriefing process helped us measure their incidence. We have reported the extent of the problem to hospital management.

Perfusion equipment problems were of minor significance. At no stage did a pump need replacement.

Errors relating to surgical technique formed the basis of discussion between trainer and trainee. The most serious related to going through the back wall of the vessel at arteriotomy.

3.1. Comparison of problematic and non-problematic cases

There was no correlation between age, EuroSCORE or type of operation with the incidence of problems (Table 3).
However, Hospital 1 was associated with significantly less problems (Table 4). This may be explained in the size difference between a large teaching hospital and a small private provider. The latter is more responsive to problems as there is always a single person available (site manager) to report to after debriefing and they offer feedback on resolution or investigation of problems.

3.2. Theatre team reactions

Fifteen staff members including anaesthetists, perfusionists, scrub nurses and technicians volunteered comments on the briefing–debriefing process. Interviews were subjected to a simple qualitative analysis that counted the adjectives used. The more common terms are represented as a bar chart (Fig. 1). There were no derogatory or critical comments. The team’s collective feeling is that it has reinforced professionalism and improved communication. Two trainees felt more confident learning and performing delicate tasks under supervision.

Above all, it has reminded everyone that the patient on table has a name.

3.3. Comments

‘It is nice to come to work for a change and feel that people are bothered and take their time to ask about your wellbeing and that your opinions seem to matter. You feel more valued’.

‘It helps with communication between all members of the team, and now people are willing to say when they are not happy with something. They are not worried about ‘back lash’ any more’.

4. Discussion

4.1. Background

Characteristics of a strong safety culture include a commitment to discuss and learn from errors, proactive identification of latent threats and incorporating non-punitive systems for reporting and analyzing adverse events [7]. Near misses may be used to create opportunities for learning and improvement [9]. These occurrences can be discussed openly within care teams to guide process improvement. Health care CRM requires surgeon leadership supported by a broader organizational safety culture [9].

A significant number of OR staff have difficulty speaking up if they perceive a problem with patient care [7]. Many feel unable to express disagreement and have seen the same mistake occur repeatedly. Indeed some would not feel safe being a patient in their own OR. Furthermore, the actuality and anticipation of clinical error imposes a measurable psychological burden on the team [7].

4.2. Essence of briefing

Briefing establishes a platform for common understanding and gives people permission to be frank and honest. It gets all members of the team on the same page and provides a structure for collaborative planning [5]. The consultant surgeon has introduced the questions ‘anything to celebrate’ and ‘anyone troubled by anything’ to the briefing process. In a high performance team socialisation at work reduces some of the communication barriers. It is not included in the World Health Organization (WHO) checklist but we believe benefits are reflected in the comments that team members ‘feel valued’.

4.3. Essence of debriefing

Debriefing constitutes real time reporting and can capture ‘near-misses’ which are usually not detected by record review at some time remote from the procedure. With effective leadership the OR debrief can drive the quality improvement process by identifying and addressing recurring issues with communication, equipment deficiencies, systems issues and most of all safety [8].

The identification and documentation of errors has enabled us to explore second order problem solving [10]. A more responsive customer-supply chain is being developed.
4.4. CRM in aviation and health care

Commercial and military aviation have been utilising CRM for more than two decades [10]. Relevant research does not provide detailed information pertaining to the robustness of the methodologies used. Therefore, we must ‘take a leap of faith’ in suggesting that there is a connection among CRM, learning and performance [11].

The medical community has implemented CRM in the OR, emergency and intensive care units [1]. Patient outcome is determined not only by preoperative risk factors and surgical skill, but also by team coordination and effective communication [5]. In line with the aviation paradigm, communication is essential to the prevention of complications and can be taught to surgeons in training just like ergonomic skills [12, 13].

Further research is needed in order to establish that CRM can be translated effectively from aviation to health care in a manner that results in tangible changes in individual and team behaviours [9]. We have examined our database for tangible improvement in postoperative clinical events. None are forthcoming at present but we have embarked upon an irreversible journey of learning and improvement.

5. Limitations

We are aware of the difficulty in establishing a credible, direct cause–effect relationship between the briefing–debriefing technique and patient outcome. The low occurrence of significant clinical events prevents it.

The results of the study are limited to descriptive statistics because of the small sample size and non-independence of observations. Analysis of team attitudes in the clinical environment is extremely difficult and only qualitative terms were used.

The current evidence for the effectiveness of CRM is impressive albeit imperfect. Evaluations at multiple levels are needed to ascertain whether reactions correlate with learning, behavioural change and organizational results.

6. Conclusion

The health industry may benefit from embracing the briefing–debriefing technique as an adjunct to continuous improvement through reflective learning, deliberate practice and immediate feedback [13]. This process allows learners to integrate experiences into their semantic networks, making access to information consistent and reliable. The briefing–debriefing concept adds clearly enunciated educational objectives and may promote patient safety.

References