2015 Science Writers Symposium

Lab Tour: Functional Performance and Device Use Lab

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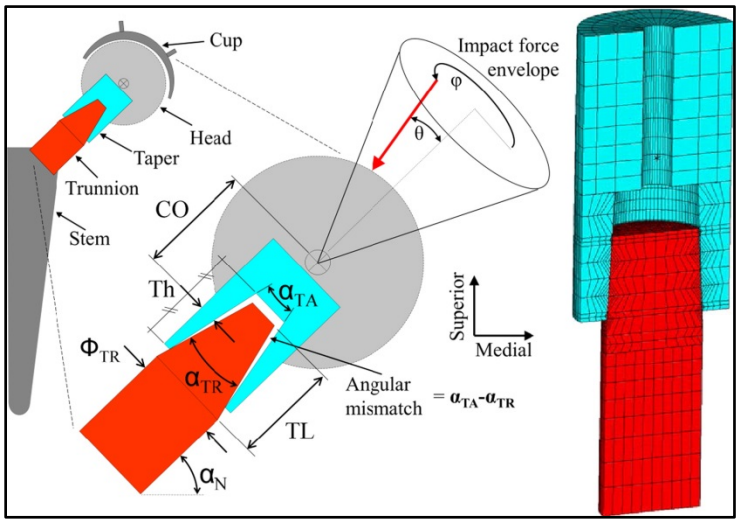
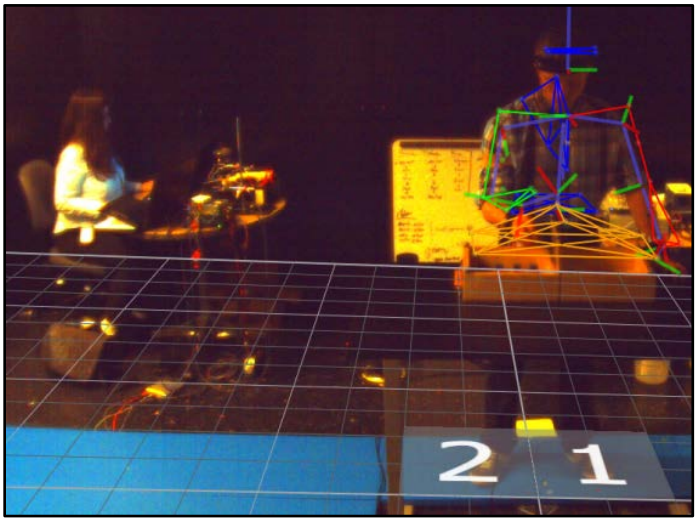


Computational model of total hip replacement components with expanded view of taper-trunnion connection (Finn Donaldson, James Coburn, Karen Siegel, *J Biomechanics* 2014 47:1634-1641). This model can be used to predict the conditions under which some hip components may undergo excessive wear.



Use of motion-capture technology to study movement quality during an arm/hand functional performance task. Wireframe (shown as red, blue, green lines) is constructed by the computer in order to analyze the subject's movements as he manipulates a standardized set of objects on the table.

The Functional Performance and Device Use Lab advances regulatory science through the study of human interaction with existing and emerging medical device technologies. Our overarching goal is to improve therapeutic, diagnostic, and rehabilitative outcomes for patients. In addition to applications for neurology, physical medicine, orthopedics, and surgery, the lab is equipped to address cognitive and other human factors that influence device usability across therapeutic areas.

The lab includes an extensive array of leading edge instrumentation for monitoring and modeling medical devices and human users, including 3D printing capabilities (shown at left), motion and ground force capture technologies, computational modeling and simulation, and muscle monitoring (electromyogram), brain monitoring (electroencephalogram), and eye-tracking systems.

Current project areas include:

- Test method development for next-generation upper limb prosthetics
- Sex-specific modeling and analysis of ACL injury susceptibility
- Population variability of EEG biomarkers with potential diagnostic utility
- Assessment of patient views on risks and benefits of innovative prosthetic technologies
- Human factors evaluation of 3D-printed patient-matched surgical instrumentation

We continually seek collaborations with other medical device stakeholders, including clinicians, academic researchers, technology developers, and our colleagues at the FDA and the National Institutes of Health.

Questions? Contact FDA's Office of Media Affairs at 301-796-4540 or fdaoma@fda.hhs.gov.