ORIGINAL REPORT

Using Objective Structured Clinical Examinations to Assess Intern Orthopaedic Physical Examination Skills: A Multimodal Didactic Comparison

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Patient care is 1 of the 6 core competencies defined by the Accreditation Council for Graduate Medical Education (ACGME). The physical examination (PE) is a fundamental skill to evaluate patients and make an accurate diagnosis. The purpose of this study was to investigate 3 different methods to teach PE skills and to assess the ability to do a complete PE in a simulated patient encounter.

DESIGN: Prospective, uncontrolled, observational.

SETTING: Northeastern academic medical center.

PARTICIPANTS: A total of 32 orthopedic surgery residents participated and were divided into 3 didactic groups: Group 1 ($n = 12$) live interactive lectures, demonstration on standardized patients, and textbook reading; Group 2 ($n = 11$) video recordings of the lectures given to Group 1 and textbook reading alone; Group 3 ($n = 9$): 90-minute modules taught by residents to interns in near-peer format and textbook reading.

RESULTS: The overall score for objective structured clinical examinations from the combined groups was 66%. There was a trend toward more complete PEs in Group 1 taught via live lectures and demonstrations compared to Group 2 that relied on video recording. Near-peer taught residents from Group 3 significantly outperformed Group 2 residents overall ($p = 0.02$), and trended toward significantly outperforming Group 1 residents as well, with significantly higher scores in the ankle ($p = 0.02$) and shoulder ($p = 0.02$) PE cases.

CONCLUSIONS: This study found that orthopedic interns taught musculoskeletal PE skills by near-peers outperformed other groups overall. An overall score of 66% for the combined didactic groups suggests a baseline deficit in first-year resident musculoskeletal PE skills. The PE should continue to be taught and objectively assessed throughout residency to confirm that budding surgeons have mastered these fundamental skills before going into practice. (J Surg Ed ▮:▮▮▮-▮▮▮. © 2016 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: orthopedics, physical examination, near-peer, residency training, OSCE

COMPETENCIES: Medical Knowledge, Patient Care, Practice-Based Learning and Improvement

INTRODUCTION

Patient care is 1 of the 6 core competencies defined by the Accreditation Council for Graduate Medical Education (ACGME) and improving mastery of these competencies is paramount to resident education.[1-3] However, preparing orthopedic surgery interns with the skills necessary to be competent and compassionate physicians remains challenging for residency programs.[4-6] Efforts to implement standardized, competency-based modules and assessments for orthopedic residents have increased dramatically in recent years. Though numerous studies have reported on methods

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to improve and assess the surgical skills of orthopedic residents,[5,7-9] few have sought to investigate resident competency in musculoskeletal (MSK) physical examination (PE) skills. The PE is a fundamental aspect of patient care necessary to evaluate patients, make an accurate diagnosis, and provide care plans. The PE is a key component of the patient care developmental milestones in the milestone specific cases.

Results from recent investigations demonstrate medical school graduates are disproportionately deficient in MSK fund of knowledge compared to other fields despite the world prevalence of MSK disease burden.[10-12] Orthopedic residents have similarly also been documented to be lacking MSK PE skills at the outset of their training.[13] These findings serve as further impetus to design effective didactics in MSK PE skills for orthopedic interns. Efforts to improve this gap in knowledge for medical students have had varying rates of success, though multimedia resources, live simulation, and near-peer teaching show promise.[14-17]

Many orthopedic surgery programs have implemented "boot camps" to assist in preparing their orthopedic residents for the demands of patient care. These fast-paced training periods often emphasize surgical skills such as suturing, bone drilling, and patient draping.[18,19] Orthopedic boot camps have been met with positive feedback from residents and attending surgeons alike. Residents participating in these modules have been shown to retain surgical skills taught over time and have improved surgical performance and self-efficacy. In Toronto, use of student led or "near-peer" teaching has also shown potential for further improvement of surgical skills.[20]

Over the last 3 years, our institution has used an objective structured clinical examination (OSCE) as a component of our boot camp training module to assess and improve the MSK PE skills of orthopedic interns. We have used video instruction, live lectures, and near-peer teaching by residents to gauge the most effective instructional approach for teaching mastery of MSK PE skills. The purpose of this study was to contrast results from these 3 different didactic approaches to teaching MSK PE skills in our program and to assess the ability of orthopedic interns to perform a complete PE in a simulated patient encounter using orthopedic milestone specific cases.

METHODS

A total of 32 residents participated in a PE curriculum. Group 1 (total 12 interns) was taught with live interactive lectures, demonstration on standardized patients (SPs), and textbook reading about the PE process. Group 2 (total 11 interns) was taught using video recordings of the lectures given to Group 1 and textbook reading. Group 3 (total 9 interns) was taught in an orthopedic boot camp setting, in which the resident taught the interns PE skills in 90-minute modules based on joint specific units, and textbook learning (Fig. 1).

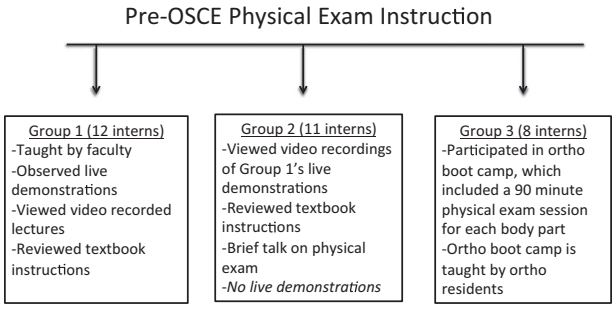

FIGURE 1. Diagram description of orthopedic resident intern didactic methods for the 3 groups included in this study.

Each group participated in an OSCE to assess PE skills. In the OSCE, SPs enacted 6 clinical scenarios based on milestone-specific cases: carpal tunnel syndrome, meniscal tear, ankle arthritis, hip arthritis, spinal stenosis, and rotator cuff tear. Each actor or SP received at least 2.5 hours of initial training from the orthopedic faculty prior to the OSCE. Comprehensive scripts were developed for each scenario that encompassed the history, PE findings, and emotional and social issues.

The OSCEs were conducted in a state-of-the-art simulation center located at one of the major hospitals at our institution. The examination rooms contain ceiling-mounted cameras with the recording taking place in an isolated monitor room. There are 2 cameras in each examination room that can be adjusted to follow the entire encounter. The residents are aware that the encounters are being filmed and that this film would be reviewed. Viewing is available through 1-way glass panels in the simulation center as well.

Following the OSCE, all residents received video access to review their performance and complete a PE checklist for each clinical scenario (Fig. 2). Specialists for each clinical scenario developed the PE checklists. Each item on the PE was scored by the resident on a 3-point scale consisting of: completed, partially completed, or not completed.

Results were analyzed by percentage of skills completed correctly. Partially completed skills were not counted toward final scores of the residents. Comparison was made between 3 groups of interns who participated in the PE teaching and OSCE during internship year. Differences were assessed between groups using the independent samples *t*-test (Fig. 3).

RESULTS

Overall percentages of PE tasks completed correctly were comparable between the groups (62% in Group 1, 58% in Group 2, and 72% in Group 3). Group 3 overall scores were significantly higher than those in Group 1 ($p = 0.02$).