

Topic 4: Being an effective team player

Why teamwork is an essential element of patient safety 1

Effective teamwork in health-care delivery can have an immediate and positive impact on patient safety [1]. The importance of effective teams in health care is increasing due to factors such as: (i) the increasing complexity and specialization of care; (ii) increasing co-morbidities; (iii) increasing chronic disease; (iv) global workforce shortages; and (v) safe working hours initiatives. Paul M. Schyve, MD, senior vice president of the Joint Commission has observed, “Our challenge ... is not whether we will deliver care in teams but rather how well we will deliver care in teams.”[2]

A typical example of complex care involving multiple teams would be a pregnant woman with diabetes who develops a pulmonary embolus—her medical care team includes: an obstetrician, an endocrinologist and a respiratory physician. The doctors and nurses looking after her will be different during the day compared to at night and on the weekend. In a teaching hospital, there will be teams of doctors for each specialty area, all of whom need to coordinate care with each other, the nursing staff, allied health providers and the patient’s primary care team.

This topic acknowledges that medical students are unlikely in their early years to have participated as a member of health-care team themselves and often have little understanding of how teams are constructed and operate effectively. We aim in this topic to draw on students' past experiences of teamwork as well as look forward to the teams they will increasingly participate in as later year students and practising clinicians.

Keywords:

Team, values, assumptions, roles and responsibilities, learning styles, listening skills, conflict resolution, leadership, effective communication. 2

Learning objectives:

- understand the importance of teamwork in health-care;
- know how to be an effective team player;
- recognize you will be a member of a number of health-care teams as a medical students.

Learning outcomes: knowledge and performance

What students need to know (knowledge requirements) 3 4

Knowledge requirements in this module include a general understanding of:

- the different types of teams in health care;
- the characteristics of effective teams;
- the role of the patient in the team.

What students need to do (performance requirements) 5

Use the following teamwork principles to promote effective health care including:

- mindful of how one’s values and assumptions affect interactions with others;
- mindful of the of team members and how psychological factors affect team interactions;
- aware of the impact of change on teams;
- include the patient in the team;
- use communication techniques;
- resolve conflicts;
- use mutual support techniques;
- change and observe behaviours.

WHAT STUDENTS NEED TO KNOW (KNOWLEDGE REQUIREMENTS)

The different types of teams in health care

What is a team? 6

The nature of teams is varied and complex, they include: (i) teams that draw from a single professional group; (ii) multiprofessional teams; (iii)

teams that work closely together in one place; (iv) teams that are geographically distributed; (v) teams with constant membership; and (vi) teams with constantly changing membership.

Regardless of the type and nature of the team they can be said to share certain characteristics.

These include:

- team members have specific roles and interact together to achieve a common goal; [3]
- teams make decisions; [4]
- teams possess specialized knowledge and skills and often function under conditions of high workloads; [5,6]
- teams differ from small groups in as much as they embody a collective action arising out of task interdependency [7].

Salas defines teams as a “distinguishable set of two or more people who interact dynamically, interdependently, and adaptively towards a common and valued goal/objective/mission, who have been each assigned specific roles or functions to perform, and who have a limited lifespan of membership” [8].

Examples of teams include choirs, sporting teams, military units, aircraft crew and emergency response teams.

What different types of teams are found in health care?

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There are many types of teams in health care. They include labour and delivery units, ICUs, medical wards, primary care teams in the community, teams assembled for a specific task such as an emergency response team or multiprofessional teams such as multidisciplinary cancer care teams that come together to plan and coordinate a patient’s care.

Teams in health care can be geographically co-located, as in an ICU or surgical unit, or

distributed as in a multidisciplinary cancer team or primary health-care team.

Teams can include a single discipline or involve the input from multiple practitioner types including doctors, nurses, pharmacists, physiotherapists, social workers, psychologists and potentially administrative staff. The role these practitioners play will vary between teams and within teams at different times. Roles of individuals on the team are often flexible and opportunistic such as the leadership changing depending on the required expertise or the nurse taking on the patient education role as they are the ones that have the most patient contact.

In support of patient-centred care and patient safety, the patient and their carers are increasingly being considered as active members of the health-care team. As well as being important in terms of issues such as shared decision making and informed consent, engaging the patient as a team member can improve the safety and quality of their care as they are a value information source being the only member of the team who is present at all times during their care.

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The TeamSTEPS™ [9] programme developed in the United States identifies a number of different but interrelated team types that support and deliver health care:

1. Core teams

Core teams consist of team leaders and members who are involved in the direct care of the patient. Core team members include direct care providers (from the home base of operation for each unit) and continuity providers (those who manage the patient from assessment to disposition, for example, case managers). The core team, such as a unit-based team (physician, nurses,

physiotherapist, and pharmacist) is generally based where the patient receives care.

2. *Coordinating teams*

The coordinating team is the group responsible for:

- day-to-day operational management;
- coordination functions;
- resource management for core teams.

3. *Contingency teams*

Contingency teams are:

- formed for emergent or specific events;
- time-limited events (e.g. cardiac arrest team, disaster response teams, rapid response teams);
- composed of team members drawn from a variety of core teams.

4. *Ancillary services*

Ancillary services consist of individuals such as cleaners or domestic staff who:

- provide direct, task-specific, time-limited care to patients;
- support services that facilitate care of patients;
- are often not located where patients receive routine care.

Ancillary services are primarily a service delivery team whose mission is to support the core team. This does not mean that they should not share the same goals. The successful outcome of a patient undergoing surgery requires accurate information on catering and instructions in relation to “nil by mouth” orders so that a patient does not inadvertently receive a meal that may place them at risk of choking. In general, an ancillary services team functions independently, however, there may be times when they should be considered as part of the core team.

5. *Support services*

Support services consist of individuals who:

- provide indirect, task-specific services in a health-care facility,
- are service-focused, integral members of the team, helping to facilitate the optimal health-care experience for patients and their families.

Their roles are integrated in that they manage the environment, assets and logistics within a facility. Support services consist primarily of a service-focused team whose mission is to create efficient, safe, comfortable and clean health-care environments, which impact the patient care team, market perception, operational efficiency and patient safety.

6. *Administration*

Administration includes the executive leadership of a unit or facility, and has 24-hour accountability for the overall function and management of the organization. Administration shapes the climate and culture for a teamwork system to flourish by:

- establishing and communicating vision;
- developing and enforcing policies;
- setting expectations for staff;
- providing necessary resources for successful implementation;
- holding teams accountable for team performance;
- defining the culture of the organization.

How do teams improve patient care?

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Medical practice has traditionally focused on the individual physician as solely responsible for a patient's care. However, patients today are rarely looked after by just one health professional. Patient safety, in the context of a complex medical system, recognizes that effective teamwork is essential for minimizing adverse events caused by miscommunication with others caring for the patient and misunderstandings of their roles and responsibilities.

The link between non-technical skills such as

teamwork and adverse events is now well established [10,11], as is the increasing burden of chronic disease, co-morbidities and ageing populations that require a coordinated and multidisciplinary approach to care [12].

Baker et al. [1], in a major review of team training, contended that the training of health professionals as teams “constitutes a pragmatic, effective strategy for enhancing patient safety and reducing medical errors”.

Teamwork has been associated with improved outcomes in areas such as primary care [13] and cancer care [14]. Teamwork has also been

associated with reduced medical errors [15,16]. As summarized in Table 12, improving teamwork can have benefits beyond improving patient outcomes and safety that include benefits for the individual practitioners in the team, the team as a whole as well as the organization in which the team resides (adapted from Mickan, 2005) [12].

How do teams form and develop? 11

Considerable research into how teams form and develop has been conducted in other high stakes industries. As detailed in Table 13, Tuckmann [17] identified four stages of team development: forming, storming, norming and performing.

Table 12: Measures of effective teamwork (adapted from Mickan, 2005)

Outcome measures of effective teamwork			
		Individual benefits	
<i>Organizational benefits</i>	<i>Team benefits</i>	<i>Patients</i>	<i>Team members</i>
Reduced hospitalization time and costs	Improved coordination of care	Enhanced satisfaction	Enhanced job satisfaction Reduced unanticipated admissions
Efficient use of health-care services	Acceptance of treatment	Greater role clarity	Better accessibility for patients
Enhanced communication and professional diversity	Improved health outcomes and quality of care	Reduced medical errors	Enhanced well-being

Table 13: Stages of team development (modified from Flin [18])

Stage	Definition
Forming	Typically characterized by ambiguity and confusion when the team first forms. Team members may not have chosen to work together and may be guarded, superficial and impersonal in communication, as well as unclear about the task.
Storming	A difficult stage when there may be conflict between team members and some rebellion against the tasks assigned. Team members may jockey for positions of power and frustration at a lack of progress in the task.
Norming	Open communication between team members is established and the team starts to confront the task at hand. Generally accepted procedures and communication patterns are established.
Performing	The team focuses all of its attention on achieving the goals. The team is now close and supportive, open and trusting, resourceful and effective

Similar to other industries, many health-care teams (such as surgical teams) are required to work together and need to be fully functioning without any time to establish interpersonal relationships and go through the forming or norming phases described above [18]. This makes team training essential for all members of the team prior to joining the team.

The characteristics of successful teams

What makes for a successful team? 12

There are many models describing effective teamwork. Historically these come from other industries such as aviation's Crew Resource Management. Extensive studies have been conducted into health-care teams and this has led to the development of a number of models and toolkits specific to health care.

Mickan and Roger [19] offer the following six simple characteristics that underpin effective health-care teams:

1. *Common purpose*
Team members generate a common and clearly defined purpose that includes collective interests and demonstrates shared ownership.
2. *Measurable goals*
Teams set goals that are measurable and focused on the team's task.
3. *Effective leadership*
Teams require effective leadership that set and maintain structures, manage conflict, listen to members and trust and support members. The authors also highlighted the importance of teams to agree and share leadership functions.

4. *Effective communication*
Good teams share ideas and information quickly and regularly, keep written records as well as allow time for team reflection. Some of the most in-depth analysis of interprofessional team communication has occurred in high stakes teams such as are found in surgery [20,21].
5. *Good cohesion*
Cohesive teams have a unique and identifiable team spirit and commitment and have greater longevity as teams members want to continue working together.
6. *Mutual respect*
Effective teams have members who respect the talents and beliefs of each person in addition to their professional contributions. In addition, effective teams accept and encourage a diversity of opinion among members.

Additional requirements for effective teams include: [9,18,22]

- demonstrating individual task proficiency (both in terms of personal technical skills and teamwork skills);
- having task motivation;
- being flexible;
- monitoring their own performance;
- effectively resolving and learning from conflict;
- demonstrating situation monitoring.

Leadership

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Effective leadership is a key characteristic of an effective team. Effective team leaders facilitate and coordinate the activities of other team members by:

- accepting the leadership role;
- calling for help appropriately;
- constantly monitoring the situation;
- setting priorities and making decisions;

- utilizing resources to maximize performance;
- resolving team conflicts;
- balancing the workload within a team;
- delegating tasks or assignments;
- conducting briefs, huddles, debriefs;
- empowering team members to speak freely and ask questions;
- organize improvement activities and training for the team;
- inspire “followers” and maintain a positive group culture.

Including the patient as a member of the health-care team is a new concept in health care. Traditionally the role of the patient has been more passive as being a receiver of health care. But we know that patients bring their own skills and knowledge about their condition and illness. Medical student can begin showing leadership in this area by trying to include the patient or their family as much as possible. Establishing eye contact with patients, checking and confirming information and seeking additional information can all be done in the context of a ward round. Including the patient is a safety check to ensure the correct information and complete information is available to everyone on the team.

Communication techniques for health-care teams

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George Bernard Shaw said, “The greatest problem with communication is the illusion that it has been accomplished.” Good communication skills are at the core of patient safety and effective teamwork. The following strategies can assist team members in accurately sharing information and ensuring that the focus is on the information being communicated. Use of a modified version of the “SBAR” called the “ISABAR” has recently been demonstrated to improve telephone referrals by medical students in an immersive simulated environment [23].

The following description of tools and case examples have been taken from The

TeamSTEPPS™ [9] programme and can be found at <http://www.ahrq.gov/qual/teamstepps/>.

SBAR

SBAR is a technique for communicating critical information about a patient’s concern that requires immediate attention and action. The technique is intended to ensure the correct information and level of concern is communicated in an exchange between health professionals.

Situation

What is going on with the patient?

“I am calling about Mrs Joseph in room 251. Chief complaint is shortness of breath of new onset.”

Background

What is the clinical background or context?

“Patient is a 62-year-old female post-op day one from abdominal surgery. No prior history of cardiac or lung disease.”

Assessment

What do I think the problem is?

“Breath sounds are decreased on the right side with acknowledgement of pain. Would like to rule out pneumothorax.”

Recommendation

What would I do to correct it?

“I feel strongly the patient should be assessed now. Are you available to come in?”

Call-out

Call-out is a strategy to communicate important or critical information that:

- informs all team members simultaneously during emergent situations;
- helps team members anticipate the next steps;
- directs responsibility to a specific individual responsible for carrying out the task.

An example of a call-out exchange between a team leader and a resident would be:

Leader: *Airway status?*

Resident: *Airway clear.*

Leader: *Breath sounds?*

Resident: *Breath sounds decreased on right.*

Leader: *Blood pressure?*

Resident: *BP is 96/92.*

- receiver accepts message and provides feedback;
- sender double-checks, to ensure the message is understood.

Doctor: *Give 25 mg Benadryl IV push.*

Nurse: *25 mg Benadryl IV push?*

Doctor: *That's correct.*

Check-back

This is a simple technique for ensuring information conveyed by the sender is understood by the receiver, as intended:

- sender initiates message;

Handover or handoff

Handover or handoff are crucial times where errors in communication can result in adverse outcomes. "*I pass the baton*" is a strategy to assist timely and accurate handoff.

I	Introduction	Introduce yourself, your role and job and the name of the patient.
P	Patient	Name, identifiers, age, sex, location.
A	Assessment	Present chief complaint, vital signs, symptoms and diagnosis.
S	Situation	Current status/circumstances, including code status, level of (un)certainly, recent changes and response to treatment.
S	Safety concerns	Critical lab values/reports, socioeconomic factors, allergies and alerts(falls, isolation and so on).
The		
B	Background	Co-morbidities, previous episodes, current medications and family history.
A	Actions	What actions were taken or are required? Provide brief rationale.
T	Timing	Level of urgency and explicit timing and prioritization of actions.
O	Ownership	Who is responsible (person/team), including patient/family.
N	Next	What will happen next? Anticipated changes? What is the plan? Are there contingency plans?

Resolving disagreement and conflict



Key to successful teamwork is the ability to resolve conflict or disagreement in the team. This can be especially challenging for junior members of the team, such as medical students, or in teams that are highly hierarchical in nature.

However, it is important for all members of the team to feel they can comment when they see something that they feel will impact on the safety of a patient.

The following protocols have been developed to help members of a team express their concern in a graded manner.

Two-challenge rule

The two-challenge rule is designed to empower all team members to “stop” an activity if they sense or discover an essential safety breach. There may be times when an approach is made to a team member but is ignored or dismissed without consideration. This will require a person to voice his or her concerns by restating their concerns at least twice, if the initial assertion is ignored (thus the name “two-challenge rule”). These two attempts may come from the same person or two different team members:

- the first challenge should be in the form of a question;
- the second challenge should provide some support for the team members’ concern;
- remember this is about advocating for the patient—the “two-challenge” tactic ensures that an expressed concern has been heard, understood, and acknowledged;
- the team member being challenged must acknowledge the concerns;
- if this does not result in a change or is still unacceptable, then the person with the concern should take stronger action by talking to a supervisor or the next person up the chain of command.

CUS

CUS is shorthand for a three-step process in assisting people in stopping the activity.

I am **C**oncerned

I am **U**ncomfortable

This is a **S**afety issue

DESC Script

DESC describes a constructive process for resolving conflicts.

Describe the specific situation or behaviour and provide concrete evidence or data.

Express how the situation makes you feel and what your concerns are.

Suggest other alternatives and seek agreement.

Consequences should be stated in terms of impact on established team goals or patient safety. The goal is to reach consensus.

Barriers to effective teamwork

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A number of specific barriers exist to establishing and maintaining effective teamwork in health care. These include:

Changing roles

There are currently considerable change and overlap in the roles played by different health-care professionals. Examples include radiographers reading plain film X-rays, nurses performing colonoscopies and nurse practitioners having prescribing rights. These changing roles can present challenges to teams in terms of role allocation and acknowledgement.

Changing settings

The nature of health care is changing including increased delivery of care for chronic conditions into community care and many surgical procedures to day-care centres. These changes require the development of new teams and the modification of existing teams.

Medical hierarchies

Medicine is strongly hierarchical in nature and this is counterproductive in terms of establishing and effectively running teams where all members’

views are accepted and the team leader is not always the doctor. While there has been a growing acknowledgement that teamwork is important in health care this has not necessarily been translated into changed practices, especially in emerging and developing nations where cultural norms of communication may mitigate against teamwork.

Individualistic nature of medicine

The practice of medicine is based on the autonomous one-on-one relation between the doctor and patient. While this relationship remains a core value, it is challenged by many concepts of teamwork and shared care. This can be at many levels including doctors being unwilling to share the care of their patients through to medico-legal implications of team-based care.

Instability of teams

As already discussed, health-care teams are often transitory in nature, coming together for a specific task or event (such as cardiac arrest teams). The transitory nature of these teams places great emphasis on the quality of training for team members, which raises particular challenges in medicine where education and training is often relegated at the expense of service delivery.

Accidents in other industries

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Reviews of high-profile incidents such as the crash of Pan Am flight 401 have identified three main teamwork failings as contributing to accidents, namely: [18,24]

- roles not being clearly defined;
- lack of explicit co-ordination;
- miscommunication/communication.

Assessing team performance

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Assessing the performance of a team is an important step in improving team performance.

A number of teamwork assessment measures are available [18,25, 26]. Assessment of teams can be carried out in a simulated environment, by direct observation of their actual practice or through the use of teamwork exercises such as described in the section below on teaching teamwork.

Assessment of teams can either be done at the level of individual performance within the team or at the level of the team itself. Assessment can be performed by an expert or through peer rating of performance.

An analysis of the learning styles or problem solving skills individuals bring to teamwork can be useful following the assessment of team performance [27].

Summary

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Teamwork does not just happen. It requires an understanding of the characteristics of successful teams, knowledge of how teams function and ways to maintain effective team functioning. There are a variety of team tools that have been developed to promote team communication and performance and these include SBAR, call-out, check-back and I Pass the Baton.

WHAT STUDENTS NEED TO DO (PERFORMANCE REQUIREMENTS)

Using teamwork principles

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Medical students can use teamwork principles as soon as they start their medical courses. Many medical degrees are based on a problem based learning (PBL) format and require

students to work together in teams to build knowledge and solve clinical problems. They can begin to understand how those teams function and what makes an effective PBL group. Learning to share information, textbooks and lecture notes is a forerunner to sharing information about patients.

Be mindful of how one's values and assumptions affect interactions with other team members

Students learn by observing how different health professionals interact with each other. They will realize that even though a team can be made up of many personalities and practice styles, this does not necessarily make the team less effective. Rather, it can show how the strengths and weaknesses of different members of the team can assist deliver quality and safe care.

Be mindful of the role of team members and how psychosocial factors affect team interactions, recognize the impact of change on team members

It can often be difficult for medical students (and indeed practising clinicians) to appreciate the different roles that health-care professionals play in teams, or how teams respond to change or psychosocial factors. Students can be encouraged to make structured observations of teams to observe what roles are played by different individuals and how this relates to factors such as their personal characteristics as well as their profession. Students can be encouraged to talk to different team members around their experience of working in a team. Faculty can themselves ensure that students are included in teams and assigned roles so they can observe these processes from the inside.

Include the patient as a member of the team

Medical students can ensure that when they are taking histories or performing procedures on

patients that they take the time to engage with the patient. This can include discussing with the patient the procedure they are undergoing or any anxieties or concerns the patient or their carers may have. They can actively include patients in ward rounds by either inviting them at the time to participate or by discussing with the team how patients might be included in ward round discussions.

Using mutual support techniques and resolving conflicts, using communication techniques and changing and observing behaviours

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Medical students can practise all of these competencies either in their work with their peers in study groups or within health-care teams as they move through their programme and are increasingly involved. As detailed below, many teamwork activities can be used with groups of students and practitioners to explore leadership styles, conflict resolution and communication skills.

A number of practical tips exist to help medical students improve their team communication skills. They can start practising good teamwork at the very beginning of their medical course. The following activities and steps will promote good teamwork in any situation whether as a medical student or a hospital senior doctor.

- Always introduce yourself to the team or those you are working with even if it is for a few minutes.
- Reading back and closing the communication loop in relation to patient care information.
- Stating the obvious to avoid confusion.

Nurse: *Mr Brown is going to have an X-ray.*

Student: *So, we are taking Mr Brown to have an X-ray now.*

- Asking questions and continually clarifying.
- Delegating tasks to people—look at them and check they have the information to enable them to do the task. Talking into the air is an unsafe practice because the person may not think that it is they who have the responsibility of the task.
- Clarifying your role in different situations.

Nurse: *Mr Brown is going to have an X-ray.*

Student: *So, we are taking Mr Brown to have an X-ray now.*

Nurse: *Yes.*

Student: *Who is taking Mr Brown for his X-ray?*

- Using objective language not subjective language.
- Learning the names of people who are in the team and using them. Some doctors do not bother to learn the names of the nurses and other allied health-care workers thinking they are not as important. However, doctor better relationships with other team members if they use people's names rather than referring to them by their profession, such as "nurse".
- Being assertive when required. This is universally difficult, yet if a patient is at risk of serious injury then the health professionals, including students, must speak up. Senior clinicians will be grateful in the longer term if one of their patients avoids a serious adverse event.
- If something does not make sense, ask for clarification.
- Briefing the team before undertaking a team activity and performing a debriefing afterwards.

This encourages every member of the team to contribute to discussions about how it went and what can be done differently or better next time.

- When conflict occurs, concentrate on "what" is right for the patient not on establishing "who" is right or wrong.

CASE STUDIES

Right action, wrong result

A doctor was coming to the end of his first week in the emergency department. His shift had ended an hour before, but the department was busy and his registrar asked if he'd see one last patient. The patient was an 18-year-old man. He was with his parents who were sure he'd taken an overdose. His mother had found an empty bottle of paracetamol that had been full the day before. He had taken overdoses before and was under the care of a psychiatrist. He was adamant he'd only taken a couple of tablets for a headache. He said he'd dropped the remaining tablets on the floor so had thrown them away. The parents said they'd found the empty bottle six hours ago and felt sure that he couldn't have taken the paracetamol more than ten hours ago. The doctor explained that a gastric lavage would be of no benefit. He took a blood test instead to establish paracetamol and salicylate levels. He asked the lab to phone the emergency department with the results as soon as possible. A student nurse was at the desk when the lab technician phoned. She wrote the results in the message book. The salicylate level was negative. When it came to the paracetamol result, the technician said, "two" paused, and then, "one three", "two point one three" repeated the nurse, and put down the phone. She wrote "2.13" in the book. The technician didn't say whether this level was toxic and he didn't check whether the nurse had understood. When the doctor appeared at the desk, the nurse read out the results. The doctor checked a graph he'd spotted earlier on the notice board. It showed when to treat overdoses.

There was also a protocol for managing paracetamol overdoses on the notice board, but it was covered by a memo. The graph showed that 2.13 was way below treatment level. The doctor thought briefly about checking with the registrar, but she looked busy. Instead, he told the student nurse that the patient would need admitting overnight so that the psychiatrist could review him the next day. The doctor went off duty before the printout came back from the lab. It read “paracetamol level: 213”. The mistake wasn’t discovered for two days, by which time the patient was starting to experience the symptoms of irreversible liver failure. It wasn’t possible to find a donor liver for transplant and the patient died a week later. If he’d been treated when he arrived at the emergency department, he might not have died.

The doctor was told what had happened by his consultant on Monday when he started his next shift and, while still in a state of shock, explained that he had acted on what he thought was the correct result. He had not realised, he admitted, that paracetamol levels are never reported with a decimal point. Because he had not seen the protocol he had also not appreciated that it might have been appropriate to start treatment before the paracetamol level had come back anyway, bearing in mind that the history, although contradictory, suggested the patient might well have taken a considerable number of tablets. It would be unfair to blame the doctor or the student nurse individually. The real weakness is the lack of safety checks in the system of communicating test results. In fact, no-one made a really big mistake. At least three people made a series of small ones, and the system failed to pick these up.

Reference

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A failure to relay information between staff and to confirm assumptions, resulting in adverse patient outcome

This example highlights how the dynamics between surgical trainees and staff and the flow of staff in and out of the operating room can allow adverse events to happen.

Before a roux-en-y gastric bypass patient was brought into the operating room, a nurse reported to a second nurse that the patient was allergic to “morphine and surgical staples”. This information was repeated again to the staff surgeon and the anaesthetist before the start of the procedure.

As the surgery was coming to an end, the staff surgeon left the operating room, leaving a surgical fellow and two surgical residents to complete the procedure. The surgical fellow then also left the operating room, leaving the two residents to close the incision. The two surgical residents stapled a long incision closed along the length of the patient’s abdomen. They stapled the three laparoscopic incisions closed as well. When the residents began the stapling, a medical student removed a sheet of paper from the patient chart and took it over to the residents. The medical student tapped one of the residents on the shoulder, held the paper up for her to read and told her that the patient was allergic to staples. The resident looked at it and said “you cannot be allergic to staples.”

The staff surgeon returned to the operating room as the residents were completing the stapling. He saw that the residents had stapled the incisions and informed them that the patient did not want staples. He told them that they would have to

take all the staples out and suture the incision. He apologized for neglecting to inform them of this allergy. One of the residents asked whether you could be allergic to staples and the staff surgeon said: "It does not matter. The patient is convinced that she is." The staff surgeon told the residents they would have to remove all the staples and sew the incisions. This took an additional 30 minutes.

Case from the WHO Patient Safety Curriculum Guide for Medical Schools working group. Supplied by Lorelei Lingard, University of Toronto, Toronto, Canada.

Emergency resuscitation requires teamwork

This case illustrates the importance of the team being prepared to carry out an effective code blue or emergency resuscitation.

Medical officer Simon was in the cafeteria eating a late lunch. Halfway through his meal, a cardiac arrest announcement was made over the public address system. He ran to get the lift up to the fifth floor ward where the emergency was. It was peak hour and the lifts were busy. By the time he reached the patient, a nurse had wheeled in the cardiac arrest trolley and another nurse had an oxygen mask on the patient.

"Blood pressure, pulse, heart rate?" yelled the doctor. A nurse grabbed a blood pressure cuff and began to inflate it. The nurse holding the oxygen mask tried to find a pulse on the patient's wrist. The medical officer shouted for an ECG monitor to be placed on the patient and for the of the bed head to be lowered. The nurses tried to obey his orders; one stopped trying to get the blood pressure and lowered the bed. This made the oxygen mask fall off as the tubing gets caught in the side panels of the bed.

Simon became agitated. He had no idea of the heart rate or rhythm. The patient did not seem to

be breathing. The heart monitor came on and showed ventricular fibrillation.

"Pads and 50 joules", called Simon. The nurses look at him and say, "What?" "Pads and 50 joules, stat!" Simon replied. "Call a doctor, any doctor, to come and assist me *now!*" he yelled. They could not revive the patient.

Reference

Case from the WHO Patient Safety Curriculum Guide for Medical Schools working group.

Supplied by Ranjit De Alwis, International Medical University, Kuala Lumpur, Malaysia.

Everyone on the team counts

This is an example of how an initiative such as a preoperative team briefing can provide an opportunity for individual members of the operative team to provide information that impacts patient outcome. A preoperative team briefing is a short gathering including nurses, surgeons and anaesthetists held before the surgery with the goal of discussing important patient and procedure relevant issues.

In preparation for a low anterior resection and ileostomy, the interprofessional team met to have a briefing. The surgeon asked a nurse whether she had anything to contribute. The nurse reported that the patient was worried about her hernia. In response to this the surgeon questioned the patient (who was still awake) about the hernia. The surgeon then explains to the operating room team how he will proceed around the hernia and that he might use mesh.

Case from the WHO Patient Safety Curriculum Guide for Medical Schools working group. Supplied by Lorelei Lingard, University of Toronto, Toronto, Canada.

HOW TO TEACH THIS TOPIC

Teaching strategies and formats

This module recommends a number of strategies to build education and experience around teamwork.

Effective teams do not just happen and there is substantial body of underpinning theory that can be appropriately delivered in a didactic manner. The knowledge requirements listed above can form the basis for didactic presentations.

Given that one of the most effective ways of learning about teamwork is to participate in a team, we include a number of team-based activities that can easily be run with small groups of students with limited resources. Given that medical students will often have little experience of participating in health-care teams, we include activities where students reflect on their experiences of teamwork outside of medicine.

To familiarize students with actual health-care teams we then include activities that anticipate the types of teams that students will increasingly encounter as they move forward in their training and on to practice.

We conclude this section with a discussion of interprofessional education that may or may not be an option for consideration within your medical curriculum.

A recent systematic review of teamwork training developed for medical students and junior doctors found that teaching teamwork skills to students and young doctors was moderately effective over the short term and appeared to be more effective when more teamwork principles were addressed within the training [28].

Any team education and training programme developed must consider local culturally

acceptable behaviour in regard to speaking out in a team and the nature of hierarchies in a given country.

Building teamwork education over the course of a programme

Over a four- or six-year medical programme there is an opportunity to stratify teaching and learning around teamwork. For instance, a programme could be structured in the following ways.

Early years:



Didactic presentations around

- basics of teamwork and learning styles;
- different types of teams in health care;
- different learning styles.



Small group activities that focus on:

- building fundamental team-based skills;
- appreciating different learning and problem solving styles;
- reflecting on experience of participating in teams outside of health care;
- the roles of various health-care teams.

Middle and later years:



Didactic presentations around

- the roles and responsibilities of different health professionals in teams;
- characteristics of effective teams;
- strategies to overcome barriers to effective teams.



Small group activities that include

- interprofessional participation;
- reflection on the experience of participating as a medical student in health-care teams;
- teamwork simulation in health-care context (high or low fidelity).

Teaching activities

Engaging role models

Given that teamwork is not always recognized or valued in the health-care delivery environments encountered by students, it is important to engage clinical role models the delivery of teamwork education. If possible, identify clinicians with good reputations for working in multidisciplinary teams. Ideally, these role models would present different aspects of the theory behind teamwork and give examples from their own experiences. Wherever possible, role models should be drawn from multiple health-care professions.

Reflective activities around experiences of teamwork

A simple way to introduce teamwork concepts to medical students is to get them to reflect on teams they may have participated in during school or university. This may include sporting teams, work teams, choirs and so on. Reflective exercises can include the creation of simple surveys that can be used to draw out questions around teamwork.

Reflective exercises can also be built around examples of teamwork failures or successes that may be topical and/or current within the local community. This may include the development of quizzes or group discussions about newspaper articles describing failures in sporting teams associated with teamwork failures or high-profile examples of medical errors due to failures in teamwork. The case studies provided within the framework could also be used to reflect on failures in teamwork.

High-profile examples of teamwork failures and successes outside of health care such as plane crashes or nuclear power station failures are often used in the teaching of teamwork principles. A

number of these are described in detail by Flin et al. [18] and include the crashes of in the Pan Am and KLM 747s in Tenerife and the rescue of the Apollo 13 mission.

Team building exercises

There are a wide range of activities that can help promote an understanding of team dynamics and different learning styles. A simple search of the internet will provide access to many examples. These can be useful for any level of team participant and require no prior knowledge of health care or teamwork. The intention is that they are fun to take part in and often have a positive side-effect of bonding student groups together.

Remember, one of the most important parts of any team building exercise is the debrief at the end of the exercise. The purpose of the debrief is to

- reflect on what worked well for the team so that effective team behaviours are reinforced;
- reflect on what was difficult and what challenges the team face—strategies to manage the challenges should be explored and then practised in subsequent sessions.

Free team building games can be found on the following web site.

<http://www.businessballs.com/teambuildinggames.htm>

Building newspaper towers: an example of a team building exercise (taken from the web site above)

An interactive exercise that requires no physical contact that can be varied depending on the group size, dynamics and available time.

Basic exercise:

Split the group into smaller groups of 2–6 people. Issue each group with an equal number of newspaper sheets (the fewer the more difficult, 20–30 sheets is fine for a 10–15 minute exercise),

and a roll of sticky tape. The task is to construct the tallest free-standing tower made only of newspaper and sticky tape in the allotted time. The point of the exercise is to demonstrate importance of planning (time, method of construction, creativity) and the motivational effect of a team task. The facilitator will need a tape measure.

Instructions need to be very clear. For instance, does the tower have to be free standing or can it be braced? It does not matter which, it matters only that any issues affecting a clear result are clarified.

Tips for newspaper constructions exercises

You can allocate as many sheets as you wish, depending on the main purpose of the exercise, and to an extent the duration and how many team members per team. As a general rule, the fewer the sheets the smaller the teams and the shorter the exercise. Short timescales, big teams, lots of sheets = lots of chaos. This may be ideal for demonstrating the need for leadership and management. Unless the primary purpose is leadership and managing the planning stage, avoid small numbers of sheets with large teams. Small teams do not need lots of sheets unless you make a rule to use all materials in order to put pressure on the planning and design stage.

Examples of main purposes and numbers of sheets:

- very strong emphasis on preparation and design;
- 1-5 sheets in pairs or threes;
- design, planning, preparation, teamworking: 5-10 sheets in team of three or four;
- team building, time management, warm up, ice-breaker, with some chaos management: 20 sheets in teams of four, five or six;
- managing a lot of chaos: 30 sheets and upwards in teams of six or more.

Newspaper construction exercises are terrifically flexible and useful. Once you decide the activity purpose and rules, the important thing is to issue the same quantity of materials to each team.

Other tips for newspaper construction activities:

- Building tips: it does not matter how big the sheets are, but large double pages offer the greatest scope for the towers.
- Think about how much paper is issued as it changes the type of challenge: lots of paper makes it much easier and places less emphasis on planning. Very few sheets, or even just one sheet, increases the requirement for planning.
- The main trick (do not tell the participants before the exercise) is to make long thin round-section struts by rolling the sheets and fixing with sticky tape—Sellotape or Scotch tape, or narrow masking tape instead. The struts can then be connected using various techniques, rather like girders.
- Round struts (tubes), and any other design of struts or sections, lose virtually all their strength if flattened or bent. Very few newspaper exercise builders understand this fundamental point, and some fail to realize it even after completing the exercise, so it is worth pointing out during the review.
- Square sections are not very strong. Triangular or circular sections work best, although the former are difficult to make.
- It is possible to make a very tall tower (8-10 feet) using a telescopic design, which requires many sheets to be stuck together end-to-end, rolling together and then pulling out from the centre.
- Most people make the mistake of forming big square section lengths or spans, which are inherently very weak and unstable. This is why the newspaper constructions are such good exercises—each one needs thinking about and planning and testing or people fall

into traps and make simple mistakes.

- The best way of finding answers is to try it—you should be doing that anyway if you are facilitating and running the session. You will be amazed at how strong paper can be if it is folded and/or rolled and assembled with a bit of thought.

Simulated health-care environments

Simulation is being increasingly used to learn and practise teamwork in health care. This is an ideal learning environment for medical students, as it combines safety—there is no “real” patient—and the ability to increase or decrease the speed of evolution of the scenarios to optimize learning, especially if using mannequin-based simulation techniques. This is ideal for teamwork exercises as the importance of sound teamwork behaviours is particularly manifest in “emergency”, time-critical situations. In addition, students get a chance to experience what it is like to manage a situation in “real” time.

Ideally, simulated environments may be used to explore teamwork using mixed groups of health-care professionals. When exploring teamwork the focus should not be on the technical skills of the students but rather their interactions and communication with one another. The best way to ensure this remains the focus of the exercise is to allow the students to learn and practise the technical aspects of the scenario together prior to the actual scenario, usually through an initial procedural workshop. If the team struggle with basic knowledge and skills then the opportunity to discuss teamwork may be lost as there may be so many important medical and technical issues to discuss. However, if the students are well drilled on the technical aspects of the scenario beforehand, the challenge for them is to put what they know into action as a team. The simulation then becomes a powerful opportunity to explore the “non-technical” aspects of the scenario,

namely the teamwork, leadership and communication issues that emerge as the scenario unfolds [18].

As with the non-health-care team building exercises discussed above, it is vital that a structured debriefing is conducted that explores the way the teams performed in the exercise: what worked well and why, what was difficult and why, and what could be done to improve performance on subsequent occasions. If different health-care students are working together in the simulation, the different roles, perspectives and challenges of each profession can be discussed during the debriefing as well.

The major constraint with simulation exercises is that they can be resource intensive, especially if using a computerized mannequin and attempting to make a teaching setting look like a clinical environment.

Participating in health-care teams

Students, particularly in their later years, should be encouraged to participate in a number of different types of health-care teams at every opportunity. Just because the doctors and nurses from a particular ward or clinic maintain the traditional silo approach to health care does not prevent medical students working with other health professionals as part of a team.

The faculty should identify teams where students will be welcomed and ideally given some form of participatory role. These teams may include well-established multidisciplinary care planning teams such as found in mental health or oncology or more fluid teams as found in emergency departments. They should also include primary health-care teams in the community.

It is important to get students to reflect on team-based experiences in health care and share these

experiences with other students and faculty staff. This will allow them to discuss both the positive and negative aspects of their experience. Students should be asked to identify model teams and why they believe they can be identified as such. They should be encouraged to ask questions such as:

- What were the strengths of the team?
- What professions were represented on the team and what was their role?
- Did the team have clear goals?
- Was there a clear leader?
- Were all team members permitted to participate?
- How did members of the team communicate with one another?
- How could the student see the team being improved?
- Was the patient part of the team?

Students should be asked to explore and reflect on areas of teamwork where errors are known to occur such as communication between primary and secondary care or during handover/hand off.

It may also be possible for students to take part in a panel discussion with an effective multidisciplinary team to discuss how the team functions and works together.

Interprofessional education

While the focus of this Curriculum Guide is on medical schools, teamwork in health care cannot be discussed without discussing the important role of interprofessional education (IPE) in undergraduate health education.

At the heart of IPE is the preparation of future practitioners for effective team-based practice through bringing students from different disciplines together during undergraduate education to learn from and with each other. Undergraduate education is a good time to bring

different groups of students together to appreciate and respect the different roles of health professionals before they have joined a professional group themselves.

While there is a compelling argument that undergraduate IPE should improve subsequent teamwork in practice, the research to support this argument is not yet conclusive.

Universities have taken different approaches to introducing IPE depending on available resources, the available undergraduate programmes and the degree of support for the concept at a senior level. Approaches have ranged from a full re-engineering and alignment of all health curricula through to inserting IPE modules and activities into existing curricula on a relatively opportunistic basis.

The resources and activities included in this guide are intended to be useful either for programmes teaching only medical students or for those teaching multiprofessional student groups.

Below we include further reading on IPE and links to universities that have introduced IPE into their curricula.

Resources

Institute for Healthcare Improvement. *Health profession education: a bridge to quality*. Washington DC, National Academies Press, 2003.
Almgren, G et al. *Best practices in patient safety education: module handbook*. University of Washington, Seattle, Center for Health Sciences Interprofessional Education, 2004.

Universities that have introduced major initiatives in IPE include:

- Health Care Innovation Unit, University of Southampton, UK
<http://www.hciu.soton.ac.uk/>
- Faculty of Health Sciences, Linköping University, Sweden.
<http://www.hu.liu.se/?l=en>
- College of Health Disciplines, University of British Columbia, Canada.
<http://www.chd.ubc.ca/>
- Faculties of Health, The University of Sydney, Australia
<http://www.foh.usyd.edu.au/ipl/about/index.php>

Summary

In summary, team training for medical students can be effective using a variety of techniques, many of which can be delivered in the classroom or low-fidelity simulated environment.

Ideally, medical students should take part in real teams and learn through experience and guided reflection.

As far as possible, team training should focus on as many principles of effective teamwork as possible.

TOOLS AND RESOURCES

TeamSTEPPS™: Strategies and tools to enhance performance and patient safety

Department of Defense in collaboration with the Agency for Healthcare Research and Quality (AHRQ)
(<http://teamstepps.ahrq.gov/abouttoolsmaterials.htm>).

TeamSTEPPS™ also includes free access to a number of trigger tapes and videos.

SBAR Toolkit

Institute for Healthcare Improvement (IHI), Oakland, CA Kaiser Permanente
(<http://www.ihl.org/IHI/Topics/PatientSafety/SafetyGeneral/Tools/SBARToolkit.htm>).

Teamwork in health care: promoting effective teamwork in health care in Canada

Canadian Health Services Research Foundation (CHSRF), 2006
(http://www.chsrf.ca/research_themes/pdf/teamwork-synthesis-report_e.pdf).

How to assess this topic

Many different modalities can be used to assess teamwork.

MCQs and MEQs can be used to explore knowledge components.

A portfolio to be maintained over the entire curriculum can be used to record and reflect on team activities encountered at medical school.

Assignments can be specifically designed to require teamwork among students. This may include students self-selecting a health- or non-health-related project to complete or faculty suggesting a project such as planning the development of an apartment for a person who uses a wheelchair or planning the development of a rural outreach programme for oral health. In developing the assignment, the emphasis is not so much on the outcome of the project but rather the manner in which the students approach the teamwork aspects of working together.

Later assessments can be more complex and require items such as a review of a team with which the student is working and the development of recommendations for how that team could be improved.

A writing assignment could include tracking team functions by following either a patient stay for a defined period of time or tracking a health-care provider and reviewing how many teams they intersect with and what their roles are on each team.

Depending on available resources, simulation can also be used as an effective formative and summative assessment of health-care teamwork.

Ideally, some assessments would require students from different health professions to work together.

HOW TO EVALUATE THIS TOPIC

- As with any evaluation exercise, a number of evaluation phases need to be considered. These would include
- a needs analysis (or prospective evaluation) to judge how much teaching in teamwork currently exists and how much is needed;
- a process evaluation during the delivery of any programmes to maximize its effectiveness;
- an impact evaluation to track the impact of the programme on knowledge and competencies gained during the delivery of the programme.

See the Teacher's Guide (Part A) for more information on evaluation.

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Slides for topic 4: Being an effective team player

Didactic lectures are not usually the best way to teach students about patient safety. If a lecture is being considered, it is a good idea to plan for student interaction and discussion during the lecture. Using a case study is one way to generate group discussion. Another way is to ask the students questions about different aspects of health care that will bring out the issues contained in this topic.

The slides for topic 4 are designed to assist the teacher deliver the content of this topic. The slides can be changed to fit the local environment and culture. Teachers do not have to use all of the slides and it is best to tailor the slides to the areas being covered in the teaching session.