Part 1 The Role of Simulation

Chapter 1

Setting the Scene for Simulation-Based Education

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I still can't believe that we did that difficult epidural scenario right before it happened for real. We knew exactly what to do. So very proud of our teamwork. [Delivery suite team participant in simulation]

Practising speculum insertion on the pelvic model built my confidence before doing my first Pap smear. Although it was different on my patient, I'd rehearsed the manoeuvres and knew how to handle the speculum. [Medical student]

We tried out the functionality of our new delivery suite before it was fully fitted out by simulating a whole day of clinical practice. Probably saved a lot of money but even more importantly uncovered some flaws in our processes from patient and staff perspectives. [Hospital manager]

Introduction

Whether healthcare simulation is providing an opportunity to develop teamwork skills, build individuals' confidence and psychomotor skills, or testing processes in a new facility, its impact can be profound. Simulation practice and research has matured sufficiently such that we need no longer focus on proving that it works, but on how to use it optimally and efficiently. The question is: how can we use simulation to support students and clinicians in developing safer practices and to design safer healthcare systems? The first chapter of an edited book is written with the intent of setting the scene. It is both a privilege and a responsibility to offer the foundations for the contributions from other authors. This book focuses on the use of simulation as an educational method and contributes to the broader conversation on safer healthcare systems. We start by defining simulation and describing the current healthcare landscape with reference to drivers for simulation uptake. We then offer an overview of simulation modalities and considerations for designing and implementing simulation-based education (SBE).

Scoping the Healthcare Simulation Landscape

Simulation is

> a technique – not a technology – to replace or amplify real experiences with guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner. (Gaba, 2007)

Healthcare simulation is not a new concept. Quite conversely, it has historical origins. Take, for example, Madam du Coudray's fully simulation-based curriculum for midwives which was implemented in rural France in the eighteenth century (Owen, 2016). The drivers for that programme related in part to *macro-level* factors of the day. These agricultural populations were vulnerable to numerous socioeconomic stressors, among which high infant mortality made significant negative contribution. An important point here is that significant change occurred not because of *evidence* for the effectiveness of simulation but in response to large-scale social, economic and political demands. Today we are in a similar position, where our own modern macro-level factors are influencing simulation uptake. However, we are also equipped with knowledge about how simulation works, when and for whom. Empowered by this understanding, we can move towards addressing macro-level considerations, with simulation as an evidence-based and useful tool in our educational armamentarium.

What are some of these contemporary macro factors? Newspaper reports in 2017 document the apparently high numbers of infant deaths in one National Health Service (NHS) Trust in the United Kingdom (UK). Just as in eighteenth-century France, simulation could play a key role in addressing this issue. Despite recommendations from earlier investigations to improve professional practices and systems, the standards of care remain insufficient to meet societal expectations (Buchanan, 2017; Donnelly, 2017). The negative financial and reputational implications of these events to the NHS are significant. Perhaps even more so are the immeasurable emotional, psychological and social costs to the families and healthcare providers involved in adverse events. Although there can be no doubt that such expenses far outweigh the cost of targeted simulation training and systems testing, high-level political commitment is still required to effect change. In 2009, the UK's Chief Medical Officer (Sir Liam Donaldson) wrote that simulation was one of the top priorities of the health services for the next decade (Donaldson, 2009). He emphasised the utility of simulation in rehearsal for emergency situations, for the fostering of teamwork and for the development of psychomotor skills in safe settings that do not place patients at risk. He also questioned the logic of charging clinicians to undertake training to make their practice safer.

In Australia, a macro driver for significant government investment in healthcare simulation infrastructure and faculty development was the estimated shortfall of clinical placement opportunities for healthcare students. Of course, patient safety is an important consideration, but the pressing need for training the future healthcare workforce remains. So far, investment has largely been at entry-level health professions (Australian Government Department of Health, 2015), although several initiatives were funded in 2010 for specialty medical and surgical training. However, only the Training in Professional Skills (TIPS) programme at the Royal Australasian College of Surgeons (RACS) has been sustained (Bearman et al., 2011, 2012).

Other drivers for SBE are well reported (Box 1.1). We have already identified patient safety and the expanding numbers of health professional students, while other key drivers may be values-based, education-focused, or initiatives at *meso*- or *micro*-level. The shift to competency-based education, combined with growing evidence supporting SBE as an effective instructional approach, is also important (Nestel et al., 2013). Herein, we are seeing *accountability* arising from published standards for simulation practice, certification of practitioners and accreditation of programmes. Higher-educational systems in healthcare now offer short and award courses which feature prominent roles for simulation, thus facilitating quality control and improvement, as well as mitigation of the *human factors*. There is a vibrant research community with

Box 1.1 Drivers for Uptake of Simulation-Based Education, Adapted from Nestel et al. (2011).

Values-based drivers

- Ethical imperative of causing no harm to patients
- Recognition of importance of patients' perspectives
- Responsibility of preparing healthcare practitioners to work in a changing clinical landscape

Education-oriented drivers

- Facilitating a systematic approach to curriculum activities
- Shifting to competency-based curricula
- Assuring students/clinicians have direct/indirect exposure to certain clinical events
- Allowing for adjustment in the level of challenge offered to participants
- Identifying boundaries of competence of participants
- Providing rehearsal and assessment of technical, communication and other professional skills essential for safe clinical practice
- Enabling rehearsal of infrequently occurring events

Meso-level drivers

- Growing prominence of the patient safety movement
- Reducing length of hospital stays for patients and therefore reducing access to patients for learning
- Growing evidence of simulation as an effective educational method
- Increasing number of professional networks/societies/associations with a simulation orientation
- Establishing standards for optimal simulation practice including certification of simulation practitioners, accreditation of simulation centres or programmes

Macro-level drivers

- Working time directives/safer working hours initiatives
- Maturing national quality improvement strategies
- Growing prominence of the patient safety movement
- Increasing numbers of medical and health professional students
- Expanding national assessments for professional practice
- Billion-dollar worldwide healthcare simulation industry

new healthcare simulation-focused journals and several new textbooks such as this one. We provide a list of additional resources at the end of the chapter. It is also important to acknowledge that healthcare simulation is a billion-dollar global industry.

Healthcare simulation also has limitations and these are shared across the book. A major limitation remains the operational cost of simulation. An important area of research will be economic evaluations of SBE and other simulation applications (Maloney and Haines, 2016; Nestel et al., 2017). Further, assumptions are also often made about learning in simulation being *safe*. Although it is *patient* safe it is not necessarily safe for participants. High levels of stress, anxiety, different power relationships and the same sorts of physical risks of working in a clinical setting may all be present during SBE. Clinician safety is essential and it is incumbent on simulation practitioners to design *safe learning environments* in which all participants can develop their practice without harm.

Simulation Modalities

Simulation modalities are diverse. Most introductory books on healthcare simulation document these according to type and create a hierarchy of realism or fidelity – a highly contested notion (see later). We offer examples of core modalities and their combined use, especially in simulation scenarios. These modalities may be available in simulation centres and skills labs in higher education units and health services or may be offered *onsite* or *in situ* (Posner et al., 2017). See Chapter 5 for more information.

Simulated, or *standardised*, *participants* (SPs) refer to individuals who are paid or volunteers (patients, actors, health professionals or students) who are trained to portray specific roles within a simulation and to offer feedback to participants. As proxies for patients, SPs must be empowered to accurately represent (or simulate) them. Given that clinicians (with their own view of healthcare experiences) often train SPs, there can be challenges to the delivery of authentic *patient* perspectives (Nestel, 2015). (See example in Table 1.1.)

Task trainers enable participants to learn psychomotor skills applicable to procedures or operations. They vary in sophistication and technology from simple benchtop models (e.g. suturing, intubation) to sophisticated virtual reality models (e.g. laparoscopy; Aggarwal et al., 2007; Larsen et al., 2009) and virtual reality environments (Huber et al., 2018) (see example in Table 1.1).

Manikins are commonly used for developing team-based interprofessional care. They vary in technological sophistication and can be programmed to demonstrate physiological indicators of a patient's condition. Depending on the manikin, participants can also undertake a diverse range of clinical procedures. Examples include *SimMom* (Laerdal; enabling SBE through all phases of labour) and *Desperate Debra* (Adam Rouilly; enabling SBE in the management of impacted fetal head at caesarean section).

Screen-based simulators use different technologies to provide learners with opportunities to develop knowledge of diverse clinical skills including diagnostic decision-making, steps in operative procedures, patient-centred communication and more. They often have a tremendous advantage of being highly accessible, including at the point of care.

Hybrid simulations are those in which simulation modalities are combined. They usually involve an SP with a task trainer (e.g. urinary catheter model, rectal examination model) and enable a staged approach to the development of psychomotor and communication skills (Higham et al., 2007).

Simulation-based training packages are widely available in obstetrics. Developed in the UK, PRactical Obstetric Multi-Professional Training (PROMPT) is designed to support the development of interprofessional collaborative practice for obstetric emergencies. The package is used internationally and has demonstrated direct improvements in perinatal outcome and improvements in practitioners' knowledge, clinical skills and team-working (*PROMPT – Making Childbirth Safer, Together*, 2017). *Advanced Life Support in Obstetrics* (ALSO) and *Become a Breech Expert* (BABE) are Australian-based examples (Advanced Maternal and Reproductive Education).

Robotic surgery is emerging as a minimally invasive operative modality in gynaecology. Benefits over existing modalities include improved surgeon ergonomics, *wristed* nature of robotic instruments, and elimination of requirement for counterintuitive motion in the operative field. While we are watching this space, steady emergence of robotics must be recognised as limited by cost, access (currently available within the private health system only) and lack of robust data demonstrating global superior efficacy over techniques such as laparoscopy (Manolitsas, 2012). With increasing availability and utility of robotic surgery, simulation

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Excerpt
More Information

Table 1.1 Considerations of tasks for simulation practitioners using the simulation phases in three examples. For each example, we have assumed that th addresses a curriculum gap, meets a clinical need or is experimental. It is not possible to include all tasks but we have attempted to identify some critical o simulation as an educational method.

	SP-based formative assessment for medical students explaining vaginal examination and Pap smear to a patient	Laparoscopic simulator for trainees to learn basic skills	*In situ* delivery suite simulation with hyl interprofessional collaborative practice
Preparing	• Align assessment with curriculum requirement and set learning objectives • Write simulation plan for all phases noting Calgary–Cambridge[1] guide for debriefing phase • Choose simulators – simulated patient • Set up the environment – consultation room • Recruit SP and provide training for role portrayal and feedback • Identify rating forms • Rehearse the consultation including timings; note differences to a real encounter • Recruit and train faculty	• Set learning objectives for distributed training package that is trainee-led • Check simulator is available and working • Write simulation plan for all phases • Write guidance notes for trainees to optimise use considering different levels of experience • Ensure trainees will have access to simulators	• Set learning objectives • Develop scenario in a consultative process (w • Write simulation plan for all phases noting pa simulation and SHARP[2] after the scenario witl • Choose simulators – simulated patient and b • Recruit SP and provide training for role portra debriefing process • Obtain permissions/notify all staff of the *in sit* • Rehearse the whole scenario including timin encounter • Recruit and train faculty
Briefing	• Inform faculty and students about the simulation • Orient students to the task, learning objectives and process for feedback • Orient students to the environment and SP including differences to a real encounter • Give observer students specific tasks • Ask for questions	• Trainees new to the simulator will need orientation to its set up, tasks, data capture for feedback • Ensure reporting process if simulator is not working	• Inform faculty and participants about the sim • Orient participants to the task, learning objec debriefing approaches • Discuss current strengths and areas for devel practice • Discuss respect issues relevant to participant the debriefing • Orient participants to *in situ* simulation, the SI suit • Ask for questions
Simulating	• Implement the simulation activity as planned	• Trainees to use the simulator as requested over 6-week training package and in response to meeting end goals	• Start video-recording • Use pause and discuss approach to feedback • Ensure *in situ* simulation does not compromis
Debriefing/ offering feedback	• Give time for completion of rating forms • Use Calgary–Cambridge approach to feedback • Invite observer students to participate • Check SP has come out of role for feedback	• Trainees use feedback generated from simulator to improve their performance	• Use SHARP for debriefing • Illustrate key points with VAD • Check SP has come out of role for feedback
Reflecting	• Ask students to complete a 500-word written reflection to be placed in portfolios • Ask students to commit to a peer discussion about the task once they have had practice in real settings	• Trainees encouraged to note progress in portfolio; to identify their improvements and areas for development to help set new goals for the next training session	• Ask participants to plan how they will use the future practice • Faculty can use OSAD[2] to reflect on their debi
Evaluating	• Ask faculty, SP and students to complete a rating form about the effectiveness of the session • Use evaluation data to inform planning for next session	• Ask trainees to complete an evaluation form after the completion of the whole training package • Use evaluation data to inform planning for next training package	• Ask faculty, SP and participants to complete a of the session • Use evaluation data to inform planning for ne

[1]Kurtz, S. and Silverman, J. (1996). The Calgary–Cambridge Referenced Observation Guides: an aid to defining the curriculum and organizing the teaching in communication tr *Education*, 30, 83–89.
[2]Imperial College London. (2012). *The London Handbook for Debriefing: Enhancing Performance Debriefing in Clinical and Simulated Settings*. Retrieved from: https://workspace.imp 01%20-%20Clinical%20Medicine/lw2222ic_debrief_book_a5.pdf
[3]Krogh, K., Bearman, M. and Nestel, D. (2015). Expert practice of video-assisted debriefing. *Clinical Simulation in Nursing*, 11, 180–187.

will play a key role in ensuring adequate operator training, maintenance of skills and patient safety.

Considerations in Designing Simulation-Based Education

McGaghie et al.'s (2010) review of the SBE literature identifies features and best practices for effective use of simulation as an educational method (see Box 1.2). Being well described both in their article and then throughout this book, it is beyond the scope of this chapter to discuss them in further detail. However, key points are that *simulation is optimal when embedded in a curriculum or broader programme of learning activities relevant to the participants.* Educational design is an overarching topic for many items in the list. The importance of setting and making explicit the *educational objectives* is emphasised. Opportunities for *repetitive practice* and *feedback* are highlighted. Selecting simulation modalities that are fit for purpose is important. Although included in the list, the notion of *fidelity* is contested, with some scholars recommending dropping the term. Hamstra et al. (2014) propose that *functional task alignment* and *learner engagement* are more useful concepts. Nestel et al. (2018) argue that the fidelity (or realism) of a simulator or a simulation depends in part on the participants' willingness to engage in the activity 'as if' it were real (Dieckmann, 2009). They offer *meaningfulness* as a more useful concept for faculty involved in educational design. Finally, *faculty development* is considered critical; this includes acknowledgement that clinical experience is not a proxy for simulation instructor effectiveness.

Box 1.2 Features and Best Practices of Simulation-Based Education.

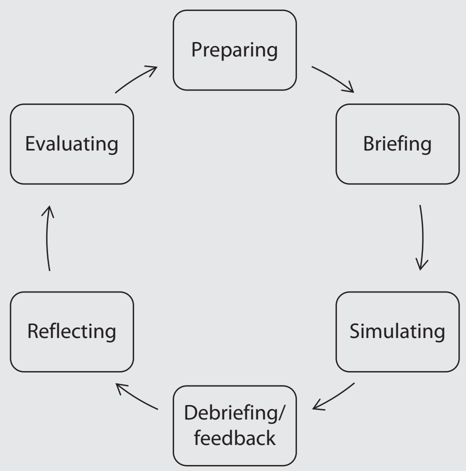
1. Feedback
2. Deliberate practice
3. Curriculum integration
4. Outcome measurement
5. Simulation fidelity
6. Skill acquisition and maintenance
7. Mastery learning
8. Transfer to practice
9. Team training
10. High-stakes testing
11. Instructor training
12. Educational and professional context

Reproduced with permission from: McGaghie, W. C., Issenberg, S. B., Petrusa, E. R. and Scalese, R. J. (2010). A critical review of simulation-based medical education research: 2003–2009. *Medical Education*, 44(1), 50–63.

There are many theories that inform SBE from behaviourist, cognitivist and constructivist traditions. Each has a specific offering and may be valuable in considering SBE design, in understanding *transfer* of learning from simulation to real clinical settings, and in appreciating the variety of participants' responses to engagement in simulation. Behaviourist theories are closely linked with the setting of learning objectives, of learning in response to a stimulus, of behaviour shaped by feedback. In SBE, the simulation activity becomes the stimulus and the briefing and debriefing (including feedback) helps to shape desired behaviour. The notions of *deliberate practice* as described by Ericsson (2015) and *mastery learning* applied extensively by McGaghie and his colleagues (McGaghie, 2015) are linked to this tradition, although they intersect with others too (Ericsson, 2015). Stimulus-response learning is insufficient in itself for sustained learning. Cognitivist theories of learning explore individuals' thinking and knowing, memory capacities and problem-solving schema (Battista and Nestel, in press). Cognitive load theory is commonly cited by simulation educators in design considerations (Reedy, 2015). Too little or too much cognitive load at any stage of the simulation activity will influence capacity to learn. Finding the optimal load is the work of the simulation practitioner. While these two traditions have the learner at their centre, they focus on the teacher *teaching*. In the *constructivist* tradition, the experiences that learners bring to the learning are valued with the acknowledgement that individuals will make meaning for themselves. *Reflective practice* is commonly described as an illustration of a constructivist approach to learning (Schon, 1983). This theory proposes that during and after an unexpected or critical event, practitioners (learners) will reflect-in-action *and* reflect-on-action. Constructivist theories also acknowledge the context in which learning occurs and its social nature. Recently, attention has shifted to a range of complexity theories and the role of non-human objects and humans influencing learning, of the influence of the broader social and political environment (Battista, 2015, 2017; Fenwick and Dahlgren, 2015). The role of theory in SBE is further discussed in a series of articles (Eppich and Cheng, 2015; Husebo et al., 2015; Nestel and Bearman, 2015; Reedy, 2015).

Important considerations for any SBE activity are outlined in Box 1.3. Although there are limitations

Box 1.3 Phases in Simulation Design.



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with oversimplifying complex processes, these defined phases help to remind the simulation practitioner of the interrelatedness of all activities. Box 1.3 illustrates these phases and Table 1.1 sets out the associated tasks for three different types of simulations.

The *preparing* phase refers to all the activities that take place before the simulation event starts, such as: identifying learners' needs; setting learning objectives; designing the scenario, sourcing simulators, medical equipment, props, etc.; booking rooms; recruiting and identifying faculty, confederates and SPs; scheduling the learners; catering, etc. The range of tasks will depend on the local simulation facility and practices.

The *briefing* phase is given relatively little attention in literature but is really important in setting up valuable learning experiences (Donnelly, 2017). The briefing for faculty includes the learning objectives, the learners' characteristics, logistics such as time frames, starting, pausing and ending the simulation activity, simulator programming, technical support, communication with the control room, audiovisual capacity, debriefing and feedback processes, reflective exercises and evaluation forms, etc. An opportunity for final questions can ensure smooth functioning. Briefing learners will include most of the above and may also include inviting learners to set their own goals relative to those prescribed and their experiences (Kneebone and Nestel, 2005).

Orientation of learners to the simulation is important. This will include explicit discussion on what is similar and what is different to reality. This is linked to what is called a *fiction contract.* Some learners find simulation stressful and it may be important to normalise the experience during the briefing. This involves acknowledgement that learners often find simulations stressful. Creating a safe learning environment involves several strategies and learner-centred attitudes from faculty. Orientation strategies include giving a clear explanation of the simulation phases and their responsibilities in each, clarity over who is observing, what will happen with audiovisual recordings, confidentiality among those involved, seeking their buy-in with respect to doing their best, the orientation or familiarisation of the simulators and setting.

During the *simulation* it is important to indicate a clear start to the simulation and observe for physical and psychological safety of those within the simulation (Donaldson, 2009). Minimal talking is often desirable to facilitate acute observation. Encouraging observers to make notes to enable specific feedback during debriefing can be valuable. If there is a pause-and-discuss option, then enact as planned. Respond to cues for finishing the scenario. Depending on the simulation modalities, during the simulation activity cues may need to be pre-programmed on to the simulators (e.g. manikin) and/or given to confederates, SPs and learners (Donaldson, 2009; Buchanan, 2017).

Once the simulation is over, observations of participants and observers can be really important in helping the facilitator to frame the opening debriefing statements. During this transition period, there can be a lot of emotion expressed that is relevant to the debriefing and feedback. Encouraging participants to regroup and spend a few minutes thinking about what has just happened can be useful, including asking them to think about what worked well and what could have been improved. If observer tools are being used, then this is a good time to complete them.

On ending the scenario, participants move to the debriefing room. As faculty, it is helpful to have the learning objectives handy to stay focused. It is easy to be sidetracked by participants' responses. Follow the processes outlined in the briefing, although flexibility is also important to ensure learner-centredness. Invite observers, confederates and SPs to participate. Use opportunities, especially for communication-based scenarios, to rehearse micro elements of the scenario. This can be a valuable way of getting observers involved.

The *debriefing and feedback* phase complements the briefing, almost as bookends to the simulation activity. Facilitators explore participants' feelings, address goals and learning objectives, seek other perspectives, summarise, affirm positive behaviours, explore unplanned issues, and seek to establish new goals (Decker et al., 2013). One goal of the debriefing is to promote reflection. However, we include this as a separate phase to highlight the importance of the locus of control for learning residing with the learner once they have left the simulation event.

Evidence of the effectiveness of debriefing has been reported (Benbow et al., 1998; Issenberg et al., 2005; Rudolph et al., 2006; Fanning and Gaba, 2007; Decker et al., 2013; Motola et al., 2013; Cheng et al., 2014). Debriefing formats vary and are usually undertaken immediately after the simulation event/warm or delayed/cold (Huber et al., 2018). Formats can be relatively unstructured to highly structured. Examples of debriefing tools include *the diamond debrief* (Laerdal, 2017) and others are provided in the London Handbook of Debriefing (Adam Rouilly, 2017). Similarly, debriefer rating tools such as the *Objective Structured Assessment of Debriefing* (Arora et al., 2012; Imperial College London, 2012; Runnacles et al., 2014) and *The Debriefing Assessment for Simulation in Healthcare* (Centre for Medical Simulation, 2011) have been developed to provide evidence-based guidelines for conducting debriefings in simulated and real clinical settings. Guidelines for video-assisted debriefing have been published (Grant et al., 2010; Grant and Marriage, 2012; Levett-Jones and Lapkin, 2013; Krogh et al., 2015), but optimal use remains unclear.

For the *reflecting* phase, learners (usually individually) are encouraged to make sense of the simulation in the light of their own experiences and those they plan. Similarly, faculty and SPs are also encouraged to reflect on all facets of their contributions. Reflecting is usually an individual activity; while debriefing is often collective and connected to the simulation activity, reflecting has a wider reach. During briefing, learners can be informed of reflecting activities and reinforced after the debriefing. Of course, there is overlap between these phases and reflecting can occur before the debriefing. There are several approaches to reflecting that have been adopted in SBE (Kolb and Fry, 1975; Schon, 1987; Husebo et al., 2015).

Learners can be directed to evidence their reflective practice following simulations by uploading and tagging digital learning resources (audio, photographs, video and podcasts, etc.) within an e-portfolio (Donnelly, 2017) or blogs, social networking sites and wikis (McGaghie, 2015). Permissions need to be considered with respect to use and storage of these images.

Evaluating refers to the success and limitations of the session in meeting its goals, rather than assessment of the individual. This phase benefits from involvement of all stakeholders although practically it is often only learners, faculty, confederates and SPs. It is well recognised in the literature and evident in simulation frameworks that evaluation is a crucial element to drive improvements in education, healthcare practice and ultimately patient care (Jeffries, 2005; Gough, 2016).

While it is essential to consider the degree to which the SBE intervention has supported learning, meaningful evaluations require more sophisticated methods. Complex learning interventions require equally complex evaluations, using qualitative and quantitative methods to draw on multiple sources and triangulating data alongside exploring multiple levels of impact can provide more meaningful evaluations (Battista and Nestel, in press).

Closing Summary

In summary, the international landscape of healthcare simulation has changed rapidly. From our opening quotations, we see that simulation has diverse applications. It responds to changes in healthcare practices (trialling new equipment or processes), addresses critical patient safety issues (reproduces sentinel or other events for learning), enables examination and development of effective interprofessional collaborative practice and supports development and assessment of clinical skills (or their components). It is an exciting time to learn how to use simulation. The remaining chapters in this book offer valuable insights to theoretical and evidence-based simulation practice.

Recommended Resources

Peer-Reviewed Journals

*Indicates open access.

Simulation in Healthcare, http://journals.lww.com/simulationinhealthcare/Pages/default.aspx: Journal of the Society for Simulation in Healthcare (SSH).

Advances in Simulation,* https://advancesinsimulation.biomedcentral.com/: Journal of the Society in Europe for Simulation Applied to Medicine (SESAM).

Clinical Simulation in Nursing, www.nursingsimulation.org/: Journal of the International Nursing

Association for Clinical Simulation and Learning (INACSL).

BMJ STEL, http://stel.bmj.com/: Journal of the Association for Simulated Practice in Healthcare (ASPiH).

Simulation and Gaming, http://journals.sagepub.com/home/sag: published in association with the International Simulation and Gaming Association (ISAGA).

Reference Books

The books cover different facets of simulation practice. Although speciality- or modality-specific, they all offer valuable insights and all have been published in the last five years.

Dudley, F. (2012). *The Simulated Patient Handbook: A Comprehensive Guide for Facilitators and Simulated Patients*. London: Radcliffe Publishing.

Grant, V., and Cheng, A. (Eds.). (2016). *Comprehensive Healthcare Simulation: Paediatrics*. Switzerland: Springer.

Levine, S., DeMaria, A., Schwartz, A. and Sim, A. (Eds.). (2013). *The Comprehensive Textbook of Healthcare Simulation*. New York, NY: Springer.

Nestel, D., and Bearman, M. (Eds.). (2016). *Simulated Patient Methodology: Theory, Evidence and Practice*. Chichester: Wiley Blackwell.

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Palaganas, J., Maxworthy, J., Epps, C. and Mancini, M. (Eds.). (2015). *Defining Excellence in Simulation Programs*. Philadelphia, PA: Wolters Kluwer.

Riley, R. (Ed.). (2016). *Manual of Simulation in Healthcare*, 2nd edition. Oxford: Oxford University Press.

Other Online Resources

Debrief2Learn provides resources on debriefing and other practices associated with healthcare simulation: http://debrief2learn.org/

PROMPT (PRactical Obstetric Multi-Professional Training) is an evidence-based multiprofessional training package for obstetric emergencies: www.promptmaternity.org/

Simulcast offers podcasts on topics of interest to simulation practitioners and guidance to other resources: http://simulationpodcast.com/

SimGhosts specialises in faculty development for simulation technologists and operations specialists: www.simghosts.org/sim/default.asp

Professional Society Websites

All listings host an annual conference and are interprofessional (except for INACSL).

Society for Simulation in Healthcare (SSH) is the largest simulation society by membership and is based in the USA: www.ssih.org/

Society in Europe for Simulation Applied to Medicine (SESAM) is based in Europe: www.sesam-web.org/

Association for Simulated Practice in Healthcare (ASPiH) is based in the UK: www.aspih.org.uk/

International Nursing Association for Clinical Simulation and Learning (INACSL) is based in the USA: www.inacsl.org/i4a/pages/index.cfm?pageid=1

International Pediatric Simulation Society (IPSS): http://ipssglobal.org/

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