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Podiatric Resident Performance on a Basic Competency Examination in Musculoskeletal Medicine

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ABSTRACT

A basic competency examination in musculoskeletal medicine has previously been administered to residents across a variety of medical specialties and has demonstrated that medical school preparation in musculoskeletal medicine might be inadequate. The objectives of the present study were to assess podiatric surgical resident performance on this examination and to assess podiatric surgical residency director opinions of the level of importance of the test subject areas. A total of 117 podiatric surgical residents from 15 residency programs completed the 25-question examination. The residents scored a mean ± standard deviation of 60.32% ± 12.60% (range 22.00% to 92.00%). On the 7 questions rated by podiatric residency directors as ≥8 on a 10-point scale of relative importance, this score improved to 84.92% ± 11.93% (range 39.29% to 100.0%). Senior level residents did not outperform junior level residents (60.76% versus 60.44%; $p = .898$), and those who had completed a general orthopedics rotation at some point in their education did not outperform those who had not (61.12% versus 58.64%; $p = .370$). The podiatric residency directors assigned a mean ± standard deviation importance score of 6.97 ± 2.07 out of 10 for the 25 questions and suggested a mean ± standard deviation passing score of 69.14% ± 9.03% for the examination. The results of the present investigation provide original data on podiatric surgical resident performance on a basic competency examination in musculoskeletal medicine. Although the residents scored well for some specific test areas, the overall performance was similar to that of previous iterations of the examination given to general surgery and internal medicine residents. The lower scores compared with those from the orthopedic and physical therapy specialties might indicate a need for improved general musculoskeletal medicine education within the podiatric curriculum.

A so-called basic competency examination in musculoskeletal medicine has previously been constructed, administered, and validated to evaluate musculoskeletal knowledge of recent medical school graduates (1,2). This was designed to include a "sample of topics in musculoskeletal medicine with which all physicians should be familiar." The results of these investigations have concluded that medical school preparation in musculoskeletal medicine could be inadequate. The examination was initially given to all medical and surgical residents at a single academic healthcare center during the first year of their residency. The mean score of the residents taking the examination was 59.6%. Orthopedic residency directors had initially suggested a passing score of 73.1% for the examination, which resulted in 82% of the examinees failing the test (1). Internal medical residency directors subsequently reviewed the examination and suggested a passing score of 70%, which resulted in 78% of examinees unable to obtain a passing score (2).

Other investigators have since administered this examination to those in other medical disciplines. Matzkin et al (3) gave the test to 113 medical students, 167 residents, and 54 staff physicians. Of the medical students, 40 had completed 2 years of medical school and 73 were completing their fourth-year clinical rotation. Of the residents and staff physicians, 44 were internal medicine physicians, 40 were orthopedic physicians, 20 were pediatric specialists, 20 were general surgeons, 17 were family practice physicians, 16 were psychiatrists, and 12 were in an "other" group consisting of anesthesiologists, emergency medicine physicians, ophthalmologists, radiologists, or transitional year physicians. A passing score of >73.1% was obtained by 5% of the students, 21% of the residents, and 52% of the physicians. The results indicated that orthopedic physicians scored significantly higher than all other groups, with a mean score of 94%.

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Table
A basic competency examination in musculoskeletal medicine, as constructed by Freeman and Bernstein*

Question	Accepted Answer	Resident Score† (n = 117)	Program Director Ranking of Question Importance (scale 0–10; n = 15)
What common musculoskeletal problem must all newborns be examined for?	Congenital dislocation/subluxation of the hip	0.63 ± 0.48	7.43 ± 2.77
What is a compartment syndrome?	Increased pressure in a closed fascial space	0.99 ± 0.09	10.0 ± 0.0
Acute septic arthritis of the knee may be differentiated from inflammatory arthritis by which test?	Any analysis of fluid from aspiration (cell count, Gram stain, culture)	0.92 ± 0.27	8.0 ± 2.32
A patient dislocates his knee in a car accident. What structure(s) is/are at risk of injury and therefore must be evaluated?	Must mention at least the popliteal artery	0.53 ± 0.50	6.21 ± 2.49
A patient punches his companion in the face and sustains a fracture of the fifth metacarpal and a 3-mm break in the skin over the fracture. What is the correct treatment, and why?	Irrigation and debridement; risk of infection (0.5 point each)	0.83 ± 0.32	6.21 ± 2.42
A patient comes to the office complaining of low-back pain that wakes him up from sleep. What 2 diagnoses are you concerned about?	Tumor and infection (0.5 point each)	0.27 ± 0.36	6.14 ± 2.88
How is compartment syndrome treated?	Fasciotomy (surgery also accepted)	0.97 ± 0.17	10.0 ± 0.0
A patient lands on his hand and is tender to palpation in the "snuff box" (the space between the thumb extensor and abductor tendons). Initial radiographs do not show a fracture. What diagnosis must be considered?	Scaphoid fracture (carpal bone fracture also accepted)	0.40 ± 0.93	4.57 ± 2.21
A 25-year-old male is involved in a motor vehicle accident. His left limb is in a position of flexion at the knee and hip, with internal rotation and adduction of the hip. What is the most likely diagnosis?	Hip dislocation	0.65 ± 0.48	6.50 ± 2.65
What nerve is compressed in carpal tunnel syndrome?	Median nerve	0.78 ± 0.42	6.14 ± 2.82
A patient has a disk herniation pressing on the fifth lumbar nerve root. How is motor function of the fifth lumbar nerve root tested?	Dorsiflexion of the great toe (toe extensors also accepted)	0.33 ± 0.47	7.79 ± 2.75
How is motor function of the median nerve tested in the hand?	Any median function (metacarpophalangeal finger flexion; thumb opposition, flexion, or abduction)	0.67 ± 0.47	5.0 ± 2.51
A 12-year-old male severely twists his ankle. Radiographs show only soft tissue swelling. He is tender at the distal aspect of the fibula. What are 2 possible diagnoses?	Ligament sprain and Salter-Harris I fracture (sprain and fracture also accepted) (0.5 point each)	0.74 ± 0.29	9.50 ± 0.85
A patient presents with new onset low-back pain. Under what conditions are plain radiographs indicated. Please name 5 (e.g., a history of trauma).	Age >50 years; neurologic deficit; bowel or bladder changes; history of cancer, pregnancy, drug use, or steroid use; systemic symptoms (night pain, fever); pediatric population (0.25 point each, full credit for 4 correct responses)	0.35 ± 0.33	5.5 ± 2.79
A patient has a displaced fracture near the fibular neck. What structure is at risk of injury?	Common peroneal nerve (peroneal nerve also accepted)	0.91 ± 0.27	9.64 ± 0.84
A 20-year-old male injured his knee while playing football. You see him on the same day, and he has a knee effusion. An aspiration shows frank blood. What are the 3 most common diagnoses?	Ligament tear, fracture, peripheral meniscal tear (capsular tear, patellar dislocation also accepted) (0.5 point each, full credit for 2 correct responses)	0.71 ± 0.43	6.43 ± 2.34
What are the 5 most common sources of cancer metastatic to bone?	Breast, prostate, lung, kidney, thyroid (0.25 point each, full credit for 4 correct responses)	0.78 ± 0.29	8.21 ± 2.01
Name 2 differences between rheumatoid arthritis and osteoarthrosis.	Any 2 correct statements (0.5 point each; e.g., inflammatory versus degenerative; proximal interphalangeal joint versus distal interphalangeal joint)	0.62 ± 0.43	8.5 ± 1.99
Which malignancy may be present in bone yet typically is not detected with a bone scan?	Myeloma (full credit for hematological malignancies—leukemia, lymphoma)	0.32 ± 0.47	7.71 ± 1.86
What is the function of the normal anterior cruciate ligament at the knee?	To prevent anterior displacement of the tibia on the femur	0.71 ± 0.46	7.14 ± 2.14
What is the difference between osteoporosis and osteomalacia?	Osteoporosis: decreased bone density Osteomalacia: decreased bone mineralization Any true statement accepted	0.48 ± 0.47	7.86 ± 1.51
In elderly patients, displaced fractures of the femoral neck are typically treated with joint replacement, whereas fractures near the trochanter are treated with plates and screws. Why?	Because of the blood supply to the femoral head (avascular necrosis and nonunion accepted)	0.63 ± 0.48	5.36 ± 2.27
What muscle(s) is/are involved in lateral epicondylitis (tennis elbow)?	Wrist extensors (full credit for any wrist extensor: extensor carpi radialis brevis, extensor carpi radialis longus, extensor digitorum communis)	0.22 ± 0.42	5.07 ± 2.3
Rupture of the biceps at the elbow results in weakness of both elbow flexion and _____?	Supination	0.34 ± 0.48	4.79 ± 2.39
What muscle(s) control(s) external rotation of the humerus with the arm at the side?	Infraspinatus or teres minor accepted (full credit also for rotator cuff)	0.26 ± 0.44	4.43 ± 2.53
Mean total score	—	15.08 ± 3.16	6.97 ± 2.07

Data presented as mean ± standard deviation.

* Freedman KB, Bernstein J. The adequacy of medical school education in musculoskeletal medicine. J Bone Joint Surg Am 80:1421–1427, 1988.

† Each question worth a total of 1 point.