QIBA Technical Committee for Shear Wave Speed (SWS) Measurement

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Purpose of the Group:
To create and support implementation of a QIBA Profile for use of Shear Wave Speed for a quantitative biomarker in ultrasound imaging.

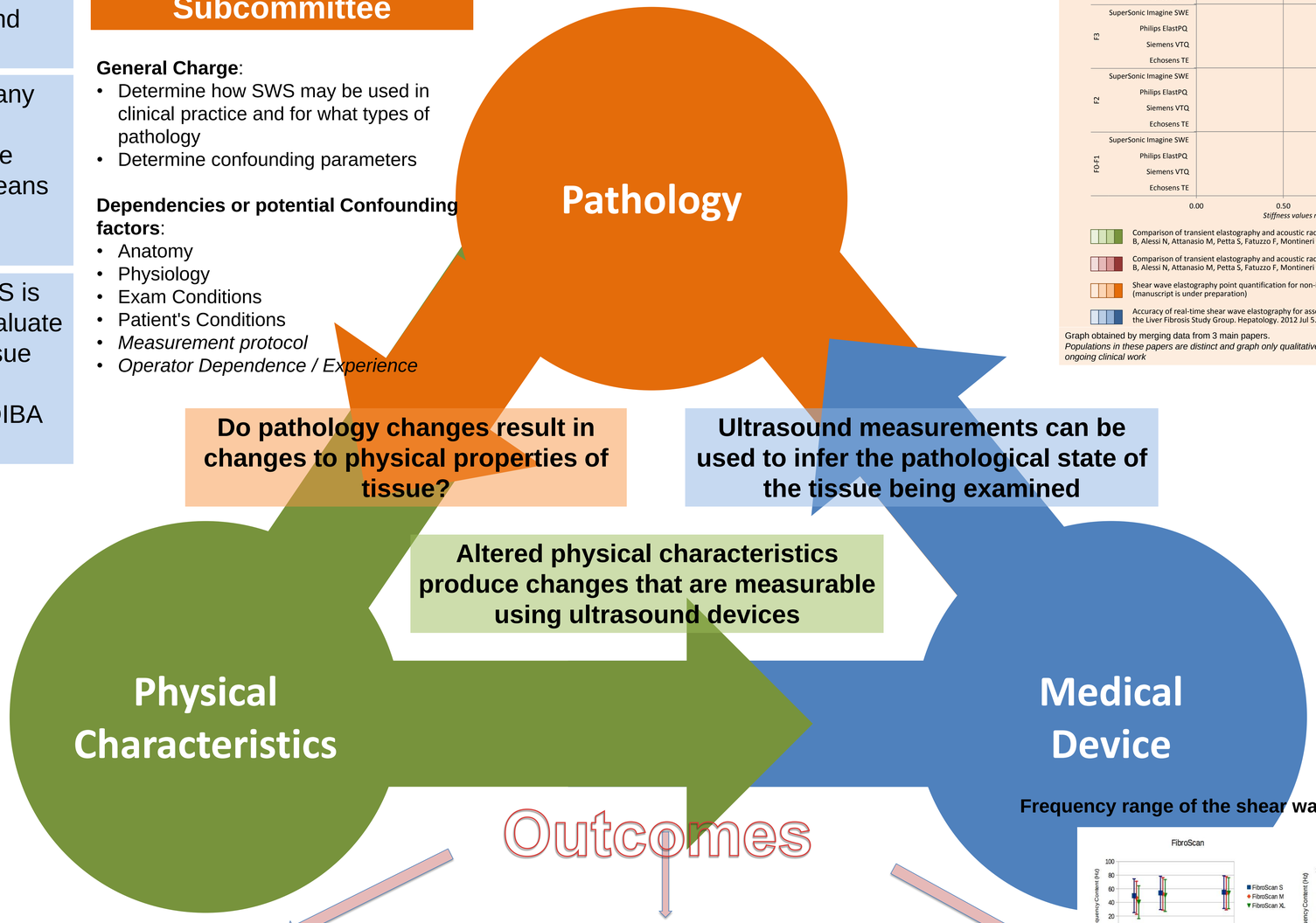
The characterization of a disease with any medical devices relies on a three-part relationship among the pathology, tissue properties and medical devices as a means to estimate the physical property and corresponding pathology.

The QIBA Technical Committee for SWS is divided into three subcommittees to evaluate the interactions between pathology, tissue physical properties, and ultrasound instrumentation in order to create the QIBA Profile.

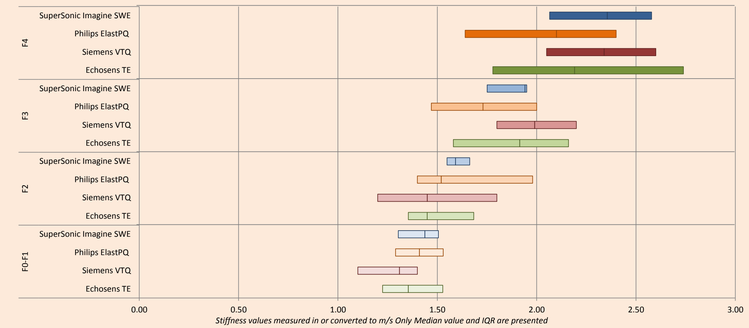
Clinical Applications and Biological Targets Subcommittee

General Charge:
- Determine how SWS may be used in clinical practice and for what types of pathology
- Determine confounding parameters

Dependencies or potential Confounding factors:
- Anatomy
- Physiology
- Exam Conditions
- Patient's Conditions
- *Measurement protocol*
- *Operator Dependence / Experience*



SWS measurement on livers and correlations with Biopsy



Comparison of transient elastography and acoustic radiation force impulse for non-invasive staging of liver fibrosis in patients with chronic hepatitis C. Rizzo L, Calvaruso V, Cacopardo B, Alessi N, Attanasio M, Petta S, Fatuzzo F, Montineri A, Mazzola A, L'abbate L, Nunnari G, Bronte F, Di Marco V, Craxi A, Cammà C. Am J Gastroenterol. 2011 Dec;106(12):2112-20

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Shear wave elastography point quantification for non-invasive liver fibrosis staging. Lu Q, Ling W, Lu C, Quan J, Ma L, Li J, He D, Liu J, Yang J, Wen T, Wu H, Zhu H, Luo Y. TBD (manuscript is under preparation)

Accuracy of real-time shear wave elastography for assessing liver fibrosis in chronic hepatitis C: A pilot study. Ferraioli G, Tinelli C, Dal Bello B, Zicchetti M, Filice G, Filice C; on behalf of the Liver Fibrosis Study Group. Hepatology. 2012 Jul 5. doi: 10.1002/hep.25936.

Graph obtained by merging data from 3 main papers.
Populations in these papers are distinct and graph only qualitatively illustrated ongoing clinical work

System Dependencies Subcommittee

General Charge:
- Establish a set of standards to allow for comparison of SWS across vendors
- Evaluate system dependencies

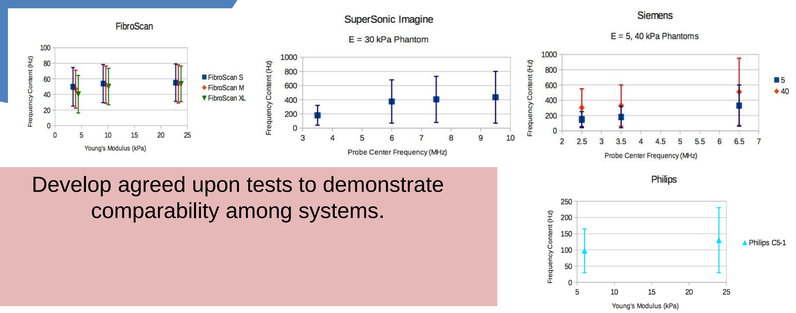
Dependencies:
- SW frequency content
- SW reconstruction artifacts
- Displacement / Velocity imaging algorithm
- *Measurement protocol*
- *Operator Dependence / Experience*

Phantom Development Subcommittee

General Charge:
- Determine the appropriate ultrasound elastography phantom material properties and phantom design needed to adequately assess SWS measurement performance
- Develop/Test/Select ultrasound phantoms

Dependencies:
Phantom materials
Phantom structure/architecture

Frequency range of the shear wave: *measurements provided by manufacturers*



QIBA Profile Components:
Specific claims of what can be accomplished

Details: What procedures and system settings are necessary for the claims to be achieved. A site following all procedures and using proper system parameters is said to be compliant with Profile.

QIBA/UPICT (Uniform Protocols for Imaging in Clinical Trials)
is a consensus-derived process used to facilitate the development and maintenance of widely acceptable, consistent imaging protocols (including imaging quality control procedures) for use in clinical trials across a range of disease states, anatomic sites, and imaging modalities. QIBA Protocols adhere to this standardized structure, whenever possible.

Develop agreed upon tests to demonstrate comparability among systems.