

Call Summary

In attendance

James T. Voyvodic, PhD (Chair)
Paul E. Bullwinkel, PhD
Edward DeYoe, PhD
Cathy Elsinger, PhD
Feroze Mohamed, PhD
Srinivasan Mukundan, Jr, MD, PhD

Daniel C. Sullivan, MD
Domenico Zaca, PhD

RSNA

Joe Koudelik
Julie Lisiecki

Identify Work Group Goals for assessing fMRI Reproducibility

- Need to define goal; under what circumstances and degree is fMRI reproducible using pre-surgical scans
- Within vs Across subject reproducibility issues may exist for complex tasks such as language
- Reproducibility is inherent across same subjects, i.e., basic topography is reproducible
- What aspect is reproducible within a clinical application, ie pre-surgical mapping?
 - Eloquent cortex
 - Size
 - Laterality
- Begin with simple sensory motor tasks to demo reproducibility
 - Location and spatial extent to demo best case
 - Demonstrate reproducibility primary step in biomarker development
 - Need to identify constraints/ limitations
- Motor cortex could be the first test case to move process of biomarker development
- Reproducibility based on healthy and pre-existing motor issues needed to validate assumptions
- Need to develop a methodology to assess reproducibility results in context of quantitative biomarker

Demonstrate and Quantify Reproducibility

- First step is compiling literature concerning motor mapping
- No acceptable “best way” found in literature yet to help assess reproducibility; laterality index not always 100%; reproducibility may have 20% laterality
- Need to determine a metric and kind of data to apply to metric
- Quantitative behavioral measures needed as well
- Sources of variability; look at methodologies to collect data – how do they affect reproducibility
- Need to establish a “Good / Better / Best” Profile Claim for reproducibility
- Prospective data collection to help provide/establish a “typical” range of data; is retrospective data still reproducible?
- Data is abundant, just need a plan and what to look for
 - Possible datasets to utilize
 - BIRN database of bilateral task data
 - Dr Voyvodic has data

Current Projects

- Dr DeYoe has a one-year study planned based on hand/foot motor movement
- Need to perform analysis based on “Good/ Better/ Best” with reproducibility measure for each classification
- Dr DeYoe to collect data to simplify prospective study design
- Work Group members encouraged to look at their own data and attach some analysis and quantifying reproducibility; use fixed datasets to analyze with different approaches
 - General-what’s common now
 - Successive levels of sophistication
 - Specific aspects of data editing, movement correction, etc

- Begin with patients doing same tasks multiple times; before and after surgery might be too complicated due to many biological variables
- Review results of our own data and compare with others
- Need a mix of datasets, both patient and healthy subject data
- Generate two map sets to compare similarities and differences
- Work out motor issues 1st, then language

Next steps:

- Discuss current literature/ data regarding fMRI reproducibility
- Discuss what is needed to demonstrate adequate reproducibility
- Discuss strategy for demonstrating quantifiable reproducibility
- Dr Voyvodic to post data online before next call
- Bi-weekly call schedule proposed initially, then move to monthly
- Oct 19 next call at 11 am CDT