The importance and practice of debrief in medical simulation

As simulation-based education in health care expands as a speciality it has been increasingly recognized that the key to its educational benefit is in the debrief. Few papers have attempted to outline an evidence base for debriefing. This article looks at the various frameworks, tools and structures for post-simulation feedback and searches for evidence of 'the best'.

Background

The origins of debrief are not from medicine or indeed education. The American Heritage Dictionary of the English Language (Editors of the American Heritage Dictionaries, 2011) defines debrief as:

1. To interview (a government agent, for example) at the end of an assignment, especially to obtain intelligence or to provide instructions regarding information that should be kept secret
2. To meet with (one who has undergone a traumatic or stressful experience), especially for therapeutic or diagnostic purposes.

This gives clues as to its military origins where pilots and combatants were debriefed on return from missions. In the military, debrief served a dual purpose of psychological support and also allowed the information provided to be examined and used to plan future operations.

In the early 1990s Mitchell (1993) applied a similar approach to emergency service workers responding to traumatic events. His hope was to reduce the stress of such events, speed up the recovery of the individuals and group involved and no doubt aid their return to 'front line' work. He developed critical incident stress debriefing (Mitchell, 1993) using facilitators to allow those involved to discuss all aspects of the event they had experienced. This system is still widely used in the emergency services after major incidents such as the London bombings and more informally it is used with health-care workers after traumatic or unpleasant encounters. Critical incident stress debriefing was initially planned as a one-off debrief but many people may require ongoing professional support.

Ideas of educational debriefing have developed from these military, crisis and psychological starting points, the suggestion being that long-lasting learning can be born of reflection, discussion and the acquiring of new knowledge from an educational event. Debrief (or feedback) has now become a key area in education. In terms of simulation training it is considered by many to be the most important component of learning.

Debrief in medical education

McGaghie et al (2010) carried out an extensive review of simulation-based medical education research. Their aim was to critically evaluate the research and present the 12 main 'framework' features of simulation and best practice of simulation to achieve maximum benefits. In order of importance they identified:

1. Feedback
2. Deliberate practice
3. Curriculum integration
4. Outcome measurement
5. Simulation fidelity
6. Skill acquisition and maintenance
7. Mastery learning
8. Transfer to practice
9. Team training
10. High stakes training
11. Instructor training
12. Educational and professional context.

The evidence suggests that debrief is the most essential element to achieve effective learning in simulation training, having been cited as such in more articles than any other factor. Indeed, Rall et al (2000) go further, stating somewhat poetically that 'debrief is the heart and soul of the simulated experience'.

However, recognizing its importance and implementing debrief in the most educationally effective way are very different things. Educators need to know which models to use, how much feedback to give and how to assess the quality of their debrief. Unfortunately these knowledge gaps are difficult to fill. Issenberg et al (2005) stated that:

> **'Few published articles on the effectiveness of simulations in medical education have been performed with enough quality and vigour to yield useful results. Only 5% of publications meet the minimum quality standards.'**

As a result, specific evidence supporting debrief models is at best scarce or flawed and at worst absent. However, there are general research-based 'rules' as to what debrief should include.

Lederman (1992) outlined the seven common structural elements involved in debrief. The list includes basic components such as having a debriefer, participants and an event to debrief (*Figure 1*). However, the interest comes in the recognition that self-debriefing can occur in a peer to peer model and that formal debrief does not have to occur immediately after the experience but can follow a period of reflection.

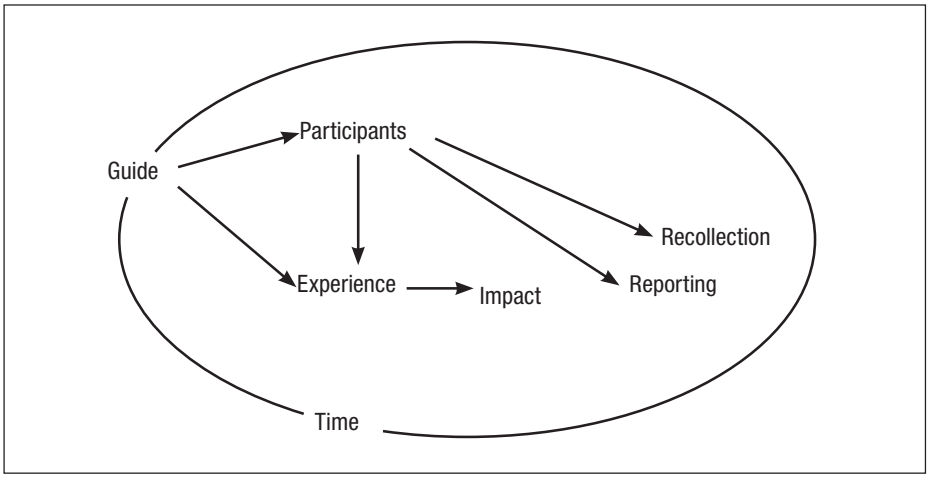
These structural elements may be the foundations of organized debrief but Salas (2008) went further and listed 12 best practices that should guide the feedback process. The key ones focused on debrief occurring in a supportive learning environment and ensuring team members are comfortable during the session. In addition Salas encourages faculty education on the science of debrief and suggests that both team and individual feedback should be provided.

Best practice

Lyons et al (2015) published an updated version of Salas' work on best practice in debrief, looking more specifically at team debrief post-simulation scenario. This

Dr Andrew McKechnie is ST7 Anaesthetist in the Department of Anaesthesia, Kings College Hospital, London SE5 9RS (admckechnie@doctors.org.uk)

Figure 1. The elements of the debriefing process. Adapted from Lederman (1992).



appears to be the most complete guide to debrief yet published. The group split the recommendations into three areas: preparing for debrief, during debrief and debrief content.

Preparing for debrief

1. Design measurement and debriefing tools around learning objectives and associated key behaviours
2. Subject expertise is not everything. Consider facilitation skills when selecting debrief facilitators
3. Train facilitators and prepare them for difficult conversations
4. Consider video and multimedia to enhance debriefing.

During debrief

During the debriefing itself the facilitator should:

1. Set the stage for learning and establish goals, expectations, and a positive learning environment
2. Facilitate the team discussion but encourage team members to lead the conversation
3. Encourage (and seek) participation by all team members
4. Protect time for debriefing and prioritize discussion of critical performance issues
5. Create a safe, supportive environment for team member sharing and discussion.

Debrief content

In terms of the content of the debrief:

1. Make time to discuss emotions and differences in opinions
2. Address both individual and team-level performance
3. Emphasize the behavioural processes used during simulation rather than outcomes
4. Don't just point out problems, develop team solutions.

Lyon et al (2015) suggested that these best practices are evidence based and that:

> **'The 13 best practices should help health care organizations to promote team development by guiding team simulation administrators, self-directed medical teams, and debriefing facilitators in the optimization of debriefing to support learning for all team members.'**

There are a number of models which use some or all of these general principles. Thatcher and Robinson (1985) suggest a series of phases. The debrief should initially identify the impact of the experience, then the process which developed during the scenario should be considered. Any facts, concepts and principles should be clarified. In the fourth phase the way in which emotion was involved is identified and finally different views of each of the participants should be sought.

Petranek (1994) proposes seven very similar phases which progress from the event, through to explanation and analysis and finally to evaluation.

Within some simulation centres, this has been distilled further into three stages:

1. The descriptive phase – the group and candidate are encouraged to describe the events that have taken place
2. Analysis – the debriefer questions the group and the candidate to explore what went well or badly
3. Commit – debriefer and group determine how situations will be handled differently in future. Learning resources are flagged up and ongoing reflection is encouraged.

As previously stated, the roots of debrief in medical education lie in the military, where its purpose was to objectively review what happened during a mission. The after action review is one of the best known and longest standing debriefing processes in the American military. The after action review (US Army, 1993) is described as a:

> **'professional discussion of an event, focused on performance standards, that enables soldiers to discover for themselves what happened, why it happened, and how to sustain strengths and improve weaknesses.'**

The after action review system has been used widely used outside the military by large multinational companies. Sawyer and Deering (2013) have adapted the process for use in health-care simulation by relying on learning objectives and benchmarking. The adapted format includes seven sequential steps:

1. Define the rules of the debriefing
2. Explain the learning objectives of the simulation
3. Benchmark performance
4. Review what was supposed to happen during the simulation
5. Identify what actually happened
6. Examine why events occurred the way they did
7. Formalize learning by reviewing with the group what went well, what did not go well and what they would do differently if faced with a similar situation in real life.

The authors state their belief that the 'AAR [after action review] format provides even novice debriefers with a well-structured and supported method to conduct a concise and productive debriefing.'

In common with many systems there are few published data on its effectiveness; however, it appears to have all the components to potentially help the feedback process.

Pendleton's rules (Pendleton, 1984) are a well-known model of debriefing and are commonly used on adult life support courses. There are five stages:

1. Points of information and fact are clarified
2. The learner is asked to outline what he/she did well. Only strengths in performance are identified

KEY POINTS

- The debrief is a key area in simulation to ensure effective learning.
- There are many frameworks of debrief in use with more models being developed with increasing frequency.
- There is little evidence showing benefits of one model over another and more research is needed.
- A sensible approach is to have a general framework for the debriefing session that puts the learner at the centre of the exercise and is facilitated by appropriate and experienced debriefers.

3. The debriefer and the group add their own positive observations
4. The candidate outlines weaknesses in performance and what he/she would change next time
5. The debriefer and group add negative observations.

Pendleton's rules are often criticized for being too rigid but they do encourage the learner to reflect on his/her own performance and the positives are balanced with negatives. However, the system is inflexible and formulaic in its approach. The learner may not want to separate good points from bad. Often the learner will want to 'vent' about what went badly and then move on. It often leads to a stilted discussion that seems to repeat itself and becomes time consuming. In addition the session is controlled by the facilitator who has a central role and determines its path.

The agenda-led outcome-based analysis (ALOBA) model (Thatcher and Robinson, 1985) is a 12-step approach to feedback that attempts to put the learner at the centre of the process. In the author's opinion, the system seems to provide a far better framework for learning than the prescriptive Pendleton rules. It seems more centred on the needs of the candidate which can only encourage learning.

The anaesthetic non-technical skills (ANTS) model (Flin et al, 2010) is a skills taxonomy and behavioural rating system designed to be used as a tool in simulation debriefing and for self-reflection. It was developed following the recognition that non-technical skills and human factors are vital to safe clinical practice. It is tailored to anaesthetists but the four headings for debrief are very generic and can be used in all debriefing scenarios:

1. Situational awareness
2. Decision making
3. Team working and leadership
4. Task management.

While it is not a complete model for feedback, it certainly has a place in a debriefing structure and can be adapted to the needs of the session.

In returning to look at best evidence and analysis of the various systems, there is little in the literature, which is a recurrent problem in academic research regarding simulation in health education.

Most simulation centres have the ability to record everything that occurs in the simulated scenario. Sawyer et al (2012) investigated if using this video-assisted debrief conferred benefits over standard oral debriefing techniques. They split 30 residents into two groups and performed simulated neonatal resuscitation scenarios. Half received video-assisted feedback and half a standard oral debrief. The objective parameters were pre- and post-session timed key tasks. They failed to show a significant educational benefit of video-assisted debrief. They concluded that:

> **'Although our results suggest that the use of video assisted debriefing may not offer significant advantage over oral debriefing alone, exactly why this is the case remains obscure'.**

Another group (Van Heukelom et al, 2010) compared the effectiveness of standard post-simulation session debrief with in-scenario debrief. A total of 160 students were randomly assigned to receive either of the feedback methods and were surveyed using a Likert scale to assess self-reported confidence and knowledge level related to the simulation scenario.

The outcome measures studied were self-reported effectiveness of the debriefing style, debriefing leading to effective learning, and the debriefing helping them to understand the correct and incorrect actions. All of these measures were ranked higher by the group that received post-scenario debrief, leading the group to conclude that post-simulation debrief led to a more effective educational experience. Interestingly, however, students did not feel that interruptions during the simulation significantly affected the realism.

A meta-analysis was performed in an attempt to 'identify debriefing features that are associated with improved outcomes, and evaluate the effectiveness of debriefing when combined with simulation' (Lyons et al, 2015). It was hoped that this would not just give debriefers a structured framework of general principles but also provide an evidence base of best practice and debrief that is of educational benefit. They looked at over 10 000 studies and identified 177 eligible ones. They studied the key characteristics of debriefing (e.g. duration, educator presence and characteristics, content, structure, method, timing, use of video) but often found incomplete reporting. Unfortunately the conclusions were disappointing, suggesting that more research is needed in order to determine evidence-based best practice:

> **'Limited evidence suggests that video-assisted debriefing yields outcomes similar to those of non-video-assisted debriefing. Other debriefing design features show mixed or non-significant results. As debriefing characteristics are usually incompletely reported, future debriefing research should describe all the key debriefing characteristics along with their associated descriptors' (Lyons et al, 2015).**

Conclusions

Debrief is the key component of any simulation training and it is vital to do it effectively to aid learning. There is limited evidence to suggest which specific models are best but a combination of best practice principles, putting the learner at the centre and inclusion of non-technical elements seems to be a sensible structure. Although there is no evidence as to the effectiveness of video feedback, it is another tool to aid the learning experience. Centres require a systematic and standardized approach to the debrief session, that puts the learner at the centre of the exercise and uses experienced and appropriate facilitators in order to gain maximal educational benefit. **BJHM**

Conflict of interest: none.

Editors of the American Heritage Dictionaries (2011) *American Heritage Dictionary of the English Language.* 5th edn. Houghton Mifflin Harcourt Publishing Company, Boston

Flin R, Patey R, Glavin R, Maran N (2010) Anaesthetists' non-technical skills. (ANTS).

Br J Anaesth **105**(1): 38–44 (doi: 10.1093/bja/aeq134)
Issenberg SB, McGaghie WC, Petrusa ER, Lee Gordon D, Scalese RJ (2005) Features and uses of high fidelity medical simulation that lead to effective learning: a BEME systematic review. *Med Teach* **27**: 10–28 (doi: 10.1080/01421590500046924)
Lederman LC (1992) Debriefing toward a systematic assessment of theory and practice. *Simul Gaming* **2**: 145–59
Lyons R, Lazzara EH, Benishek LE, Zajac S, Gregory M, Sonesh SC, Salas E (2015) Enhancing the effectiveness of team debriefings in medical simulation: more best practices. *Jt Comm J Qual Saf* **41**(3): 115–25
McGaghie WC, Issenberg SB, Petrusa ER, Scalese RJ (2010) A critical review of simulation based medical education research: 2003-2009. *Med Educ* **44**: 50–63 (doi: 10.1111/j.1365-2923.2009.03547.x)
Mitchell JT (1993) *Critical incident Stress Debriefing: An Operations Manual for the Prevention of traumatic Stress Among Emergency Services and Disaster Workers.* Chevron Publishing, Ellicott City, MD
Pendleton D (1984) *The Consultation: An Approach to Learning and Teaching.* Oxford University Press, Oxford
Petranek C (1994) Maturation in experiential learning. Principles of simulation and gaming. *Simul Gaming* **25**(4): 513–22
Rall M, Manser T, Howard S (2000) Key elements of debriefing for simulator training. *Eur J Anaesthesiol* **17**: 516–17
Salas E (2008) Debriefing medical teams: 12 evidence based best practices and tips. *Jt Comm J Qual Patient Saf* **34**: 518–27
Sawyer T, Sierocka-Castaneda A, Chan D, Berg B, Lustik M, Thompson M (2012) The effectiveness of video-assisted debriefing versus oral debriefing alone at improving neonatal resuscitation performance. A randomized trial. *Simul Healthc* **7**(4): 213–21 (doi: 10.1097/SIH.0b013e3182578eae)
Sawyer TL, Deering S (2013) Adaptation of the US Army's After-Action Review for Simulation Debriefing in Healthcare. *Simul Healthc* **8**(6): 388–97 (doi: 10.1097/SIH.0b013e31829ac85c)
Thatcher DC, Robinson MJ (1985) *An Introduction to Games and Simulations in Education.* Solent Simulation, Hants
US Army (1993) Training Circular 25-20, A Leaders' Guide to the After-Action Review, Headquarters, Department of the Army, Washington DC. www.au.af.mil/au/awc/awcgate/army/tc_25-20/tc25-20.pdf (accessed 23 September 2015)
Van Heukelom J, Begaz T, Treat R (2010) Comparison of postsimulation debriefing versus in-simulation debriefing in medical simulation in healthcare. *Simul Healthc* **5**(2): 65–125 (doi: 10.1097/SIH.0b013e3181be0d17)