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How to Use Simulation for Medical Education

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- Medical simulation (MS) is commonly used as an adjunct to clinical and didactic experiences.
- The **main benefits** of MS include using active learning exercises, with targeted learning objectives and exposure to rare and critical events, in a learner-centered and psychologically safe environment.
- The **main challenges** in using MS include significant development time, limited administrative/technical resources, and competing efforts to acquire instructors and learners.
- MS can be used to facilitate sessions with many types of learners at different levels of training, on several topics, and to address all six ACGME Core Competencies [Table 1].
- MS can also be used to introduce and/or test current workflow processes and assist with the effective design of new workspaces.
- MS sessions can be facilitated using low-fidelity equipment [i.e., simple task trainer for performing intubation], or high-fidelity equipment [i.e., automated manikin with ability to defibrillate].
- MS sessions can be held in a simulation center with a simulation room, a separate observation area, and a distinct area for debriefing and teaching. MS sessions can also be held in actual patient care environments, which are referred to as "in-situ" simulations.
- **The debriefing session is considered the most critical portion of the MS session;** it allows the learner to develop areas for future improvement.
- MS sessions should be strategically designed [Table 2].
- While formative evaluations of learner progress are commonly used in MS, summative assessments that focus on measurement of outcomes or achievement of objectives can also be used.

Table 1: Examples of Pediatric Anesthesia MS scenario topics and the related ACGME Core Competencies

ACGME competency	**MS scenario focus**
Medical Knowledge	Detection of correct arrythmia [i.e., SVT]
Patient Care	Treatment of respiratory event [i.e., laryngospasm]
Interpersonal and Communication Skills	Delivery of news to a family member [i.e., bad prognosis]
Professionalism	Discussion of ethical perioperative considerations [i.e., Jehovah's Witnesses]
Practice-Based Learning and Improvement	Recognition of a near-miss event [i.e., medication error]
Systems-Based Practice	Arrangement of care [i.e., ICU transfer after an unplanned adverse event]

Table 2: Strategies for creating a MS scenario

Determine SMART learning objectives.
Identify the learner type[s].
Establish the staffing of instructor[s].
Categorize facility/equipment requirements.
Create a scenario storyboard.
Develop the debriefing session.
Characterize the evaluation format[s].

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