College of Emergency Medicine High Fidelity Simulator Faculty course

Pre-course Reading

Fourth Edition 2014

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Chapter 1: Introduction

Simulation in Emergency Medicine Training

"Unlike patients, simulators do not become embarrassed or stressed; have predictable behaviour; are available at any time to fit curriculum needs; can be programmed to simulate selected findings, conditions, situations, complications; allow standardised experience for all trainees; can be used repeatedly with fidelity and reproducibility; and can be used to train both for procedures and difficult management situations"

There are currently many forms of simulation available. These include

- Simple case studies using photographs or other clinical material
- Role play, or actors playing the role of patients
- Computer based simulation, either on a traditional screen or as part of a "virtual reality" set-up
- Simulation using anatomical mock-ups (partial task simulators) or full body manikins of varying complexity

This course is principally concerned with high fidelity simulation, where full-sized computer-controlled, mechanised, adult or paediatric mannequins are used to enhance learning around complex clinical scenarios. These mannequins may be situated in dedicated Simulation Centres, or may be set up in clinical environments. The learner is fully immersed in the scenario presented, so to enhance the learning by grounding the scenario in an approximation of the real world. Simulation "animates the curriculum."

Despite this focus, some attention is also given to other ways of delivering simulation training through lower fidelity mannequins and using 'Real people' alternatively called 'Standardised Patients.' It must be remembered that the principles covered in the debriefing sections are applicable across all simulation modalities.

The use of simulators in medical education is becoming more widespread. This helps emergency physicians to "learn by doing" in a safe environment. Rare but life threatening presentations can be simulated, along with common scenarios where there are established algorithms or guidelines. Simulation also offers a unique opportunity to explore human factors and non-technical skills which are so vital to the safe care of patients in the Emergency Department. Debriefing, supported by video playback, can provide powerful learning, enabling trainees to explore and reflect on their own performance and behaviour. Simulation is playing an increasingly important role in selection and assessment.

Teaching on simulators is both challenging and enjoyable. There are specific elements to learn (how to drive simulators) along with new twists on debriefing skills. You need to be able to teach both clinical skills, and non-technical skills. There is sound educational theory supporting this tool, applied in a very practical way. You will be at the forefront of medical education as we train the emergency physicians of the present and future

Advantages of simulation training

- Safe environment for training that does not expose patients or trainees to risk
- Simulator based clinical training can be planned and designated with pre-designed clinical encounters within a systematic curriculum rather than relying on random case availability
- Multiprofessional team training and specific behavioural skills can be taught using simulated environments
- The component parts of learning a skill can be analysed by trainees and trainers. A simulation can be frozen to allow discussion, and then repeated or alternative techniques demonstrated
- Unlimited exposure to uncommon but critical or fatal events that require a rapid clinical response.
- Crisis intervention skills can be taught
- New technology and processes can be tested and experienced without affecting patient safety.
- Simulation training and debriefing is compatible with a number of learning theories and encourages candidate reflection and deep learning.

Disadvantages of simulation training

- High capital costs.
- Cost benefits are indirect, intangible, and long term
- Lack of trainers and curricula
- Certain physical findings not reproducible e.g. seizures or patient skin colour
- Computer anomalies affecting scenario running
- Participants may approach a simulator differently to real life.
- Weak but growing evidence base on the benefit of simulation based training

Chapter 2

Patient Safety, Human Factors and Emergency Medicine Non-Technical Skills (EmNTS)

Definitions

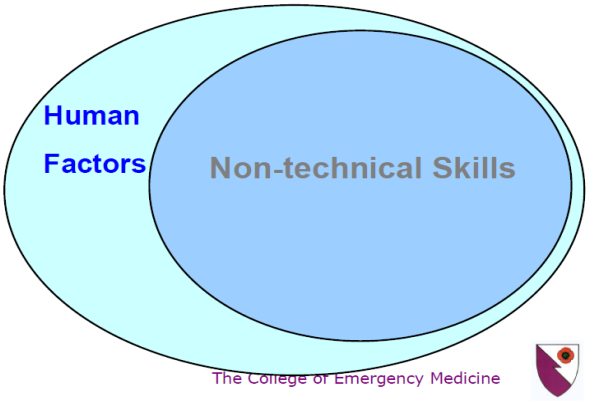
- Human Factors

A science concerned with understanding the interactions between humans and between humans and other elements of a system

- Non-Technical Skills

Social, personal and cognitive skills and behaviours

A large part of the science of human factors is concerned with non-technical skills. The terms are often used interchangeably.



Background

Crew Resource Management (CRM) was developed by the aviation industry in the late 1970's by aviation psychologists after an analysis of airplane crashes showed that human error was involved in 85% of events. It emphasised the role of human factors in high stake environments and taught crews to use all available resources to achieve safe flight operations. A decade later, an American anaesthetist called David Gaba was training as a Pilot when he recognised some of the similarities between the two environments of the operating theatre and the cockpit. From there, anaesthetic crisis resource management was born and the full immersive medical simulation we know today began its development. The term CRM is now rarely used and has been replaced by the broader terms 'Human factors' and 'Non-technical skills. Many specialities including our own have developed speciality specific non-technical skills taxonomies.(4-6)

The publication of "To Err is Human: Building a Safer Healthcare System" in 1999 by the Institute of Medicine in the US brought Human Factors into focus as the healthcare community began to realise the extent of medical error. This publication as well as documenting the extent of the problem, challenged the existing view that errors resulted from individual recklessness. Instead they suggested it was faulty systems, processes and conditions that led people to make mistakes or fail to prevent them. The results of this study have been

replicated in Australia and here in the UK(7-9). Investigation of critical incidents and serious untoward events by the National Patient Safety Authority suggest that human factors form part of the error chain in 70% of cases. Data from the National Health Service Litigation Authority shows that Emergency Medicine is ranked 3rd highest error prone environment. Human factors including non-technical skills form an essential part of avoiding error and improving patient safety.(10)

The importance of developing these competences to support safe patient care has been embraced by the GMC in good medical practice and they are embedded within the common competencies in the CEM curriculum. In the past these skills have been learned tacitly through experience. However it is increasingly recognised that both simulation and workplace based observation provide opportunities to learn and hone these skills. (12)

What do Non-Technical Skills involve?

Non technical skills in emergency medicine can be thought of in four domains.(4) These reflect a lot of what is thought to be the hallmarks of an excellent and effective emergency physician.

1. Situational awareness
    - The ability to perceive and assess a situation and anticipate future developments
    - Background control is a technique to avoid the fixation error inherent in concentration.
    - Ensure you remember to scan your environment frequently to pick up change.
    - Encourage all team members to take on this task

2. **Decision making**
    - Generate options – avoid fixation error by listing differential diagnosis or alternative actions
    - Planning is a mental process requiring effort – ensure this is your only task
    - Consider the worst case scenario
    - Always plan with alternatives and factor in a sufficient buffer of time, resources and staff.
    - Consider long-term consequences – as emergency physicians we are particularly poor at this

3. **Teamwork and cooperation**

Effective patient management in critical situations is based around the formation of a **mental model** that reflects the patient's clinical state. High functioning team working is achieved when all members of a team contribute to and share the mental model, a process facilitated by the team leader. The whole team should have a shared understanding of what is happening to the patients and what the next steps are.

A shared mental model can be detrimental to patient outcome if it is inaccurate. (See Chapter 3 for more detail)

Communication

Effective teams ensure clear identification of names and roles, efficient sharing of information between team members and dissemination to relevant external parties. Closed-loop communication is useful and allows the effective exchange of information between a sender and a receiver.

Communication failures are a major contributor to adverse events in health care. A number of structured handover communication tools such as SBAR (situation, background, assessment recommendation) have been developed to reduce ambiguity, enhance clarity and send an unequivocal signal when needed. This is particularly important in situations where staff may be uncomfortable about making a recommendation i.e. those who are inexperienced or who need to communicate up the hierarchy. The use of SBAR prevents the hit and miss process of 'hinting and hoping'. (1) It allows staff to communicate assertively and effectively, reducing the need for repetition.

4. **Management and supervision**

This refers to the ability of the emergency physician to manage and lead the emergency department. This includes ensuring quality and safety standards are met; such as infection control and compliance with standard operating procedures. It also includes the leadership and supervison of junior staff, ensuring appropriate task allocation and delegation.

The table overleaf provides an observation tool that can be used to help identify examples of these non-technical skills. The example behaviors are not meant to be exhaustive, but provide you with some pointers. This tool could be usd by observers during a simulation or during a period of workplace observation. Make notes in the blank spaces which can then be used to inform feedback and debriefing.

Assessment of EM physicians' non-technical skills Assessor Trainee Date

Management & Supervision	**Maintenance of Standards**	Subscribes to clinical and safety standards as well as considering performance targets. Monitors compliance.	
	Workload Management	Manages own and others' workload to avoid both under and over-activity. Includes prioritising, delegating, asking for help and offering assistance.	
	Supervision & Feedback	Assesses capabilities and identifies knowledge gaps. Provides opportunities for teaching and constructive feedback.	
Teamwork & Cooperation	**Team Building**	Provides motivation and support for the team. Appears friendly and approachable.	
	Quality of Communication	Gives verbal and written information concisely and effectively. Listens, acknowledges receipt of information and clarifies when necessary.	
	Authority & Assertiveness	Behaves in an appropriately forceful manner and speaks up when necessary. Resolves conflict effectively and remains calm when under pressure.	
Decision- Making	**Option Generation**	Uses all resources (written and verbal) to gather information and generate appropriate options for a given problem or task. Involves team members in the decision making process.	
	Selecting & Communicating Options	Considers risks of various options and discusses this with the team. Involves clearly stating decisions and explaining reasons, if necessary.	
	Outcome Review	Once a decision has been made, reviews suitability in light of new information or change in circumstances and considers new options. Confirms tasks have been done.	
Situational Awareness	**Gathering Information**	Surveys the environment to pick up cues that may need action as well as requesting reports from others.	
	Anticipating	Anticipates potential issues such as staffing or cubicle availability in the department and discusses contingencies.	
	Updating the Team	Cross-checks information to ensure it is reliable. Communicates situation to keep team 'in the picture' rather than just expecting action.	

Management & Supervision	**Maintenance of Standards**	• Notices doctor's illegible notes and explains the value of good note keeping • Explains importance of ensuring sick patient is stable prior to transfer • Ensures clinical guidelines are followed and appropriate pro forma is complete	• Fails to write contemporaneous notes • Does not wash hands (or use alcohol gel) after reviewing patient • Fails to adhere to clinical safety procedures
	Workload Management	• Sees a doctor has spent a long time with a patient and ascertains the reason • Ensures both themselves and other team members take appropriate breaks • Deals with interruptions effectively	• Fails to act when a junior is overloaded and patient care is compromised • Focuses on one particular patient and loses control of the department • Fails to escalate appropriately when overloaded
	Supervision & Feedback	• Gives constructive criticism to team member • Takes the opportunity to teach whilst reviewing patient with junior doctor • Gives positive feedback to junior doctor who has made a difficult diagnosis • Leads team through appropriate debrief after resuscitation	• Criticises a colleague in front of the team • Does not adequately supervise junior doctor with a sick patient • Fails to ask if junior doctor is confident doing a practical procedure unsupervised
Teamwork & Cooperation	**Team Building**	• Even when busy, reacts positively to a junior doctor asking for help • Says thank you at end of a difficult shift • Motivates team, especially during stressful periods	• Harasses team members rather than giving assistance or advice • Speaks abruptly to colleague who asks for help • Impolite when speaking to nursing staff
	Quality of Communication	• Gives an accurate and succinct handover of the department • Ensures important message is heard correctly • Gives clear referral to specialty doctor with reason for admission (e.g. SBAR)	• Uses unfamiliar abbreviations that require clarification • Repeatedly interrupts doctor who is presenting a patient's history • Gives ambiguous instructions
	Authority & Assertiveness	• Uses appropriate degree of assertiveness when inpatient doctor refuses referral • Willing to speak up to senior staff when concerned • Remains calm under pressure	• Fails to persevere when inpatient doctor refuses appropriate referral • Shouts instructions to staff members when under pressure • Appears panicked and stressed
Decision making	**Option Generation**	• Seeks help when unsure • Goes to see patient to get more information when junior is unclear about history • Encourages team members' input	• Does not look at previous ED notes/ old ECGs when necessary • Fails to listen to team members input for patient management • Fails to ensure all relevant information is available when advising referral
	Selecting & Communicating Options	• Verbalises consideration of risk when sending home patient • Discusses the contribution of false positive and false negative test results • Decisive when giving advice to junior doctors	• Uses CDU to avoid making treatment decisions • Alters junior doctor's treatment plan without explanation • Forgets to notify nurse-in-charge of admission
	Outcome Review	• Reviews impact of treatment given to acutely sick patient • Follows up with doctor to see if provisional plan needs revising • Ensures priority treatment has been given to patient	• Fails to establish referral outcome of complicated patient • Sticks rigidly to plan despite availability of new information • Fails to check that delegated task has been done
Situational Awareness	**Gathering Information**	• Uses Patient Tracking System appropriately to monitor state of the department • 'Eyeballs' patients during long wait times to identify anyone who looks unwell • Notices doctor has not turned up for shift	• Fails to notice that patient is about to breach and no plan has been made • Ignores patient alarm alerting deterioration of vital signs • Fails to notice that CDU is full when arranging new transfers
	Anticipating	• Identifies busy triage area and anticipates increased demand • Discusses contingencies with nurse-in-charge during periods of overcrowding • Prepares trauma team for arrival of emergency patient	• Fails to anticipate and prepare for difficulties or complications during a practical procedure • Fails to ensure that breaks are planned to maintain safe staffing levels • Fails to anticipate and plan for clinical deterioration during patient transfer
	Updating the Team	• Updates team about new issues such as bed availability or staff shortages • Keeps nurse-in-charge up to date with plans for patients • Communicates a change in patient status to relevant inpatient team	• Notices the long wait but fails to check the rest of the team is aware • Fails to inform team members when going on a break

So why do we need these skills?

We work in an extremely error prone environment due to the complexity of our working environment, not only due to its characteristics but also due to the demands imposed on us as problem solvers.

Problem solving in the complex environments is exacerbated by:

- Uncertainty
- Lack of transparency
- Singularity of the situation
- Information overload or lack of information
- Time pressure
- Risk
- Plurality of goals
- Presence of many players

Complexity is a subjective characteristic i.e. “a mental construction” which depends on the experience of the individual of a situation or of task demands. While you may not experience the situation as complex your colleagues might.

The Future

When discussing ‘Human factors’ with patients, they rarely mention situational awareness or decision making. Most patients would understand ‘Human factors’ as care, compassion and bedside manner. These are non-technical skills and require doctors to develop and hone emotional intelligence. Some of these behaviours may be considered less important in maintaining patient safety, but they are valued by patients and improve their experience of healthcare. It could be argued that if we deliver caring compassionate healthcare, then maybe we would be listening more effectively to our patients and keeping them safer. Following the Francis report into the failings at MidStaffs, there has been increasing interest and focus on using simulation to develop these patient centred non-technical skills. In the coming years the remit of simulation is likely to become broader and encompass training in this area.

Conclusion

Although simulation training has made the training of non-technical skills its remit it should not be the only place to experience and practice these skills. For them to become effective in practice, they need to be practised daily.

Chapter 3

Team-working in the emergency department

Team working is so important to emergency medicine that this particular human factor merits its own section.

A team is two or more people acting together to achieve a common goal

Doctors are trained to function as autonomous practitioners; however in hospital, they generally work in teams. Team-working generally operates at a subliminal level, occurring during normal working conditions. This experiential practice, together with standard life support courses, creates the assumption that Emergency Medicine doctors are good at working in teams.

Usually it is not until times of resource intensive cases or resuscitation cases that this autonomous medical role is displaced by one that involves multiple individuals coming together to form a team.
These teams are generally multi-disciplinary with roles assigned along speciality divides and following clinical management frameworks such as ATLS. Commonly, due to imposed working patterns, team members are unlikely to have worked together and will have varied experiences of team-working.

Team working skills are rarely explicitly taught. Understanding team constructs, dynamics and functioning is a significant part of the non-technical skill base that Emergency Physicians need for effective team-working and improved patient outcomes. A simulated scenario is an excellent way to train team working skills and give individuals an understanding of team dynamics.

Three main areas are considered:

- The components of effective team functioning
- The construct of teams
- The dynamics of teams

The components of effective team functioning: roles and processes
Team roles

Team leadership

The team leader is responsible for co-ordinating and directing the team approach, task allocation with roles and responsibilities, assessment/ re-assessment of performance, planning and organization, team motivation and establishing/ maintaining a positive atmosphere.

Team membership: the ability to be a member of a team

The ability to follow is as important to lead. A team member should recognise of the importance of a shared team goal and the ability to relinquish individuality, with the security of knowing that one's judgement and viewpoint

will be respected and heard.

Team processes

Mental modelling

Effective patient management in critical situations is based around the formation of a mental model that reflects the patient's clinical state. High functioning team working is achieved when all members of a team contribute to and share the mental model, a process facilitated by the team leader.
The additional challenge for the team leader is the responsibility to ensure that this process results in a **mental model** that equates as closely as possible to the reality of the patients presentation, clinical state and underlying pathology. A shared mental model can be detrimental to patient outcome if it is inaccurate.

'*A **mental model** is an explanation of someone's thought process about how something works in the real world. It is a representation of the surrounding world, the relationships between its various parts and a person's intuitive perception about their own acts and their consequences. Our mental models help shape our behaviour and define our approach to solving problems (akin to a personal algorithm) and carrying out tasks.*'

Mutual trust and respect

The shared belief and understanding between team members that they will perform their roles and undertake their responsibilities while respecting the team dynamic, each other, and the leadership role.

Performance monitoring

Critical error avoidance is achieved through mutual surveillance, non-judgemental feedback and effective conflict resolution between team members.

Backup behaviour

Acknowledgement of the potential limitations of team member's abilities and the need to delegate tasks and workload among members is required to achieve effective personnel and resource utilisation. Leadership transition: the ability to handover the leadership role in a structured way when appropriate.

Adaptability

The ability to react to dynamic changes in circumstances, utilising backup behaviour and resource management through re-tasking of team members/ adapting task priorities.

Communication

Effective teams ensure clear identification of names and roles, efficient sharing of information between team members and dissemination to relevant external parties. Closed-loop communication is useful and allows the effective exchange of information between a sender and a receiver.

These components can be simplified to four “C’s” which are the hallmarks of effective team leadership and membership: Cooperation, Co-ordination, Control and Communication.

The construct of teams
The construct of teams can vary, four models are considered:

A Team of individuals

The team of experts rather than an expert team analogy – these teams have no cohesion and can lead to individuals being unintentionally obstructive as there is no commonality of a shared mental model or formalised leadership structure.

The Team

Individuality is replaced by a cohesive approach incorporating the key components of effective team functioning. High functioning team work is achieved with effective leadership and membership, targeted against a shared mental model.

The Team + individuals

Occurs when a team member disengages from the team structure or an individual external to the team participates in the management of the case without engagement with the team approach – unless carefully managed this can lead to conflict, uncoordinated effort and confusion of purpose.

The Team incorporating sub-teams

This represents the highest functioning of team practice. Its structure allows effective delegation of person intensive tasks to sub teams and thereby promotes horizontal functioning against the shared mental model where different sub teams can be simultaneously tasked. The best medical examples occur in established theatre teams.

The dynamic formation of a team

Preformed guidelines and protocols (such as ATLS, ALS) do not reflect the way in which teams form in order to manage the dynamic presentation of critical care cases.

Dynamic team formation core team – primary attendees, secondary (delayed) attendees, tertiary (invited) attendees (uninvited – appropriate/ inappropriate)
Ancillary teams

Core team
The core team contains the knowledge and skill competencies to manage the patient and is made up of primary and secondary attendees and augmented, as required, by tertiary attendees. The ultimate person responsible for the definitive management of the patient should have representation within one of these three sub-groups.

Primary attendees: those who are present to take initial responsibility for the patient in the Emergency department and have participated in a briefing prior to the patient's arrival. The core team should demonstrate a coordinated strategy for the initial management of the patient. This strategy is relatively formulaic and generally follows common published guidance. The initial task within the primary attendees is to identify a team leader.

Secondary attendees: consist of those persons who would be expected to be present in the receiving team but whose presence is delayed. These persons are aware of the generic structure and approach to the model of care being applied by the Core team and can adopt team roles with limited handover information. Any transition of the leadership role must occur in an agreed and structured fashion and must be communicated to all team members.

Tertiary attendees are those persons who are not core team members – there are two distinct groups: those persons whose input/ participation is invited and those persons who provide uninvited participation.

Care to must be given the integration of invited participants as critical information can be easily lost if communication is not effective – communication aids such as SBAR are useful to update team members.

Uninvited participation represents a greater leadership challenge, as it can be detrimental to the team effort, often occurring without effective communication or adherence to the team structure. A lack of co-ordination with team goals and objectives means that these participants must be carefully managed by team members and the team leader utilising communication, assertion, conflict resolution and distraction management skills. Uninvited participants represent an added resource pressure on an already resource intensive situation and strategies must be in place to enable their effective management tin order to minimise detrimental effects to the team structure and objectives.

Ancillary teams

These teams represent those resources that are required to support the core team – such as pathology, portering, radiology, theatre services, and other specialist teams.

Further Resources:

- Elearning module ENLIGHTENme https://web.nhs.net/OWA/redir.aspx?C=uY-S1FvhlUek2M-g7eNHhTrdXMjpGtFIX_ASsfcWYlXS_2NAH75mVEMoJavETxewcHQRdBTwQIo.&URL=http%3a%2f%2fwww.enlightenme.org%2fthe-learning-zone%2fmanagement-issues-in-em%2fhuman-resource-issues%2fintroduction-human-factors-and-patient-safety

- Human Factors in the Healthcare Setting. A pocket guide for Clinical Instructors. *Advanced Life Support Group*, *Peter-Marc Fortune (Editor)*, *Mike Davis (Editor)*, *Jacky Hanson (Editor)*, *Barabara Phillips (Editor).* (Available through ALSG and Amazon)

- Making Things Happen. http://www.youtube.com/watch?v=PXAMlCwQAyY *Cliff Reid*

- Human factors in Patient safety. A review of Topics and Tools. *http://www.who.int/patientsafety/research/methods_measures/human_factors/human_factors_review.pdf*

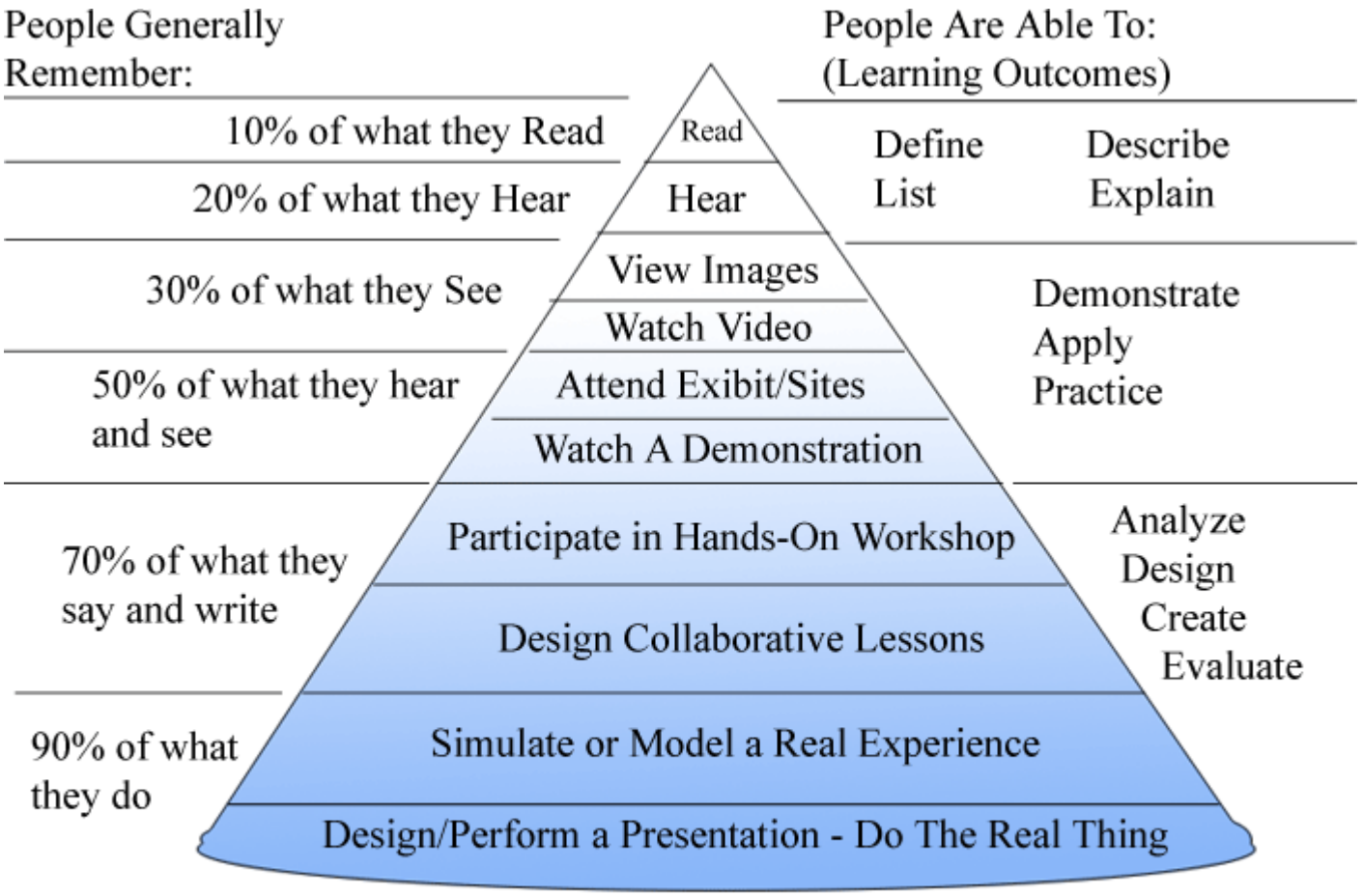
Chapter 4

Application of adult educational theory to simulation

Simulation is a unique learning environment in which candidates can experience the application of interventions in a 'safe' environment. Simulation enables various adult learning theories to be applied to a wide variety of clinical scenarios. It is important to understand how adults learn in order to target simulation to individuals and groups. Dale's cone of experience illustrates how effective different learning styles are two weeks after the teaching event. The closer a simulation is to a real event, the more information will be retained and used.

It is important to refresh yourself with the features of adult learners.

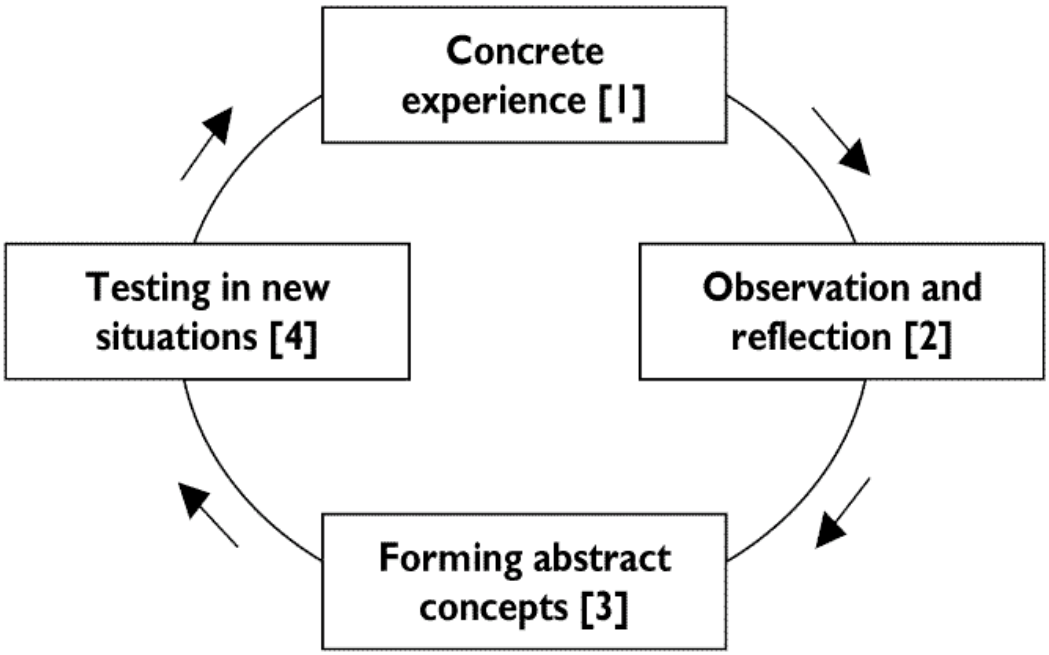
- Adult learners bring a wide range of experiences, knowledge, self-direction, interests and competencies
- Adults learn better if the goals and objectives are realistic and personal to them
- Adult learners need direct, concrete experiences that can be applied in the 'real' work place
- Adult learners in small-group activities enable application, analysis, synthesis and evaluation as well as providing an environment in which to share, reflect and generalise learning experiences
- Adult learners require feedback on their progress and efforts
- Adult learners need coaching and support to help them transfer learning into daily practice



Dale's Cone of Experience

Relevant Educational Theories

The commonly used educational theories are ***behaviourism***, ***constructivism*** and ***cognitivism***. The behaviourism theory assigns teachers in modifying behaviour by creating situations where learning is reinforced by responses exhibited. The constructivism approach emphasises the learner's ability to solve real life problems. The theory of constructivism is that reflecting on one's experience generates one's own understanding of the world. An example is the Kolb's cycle of experiential learning.



Kolb's cycle of experiential learning

The learning process often begins with a person performing a task and then seeing the effect of the action. The second step involves understanding the effects to enable the learner to anticipate the action that would follow. The third step is understanding the general principles of the action involved. The final step involves implementation of the action.

Kolb's principle is applied in simulation by the introduction of a new skill to the candidates, such as management of the difficult airway. A potentially life threatening condition that may not have been encountered in the clinical environment can be created in a 'safe' environment in simulation for the candidates to experience.(7) This will allow reflection and discussion with a clinical expert on the management of this type of scenario. The learner is able to develop, from a 'safe' environment of simulation, a pathway in this situation that can be used to manage such a patient in the clinical environment.

Cognitivism occurs when the learner processes information. There are three components to learning a subject. (8) Firstly, acquisition of new information built on something that is already known. Secondly, transformation of information for use in new situations. Finally, evaluation of all aspects of information processing to ensure it is correct. In simulation, cognitivism is applied to debriefing of scenarios. The debriefer guides the candidates to the next questions and facilitates the journey to learning and reflection. Also, new information is acquired, transformed and evaluated by the candidate through involvement in the scenarios and debriefing process.

Conclusion

Simulation-based training represents an evolution of the apprentice model of teaching (i.e. see one, do one, teach one) in which the needs of adult learners are met more effectively. It has the potential to increase competency as well as improve patient safety. The effectiveness of simulation lies in the application of the educational theory. The most significant learning experiences occur in authentic activity, during immersion in realistic settings via hands-on training. The unique environment in simulation enables the development of knowledge and skills of the clinical environment that mirrors the clinical setting and is better and ‘safer than the real thing’.

Chapter 5

Designing a scenario

This chapter will discuss how to design scenarios effectively. Most simulation centres will have a bank of ready-designed scenarios that you either use directly or modify. The College of Emergency Medicine has developed a range of courses and scenarios covering both clinical and Emergency Medicine Non-Technical Skills. As you continue to teach using a simulator, you will probably want to start designing scenarios and sessions of your own. A great advantage of simulation is that you can create bespoke scenarios for different levels of trainee doctors.

The first step is to decide on what learning objectives you want to achieve. It is worth spending a bit of time on this. Decide whether you are designing a scenario for assessment or training. Decide whether you want to focus mainly on clinical aspects or non-technical skills. Assessment scenarios have to be completely reproducible and validated for a 'pass mark.' OSCEs are a type of assessment using simulation. Teaching scenarios can be more flexible and can be adjusted 'on the hoof' to meet the ability of the candidate.

Decide **who** is going to undergo the scenario and what you think they really need to know. Decide whether you need a simulator to deliver the objectives. Is this an area where you could use other educational methods such as case base discussions or an elearning module? Avoid the temptation to make the scenarios too complex or involved. Some candidates will fail at the first step and a lot of effort can be wasted. How many candidates are you going to have in the scenario? Multiple candidate scenarios are very useful for bringing out key non-technical skills such as communication and leadership, but are harder to use for assessment.

Consider whether other healthcare professionals need to have some input into the scenario development. If you are planning an interprofessional simulation training session involving nursing staff, it would be wise to get some nursing input into your scenario development.

Consider the training needs of your candidates. For instance, medical students would benefit from a scenario aiming to teach them the recognition of severe sepsis. Post MCEM trainees would not find this challenging, but they would benefit from a scenario about when to initiate inotropes and blood transfusions and how to prepare a patient for transfer. As a general rule, simulation scenarios work best when there is educational significance and learning that can be immediately applied back in the workplace.

Consider the focus of your scenario. Are your learning objectives predominantly around the clinical management of the patients, or is the focus more on non-technical skills? If the focus is the former, some procedural experience and good reproducible physical signs that change dynamically

with interventions are helpful. If the focus is on non-technical skills, think about how you can design your scenario to explicity challenge the non-technical skills you want to cover. Consider adding in distractions, difficult referrals, handovers, incorrect advice etc

Consider whether the candidates will have the technical aspects of the scenario in advance. There are real advantages having the candidates fully briefed on the technical aspects of the scenarios before. This allows you to focus on the **application** of their knowledge, rather the **acquisition** of knowledge, which may be done more efficiently elsewhere. Remember the objectives do not have to be technical, you might want to emphasise a non-technical skill. For instance, you might want to create a scenario that tested the ability of a trainee to lead a team or deal with inappropriate advice. The more specific a learning objective is, the better the scenario will be. It is easy to be seduced by the 'bells and whistles' of a high fidelity simulator and produce a scenario that is a slave to the technology. Remember the technology is there to help you, not the other way round! The table below shows some examples of effective and ineffective learning objectives.

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Effective learning objective	**Ineffective learning objectives**
Recognition of septic shock from a pneumonia (Convincing physical signs, important condition)	Recognition of Acute Intermittent Porphyria (No convincing physical signs / very rare scenario with a non-specific presentation)
Effective triage of multiple critically ill patients using the ABCDE system (Common and important scenario, though not all simulators can do multiple patient scenarios)	Assessment of Diabetic Keto-acidosis. (Vague learning objective, physical signs change slowly, relevant knowledge can be more efficiently taught didactically)
Organisation and leadership of a trauma team for an unstable patient with bilateral lower limb amputations (Convincing physical signs and CRM principles important)	Management of cardiac arrest (More efficiently taught on life support courses)
Transferring a critically ill patient safely (Common and important scenario, well supported by high level of realism)	Laparoscopic procedure (Psychomotor skill better taught with model and in theatre)
Practice airway drills for failed intubations (Important scenario where emphasis is on application of knowledge, supported by procedural	How to perform tracheal intubation (Technical skill better taught in theatre or on life support courses)

experience)	

Once you have the objectives established, plan how you will use the simulator to deliver these. Most simulators have a built in library of pre-prepared scenarios that you can adapt easily. For instance, an anaphylaxis scenario can easily be adapted to become a major gastro-intestinal bleed. Try to make the scenario as realistic as possible and a good collection of props can really help. Anticipate that most candidates will ask for a chest x-ray, ECG and arterial blood gases.

Confederates are faculty members that take on specific roles within the scenario. They can be used strategically within the scenario to ensure that specific learning objectives are met. For example, you may have a learning objective around assertive communication. A faculty member acting as a confederate may take on the role of a consultant in the scenario who deliberately fails to notice a deterorating airway. The candidate would be expected to challenge the confederate playing the role of the consultant using assertive communication techniques to ensure that the patient is treated safely. The use of confederates is particularly helpful when the scenario is focused on non-technical skills. If you decide to use a confederate this needs to be designed in to your scenario

It is well worth practising your scenario on yourself and a volunteer to trouble shoot. Ask your volunteer for feedback. Does your scenario deliver the learning objectives well? After the session is run 'live' for the first time, ask the students what they thought. Did it work for them? Was it too hard or too easy?

Check list for designing a simulator scenario
1. What are the learning objectives? Are they non-technical or technical?
2. Who is this for?
3. Do I need a simulator for these objectives?
4. Is this for assessment or teaching?
5. How many students are going to be involved in the scenario?
6. Is this scenario already written?
7. Can I adapt another scenario easily?
8. What props do I need? (Chest x-rays / arterial blood gases / ECGs / intubation equipment / ventilators)

9. Do I need a confederate?
10. Rehearsed on yourself, does this scenario meet the learning objectives?
11. Rehearsed on a volunteer and feedback obtained?
12. After the session, what did the students think? Did they find it helpful? Do you think they got the objectives that you wanted?

If this scenario is going to be used by other faculty, it is worth having a short written guide. An example is shown below.

Specimen Scenario

Synopsis. A 45 year old man is brought into the resuscitation room unconscious. He collapsed after a single blow with a baseball bat to his head. He has a dilated right pupil. His initial observations are BP180/120 mmHg, pulse 45bpm, GCS 3/15, SaO2 94% and respiratory rate 8. He requires intubation with a rapid sequence induction, intravenous Mannitol, urgent CT scanning and an urgent neurosurgical operation.

Learning objectives
This is designed for ST1-3 trainees.
Technical: outline use of Mannitol in raised intracranial pressure.
Non-technical: organisation of anaesthetist, radiologist and neurosurgeon by telephone to ensure smooth transition. Inter-professional communication.
Expected actions.

1. The candidate will identify that the patient is coning and that this is a neurosurgical emergency. The candidate will identify that the patient requires a definitive airway and contact an anaesthetist urgently. The patient should receive intravenous Mannitol prior to intubation.
2. While the anaesthetist is preparing the patient for RSI, the candidate will contact the radiologist and CT scanning.
3. The candidate may decide to contact the neurosurgeon before the CT scan so that the neurosurgeon is in the CT scanner as the images are processed and can make a prompt decision whether to take the patient straight to theatre.

Equipment
The room should look like the resuscitation room
Neck collar
Intubation equipment (ET tubes / portable ventilator / intravenous drugs / ties)
Infusion pumps
Monitors
Defibrillator
Nurse (can also be a candidate)
Anaesthetist (can be a candidate)
Normal set of blood gases
Normal chest x-ray

Chapter 6

Avoiding problems and pitfalls during the scenario

If problems are anticipated, they are much more easily overcome. In simulation training there are three main areas which need particular attention, the **equipment**, the **scenario** and the **candidates**.

Many potential problems can be avoided by rehearsal and adequate preparation

The equipment

The facilitators of a training episode must be aware of the functionality and limitations of the simulator they are working with. A trainer must know whether the simulator will be capable of demonstrating the physiology, anatomy, pathology and interventions required to allow the candidates to achieve their learning objectives. If it does not have the appropriate capacity, consider whether any additional equipment may be required.

High fidelity simulators can be fragile pieces of equipment with many moving parts and complex electronics. Whilst the software used to drive them is robust, the hardware can malfunction and require on the spot repairs. As a facilitator it helps to have a working knowledge of the simulator you are working with, understanding how the signs are generated and what may be done to overcome unforeseen difficulties.

Sufficient time during preparation must be made to ensure set-up of the simulator, checking the required parameters for that training episode can be generated. The room should be made as similar to the working environment as possible. The candidates must have every opportunity to immerse themselves in the scenario, and should be provided with a set-up that they would be expected to work with in reality. A comprehensive collection of fully functioning peripheral equipment laid out in a way to replicate a real working environment helps achieve realism.

The scenario

A trainer must be clear what they wish to gain from a particular scenario and ensure that everything is in place to enable those goals to be reached. Ideally the whole scenario should be rehearsed to ensure that it will deliver the desired training objectives. Written (anonymous) feedback should be sought from the trainees, highlighting problems they perceive with the simulator, scenario and achieving the training objectives. High quality preparation is the key to delivering high quality training. Candidate feedback will help you develop better training.

Chapter 7

Simulated patients

When one imagines simulation training in emergency medicine, the image is often one that involves a plastic manniquin. In other specialities such as general practice and in undergraduate education patient actors are commonly used, particularly for teaching and assessing consultation and communication skills. These patient actors may be drawn from acting companies specialising in medical education, the local amateur dramatic society, expert patients, colleagues or willing friends. It is possible to combine the manniquin software to provide accurate physiology responses with a person playing the role of the patient. Whether a professional actor or a friend/colleague the term used is 'Simulated patient' or 'SP'

The decision to use an SP will be determined by your learning objectives. For example, if you want to run a session where you would like to explore the impact of different styles of breaking bad news, an SP would be ideal. They would be able to give appropriate emotional responses and provide feedback to the trainee unlike a manniquin.

Whether you use a professional actor or a colleague will be determined by resources and availability. However, whoever you choose there are common issues to consider to ensure the success of your training session.

Considerations when developing your training session

- What is the learning activity and objectives?

- Who is the trainee and what is expected of them?
- What is the setting?
- How long will they be with the patient?
- Are there any risks for the SP?
- Are there any risks for the trainee?
- What is the most likely outcome for the patient (SP)?
- What is the process for feedback?
- Will there be an audiovisual recording?
- Will there be a tutor?

It is helpful to demonstrate what the learning activity looks like to let the SP know the endpoint. The scenario plan needs to be shared with the SP in advance of the session.

Considerations when developing your patient (This is best done in consultation with your SP)

- Why is this patient in this scenario?
- What facts are important in this context?
- What is the patient's understanding of their healthcare issue in the scenario?
- What are the patient's main concerns?
- What is the patient's most likely outcome in this context?
- What is this patient's current emotion? Why?How will it be presented? Intensity?
- What is the most likely patient behaviour throughout the scenario?
- What clinician behaviour will influence the patient's emotion? How?

Rehearsal

Spend some time with the SP rehearsing, integrating all the components of the SPs role play character. What are the likely opening lines? Get familiar with the setting. This can be done in advance or just before the session.

This may sound arduous, but remember you may run the scenario many times and this prep with this SP is only needed once. In addition, the character that you have created can be integrated into other clinical scenarios. Perhaps you have a difficult scenario where you have to explore possible safeguarding issues with this character. Next time you use this SP she plays the same person but this time you are taking a sexual health history.

This chapter just provides a very brief introduction to using simulated patients.

Chapter 8

Debriefing in Simulation training

The debrief is a chance for the learner to reflect on the simulated learning experience, and learn from their performance. It is where the majority of the candidate‟s learning takes place after simulation. It is not the same as feedback, although feedback from the group and the faculty member is a vital part of an effective debrief. The emphasis during a debrief should always be on prompting the candidate to reflect on their own performance, with the aim of bringing out the main learning points, as well as emphasizing the positive aspects of their performance

Why debrief?

The candidate‟s recollection of the simulated clinical encounter is frequently factually incorrect and often incomplete. In addition structured discussion of what happened will facilitate learning. The main purposes of the debrief are
1) To summarize the encounter accurately
2) To bring out the positive aspects of the candidate's performance. This is especially important, as participating in simulation can be very stressful and emotive
3) To identify aspects of the performance that could have gone better. This clearly needs to be undertaken in a constructive manner. Remember it is stressful for any candidate to have their performance discussed in front of other colleagues. It is helpful to remain non-judgemental and factual.

For example:
1. (Facilitator) *"Your leadership of the team was wayward at this stage, and nobody could hear you or understand what they were supposed to do"*
2. (Facilitator) *"I noticed that you were very quiet at this stage in the scenario, and things were happening around you. Were you aware of that?"*
(Candidate replies) *"No, not really"*
"Did everyone from the team have a clear idea of what they were supposed to be doing?"
(Team member) *"I wasn't too sure, so just did what I thought would be right"*

"I would suggest directing your team explicitly at all times during a resuscitation effort, as you run the risk of team members being unsure of their roles if you don't"

The first example is likely to leave the candidate demoralised. They will not understand what they could have done better, and are likely to take little away from the debrief from this point onwards. In the second example, the facilitator has encouraged the group to become engaged, and brought out some reflection from the learner. This approach is far more likely to be educational.

Models of Debrief

1. **Positive Sandwich**: The learning points are 'sandwiched' between positive comments. This ensures that the feedback always begins and ends on a positive note, with the intention being that it is less distressing for the candidate. There is a danger however that important learning points can be missed and the 'relentless optimism' approach could be unhelpful with a candidate who has a lot to learn.

2. **Reflective**: This is otherwise known as 'Pendleton's Rules'. This model has been historically used on many life support provider courses. It is structured as follows:
    a. 'Tell me what you did well'
    b. 'I will tell you what you did well'
    c. Tell me what you could do better'
    d. 'I will tell you what you could do better'

    This model has the advantages that it is well structured and there is equal emphasis on positive points and learning points. It can feel slightly awkward if the candidate is reluctant to discuss positive points and, in reality, most candidates wish to focus on negative points first.

3. **Narrative:** This model involves a comprehensive review of a scenario in time order from start to finish. It has the advantage that it is inclusive of all events and therefore there is little likelihood of anything important being missed out. As such, it is more time consuming than the other model. There is no facility to prioritise learning points as they are addressed in the order that they happened.

4. **Learning Conversation:** This approach has been developed by the Advanced Life Support Group (ALSG) and Resuscitation Council (UK) for their life support courses. Despite looking more complex, it is less time consuming than the narrative approach and has as its main advantage the ability to prioritise what the candidate and faculty want to talk about first. At its heart is the concept of ***advocacy with inquiry***, which involves combining a blame-free description of an event followed by an invitation for the candidate to give their perspective. An example is used in the scenario above – *"I noticed that you were very quiet at this stage in the scenario, and things were happening around you. Were you aware of that?"*

All of these models have advantages and disadvantages and it is important to be able to adapt your debriefing style to suit the circumstances of the simulation session you are running. The College of Emergency Medicine has developed a group of courses specifically designed to enable observation of non-technical skills, which can then be explored in the debrief. The courses are designed to enable a significant amount of time debriefing. We would recommend using the '**Learning Conversation'** style of debrief for these courses. It is this style of debriefing that you will be practicing on the Simulation Faculty Training course.

The debrief is a chance for the learner to reflect on the simulated learning experience, and learn from their performance. It is where the majority of the candidate's learning takes place after simulation. It is not the same as feedback, although feedback from the group and the faculty member is a vital part of an effective debrief. The emphasis during a debrief should always be on prompting the candidate to reflect on their own performance, with the aim of bringing out the main learning points, as well as emphasizing the positive aspects of their performance

Debriefing a team

The standard sequence of **Description, Analysis** and **Application** should be followed. Particular themes that can be brought into a team debrief are shown below. Asking a couple of prompting questions in the analysis can be very helpful.

With senior trainees, it can be valuable to explore team dynamics and how the team performed.

Control Team roles
Leadership – Identification
Transition
Examples: '*Who was in charge?'*
'Given that Dr Tim was in charge, what do you think his responsibilities were?'
Membership
Knowledge base/ skill set
Dealing with uninvited participants

Co-ordination Roles/ responsibilities
Example '*What do you think your roles were in this scenario?'*
Task allocation
Example '*I noticed you asked for lots of things to be done quickly and they didn't all get done. Why do you think that was?*'
Mental modelling
Examples '*What do you think this patient needed?' 'What did you think was going on with the patient at that time? Did you think everyone in the team knew this?'*
Shared
Accuracy

Cooperation Team cohesion
Mutual trust
Mutual surveillance / Error detection
Conflict resolution
Example *'What do you think the priorities were for this patient? What could you defer? How do you make that decision?*'

Communication
Internal & external
Example '*What happened when you handed over the patient?*'

The Difficult Debrief

The majority of debriefs are a positive and worthwhile experience for candidates and faculty alike. However even skilled and well prepared faculty are likely to run into difficulties on occasion. The aim of this chapter is to prepare the faculty member for challenges and difficulties that may arise in the debrief. An understanding of the common problems that can occur and the underlying reasons why they occur will help the faculty member overcome these situations or avoid them developing in the first place.
In the course we will discuss several challenging debrief scenarios, and in each case we will discuss and answer two key questions:

Why is the candidate behaving in this way?
How can we manage the debrief?

As in clinical practice, an accurate diagnosis is essential to direct the treatment. In order to understand the problem, it is helpful to have a systematic approach to diagnosis. Difficulties can be divided into candidate and faculty factors. To further assist, we will also apply the conscious competence learning model.

Candidate Factors

These can be divided into personality traits and learning styles which are relatively fixed in different situations and at different times, and current thoughts and emotions. The latter are influenced by a number of factors including past experience, and are more variable at different times.

Personality traits

Personality is an important factor in the way people approach simulation. In particular, the position of the candidate on the spectrum from introversion to extraversion is likely to affect their simulation experience. People who are highly extraverted are likely to be more comfortable with the performance aspect of the simulation scenario and non-technical skills relating to communication, teamwork and leadership. These aspects may come less easily to people who are more introverted. Therefore we may be asking introverted individuals to engage in an activity that makes them feel uncomfortable or that they would normally try to avoid. Conversely, people who are more introverted may be more comfortable with the analysis and reflective aspects of the debrief. Even so, they may not want to vocalise their thoughts. Skilful facilitation is necessary to ensure that the simulation activity and debrief in particular are not dominated by candidates with the more extraverted personalities. It is important to involve the whole group in the learning.

Learning Styles and Simulation Artefact

People vary in their favoured learning style. Simulation faculty generally believe that simulation is superior to other forms of learning, but for candidates this type of learning may not be their favoured approach. People vary greatly in their response to simulation as a learning modality. Some are able to rapidly feel comfortable with the 'suspension of disbelief' required and the fact that their performance is being watched discussed and possibly recorded on video. Others find it difficult to deal with the 'realism gap' between the simulation and reality. They may find it difficult to respond to a scenario as if it was a real scenario. Or they may feel uncomfortable with video cameras and mirrored glass windows. As a result these factors, there is a higher risk of *simulation artefact* occurring. This is where a candidate's performance is unduly affected by the fact that the scenario is simulated, and therefore their performance does not reflect their real-world performance. The presence of difficulties in this area may be evidenced by comments such as:

I only did X because it was a simulation...

Normally, I would have done X, but instead I did Y...

In other cases, a candidate will 'hide behind' realism issues as an excuse for poor performance. In either case, the best approach is usually to agree that the realism is not perfect, but that this should not prevent learning. It is important not to let discussions about realism dominate the debrief.

Current Thoughts and Emotions

The candidate's mindset on the day they attend the simulation may be affected by many factors. Some factors may be unrelated to the simulation itself such as recent life events, stress, difficulties in escaping other duties or travel or parking problems. Other issues may be related to their thoughts and expectations regarding the simulation itself. For example, they may have had bad experiences of simulation in the past. Or they may have come with an incorrect impression of the course – are they expecting summative assessment, negative critical comment or even ridicule? Mandatory courses are likely to involve more reluctant participants than those people have to choose to attend.

The pre-course information and the introductory briefing are crucial to ensure candidates have a realistic idea of what to expect, and preventing their imagination from taking over. Occasionally candidates will be extremely anxious and really not want to take part. Early identification is best -crying is a late sign! These candidates may require more support before, during or after the course. It may be necessary to take them to one side and find out exactly what the problem is.

Poor Performance

Poor real-world performance can occasionally go undetected for long periods, especially if an individual can pass exams and assessments or rely on team members to make up for deficits. Being 'put under the microscope' in simulation may be one of the few or only times a candidate's true level has been revealed. There is no hiding place in the simulation room! When the

performance observed is worryingly poor, simulation may therefore become the starting point, or a significant catalyst, for addressing an individual's poor performance. However, breaching the normal confidentiality of the simulation session and involving the candidate's supervisor is not for merely below average performance or a candidate who has a bad day. It is only appropriate when the performance is such that faculty are concerned that similar performance in the real world would put patients at risk. This is in accordance with the General Medical Council's 'Duties of a Doctor'. Similar principles apply to other staff groups.

As discussed above, it remains crucial to consider the possible contribution of simulation artefact to poor performance when making a judgement to involve the supervisor. For the same reason, supervisors should not use simulated performance in isolation to judge real-world performance. When the faculty decide to involve the candidate's supervisor, the candidate must be informed of this and the reasons explained. This discussion may be best left to the end of the simulation or course, as it can make further participation difficult for the candidate.

Faculty Factors

The faculty member's skill and experience in simulation training is clearly important. Inexperienced faculty should be supported by experienced faculty. Inexperienced faculty are often less adept at involving the whole group in the learning, and can often focus on the main actor or leader during the debrief. They often approach the debrief in the same way as they would on a life support course – by giving the main actor feedback on their performance. This approach wastes the opportunity to educate the whole group, and can lead to them feeling irrelevant and disengaged. The more skilled and experienced faculty member is able to use the simulation as resource from which they can craft a worthwhile learning experience and discussion for everyone in the room, including candidates who were observing rather than participating.

The faculty members are human too and their personalities and current mindsets will affect how they approach the simulation, sometimes with adverse effects. Either of these factors can result in an excessively aggressive approach, which is overly critical and negative. This is likely to make the candidates anxious, defensive and taciturn during the debrief. The debrief is not the place for personal arguments, point-scoring or belittling individuals. It is an educational experience, and too much criticism and negativity will seriously reduce the educational benefit. Any serious issues with individual candidates are best dealt with outside of this public forum. The educational benefit of the debrief is greatest when it is positive but honest.

The Conscious Competence Learning Model

This model evolved in education and management theory in the late 1960s and 70s. It is a useful tool for understanding the learning needs and potential difficulties for candidates in simulation training. The four stage model can be

seen as a ladder that is progressed in a stepwise manner. It can also be expressed as a matrix. A fifth stage was added later and has been given various names. The stages are:

1. Unconscious Incompetence
2. Conscious Incompetence
3. Conscious competence
4. Unconscious Competence
5. Enlightened Competence

The meaning of these stages can be illustrated using the example of learning to drive a car where the stages equate to:

1. Never driven – unable to perform task and not aware of what is involved
2. Beginner – aware of what is involved but not yet competent
3. Just passed test – able to perform task but needs to concentrate
4. Experienced – has been driving for years and is able to perform task with minimal attention e.g. can talk and eat sandwich at same time as driving
5. Instructor - has been driving for years and is able to analyse and explain what he or she is doing

Applying the Conscious Competence Model to Simulation

We can see parallels in simulation candidates. Understanding where they lie on the progression helps to understand what they need to do to improve, and helps us to understand why difficulties are arising. Sometimes difficulties arise because the faculty has misjudged the level of a candidate on this ladder. It is worth considering the issues associated with candidates at each level and how they can be managed.

1. Unconscious Incompetence

This category is most applicable in simulation when the candidate's performance is poorer than expected for their grade or band and experience, *and* they are unaware of this. This is potentially the most dangerous category due to the lack of insight. The candidate may perform very poorly, but because they do not understand the task, may fail to appreciate their lack of skill. Explaining or using the group to convey the finer points that the candidate has missed may help move this candidate on to conscious incompetence. However, if insight to poor performance remains lacking, and the faculty is concerned about the candidate's safety, this may be one of the few cases where it is necessary to discuss the performance with the candidate's supervisor as described above. Any significant technical errors must be discussed in the debrief. However, it does not help to dwell on these errors, blame or criticise in the debrief. The issue needs to be addressed in more detail in a one to one discussion with the individual.

2. Conscious Incompetence

Perhaps the term 'incompetence' is too harsh for our uses, but these candidates could be described as having a relatively low skill level. However,

they also have awareness that their skill level is low. As a result, they are therefore usually safe as they are aware of their limits and will not normally try to go beyond them. A major issue for this type of candidate may be the anxiety and lack of confidence that results from their knowledge that they are struggling with the task. Therefore the debriefer may need to reduce anxiety and boost confidence in order to settle this type of candidate into the simulation and allow them to perform at their best. It may be helpful to emphasize positives and reassure candidates that they are not expected to go outside of their competence.

3. Conscious Competence

This is where the majority of candidates on a simulation course usually lie. It is normally the least problematic category. The candidates already have a moderate skill level and the purpose of the simulation is to help them move towards a higher skill level and the next stage.

4. Unconscious Competence

A candidate in this category will be experienced. Issues may arise because they feel they 'know it all already'. Indeed in some cases they may have more specialist knowledge than the faculty member. However, whilst an individual may have little to learn about technical skills, they may have everything to learn about non-technical skills!

A common problem is failure to engage, as the candidate feels the course is 'pointless' for them. The other common problem is that the candidate may argue with faculty, attempting to prove that they 'know better'. The first approach in both cases can be to gently persuade them that their full participation in the spirit of the simulation would be worthwhile for them and would assist everyone else. The group response can be very helpful to apply pressure to bring an individual back into line. However, if the failure to engage or disruptive behaviour continues, the focus may need to shift to ensuring the behaviour does not adversely affect the learning for the rest of the group. Individual arguments should be avoided. They are likely to cause the rest of the group to disengage, feel excluded or that the faculty is too aggressive, causing them to withdraw. For this reason, having made your point, it is usually better to *sidestep* the argument rather than *confront head on* during the debrief. Arguments over technical matters such as the details of a protocol or guideline can be avoided or cut short by having the up to date document to hand for the debrief.

5. Enlightened Competence

A candidate at this level will be very senior and would often be better placed as a faculty member. However, they may be asked to participate to make up a realistic multidisciplinary team. Provided they 'buy into' the simulation and feel it is worthwhile, there should be no problem. Their ability to analyse performance should provide some useful insight in the debrief, potentially

making the faculty's job easier. However, if they are participating reluctantly or under duress, they may cause similar difficulties to the previous category.

Quick Approach to Challenges in the Debrief

Diagnosis

- Why is candidate behaving in this way?
  - Personality, learning style or current issues?
  - Previous experience – real or simulated
  - What stage are they at on the conscious competence model?
- Is it simulation artefact?
- Has the faculty contributed to the difficulties?
  - How was the scene set?
  - Has the debrief been overly negative or critical?

Management

- Utilise the group response
- Have guidelines available to close debate
- Focus on *group* learning – avoid individual arguments. Keep it positive
- Issues may need to be taken up outside of session

Chapter 9

Multidisciplinary Simulation

Multidisciplinary simulation involves more than one professional group as participants and is also referred to as multiprofessional. In its simplest form this could mean doctors and nurses from a single specialty. More professional groups can be added such as doctors from different specialties and allied health professionals such as physiotherapists, radiographers or operating department practitioners (ODPs). Simulation is not multidisciplinary if the additional professional groups are roles played by faculty; they must be participants.

Multidisciplinary candidates warrant a multidisciplinary faculty. This ensures the highest quality debrief for all of the participants. Whilst all faculty members should be able to debrief on non-technical skills and generic skills, the finer points of certain technical skills and the workplace context may require specialist knowledge. For example, it may be difficult for a paediatrician to debrief an anaesthetist on the finer points of rapid sequence induction and it may be hard for a surgeon to debrief a nurse on the finer points of preparing an intravenous infusion.

In situ simulation is usually multidisciplinary as this reflects the way most teams work in practice, in the ED and elsewhere. ED in situ simulation may involve just the ED doctors and nurses. However, it can involve the participation of other specialties, and there are also simulation centre courses that involve more than one specialty. Common examples of this relating to emergency medicine are courses on paediatric emergencies or major trauma, as these are two of the areas in which multi-specialty working is commonly required in the ED.

Potential Candidates for Multidisciplinary Simulation in Specific Subjects:

Paediatric Emergencies: emergency physicians, emergency nurses, paediatricians, anaesthetists and ODPs

Major Trauma: emergency physicians, emergency nurses, anaesthetists, ODPs, general and specialist surgeons, orthopaedic surgeons, radiology staff, paramedics

Purpose of Multidisciplinary Simulation

ED staff rarely work independently of all other staff groups. As a minimum, most patient episodes involve interaction between the ED nurses and doctors. Because so much work is done together, it makes sense for the ED doctors and nurses to train together. Working with doctors from other specialties is also very common. This interaction can be at a relatively simple level such as a referral to a specialist or a specialist requesting a drug or treatment for their patient in the ED. The interaction is kept relatively simple when care is handed over from the ED to the specialty. Interactions become more complex when the ED staff work in parallel with specialist doctors on the same patient, typically in the resuscitation room. These more complex interactions are often the focus of multidisciplinary simulation. In these scenarios non-technical skills (NTS) such as teamwork, communication, leadership and situational awareness are particularly important.

Characteristics of Multidisciplinary Emergency Teams

Emergency teams that work in EDs such as paediatric arrest teams and trauma teams differ in characteristics from the everyday use of the word 'team', as in for example, a 'football team'. Members of the emergency team often do not meet before they are required to perform at a high level. They have usually never practised together. They can therefore be described as an *ad hoc, unrehearsed* team. There is some common understanding of roles and responsibilities, but there may also be significant differences in assumptions. Team members may not have a detailed understanding of their colleagues' experience and capability. If introductions are poor or omitted, they may not even be clear who their fellow team members are and what their role is! If a football team was assembled on this basis (a group of people who have mostly never met before, arriving on the pitch at different times), it would not be expected to perform well ... To make matters worse, the team has to form and start working immediately, under highly stressful and time pressured circumstances, which makes resolving these issues more difficult.

Another factor that can make teamwork more difficult is the sheer number of individuals who can be involved. For example, paediatric resuscitations, particularly at teaching hospitals, are notorious for involving teams which are so large it becomes a hindrance rather than a help. Communication can become very difficult in these circumstances and the team can break into smaller sub-teams which begin to work in silos.

Debriefing the Non-technical Skills in Multidisciplinary Emergency Teams

This section will consider the NTS debrief issues that arise in multidisciplinary simulation. It remains essential to cover the technical issues as well, as in any other simulation. However, it is the non-technical issues are worthy of special consideration in the multidisciplinary scenario. Each section leads with example questions that have proved useful, followed by discussion. These questions can be incorporated into an advocacy/enquiry.

Introductions and Handover

Did people introduce themselves? If not, why not?
How was the handover? Was any important information missing?
People often don't introduce themselves or wear a name badge. This results in assumptions and guesses which are often wrong e.g. 'Is he an ODP or consultant anaesthetist? Theatre scrubs, no badge, looks experienced – how can I tell??' Although introductions are made difficult and rushed by the need to continue resuscitation, there is no excuse for not doing it at all. Name, specialty and grade are required.
Handover in this context means handover of clinical information and not all responsibility for the patient. The SBAR (situation, background, assessment and recommendation) format can be used. In more urgent situations, it may be best to start with a recommendation for immediate action, and provide the other information after. New team members need to know what has been done so far, so this should be part of the handover. It allows the new arrival to consider if there is anything else they think should be done. It also avoids, for example, the tenth person arriving at a meningococcal scenario being the tenth person to ask 'have you given any antibiotics?' A whiteboard can be a very useful adjunct to handover if used to document times of interventions and drugs given.

Leadership and Followership

Who was in charge?
Did the leader stand back and avoid getting involved in technical tasks?
How did you decide who would lead?
Who should lead the team in this scenario?
What was it like to be a follower in this team?

A team with a clear leader performs better than one without. A well rehearsed team may be able to operate smoothly with little explicit leadership, because everyone knows their role and how they work together. However, the type of ad-hoc, unrehearsed and possibly excessively large team described, really needs good leadership in order to function well from the outset. The leader needs to assign roles and lines of communication quickly and have a high level of situational awareness to monitor the capabilities and performance of the team members he or she may never have met before.

A good leader sets goals and priorities in a timely fashion and makes the job of followership easier. Leaders are more successful when they stand back and do not get involved in technical tasks. It is very difficult to lead the team whilst intubating the patient, for example. Followers can be overloaded with tasks, often given in the order that they are thought of rather than the order of priority. Tasks should be prioritised by the leader.

There is often no clear answer as to who should lead. It should be whoever is best equipped to do so. In an ED paediatric resus scenario for example, it may be natural for the paediatric middle grade to lead, as they would in an emergency on the paediatric ward. This will be made more likely if the EM middle grade is inexperienced. Conversely, it may be equally natural for the EM middle grade to lead, as they have the best knowledge of the department and resources available. The leader does not have to be the most knowledgeable person. A leader with good leadership skills may fare better than a leader who is the most knowledgeable individual, provided they consult the whole team. Anaesthetists are used to leading in theatres and ITU, but when working in a multidisciplinary resus scenario, if they end up leading it is often reluctantly, when no one else is doing so effectively. This is usually less ideal, as they have complex technical tasks such as intubation to complete and cannot stand back.

Teamwork, Communication and Situational Awareness

What did each individual/the team think was going on (at a certain point)?
Was everyone aware of (a certain event, result, decision etc)? If not why not?
What was the team's goal? How did you make decisions?
How could the communication/teamwork/handover be improved?
Did the team feel they could ask questions and make suggestions?
How steep was the hierarchy? (this will need explanation)

Information should ideally go to the team leader and then be disseminated to the team. Without clear leadership, the overall team can break into 'teams within the team' – such as a nursing team and anaesthetic team. This leads to communication breakdown and loss of coordination.

It can be instructive to look at who was and was not told blood gas or other results when they arrive, as an indicator of the effectiveness of group communication. Ideally the whole team should find out at the earliest possible opportunity, but often results and other important information spread by 'Chinese whispers' and do not reach all team members. Some individuals may need to actively raise their voices to gain the attention of the whole team and communicate effectively in the scenario of a large, often noisy group.

Frequent reviews by the team leader are a good way of ensuring nothing has been missed, updating the team on progress and then moving on to decision making and forward planning. This can be done using an ABC (i.e. airway,

breathing and circulation) format. This helps the team to have a shared mental model of the scenario and goals. When this did not happen, it is valuable to use questioning to illustrate the lack of a shared mental model and common goals.

It can be worth exploring whether the hierarchy was steep or flat and explaining this concept to the candidates. To summarise, a steeper hierarchy means didactic leadership and obedient, unquestioning followers. A flatter hierarchy encourages input from all team members, but does not mean there is no leader. A flatter hierarchy is generally accepted as being safer and more effective in resuscitation scenarios. This is with the caveat that at very critical moments, a more didactic approach may be more appropriate and lead to quicker action. Even in this situation, however, team members should still be able to input on crucial matters, for example to point out that the oxygen has become disconnected. Leaders can influence the steepness of the hierarchy by either actively encouraging any questions, ideas or suggestions from team members, or by being negative, critical or dismissive towards input from others. Followers can influence the hierarchy by being assertive with their input.

Care of Relatives

To the relative actor: How did you feel you were treated?
Relative roles are not essential in multidisciplinary simulation, but can provide very useful learning points when included. The ideal for managing with relatives is to have a nurse dedicated to looking after them, explaining what is happening and keeping them close to the patient without impinging on staff. This dedicated role is often not possible with two or fewer nurses, but it helps if one nurse can take the lead on this task and keep returning to it when possible. In teams with many doctors, the nurses can be overloaded with tasks whilst the most junior doctors are less busy as a result of their seniors being present. In these circumstances, a junior doctor may be able to take on the relative liaison role. Unfortunately what often happens is that many different team members speak briefly to the relative at different times potentially giving an inconsistent message.

Tips for Debriefing a Multidisciplinary Team

- Include *all* the candidates in the debrief. There is a tendency to focus on the leaders, but followers must also be included.
- With a multidisciplinary faculty, you will need some structure as to who is going to speak when. This is particularly important when working with faculty you don't know well. One solution is for a named faculty member to lead each debrief and allow contributions from the other faculty members either during or at the end of their debrief.
- Some questions are focussed at the individuals involved. However, there is much benefit in asking questions not of the 'actor', but the

person on the receiving end of the action. For example: *how did the anaesthetist team find the ED team handover? What did the nurses think of the leadership? Who did the group think was leading?* (ensuring answers from as many individuals as possible, sometimes all different!) *What did the person acting the relative feel about how they were treated?* This approach aims to utilise the feedback that exists within the group, which may be seen as more valid than feedback from an external debriefer.

-

Conducting a well-constructed debrief that incorporates views from all faculty members, includes all the candidates *and* runs to time is a true challenge!

Chapter 10

Sim on a shoestring: Making it work in your department. Practical tips

Introduction

Good quality simulation training in emergency medicine benefits not only individual trainees but multidisciplinary teams and entire departments, hospitals and regional networks. There is a growing body of evidence showing that while actual clinical outcome improvements afforded by simulation training are hard to prove, this approach does lead to significant improvements in non-technical skills such as team working and communication that have been shown to influence patient outcomes, particularly in high stress and acute settings[i].

The use of purpose built simulation suites allows high volume, high fidelity immersive scenario training which can be planned and timetabled. Using high fidelity mannequins and creating a realistic clinical environment helps to minimise direct interaction with the sim facilitator, avoiding the "what am I hearing?" question, which disrupts the suspension of disbelief required for good quality simulation training. However using these facilities may come at significant financial cost and is rarely suitable for ad-hoc training opportunities. This article provides some tips on running low cost high educational value simulation training in your departments.

All simulation scenarios should endeavour to take the participants into "the zone" where they are sufficiently immersed in the experience to act, think and behave as they would in the workplace [ii]. This can be achieved through ensuring the environment, equipment and personnel are as close to "real life" as possible, with a realistic level of stress for psychological fidelity. Where better to run regular ED simulation training sessions, than on the shop floor in your ED?

ED in-situ Sim

ED in-situ simulation is a low cost way of providing multidisciplinary training which can also provide a useful clinical governance tool. It is a high fidelity environment but can use low fidelity simple mannequins which are relatively cheap, robust and rapid to set up and clear away. By simulating recent actual ED cases it is possible to use anonymised radiology images/ambulance sheets/ECGs etc to enhance realism. Multidisciplinary teams are able to train in their local environment and test local pathways and procedures. ED cases which in hindsight may have been managed sub optimally can be *run again* to encourage team based reflective practice.

In-situ sim can also clarify previously unrecognised difficulties (with equipment, personnel, environment or local clinical pathways) both in the resus room and beyond in other critical care areas such as CT, theatres, interventional radiology etc. Potential solutions are often identified during the debrief and can be tested safely through future ED simulation training.

Apps available through smartphone and tablet technology can be used to support and enhance the delivery of low cost high fidelity simulation within the ED. At the Royal Cornwall Hospital we have found the following apps useful although there are many more being developed daily. We have used apple products (iPad and iPhone/iTouch) but android apps are also available.

SimMon and SimMonitor are both low cost (a few pounds) simulated monitors which replicate standard screen from most ED resus rooms. It is displayed on an iPad and parameters can be adjusted easily from another iPad or iPhone/iTouch, linked via wifi or bluetooth.

AirBeam is a video transmission app, allowing live video feed to be sent to a remote audience. Video can be recorded for playback at debrief (although it doesn't have the facility to mark segments of interest during the scenario). This enables higher numbers of participants to benefit without crowding the resus room with an audience. Local wifi connectivity is required with a good bandwith, may need to discuss with your local IT department. Cost: free.

Genius PDF converts pictures from a camera phone to PDF format which can then be easily emailed. It's a great app which makes collating anonymised paper records (ECGs, ambulance sheets, blood results etc) easy and able to save with scenarios which can be printed as a pack when needed. It is also possible to minimise sim facilitator interaction by using a wireless printer to produce ECGs, blood results etc from a smartphone/tablet. Cost: free.

Simple mannequins should have a realistic size/weight, be robust and readily available for rapid start/stop simulation training. Consider your departmental need for features such as allowing tracheal intubation to take place. Some scenarios may work better with medical students (or other volunteers, willing or otherwise) acting the part of the patient to enhance realism such as combative patient with suspected C-spine injury.

How to make it work

Although cheap to run, in-situ sim require planning and communication to be effective. You will need to have a *plan B* for when your department is too busy to safely run a simulation - an alternative venue e.g decontamination room or seminar room nearby can be invaluable for this. Providing nearby patients/relatives with a brief information sheet about what to expect in the bay next door saves causing unnecessary upset, and the responses received so far in our unit have been uniformly positive. Using simulation training to

feed to and from local clinical governance programmes has encouraged *buy-in* and enhances the benefit to the department and wider trust.

Making regular multidisciplinary simulation training part of the ED culture takes time, patience, good humour and a lot of perseverance! Involving nursing and in-patient specialty sim champions go a long way towards achieving this. Your multidisciplinary ED sim faculty should reflect the participants - this is essential for effective debrief and to ensure roles are realistic (avoid participants *being* the nurse or ITU consultant). Engage in-patient teams - this has been especially useful in Trauma team simulations but requires strict adherence to start/finish times to maintain regular attendance from all specialities.

We have found that identifying two sorts of sim are useful. We run a one hour critical illness and a one hour trauma simulation each month. We also hold a 15 minute daily sim from 0815-0830 to capture the leaving night team following handover, and cover a single team skill (eg. "kit off procedure" for trauma case reception). These are rapid set up/clear away scenarios in the resus room including a 3-5 minute debrief. They don't always happen and require significant *buy in* from clinical staff, but have now become part of our departmental culture.

Having a low cost ED simulation programme does not negate the absolute requirement for high quality debriefing so it is essential to invest in training for your multidisciplinary ED sim faculty. The College of Emergency Medicine's simulation faculty course is highly recommended and is available at a number of centres across the UK.

Chapter 11:

Keeping up your debriefing skills. Continuing Professional Development

This course provides you with an introduction to debriefing. You need to use these new skills, develop and hone them. It can be daunting running your first simulation and debrief. We would recommend teaching on one of the College Simulation courses where you can be supported by more experienced debriefers. The College website has a list of e-mails for all the regional simulation leads. They should be able to tell where courses are running near you and put you in touch with other simulation faculty. Click here to go to the simulation pages.

If there are no courses near you, you can still use the College scenarios and run the simulations in your department. Get somebody to assist/observe your debrief.

We recommend that you run two observed debriefs a year. You should seek feedback from your observer on the following aspects of your debrief. To what extent did you:

(1) Establish an engaging learning environment

(2) Maintain an engaging learning environment

(3) Structure debriefing in an organized way

(4) Provoke engaging discussions

(4) Identify and explore performance gaps

(5) Help trainees achieve or sustain good future performance

It is helpful if your observer gives you examples of good and poor practice. This feedback can then feed in to your appraisal.

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Appendix 1 Example Simulation Course Business plan

Business case for 'ST4 Course for Emergency Medicine Trainees'

Summary of the bid

A bid for the high fidelity simulation training of Emergency Medicine ST4 trainees, approved by the College of Emergency Medicine. The course has been supported and highly recommended by the Registrar of the College of Emergency Medicine (Ruth Brown). A pilot course was successfully run on 3rd March 2010 at the Simulation Centre at Guy's Hospital. Nicola Jakeman facilitated on this course. A further 3 courses have been run within the London deanery where it has now become established for all ST4 emergency medicine trainees.

Proposer of the bid

Dr Nicola Jakeman, Simulation Lead for the Southwest Deanery.

Course Outlines and Outcomes

Course outline

This course is designed for ST4 trainees in Emergency Medicine in response to training issues identified since the introduction of the new training structure. It is focused around improving patient safety by teaching human factors, primarily Emergency NMedicine Non-Technical Skills (EmNTS) skills and practicing them in a clinical environment.

The working environment of the ST4 trainee in Emergency Medicine is reflected within this course. The course has been developed following a curriculum mapping exercise against the College of Emergency Medicine curriculum. The topics chosen are a combination of:

- *Those identified as necessary for the ST4 in Emergency Medicine to master*
- *Those which lent themselves to teaching through high fidelity simulation.*

The first time an Emergency Medicine trainee is responsible for independent clinical decision making, and leading the shop floor will be at ST4 level. This course allows the learners to practise those non-technical skills required to perform these tasks. It will also allow the faculty to focus on those aspects of the CEM curriculum that require them to:

- *Make safe clinical decisions rapidly and in response to a particular scenario*
- *Show leadership skills and working effectively with a multi-disciplinary team towards a common goal*
- *Demonstrate effective communication skills and professional behaviour within a team*
- *Demonstrate the ability to triage and prioritise patients*
- *Demonstrate the ability to cope with distractions & disruptions, which are common in an Emergency Department.*

Pre-course reading material of 6 chapters has been written. The reading material includes aims and objectives of the course, adult educational theory applied to simulation, the simulation room, debriefing and crisis resource management.

Each candidate will be given a USB key with their scenario loaded on so that they can review their performance after the session and reflect on it with their trainer. This could form part of their personal development plan.

Course structure

*This bid is focused around one day's training within the ST4 year. The bid is based around training 6 ST4 trainees per course. In order for each scenario to feel as 'real' as possible, there will be both nursing staff and 3 ACCS trainees from Emergency Medicine. There will be 4 faculty to run the course. This course was run in pilot form on 3rd March 2010 at Guy's Hospital. The pilot was a great success and the trainees felt that the course should be taken by all ST4 trainees nationally (**see collated feedback attached separately**). This course is now established within several Deaneries across the UK*

Course Timetable

ST4 Simulation Training Course for Emergency Medicine

08:30 Welcome & Registration

08:45 Introduction

09:00 Familiarisation with SimMan

09:20 *Emergency Medicine Non-Technical Skill workshop*

10:00 *Scenario 1 and Debrief*

11:00 *Tea*

11:15 *Scenario 2 and Debrief*

12:15 *Scenario 3 and Debrief*

13:15 *Lunch*

13:45 *Scenario 4 and Debrief*

14:35 *Scenario 5 and Debrief*

15:25 *Tea*

15:40 *Scenario 6 and Debrief*

16:30 *Closure & Feedback*

17:00 *End*

Learning outcomes addressed

Over the course of the day we will examine the candidates' aptitude in these general areas:

Time management and decision making

- *Recognises personal limitations and seeks help at an early stage*
- *Does not act beyond own competency*
- *Can recognise clinical situations which are unsafe or could lead to harm, and takes appropriate action*
- *Demonstrates understanding of the range of adverse events in health care, their basis, and how they can be reduced*
- *Identifies patients who are not responding as expected and takes appropriate and timely action*
- *Enters discussions with colleagues and patients about treatment options, including relative risks and benefits*
- *Meticulously cross-checks instructions and actions with colleagues (e.g. medicines to be injected)*
- *Communicates effectively with all team members to ensure shared understanding of patients' problems, preferences, wishes and needs to foster continuity of care*

Working with colleagues

- *Displays effective team-working skills with understanding of personal role and ability to support the team in a multi-disciplinary environment*
- *Listens to other healthcare professionals and heeds their views*
- *Has a good understanding of the role of other team members in the clinical team and understands their competences and care philosophies*
- *Takes leadership role in the context of own competence*
- *Treats all members of the healthcare team with respect, whatever their professional qualifications, lifestyle, culture, religion, beliefs, ethnic background, sex, sexuality, disability, age, or social or economic status.*
- *Puts goals of the clinical team before personal agenda*
- *Shows leadership skills but at the same time works effectively with others towards a common goal*
- *Encourages an atmosphere of open communication and appropriate directed communication within teams*
- *Demonstrate skills in referrals to other specialties, especially when the diagnosis is not very clear, without compromising patient safety*
- *Makes polite and reasonable telephone calls and personally delivered requests to laboratory and imaging staff*
- *Arranges appropriate urgent investigations and chases results when necessary.*

Probity and professional behaviour

- *Recognises that the hallmark of the professional is the ability and habit of reflection on learning from practice*
- *Respects and supports the privacy and dignity of patients*
- *Recognises challenging or difficult situations and calls for help without causing upset or offence*

Recognition and management of an acutely ill patient

The themes in common with all scenarios involving the recognition and management of acutely ill patients are:

- *Clinical interpretation of acutely abnormal physiology with a clear understanding of normal limits*
- *Ability to make accurate diagnosis and differentials*
- *Demonstration of accurate management of the patient in terms of priority and urgency*
- *Demonstrate the correct use and knowledge of established guidelines and protocols*
- *Demonstrates good clinical knowledge in terms of data interpretation, ECG interpretation, imaging interpretation*
- *Ability to demonstrate practical procedures where appropriate*

- *Ability to use Resuscitation protocols to immediate life support level*
- *Ability to use Resuscitation protocols to advanced life support level*

Scenarios

A total of 14 scenarios have been written for the ST4 course as follows:

- *Tricyclic antidepressant overdose*
- *Thyroid storm in a pregnant patient*
- *Acute aortic dissection*
- *Pre-eclampsia*
- *Pulsed Ventricular tachycardia*
- *COPD and use of NIV*
- *Adult trauma and SVT*
- *Headache and subarachnoid haemorrhage*
- *Gynaecological/surgical dilemma*
- *Carotid artery dissection*
- *4 trauma scenarios*

Course Evaluations

The courses will be evaluated by a pre-course and post-course questionnaire as well as a 30 minutes feedback session discussing the day and what has been learnt and how it may be taken forward to apply in the workplace.

ST4s in the Southwest

*There are currently * ST4s in Emergency medicine in the *. This is likely to fluctuate a little. At the moment we have * faculty able to deliver this course in the region,. I am hoping that the number of faculty will expand as further faculty training is delivered. With this in mind, I anticipate running this course twice a year initially, increasing this as we have more trained faculty.*

Simulation training is popular with trainees. It would seem from trainee feedback (see attached), that this would add to the attractiveness of EM training in this region.

Cost of running a one day ST4 course:

Facilities for hiring including technician charge: *£****

Simulation nurse / plant (band 6): *£****

Faculty X 4)
Travel expenses *£***
Accommodation *£***
Faculty meal (Also used for preparation time) *£****

Handouts / memory sticks *£***

Catering *£****
(Based on 6 ST4 trainees, 1 nurse, 3 ACCS trainees and 4 faculty)

Cost per trainee (6 ST4s and 3 ACCS)

Total cost for 1 day
GRAND TOTAL

Appendix 2 Example business case for Simulation Fellow

Business Case
Combined Simulation and Emergency Medicine Clinical Fellow

1. Introduction

The purpose of this business case is to demonstrate the benefits to the Royal United Hospital Trust as a whole, Bristol University, Bath Academy and specifically the Emergency Department of funding and appointing a Clinical Fellow in Simulation and Emergency Medicine.

The delivery of high quality and safe clinical practice is at the heart of service provision and must be supported by an educational programme that is effective and innovative. Training is moving away from the individual to a team-based approach reflecting the complexity of healthcare delivery. With complexity comes risk. This can be mitigated by supporting processes that promote effective, safe practice and by satisfying training needs to develop a competent workforce. Simulation has a role in both these functions.

This post will enable further development and delivery of undergraduate and post graduate multiprofessional simulation training. It will support the Trust's patient safety agenda, with the development and delivery of multiprofessional simulation training in response to serious untoward incidents, adverse events and patient complaints. The post will support some of the work required to deliver a range of CQC standards and help with the work towards gaining Foundation Trust status.

The appointment of an experienced doctor to the emergency department will help to deliver a range of quality standards which require senior doctor decision making and assist in delivering the 4 hour target.It is expected that the appointment will lead to a net reduction in the cost of employing locums in the Emergency Department. It is a fixed 1 year post.

2. Background

Recruitment and retention within Emergency Medicine at middle grade level is challenging. This is reflected nationally with over 60 registrar posts at ST4 remaining unfilled in the last recruitment round. The department currently operates with 8.7 WTE middle grade doctors and frequently requires locums to fill gaps in the rota. The cost of employing locums within the department over this financial year is forecast at £58,819. This pilot post would go some way to off setting this cost.

Key quality indicators for Emergency Medicine focus on the delivery of patient care by experienced middle grade doctors and above. In addition, patient care in the emergency setting is becoming ever more complex and demanding. In order to maintain patient safety and quality of care in the Emergency Department an increasing proportion of patients need to be seen by experienced middle grade doctors and above. Therefore it is essential that we develop innovative ways of attracting and retaining experienced high quality doctors within Emergency Medicine to ensure that we continue to deliver effective emergency medical care for all of our patients, meeting national and local priorities.

It is now well understood, that up to 80% of errors within the NHS are caused by human factors and that teaching and training in this area should start at undergraduate level. Training using simulation is a well recognised method of delivering this type of learning in postgraduate education, but needs to be developed effectively in undergraduate education within Bristol Medical School and also within multiprofessional teams across the Trust.

Combined Emergency Medicine and Simulation Clinical Fellow posts have been developed successfully in Guy's and St Thomas's in London. They have recruited high quality doctors that have developed and delivered both innovative simulation training at both undergraduate and postgraduate levels and contributed to the middle grade doctor emergency medicine rota. We have lost an Emergency Medicine trainee from the Southwest to one of these posts in London.

3. Problem / Opportunity statement

- *Reduced use of locums within the Emergency Department*
- *Bath Simulation Centre requires a dedicated clinician to sustainably develop and deliver simulation training to both undergraduate and postgraduate trainees and other healthcare teams across the trust.*
- *The Bath Academy Undergraduate Dean fully supports this post and will provide 90% of the funding.*

4. Proposal and Strategic fit

This business case supports 3 of the Trusts strategic pillars and objectives for 2012

- *Quality improvement: The post holder will utilise adverse events, critical incidents, complaints and real patient stories to help develop effective simulation training. The post holder will work with clinical and corporate staff including complaints and litigation. The focus of simulation training will be on improving patient safety, clinical outcomes and patient experience.*

- *Demonstrate performance: The post holder will support the delivery of quality indicators for Emergency Medicine*

- *Workforce development: The post holder will develop and deliver effective simulation training, helping to optimise the skill of the workforce.*

This business case also supports 5 of the Trusts priorities for 2012

- *Deliver patient safety program through effective clinical leadership: The post holder will work with the academy dean, simulation group and members of the qulturum to ensure that training developed supports the Trust's patient safety agenda.*

- *Become more patient orientated and responsive: The post holder will work with complaints and litigation and the patient experience group when developing simulation training.*

- *Staff training: The post holder will develop and deliver simulation training to undergraduates and clinical staff across the trust.*

- *Staff engagement: The post holder will engage clinical staff in the development of simulation training, ensuring that patient safety issues raised by the clinical workforce are addressed within the simulation training.*

- *Foundation Application: By providing an effective educational response to real adverse incidents.*

This business case also supports a key standard for the Trust in 2012

- *Consistent delivery of A&E quality indicators*

5. Option Appraisal

Summarised below are the options considered against this business case.

5.1 Option 1- Do Nothing

[describe option including benefits and risks and any associated costs / workforce implications]

Description:	*Do not appoint combined Emergency Medicine and Simulation Clinical Fellow*
Benefits:	• *May assist in short term financial savings required by Emergency Department*
Risks:	• *Continued requirement for locum doctors* • *Risk losing current middle grade staff who are required to work additional unsustainable antisocial hours while gaps in the rota remain.* • *Risk losing ability to provide 24/7 middle grade cover within the Emergency department which will impact on achieving a range of quality indicators.* • *Loose recognition as lead Academy for the development and delivery of Simulation training to undergraduate medical students.* • *Will be seen as less attractive than other local trusts (UBHT and NBT) where simulation fellows have been appointed and deliver a significant amount of simulation training.*
Cost:	*No additional cost, but locum costs remain the same*

5.2 Option 2 – [Full time simulation fellow]

Description:	*Appointment of full time simulation fellow*
Benefits:	• *Their time will be dedicated solely to the development and delivery of simulation training*
Risks:	• *Less attractive than a post incorporating some clinical work.* • *Need to maintain clinical commitment to develop effective relevant simulation training.* • *More difficult for applicant to return to clinical workforce* • *Gap in Emergency Medicine middle grade rota remains unfilled*
Cost:	*No cost to emergency department.* *Post fully funded by Bath Academy*

5.3 Option 3 – [Emergency Medicine Clinical Fellow]

[

Description:	*Appointment of 0.3WTE Emergency Medicine Clinical Fellow*
Benefits:	• *Reduction in locum requirement*

Risks:	• *Unlikely to fill a 0.3WTE post* • *No further development and delivery of simulation training within Bath academy and across the Trust.* •
Cost:	*There would be limited funding within the ED budget to support this post*

5.4 Preferred option

The preferred option is the appointment of a combined Simulation and Emergency Medicine Clinical fellow because:

In summary:

- *The joint post addresses a staffing issue within the Emergency Department*
- *The post will provide the only clinician with significant dedicated time to work within the simulation centre thus providing a valuable resource for both Bath Academy and the Trust.*
- *Post supported by Bath Academy Dean who will provide 90% of the funding.*

6

Possible rota

Simulation fellow.

Academic rota 0.7 WTE

Rota Slot / week	*Mon*	*Tues*	*Wed*	*Thurs*	*Fri*	*Sat*	*Sun*
Week 1	*+++*	*8-17*	*8-12*	*8-17*	*8-17*		
Week 2	*8-17*	*8-17*	*8-12*				
Week 3	*8-17*	*8-17*	*8-12*	*8-17*			
Week 4	*+++*		*8-12*	*8-17*	*8-17*		
Week 5	*8-17*	*8-17*	*8-12*	*8-17*			
Week 6	*8-17*	*8-17*	*8-12*	*8-17*	*8-17*		
Week 7	*8-17*	*8-17*	*8-12*	*8-17*			

Total number of hours: 208 all within NWD average of 29.7 hours a week
Clinical rota 0.3 WTE

Rota Sl	*Mon*	*Tues*	*Wed*	*Thurs*	*Fri*	*Sat*	*Sun*

ot / week							
Week 1			*12-20*				
Week 2			*12-20*	*22 - 9*			
Week 3			*12-20*			*8-20*	*22-9*
Week 4			*12-20*				
Week 5			*12-20*		*8-19*		
Week 6			*12-20*				
Week 7			*12-20*		*8-19*		*14-00*

Full shift pattern

Total number of hours 122, average of 17.4

6.4 Other Funding Sources

Does this proposal attract any non-contractual / protected funding from agencies other than our commissioners?

Yes: Through SIFT funding

The SIFT funding for this post has been given written approva Academy Dean

What is the exit strategy for the proposal when the funding expires?

This post will be on a fixed term 1 year contract. I would anticipate re-appointing annually, providing this pilot post is successful.

6.5Savings, Return on Investment and Productivity Improvements

Describe how efficiency savings are released and the value of the savings.

What productivity improvements will the proposal deliver?

- *4 hour and other quality inicators are more likely to be achieved.*
- *Reduced locum use*

- *Reduced admissions and use of diagnostics through increased presence of senior specialist.*
- *Better retention and recruitment.*

7. Risk Assessment of preferred option

[Based on the options appraisal in section 5, summarise the identified risks and mitigating actions you intend to take to reduce these risks]

The main risks associated with the preferred option and plans to mitigate these are set out in the table below:

	Risk	***Mitigating Action***	***Scoring***		
			Severity	*Likelihood*	*Score*
1.	*[add risks]*	*[add mitigating actions]*	*[1-5]*	*[1-5]*	
2.	*Reduced SIFT funding*	*Post holder appointed on a fix term yearly contract*	*3*	*2*	*5*
3.					

{Risk scoring: ***Severity*** *1: Negligible 2: Minor, 3: Moderate, 4: Major: 5: Catastrophic*
Likelihood *1: Rare, 2: Unlikely, 3: Possible, 4: Likely, 5: Very likely}*

8. Costings

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9. Revenue costs

The table below summarises the revenue costs of this proposed development, savings and potential loss of income through loss of service:

10. Recommendation

The Management board is asked to approve this case to appoint a combined Simulation and Emergency Medicine Clinical Fellow to support the development and delivery of simulation training across the trust focussing on patient safety, clinical outcomes and patient experience. The post will also help deliver effective patient care within the Emergency Department.

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[i] Y. Okuda, E. O. Bryson, S. DeMaria Jr et al, *The utility of simulation in medical education: what is the evidence?* Mt Sinai J Med. 2009 Aug;76(4):330-43

[ii] Bredmose et al, *Scenario based outdoor simulation in pre-hospital trauma care using a simple mannequin model*. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine 2010 18:13.