



39 Simulation is Now Integral to EM Resident Training Nationwide

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Background: Simulation-based education has grown rapidly in the 21st century. In 2003 McLaughlin found that only 29% of EM residency programs in the US were using high-fidelity mannequin-based (HFMB) simulation to train residents. By 2008, Okuda found use of HFMB sim had risen to 85% of programs, and 43% owned their own mannequin simulators, up from 8% only 5 years earlier.

Objectives: To describe the current role of simulation in the education and evaluation of EM residents in the US.

Methods: A national survey of EM residency program directors was conducted. The study received exemption from review by Yale Institutional Review Board. The survey consisted of 39 multiple-choice questions developed by the study authors. It was administered electronically, via surveymonkey.com, and distributed via email to the CORD listserve in Fall 2015.

Results:

- 99 programs completed the survey, from 35 states, Puerto Rico and District of Columbia. 91 were allopathic programs, constituting 54% of ACGME-accredited residencies. 7 osteopathic programs responded, out of 44 accredited by AOA. (1 respondent declined to indicate DO vs MD.)
- 100% of respondents reported that simulation is incorporated in their curriculum in some fashion. 80% indicated plans to expand sim curricula in the next 5 years. Table 1 details current uses for simulation in EM curricula.
- 71% of residents participate in sim at least once a month, 23% “once every few weeks,” and 4% only 1-2 times per year.
- 84% of programs have on-site facilities dedicated

to simulation, and 20% indicated they plan to build new sim facilities in the next 5 years.

- 97% of programs are using sim to teaching procedural skills; Table 2 details which procedures. Central venous catheter insertion is taught via sim at 96% of programs, indicating that simulation is now a universally standard part of teaching this critical procedure.
- 53% of programs use simulation for milestone assessment, and a further 27% plan to do so in the near future.

Conclusions: Though our study was limited by its response rate, our findings show that HFMB simulation has become a ubiquitous part of EM residents’ training in the US. It is particularly well-integrated into procedural teaching and skills assessment, as seen in the example of CVC insertion. We must continue to explore and expand on the possibilities of simulation-based modalities for training the next generation of EM physicians.

Table 1. Uses for Simulation.

Application	# of respondents, n = 98 (%)
Education	96 (98%)
Procedural Skills	95 (97%)
Team Training	81 (83%)
Evaluation/Assessment	69 (70%)
Interdisciplinary sessions with other departments/healthcare providers (e.g., RNs, techs)	65 (66%)
Milestone Assessment	58 (59%)
Remediation	56 (57%)
Quality Improvement/Quality Assurance	26 (27%)
Credentialing	19 (19%)
Other (both described forms of interprofessional team training)	2 (2%)

Table 2. Procedures Taught Via Simulation.

Procedure	# of respondents, n = 83 (%)
Central Venous Catheter Insertion	80 (96%)
Cricothyroidotomy	75 (90%)
Cardioversion/Defibrillation	67 (81%)
Thoracostomy	65 (78%)
Lumbar Puncture	64 (77%)
FAST and ultrasound skills	62 (75%)
Pericardiocentesis	60 (72%)
Vaginal delivery	43 (52%)
Peripheral IV placement	41 (49%)
Arthrocentesis	27 (33%)
Paracentesis	16 (19%)
Foley catheter insertion	14 (17%)
Other	14 (17%)
“Other” procedures described by respondents: intubation and airway management (3), cardiac pacing (3), intra-osseous placement (2), thoracotomy (2), arterial lines, umbilical lines, fasciotomy, lateral canthotomy	