Inter-operator reliability enables cross-site comparison of data between different clinicians and/or researchers.

- Electromyography (EMG) is a useful tool in clinical practice and research studies
  - Can evaluate measures of muscle dysfunction, including weakness (amplitude) and fatigue (frequency)
- Surface EMG has good reliability, but cannot be used for deep and/or small muscles
- Studies of the inter-operator reliability of fine-wire EMG are limited

Objective: To assess the inter-operator reliability of fine-wire EMG amplitude parameters.

3 experimenters (1-3 years experience) inserted fine-wire EMG electrodes into each subject's (n=5) elbow flexors with ultrasound guidance.

Study Design:
- Experimenter insertion order randomized
- Previous insertions removed between experimenters

Tasks:
- 2 sets of 5 weighted (10-lb) bicep curls per experimenter
- 3 curls from each set of 5 analyzed

Processing:
- 20-450 Hz bandpass
- Rectified
- Root-mean-squared (RMS) envelope (100-ms)
- Within-task normalization

Analysis:
- Calculated intra-class correlation coefficient (ICC) → two-way random effects
  - Moderate: 0.5-0.75
  - Good: 0.76-0.9
  - Excellent: >0.9

Fine-wire EMG demonstrated good reliability (ICC = 0.761, CI [0.661, 0.835]) across the elbow flexors.

This study demonstrates that fine-wire EMG amplitude parameters have good inter-operator reliability across the elbow flexors, enabling cross-site comparison.

- Past surface EMG studies have demonstrated higher ICC values, however fine-wire EMG is more variable within-subject with a constant electrode location
- The inter-operator reliability of fine-wire EMG frequency should be assessed across experimenters in future studies to validate cross-site evaluation of muscle fatigue