QIBA Perfusion, Diffusion and Flow – MRI Biomarker Committee Update Call
Wednesday, 22 July 2015 at 11 AM (CT)
Call Summary

Participants

Michael Boss, PhD (Co-Chair)
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Moderator: Dr. Boss

DCE-MRI TF Update (Dr. Chung)

• The DCE TF Literature Review Strategy, which was discussed at the previous DCE TF call was presented:
  - Databases used: PubMed – 916 articles, MEDLINE/Embase – 1845 articles
  - DCE search terms used: MRI, dynamic, DCE-MRI, contrast enhancement, permeability, site-specific terms: e.g. brain
  - Standardized search strategy = ((((DCE-MRI) OR MRI)) AND ((dynamic) OR contrast enhance*)) AND permeability
  - Fields to include: preclinical/clinical, field strength, parallel imaging, MR sequence: SE, GRE, TR, TE, FOV, matrix size, slide thickness, temporal resolution, overall scan duration, contrast: type, dose, injection protocol, data analysis: post-processing techniques applied prior to analysis, method of analysis, tissue/location analyzed, quantitative measurements extracted, main study purpose and overall study conclusion
  - Dr. Boss suggested that a type of reproducibility metric be indicated
  - A decision will be made regarding whether both pre-clinical and clinical literature will be reviewed
  - Use primary research articles only (use review articles to gather any additional references)
  - Volunteers were requested for sites to which no experts have yet been assigned
  - Google Docs is being considered as a cloud-based place for reviewers to access the article list
  - Dr. Chung will be adding three more columns to the article list spreadsheet:
    - Relevance score (papers will be ranked according to how applicable they are to the Profile)
    - Number of sites represented
    - Number of vendors represented

ACRIN Update (Dr. Rosen)

• Round 2 (2012) DCE-MRI Project Update
  - “Field-test” of DCE-MRI x1.0 claims in humans
  - Population:
    - Patients presenting for prostate MRI staging
    - Prostate (not the tumor) as a uniform target
    - AP imaging of interest in oncology
    - Uniformity of target – no issues with breathing
  - Challenges and Deviations
    - Avoidance of ecoil to maintain option of coil corrections for linear approximation
      - Challenge of test-retest recruitment
- Need to use MRI exam for clinical staging
  - Requires use of 3T
  - Axial imaging plane

- Added DWI as an additional endpoint
  - Emergence of clinical and biomarker use

  - ACRIN 6701 Site Imaging Manual by Drs. Rosen, Jackson, Chenevert, co PIs - ACRIN 6701
    - "Repeatability Assessment of Quantitative DCE-MRI and DWI: A Multicenter Study of Functional Imaging Standardization in the Prostate"

- Hypotheses, other planned analyses, trial summary, site qualification and quality assessment were presented

- Current Status
  - Nine sites qualified
  - Seven sites previously or actively enrolling
  - GE sites complete
  - Philips sites near-complete
  - Siemens sites still accruing

- Next Steps
  - Complete accrual at Siemens (& Philips) sites
  - Initiate segmentation phase
    - Two-reader evaluation
      - Identify dominant tumor nodule
      - Segment whole prostate and dominant tumor nodule (separately on DWI and DCE scans)
    - Compute automated Arterial Input Functions (AIF)
      - Need to avoid bias caused by reader-selection process bias
    - Computation and analysis phase

- Future Goals
  - Publish data set for QIBA investigators
    - Phantom images – separate analysis/publication
    - Human images – need to work within ECOG-ACRIN guidelines
  - Engage investigators in 2º/3º analyses
    - QIBA cohort
    - Site PIs
    - Other interested parties (QIN/ISMRM)

Next PDF-MRI Biomarker Committee Call: August 5 at 11 AM CT [Dr. Rosen to moderate]