QIBA Multi-parametric Metrology TF Call
4 November 2020 at 10 AM CT
Call Summary

In attendance

			RSNA
Nancy Obuchowski, PhD (Chair)	Charles Hatt, PhD	David Raunig, PhD	Joe Koudelik
Nandita deSouza, MD	Bernice Hoppel, PhD	Daniel Sullivan, MD	Julie Lisiecki
Alexander Guimaraes, MD, PhD	Erich Huang, PhD	Ying Tang, PhD	
Timothy Hall, PhD	Gene Pennello, PhD	Xiaofeng Wang, PhD	

Moderator: Dr. Raunig

Approval of Call Summary

- The notes from October 19, 2020 were approved as presented

Use case #1: (Dr. Raunig) – Topics discussed included:
- Introduction to the use of multi-variates and multiple quantitative imaging biomarker (QIB) criteria
- Inclusion of Choi reference for multivariate example
- Functional research for DTI – some references found
- Need a multi-parametric biomarker example that is for an "and" situation, rather than an "and/or"
  - Dr. deSouza suggested PET SUV, ADC MRI, or idiopathic pulmonary fibrosis as potential examples
  - Dr. Huang suggested that this could perhaps be considered as a "region" or a "space"
- High's Law which looks at something very sensitive and then very specific
- Dr. Hall offered some ultrasound publications/data that might be helpful
- QIB in response to treatment – not as a diagnostic measure
- QIB candidate selection
- Technical performance of each QIBA individually
- Reminder to reference the use of AI in use case #4
- Model evaluation
- Need for parsimony
- Sample sizes and questions on repeatability / reproducibility
- Question to answer: "Should all subjects cover the measurement interval for all QIBs?"
- Clinical validity in choosing QIBs deemed outside the QIBA scope
- Unusual distributions that cannot be easily transformed
- Non-parametric ways of building a model
  - Example: tumor response at the cellular level, e.g., necrosis, etc.
- Question: "Can we mix or group multi-dimensional clusters?" = yes.
- Bimodal or mixture of distributions require more discussion re: a pattern or mixture modeling approach
- Paper is in progress with an anticipated deadline of the end of the year

Action item:
- Mr. Buckler will lead the next Use Case #2 call by walking the group through a cardiac example

Next call: Use case #4 (Dr. Wang) on Monday, Nov 16th at 2 pm CT

Call Schedule: schedule has been adjusted as of 10/7 – Presenters: please review.

Date:	Topic:	Lead:
Monday, Nov 16 (2 pm CT)	**Use case** 4: Radiomics	Dr. Wang
Wednesday, Dec 9 (10 am CT)	**Use case** 2: Phenotype classification	Dr. Delfino
Monday, Dec 21 (2 pm CT)	**Use case** 3: Risk prediction	Dr. Huang
Monday, Jan 4 (2 pm CT)	**Use case** 4: Radiomics	Dr. Wang
Wednesday, Jan 20 (10 am CT)	**Use case** 1: Multi-dimensional descriptor	Dr. Raunig

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