

Physical Examination and Radiographic Interpretation of Carpal Anatomy in Orthopedic Residents and Emergency Medicine Physicians

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Abstract

The purpose of this study was to evaluate carpal anatomy proficiency in orthopedic residents as well as emergency medicine physicians.

Orthopedic surgery residents and emergency medicine physicians were tested on their understanding of normal carpal anatomy using a Wrist Anatomy Assessment (WAA) score, which consists of both palpation of carpal bony landmarks and radiographic interpretation of the carpal bones. There were 89 participants in this study. Cohorts of orthopedic residents ($n = 20$), emergency medicine residents ($n = 21$), emergency medicine attending physicians ($n = 26$), and 4th-year medical students (22) were used. Group size was based on 100% orthopedic resident involvement.

Total WAA scores (score of 17 = 100% correct) ranged from 2 to 16, with a mean of 8.6. Carpal palpation and radiographic interpretation means were both significantly better in the orthopedic resident cohort (total WAA score, 13.8), compared with either of the emergency medicine groups (resident total WAA score, 7.5; attending total WAA score, 7.2).

Orthopedic residents have a better understanding of the clinical and radiographic anatomy of the carpal bones than emergency medicine residents and attending physicians. Future research to test educational interventions to improve carpal anatomy education is warranted.

When a patient presents to the emergency department with wrist pain after a trauma such as a fall on an outstretched hand, he or she will be assessed by medical professionals with varying degrees of expertise, from emergency med-

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icine (EM) residents, to EM attending physicians, to orthopedic resident consultants. A limited understanding of normal carpal anatomy can lead to an inaccurate diagnosis and potentially an inappropriate treatment plan for patients who have sustained a wrist injury such as a carpal fracture or pericarpal dislocation. Correctly diagnosing carpal injuries may sometimes be challenging in the acute trauma setting and requires a solid understanding of carpal bone anatomy. The initial physical exam in the emergency department directs the subsequent course of treatment, and therefore, marks a critical moment in a patient's care. Knowledge of carpal anatomy, which is second nature to the trained hand surgeon, may or may not have been mastered during medical school by EM physicians. How good are we in the United States at medical student musculoskeletal education, let alone the narrow topic of carpal anatomy? Can we do better? One study conducted by Day and colleagues¹ at Harvard Medical School indicated that medical students do not feel adequately prepared in the area of the musculosk-

Study Form	Wrist Anatomy Assessment	subject number:
	VAS Scale	Visit Date: _____



Subject SELF EVALUATION

- 1. Please rate the level of confidence you have in your palpation technique.**

None Complete
- 2. Please rate the level of confidence in your x-ray interpretation.**

None Complete
- 3. Please rate the energy level you have today.**

Exhausted Ready to run a marathon
- 4. Please rate the amount of test-taking anxiety you are experiencing today.**

None Extreme

Figure 1. Visual analog scale questionnaire.

