8:00am-12:00pm | Oct 21, 2015 (Wednesday)

1B

Title:	**Elasticity Imaging: Methods and Applications**
Lecturer:	**Mark Palmeri,** Duke University, USA
Abstract:	The characterization of tissue stiffness through manual palpation has been used for centuries by clinicians to evaluate anatomy and disease states. Non-invasive, ultrasonic elasticity imaging systems have been developed that can characterize the viscoelastic properties of tissues. This short course will provide an overview of how ultrasonic elasticity imaging systems function and their current clinical applications. The fundamentals of ultrasound imaging, as related to elasticity imaging, will be reviewed, including displacement estimation methods from raw radio frequency (RF) and in-phase/quadrature (IQ) data. The material constants used to describe viscoelastic media will be presented in the context of static and dynamic stress-strain relationships that exist for both compressive strain and transient acoustic radiation force imaging methods. Shear wave mechanics and shear wave speed reconstruction approaches will be presented for viscoelastic media and extended to anisotropic and nonlinear materials. Clinical applications of ultrasonic elasticity imaging systems will be reviewed, along with efforts to standardize shear wave speed measurements across systems through the RSNA Quantitative Imaging Biomarker Alliance.

Biography

Mark L. Palmeri received his B.S. degree in Biomedical and Electrical Engineering from Duke University, Durham, NC, in 2000. He was a James B. Duke graduate fellow and received his Ph.D. degree in Biomedical Engineering from Duke University in 2005 and his M.D. degree from the Duke University School of Medicine in 2007. He is currently an Assistant Research Professor in Biomedical Engineering and Anesthesiology at Duke University. He is an Associate Editor for Ultrasound in Medicine and Biology and IEEE Transactions in Medical Imaging. He serves as a sub-committee co-chair for the RSNA Quantitative Imaging Biomarker Alliance (QIBA) ultrasound shear wave speed imaging committee. His research interests include acoustic radiation force shear wave elasticity imaging, ultrasonic imaging, finite element analysis of soft tissue response to acoustic radiation force excitation, medical image processing and medical instrumentation design.