When a patient with an orthopedic complaint presents to the emergency department (ED), an emergency medicine (EM) physician or another primary care physician first evaluates the patient to determine whether the issue requires an urgent orthopedic consult or if the patient can be stabilized for elective follow-up care in an orthopedic clinic. Correct identification of orthopedic diagnoses requiring urgent care is particularly important, as on-call participation for orthopedic surgeons has declined nationally within the past several years.\textsuperscript{1} Neglecting to call for an urgent consultation for particular orthopedic diagnoses can lead to incomplete reduction, missed fractures, malunion, nonunion, avascular necrosis, increased infection rate, or growth disturbances.\textsuperscript{2-5}

Understanding the key role of primary care and EM physicians, the authors investigated the decision-making process of orthopedic surgeons, pediatricians, and EM physicians to determine whether these 3 specialties reached different conclusions on the urgency of ED orthopedic consults. The authors also studied whether these decisions varied by year in training, to ascertain if variable or no musculoskeletal education during medical school was made up for during the residency training years. An online survey invitation was sent to orthopedic surgeons, pediatricians, and EM physicians at 3 institutions and remained accessible for a period of 3 months. The survey consisted of 16 ED presentations, 8 adult and 8 pediatric cases, with the pediatricians only having access to the 8 pediatric scenarios. Each scenario included a brief patient history, laboratory or physical examination findings, and selected radiographs. Each physician was asked to determine whether orthopedic consultation was required acutely, or whether the patient could be discharged with later orthopedic clinic follow-up.

The authors’ study proved that there was a significant difference in the consult choices between orthopedic surgeons, pediatricians, and EM physicians. Among the 8 pediatric scenarios, the largest differences were seen between specialties’ perceptions of whether orthopedic consult was needed for lateral condyle fracture and slipped capital femoral epiphysis presentations. These 2 pathologies require both radiographic and clinical familiarity to recognize the diagnosis and therefore to make the correct decision regarding urgency of the consultation. A lateral condyle fracture or slipped capital femoral epiphysis, which were not identified as “requiring urgent orthopedic consult” by both pediatricians and EM physicians, can have grave consequences if not promptly treated. Additionally, both orthopedic surgeons and pediatricians showed a statistically significant difference compared with EM physicians in obtaining the correct consult for a patient with a Monteggia fracture.

Differences in orthopedic consultation were also seen in adult cases. In the first case, EM physicians were more likely than orthopedic surgeons to request an ED consultation for a stable ankle fracture. In this scenario, additional patient time and money would be spent obtaining an urgent orthopedic consult that would not be expected to change the acute management or outcome for the patient. In contrast, EM physicians were less likely than orthopedic surgeons to request an ED consultation for a hip dislocation; this could result in avascular necrosis, which can have long-term negative effects for a patient.\textsuperscript{2-5}

The authors also noted a significant difference between years in training regarding recognizing the need for an urgent orthopedic consult. The results showed that pediatricians’ and EM physicians’ ability to assess the proper level of urgency for an orthopedic consultation increased as they accumulated years of residency.
Recent literature has highlighted the variable and often inadequate exposure to musculoskeletal education in medical schools and non-orthopedic residency training programs. Of 122 medical schools in the United States, only 42% offer a required preclinical musculoskeletal module, with only 20% requiring a clinical musculoskeletal clerkship. This is not just a problem in the United States, as the lack of musculoskeletal education in medical school curricula has also been identified in India and Australia. Forty-two percent of final-year undergraduate students in India felt that they had the most difficulty in examining and diagnosing orthopedic disorders. In 2007, Day et al surveyed Harvard medical students to determine their confidence in performing musculoskeletal physical examinations and their level of musculoskeletal competency. Not only did students report a statistically significant difference regarding their level of confidence in the physical examination and differential diagnosis between the musculoskeletal system and the pulmonary system (acting as the control), but also only 26% of the fourth-year students passed a validated musculoskeletal examination (7% of third-year students and 2% of second-year students). These students reported insufficient curriculum time devoted to musculoskeletal education, and those who had attended a musculoskeletal clerkship performed significantly better than those who had only received the required musculoskeletal curriculum.

A validated examination with a passing score determined by US orthopedic residency chairmen showed that 82% of interns in non-orthopedic programs failed to reach a level of basic competency on musculoskeletal topics. Again, the mean scores for residents who had elected to take a clerkship in orthopedics were significantly higher than those of residents who had only participated in the basic medical school curriculum. Despite their inadequate training, these primary care physicians are generally the ones to initially identify and triage orthopedic conditions. In the United States, 13.9% of ED visits are for musculoskeletal complaints. In 2004, musculoskeletal injuries accounted for more than 57 million health care visits, representing 60% of all injury treatment visits. Orthopedic care accounted for 5.6% of ED procedures performed, with annual direct and indirect costs for bone and joint health accounting for $849 billion—7.7% of the gross domestic product.

In a retrospective review of radiology residents’ dictations from a pediatric ED, 69% of the errors involved fractures and/or dislocations, and these cases made up 65% of recurrent errors. Four of the 6 most common errors involved fractures and 1 consisted of over-called fractures. Previous studies have shown that orthopedic injuries accounted for 60% of delayed diagnoses in pediatric injuries. In a study in which a case-based questionnaire with radiographs was administered to pediatric residents, the mean total score of correct responses for all of the residents was 38.5 of a possible 64 points. A significant difference in the mean correct responses was found between the first- and third-year residents, with an improvement in scores seen at the higher level of training. A recent study comparing physical examination and radiographic interpretation of carpal anatomy showed that orthopedic residents had a significantly higher level of proficiency than ED residents.

There are signs of increased emphasis on musculoskeletal issues in medical school. United Kingdom medical schools have introduced a new structured curriculum that increases the time spent in musculoskeletal education and provides for more focused teaching. This new curriculum improved the performance of students on a multiple-choice examination by 6%, which the authors considered educationally significant. Harvard’s new addition of mandatory musculoskeletal anatomy, pathophysiology, and physical examination hours, including 14 additional hours of upper extremity study in the preclinical years, has shown a statistically significant increase in students’ perceived confidence in performing a clinical examination of the hand and wrist.

The literature and the current study emphasize the need to increase the exposure to musculoskeletal issues in medical education, particularly in primary care and EM clerkships and residency programs. A solid knowledge of orthopedic emergencies allows these first-line providers to properly triage orthopedic patients for immediate consultation or to stabilize injuries with later orthopedic follow-up. With improved musculoskeletal training and multidisciplinary communication, orthopedic surgeons could expect their primary care and EM colleagues to properly triage patients seen in the ED.

REFERENCES


