The Role of Debriefing in Simulation-Based Learning

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The aim of this paper is to critically review what is felt to be important about the role of debriefing in the field of simulation-based learning, how it has come about and developed over time, and the different styles or approaches that are used and how effective the process is. A recent systematic review of high fidelity simulation literature identified feedback (including debriefing) as the most important feature of simulation-based medical education.[1] Despite this, there are surprisingly few papers in the peer-reviewed literature to illustrate how to debrief, how to teach or learn to debrief, what methods of debriefing exist and how effective they are at achieving learning objectives and goals.

This review is by no means a systematic review of all the literature available on debriefing, and contains information from both peer and nonpeer reviewed sources such as meeting abstracts and presentations from within the medical field and other disciplines versed in the practice of debriefing such as military, psychology, and business. It also contains many examples of what expert facilitators have learned over years of practice in the area. We feel this would be of interest to novices in the field as an introduction to debriefing, and to experts to illustrate the gaps that currently exist, which might be addressed in further research within the medical simulation community and in collaborative ventures between other disciplines experienced in the art of debriefing.

THE BACKGROUND OF SIMULATION-BASED LEARNING

Generally, in simulation-based learning, we are dealing with educating the adult professional. Adult learning provides many challenges not seen in the typical student population. Adults arrive complete with a set of previous life experiences and frames ("knowledge assumptions, feelings"), ingrained personality traits, and relationship patterns, which drive their actions.[2] Adult learners become more self-directed as they mature. They like their learning to be problem centered and meaningful to their life situation, and learn best when they can immediately apply what they have learned.[3] Their attitudes towards any specific learning opportunity will vary and depend on factors such as their motivation for attending training, on whether it is voluntary or mandatory, and whether participation is linked directly to recertification or job retention. Traditional teaching methods based on linear communication models (ie, a teacher imparts facts to the student in a unidirectional manner) are not particularly effective in adult learning, and may be even less so in team-oriented training exercises. The estimated half-life of professional knowledge gained through such formal education may be as little as 2 to 2.5 years.[4] In the case of activities requiring both formal knowledge and a core set of skills, such as Advanced Cardiac Life Support, retention can be as little as 6 to 12 months.[5,6]

Much of the research in teaching adults indicates that active "participation" is an important factor in increasing the effectiveness of learning in this population.[7] In fact, in any given curriculum, learning occurs not only by the formal curriculum per se but informally through personalized teaching methods (informal curricula), and even more so through embedded cultures and structures within the organization (hidden curricula).[8]

Adults learn best when they are actively engaged in the process, participate, play a role, and experience not only concrete events in a cognitive fashion, but also transactional events in an emotional fashion. The learner must make sense of the events experienced in terms of their own world. The combination of actively experiencing something, particularly if it is accompanied by intense emotions, may result in long-lasting learning. This type of learning is best described as experiential learning: learning by doing, thinking about, and assimilation of lessons learned into everyday behaviors. Kolb describes the experiential learning cycle as containing four related parts: concrete experience, reflective observation, abstract conceptualization, and active experimentation.[9] Gibbs also describes four phases: planning for action, carrying out action, reflection on action, and relating what happens back to theory.[10] Grant and Marsden similarly describe the experiential learning process as having an experience, thinking about the experience, identifying learning needs that would improve future practice in the area, planning what learning to undertake, and applying the new learning in practice.[11]

Simulation training sessions, which are structured with specific learning objectives in mind, offer the opportunity to

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go through the stages of the experiential cycle in a structured manner and often combine the active experiential component of the simulation exercise itself with a subsequent analysis of, and reflection on the experience, aiming to facilitate incorporation of changes in practice. Simulation offers the opportunity of practiced experience in a controlled fashion, which can be reflected on at leisure. Experiential learning is particularly suited to professional learning, where integration of theory and practice is pertinent and ongoing.[11] In experiential learning, the experience is used as the major source of learning but it is not the only one. Both thinking and doing are required and must be related in the minds of the learner.[10]

The concept of reflection on an event or activity and subsequent analysis is the cornerstone of the experiential learning experience. Facilitators guide this reflective process. Indeed this ability to reflect, appraise, and reappraise is considered a cornerstone of lifelong learning. This is one of the core elements of training in healthcare articulated by the Accreditation Council on Graduate Medical Education in the United States.[12] In practice however, not everyone is naturally capable of analyzing, making sense, and assimilating learning experiences on their own, particularly those included in highly dynamic team-based activities. The attempt to bridge this natural gap between *experiencing* an event and making *sense* of it led to the evolution of the concept of the "postexperience analysis"[13] or debriefing. As such, debriefing represents facilitated or guided reflection in the cycle of experiential learning.

ORIGINS OF DEBRIEFING IN SIMULATION-BASED LEARNING

Historically, debriefing originated in the military, in which the term was used to describe the account individuals gave on returning from a mission.[14] This account was subsequently analyzed and used to strategize for other missions or exercises. This military-style debriefing was both educational and operational in its objectives. Another connotation of debriefing developed out of the combat arena as a therapeutic or psychological association, as sort of "defusing," and aided the processing of a traumatic event with the aim of reducing psychologic damage and returning combatants to the frontline as quickly as possible. In this therapeutic approach, emphasis was placed on the importance of the narrative to reconstruct what happened. This cognitive reconstruction of events was performed in groups so that there was a shared meaning. The participants were brought together to describe what had occurred, to account for the actions that had taken place, and to develop new strategies with each other and the commanding officers.

Another form of debriefing, critical incident debriefing, was pioneered by Mitchell[15] and is used to mitigate stress among emergency first responders. He formulated a set of procedures termed the Critical Incident Stress Debriefing (CISD).[15] CISD is a facilitator-led approach to enable participants to review the facts, thoughts, impressions, and reactions after a critical incident. Its main aim is to reduce stress and accelerate normal recovery after a traumatic event by stimulating group cohesion and empathy.

Dyregrov modified this technique and called it psychological debriefing, designed to take place in the 48 to 72 hours after a traumatizing event in an attempt to assist participants in the cognitive and emotional processing of what they experienced.[16]

Currently, there is concern that an unrealistic expectation of CISD and its usefulness may be developing. A single session approach may be inadequate for certain individuals and situations, particularly as the technique is applied outside the realms for which it was originally designed.[17]

Another origin for the term "debriefing" comes from experimental psychology, and describes the means by which participants who have been deceived in some manner as part of a psychology study are informed of the true nature of the experiment.[18] The purpose of this ethically required debrief is to allow dehoaxing to occur, and to reverse any negative effects the experience may have had.[19]

Each of the three fields have contributed to the development of debriefing in the educational arena, facilitator-led participant discussion of events, reflection, and assimilation of activities into their cognitions produce long-lasting learning.

THE DEBRIEFING PROCESS

Approach to Debriefing

Just as in noneducational debriefing, where there exists an ethical duty of facilitators to set a safe, confidential scene for facilitation, there is the ethical obligation for the facilitator in simulation-based learning to determine the parameters within which behavior will be analyzed, thereby attempting to protect participants from experiences that might seriously damage their sense of self-worth.[20] To ensure a successful debriefing process and learning experience, the facilitator must provide a "supportive climate"[21] where students feel valued, respected, and free to learn in a dignified environment. Participants need to be able to "share their experiences in a frank, open and honest manner."[14] An awareness of the vulnerability of the participant is needed, which must be respected at all times. This is highlighted by a recent study regarding the barriers to simulation-based learning, where approximately half the participants found it a stressful and intimidating environment and a similar proportion cited a fear of the educator and their peers' judgment.[22]

It is essential that the facilitator creates an environment of trust early on, typically in the prebrief session. This prebrief period is a time when the facilitator illustrates the purpose of the simulation, the learning objectives, the process of debriefing, and what it entails. It is the period where the participants learn what is expected of them and sets the ground rules for their simulation-based learning experience. It is also a time for the facilitator to reflect on the learning objectives, and to consider that every participant comes to the simulation with a preceding set of individual frames and life experiences.[2] These previous experiences have an impact on how effective training will be, and need to be taken into consideration irrespective of the debriefing model employed. These frames or internal images of reality, how a person perceives something relative to someone else, affect the way people receive, process, and assimilate information.[2] The simulation sce-

nario and the debriefing techniques employed need to take individual learning styles into consideration.

This factor is illustrated by Kolb with the incorporation of the experiential learning cycle with basic learning styles.[23] Four prevalent learning styles are identified: *diverging, assimilating, converging, and accommodating*. Participants with diverging learning styles use concrete experience and reflective observation to learn. This style facilitates generation of ideas, such as brainstorming. Individuals with this learning style prefer to work in groups, listening and receiving feedback. Individuals with assimilating learning styles prefer abstract conceptualization and reflective observation. They like reading, lectures, and analysis. Converging-styled learners use abstract conceptualization and active experimentation. They like to find practical uses for ideas and theories. In a formal learning setting, they prefer to experiment with new ideas, simulations, laboratory experiments, and practical applications. Accommodating-styled learners use concrete experience and active experimentation. People with this style learn primarily from hands-on experience. In formal learning, they prefer to work in teams, to set goals, to do fieldwork, and to test different approaches to compiling a project. When learning in teams, individuals tend to orientate themselves and contribute to the team learning process by using their individual learning styles to help the team achieve its learning objectives.

Highly effective teams tend to possess individuals with a number of different learning styles. In our experience, pairing appropriately learning-styled individuals may add to the team's performance. Individual learning styles and team composition are important factors for facilitators to consider when choosing which style of debriefing will be most successful for each simulation session. It is also important for facilitators to learn about the characteristics of the group: whether group members know each other, are novices or are experienced, or are new to simulation. The prebrief period can afford the experienced facilitator an opportunity to observe team behaviors and identify learner characteristics early on, and debrief accordingly.

Structural Elements of the Debriefing Process

Despite many approaches to debriefing,[24,25] there are a number of structural elements common to most forms of facilitation. Lederman identified seven common structural elements involved in the debriefing process (Table 1).[18] The first two elements are the *debriefer(s)* and *those to be debriefed*. It is possible for these two to be the same if participants act as their own debriefers.[26] The third element is the *experience* itself (eg, the simulation), and the fourth is the *impact* this experience has on the participants. The concept of impact is important because adult learners typically need to be emotionally moved by the event, and the event needs to be relevant to their everyday lives to make an impact. The fifth and sixth elements involve *recollection* and *report*. Reporting of the event, although usually carried out in a verbal manner, may be written or involve the completion of a formal questionnaire.[24] The seventh element is *time*: the experience will be seen differently depending on how much time has passed before the debriefing. Although most debriefing approaches are conducted very soon after the experience, some allow more time for formal reflection, with reporting long after the event via a written report of an individual event or through keeping a journal (a written review of educational experiences over a semester).[24]

Table 1. Seven Common Structural Elements Involved in the Debriefing Process[18]

1. Debriefer
2. Participants to debrief
3. An experience (simulation scenario)
4. The impact of the experience (simulation scenario)
5. Recollection
6. Report
7. Time

Models of Debriefing

A number of models exist incorporating these structural elements and describe various debriefing or facilitation styles.[27–29] These models probably all evolve out of the natural order of human processing: to experience an event, to reflect on it, to discuss it with others, and learn and modify behaviors based on the experience. Although reflection after a learning experience might occur naturally, it is likely to be unsystematic. It may not occur at all especially if the pressure of events prevents focusing on what has just transpired. Conducting a formal debriefing focuses the reflective process, both for individual participants and for the group as a whole.

Naturally, debriefings may move of their own power through three phases: description, analogy/analysis, and application. However, without a facilitator participants may have trouble moving out of this first descriptive phase, particularly the active "hot-seat" participant who is emotionally absorbed in the event and is blinkered in their view of what has occurred. The challenge for the facilitator is to allow enough time for defusing to occur, but direct the discussion in a more objective, broad-based capacity. The facilitator needs to move the discussion away from the very personalized account of what the participant thought occurred, to the more global perspective, away from the individual to the group, and the person to the event, but must be cognizant not to cut the participant off, or make him/her feel alienated.

Although the core of the debrief centers on reflection of the active experience and making sense of the event, there are supporting phases that are necessary to allow this reflection and assimilation to occur. These phases of the debrief are described by many authors, and are categorized in different manners. The basic tenets of the various debriefing models have many overlapping elements (Table 2).

An initial phase of identifying the impact of the experience, considering the processes that developed and clarifying the facts, concepts, and principles which were used in simulation is described by Thatcher and Robinson.[27] Lederman describes this phase as the introduction to systematic reflection and analysis that follows the active component of the simulation: "the recollection of what happened and description of what participants did in their own words."[28] Paternek

Table 2. Models of the Debriefing Process

Model
Thatcher and Robinson[27]
1. Identifying the impact of the experience
2. Identifying and considering the processes which developed
3. Clarifying the facts, concepts, and principles
4. Identifying the ways in which emotion was involved
5. Identifying the different views which each of the participants formed
Lederman[28]
1. The introduction to the systematic reflection and analysis
2. The intensification and personalization of the analysis of the experience
3. The generalization and application of the experience
Petranek[29]
1. Events
2. Emotions
3. Empathy
4. Explanations and analysis
5. Everyday applicability
6. Employment of information
7. Evaluation

describes this introductory phase as the description of the events that occurred.[29]

The second phase is described as identifying the ways in which emotion was involved, either individually or for the group;[27] the intensification and personalization of the analysis of the experience, where participants explore the feelings they experienced during the event;[28] or the emotional and empathic content of the discussion.[29]

The third phase involves identifying the different views formed by each participant, and how they correlate with the picture as a whole;[27] the generalization and application of the experience, during which participants attempt to make comparisons with real-life events;[28] a phase of explanations and analysis, everyday applicability and evaluation of behaviors.[2]

Objectives of the Debriefing Session

The design of the debriefing session should be tailored to the learning objectives and the participant and team characteristics. Objectives may be well defined, and specified beforehand, or may be emergent and evolve within the simulation. For well-defined objectives, such as a technical skill or a particular team behavior, the debriefing session affords the opportunity to examine how closely participants' performance has approached a known target, and what needs to be done to bridge any observed gaps between performance and target. It also affords an opportunity to share these objectives with participants. With emergent objectives, participants may be asked to reflect on the observed evolution of the scenario and to see how the behaviors, attitudes, and choices uncovered in the simulation relate to real life situations. When exploring objectives or goals, there are two main questions: 1) which pieces of knowledge, skills, or attitudes are to be learned? and 2) what specifically should be learned about each of them? In the case of emergent objectives, simulations may be viewed as experiments in which participants try alternative ways of behavior or test new strategies or courses of action. To debrief about such objectives is complicated because there are fewer predefined ideas about how the participants should have acted, so discussion must focus around issues that arise from the events themselves and their meaning to those involved.

Role of the Facilitator in the Debriefing Process

There is a tension between making participants active and responsible for their own learning versus ensuring they address important issues and extract maximum learning during debriefings. Data from surveys of participants indicates that the perceived skills of the debriefer have the highest independent correlation to the perceived overall quality of the simulation experience.[30] As the skill of the debriefer is paramount in ensuring the best possible learning experience, training in facilitation is vital. A number of centers offer facilitation courses providing training in debriefing skills (Table 3).[31] In addition to the formal education of facilitators, techniques such as the pairing of expert with novice facilitators early in their career to give guidance and direction are important. A recent study of facilitation in problem-based learning illustrated that while facilitators felt that a formal training course provided sufficient skills to commence debriefing, it was only with experience, and in the presence of an expert role model that they became more comfortable with the process.[32] In the same study, students commented on the skill of facilitators as being an important factor in the learning process and the credibility of the course. Basic and advanced courses and refresher courses in facilitation are probably universally required.

The exact level of facilitation and the degree to which the facilitator is involved in the debriefing process can depend on a variety of generic factors:

- The objective of the experiential exercise,
- The complexity of the scenarios,
- The experience level of the participants as individuals or a team,
- The familiarity of the participants with the simulation environment,
- Time available for session,
- The role of simulations in the overall curriculum,
- Individual personalities and relationships, if any, between the participants.

Unlike the traditional classroom "teacher," facilitators tend to position themselves not as authorities or experts, but rather as colearners. This more fraternal approach may be most productive where the learning objective is behavioral change. Facilitators aim to guide and direct rather than to lecture. The role of the student or participant in debriefing is expanded from the traditional passive role to one where the skills demanded of them are the ability to critically analyze one's own performance retrospectively—not just what went well but what went wrong, and why it went that way, and to contribute actively to the learning process.

Table 3. List of Institutions and Organizations that Offer Formal Training for the Simulation-based Healthcare Educator[31]

Institution/Organization	Course/Type of Training
Center for Advanced Medical Simulation Karolinksa University Hospital (http://www.simulatorcentrum.se/)	Several courses for faculty training on crisis resource management in anesthesia and emergency medicine.
Center for Medical Simulation, Boston (http://www.harvardmedsim.org/cms/)	A variety of courses including week-long immersive experience for those who want to develop and maintain healthcare simulation programs. Other courses offer training for instructors who teach with simulators, those who have leadership positions.
Hertfordshire Intensive Care and Emergency Simulation Centre, University of Hertfordshire (http://www.health.berts.ac.uk.hicese/)	One-day course for participants to learn how to train and teach with simulators and courses on multidisciplinary simulation-based training.
Mainz simulation Center (http://www.simulationzentrum-mainz.de)	Several "train the trainer" courses covering simulator operations and programming, crisis resource management, teamwork, communication skills, and debriefing techniques.
Mayo multidisciplinary simulation center (http://www.mayo.edu/simulationcenter/)	Courses for participants to develop knowledge and skills in planning, designing, building and maintaining a simulation center.
SIMS Medical Academy (http://www.healthprograms.org)	Beginner and intermediate level courses for participants to learn how to develop and implement patient simulation scenarios into their local curriculum.
Society for Education in Anesthesia (http://www.asahq.org/)	A variety of courses and workshops on developing teaching skills including the use of innovative simulation technologies.
Simulation Center at the VA Palo Alto HCS, Stanford (http://www.med.stanford.edu/VA simulator/)	Faculty development courses on anesthesia and emergency medicine crisis resource management.
TuPass Center for Patient Safety and Simulation (http:/www.tupass.com)	Several courses for instructors aimed at the competencies necessary to conduct simulation based training in acute medical care crisis.
University of Miami Michael S. Gordon Center for Research in Medical Education (http://www.crme.med.miami.edu)	Several "training the trainer" courses for participants to learn to use a variety of simulation tools for a wide range of courses (acute stroke, disaster and terrorism response).
University of Pittsburgh WISER (http://www.wiser.pitt.edu/)	A variety of courses covering the foundations for simulation in healthcare, including simulator programming, creating and developing a simulation center as well as faculty facilitator and technical support specialist preceptor training.

This list covers a number of well-known programs, but is not exhaustive. No endorsement of the programs by the Society of Simulation in Healthcare is implied.

Practical Points on Debriefing

There are a number of methods of debriefing, and levels of facilitation that may be employed. Dismukes and Smith, while discussing debriefing in aviation, delineate three levels of facilitation.[33]

High

Participants largely debrief themselves with the facilitator outlining the debriefing process and assisting by gently guiding the discussion only when necessary, and acting as a resource to ensure that objectives are met. Thus, paradoxically the *high* level facilitation actually implies a *low* level of involvement by the facilitator. This level of facilitation—initially described by Carl Rogers—describes the facilitator as a catalyst, allowing clients or students to draw their own conclusions, creating their own prescription for change.[34] He described "core conditions" for the facilitative process, both counseling and educational. These are congruence (realness), acceptance, and empathy. Realness refers to genuine nature of the facilitator. The idea of acceptance is that the learner feels that their opinions are prized, as are their feelings and their person. For the third, empathy, the teacher aims to understand the learner's viewpoint and have sensitivity for it.

Examples of techniques in high-level facilitation would be the use of pauses to allow thoughtful responses and comment, open-ended questions and phrases rather than statements of fact. The artful use of silence is another technique to draw further discussion from the group.

Intermediate

An increased level of instructor involvement may be useful when the individual or team requires help to analyze the experience at a deep level, but are capable of much independent discussion. Examples of techniques used in intermediate-level facilitation would include rewording or rephrasing rather than giving answers, asking questions in a number of ways to a number of participants and changing the tone of questions. Other techniques would be asking one member to

comment on another, or moving around a group asking for input from all team members.

Low

An intensive level of instructor involvement may be necessary where teams show little initiative or respond only superficially. In such cases the facilitator guides the individual or the group through the debriefing stages, asks many questions and strongly directs the nature of the discussion. In low-level facilitation, participants show little initiative and tend to respond only superficially. Here the facilitator may need to be directive to operate a stepwise or pattern of analysis. Examples of techniques used in low-level facilitation would include answering for participants, confirming statements, agreeing, recapping, and reinforcing thoughts and ideas. Other techniques such as active listening, echoing, and expanding on statements and nonverbal encouragement such as nodding, leaning forward, and focused eye contact are useful.

It is probably most beneficial to facilitate at the highest possible level, with the participants independently generating a rich discussion among themselves of all key issues. In our experience in healthcare, this ideal is rarely achieved, especially with relatively junior trainees or with first-time simulation participants of any age. Matching the level of instructor involvement to the nature of the material and the group is critical.

Conversely, there may be a tendency for instructors to debrief at a lower level (with more instructor involvement) than the participant group might really need—that is, to "overinstruct." To ensure that participants become involved at the highest level, a good prebrief is essential. Individuals and teams unfamiliar with this kind of learning may start off a sequence of simulations and debriefings with a need for high instructor input but then become more participant-directed as the day progresses.

Other Styles of Facilitation

Just as different levels of facilitation may be employed to suit the needs of participants, different facilitator techniques may be used to engage participants in the debriefing process. Examples of other styles of facilitation include: *funneling*, where the facilitator guides or funnels the participants, but refrains from commenting; *framing*, introducing the experience in a manner that enhances its relevance and meaning; and *frontloading*, using punctuated questions before or during an experience to redirect reflection. Solution-focused facilitation changes the focus of questions away from problems, and directional-style debriefing is intended to change the way people feel or think.[35]

Techniques such as plus-delta may also be useful. This technique which involves creating two headings or columns entitled delta, the Greek symbol for change, and plus. Under the delta column, the participants or/and the facilitator place all the behaviors/actions they would change or improve on in future, where the plus column contains examples of good behaviors or actions. Different participants can contribute to the critique, which may single out individual or team behaviors. Variations on the technique include placing behaviors or actions that were found to be difficult on the delta column, and easier tasks or behaviors on the plus column, and subsequently discussing why this was the case.

Facilitators at the Karolinska University Hospital in Sweden use a target-focused technique to aid facilitation.[36] Target behaviors are identified prior to the simulation scenario in the prebrief period, and subsequently during the debrief these can be identified and evaluated by facilitators, participants, and by observers. This technique offers a structure for debriefing that may facilitate debriefing by participants.

Facilitators may decide to use different communication styles while debriefing: using commands, cues, or questions. They may also decide to use acceptance and praise or be scolding and corrective.[37] If there are a number of debriefers, they may decide to use opposing styles: "good cop-bad cop" to encourage discussion and cohesiveness within a participant team. A group of debriefers may offer advantages where specific educational or technical points need to be addressed. An expert (expert content debriefer) may debrief on specialized issues and offer credibility to the discussion, particularly where dealing with an experienced group of participants. When a number of facilitators are present, their roles need to clearly described before debriefing commences to avoid excessive facilitator input in discussions. This is particularly pertinent if the principal debriefer is attempting to use techniques such as active listening and silence to encourage group participation.

The Debriefing Setting

The physical environment in which debriefing is conducted is also an important factor. For complex debriefings lasting more than a few minutes, debriefings often take place in a room separate from the active portion of the simulation to allow diffusion of tension and to provide a setting conducive to reflection (this also frees up the simulation room to be set up for the next scenario). However, not all debriefings are held after the simulation, but in certain instances, for example, where the aim is to teach a technical skill or if the team behaviors are seriously flawed, debriefing may occur during the simulation, "in-scenario" debriefing.

The debriefing room should be comfortable, private, and a relatively intimate environment (for example, a large auditorium would typically not be appropriate). The seating arrangement may vary with the style of the debriefing and the degree of facilitation intended. In a more traditional teaching approach, the facilitator may position himself at the head of the table, whereas in a more participant-directed debrief, the facilitator may be seated among the participants, away from the table, out of sight, or indeed even outside the debriefing room. If a larger group is to be debriefed, participants may be separated into smaller groups. Each subgroup might have an individual facilitator, or they might self-debrief initially, and then come together to express their thoughts in a larger group setting.

Steinwachs describes a way of debriefing a larger group, involving the "fish bowl" method.[25] Here a smaller circle exists within a larger circle, and participants may move to the inner circle when they wish to actively participate in the debrief. Steinwachs advises that individuals sit next to each other to avoid creating "energy gaps" (opportunities for dis-

continuity in discussion as one participant is removed from the group as a whole). Irrespective of the type of facilitation models and communication styles used and the physical environment debriefing is carried out in, it is always important to be cognizant of the participants' profiles (eg, novice/expert) in delivering the debrief.

To Debrief or Not?

Although many learning experiences require feedback, debriefing is a special kind of feedback process. If the core objectives are to, for example, teach a technical skill such as intubation or central line placement, does the participant require in-depth facilitation and reflection on the skill to master it? We suggest that the learning objectives, target population, and modalities of simulation will drive whether a debriefing is useful, and if so how in-depth the debriefing process needs to be. Typically topics that may benefit from debriefing are team training, crew resource management skills and multidisciplinary training. Thiagarajan examines this concept of the necessity of the debrief by asking: 1) do participants lack a sense of closure and 2) can we derive useful insights through a discussion of the experience?[38] If so, debriefing should add to the experience.

The Effectiveness of Debriefing Sessions

Although the experience in other high-hazard industries that conduct complex simulations suggests that debriefing is important,[39] what data exist regarding the actual benefits of debriefing? Such questions prompted a survey of debriefing practices in 14 European Simulation Centers to explore what experienced debriefers instinctively felt were important elements of a good debrief, and also what was felt to constitute a poor or harmful debrief.[40] The survey was carried out in response to interest in the topic displayed at a workshop in debriefing at an international simulation education meeting. All respondents claimed that debriefing was the most important part of realistic simulator training, "crucial to the learning process," and if performed poorly could harm the trainee. The majority felt that a thorough prebrief was essential and stressed the importance of confidentiality and creating a nonthreatening atmosphere. Elements of a good debrief included the use of open-ended questions, positive reinforcement, the use of cognitive aids, and good use of audiovisual capabilities. Respondents felt that, where possible, facilitation or self-debriefing should be encouraged. Elements of a poor debrief included the use of closed questions, criticism, or ridicule; concentrating on errors; or concentrating too much on the technical points and not enough on crew resource management skills. This survey's findings reinforce common beliefs of experienced facilitators regarding good debriefing.

Intuitively, many instructors feel that such core elements of debriefing are essential but what, if any, empirical data exists to explore the real value of the debrief and the various methods of facilitation? How does one even approach assessing debriefing techniques? Lederman outlined a conceptual process for assessing the effectiveness of the debriefing process, which may serve as a template for future studies.[18] She asks five questions:

1. Were the learning objectives met or enhanced through the debriefing?
2. How was the debriefing conducted considering situational constraints (eg, time, finances, and group structure)?
3. Was the correct strategy used to accomplish the learning objectives given the situational constraints?
4. How uniformly, if at all, was the stated debriefing strategy actually implemented in practice?
5. What, if any, quality management of the debriefing process took place?

These questions can be raised about specific issues and types of debriefing. There are also some more general questions about debriefing:

1. Do all types of simulations need a debrief, and if some do, what benefits have been demonstrated?
2. Is self-debriefing or written debriefing sufficient or is a facilitator really needed?
3. How much, if at all, does playback of simulation video help the debriefing process?
4. Do specific methods of debriefing have specific benefits, or are they all alike?

A number of studies have found the debriefing process beneficial. In a study aiming at improving dynamic decision making and task performance involving computer simulation-based interactive learning environments, Qudrat-Ullah evaluated the usefulness of the debrief.[41] The study assessed participants' skills in a managing a dynamic task, such as playing the role of fishing fleet managers in an environment of over exploitation and mismanagement of renewable resources. Thirty-nine participants were examined over four parameters: task performance, structural knowledge, heuristics knowledge, and cognitive effort. The experimental group received a debrief, whereas the control group did not. Across all four domains the group who were debriefed did better. Similarly in a medical simulation study, Savoldelli et al. found that participant's nontechnical skills failed to improve if they were not debriefed.[42]

As Dismukes et al. state: "When it comes to reflecting on complex decisions and behaviors of professionals, complete with confrontation of ego, professional identity, judgment, motion, and culture, there will be no substitute for skilled human beings facilitating an in-depth conversation by their equally human peers."[43]

How Should We Debrief? Self-debriefing Versus Written/Blog Debriefing Versus Facilitated Debriefing

Increasingly, due to the cost of expert debriefers, there has been an interest in self-debriefing.[44] In fact, in a survey of team versus instructor-led debriefs, pilots surveyed were equally satisfied with both methods.[26] A recent healthcare study looked at the ability of participants to critique their own performance and that of their colleagues, and how that critique was received.[45] Subjects were asked to provide ratings of their own performance and the performance of their peers in a series of simulation scenarios, using an electronic rating system. Rating took place before the formal debrief. In the initial instance, the participants overestimated their performance; in the second instance they underestimated it. However, over time, the trainees' perceptions became closer to that of expert raters. This study suggests a role for struc-

tured self and peer rating, although it is not clear whether participants learned additional insight from their colleagues that they would not have gleaned from the formal facilitated debriefing process. Self- and peer-assessments are often inaccurate, and some degree of expert direction may be required. A recent study evaluating the self-assessment skills of medical students showed that low achieving students score themselves and their peers generously.[46] Standard or satisfactory students tend to be pretty accurate at scoring themselves and their peers and good students underscore themselves, but are accurate regarding their peers illustrating the discrepancy in novice self appraisal. This is not confined to students, but applies across all levels of experience. A recent review of physician self-assessment examining 17 studies concluded a limited ability to self assess.[47]

One approach to encouraging but also directing self and peer debriefing may be to introduce guidelines or aids to self-assessment. A study by Zottmann et al. explored the use of collaboration scripts by observers (nonactive participants in a simulation scenario), to aid in their ability to debrief team members on their performance.[48] A collaboration script is an instruction tool that distributes roles and activities among learners and may also include content-specific support for the completion of a task. Thirty-three medical students were studied and the group was divided into observers who received a collaboration script and those that did not. In this study the collaboration script illustrated individual and collaborative elaboration of Crew Resource Management (CRM) key points and learning outcomes (CRM skills). Objective (individual notes during observation phases) and subjective data (self-assessment and CRM skills) were analyzed for both groups. Initial results indicated positive effects of the collaboration script learning process. Scripted learners made more notes regarding CRM during the observation and felt more active in the debriefing process. Collaboration scripts may help make passive learning situations during observation phases more active and focused, and may encourage "passive" participants to contribute to the debriefing process. Schwid et al. evaluated whether screen based anesthesia simulation with a written debrief improved subsequent performance in a mannequin-based anesthesia simulator and found it superior in preparing the participants for mannequin-based simulation to traditional learning techniques.[49] The study, however, did not examine whether the written debrief or the practice session on the screen based system was responsible for the improved performance in the mannequin-based simulation.

Elaborating on the role of the written debrief, Petrenak, over a 20-year teaching period, encouraged his students to maintain a journal examining their educational experiences concerning 8 to 12 simulations played in a semester.[24] After attending one of his simulation workshops, students were encouraged to write a letter on the experience which was mailed to them 2 to 3 months later. This technique allows reflection on learning over time free from the "ridicule or rejection" of traditional debriefing. It is also in essence a form of self-debrief. Perhaps the modern-day "blog," although not providing feedback as such, may also play a role in this self-reflective and peer-appraisal approach, although it remains to be tested a scientific fashion.

Is Video Playback Beneficial?

Many sites conducting team-oriented simulations in healthcare, whether for single disciplines or for combined teams, use video playback as an aid in debriefing.[33] In a study evaluating the role of video playback in producing sustained behavioral change, Scherer et al. studied surgical residents' trauma resuscitation skills.[50] Over a 6-month period, resuscitations were taped and reviewed. For the first 3 months, team members were given verbal feedback regarding performance and their behavior failed to change. In the second 3-month period, video playback and verbal feedback were combined, and within 1 month, behavior improved and was sustained for the duration of the study. The advantage of video playback is not seen consistently. A study by Savoldelli et al. assessed debriefing with or without video playback in their study of 42 anesthesia residents.[42] Participants who underwent debriefing improved more than those who did not, but there was no difference whether the debriefer used video playback or not. This was similar to the findings in the Beaubien study.[26] In fact, in Savoldelli's study, there was a trend towards greater improvement in participants who received an oral debriefing rather than an oral debriefing with video playback. This may have been related to a reduced actual instruction time for the video playback group, or the potential distractive nature of the video itself.[42] Still, video playback may be useful for adding perspective to a simulation, to allow participants to see how they performed rather than how they thought they performed, and to help reduce hindsight bias in assessment of the scenario. Further, the optimal use of video is currently an art, not a science. If lengthy or unrelated video segments are played, it may stifle discussion of the key issues, and may detract from the focus of the debriefing session.

Participants often want to see video footage and enjoy doing so. In a study by Bond et al. using simulation to instruct emergency medicine residents in cognitive forcing strategies, about half the participants said that they would have liked video playback, although it was not available.[51] Interestingly in this study, the participants received a traditional oral debrief, but also a PowerPoint presentation and didactic lecture as part of their simulator learning experience. It seems likely that the use of mixed media modalities and strategic use of video replay may be useful, especially as participants undergo repeated simulation experiences over time and are able to extract more out of debriefing sessions. Video playback of other simulation sessions and their debriefings may also play a role in teaching both behavioral and technical skills. A library of "classic vignettes" may be a useful way of elaborating not only on teaching points but also in illustrating debriefing techniques.

Does Effectiveness of Debriefing Depend on the Debriefing Technique Used?

Debriefing is classically described as nonjudgmental in its approach, with the facilitator seen as colearner rather than expert or authority. But is this actually the best approach to ensure that learning objectives are met? Do participants like

an open method of learning or do they prefer it to be more directed? What methods leads to the greatest improvement in skill and behavior? Although very few learners will respond well to a humiliating style of debriefing, they may find that debriefings that avoid analysis or criticism result in a failure to learn anything at all. It was with this in mind that Rudolph and colleagues developed the concept of debriefing with "good judgment," which focuses on creating a context for the adult learner to learn important lessons, and incorporate them into cognitions while amalgamating new information with their prior frames/life experience.[2] Participants may feel that this approach enables them to acquire knowledge in a structured manner, but having enough freedom to explore the personal nature of their experience and incorporate what they learn into their own practice.

In certain instances, participants prefer a more technical debrief to a cognitive one. In a study involving 62 emergency medicine residents who were randomized to receive either a technical/knowledge debriefing (ie, one covering medical subject matter) or a cognitive debriefing (ie, describing the concept of vertical line failure or other models of cognitive error),[52] the technical debriefing was better received by participants. This may be in part due to the fact that this type of debriefing is more familiar to the resident, being more akin to the traditional teaching process, where the teacher is the expert and imparts their knowledge in a more linear manner. The authors of this study suggest a combination of approaches may be beneficial in practice.

Do Debriefers Practice What They Preach About Debriefing?

Lederman's construct for assessing the debriefing process looks at whether instructors actually implement the debriefing strategy they set out to perform.[18] Just like the participants who are reconciled with what they did and what they actually thought they did when viewing video feedback, facilitators can view their debriefing technique, and reconcile how the debriefing session actually unfolded rather than how they presumed it did. A study that assessed debriefings in 36 US airline crews, illustrated that most facilitators talked more than any of the crew members.[33] Instructors asked a larger number of questions, averaging close to one per minute. Half the content of the debriefing centered on discussing the crew's performance, and crew members tended to give neutral responses concerning their performance. Instructors failed to pause, or use silence to encourage crew participation. The average duration of the debrief was only 31 minutes, probably not allowing for in-depth analysis.

Dieckmann et al stress the importance of regular feedback, using video footage to appraise oneself and fellow instructors.[53] They have also devised a simple tool for observing and evaluating instructor practices during the debriefing process, and the roles played by participants and their degree of participation during the debriefing phase. This tool, designed for formative evaluation, feedback, and discussion uses Microsoft Word to collect the desired information. The reviewer observes the debriefing process. Instructor, participants, nurse, and consultants, for example, are assigned a letter such as Instructor = I, Anesthesiologist = A. The reviewer presses and holds the relevant key on their laptop as long as a particular person is talking. Because holding a key down generates a fixed rate of repetition of that character, this can be used as a simple means to capture the duration of utterances addressed to each party. The final data is entered into a spreadsheet and the proportion of talking time taken up by each individual can be viewed, as can the patterns of communication.

Feedback on debriefing performance may also be achieved by inviting other specialists in the area, such as psychologists or anthropologists, to comment on either live or videotaped practice. Regular appraisal of debriefing skills is necessary for every facilitator, both on a local level, and by attending regular refresher facilitation courses and workshops globally.

Translating Debriefing from the Simulator World to the Real Clinical World

The concepts of briefings and debriefings apply not only to simulated environments but also to real operational worlds. Aviation has stressed preflight briefings and postflight debriefings as a method of information exchange, team building, and quality management.[33] The same approaches are being adapted to healthcare settings. In situ simulation in "real-life settings" or the debriefing of "real-life" events, such as in the study by Scherer et al., illustrate the effectiveness of debriefing in changing patterns of behavior.[50] Curricula that teach staff physicians to debrief their subordinates are another example of this trend. Blum et al., in their simulation courses for faculty anesthesiologists, include one scenario which involves debriefing a resident regarding a medical error.[54] At the end of the course and 1 year later, participants were requested to complete a questionnaire on their experience. Participants felt more equipped to debrief a resident immediately following the simulation course than before it, and this was maintained even 1 year later. This study also illustrates that although faculty may debrief well after real-life events, the practice is not as prevalent as residents may find useful.

This is reiterated in a study by Tan, who audited the practice of debriefing after critical incidents for anesthetic trainees by postal survey.[55] Debriefing after a critical incident was perceived by most trainees to be useful, although 36% had never been debriefed. Trainees ranked their preferred content for debriefing as "anesthetic issues," followed by "psychologic impact," "patient issues," and "surgical issues." Almost half did not feel supported by their department after a negative outcome incident. Trainees who were debriefed felt more supported by their senior colleagues. This study suggests that to have maximum effect, these facilitated team debriefings should be performed after real patient care situations, not just training exercises. This would reinforce the lessons learned in simulation and have the best chance of improving behavior, and strengthening departmental cohesiveness between staff and residents.

Future Research on Debriefing

This review illustrates some of the gaps that exist in our understanding of the role of debriefing in simulation based learning: fundamental issues such as whether debriefing is always required and, if it is, what are the most effective techniques to achieve a particular learning objective? How or should debriefing in teams differ from individual debriefing,

or debriefing novices differ from debriefing more experienced participants? How do we effectively evaluate the success of particular debriefing techniques and the use of auxiliary aids, such as video playback in the learning process as a whole? A primary area of research would be the development of models and theories of debriefing specifically within the field of simulation-based learning. Analysis and evaluation of debriefing models using common metrics, both quantitative and qualitative, would be beneficial to compare with other educational methods and techniques. Large, well-designed, high-powered collaborative studies within the simulation community both medical and nonmedical may provide an avenue to explore some of the current pertinent questions in simulation-based learning.

CONCLUSION

It is widely accepted that debriefing is the "heart and soul" of the simulation experience.[40] Currently, there is an increasing body of work exploring the role and effectiveness of debriefing in an objective manner in the learning process. To date, only a small proportion of this has reached peer-review journal publication, but the ever-increasing presentations of techniques, methods, and assessment of the process at international meetings on simulation in healthcare are encouraging.

REFERENCES

1. Issenberg SB, McGaghie WC, Petrusa ER, et al: Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. *Med Teach* 2005;27:10–28.
2. Rudolph JW, Simon R, Dufresne R, et al: There's no such thing as "Nonjudgmental" debriefing: A theory and method for debriefing with good judgment. *Simul Healthcare* 2006;1:49–55.
3. Knowles M: The Modern Practice of adult education: From Pedagogy to Andragogy. San Francisco, CA: Jossey-Bass, 1980:44–45.
4. Carpentio LJ: A lifetime commitment: mandatory continuing education. *Nurs Times* 1991;87:53–55.
5. Stross JK: Maintaining competency in advanced cardiac life support skills. *JAMA* 1983;24:3339–3341.
6. O'Steen DS, Kee CC, Minick HP: The retention of advanced cardiac life support knowledge among registered nurses. *J Nurs Staff Div* 1996; 12:66–72.
7. Seaman DF, Fellenz RA: Effective strategies for teaching adults. Columbus, OH: Merrill, 1989.
8. Hafferty FW: Beyond Curriculum Reform: Confronting Medicine's Hidden Curriculum. *Acad Med* 1998;73:403–407.
9. Kolb DA: Experiential learning: Experience as the source of learning and development. Englewood Cliffs, NJ: Prentice Hall, 1984.
10. Gibbs G: Learning by Doing: A guide to Teaching and Learning methods. London: Fell, 1988.
11. Grant J, Marsden P: Training senior house officers by service based training. London: Joint Conference for Education in Medicine, 1992.
12. Available at: http://www.acgme.org/outcome/comp/compFull.asp. Accessed October 2006.
13. Lederman LC: Intercultural communication, simulation and the cognitive assimilation of experience: An exploration of the post-experience analytic process. Presented at the 3rd Annual Conference of the Speech Communication Association, Puerto Rico, San Juan, December 1–3, 1983.
14. Pearson M, Smith D: Debriefing in experience-based learning. *Simulation/Games for Learning* 1986;16:155–172.
15. Mitchell JT, Everly GS: Critical incident stress debriefing: An operations manual for the prevention of traumatic stress among emergency services and disaster workers. Ellicott City, MD: Chevron Publishing, 1993.
16. Dyregrov A: Caring for helpers in disaster situations: Psychological debriefing. *Disaster Manage* 1989;2:25–30.
17. Hiley-Young B, Gerrity ET: Value and limitations in disaster response. Critical Incident Stress Debriefing. Available at: http://www.ncptsd.va.gov/publications/cq/v4/n2/hiley-yo.html.
18. Lederman LC: Debriefing: Toward a systematic assessment of theory and practice. *Simul Gaming* 1992;2:145–159.
19. Available at: http://www.apa.org/ethics/code2002.html. Accessed October 2006.
20. Lederman L: Debriefing. A critical reexamination of the Postexperience Analytic process with implications for its effective use. *Simul Games* 1984;15:415–431.
21. Gibb J: Defensive communication. *J Communication* 1961;11:141–148.
22. Savoldelli GL, Naik VN, Hamstra SJ, et al. Barriers to the use of simulation-based education. *Can J Anesth* 2005;52 944–950.
23. Kolb DA: The learning style inventory LSI Learning style inventory version 3. Boston: TRG Hay/McBer Training Resources Group, 1999.
24. Petranek CF: Written debriefing: The next vital step in learning with simulations. *Simul Gaming* 2000;31:108–118.
25. Steinwachs B: How to facilitate a debrief. *Simul Gaming* 1992;23:186–195.
26. Beaubien JM, Baker DP: Post-training feedback: The relative effectiveness of team-versus instructor-led debriefs. Proceedings of the 47th Annual Meeting of the Human Factors and Ergonomics Society. Denver, CO, October 13–17, 2003.
27. Thatcher DC, Robinson MJ: An introduction to games and simulations in education. Hants: Solent Simulations, 1985.
28. Lederman LC: Differences that make a difference: Intercultural communication, simulation, and the debriefing process in diverse interaction. Presented at the Annual Conference of the International Simulation and Gaming Association, Kyoto, Japan, July 15–19, 1991.
29. Petranek C: Maturation in experiential learning: Principles of simulation and gaming. *Simul Gaming* 1994;513–522.
30. Wilhelm J: Crew member and instructor revaluations of line orientated flight training. Proceedings of the 6th international symposium on aviation psychology, 1991:362–367.
31. Issenberg SB: The scope of simulation-based healthcare education. *Simul Healthcare* 2006;1:203–208.
32. McLean M: What can we learn from facilitator and student perceptions of facilitation skills and roles in the first year of a problem based learning curriculum. *Med Educ* 2003;3:1–10.
33. Dismukes R, Smith G: Facilitation and debriefing in aviation training and operations. Aldershot; UK: Ashgate, 2000.
34. Rogers CR: Freedom to learn. Columbus, OH: Charles E. Merrill, 1969.
35. Available at: http://www.tarrak.com/EXP/exp.htm. Accessed August 2006.
36. Wallin CJ, Meurligh L, Hedren L, et al: Target-focused medical emergency team training using a human patient simulator: effects on behavior and attitude. *Med Educ;* in press.
37. O'Hare D, Roscoe S: Flight deck performance. The human factor. Ames: Iowa State University, 1990.
38. Thiagarajan S: Using games for debriefing. *Simul Gaming* 1992;23: 161–173.
39. Rudolf JW, Talyor SS, Foldy EG: Collaborative off-line refection. A way to develop skill in action science and action inquiry. In Handbook of Action Research. Thousand Oaks, CA: Sage, 2000.
40. Rall M, Manser T, Howard S: Key elements of debriefing for simulator training. *Eur J Anaesthesiol* 2000;17:516–517.
41. Qudrat-Ullah H: Improving dynamic decision making through

debriefing: An empirical study. Proceedings IEEE International Conference on advanced learning technologies. Finland: ICALT, 2004.

42. Savoldelli GL, Naik NV, Park J, et al: Value of debriefing during simulated crisis management. *Anesthesiology* 2006;105:279–285.
43. Dismukes RK, Gaba DM, Howard SK: So many roads: facilitated debriefing in healthcare. Simul Healthcare 2006;1:23–25.
44. Butler RE: Loft: Full-motion simulation as crew resource management training. Cockpit resource management. San Diego: Academic Press, 1993.
45. Foraida MI, DeVita MA, Schaefer JJ: Evaluation of an electronic system to enhance crisis resource management training. *Simul Healthcare* 2006;1:85–91.
46. Langendyk V: Not knowing that they do not know: self-assessment accuracy of 3rd year medical students. *Med Educ* 2006;40:173–177.
47. Davis DA, Mazmanian PE, Fordis M, et al: Accuracy of physician self-assessment compared with observed measures of competence: a systematic review. *JAMA* 2006;296:1094–1102.
48. Zottmann J, Dieckmann P, Rall M, et al: Fostering simulation-based learning in medical education with collaboration scripts. *Simul Healthcare* 2006;1:193.
49. Schwid HA, Rooke AG, Michalowski P, et al: Screen based anesthesia simulation with debriefing improves performance in a mannequin-based anesthesia simulator. *Teach Learn Med* 2001;13:92–96.
50. Scherer LA, Chang MC, Meredith JW, et al: Videotape review leads to rapid and sustained learning. *Am J Surg* 2003;185:516–520.
51. Bond WF, Dietrick LM, Arnold DC, et al: Using simulation to instruct emergency medicine residents in cognitive forcing strategies. *Acad Med* 2004:79:438–446.
52. Bond WF, Deitrick LM, Eberhardt M, et al: Cognitive versus technical debriefing after simulation training *Acad Emerg Med* 2006;13:276–283.
53. Dieckmann P, Striker E, Rall M: Methods for formative evaluations of debriefing as a tool for feedback and improvement. *Simul Healthcare* 2006;1:190.
54. Blum RH, Reamer DB, Carrol JS, et al: Crisis resource management training for anesthesia faculty: a new approach to continuing education. *Med Educ* 2004;38:45–55.
55. Tan H: Debriefing after critical incidents for anesthetic trainees. *Anaesth Intensive Care* 2005;33:768–772.

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Featured Article

Standards of Best Practice: Simulation Standard VI: The Debriefing Process

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Abstract: All simulation-based learning experiences should include a planned debriefing session aimed toward promoting reflective thinking. Learning is dependent on the integration of experience and reflection. Reflection is the conscious consideration of the meaning and implication of an action, which includes the assimilation of knowledge, skills, and attitudes with pre-existing knowledge. Reflection can lead to new interpretations by the learner. Reflective thinking does not happen automatically, but it can be taught; it requires time, active involvement in a realistic experience, and guidance by an effective

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facilitator. The skills of the debriefer are important to ensure the best possible learning; learning without guidance could lead the learner to negatively transfer a mistake into their practice without realizing it had been poor practice, repeat mistakes, focus only on the negative, or develop fixations. Research provides evidence that the debriefing process is the most important component of a simulation-based learning experience.

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Statement

All simulation-based learning experiences should include a planned debriefing session aimed toward promoting reflective thinking.

Rationale

Learning is dependent on the integration of experience and reflection. Reflection is the conscious consideration of the meaning and implication of an action, which includes the assimilation of knowledge, skills, and attitudes with pre-existing knowledge. Reflection can lead to new interpretations by the learner. Reflective thinking does not happen automatically, but it can be taught; it requires time, active involvement in a realistic experience, and guidance by an effective facilitator. The skills of the debriefer are important to ensure the best possible learning; learning without guidance could lead the learner to negatively transfer a mistake into their practice without realizing it had been poor practice, repeat mistakes, focus only on the negative, or develop fixations. Research provides evidence that the debriefing process is the most important component of a simulation-based learning experience.

Outcome

Integration of the debriefing process into simulation-based experience enhances learning and heightens participant self-confidence. Debriefing promotes understanding and supports transfer of knowledge, skills, and attitudes with a focus on best practices to promote safe, quality patient care.

Criteria

To achieve the desired outcomes, the effective debriefing process is:

1. Facilitated by a person(s) competent in the process of debriefing.
2. Conducted in an environment that is conducive to learning and supports confidentiality, trust, open communication, self-analysis, and reflection.
3. Facilitated by a person(s) who observes the simulated experience.
4. Based on a structured framework for debriefing.
5. Congruent with the participants' objectives and outcomes of the simulation-based learning experience.

Guidelines

Criterion 1: Facilitated by a Person(s) Competent in the Process of Debriefing

Guideline: Identify the process to achieve competency in debriefing.

Guideline Statement: Debriefing is a learner-centered reflective conversation. It is intended to assist learners in examining the meaning and implications of actions taken during a simulated experience. Through this process of understanding, new knowledge can be created. Reflective thinking does not happen automatically and requires guidance by an effective debriefing facilitator, commonly called a debriefer. Debriefing facilitators require skill both in diagnosing learning needs and managing optimal group processes to adjust the level of facilitation to that which is required by the group. For best outcomes during simulation-based experiences, debriefers should have formal training and competency assessment.

The debriefer should:

- Understand best practices in debriefing with regard to structuring the format of the debriefing and facilitating reflective discussion.
- Acquire specific education provided by a formal course, a continuing education offering, or targeted work with an experienced mentor.

- Validate competence through the use of an established instrument.
- Validate competence through input from both learners and experienced debriefers.
- Actively maintain debriefing skills through practice in simulation-based experiences.

Criterion 2: Conducted in an Environment That Supports Confidentiality, Trust, Open Communication, Self-Analysis, and Reflection

Guideline: Create a safe environment for participant debriefing.

Guideline Statement: Although active learning educational methods such as simulation promote learning, these strategies may be stressful and cause feelings of anxiety.

Therefore, to create a safe environment for the debriefing process, in an effort to achieve desired outcomes, the debriefer should:

- Orient the participants to the overall objectives and purposes of the debriefing process.
- Establish expectations regarding confidentiality of participants' work, the content of the simulation scenario, and the content of the debriefing process.
- Develop rules of participant conduct concerning constructive, honest, yet respectful feedback.
- Demonstrate positive regard for participants.
- Encourage participants' reflection related to personal culture, background, experiences, personality, skills, and knowledge.
- Use verbal and nonverbal supportive demeanor to encourage discussion.
- Allow sufficient time for the early reaction phase of the debriefing process to elicit the participants' emotional response and their primary concerns prior to engaging in an analysis of actions.
- Explore the participants' perspectives and understandings of the situation to close gaps between actual and desired performance.
- Engage both participant observer and active participants in debriefing to support collaborative learning.

Criterion 3: Facilitated by a Person(s) Who Observes the Simulated Experience

Guideline: Identify the facilitator's responsibilities during the debriefing process.

Guideline Statement: The role of the facilitator during the debriefing process is to guide the participants as they reflect on the events of the simulated experience and the actions taken or not taken during the event. The discussion should be guided by the participant objectives with the aim of closing the gap between the desired and actual performance of the participants through constructive feedback or debriefing. (See ''Standard III: Participant Objectives,'')

The debriefer should:

- Establish a climate of professional respect, including a requirement for confidentiality related to the content of the debriefing discussions.
- Outline the process for debriefing, including the expectation that the discussion will be driven by the participants as they critically analyze their own performance.
- Facilitate participants' engagement in the reflective process.
- Adjust the level of facilitation needed to engage every participant in discussion.
- Provide constructive feedback or debriefing based on participants' decisions and actions, including reinforcing positive behaviors, correcting misunderstandings, and clarifying cognitive frames that led to incorrect decisions.
- Assist participants in conceptualizing how the learning constructed during the simulation and debriefing can be applied to future clinical situations.
- Summarize learning at the end of the debriefing process

Criterion 4: Based on a Structured Framework for Debriefing

Guideline: Identify the structural elements of debriefing to include the optimal time and duration required to achieve the objectives.

Guideline Statement: The optimal time length for a debriefing session depends on the objectives and type of simulation-based experiences. An experience designed for novice-level critical thinking and skills demonstration may require only constructive feedback and guided reflection. Complex simulation-based experiences that require clinical judgment or reasoning while demonstrating skill competency or are emotionally charged require debriefing sessions of longer duration. The longer time period is required to facilitate deeper thinking and critical reflection. Additionally, a period of self-reflection after the debriefing session may be necessary to achieve desired objectives. Therefore, the optimal time and duration of debriefing should be flexible.

The debriefer should:

- Create a safe and supportive environment (See Criteria 5).
- Use the appropriate style of debriefing (including video playback) based on participant objectives (See Criteria 4).
- Allow progression through the phases of debriefing (reaction, analysis, and summary).
- Allow unexpected topics to be addressed.
- Facilitate appropriate clinical judgment, reasoning, and reflection.
- Allow facilitation to be modified based on assessed participant needs and the impact of the experience.
- Allow for postdebriefing activities that promote self-reflection and critique.

Criterion 5: Congruent with the Participants' Objectives and Outcomes of the Simulation-Based Learning Experience

Guideline: Focus debriefing on the participant objectives and outcomes.

Guideline Statement: Debriefing should be based on preset participant objectives and the outcomes of the simulation-based experience. Participant objectives guide the development and appropriate implementation of the experience, whereas outcomes provide an assessment of the participant's performance and clinical judgment or reasoning based on the predetermined objectives or critical events that occurred during the simulation-based experience.

The debriefer should:

- Consider participant objectives in the debriefing session.
- Facilitate participant's identification of strengths in performance and clinical judgment or reasoning.
- Identify performance gaps based on the outcomes of the simulation-based experience at the end of the debriefing session.
- Recommend activities to alleviate identified performance gaps at the end of the debriefing session.

Original INACSL Standard VI Reference

The INACSL Board of Directors. (2011, August). Standard VI: The debriefing process. *Clinical Simulation in Nursing, 7*, s16-s17.

Supporting Materials

Arafeh, J. R., Hansen, S., & Nichols, A. (2010). Debriefing in simulated-based learning: Facilitating a reflective discussion. *Journal of Perinatal & Neonatal Nursing*, *24*(4), 302-309.

Boud, D., Koegh, R., & Walker, D. (1985). Promoting reflection in learning: A model. In D. Boud, R. Keogh, & D. Walker (Eds.), *Reflection: Turning experience into learning* (pp. 18-40). London: Kogan Page.

Decker, S., & Dreifuerst, K. T. (2012). Integrating guided reflection into simulated learning experiences. In P. Jeffries (Ed.), *Simulation in nursing education from conceptualization to evaluation* (2nd ed.). (pp. 91-104) New York: NLN.

Decker, S., Gore, T., & Feken, C. (2011). Simulation. In T. Bristol, & J. Zerwekh (Eds.), *Essentials of E-learning for nursing educators*. Philadelphia: F.A. Davis Company. pp. 277-294.

Dismukes, R. K., & Smith, G. M. (2000). *Facilitation and debriefing in aviation training and flight operations*. Burlington, VT: Ashgate.

Dreifuerst, K. T. (2009). The essentials of debriefing in simulation learning: Concept analysis. *Nursing Education Perspectives*, *30*, 109-114.

Dreifuerst, K. T., & Decker, S. (2012). Debriefing: An essential component for learning in simulation pedagogy. In P. Jeffries (Ed.), *Simulation in nursing education from conceptualization to evaluation* (2nd ed.). (pp. 105-130) New York: NLN.

Fanning, R. M., & Gaba, D. M. (2007). The role of debriefing in simulation-based learning. *Simulation in Healthcare*, *2*, 115-125.

Gaba, D. M. (2004). The future vision of simulation in healthcare. *Quality Safety in Health Care*, *13*, i2-i10.

Glaze, J. (2002). Stages in coming to terms with reflection: Student advanced nurse practitioners' perceptions of their reflective journeys. *Journal of Advanced Nursing*, *37*, 265-272.

Imperial College of London. (2012). *The London handbook of debriefing*. London: National Health Services.

Murphy, J. I. (2004). Using focused reflection and articulation to promote clinical reasoning: An evidence-based teaching strategy. *Nursing and Health Care Perspectives*, *25*, 226-231.

Neill, M. A., & Wotton, K. (2011). High-fidelity simulation debriefing in nursing education: A literature review. *Clinical Simulation in Nursing*, *7*(5), e1-e8. http://dx.doi.org/10.1016/j.ecns.2011.02.001.

Paget, T. (2001). Reflective practice and clinical outcomes: Practitioners' views on how reflective practice has influenced their clinical practice. *Journal of Clinical Nursing*, *10*(2), 204-214.

Rudolph, J. W., Simon, R., Dufresne, R. L., & Raemer, D. B. (2006). There's no such thing as "nonjudgmental" debriefing: A theory and method for debriefing with good judgment. *Simulation in Healthcare*, *1*(1), 49-55.

Rudolph, J. W., Simon, R., Raemer, D. B., & Eppich, W. J. (2008). Debriefing as formative assessment: Closing performance gaps in medical education. *Academic Emergency Medicine*, *15*(11), 1010-1016.

Wong, F. K. Y., Kember, D., Chung, L. Y. F., & Yan, L. (1995). Assessing the level of student reflection from reflective journals. *Journal of Advanced Nursing*, *22*(1), 48-57.

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Review Article

Best Practice Recommendations for Debriefing in Simulation-Based Education for Australian Undergraduate Nursing Students: An Integrative Review

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KEYWORDS
simulation;
simulation-based training;
debrief;
critical thinking;
nursing students;
health professionals

Abstract

Background: An integral and possibly the most important component of the simulation-based learning is the debriefing process. It is desirable to then examine the literature to determine best practice guidelines.

Method: This integrative literature review searched several relevant online databases including Joanna Briggs Institute, Cochrane Library, MEDLINE, CINAHL, Psych Info, Science Direct, ProQuest, Ovid, and Web of Science. Libsearch, Google Scholar, and Google were also searched to capture relevant literature and research. As a systematic review of randomized control studies already existed in Joanna Briggs Institute (2012), it was decided to include that study and limit the search to only those articles published after 2012.

Results: There were eight predominant themes that emerged from the literature reviewed regarding the best practice guidelines for debrief phase in simulation-based education: (a) types of debriefing (video assisted and facilitator only), (b) debrief in simulation versus postsimulation, (c) environment in which the debrief takes place, (d) the person who should facilitate the debrief, (e) assessment and training of the person who debriefs, (f) identification of the learning outcomes, (g) method of debrief, and (h) structure of the debrief.

Conclusion: Following an extensive literature review, it was established that there were eight best practice recommendations to facilitate the debrief process. The integrative review strongly suggested that a safe, structured debrief following the simulation immersion is aligned to best practice. Best practice in simulation is conducive to promoting clinical psychomotor skills and knowledge.

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Introduction

The use of simulation in the education of health professionals began in the 1960s and has evolved at an unprecedented pace (Levett-Jones & Lapkin, 2014). Simulation is defined as a technique to "replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion" (Gaba, 2004, p. i2). In some countries, it is even a mandated part of the curricula, due in part to the increased complexity of patients, the need to manage risk and patient safety, and the intense competition for quality clinical placements for students (Anderson, Bond, Holmes, & Cason, 2012).

Key Points

- Debriefing is an essential component of simulation-based learning.
- Debriefing requires a structure framework.
- Video-assisted and facilitator only debrief are both equally effective techniques.

An integral and possibly the most important component of simulation-based learning is the debriefing process (Dreifuerst, 2012; Edgecombe et al., 2013; Health Workforce Australia, 2010). Within the debriefing process, theory is connected to practice; reflection, critical thinking, and clinical reasoning take place; and learning is maximized (Edgecombe et al., 2013).

Debrief, despite being such an important area, and potentially the most important area for the innovative, educational pedagogy of simulation-based-learning, has not received the attention it deserves. This integrative review attempts to synthesize the evidence and determine best practice in simulation.

Background and Rationale

Simulation-based learning has been adopted by education institutions at a remarkable pace, and it is a mandated part of nursing curricula in New Zealand and the United States (Edgecombe et al., 2013). In Australia, Health Workforce Australia (HWA) was established in 2008 by the Council of Australian Governments, with the predominant aim of delivering national health reform. An overarching aim of this reform was to expand health simulated learning environments by optimizing simulation training experiences to enhance the development of theoretical skills and clinical competencies required by health professionals pre- and post-registration (HWA, 2010). This was as a direct result of the increasing concerns for patient safety and the decreased opportunity for experiential learning in a clinical placement environment (Imperial College of London, 2012). It is important to note that the use of simulators alone does not equate to high-quality training, and it is the role of feedback and debriefing that enables the learner to integrate their learning experience (Imperial College of London, 2012). Debriefing provides the process whereby the students develop their clinical reasoning through reflection and metacognition (Mariani, Cantrell, Meakim, Prieto, & Dreifuerst, 2013). Effective debriefing links theory to practice and research and enables students to critically think and to intervene professionally in complex situations (Anderson et al., 2012; Jeffries, 2005). Debriefing is elevated to the most important component of the simulation-based learning experience (Decker et al., 2013). It is an "integral part of the experience and creates the platform where critical thinking and learning integration takes place" (Levett-Jones & Lapkin, 2014, p. 1). Despite debriefing being common practice postsimulation, conflicting views exist as to what is most appropriate or best practice. Through an integrative literature review, this article will aim to establish best practice for debriefing in simulation using high-fidelity mannequins and standardized patients.

Research Question

The research question "What is the best practice for debriefing simulation-based education for undergraduate nursing students?" was used to guide the research strategy. An approach identified by Sackett et al. (1997)—PICO—was used to describe the elements of the research question to be considered: *P*, *for patient or problem*; *I*, *intervention or interest*; *C*, *for comparison*; and *O*, *for outcome*.

In relation to this integrative review, these components were as follows: P = nursing students, I = debriefing with simulation-based education, C = no comparison was required as the review was aimed at determining best practice, and O = to identify best practice guidelines for debrief facilitation in simulation-based learning.

Search Strategy

This integrative literature review searched several relevant online databases including Joanna Briggs Institute (JBI), Cochrane Library, MEDLINE, CINAHL, Psych Info, Science Direct, ProQuest, Ovid, and Web of Science. Libsearch, Google Scholar, and Google were also searched to capture relevant literature and research (Figure).

The search terms used included *simulation*, *debrief*, and *health professionals* along with variations of these words that resulted in 2,434 responses. The terms were then combined using the Boolean operator "AND" and further reduced. As a systematic review of randomized control studies already existed in JBI (2012), it was decided to include that study and limit the search to only those articles published after 2012.

The resulting abstracts of 435 studies were included if they contained all defined search terms. One seminal article was also included in the review that was Jeffries (2005) framework for simulation. Studies were then excluded if they contained only computer-based simulation, low-fidelity simulation, and military or aviation studies. This resulted in 21 articles being integrated in the review (Table 1).

Data Analysis

All articles that met the inclusion criteria were analyzed separately by the first author. The predominant findings of each article were then compared across all articles to identify similarities and differences in debriefing techniques, targeted student groupings, and recommendations and/or guidelines. The Joanna Briggs Institute Hierarchy of Evidence (2014) was used to guide the author in determining the rigor and methodological quality of the included literature and assist in establishing clinical bottom line and best practice guidelines. It is important to note that the author is not a JBI reviewer (Table 2).

Results

Given the range of debriefing methods used and the great variation of outcomes, the findings were synthesized and presented in themes. Essentially, the results of this integrative review found there were eight predominant themes that emerged from the literature reviewed regarding the best practice guidelines for debrief phase in simulation-based education. These themes included (a) *types of debriefing (video assisted and facilitator only)*, (b) *debrief in simulation versus postsimulation*, (c) *environment in which the debrief takes place*, (d) *the person who should facilitate the debrief*, (e) *assessment and training of the person who debriefs*, (f) *identification of the learning outcomes*, (g) *method of debrief*, and (h) *structure of the debrief*.

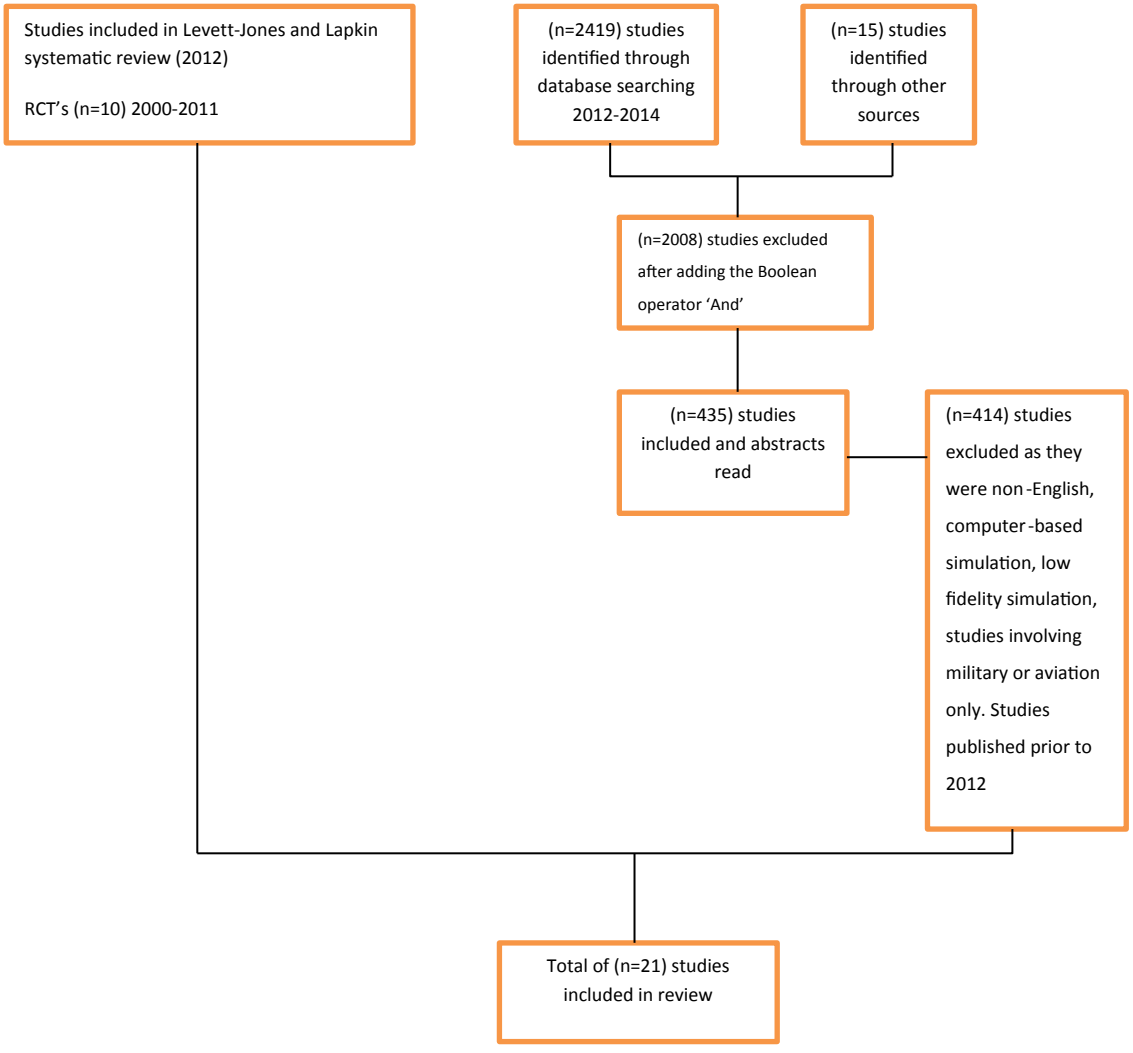

Figure Search progression.

Table 1 Search Strategy

Electronic Databases (n = 426)	Search Engines (n = 9)
JBI (n = 1) Cochrane (n = 0) MEDLINE (n = 138) ProQuest (n = 56) Web of Science (n = 22) CINAHL (n = 28) Psych Info (n = 33) Science direct (n = 36) Ovid (n = 103)	TRIP (n = 0) NICE (n = 1) Google (n = 1) Google Scholar (n = 2) Libsearch (n = 3) Library search (n = 2)

Keywords			
Simulation Simulation based-training Clinical simulation Healthcare simulation	Debriefing Debrief Reflection Reflective thinking Clinical reasoning	Critical thinking Critical reasoning Clinical judgment Feedback	Health professionals Medical students Nursing students Psychologists

Inclusion Criteria	Exclusion Criteria
English Published between 2012 and 2014	Non-English Computer-based simulation Low-fidelity simulation Studies involving military or aviation only. Studies published prior to 2012

Final Included Articles (n = 21)	Organizational and Government Literature/Guidelines
JBI (n = 1) Cochrane (n = 0) MEDLINE (n = 2) ProQuest (n = 4) Web of Science (n = 3) CINAHL (n = 0) Psych Info (n = 0) Science direct (n = 5) Ovid (n = 2) Google scholar (n = 1)	HWA AKO National Centre for tertiary teaching excellence Imperial College London

Note. HWA = Health Workforce Australia; JBI = Johanna Briggs Institute.

These themes are briefly discussed in the following sections.

Type of Debriefing

A systematic review by Levett-Jones and Lapkin (2012) found that four of six randomized control studies identified no statistically significant difference between facilitator-only and video-assisted debriefing in achieving learning outcomes. Similar results were found in a systematic review on simulation-based training in anesthesiology (Lorello, Cook, Johnson, & Brydges, 2014).

A study by Grant, Moss, Epps, and Watts (2010) involving 40 anesthetia and nursing students who were randomly assigned to experimental and control groups found no statistical difference on total performance scores between the experimental group receiving video-assisted debriefing and the control group that received facilitator-assisted debriefing. Similarly, a study by Chronister and Brown (2012) on 37 undergraduate nursing students participants also randomly assigned participants to a control group who undertook 30 minutes of facilitated debrief or an experimental group with video-assisted debrief. The outcomes of interest were response times, quality of skills, and knowledge retention. Response time was higher in the experimental group, but retention was higher in the control group. Quality of skills remained the same for both groups (Levett-Jones & Lapkin, 2012).

These findings were further supported in a study by Reed, Andrews, and Ravert (2013) that used a quasi-experimental design to compare the experiences of 64 undergraduate nursing students who were participating in simulations that were part of their intensive care course. These students had previously participated in six to seven

Table 2 Review of the Literature

Author/Year	Purpose of the Study	Methodology/Sample	Results
Anderson et al. (2012)	To describe how conference participants rated their level of proficiency with simulation skills and how these skills were obtained and preferred learning styles	Descriptive study surveying 58 individuals who attended a simulation conference in St Louis, MO (2009), majority 95% using simulation-based learning	Learning from someone skilled in simulation was the best way to learn the skills
Buckley et al. (2012)	To compare student perceptions pre and post interprofessional simulation	Qualitative pre- and postsimulation survey (n = 191), medical students (n = 86), nursing students (n = 71), ODP, physiotherapy and radiology students (n = 34)	Increased understanding and confidence Most students reported video feedback was helpful All students reported verbal feedback from peers, role-players, and facilitators was useful Recommended a need for a safe environment for feedback
Decker et al. (2013)	To define the standard of best practice in simulation	Guidelines	All simulation experiences should include a planned debriefing session Facilitators should be competent in the process of debriefing The environment should support confidentiality Facilitated by the person who observes the experience Based on a structured framework It should be congruent with participants objectives and outcomes
Dreifurst (2012)	The relationship of DML on development of clinical reasoning skills in nursing	Exploratory quasi-experimental pre- and posttest study (n = 238)	DML is successful in teaching nurses' clinical reasoning skills
Dufrene and Young (2014)	Explore options for debriefing	Literature review (n = 9)	Recommended teacher-assisted debrief The person who facilitates the SLE should perform the debrief The facilitator should be trained in debrief
Edgecombe et al. (2013)	To establish guidelines for teaching and learning using clinical simulation for undergraduate nurses	Literature review of 13 studies from policy, regulatory and strategic literature, or systematic and literature reviews	Debriefing is essential to simulation-based learning. Debriefing needs to be structured Debrief needs to be based on learning outcomes Debrief needs to be in a safe environment The debrief person needs knowledge about debriefing

(*continued on next page*)

Table 2 (*continued*)

Author/Year	Purpose of the Study	Methodology/Sample	Results
Gardner (2013)	An introduction to debriefing and an approach to evaluate debriefing skills of the facilitators	Narrative discussion	Debriefing is required post scenario Three-stage reaction, understanding, and summary A safe environment is needed Confidentiality is required Acknowledging the skills learnt is needed Use of DASH tool to rate the debriefer
Health Workforce Australia (2010)	Review of simulation-based learning in nursing	Literature review	Increased psychomotor skills Need for enhanced collaboration, shared resources, and the development of a pool of "best practice" resources for general usage (e.g., scenarios, software) and where a community can share experiences and learn from the experience of others
Imperial College of London (2012)	Evidence-based, user-informed tools for conducting and assessing debriefings in clinical and simulated settings	Handbook for debriefing	Identified SHARP tool for feedback and debrief OASD for assessing quality of debrief
Jaeger (2012)	To determine how high-fidelity simulation enhances clinical reasoning skills in undergraduate nursing programs	Qualitative design: case study (n = 10). Interviews conducted with five schools of nursing one faculty member and one simulation facilitator from each school	Debriefing was considered the most important component of the simulation process Debriefing enhances clinical reasoning
Jeffries (2005)	A framework to design, implement, and develop simulation in nursing	Descriptive	Jeffries model for simulation (framework) Debriefing takes place at the end of the session
Kelly et al. (2014)	Explore students' opinions about "what matters most" in the design and deliver of simulation	Quantitative descriptive study (n = 150)	Simulation enhances learning Facilitated debrief enhances critical thinking Reflection enhances critical thinking and ranked second to debriefing
Levett-Jones and Lapkin (2012)	To identify, appraise, and synthesize the best evidence for debriefing in simulation-based learning	Systematic review of 10 randomized controlled studies, 2002-2011	No clinical or practical differences in outcomes between facilitator only or facilitator and video-enhanced debriefing
Levett-Jones and Lapkin (2014)	To identify, appraise, and synthesize the best evidence for debriefing in simulation-based learning	Systematic review of 10 randomized controlled studies, 2000-2011	Debrief contributes to effective learning Video-assisted leaning offers no educational advantage over instructor only debriefing
Lorello et al. (2014)	Comparison between simulation-based learning, no intervention, and	Systematic review on PRISMA standards of quality for meta-analyses (n = 77)	Little difference between video assisted and facilitator only debriefing

	nonsimulation instructional approaches in anesthesiology		High-fidelity mannequins did not necessarily add value to the training
Lusk (2013)	Explores strategies that optimize after simulation as a means to promote clinical judgment in nursing students	Literature review 2004-2012 and 22 articles are included in the review	Simulation provides the context to develop practical knowledge Debrief the context to organize information so that it can be applied in clinical situations Developed a framework of reflecting, noticing, interpreting, and responding (Tanners model)
Mariani et al. (2013)	Explores strategies to debrief and promote clinical reasoning in nursing students	Literature review of 27 articles including 3 systematic reviews	Debriefing is needed to develop clinical reasoning It needs to be structured Small group sizes Clear learning outcomes Sufficient time allotted
Pivec (2011)	To design a debriefing tool to be used after simulation	Literature review	Safe environment required for debriefing Debrief should occur immediately after the simulation The facilitator needs to be competent Confidentiality required
Reed et al. (2013)	To evaluate the nursing students' experience during debriefing using video-assisted debriefing or facilitator-only debriefing	Quasi-experimental study design. Nursing students (n = 64)	Neither debriefing method was superior with video of facilitator only
Rudolph et al. (2013)	Strategies to avoid the task-versus-relationship dilemma and debrief more effectively	Case study	Nonjudgmental, honest feedback. Normalizing difficulties
Williamson et al. (2013)	To describe a simulated general practice clinic for medical students	Case study	This clinic offers students to engage without observation and SPs give feedback. Student feedback is overwhelmingly positive.

Note. DML = debriefing for meaningful learning; OASD = objective structured assessment of debriefing; ODP = Operating Department Practice; PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses; SLE = simulated learning environment; SP = simulated patients.

Table 3 Debrief Models

Model or Author-Identified Phases	Beginning/Introduction/Opening
National League for Nursing Simulation Innovation Resource Center (Anderson, 2008)	Middle
	Closing/Summary
The Mayo Clinic Model for Debriefing (Mayo Clinic, n.d.)	Experience
	Reflection
	Conceptualization
	Experimentation
Plus-Delta (Decker et al., 2013, Jeffries, 2010)	What went well
	What would like to change
	How to change
Advocacy-Inquiry (Decker et al., 2013, Jeffries, 2010)	Statement of observation followed by probing question of inquiry/why
Lederman (1992)	Systematic reflection and analysis
	Intensification and personalization
	Generalization and application
GREAT (Owen & Follows, 2006)	Guidelines
	Recommendations
	Events
	Analysis
	Transfer
Fanning and Gaba (2007)	Description
	Analogy/analysis
	Application
Dreifuerst (2010)	Engage
	Explain
	Elaborate
	Evaluate
	Extend
3D Model of Debriefing (Zigmont et al., 2011)	Defusing
	Discovering
	Deepening
SHARP (Edgecombe et al., 2013)	Set learning goals
	How did it go
	Address concerns
	Review learning points
	Plan ahead future practice

simulations with facilitator-only debriefs. None had participated in video-assisted debrief. They were randomized into two groups: 32 participants who received debriefing with video and 32 who received facilitator-only debriefing. The simulation went for 1 hour and debrief for 25 minutes, with 5 minutes allowed to get to the debrief room. Data were collected using the ''debriefing experience scale,'' which consisted of 20 questions divided in 4 subscales. Statistically significant differences were found in only 3 out the 20 items Debriefing with video had the higher means in two of the questions and debriefing alone in one. After analysis with an independent sample t-test, the authors concluded that neither debriefing with video or debriefing alone is superior (Reed et al., 2013).

Debrief in Simulation Versus Post Simulation

Van Heukelom, Begaz, and Treat (2010) conducted a randomized control study on 161 third-year medical students who were randomly assigned into two groups: in-simulation debrief and postsimulation debrief. Learning objectives, critical actions in the simulation, and type of debrief they would be assigned to were discussed prior to the simulation. One scenario involved a patient with sinus tachycardia elevation myocardial infarction who deteriorated to ventricular fibrillation and the other a third-degree atria ventricular block who required cardiac pacing. The 84 students in the control group were provided immediate feedback during the simulation—a ''pause and discuss'' experience. The experimental group, comprising 77 students, were given comprehensive instructor-facilitated debriefing after the simulation. Results showed that both groups showed significantly higher postsimulation means and then presimulation means, both in self-reported knowledge and confidence on a Likert-scale survey. The postsimulation experimental group, however, reported more effective learning and a better understanding of the correct and incorrect actions. Overall, postsimulation

debriefing was more effective than the debriefing that occurred during simulation ($p = .001$), suggesting that postsimulation debrief was more effective (Levett-Jones & Lapkin, 2012).

Cantrell (2008), in a focus group study of nursing students (n = 11) who participated in teacher-facilitated debrief immediately following the first two simulations and with video-assisted debrief following the third, reported that they preferred to participate in debriefing immediately following simulation because the activity was fresh in their memory, and they felt the method of debrief was less important than the timing (Dufrene & Young, 2014). Similarly, Bond et al. (2004) in their study of emergency medicine residents (n = 15) found one of the themes that emerged was that feedback was seen as more desirable following the simulation experience (Dufrene & Young, 2014).

Environment in Which the Debrief Takes Place

There is significant evidence that experiential learning causes feelings of anxiety in the learner and as such it remains important to create a safe environment for participant debrief (Decker et al., 2013). Furthermore, Decker et al. (2013) suggest that it is made clear that there is an expectation of confidentiality in regards to the simulation scenarios, the participant's actions, and debrief discussions. Rules of conduct must also be clear concerning constructive, honest, and respectful feedback. Sufficient time needs to be allocated in the early phase of reaction in debrief to elicit emotional and cultural responses (Chung, Dieckmann, & Saul, 2013), and personal responses and experiential reflections should be explored (Dreifuerst, 2012). There is a need for both participants and observers to be active in the debrief process (Decker et al., 2013). Gardner (2013, p. 170) supports the importance of the environment and the reassurance that debriefing is confidential—a ''zone of safety.'' The need for confidentiality was elaborated on by Rudolph et al. (2013), who contends that a safe environment is needed to discuss openly and honestly. This can be addressed by stating upfront that simulation can be confusing and developing a contract with rules for engagement and confidentiality (Dreifuerst, 2012). Pivec (2011) also suggested that confidentiality remains paramount and may well be established by a confidentiality agreement, and the debrief environment should be separate from the simulation where possible.

The Person Who Should Facilitate the Debrief

The International Nursing Association for Clinical Simulation and Learning, in their best practice guidelines for debriefing (2011), states that the simulation debrief should be done by the person who observes the clinical experience with the aim of closing the gap between desired and actual performance (Decker et al., 2013; Edgecombe et al., 2013). The standard practice in simulation is for educators to observe the simulation and the same educators to debrief: observing guides the facilitator on how to review actions, decisions, and judgments of the participants (Dufrene & Young, 2014; Lusk, 2013).

Training of the Debrief Facilitator

Debriefing facilitators require skill in diagnosing the learning needs of participants and the ability to adjust the level of facilitation needed for the group. They should have formal training and assessment (Decker et al., 2013). Competency should be validated through input from learners, those experienced in debrief and assessment instruments. The facilitator also needs to practice in simulated environments (Decker et al., 2013).

Rall, Manser, and Howard (2000) found in a study of 14 participants that debriefing is essential to successful learning, and poorly performed debriefing can result in misinformation, bad habits, humiliation, and decreased involvement and motivation in participants (as cited in Pivec, 2011). Gardner (2013) suggests that skills for debriefing should be refined through ongoing educational activities, peer assessments, and self-education. Educators need to understand the debriefing process (Dufrene & Young, 2014; Gardner, 2013).

Identification of Learning Outcomes

Debriefing should be based on the preset learning outcomes of the simulation experience (Decker et al., 2013). These set the expectations for the debrief and define the standard of performance expected of the learner (Rudolph, Simon, Raemer, & Eppich, 2008). This is supported by the Imperial College London Handbook for debriefing (2013). This handbook outlines basic principles for high-quality debrief based on a comprehensive literature review and an international interview study of debriefing experts using their SHARP tool. It recommends setting learning objectives before the simulation and reviewing these learning outcomes during debrief: ''Learning objectives are imperative to enable the student to build their knowledge base and provide a more focused and deeper learning experience that promotes critical thinking and clinical reasoning'' (Edgecombe et al., 2013, p. 12).

In a study conducted on 68 junior nursing students experiencing a 20-minute simulation with high-fidelity mannequins, self-confidence and satisfaction with simulation experience were assessed using a student's satisfaction and self-confidence in learning five-point Likert scale. The results clearly indicated the need for clear objectives and increased learning when these objectives could be linked to their actions in debrief (Smith & Roehrs, 2009).

Method of Debrief

There are many different debrief models; however, the scarce amount of research into this area does not allow for the establishment of best model. What is clear is that debriefing should be based on a structured framework; it should allow learner to progress through the identified phases of debrief: reaction, analysis, and summary or other similar phases and frames identified (Decker et al., 2013; Mariani et al., 2013).

Fanning and Gaba (2007) suggest that debriefing follows a constructivist teaching strategy focusing on what was done correctly and what would they do differently evoking deductive and inductive thinking (Rudolph et al., 2008). It involves a description of the events including reactions, analogy or analysis of students' perspectives, assumptions and goals, and application to future learning (Gardner, 2013).

Similarly, Advocacy-Inquiry (Decker et al., 2013; Jeffries, 2010) begins with an observation or inquiry and again utilizes a constructivist model to explore participant's actions assumptions and understandings to determine application and critical thinking.

Plus Delta (Decker et al., 2013; Jeffries, 2010) requires that the debrief explores what went well? (Plus column), what did not go well? (Delta column), and how to change? This technique benefits debrief that has only a short amount of time available for delivery and aims to explore how systems function rather than frames (Levine, DeMaria, Andrew, & Sim, 2013). When combined with Advocacy-Inquiry, it lends well to team and individual learning.

Dreifuerst (2012) found that structured debriefing for meaningful learning (DML) had a positive influence on the development of clinical reasoning skills in undergraduate nurses. It guided the student through clinical reflection using a structured process of engage, evaluate, explore, explain, elaborate, and extend. This study involved 238 nursing students who were allocated either to the control group using customary debrief structure or to an experimental group using DML. Results were compared using the Health Sciences Reasoning Test. Statistically significant higher scores were found posttest on those in the experimental group using DML (Mariani et al., 2013). Mariani et al. (2013) conducted a mixed method study on 86 junior level nursing students who were assigned to either a control group experiencing standard debriefing postsimulation or the experimental group who received DML debriefing postsimulation. The students were assessed on four components of clinical judgment: noticing, interpreting, responding, and reflecting using the Lasater Clinical Judgment Rubric that has interrater reliability of 0.97. In this study, no statistical difference was found. A focus group comprising of 60-minute interviews found that all students from both groups reported debriefing regardless of type assisted them with their learning.

The SHARP tool was established by the Imperial College of London (2012) to provide a pneumonic to ensure that debriefers covered the basics in debrief, determined after reviewing the literature and employing a qualitative study of (n = 33) semi-structured interviews with surgeons, anesthesiologists, and operating room nurses from the United Kingdom, United States, and Australia. SHARP tool involves: setting the learning goal, how did it go, addressing the concerns, reviewing learning points, and planning ahead for future practice.

Similarly, GREAT (Owen & Follows, 2006) utilizes a pneumonic to ensure the basics of debrief are adhered to Guidelines that ensure the facilitator has followed evidence-based practice, and if these are not available the facilitator has used the best Recommendations from published reviews. Events involve ensuring participants have adequate time to reflect, Analysis, and the Transfer knowledge (Owen & Follows, 2006).

The 3D model (2011) explores reactions to the experience, analysis of behavior, and synthesis of knowledge by Defusing emotions and reactions, Discovering possible alternative responses, and Deepening by connecting to new learning (Zigmont, Kappus, & Sudikoff, 2011).

Lederman (1992) identified seven elements of the debriefing experience: the debriefer, the participants, the experience, the impact of the experience, the recollections and reporting of the experience, and the time to process it. All are addressed during the three phases of reflection and analysis, intensification and personalization, and generalization and application, exploring the experience, the meanings for them, and broadening these to other experiences.

The Anderson (2008) model of debriefing was adopted by the National League of Nursing for their Simulation Innovation Resource Center. It simplifies the process to ensure there is a beginning or introduction, middle, and closing or summary. It offers the ability to integrate several other models into this structure to allow for more guidance.

The last model identified is the Mayo Clinic model of debriefing that is based on the Kolb Learning style (2005) and leads the student through experience, reflection, conceptualization, and experimentation (Pivec, 2011).

A synopsis of the different debriefing models identified during the integrative review can be found in Table 3.

Discussion

Taking into account the review of the literature, a clinical bottom line is established to determine best practice guidelines. Findings included the following:

- Debriefing is the most important component for developing clinical judgment in simulation-based learning (Kelly, Hager, & Gallagher, 2014). Debriefing is the most important component in knowledge acquisition

in simulation-based learning, resulting in significant increases in knowledge (Dufrene & Young, 2014). Debriefing after simulation-based learning for health care students leads to a significant increase in the confidence to care for the unstable patient (Buckley et al., 2012; Dufrene & Young, 2014).

Best practice: Debriefing is an essential component of simulation-based learning

- Facilitator-only debriefing is as effective as facilitator- and video-assisted debriefing in achieving learning outcomes (Levett-Jones & Lapkin, 2012, 2014; Lorello et al., 2014; Reed et al., 2013).

Best practice: Facilitator-only debriefing and video-assisted debriefing can both be used as effective techniques in debriefing.

- Debriefing is more effective when it immediately follows the simulated clinical experience in terms of knowledge and confidence (Dufrene & Young, 2014; Levett-Jones & Lapkin, 2012).

Best practice: Debriefing immediately follows the simulation-based learning activity.

- There is a need to create a safe environment and confidentiality for debriefing to be effective in simulation-based learning (Decker et al., 2013; Dreifuerst, 2012).

Best practice: A confidential safe environment is created to ensure that debriefing is effective for the learner.

- The debrief facilitator should be formally trained in debriefing (Decker et al., 2013; Dufrene & Young, 2014).
- The debrief facilitator's competency should be assessed through input from learners, practice in simulate environments, and assessment instruments (Decker et al., 2013; Gardner, 2013).

Best practice: The debrief facilitator receives formal training, feedback, assessment, and ongoing experience to ensure competency.

- The person who observes the simulation should be the person who facilitates the debrief (Decker et al., 2013; Dufrene & Young, 2014; Edgecombe et al., 2013).

Best practice: The debriefing is facilitated by the person who observed the simulation-based activity.

- Debriefing should be based on the preset learning outcomes (Decker et al., 2013; Rudolph et al., 2008, 2013).

Best practice: Debriefing is based on the preset learning outcomes.

- Debriefing should be based on a structured framework; however, researchers differ about which framework is most effective (Decker et al., 2013; Dreifuerst, 2012; Gardner, 2013; Mariani et al., 2013).

Best practice: Debriefing uses a structured framework.

Conclusion

There is no denying that simulation-based learning contributes to the development of much desired abilities of critical thinking and clinical reasoning for proficient health practitioners. The debrief phase of the simulation traditionally follows the main simulation exercise and is arguably the most important component of the activity. Following an extensive literature review, it was established that there are eight best practice recommendations to facilitate the debrief process. It was further found that although simulation-based learning creates a safe environment to develop clinical psychomotor skills and knowledge, dedicated research on the debriefing phase remains scant and further research is needed. Findings from this integrative review strongly suggested that a safe, structured debrief following the simulation immersion is aligned to best practice. Best practice in simulation is conducive to promote clinical psychomotor skills and knowledge.

References

Anderson, M. (2008). *Debriefing and guided reflection*. Retrieved from http://sirc.nln.org/mod/resource/view.php?id=168.

Anderson, M., Bond, M. L., Holmes, T. L., & Cason, C. L. (2012). Acquisition of simulation skills: Survey of users. *Clinical Simulation in Nursing*, *8*(2), e59-e65. http://dx.doi.org/10.1016/j.ecns.2010.07.002.

Bond, W. F., Deitrick, L. M., Arnold, D. C., Kostenbader, M., Barr, G. C., Kimmell, S. R., & Worrilow, C. C. (2004). Using simulation to instruct emergency medicine residents in cognitive forcing strategies. *Academic Medicine*, *79*(5), 438-446.

Buckley, S., Hensman, M., Thomas, S., Dudley, R., Nevin, G., & Coleman, J. (2012). Developing interprofessional simulation in the undergraduate setting: Experience with five different professional groups. *Journal of Interprofessional Care*, *26*(5), 362-369. http://dx.doi.org/10.3109/13561820.2012.685993.

Cantrell, M. A. (2008). The importance of debriefing in clinical simulations. *Clinical Simulation in Nursing*, *4*(2), e19-e23. http://dx.doi.org/10.1016/j.ecns.2008.06.006.

Chronister, C., & Brown, D. M. (2012). Comparison of simulation debriefing methods. *Clinical Simulation in Nursing*, *7*(8), e281-e288. http://dx.doi.org/10.1016/j.ecns.2010.12.005.

Chung, H. S., Dieckmann, P., & Saul, B. I. (2013). It is time to consider cultural differences in debriefing. *Simulation in Healthcare*, *8*, 166-170.

Decker, S., Fey, M., Sideras, S., Caballero, S., Rockstraw, L., Boese, T., …, & Borum, J. C. (2013). Standards of Best Practice: Simulation Standard VI: The Debriefing Process. *Clinical Simulation in Nursing*, *9*(6), S26-S29.

Dreifuerst, T. K., Jeffries, P. R., Horton-Deutsch, S. L., McNelis, A. M., & Pesut, D. J. (2010). Debriefing for Meaningful Learning: Fostering Development of Clinical Reasoning through Simulation. *ProQuest Dissertations and Theses*.

Dreifuerst, K. (2012). Using debriefing for meaningful learning to foster development of clinical reasoning in simulation. *Journal of Nursing Education*, *51*(6), 326-333. http://dx.doi.org/10.3928/01484834-20120409-02.

Dufrene, C., & Young, A. (2014). Successful debriefing—Best methods to achieve positive learning outcomes: A literature review. *Nurse Education Today*, *34*(3), 372-376. http://dx.doi.org/10.1016/j.nedt.2013.06.026.

Edgecombe, K., Seaton, P., Monahan, K., Meyer, S., LaPage, S., & Erlam, G. (2013). *Clinical simulation in nursing: A literature review and guidelines for practice*. Aotearoa: AKO National Centre for Tertiary Teaching Excellence.

Fanning, R., & Gaba, D. (2007). The role of debriefing in simulation-based learning. *Simulation in Healthcare: Journal of the Society for Simulation in Healthcare*, *2*(2), 115-125.

Gaba, D. M. (2004). The future vision of simulation in health care. *Quality and Safety in Health Care*, *13*(Suppl 1), i2-i10. http://dx.doi.org/10.1136/qshc.2004.009878.

Gardner, R. (2013). Introduction to debriefing. *Seminars in Perinatology*, *37*(3), 166-174. http://dx.doi.org/10.1053/j.semperi.2013.02.008.

Grant, J. S., Moss, J., Epps, C., & Watts, P. (2010). Using video-facilitated feedback to improve student performance following high-fidelity simulation. *Clinical Simulation in Nursing*, *6*(5), e177-e184.

Health Workforce Australia. (2010). *Use of simulated learning environments (SLE) in professional entry level curricula of selected professions in Australia*. Adelaide: HWA.gov.au. Retrieved from http://www.hwa.gov.au/sites/uploads/simulated-learning-environments-2010-12.pdf.

Imperial College of London. (2012). *The London handbook of debriefing*. London: National Health Services.

Jaeger, K. R. (2012). *Simulation enhancement of clinical reasoning skills in undergraduate nursing programs: Faculty perspectives*. (3536683 Ph.D.). Ann Arbor: University of Idaho. Retrieved from http://0-search.proquest.com.alpha2.latrobe.edu.au/docview/1318896191?accountid=12001 Retrieved from http://CM8EK7ZY3D.search.serialssolutions.com/?ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&rfr_id=info:sid/ProQuest+Nursing+%26+Allied+Health+Source&rft_val_fmt=info:ofi/fmt:kev:mtx:dissertation&rft.genre=dissertations+%26+theses&rft.jtitle=&rft.atitle=&rft.au=Jaeger%2C+Kathleen+Rae&rft.aulast=Jaeger&rft.aufirst=Kathleen&rft.date=2012-01-01&rft.volume=&rft.issue=&rft.spage=&rft.isbn=9781267953124&rft.btitle=&rft.title=Simulation+enhancement+of+clinical+reasoning+skills+in+undergraduate+nursing+programs%3A+Faculty+perspectives&rft.issn=.

Jeffries, P. R. (2005). A framework for designing, implementing, and evaluating simulations used as teaching strategies in nursing. *Nursing Education Perspectives*, *26*(2), 96-103.

Jeffries, P. (2010). The art of debriefing: How to conduct a guided reflection and its importance. Presentation. *Presented at the National League of Nursing Conference, Las Vegas, Nevada*.

Kelly, M. A., Hager, P., & Gallagher, R. (2014). What matters most? Students' rankings of simulation components that contribute to clinical judgment. *Journal of Nursing Education*, *53*(2), 97-101. http://dx.doi.org/10.3928/01484834-20140122-08.

Lederman, L. C. (1992). Debriefing: Toward a systematic assessment of theory and practice. *Simulation & Gaming*, *23*(2), 145-160. http://dx.doi.org/10.1177/1046878192232003.

Levett-Jones, T., & Lapkin, S. (2012). The effectiveness of debriefing in simulation-based learning for health professionals: A systematic review, *JBI Database of Systematic Reviews and Implementation Reports, 9* (64), 2014, 1-16. http://dx.doi.org/10.11124/jbisrir-2011-317.

Levett-Jones, T., & Lapkin, S. (2014). A systematic review of the effectiveness of simulation debriefing in health professional education. *Nurse Education Today*, *34*, e58-e63.

Levine, A., DeMaria, S., Andrew, D., & Sim, A. (2013). *The comprehensive textbook of healthcare simulation*. Dordrecht: Springer.

Lorello, G. R., Cook, D. A., Johnson, R. L., & Brydges, R. (2014). Simulation-based training in anaesthesiology: A systematic review and meta-analysis. *British Journal of Anaesthesia*, *112*(2), 231-245. http://dx.doi.org/10.1093/bja/aet414.

Lusk, J. M. (2013). Post simulation debreifing to maximize clinical judgement development. *Nurse Educator*, *38*(1), 3.

Mariani, B., Cantrell, M. A., Meakim, C., Prieto, P., & Dreifuerst, K. T. (2013). Structured debriefing and students' clinical judgment abilities in simulation. *Clinical Simulation in Nursing*, *9*(5), e147-e155. http://dx.doi.org/10.1016/j.ecns.2011.11.009.

Mayo Clinic, Basic debriefing principles (n.d.), Retrieved from http://www.mayo.edu/simulationcenter/Instructor_Development-Course.html.

Owen, H., & Follows, V. (2006). GREAT simulation debriefing. *Medical Education*, *40*, 488-489. http://dx.doi.org/10.1111/j.1365-2929.2006.02421.x.

Pivec, C. R. J. (2011). *Debriefing after simulation: Guidelines for faculty students*. (Master of Arts in Nursing). St Paul, MN: St Catherine University. Retrieved from http://sophia.stkate.edu/cgi/viewcontent.cgi?article=1013&context=ma_nursing&sei-redir=1&referer=http%3A%2F%2Fwww.bing.com%2Fsearch%3Fq%3Ddebriefing%2520after%2520simulation%2520guideline%26FORM%3DTSHPLB%26PC%3DMATP%26QS%3Dn#search=%22debriefing%20after%20simulation%20guideline%22.

Rall, M., Manser, T., & Howard, S. K. (2000). Key elements of debriefing for simulator training. *European Journal of Anaesthesiology. 17*, 516-517. http://dx.doi.org/10.1046/j.1365-2346.2000.00724-1.

Reed, S. J., Andrews, C. M., & Ravert, P. (2013). Debriefing simulations: Comparison of debriefing with video and debriefing alone. *Clinical Simulation in Nursing*, *9*(12), e585-e591. http://dx.doi.org/10.1016/j.ecns.2013.05.007.

Rudolph, J. W. P., Foldy, E. G. P., Robinson, T. R. N., Kendall, S. M. A., Taylor, S. S. P., & Simon, R. E. (2013). Helping without harming: The instructor's feedback dilemma in debriefing—A case study. *Simulation in Healthcare*, *8*(5), 304-316. http://sirc.nln.org/mod/resource/view.php?id=168.

Rudolph, J. W., Simon, R., Raemer, D. B., & Eppich, W. J. (2008). Debriefing as formative assessment: Closing performance gaps in medical education. *Academic Emergency Medicine*, *15*(11), 1010-1016. http://dx.doi.org/10.1111/j.1553-2712.2008.00248.x.

Sackett, D. L., Straus, S. E., & Richardson, W. S. (1997). *Evidence based medicine: How to practice and teach EBM* (2nd ed.). London: Churchill Livingstone.

Smith, S. J., & Roehrs, C. J. (2009). High-fidelity simulation: Factors correlated with nursing student satisfaction and self-confidence. *Nursing Education Perspectives*, *30*(2), 74-78.

The Joanna Briggs Institute Levels of Evidence and Grades of Recommendation Working Party. (2014). *Supporting document for the Joanna Briggs Institute levels of evidence and grades of recommendation*. Adelaide: The Joanna Briggs Institute. Retrieved from http://joannabriggs.org/assets/docs/approach/Levels-of-Evidence-SupportingDocuments.pdf.

Van Heukelom, J. N., Begaz, T., & Treat, R. (2010). Comparison of post simulation debriefing versus simulation debriefing in medical simulation. *Simulation in Healthcare*, *5*(92), 91-97. http://dx.doi.org10.1097/SIH.0b013e3181be0d17/.

Williamson, M., Walker, T., Egan, T., Storr, E., Ross, J., & Kenrick, K. (2013). The Safe and Effective Clinical Outcomes (SECO) clinic: Learning responsibility for patient care through simulation. *Teaching and Learning in Medicine*, *25*(2), 155-158.

Zigmont, J., Kappus, L., & Sudikoff, S. (2011). The 3D model of debriefing: Defusing, discovering, and deepening. *Seminars in Perinatology*, *35*(2), 52-58. http://dx.doi.org/10.1053/j/j.semperi.2011.01.003.

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Using debriefing and feedback in simulation to improve participant performance: an educator's perspective

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Background

As a clinical skills educator I am involved in the delivery of simulation based education for UK trained doctors in their first year post qualifying (Foundation Year 1 [FY1]). I have an interest in the use of feedback and debrief as a tool to improve performance through reflection.

When relating simulation to Kolb's[1] learning cycle it is evident that taking part in the simulated scenario only accounts for the concrete experience component. Debrief and feedback accounts for the reflective observation, abstract conceptualization and active experimentation components of the learning cycle by helping participants make sense of the simulation scenario and reflect on their practice to improve future performance.

Preparation for simulation

A simulation event took place in a hospital skills laboratory set up to resemble a patient bed space. All simulation scenarios involved the management of an acutely unwell patient. Each participant was an FY1 doctor and all participated in a simulation scenario followed by feedback from both faculty and the other participants attending the event.

Four participants attended the event in total. This small group size allowed for debate and discussion as well as helping students to feel relaxed and promoting interaction between the participants. All participants had completed their training in the UK so it was assumed they already had a threshold of knowledge and skills as documented by the General Medical Council (GMC).[2]

Prior to the simulation event individualized scenarios were developed relevant to each participant's current placement as it is important for the simulation to be appropriate for students' needs.[3, 4] It could be argued that by only focusing on what it is felt students "need to know" they are not experiencing a full breadth of learning. However, I consider that the scenarios delivered to the students are common emergency scenarios that could potentially be experienced across all disciplines of medicine.

Learning outcomes that fulfilled the requirements of the GMC[5, 6] were used as a basis for developing the simulations. Clear outcomes were set for the event so participants knew what knowledge; skills, attitudes and behaviours needed to be demonstrated.[3,8] The outcomes included both the technical and non-technical aspects of care delivery. Both of these aspects are imperative in delivering safe patient care [5-9] and are focused on critical thinking and problem solving. Discussing the learning outcomes at the beginning of the event enabled exploration of the importance of non-technical skills. In the future, I plan to ask the students what their objectives for the session are to increase participation, motivation and performance.[10] The HEA[11] recognizes that student centred learning increases student confidence and excitement about the subject.

Delivering the simulation

On the day of the simulation, students were given an overview of each of the faculty members' roles and information regarding the manikin's limitations and equipment being used. Identifying limitations before starting the scenarios improved fidelity[3] as the faculty didn't have to interrupt the scenario to acknowledge constraints.

Providing a pre-brief at the beginning of the session was useful and helped to facilitate reflective practice by preparing students for the discussion at the end of their scenario and making them aware of how they would receive their feedback.[12] It also alerted the students that they were equal partners in the feedback process and triggered internal feedback.[12, 13]

Each student was allocated a scenario and acted as the team leader whilst faculty acted as other members of the healthcare team. During the scenario the faculty observed the students' so that feedback could be given. However,direct observation does not facilitate in-depth exploration of clinical reasoning or problem-solving abilities.[14] In future sessions a member of the faculty will act as a medical

student to question the participant and determine their underpinning knowledge.

Debrief and feedback

After completing the individual scenarios, oral feedback was given to students by the faculty and their peers. Group feedback and peer learning are all effective assessment for learning tools.[11] Individuals can learn a lot through the experience alone but specific feedback will maximise learning.[15, 16]

Waiting until completion of the scenario before giving feedback allowed the participants to self-reflect and make sense of what had just happened. Facilitators and peers were then able to discuss the strengths and weaknesses of the student's performance without interrupting the scenario and decreasing scenario fidelity and allows participants to discuss the consequences of their actions.[15]

Feedback on the participant's performance is the most important feature of simulation education as it produces long lasting learning and allows the student to develop a deep insight and reflection about their performance as well as slowing the decay in knowledge.[3]

During debrief students discussed any emotions that they had about the simulation scenario as well as reflecting on and exploring their decision making processes. Giving oral feedback to students enabled the faculty to be flexible with their questioning, allowed an immediate response from the student and permitted clarification of any misunderstandings.[17] However, oral feedback does not allow the person giving feedback time to reflect on the student's performance.[18]

A criticism from one of the participants was that they would have liked written feedback for portfolio evidence. One option would be for the faculty to meet after the event, discuss each student's performance and then email individual feedback. However, this option would be time consuming and may not be feasible.

When giving feedback, the first question the student was asked was: "How do you feel that went?" This facilitated self-evaluation which is essential to reducing the emotive impact of feedback.[13] Facilitating self-evaluation will also promote the student to function in a reflective mode in their daily practice. However, we all hold biases in the way we judge our own performance.[13] Self-evaluation relies on the student to be self-aware and effective at critiquing their own performance;[13] a skill not always present. Self-evaluation alone is inadequate for performance improvement,[19] it needs to be facilitated by skilled evaluators who can change their questioning strategy appropriately to ensure student understanding.[17]

Overall participants evaluated the simulation event as a valuable learning experience that gave them a chance to apply their theoretical knowledge to simulated reality and made them aware of the national and local guidance available to them. However, feedback was identified as an area for faculty development. One student asked for "more strict feedback" This feedback itself is somewhat unhelpful due to its vagueness. Another student asked that the "feedback sandwich" be "more strictly enforced". I have never been a devotee to the feedback sandwich as I find it predictable, patronising and a wasted opportunity to discuss the meat of the issue and improve student performance. For feedback to be useful it needs to lead to action which will improve the student's performance.[1,13,16,19] Feedback can only do this if it identifies specific areas for development and supports the learner in identifying strategies to bridge the gap between current and desired performance.[5, 16]

The simulation event presented valuable learning for the faculty. Most student errors were human factor errors. For example, guidelines were either not used or not followed correctly and communication was often poor leading to delays in patient treatment. In future sessions more emphasis will be put on human factor training and a structured model of debrief will be used.

Conflict of Interest

The author declares that she has no conflict of interest.

Reference

1. Kolb DA. Experiential learning: experience as a source of learning and development. Englewood Cliffs, NJ: Prentice Hall; 1984.

2. General Medical Council. Tomorrow's Doctors. 2009 [cited 12 September 2015]; Available from: http://www.gmc-uk.or /Tomorrow_s_Doctors_1214.pdf_48905759.pdf.

3. Issenberg SB, McGaghie WC, Petrusa ER, Lee Gordon, Scalese RJ. Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. Med Teach. 2005; 27(1):10-28.

4. Ker JS, Hesketh EA, Anderson F, Johnston DA. Can a ward simulation exercise achieve the realism that reflects the complexity of everyday practice junior doctors encounter? Med Teach. 2006; 28(4):330-4.

5. General Medical Council. Good Medical Practice. 2013 [cited 12 September 2015]; Available from: http://www.gmc-uk.org/static/documents /content/Good_medical_practice_-_English_0914.pdf

6. General Medical Council. Medical students: professional values and fitness to practise. Guidance from the GMC and MSC. 2004 [cited 12 September 2015]; Available from: http://www.gmcuk.org/education /undergraduate/professional_behaviour.asp.

7. Department of Health. A Framework for technology enhanced learning, 2011 [cited 9 September 2015]; Available from: https://www.gov.uk /government/publications/a-framework-for-technology-enhanced-learning.

8. NHS North West. Supporting simulation education within the NHS in the North West. Manchester: NHS NW; 2010.

9. Reese CE, Jeffries PR, Engum SA. Learning together: using simulations to develop nursing and medical student collaboration. Nurs Educ Perspect. 2010; 31(1):33-7.

10. Lea SJ, Stephenson D, Troy J. Higher education students' attitudes to student-centred learning: beyond 'educational bulimia'? Studies in Higher Education. 2003; 28(3):321-34.

11. The Higher Education Academy. A marked improvement: transforming assessment in higher education. 2012 [cited 9 September 2015] Available from: https://www.heacademy.ac.uk/sites/default/files/A_Marked_Improvement.pdf.

12. Brockbank A, McGill I. Facilitating reflective learning in higher education. 2nd edition. Maidenhead: Open University Press; 2007.

13. Boud D, Malloy E, (editors). Feedback in higher and professional education: understanding it and doing it well. Abingdon: Routledge; 2013.

14. Clouder L. Toms J. An evaluation of the validity of assessment strategies used to grade practice learning in undergraduate physiotherapy students. The Higher Education Academy. Final report to the health science and practice subject centre of the higher education academy. 2005 [cited 9 September 2015] Available from: http://curve.coventry.ac.uk/open/file/33883be6-08a7-7610-f9da-bfb3917edfe1/1/An%20evaluation%20of%20the%20validity.pdf.

15. Gaba DM. The future vision of simulation in health care. Quality and Safety in Health Care. 2004; 13(suppl_1):i2-35.

16. Hattie J, Timperley H. The power of feedback. Review of Educational Research. 2007; 77(1):81-1.

17. Gardner J. Assessment and learning. 2nd edition. London: Sage publications; 2012.

18. Fanning RM, Gaba DM. The Role of debriefing in simulation-based learning. simulation in healthcare. The Journal of the Society for Simulation in Healthcare. 2007; 2(2):115-2.

19. Eva KW, Regher G. Department of Health: an organisation with a memory: report of an expert group on learning from adverse events in the NHS. London: DH; 2000.