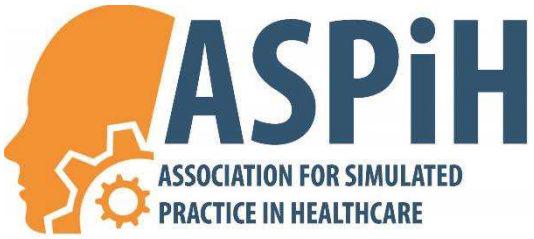


# Simulation Based Education in Healthcare

## Standards for Practitioners - Consultation Document



STANDARDS CONSULTATION

DR MAKANI PURVA HULL ROYAL INFIRMARY |

# CONTENTS

## Foreward

ASPiH serves the UK and Ireland healthcare sectors by supporting a community of practice for those involved in simulation, acting as the communication portal between members and the wider healthcare community, the Association has expanded both its membership and influence over the 6 years since its inception.

In 2012/13 ASPiH conducted a National Scoping Project, supported by Health Education England and the Higher education Academy, to map the resources and implementation of Simulation Based Education (SBE) and Technology Enhanced Learning (TEL) across the United Kingdom. One of the key issues identified in this report was the need for improved quality control and standardisation across the increasing number and breadth of institutions, departments and individuals designing and delivering SBE.

**As a not-for-profit, fully independent Association with a unique multi-disciplinary membership, ASPiH has developed these standards for consultation with the aim of becoming a national focus for quality development in SBE.**

## Introduction

Simulation based education has matured into a formally recognised teaching method embedded in all healthcare training programmes and it is important that standards of delivery are set and maintained.

The Association for Simulated Practice in Healthcare (ASPiH) has created these multi-professional standards to bring together relevant best practice and already published evidence in simulation based education (SBE) for all healthcare professionals involved in simulation education at pre and post registration, undergraduate and postgraduate training and assessment. They intended for use by both novice and experienced simulation faculty.

## Faculty development

Simulation programme faculty members are recruited from a pool of educators who may be experts in simulation based education or content experts in the subject being delivered, or both. Faculty delivering simulation based courses should be appropriately trained to undertake this role.

The role of an effective facilitator or faculty member is key to delivering effective learning in SBE(1) (2). A good facilitator should be able to (3):

- Set learning objectives which are appropriate to the skill or behaviour being taught, at a level appropriate to the learner and makes participants aware of these.
- Create and maintain a safe environment during a simulation exercise.
- Maintain and encourage 'fidelity', ensuring that an activity is as realistic as possible
- Encourage self-reflection on learning.

- Provide clear and constructive feedback on whether learning objectives were achieved and propose refinement in future practice through the process of debriefing.
- Act as a role model to learners and promote professional behaviour and integrity.

**Recommendations**

- An introductory course should introduce novice simulation faculty to the principles of adult learning theory and explore underpinning educational theories / pedagogy relevant to the spectrum of simulation. In addition it should provide a definition of simulation, clarify terminology used, and describe the simulation process and how scenarios are developed. The course may also provide an introduction to the technical aspects of specific simulation equipment and how to engage with simulated patients (SPs).
- Specific training in debriefing should be provided to faculty as effective debriefing is recognised to be the most important element of learning in a simulated environment (1).
- Faculty delivering human factors training should have undergone bespoke training in systems engineering, human factors or other systematic approaches to tackling workplace error and patient safety concerns(4).
- New faculty should observe or co-facilitate existing courses alongside a more experienced educator or mentor and receive feedback using validated tools such as DASH(5) or OSAD(6).
- Regular evaluation of faculty performance is required by both participants and fellow faculty and could be achieved using a peer observation process(7).
- In designing SBE activities or courses, faculty should ensure content adheres to best practice standards in education where applicable(8,9).
- Content should adhere to best practice when engaging with simulated patients such that the four principles of biomedical ethics are adhered to: autonomy, beneficence, non-maleficence and justice.
- Attracting, recruiting and retaining faculty is key to delivering courses effectively and in a sustainable fashion. A supportive environment for faculty with protected time to develop simulation activities should be key considerations for faculty development and retention. The skills and expertise of Simulation Technicians should be both recognised and fully utilised in developing and sustaining faculty.
- The process of becoming faculty should be streamlined as much as possible; keeping faculty training to an effective minimum as a lengthy process requiring multiple days of study leave could deter potential candidates.
- Faculty development is a lifelong process and faculty should engage in continuing professional development (CPD) activities (RCPCH guidelines) such as attendance at conference and keeping up to date with publications. Ideally, a record of CPD activities should be maintained. Further continuing professional development of the faculty could be delivered using e learning courses.
- Buy-in from management of healthcare organisations is vital to ensure continued support for faculty development.
- SPs involvement as a specialist group of faculty should be supported, with the same considerations as other faculty members.

## Programme Structure

Simulation based educational programmes should be developed with input from trainers from the clinical workplace or higher education institutions especially for pre-registration courses or credited post registration courses after a detailed gap analysis of the curriculum and clinical need.

**Recommendations**

- Consultation with learners, managers and patient groups should assist in identifying the training needs. This is the only way to achieve reliable and valid coverage of the curriculum outcomes, goals of the organisations and clinical need.
- Learning objectives should be appropriate to the level of the learner and, at the same time, designed to be challenging but achievable(11).
- Use Bloom's taxonomy or equivalent to describe the domains (cognitive/affective/psychomotor) of learning involved in the activity. This encourages the facilitator to aim to provide holistic teaching on the skill or task set for learners (12).
- Consideration should be given to the incorporation of the human factors approach in SBE programmes to develop better healthcare practitioners with an improved understanding of the role of human factors in workplace error.
- Ensure that the activity corresponds to the goals of organisations, clinical need and curriculum skills identified as appropriate for teaching using SBE.
- Ensure that learning objectives are set beforehand and discussed as part of the debriefing process which takes place after completing a simulated scenario or in feedback on completing a practical skill (13).
- Incorporate up-to-date evidence based practice in course content(14). Training in silos should be avoided and every effort to incorporate interprofessional education into simulation programmes should be made.
- Promote holistic care and appropriate values set out in GMC/NMC guidelines (15)and those of other relevant professional bodies.
- A programme and scenario manual should be maintained to ensure consistency between design and delivery of programme and reproducibility between trainers.
- The faculty should be chosen appropriate to the needs of the learners and content of the
- Programme(4).
- A faculty member with expertise in simulation based education should oversee the simulation programme design and ensures that it is regularly peer reviewed and kept up to date and relevant to the organisation goals, the clinical need and curriculum that it is mapped on to(4).

- Regular evaluation of programmes(16) and faculty should be undertaken to ensure that content and relevance is maintained. This should be achieved at a minimum through feedback from participants and other simulation educators (17).

- Higher levels of evaluation should be encouraged through assessment of skills, knowledge or behaviours in the clinical setting before and after a session using validated metrics. This could also be achieved through surveying patent satisfaction and demonstrating improved patient safety through a review of critical incidents, complaints and serious untoward incidents in the workplace(18).

## Debriefing

Debriefing is a facilitator-led activity that follows a simulation session, in which the participant's reflective thinking is encouraged and feedback is provided regarding their performance (13). A widely accepted view that the debriefing process is the most important component of simulation-based medical education is supported by evidence from research (2).

Facilitators require training in order to do this effectively. They will also require training in engaging with the SP in order to gather feedback from their perspective. The SP will also require training in order to feedback objectively, effectively and alongside the facilitator

**Recommendations**

- All scenario-based simulation activities should include a planned debriefing session to optimise participant reflection and enhance learning.
- The *facilitator* should be a person competent in the process of debriefing. Evidence from research suggests that the perceived skills of the debriefer have the highest independent correlation to the perceived overall quality of the simulation experience (19).
    - The facilitator must be able to structure debriefing in an organised way and establish an engaging learning environment(20).
    - The facilitator must identify pertinent elements of the simulation to discuss and relate to the objectives (21).
    - Facilitators should aim to guide and direct rather than to lecture; they should clarify information, use active listening and provide constructive feedback.
    - Facilitators should engage with the SP in order to access, enable and incorporate their feedback. SPs should be competent in the process of debriefing and feedback from their perspective – as agreed on with the facilitator – in role, in neutral or out of role.
    - Facilitators and SPs may benefit from an additional debrief after the session as and when required, without learner presence.
    - The facilitators and where appropriate the SP should acquire specific training provided by a formal course, a continuing medical education offering, or targeted work with an experienced mentor.

- Debriefing should be conducted in an *environment* that is safe, positive and non-threatening. An environment of trust, respect, and confidentiality is necessary for all participants to feel comfortable to share (22).
    - Debriefings should ideally 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(23). The debriefing room should be comfortable, private, and a relatively intimate environment.
    - The seating arrangement may vary with the style of the debriefing and the degree of facilitation intended. Participation is encouraged and best accomplished by all participants sitting eye-level in a circle (22).
- *Duration and timing* of debriefing is crucial but should be flexible enough to allow progression through the phases of debriefing (reaction, analysis, and summary).
    - It should occur immediately (less than 5 minutes) after simulation so thoughts, feeling, and actions are not forgotten (22).
    - There are several popular *models of debriefing*, which the facilitator may wish to use as a structure for the process such as the advocacy enquiry model, 3D Model of debriefing, the Mayo clinic model or the Lederman model (20,24,25). However, there is currently no standardised process or model of debriefing.

## Assessment

### *Formative assessment*

#### Overall guidance

Formative assessments can be highly effective in simulation-based learning experiences. This can give learners ongoing feedback on their progress toward the development of knowledge, understanding, and skills. Feedback can be from assessors and SPs. The outcome of formative assessment is the improvement of learners' performance.

#### Recommendations

- The formative assessment must be based on the intended learning outcomes of the exercise, with clarity regarding the knowledge, skills and attitudes to be evaluated(31). The choice of skills to be evaluated is usually guided by curricular information, competency guidelines, and the limitations of the chosen simulation methods. (32).
- To be effective, the assessment activities must also be targeted at the level of experience and ability of the learner(33).
- The formative assessment should be specific to provide supplemental strategies for achieving participant outcomes(34).
- Specific skill sets such as team work, leadership, clinical decision making and communication may be assessed using simulation scenarios based on reasonably complex events involving multidisciplinary teams or stand-alone simulation scenarios using SPs.
- Certain skills may be assessed using hybrid or bi/multimodal simulation which includes SPs.

## *Summative assessment*

### Overall guidance

Simulation environments are traditionally recognised as "safe" learning environments for the learner to make mistakes safely and learn from them. Hence SBE has been used more for formative assessment. However considerable interest in summative assessment has resulted in SBE being used as an evaluation tool of healthcare professionals (35).

Summative assessments, also known as high stakes testing, can be used in SBE for assessment and measurement of outcomes or achievement of objectives, with a view to determining competency, ability to move to the next level or training or readiness to practise independently.

### Recommendations

- Participants need prior experience and familiarity with simulation prior to summative evaluation.
- Psychological safety of the learner should be taken into account. Learners may experience heightened anxiety at the prospect of mistakes potentially leading to negative consequences.
- Performance standards should be agreed and be explicitly shared between learners and trainers
- A clear policy of actions in case of a concern being raised during SBE should be available prior to running simulation, to reduce any claims of unfairness.
- Facilitation of effective performance assessment within simulation should rely on robust, realistic, and specific learning objectives appropriately tailored to professional curricula, taking into consideration the regulatory body standards from the outset. These should reference the minimum expected standard, which should the learner fail to demonstrate, would be considered as under performance.
- Summative assessment should be based on evaluation tools previously tested with like populations for validity and reliability(34).
- Simulated patient-based simulation may be used as a summative assessment modality to assess communication skills, professional behaviour and information gathering.
- Raters of the summative assessment should be appropriately trained to ensure that there is good inter-rater reliability and validity.
- Recognition that candidate underperformance is a ‘symptom, not a diagnosis’, which should be identified as early as possible to facilitate appropriate investigation and intervention to ensure that ‘learners in difficulty’ are managed effectively and successfully(15,36–38).
- Consideration should be given to the fact that several assessments may be required to make a valid judgement of a learner's competence in a particular area and therefore judgements should not be made on isolated simulation encounters. Principles of summative should be adhered to.

- Documentation of the concern is very important. Following faculty discussion, the lead faculty member should complete formal documentation of underperformance concerns.
- There should be recognition that patient safety is at the forefront of patient care and therefore educators have a responsibility to raise concerns regarding learner performance within educational settings, including simulation(39–41).

## Resources

Participants should be taught in a simulated environment with appropriately trained faculty using robust educational programmes and where relevant , on suitable equipment and with appropriate expert feedback (26).

A designated individual should oversee and regularly review all SBE programmes to ensure a strategic approach to the delivery of programmes, avoiding duplication, facilitating sharing of good practice and encouraging equity of access to all users.

### Simulation Facility and Technology

**Recommendations**

- The Department of Health Technology Enhanced Learning (TEL) Framework document emphasises the need for investment in simulation equipment to 'deliver value for money' and 'ensure equity of access and quality of provision' across the health and social care workforce(27). Simulation equipment can be extremely costly, thus careful thought and planning should precede its procurement.
- The aim of technology used in SBE should be to enhance training, improve productivity and reduce duplication in a cost effective manner; not simply to use technologies as an end in themselves(27). Ultimately the aim of the educational experience should be to improve patient experience and safety.
- A designated individual should oversee the strategic delivery of SBE programmes and ensure appropriate maintenance of simulation equipment occurs and to make certain that ongoing simulation technology procurement continues to be appropriate to learning needs(4).
- A named faculty member with expertise in simulation based education is required to oversee the simulation programme design and ensure that it is regularly reviewed and kept up to date and relevant to the curriculum that it is mapped onto(4).
- An individual with technological expertise should provide guidance and instructional support for the simulation programme. This may include, daily operations of the simulation facility, maintenance of equipment, management of consumables and 'props', management of simulators, programming responsibility of simulators and collaboration with faculty and staff(28).
- An appropriate variety and level of simulation modalities e.g. simulated patients, part task trainers, virtual reality simulation equipment and high fidelity mannequins should be incorporated into simulation programmes to achieve appropriate realism of the learning environment(4).

- Training should be provided to educators and trainers to ensure that they are competent to use simulation equipment(4).
- A simulated patient programme, with robust infrastructure should be accessible, with SPs engaging with learners and users as a stand alone modality or as bi/multi modal or hybrid modality.
- The aim of engaging with SPs should be to enhance training and assessment not simply to use technologies as an end in themselves.
- A designated individual should ensure that appropriate and ongoing training and review of SPs occurs and oversee a regular review of all SBE programmes to ensure that ongoing SP recruitment continues to be appropriate to learning and clinical need.
- Training should be provided to educators and trainers to engage with simulated patients.

## Management, Leadership and Development

A designated lead with organisational influence and accountability is required to manage the simulation facility. The lead must ensure a supportive environment for delivery of SBE programmes, oversee appropriate and responsive programme design , develop and retain faculty and sustain SBE programmes.

**Recommendations**

- The facility should have well defined aims and objectives relevant for all healthcare groups and should be pertinent to the needs of the organisation within which the facility may be situated or attached to.
- The facility should have a clear strategic plan which addresses wider organisational and stakeholders needs. The strategy should address how simulation is supported across the organisation. Further the strategy should identify standards for faculty development, programme creation and regular review of courses and programmes(18).
- Key stakeholders should be involved in centre management and governance.
- A realistic feasibility and resource analysis should be conducted prior to the commencement of new programmes to ensure that there is equitable access for all learners in the region/ programme and sharing of faculty can be arranged for long term sustainability of programmes.
- Funding streams for new simulation programmes can be challenging to arrange, but can be identified through collaboration between local education providers, as well as both local education and training boards.
- Ensure adequate emphasis is placed on recruitment and retention of simulation faculty.
- Appropriate recognition of faculty must be provided to allow retention. This may take the form of certificates, teaching observations for their e-portfolio and evidence that can be incorporated towards appraisal and revalidation where appropriate (e.g. CPD points).

- Ensure mentoring of novice SBE faculty.(refer to section on Faculty development)
- Consider establishing a Simulation Fellowship Programme(29). Such programmes could contribute to the creation of a faculty base for the future and ensure a high quality of programme creation and faculty development.
- Recruitment of simulation champions must be considered to forward the cause of simulation within educational and healthcare institutions and must be linked to strategic goals and objectives of the facility.
- Buy-in is particularly important from clinical/academic deans and hospital leads in terms of enabling dedicated time for development and financial support(30).
- Programmes should aspire to act as a Quality and Risk Management resource for organisations to help achieve the goals of improved patient safety and quality. In situ simulations can be used to identify latent errors in clinical environments and should be actively promoted as the future of SBE programmes.
- In situ simulations should complement simulation centre based SBE programmes.

## In situ simulation

In situ simulation (ISS) is simulation-based training (SBT) that occurs in the actual clinical environment (1). The focus in recent years has shifted from delivering SBT in the simulation centre to real clinical environment. Evidence suggests that this can lead to more natural responses to training interventions and improve team working and clinical performance (2). Further ISS can lead to the identification and resolution of latent errors (3), which are potential hazards in the system that can lead to patient harm. ISS has also been successfully employed to test run a new facility (4) in a patient safe environment.

**Recommendations**

- Every effort should be made to conducting a formal educational needs analysis to identify the needs of the learners, the team and the organisation within which the in situ exercise will be placed.
- Involvement of all stakeholders will ensure that the expertise of various specialties and teams are utilised at the inception phase of the ISS activity to generate a well defined programme with appropriate complexity that achieves the learning objectives of individuals, team and the organisation (5).
- Every ISS exercise should have clearly defined learning objectives that achieve individual, team, unit level and/or organisational competencies (6).
- Every effort should be made to deliver training in an environment, which closely resembles the real life situation. Local processes and procedures should be carefully reviewed in order to deliver ISS activity authentically.
- Close collaboration should be established between the ISS training team and the parent unit where the ISS activity is to take place. This will ensure maximum gain from the activity with

minimal disruption to the day to day clinical work of the parent unit. Close liaison will also ensure that clinical staff is released from clinical duties to participate in the ISS.

- Faculty delivering the ISS activity should be proficient in SBT and have the required expertise on a given topic. (Refer to standards on faculty development) They should be able to adapt to changing demands of the in situ environment, utilise different resources and data capture methods, focus on individual and team learning and integrate both for wider organisational learning. Hence, ideally, faculty delivering ISS should undergo specific faculty development courses. (6)
- ISS activity may entail utilisation of variety of equipment, the logistics of which should be carefully planned in order to avoid delays or even cancellations. Consideration should be given to acquiring in own training kit such as a resuscitation trolley to avoid sharing essential clinical equipment during the training which may be needed elsewhere for patients in real emergencies.
- Adequate time should be factored in to the planning for the session to allow setup and disbanding of equipment and personnel. This will avoid unnecessary delays to resuming clinical work.
- In order to avoid any patient safety issues, equipment and devices used during ISS activity should be replaced and the clinical environment left similar to what it was before the start of the ISS activity.
- Sufficient time needs to be allocated to debriefing as soon as possible in the clinical settings to gain the maximum benefit. A multidisciplinary approach to evaluating team interactions should be undertaken with a focus on human factors approach to evaluate impact of latent errors and to identify remedial steps to overcome such errors.
- ISS activity may depend on the availability of the clinical area and team and could be prone to cancellations. Participants should be clearly informed that the session might not be delivered (5) if the space is utilised for actual clinical activity. Consideration should be given to scheduling ISS activity to ensure that cancellations do not take place.
- Latent errors identified during ISS should be discussed in the debriefing after the session to capture learning and identify preventative strategies. Sharing personal and team experiences will help translate training experience into improved patient outcomes.
- Latent errors should be graded using appropriate systems such as the NPSA risk matrix (7) to quantify the threat to patient safety. The risks should be notified to the organisation and recommendations should be drawn to avert these errors in the future.
- Consideration should be given to costs incurred during the delivery of ISS in the clinical area. This may be due to personnel, equipment and consumables costs (4).
- Educators should evaluate ISS activity by using appropriate measurement tools, which demonstrate not only improvement of knowledge but also transfer of learning to clinical environment. Observational tools should be designed to capture system improvements through the identification of latent errors during ISS activity. (5)

- Constant re-evaluation of the ISS services should be employed in order to ensure smooth delivery.

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## Glossary

**Assessment** refers to the process that provides feedback about performance to a participant or group of participants. Assessment can be summative or formative.

**Bloom's Taxonomy** is a system for the classification of learning objectives.

**Continuing Medical Education** (CME) is a formal system of further education in medical, nursing and other allied healthcare professional fields.

**Formative Assessment** is assessment for learning rather than of learning. The focus is the attainment of goals set by the learner in consultation with the trainer.

**Fidelity** refers to the degree to which a simulated experience approaches reality. It is also referred to as authenticity and is influenced by the environment, equipment and resources used to develop the simulation based educational programme.

**Facilitator** is the individual who provides guidance and support during simulation-based learning experiences.

**Hybrid Simulation** is the term used when two or more simulation modalities are used in training activity.

**Human Factors** is the discipline or science of studying the interaction between humans and systems and technology.

**In-Situ Simulation** refers to simulation activities which take place in the actual clinical environment.

**Interprofessional education** refers to educational activities that involve learners from more than one professional field.

**Participant** is a learner who participates in a simulation-based learning activity to gain knowledge, skills and/or attitudes to enhance their professional practice.

**Non-technical Skills** are behavioural skills which are skills of decision making (e.g., anticipation and planning, use of cognitive aids, avoiding fixation errors) or skills of teamwork and team management ( workload distribution, communication, and/or role clarity)(42)

**Objective** is a statement of a specific result that the participant of a simulation activity is expected to achieve by the end of the activity.

**Reliability** is reproducibility of a measure across repeated tests.

**Scenario** is the recreation of a clinical situation using a set of events and time lines to achieve programme objectives. Scenarios can be run 'on the fly' or are programmed into the manikin.

**Simulation Facility** is the physical space where the simulation based educational event takes place.

**Simulated Patient** is a live person playing the role of a patient, staff or family member in a healthcare simulation

**Simulation programme** is an educational activity which uses simulation as the predominant modality to teach learners.

**Summative Assessment** is assessment of learning rather than for learning. Assessment, here is used to pass or fail a learner and decides the future progress of a learner in their professional setting.

**Validity** is the degree to which a test or evaluation tool accurately measures the intended outcome of the test(42).

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