A Shift in Anatomy Education for Medical Students: Novel Uses of Ultrasound for Musculoskeletal Anatomy
Authors and Disclosures

- Atul Kumar, MD, MS
  - No financial disclosures
- Rafael A. Pacheco, MD
  - No financial disclosures
Ultrasound is the New Stethoscope
Background

• Medical school anatomy curriculum is currently experiencing a technological renaissance.

• Traditionally, anatomy curriculum has relied on cadaveric dissection supplemented with prosection and anatomic images.

• While these methods have proven effective in mastering anatomy, they are also time-consuming and require a significant commitment from educators and personnel dedicated to resource acquisition.

• In addition, this is not the way the majority of clinicians view anatomy in practice.
  – The vast majority (excluding surgeons) are exposed to anatomy via radiologic imaging.
Background

• At our institution, we implemented the use of ultrasound to help teach and identify musculoskeletal anatomy.
  – This is thought to be beneficial as numerous specialties outside of radiology are now purchasing and utilizing ultrasound in their practices.

• The purpose of this investigation is to determine the usefulness of implementing ultrasound in medical school anatomy curriculum for musculoskeletal imaging in order to improve students' preparedness for clinical practice.
Materials and Methods

• A literature review of ultrasound use in conjunction with cadaveric dissection for medical school anatomy curriculum was conducted.

• Simultaneously, an evaluation of the current curriculum was conducted and subsequently reconstructed with implementation of ultrasound into the first year medical students’ anatomy curriculum.

• A portable ultrasound machine and hardware able to demonstrate normal anatomy were purchased for nonclinical use by our institution.
Materials and Methods

Medical Student Reading Room with High Resolution Monitors

Portable Ultrasound Purchased for Nonclinical Use by Medical Students

Normal Anatomy Ultrasound Simulator
Materials and Methods

- A nine question survey was distributed to the medical students at our institution to assess the usefulness of teaching musculoskeletal ultrasound to first year medical students.

- A cross section of students was surveyed from first through fourth year.
Over 96% of second, third, and fourth year medical students surveyed felt that their education would have been enhanced by the opportunity to integrate MSK anatomy via ultrasound in their first year curriculum.
Was Ultrasound Helpful in Learning Musculoskeletal Anatomy?

75% of students felt the use of ultrasound in learning MSK anatomy was either very helpful or somewhat helpful.
Almost half of medical students have already had the opportunity to use ultrasound in their clinical practice sites.
The vast majority of students, greater than 82%, anticipate that they will use ultrasound in their clinical practice.
60% of medical students anticipate that they will use MSK ultrasound in their clinical practice.
Conclusions

- Current medical student anatomy curriculum can be improved upon with ultrasound.
- It allows reinforcement of musculoskeletal anatomy conventionally taught via cadaveric dissection.
- This is especially crucial in today's clinical culture where a large number of physicians are utilizing ultrasound in their practice.
- Introduction to this technology early in education is valuable.
- We plan on pursuing further investigations to evaluate if the use of ultrasound assists with long term retention of anatomic structures.