# QIBA SWS Systems Dependencies Teleconference

## November 12, 2012

- Moderator: Palmeri

- Agenda

  - Review 2012-10-26 call summary

  - Literature database meta-analysis (Palmeri & Hallam)

  - Discussion of inter-laboratory phantom measurement parameters (Wear)

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# Literature Data-Mining

- Mendely Database:
  http://www.mendeley.com/groups/2396601/qiba-sws/

- 230 manuscripts examined*

- 157 datasets recorded*

| Modality | Number of articles |
|---|---|
| FibroScan (Echosens) | 99 |
| ACUSON S2000 (Siemens) | 35 |
| 1.5T Signa MRI Scannner (GE Healthcare) | 11 |
| SONOLINE Antares Scanner (Siemens) | 2 |
| Other | 4 |

* Kristina Hallam
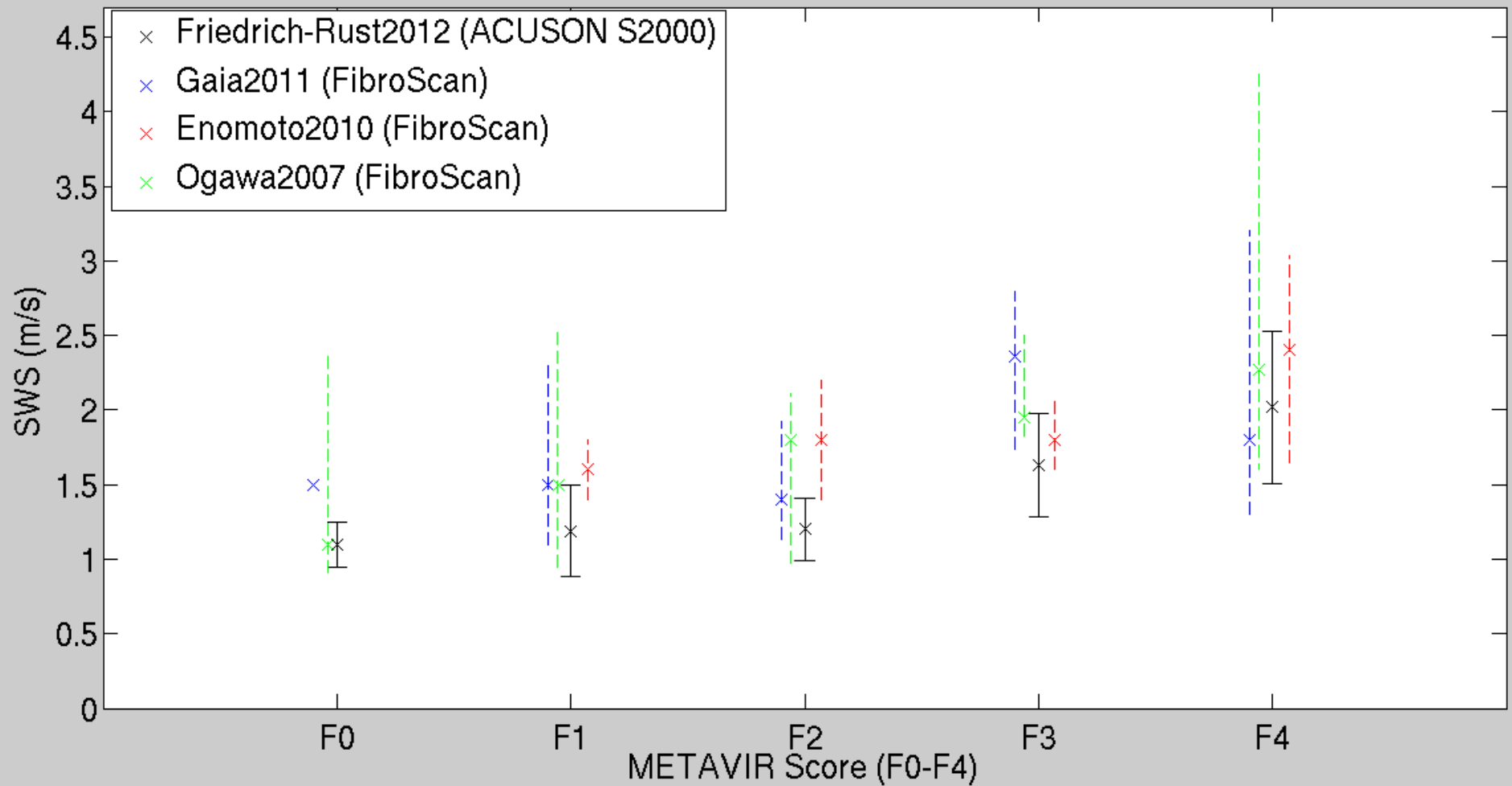
# Meta-Analysis Parameters

- Liver Disease Etiology
  - Healthy
  - Viral Hepatitis (Hep B / Hep C)
  - NAFLD
  - Mixed
- SWS
  - Converted E -> SWS (linear, isotropic, elastic)
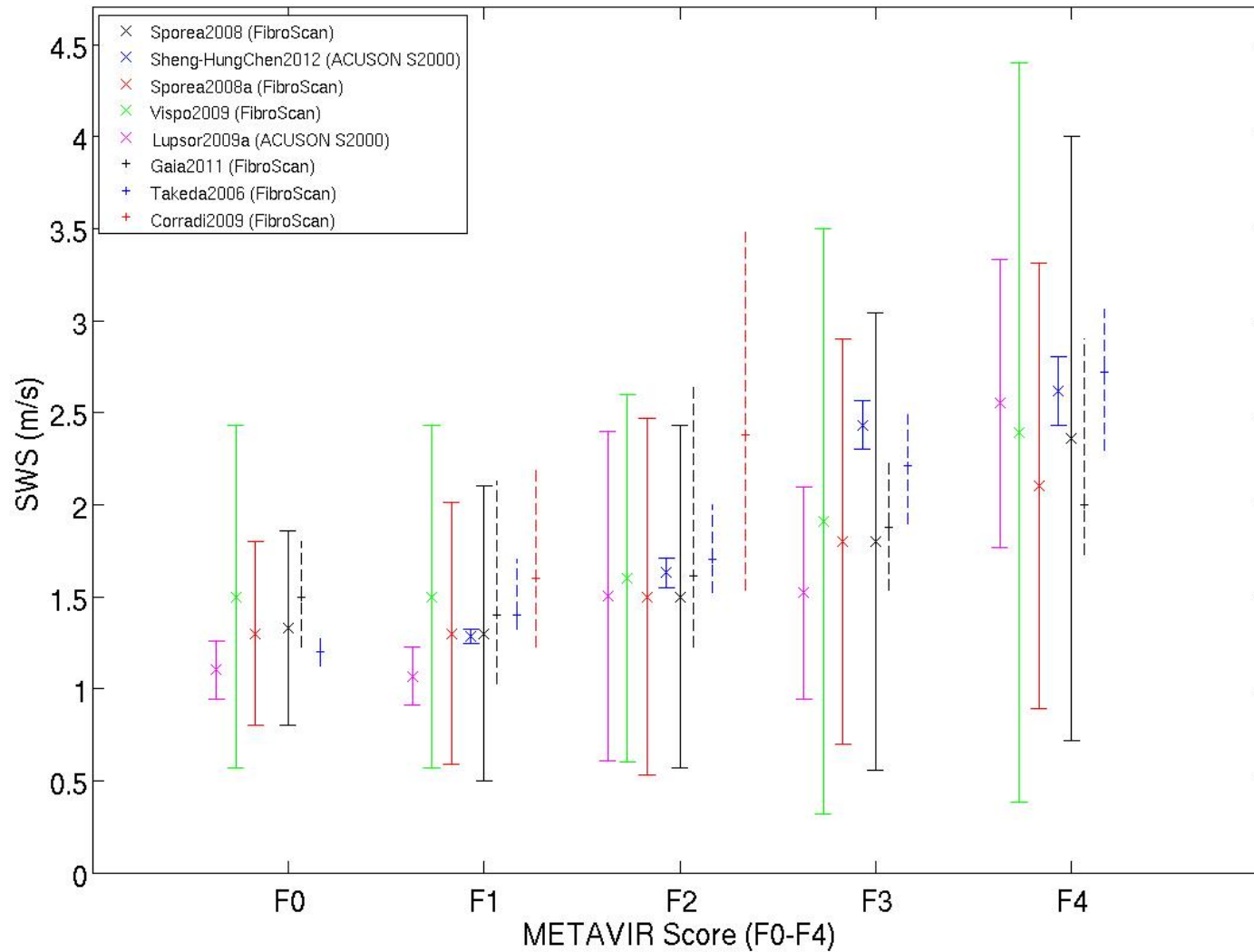  - Mean / Median
  - Standard Deviation / Range

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# Healthy Subjects



Healthy Patient Shear Wave Speeds for Different Modalities
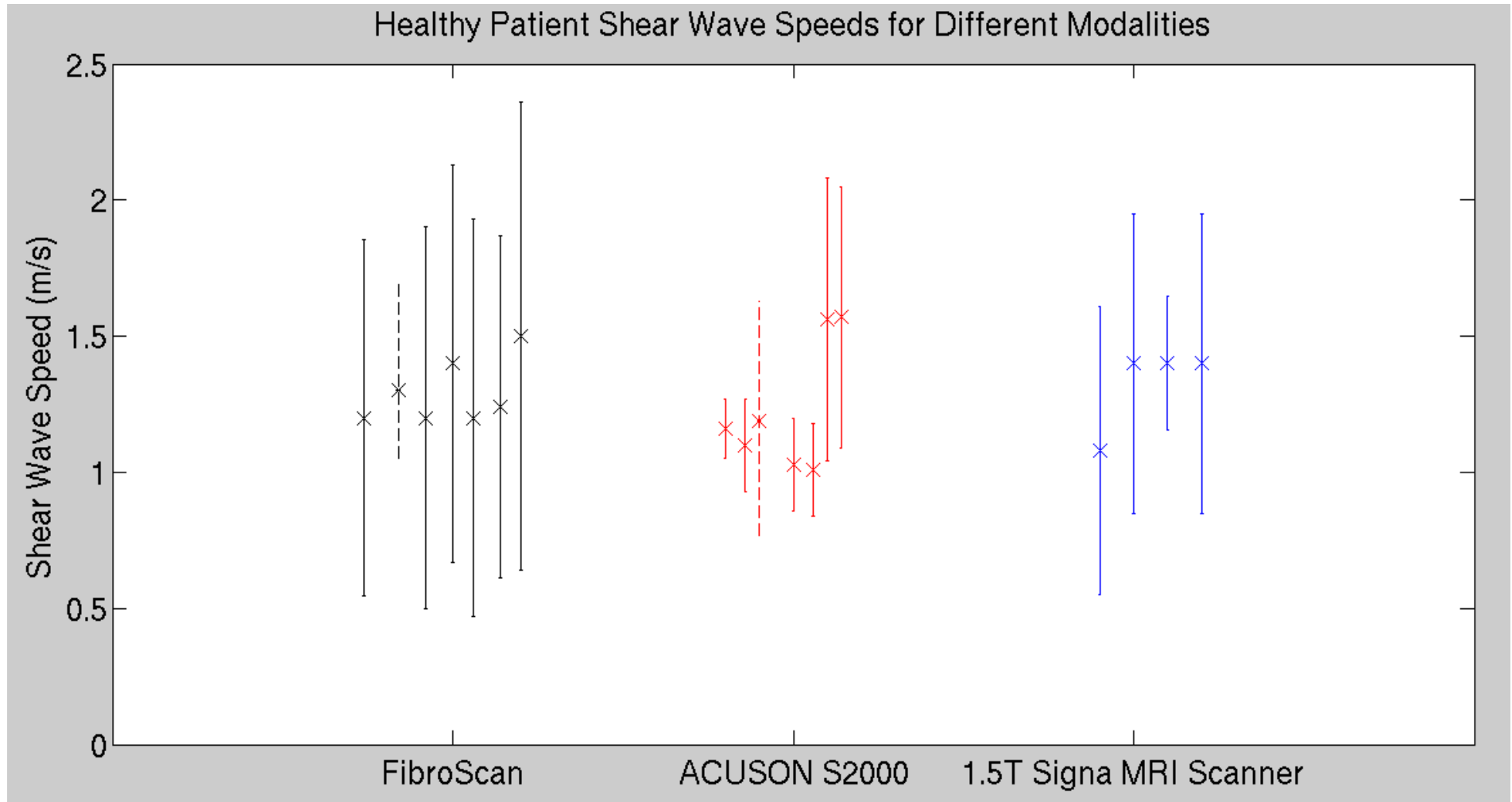
# Hepatitis B



SWS vs. METAVIR for Hepatitis B

Legend:
- × Friedrich-Rust2012 (ACUSON S2000)
- × Gaia2011 (FibroScan)
- × Enomoto2010 (FibroScan)
- × Ogawa2007 (FibroScan)

Y-axis: SWS (m/s)
X-axis: METAVIR Score (F0-F4)

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# Hepatitis C



SWS vs. METAVIR for Hepatitis C

# NAFLD



SWS vs. METAVIR Score for NAFLD

# Mixed Etiologies



SWS vs. METAVIR Score for Patients with Hepatitis B, C, or NAFLD
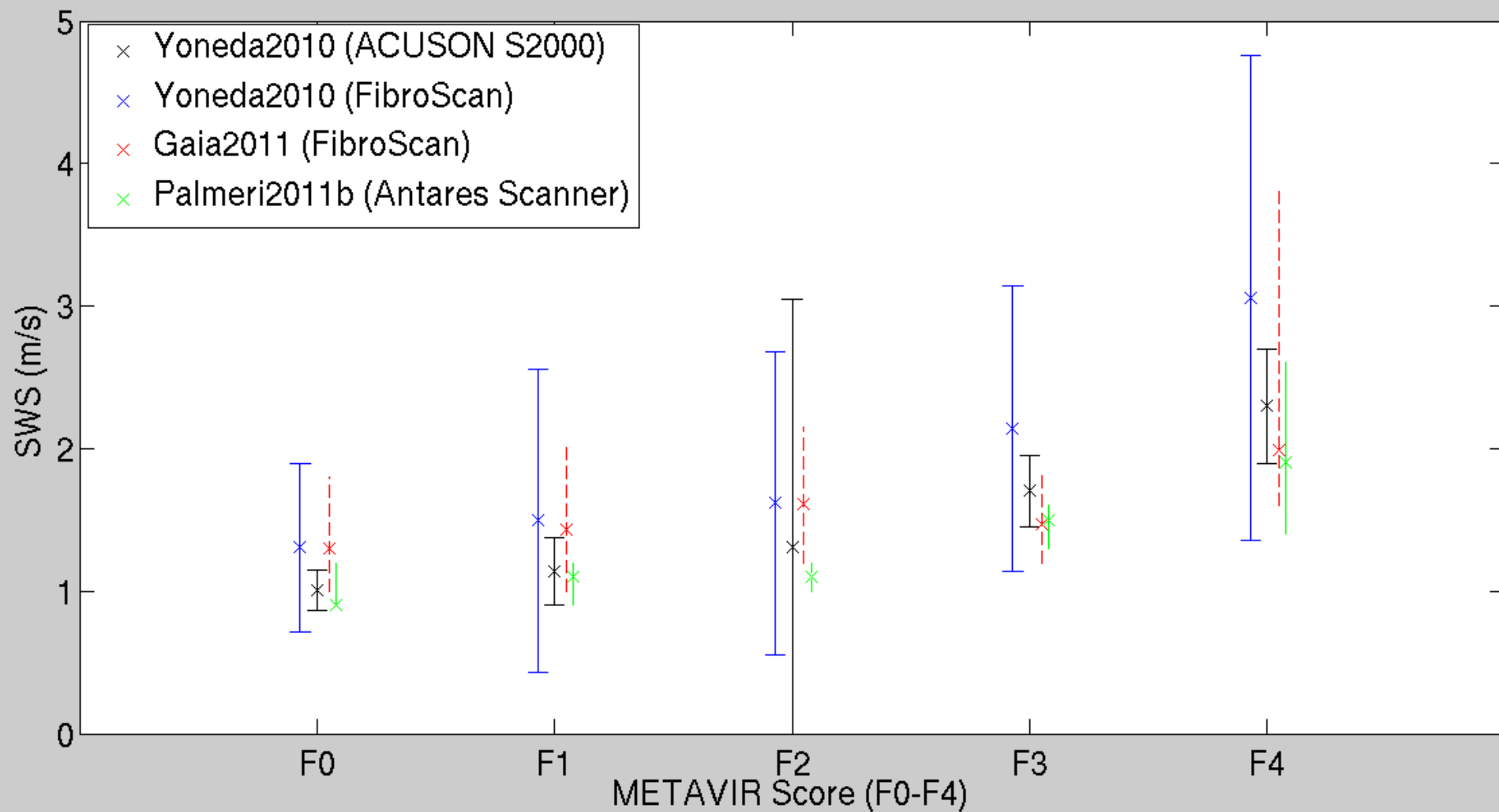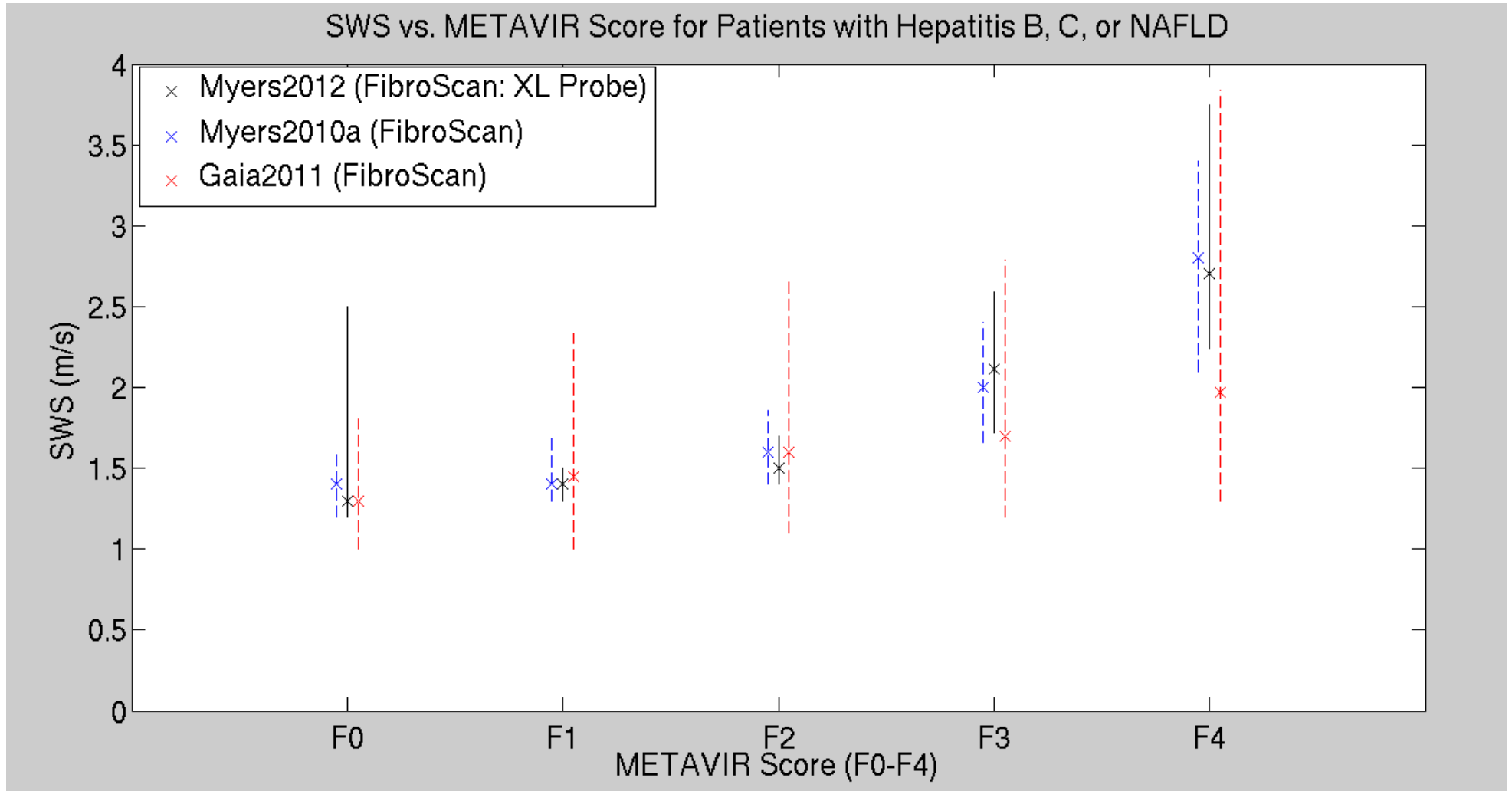
# Discussion Points

- Contributing factors that make this more difficult:
  - Different values calculated and reported (mean, median, range, standard deviation, IQR)
  - Number of studies conducted for a specific disease
  - Gender, Age, BMI, number of patients
- Compare with other meta-analyses
- How are we to compare these statistically to determine if the measures found are the same or different?

# Inter-Laboratory Phantom Measurement Parameters

- Measure variation of shear wave speed with depth from the transducer.

- Measure variation of shear wave speed with lateral range.

- All measurements should include error bars.

- Report spectral content of shear wave.

- Report Acoustic Radiation Force Push Beam transducer center frequency, focal properties, aperture size, pulse duration, and number of elements (if applicable)

- Report TI , MI, Isppa, Ispta

- Report measurements of inter-operator variability.

- Report criteria for data acceptance/rejection

- Report how measurements are reduced to single value (e.g. median, mean, outlier removal, etc.)

- Report tracking beam pulse repetition frequency.

- Report estimate of volume of averaging.

- Specify whether phase velocity or group velocity is measured.