

increasing age. For females, only stride length were statistically significant ($p=.01$), with increasing probability of injury with longer stride lengths.

Conclusion: This is the first study that characterizes foot strike and injury rates of ultramarathon runners in a competitive race. Our data suggests that foot strike might not be associated with injuries, while stride length may be a factor influencing injury in females.

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Cubitus Valgus - An Uncommon Etiology for Ulnar Neuropathy: A Case Report

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Disclosures: D. Rustom: I Have No Relevant Financial Relationships To Disclose.

Case Description: A 35-year-old woman presented with ongoing bilateral hand paresthesias that was worse during sleep and in the seated position. She had seen multiple providers who presumptively diagnosed her with carpal tunnel syndrome. She wore bilateral wrist splints for approximately two years, and received multiple carpal tunnel corticosteroid injections. She slept on her back with the arms abducted and forearms supinated. This position exacerbated paresthesias in digits 3-5. On physical examination she had atrophy of the hypothenar and intrinsic hand muscles, along with 4/5 hand grip strength. The patient had decreased two point discrimination in the distribution of the dorsal and palmar ulnar cutaneous nerves. Further examination revealed +10 degree extension in bilateral elbows, and cubitus valgus deformity. Bilateral cubital tunnel Tinel's sign was positive. Froment's sign was more prominent on the Right.

Setting: Secondary care consultation.

Results or Clinical Course: Using AP radiographs, we calculated a carrying angle of 14.5 degrees for the left, and 16 for the right elbow. The normal carrying angle is 12.0 +/-2 degrees for females. NCS revealed bilateral prolonged ulnar sensory distal latencies, with mildly attenuated CMAP amplitudes. Using the inching technique, a 0.5 ms distal latency difference was calculated approximately 1.5 cm distal to the medial epicondyle. The abductor digiti minimi showed decreased recruitment bilaterally on EMG. We implemented lifestyle modifications limiting flexion and extension, along with 45 degree hinged elbow bracing relieving ulnar nerve entrapment. She returned to work as a hairdresser, reported a 30% score reduction in the Oswestry Disability Index and slept without pain.

Discussion: The literature has not described ulnar neuropathy due to cubitus valgus, it has been attributed more commonly to varus deformities. Turner and Noonan syndromes along with supracondylar fractures are most commonly associated. Incidentally, our patient presented with bilateral deformities despite no congenital or traumatic history. Cubitus valgus has a prevalence of 3% and can be overlooked. Elbow hypermobility and prolonged extension/flexion positioning can exacerbate symptoms.

Conclusion: Cubitus valgus is an uncommon, yet treatable cause of ulnar neuropathy at the elbow.

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The Effect of a Musculoskeletal Ultrasound Course on the Accuracy of Joint Palpation in Physical Medicine and Rehabilitation Residents

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Disclosures: S. K. Chu: I Have No Relevant Financial Relationships To Disclose.

Objective: To determine the effectiveness of a 1-day musculoskeletal ultrasound course on the accuracy of lateral knee and acromioclavicular (AC) joint line palpation in Physical Medicine and Rehabilitation (PM&R) residents using ultrasound verification.

Design: Cohort Study.

Setting: PM&R residency program at an academic institution.

Participants: Twenty-one PM&R residents participating in a musculoskeletal ultrasound course (8 PGY-2, 5 PGY-3, and 8 PGY-4 residents).
Interventions: 1-day musculoskeletal ultrasound course utilizing direct ultrasound feedback on musculoskeletal physical examination maneuvers.

Main Outcome Measures: Pre-course and post-course ultrasound verification of correct needle placement over the lateral knee and AC joint lines on a male and female physical examination model. Participants were asked to place the needle parallel to the joint line based on their palpatory exam.

Results or Clinical Course: McNemar's test was performed to compare pre-course and post-course results. Overall AC joint palpation accuracy improved from 33.3% on pre-course assessment to 52.4% on post-course assessment ($P=.115$). Overall knee lateral joint line palpation accuracy improved significantly from 57.1% on pre-course assessment to 83.3% on post-course assessment ($P=.007$). For the knee lateral joint line, there was also a statistically significant improvement in palpation accuracy on the female physical examination model from 33.3% to 81.0% ($P=.006$), while there was no statistically significant improvement on the male physical examination model (81.0% to 85.7%). Based on the resident level of education, there were no statistically significant differences in the accuracy of joint line palpation.

Conclusion: Joint line palpation accuracy of the AC and lateral knee joint line in PM&R residents is low, despite prior traditional education of musculoskeletal physical examination without utilizing musculoskeletal ultrasound. A musculoskeletal ultrasound course directed at providing residents feedback on the accuracy of their palpation skills improved palpation accuracy of the AC and knee lateral joint lines. The educational use of musculoskeletal ultrasound may be an effective method of teaching musculoskeletal physical examination for medical trainees.

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The Effectiveness of Musculoskeletal Ultrasound for Teaching Joint Palpation to Medical Students

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Objective: To determine the effectiveness of a 2-hour musculoskeletal (MSK) ultrasound and physical examination class on the accuracy of knee and acromioclavicular (AC) joint line palpation in first-year medical students using ultrasound verification.

Design: Cohort study

Setting: Medical school at an academic institution.

Participants: Thirty first-year medical students.

Interventions: A 2-hour hands-on MSK physical examination class with direct feedback using ultrasound.

Main Outcome Measures: Pre-class and post-class ultrasound verification of correct needle placement over the lateral knee and AC joint lines on a physical examination model. Pre-class testing was done 1 week after the traditional medical school MSK physical examination curriculum that did not use ultrasound. Post-class testing was done 1 week after the 2-hour MSK ultrasound class was given. Participants were asked to place the needle parallel to the joint line based on their palpatory exam, and placement was verified by the MSK class instructor using ultrasound.

Results or Clinical Course: McNemar's test was performed to compare pre-class and post-class results. Overall AC joint palpation