

Add MUSCLE:

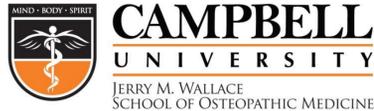
A Medical Undergraduate Simulation Curriculum for Learner-centric Education

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Description

Simulation has varied application and utility in both GME and undergraduate medical education. According to a 2011 AAMC survey, 84% of first year and 93% of second year medical students are exposed simulation in their program.¹ Simulation experts tend to divide simulation into Standardized Patient (SP)-based simulation and manikin-based simulation. Ninety-four percent of medical school respondents stated they utilized Standardized Patients, and although 96% report use of high-fidelity manikins, there was no specific information obtained as to *how* these manikins were actually used in the simulation environment.¹ Nearly all medical schools utilized SPs in their simulation education process, but do not aggressively expose students to complete, non-ACLS manikin-based simulation scenarios (SIMs) and debriefings as part of their curriculum.

We share our approach in providing in-depth manikin-based simulation exercises and debriefings within our Clinical Skills 1 and 2 courses for our undergraduate medical students – what we call “MUSCLE.” These simulations are “learner-centric” in which both the case creation process and debrief approach are completely focused on being *designed for the level of the learner, relevant to their future clinical work, and relevant to their current lecture/didactic content.*

Methods

Below we provide a general outline of Campbell University School of Osteopathic Medicine’s SP-based and SIM schedule. Like many medical schools, we utilize significant SP contact through faculty-directed small group exercises that are not presented here. We also provide significant early NBOME-style (14-min/9-min) encounters for students throughout the first two years starting at week 6 of matriculation (noted in figure 1).

The manikin-based cases begin at the start of semester 2 of the first year and continue twice per block (four times every semester) through year 3. Logistically, we run two simultaneous SIMs for two groups of five students. These two groups come together for a single 40-minute debrief. As they start their debrief, another cohort of two groups of 5 start their 18-minute simulation exercise and come together to form a second debrief group, also for 40 minutes. We are able to move half of our class size (80 students) through the complete simulation exercise in 4 hours. In early blocks, we utilize 2 faculty facilitators and two debriefing faculty. In later blocks a facilitator is not necessary as students gain more familiarity with the manikin, the room, role expectations, and team dynamics. Complexity of cases and expectations of students to incorporate and apply practical clinical skills (IV, phlebotomy, intubation, etc.) advances once students have completed separate formal procedural skills training and demonstrated ability through a formal check-off process.

Discussion

Simulation medicine has become a standard expectation of ACGME and medical undergraduate education. Unfortunately, there is very little to define specifically what “simulation” may include, likely resulting in significant variability in medical schools’ utilization of manikin-based simulation for their students. Formal case-based simulation has shown to benefit learners of varying levels.² We feel the most effective time to expose medical students to such formal simulation exercises is in their pre-clinical years where they otherwise have limited opportunities to apply their newfound medical knowledge.

Through our MUSCLE program, we provide the logistics for implementing an aggressive exposure to simulated clinical experiences during the first two years of medical school. With many medical school class sizes of 160 (or more) students, our system still allows time for meaningful and practical debriefing.

Image 1. Manikin-based simulation exercise (SIM) involving small student groups.



Figure 1. Block outline of use of manikin-based simulation (top row - SIMs) and SP-based simulation (bottom row – 14-min/9-min NBOME-style OSCE) through the first two years into early rotations.

Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7	Block 8	Year 3 Rotation 1
		2 SIMS	4 SIMS					
2 14/9 OSCEs	4 14/9 OSCEs							

Figure 2. The timeline of our typical simulation cases. All cases include a pre-simulation assessment and a post-simulation assessment.

Activity	Time	Details
Pre-reading	60 min	American Academy of Family Practice (or similar peer-reviewed) review articles, CUSOM faculty and AHA videos, clinical faculty written “one-pagers” (synopsis of clinical relevance)
Pre-SIM Assessment	2 min	Questions on understanding of medical content and clinical application of reading, self-confidence, communications and teamwork
Pre-briefing	2 min	Manikin and room orientation; clinical case background
Simulation Exercise	18 min	Team of 5: team leader, scribe, historian, physical examiner, interventionalist
Debriefing	40 min	Two teams of 5; reflective practice debriefing (emotional and physical responses to SIM), advocacy/inquiry debriefing, pre-planned teaching points, hands-on/interactive exercises that reinforce teaching points
Post-SIM Assessment	2 min	Reassessment of understanding of medical content and clinical application of reading, self-confidence, communications and teamwork

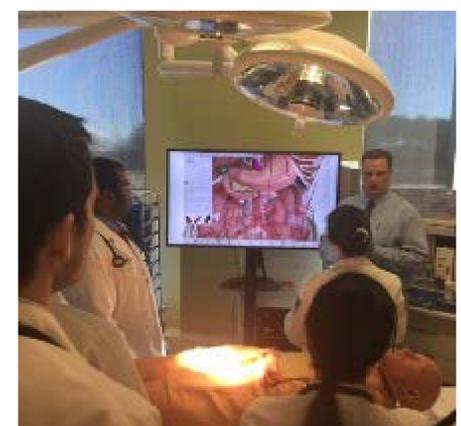


Image 2. Interactive debriefing involving a simulated surgical abdomen manikin.

References

¹ Medical Simulation in Medical Education: Results of an AAMC Survey, AAMC 2011.

² LaVelle, B. A., McLaughlin, J. J., Simulation-Based Education Improves Patient Safety in Ambulatory Care, *Advances in Patient Safety: New Directions and Alternative Approaches* (Vol. 3: Performance and Tools). Agency for Healthcare Research and Quality (US), Vol 3, Aug 2008.



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