QIBA fMRI Committee WebEx Update
Wednesday, August 25, 2010
11 AM CDT

Call Summary

In attendance
Cathy Elsinger, PhD (co-chair)
Jeffrey Petrella, MD (co-chair)
Harris Ahmad, MD
Andrew Buckler, MS
Edward DeYoe, PhD
James L. Reuss, PhD
Douglas M. Tucker, PhD, MBA
James T. Voyvodic, PhD

RSNA
Joe Koudelik
Madeleine McCoy

QIBA fMRI/DICOM Working Group Overview (Dr Tucker)

- The DICOM Working Group was organized to create a generic model for data workflow and validation; proposed models to be discussion focus of Working Group activities

Review of QIBA Initiative and the fMRI Subcommittee Goals (Dr Elsinger)

- The fMRI Subcommittee hosted its inaugural meeting at the 2009 RSNA Annual Meeting with industry partners collaborating with QIBA to determine whether the QIBA process would translate to fMRI activities, e.g., develop guidelines to regulate and standardize the use of fMRI stimulus paradigms in efforts to reduce variability in clinical applications, leading to a translation of research tools to clinical tools
- The momentum of the group should have consistency of progress
- Dr Elsinger will participate in the QIBA Strategic Planning Meeting/Retreat August 27, 2010 in Chicago and will report back to the group about projections, activities, expectations and a timeline of goals over the next year

Reproducibility of fMRI Results

- Evaluate performance of fMRI readout measures; focus on reproducibility and preliminary assessment of existing data available from committee members
- Gain as much information as possible about existing approaches, including:
    - Workflow – what are the practical steps to conducting exams
    - Paradigm implementation and selection based on thresholding of independent variables; decision of what should be measured and which response performance metric should be pursued
    - Analysis protocols and the extent to which 'standard' protocols for analysis can be employed (i.e. is every case different?)
    - Visualization, report, export to treatment planning, etc. (i.e. who is the end user and what do they need in terms of results and information)

fMRI Profile Activity

- Ideal conditions provided within the Profile to specify system performance, e.g. acceptable scanner signal-to-noise rations, etc
    - Emphasis on "measures of accuracy" and reproducibility, e.g. motor cortex
    - Effect of reproducibility, variability and types of synchronization
    - Look at the entire workflow process; determine what influences accuracy and reproducibility
    - Apply measures of reproducibility and decide what independent values are necessary, understand issues of integrity

Data Collection at Duke University (Voyvodic)

- Discussion of a better understanding of reproducibility and how this can be assessed
    - Dr DeYoe is working with Dr Voyvodic's Duke paradigm analysis data

    - Thirty-seven subjects mapped with a vision paradigms multiple times; 71 repetitions to examine variability between visual field mapping
    - Dr DeYoe to apply AMPLE thresholding in post-processing to generate a new dataset
    - Visual and motor cortex considered straight-forward, producing a sense of "ground truth" reproducibility
    - Functional field maps: ways to convert brain activity into visual field charts for point-to-point comparisons; discussion of how reproducible each map is remains a major issue
    - Work on reproducibility but not showing that fMRI is totally reproducible; start to examine data based on three tasks: motor, language and vision
    - Goal is a demonstration that fMRI is both reproducible and quantitative; need reproducibility and accuracy metrics for all three tasks

Next Steps:

- Dr Elsinger to report back to the group regarding the QIBA Strategic Planning Meeting/Retreat
- fMRI Subcommittee members encouraged to submit workflows to better understand potential differences in fMRI methodologies
- Dr DeYoe to apply AMPLE thresholding in post-processing to Dr Voyvodic's data in efforts to generate a new dataset
- Dr Voyvodic and Dr DeYoe to present data at the next meeting
- Presentation of results from Dr Hirsch's lab and clinical work at Columbia
- Next call scheduled for September 8, 2010 at 11 an CDT