

Team communication in the operating room

J. M. DAVIES

Department of Anaesthesia, Foothills Medical Centre, Calgary, Alberta, Canada

Good communication is vital for safe patient care and good team functioning, not only in the Operating Room but also in all areas of healthcare, as well as in other safety critical industries. Examples from aviation demonstrate both the failures and the successes that can arise from poor and excellent communication. There are six components of effective teamwork: situational awareness, problem identification, decision making, workload distribution, time management and conflict resolution. Practising these, and self-evaluation of team com-

munication, should help to improve team function and contribute to making patient care safer.

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THE need for good communication in healthcare is well-recognized. For example, improvements in information and communication processes were one of the four major elements for 'building a safer system' – a national strategy to improve patient safety in Canadian health care (1). However, such problems are not specific to Canada, but have been recognized world-wide in healthcare, as well as in other safety critical industries. When communication problems do occur, they are found most often between different members of a team, such as between anaesthesiologist and surgeon or nurse and doctor (2, 3). These 'interface' issues are also found in aviation (4), where team coordination and communication are considered indispensable non-technical skills.

Example cases

As an illustration, consider two tragedies from aviation. In the first accident, in 1978 an airliner crashed near Portland, Oregon, and in the second tragedy, a plane came to a cart-wheeling, fiery landing in a corn field at the airport in Sioux City, Iowa, in 1989.

What was the difference between these two tragedies?

- *Was it the company/airliner?* The 1978 crash involved a United Airlines DC8 while the 1989 involved a United Airlines DC10.

- *Was it how the planes developed problems?* The DC8 ran out of fuel, while the DC10 suffered a catastrophic loss of hydraulics and electrics after one of the fan blades in the tail-mounted engine cracked apart.
- *Was it the results of the crash?* Ten of the 197 passengers and crew died in 1978 while 112 of the 296 passengers and crew were killed in 1989.

What then was the real difference?

- In 1978, the DC8 ran out of fuel while the crew was distracted with a landing gear problem. The Captain not only failed to monitor the fuel state but also failed to respond to the crew's concern. At the same time, the other cockpit crew members failed to comprehend the fuel state criticality and failed to communicate their concerns to the Captain.
- In 1989, after the aircraft lost hydraulics, ailerons (for banking), rudder (for turning), flaps/slats (for slowing), spoilers (for descent), and steering/brakes (for manoeuvres on the ground), the flight and cabin crew worked effectively together and managed to land a crippled plane that no-one thought could be flown. Captain Al Haynes cited five key factors as contributing to the successful landing of the aircraft. These were 'luck' (as related to the time of day, location and weather), communication, preparation, execution and cooperation. (6) Indeed, the behaviour of the crew is held as an example of exemplary team work.

What can the Operating Room team learn from these tragedies?

Most aviation accidents are not related to problems with equipment or deficits in technical competence (also known as 'stick and rudder skills'). Most problems in aviation are related to problems in some aspects of human factors, which include team coordination and communication (6). Aviation has made great progress in safety throughout its 25-year development and implementation of what was first known as 'cockpit resource management' (7) and is now known as 'crew resource management' or CRM (8). Over the past two decades, CRM has evolved and is now in Generation VI (9). As part of the change in CRM there has been a progression from the Captain and his 'white silk scarf' and an autocratic style of command to a model of team coordination, with team members sharing responsibility (10). In addition, CRM is no longer found only in the cockpit but is now practised throughout the entire aircraft (9), as well as in maintenance (11), air traffic control, and in some companies, throughout the entire organization. CRM has also been transferred to healthcare, most notably first in the specialty of anaesthesiology (12) and then to the entire operating room team (3, 13).

Elements of communication

Although CRM is now focused on 'flight safety' through the management of threats and errors (9, 10), the underlying basis is the what, how and why of crew coordination and communication. One way of considering these team functions is to think of them as skills and to break them down into six critical components. These six components are: situational awareness, problem solving, decision making, workload distribution, time management and conflict resolution.

- *Situational awareness (SA)* is best defined by three questions 'Where have we come from? Where are we now? Where are we going?' At best, in the operating room, SA requires active involvement in the progress of the operation by the anaesthetic, nursing and surgical crews that make up the Operating Room team. This involvement should include, at minimum, the anaesthetic crew being able to see over the 'ether screen' and communicate easily with the surgeon. In turn, the surgical crew should be able to see the anaesthetic monitors. In this way, all members of the Operating Room team will be able to maintain their 'shared mental model' of the ongoing operation.

- *Problem identification* requires voluntary input of all their concerns from all members of the team, who should be able to speak up actively and openly, without hesitation and without being asked (14).
- *Decision-making* is fraught with potential for error (15) and requires accurate diagnosis of the problem, generation of a set of alternate solutions, and assessment of the probabilities of adverse outcomes.
- *Workload distribution* requires that each team member has an assigned task and that one individual is not overloaded.
- *Time management* is important in the short-term, during the solving of time-critical problems, and also in the longer term, when keeping an eye on the clock is linked with and part of situational awareness.
- *Conflict resolution* represents a skill that can be learned and entails listening well, keeping to the issues, bringing out the differences, acknowledging feelings, and building respect (14).

Mutual respect among team-mates is also one of the three basic requirements for setting and maintaining 'tone' in the operating room (16). What is tone? Although the Concise Oxford Dictionary (17) defines tone as the 'prevailing character of the morals and sentiments, etc. in a group', the simplest definition of 'tone' is that of 'atmosphere'. The other two requirements are courtesy and trust, which imply that all team members know that each individual has the knowledge and skills required for the tasks at hand and will carry them out in an appropriate manner. In support of good tone are the basic team tasks of briefing, on-going observation and discussion, and debriefing. Without these, individuals will not be able to join together to function as a successful team.

Principles for good team communication

Previously, Davies and Helmreich (18) described four basic principles for Human Factor programmes in healthcare. These principles can also be applied to communication and are: embedded, inaugurated, recurrent, and data-driven.

- **Embedded:** Good team communication must be embedded in an organization whose culture is such that effective team work and communication are recognized and supported by management. Such a culture requires active promotion by the senior staff, who are responsible for training and evaluation and

who will themselves need additional training in communications.

- Inaugurated: Although the education of nurses and doctors has continued to evolve to include new scientific concepts, the curriculum of many schools of medicine and nursing lack instruction about interpersonal dynamics, the propensity of individuals to human error, and the basics of human factors. Also rare is early and joint training of medical and nursing students in the knowledge, skills and attitudes necessary for team work. Such concepts should be incorporated into the curricula by the faculty and acquired and practised by students, from the first introduction to these professions.
- Recurrent: As has been shown in aviation, concepts about communication cannot be delivered in a single lesson, assumed to 'fix' the problem, and then never repeated. Reinforcement through repetition is essential if the desired outcomes are to be achieved.
- Data-driven: Evidence-based medicine suggests that medical decision-making is based ideally on the best available evidence. Similarly, programmes that guide team communication skills should be based on information about the team's performance, the organization and healthcare in general. While much can be learned from aviation and other industries, key lessons that come from one's own domain carry the most impact (10). Also, should instructors be used from other industries, such as aviation or nuclear power, then they should enter the domain of healthcare with a 'tour guide', who can interpret and facilitate the instruction. Data should include results about the team's actions and attitudes, the operation and culture of the organization, and new trends in the provision of healthcare. Such a programme will therefore require a quantitative database to be effective (19).

Finally, communication can be classified according to five characteristics, derived from seven terms originally used to define 'quality' in health care (20). These five terms are:

- *Safe*: communication reduces morbidity and mortality;
- *Accessible*: communication skills can be demonstrated by all team members.
- *Feasible*: communication can be accomplished with practise but without difficulty.
- *Effective*: communication improves team function(s).
- *Right*: communication saves not only lives but also time and money.

These five terms can even be used by a team as a guide for 'scoring' its own performance. Teams can

therefore carry out self-evaluation as part of ongoing efforts to improve coordination and communication as they work to make patient care safer.

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Address:
 J. M. Davies, MSc, MD, FRCPC
 Professor of Anaesthesia
 Room C229
 Foothills Medical Centre
 1403 29th Street NW
 Calgary
 Alberta
 Canada
 T2N 2T9
 e-mail: jdavies@ucalgary.ca