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Standards of Best Practice: Simulation

INACSL Standards of Best Practice: Simulation[SM] Simulation Design

INACSL Standards Committee

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As the science of simulation continues to evolve, so does the need for additions and revisions to the INACSL Standards of Best Practice: Simulation[SM]. Therefore, the INACSL Standards of Best Practice: Simulation are living documents.

Standard

Simulation-based experiences are purposefully designed to meet identified objectives and optimize achievement of expected outcomes.

Background

Standardized simulation design provides a framework for developing effective simulation-based experiences. The design of simulation-based experiences incorporates best practices from adult learning,[1] education,[2,3] instructional design,[4,5] clinical standards of care,[6,7] evaluation,[8-11] and simulation pedagogy.[12-16] Purposeful simulation design promotes essential structure, process, and outcomes that are consistent with programmatic goals and/or institutional mission. The design of effective health care simulations facilitates consistent outcomes and strengthens the overall value of the simulation-based experience in all settings.

All simulation-based experiences require purposeful and systematic, yet flexible and cyclical planning. To achieve expected outcomes, the design and development of simulations should consider criteria that facilitate the effectiveness of simulation-based experiences.

Potential consequences of not following this standard may include ineffective assessment of participants and inability of participants to meet identified objectives or achieve expected outcomes. In addition, not following this standard can result in suboptimal or inefficient utilization of resources when designing simulation activities.

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Criteria Necessary to Meet This Standard

1. Perform a needs assessment to provide the foundational evidence of the need for a well-designed simulation-based experience.
2. Construct measureable objectives.
3. Structure the format of a simulation based on the purpose, theory, and modality for the simulation-based experience.
4. Design a scenario or case to provide the context for the simulation-based experience.
5. Use various types of fidelity to create the required perception of realism.
6. Maintain a facilitative approach that is participant centered and driven by the objectives, participant's knowledge or level of experience, and the expected outcomes.
7. Begin simulation-based experiences with a prebriefing.
8. Follow simulation-based experiences with a debriefing and/or feedback session.
9. Include an evaluation of the participant(s), facilitator(s), the simulation-based experience, the facility, and the support team.
10. Provide preparation materials and resources to promote participants' ability to meet identified objectives and achieve expected outcomes of the simulation-based experience.
11. Pilot test simulation-based experiences before full implementation.

Criterion 1: Perform a needs assessment to provide the foundational evidence of the need for a well-designed simulation-based experience.

Required Elements:

- The needs assessment may include analysis of:
  - Underlying causes of a concern (e.g., root cause or gap analysis).
  - Organizational analysis (e.g., Strengths, Weaknesses, Opportunities and Threats analysis).
  - Surveys of stakeholders, participants, clinicians, and/or educators.
  - Outcome data (e.g., from pilot testing; previous simulation-based experiences; aggregate health care data).
  - Standards (e.g., certifying bodies, rules and regulations, practice guidelines).
- The needs assessment includes an examination of knowledge, skills, attitudes, and/or behaviors of individuals; organizational initiatives; systems analysis; clinical practice guidelines; quality improvement programs; and/or patient safety goals.
- Use the results of the needs assessment to guide the development of an overarching goal or broad objective for the simulation, which in turn directs the designer(s) in the development of simulation-specific objectives (see INACSL Standard: Objectives and Outcomes).
- Use the results of the needs assessment to create innovative and interactive simulation-based experiences that aim to:
  - Enhance curriculum in the classroom and/or clinical areas.
  - Provide opportunities for standardized clinical experiences.
  - Address competencies.
  - Improve quality of care and patient safety.
  - Promote readiness for clinical practice.

Criterion 2: Construct measureable objectives.

Required Elements:

- Develop broad and specific objectives to address identified needs and optimize the achievement of expected outcomes.
- Together, broad and specific objectives provide a blueprint for the design of a simulation-based experience.
  - Broad objectives reflect the purpose of the simulation-based experience and are related to organizational goals.
  - Specific objectives are related to participant performance measures.
- During the design phase, determine which objectives will or will not be available to the participant(s) before the experience.
  - Objectives that provide general information and context for the participant(s) should be disclosed (e.g., provide care for a patient with heart failure).
  - Participant performance measures or critical action checklists should not be disclosed.
- Use the measureable objectives to drive the design, development, and approach for the simulation-based experience (see INACSL Standard: Objectives and Outcomes).
- The facilitator assumes responsibility for guiding the achievement of the full set of objectives throughout the simulation-based experience (see INACSL Standard: Facilitation).

Criterion 3: Structure the format of a simulation based on the purpose, theory, and modality for the simulation-based experience.

Required Elements:

- Select the format of the simulation-based experience based on the needs assessment, resources, and broad objectives, taking into account the targeted participants.
- Use the purpose of a simulation-based experience to design and develop either a formative and/or summative encounter.
- Choose a theoretical and/or conceptual framework[15,17,18] based on the identified purpose and the

targeted participants (e.g., adult learners, inter-professional teams,[19] etc.).
- Select the appropriate modality for the simulation-based experience. The modality is the platform for the experience. Modalities can include simulated clinical immersion, in situ simulation, computer-assisted simulation, virtual reality, procedural simulation, and/or hybrid simulation. These modalities are achieved using standardized patients, manikins, haptic devices, avatars, partial task trainers, and so forth.
- Structure all simulation-based experiences to include a starting point, structured participant activities, and an end point.
  - The starting point represents the initial circumstances of the patient or situation when the participants start their engagement in the simulation-based experience.
  - Structured participant activities are designed for participant engagement (e.g., a simulated case or an unfolding scenario, and/or psychomotor skill teaching/evaluation).
  - The end point is the stage at which the simulation-based experience is expected to end, usually when expected learning outcomes have been demonstrated, time is exhausted, or the scenario can proceed no further.

Criterion 4: Design a scenario or case to provide the context for the simulation-based experience.

Required Elements:

- Use a process to design a scenario or case that ensures the quality and validity of the content and supports the objectives and expected outcomes.
- Design the scenario or case to include:
  - A situation and backstory to provide a realistic starting point from which the structured activity begins. The full picture of this context may be given verbally to the participants, found in the patient's file, or be revealed if requested through adequate inquiry on the part of participants.
  - Clinical progression and cues to provide a framework for the advancement of the clinical case or scenario in response to participant actions, including standardization of cues to guide the participant(s). Cues should be linked to performance measures and used to refocus participants when they stray from the intended objectives. Cues should be delivered to participants in a variety of ways, including verbally (e.g., through the patient, provider, or embedded participant), visually (e.g., through changes in vital signs on a monitor), through additional data (e.g., new laboratory results), and so forth (see INACSL Standard: Facilitation).
  - Time frames to facilitate progression of the scenario and ensure that there is reasonable time to achieve the objectives.
  - A script of a scenario or case that is developed for consistency and standardization to increase scenario repeatability/reliability. Variation from the planned dialogue may add distractions that could interfere with the objectives and affect validity and/or reliability of the scenario or case.
  - Identification of critical actions/performance measures that are required to evaluate achievement of scenario objectives. Each measure should be evidence based. Use subject matter experts to strengthen validity of the simulation scenario and the critical performance measures.

Criterion 5: Use various types of fidelity to create the required perception of realism.

Required Elements:

- Design the simulation through attention to physical, conceptual, and psychological aspects of fidelity that can contribute to the attainment of objectives.
  - Physical (or environmental) fidelity relates to how realistically the physical context of the simulation-based activity replicates the actual environment in which the situation would occur in real life. Physical fidelity includes such factors as the patient(s), simulator/manikin, standardized patient, environment, equipment, embedded actors, and related props.
  - Conceptual fidelity ensures that all elements of the scenario or case relate to each other in a realistic way so that the case makes sense as a whole to the participant(s) (e.g., vital signs are consistent with the diagnosis). To maximize conceptual fidelity, cases or scenarios should be reviewed by subject matter expert(s) and pilot tested before use with participants.
  - Psychological fidelity maximizes the simulation environment by mimicking the contextual elements found in clinical environments, for example, an active voice for the patient(s) to allow realistic conversation, noise and lighting typically associated with the simulated setting, distractions, family members, other health care team members, time pressure, and competing priorities. Psychological fidelity works synergistically with physical and conceptual fidelity to promote participant engagement.
- Develop the simulation using the appropriate types of fidelity that create the required perception of realism that will allow participants to engage in a relevant manner.[13,20]

As appropriate, use moulage to replicate features or characteristics of the patient situation and select manikins that represent the race and culture of the patients in the scenario in order to promote the sensory perceptions of participants and support the fidelity of the scenario.[21]

Criterion 6: Maintain a facilitative approach that is participant-centered and driven by the objectives, participant's knowledge or level of experience, and the expected outcomes.

Required Elements:

- Determine the facilitative approach during in the design phase.
- Use a level of facilitator involvement inversely proportional to the participant's knowledge and experience.
- Use a consistent facilitative approach among facilitators for each scenario, case, or simulation-based experience to achieve intervention fidelity.[22] (See INACSL Standard: Facilitation)
- Use facilitators who have formal training in simulation-based pedagogy (see INACSL Standard: Facilitation).

Criterion 7: Begin simulation-based experiences with a prebriefing.

Required Elements:

- Conduct a pre-briefing[23,24] to set the stage for the simulation-based experience by identifying participants' expectations that may differ depending on the level of experience of the participant(s) and theoretical framework.
- Conduct a prebriefing that is structured, planned for consistency, and completed immediately before the scenario/case.
- Incorporate into the prebriefing, activities that help establishment an environment of integrity, trust, and respect. Identify in the prebriefing expectations for the participant(s) and the facilitator(s). This includes establishment of ground rules and a fiction contract (see INACSL Standard: Professional Integrity and INACSL Standard: Facilitation).
- Incorporate into the prebriefing an orientation of the participant(s) to the space, equipment, simulator, method of evaluation, roles (participants/facilitator/standardized patient), time allotment, broad and/or specific objectives, patient situation, and limitations (see INACSL Standard: Facilitation).
- Consider use of a written or recorded prebriefing plan to standardize the process and content for each scenario/case. A written or recorded prebriefing plan should be required for simulation-based experiences when used for high-stakes evaluations.

Criterion 8: Follow simulation-based experiences with a debriefing and/or feedback session.

Required Elements:

- Identify the debriefing or feedback method for the simulation-based experience during the design phase.
- Use a planned debriefing or feedback session to enrich learning and contribute to the consistency of the simulation-based experiences for participants and facilitators. Debriefing and feedback are different, but both are critical elements that should be structured using best practices. In the case of a skills-based or testing simulation activity, debriefing may be replaced by feedback, so the participants are guided to further improve or confirm their practice.
- Use debriefing facilitators who have formal training in debriefing techniques.
- Follow INACSL Standard: Debriefing.

Criterion 9: Include an evaluation of the participant(s), facilitator(s), the simulation-based experience, the facility, and the support team.

Required Elements:

- Determine the evaluation processes in the design phase to ensure quality and effectiveness of simulation-based experiences.
- Adopt an evaluation framework to guide selection and/or development of a valid and reliable tool to measure expected outcomes.
- Ensure that participants are clear on the method of participant evaluation (formative, summative, and/or high-stakes) before or at the onset of the simulation.
- Include in the evaluation process input from participants, peers, and stakeholders.
- Use assessment data to assist in evaluating the simulation program for quality process improvement.
- Follow INACSL Standard: Participant Evaluation.

Criterion 10: Provide preparation materials and resources to promote participants' ability to meet identified objectives and achieve expected outcomes of the simulation-based experience.

Required Elements:

- The designer and facilitator are responsible for ensuring that preparatory activities address the knowledge, skills, attitudes, and behaviors that will be expected of the participants during the simulation-based experience.
- Determine necessary participant preparation in the design phase once all the elements of the simulation-based experience have been identified.
- Design and develop preparation activities and resources to promote the best possible opportunity for participants to be successful in addressing the simulation objectives. These may include:
  - Activities and/or resources to develop understanding of the concepts and content related to the simulation (e.g., reading assignments, concept mapping, coursework, didactic sessions, answering simulation-

specific questions, watching preparatory audiovisuals, completing a pretest, reviewing health record documents, skill review and practice, etc.).
  - Information regarding codes of conduct, confidentiality, and expectations (see INACSL Standard: Professional Integrity).
- Allow for participants to complete preparation activities in advance of the simulation prebriefing.

Criterion 11: Pilot test simulation-based experiences before full implementation.

Required Elements:

- On completion of the design, pilot test the entire simulation-based experiences to ensure that it accomplishes its intended purpose, provides opportunity to achieve objectives, and is effective when used with participants.
- Identify any confusing, missing, or underdeveloped elements of the simulation-based experience during pilot testing and correct before the actual simulation encounter.
- Use an audience similar to the target participant group as the optimal test environment.
- Include in the pilot test an evaluation of the evaluation tool(s), checklists, and other measures to assess for validity and to ensure consistency and reliability (i.e., content validity, expert review, inter-rater reliability, etc.).

Design Templates

Design Templates are available for educators to use that feature evidence-based design and standardize the design process. Samples of template resources are available (see references).

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About the International Nursing Association for Clinical Simulation and Learning

The International Nursing Association for Clinical Simulation and Learning (INACSL) is the global leader in transforming practice to improve patient safety through excellence in health care simulation. INACSL is a community of practice for simulation where members can network with simulation leaders, educators, researchers, and industry partners. INACSL also provides the INACSL Standards of Best Practice: Simulation[SM], an evidence-based framework to guide simulation design, implementation, debriefing, evaluation, and research.