QIBA Multi-parametric Metrology Call
26 February 2020 at 10 AM CT
Call Summary
(*Notes from Dr. Raunig's presentation*)

In attendance			**RSNA**
Nancy Obuchowski, PhD (Co-Chair)	Chaya Moskowitz, PhD	David Raunig, PhD	Joe Koudelik
Erich Huang, PhD	Gene Pennello, PhD	Xiaofeng Wang, PhD	Julie Lisiecki
Rudresh Jarecha, MBBS, DMRE, DNB			

Moderator: Dr. Raunig (The call focused on discussion of multi-dimensional descriptor, Use Case #1)

Use cases:
- **Use case 1**: (Multi-dimensional descriptor) a panel to determine how to care for a patient
- **Use case 2**: (Phenotype classification) rule or decision tool to diagnose phenotype
- **Use case 3**: (Risk prediction) several biomarkers will be evaluated to create a prediction or risk score
- **Use case 4**: (Radiomics) may not have a specific biomarker for reference

Introduction:
- Radiomics uses information from a single image to arrive at multiple descriptors of the feature of interest
    - Size and texture(s)
- Multi-dimensional descriptor fusion of multiple sources of information
    - Dimensions can be anatomical and functional
    - Not the same as PET/CT
- Information fusion
    - DCE-MRI + DWI + Perfusion
    - "The information fusion includes the theory, techniques, and tools designed and applied for exploiting the synergy in the information acquired from multiples courses such that the resulting decision is in some sense better than that obtained if these sources were used individually: - Dou 2003

Questions to address:
- What the QIBA Profile claim statements look like
- What work needs to be done to develop the claim (include literature survey, gap analysis)
- What studies should be done to test conformance to claims
- How to properly carry out these methods
- Illustrate methods with an example (include stakeholders' perspective_
- Challenges unique to the use case

QIBA Profile Claim Statements:
- Clinical context
    - Quantification of <the state of the disease> and the changes of the <disease state> due to either the natural history or to therapeutic intervention
    - Discussion
        - Detection
        - Change – Reliability (precision, linearity, no non-systematic bias)
        - Not disease specific
    - Claim
        - Should improvement be claimed over any single dimension?
            - Superiority or non-inferiority?

Challenges unique to this use case:
- Composite endpoint vs. gateway endpoints
- Multiple imaging modalities and subject logistics
- Do we include clinical information?

- What constitutes multi-dimensional thresholds for patient response to treatment?
- Databases available for training the systems do not contain enough data for reliable statistical information.

Work to be done:

- Literature search
  - Information fusion research using different detection modalities from other disciplines
  - Work already done that shows univariate properties and correlations
  - DCE + DWI + Perfusion as an example
  - What are the domains we are trying to detect / measure?
- Expert opinions
  - Delphi-like method?
- Multivariate analysis
  - Exploratory factor analysis
  - SEM / latent class

Call Schedule:

Date:	**Topic**:	**Lead**:
Monday, March 9 (2 pm CT)	**Use case 3**: Risk prediction	Dr. Huang
Wednesday, March 25 (10 am CT)	**Use case 4**: Radiomics	Dr. Wang

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