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A curricular model for simulation within orthopaedic residency training

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Keywords

Assessment of learning, Educational research methods and models, Simulation

Abstract

Purpose: To provide a curricular model for other orthopaedic residency programs at large academic institutions to follow as they endeavor to meet the 2013 ABOS simulation mandate.
Objectives: To provide other orthopaedic residency programs with a curricular model that:

- Is flexible and modifiable.
- Includes supporting documentation to implement said model, including course maps, 3-year rotating curriculum, discussion of partnerships with industry, body donation, and simulation.
- Provides potential options for assessment (though they have not been validated).
- Addresses the major concerns of the current curricular paradigm, including cost, variability in training models, limited fidelity, and time.

Introduction: Evolving rules surrounding work hours and the clinical environment have necessitated the growth of simulation in clinical education. (Morgan et al., 2017; Ruikar et al., 2018; Sayari et al., 2021; Stirling et al., 2014) In 2013 the American Board of Orthopaedic Surgery (ABOS) Residency Review Committee (RRC) introduced simulation training as a formal requirement of intern year, providing a modular curriculum that, while fundamental, is not descriptive. (ABOS Surgical Skills Modules for PGY-1 Residents,â€ n.d.) This curriculum comes with significant limitations, including cost, variability in training models, limited fidelity, and time. The authors aim to provide a model to address these limitations.

Methods: The OHSU Orthopaedics and Rehabilitation residency curriculum was based on the ABOS modules for post-graduation year one (PGY-1) residents and consisted of 18 total sessions per year cadaveric donor and dry material. OHSU Orthopaedics worked closely with OHSU Simulation to arrange to these trainings and with the OHSU Body Donation Program (BDP) to manage tissue use. Industry partners supplemented specific equipment and instrumentation needs via standard grant request processes.

Results: Advanced planning with OHSU BDP allowed for cost-effective reuse of donor material, including up to three freeze/thaw cycles whilst maintaining educational viability. This re-use also enabled OHSU Orthopaedics to cover all required ABOS modules multiple times through their three-year rotating curriculum (see Sample Curriculum 1 and 2). Combined with strategic partnerships with OHSU Simulation and industry representatives, OHSU Orthopaedics reduced the $350 cost for simulation models per resident (not including replacement parts) currently listed in the literature. Donor material enabled increased fidelity for all learners and specifically senior residents, when compared to standard dry models in the literature. Finally, the close proximity from clinical duties to OHSU Simulation allowed residents to maximize their duty hours by minimizing travel time to educational commitments.

Conclusion: The OHSU Orthopaedic education program developed a high-fidelity training program that 1) Is applicable to both junior and senior residents 2) Minimized cost per resident 3) Eliminated industry bias in training by collaborating with all major industry representatives and 4) Maximized resident work duty-hours. We propose this manuscript act as a reference for other programs and institutions to develop their own residency educational curriculum models.

Learning Objectives

1. Comprehension of the limitations of current curricular models
2. Knowledge of one institution's attempts to address said limitations
3. Knowledge of possible assessment options for simulation in orthopaedics

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