In attendance			**RSNA**
Nancy Obuchowski, PhD (Chair)	Sean Fain, PhD	Erich Huang, PhD	Joe Koudelik
Huiman Barnhart, PhD	Alexander Guimaraes, MD, PhD	Miranda Kirby, PhD	Julie Lisiecki
Jana Delfino, PhD	Timothy Hall, PhD	Chaya Moskowitz, PhD	
Nandita deSouza, MD	Charles Hatt, PhD	Gene Pennello, PhD	
Raul San José Estepar, PhD	Bernice Hoppel, PhD	Ying Tang, PhD	

Moderator: Dr. Obuchowski

Approval of Call Summary

- The notes from October 7, 2020 were approved as presented

Lung Density: (Dr. Hatt) – Topics discussed included:

- The Lung Density BC needs advice regarding how best to manage these multiparametric biomarkers
- The Lung Densitometry Profile is for Perc15 and LAA-950, biomarkers of emphysema.
    - Both are derived from the Hounsfield Unit (HU) distribution within the lungs.
    - LAA-950 is compositional and has a skewed distribution in COPD populations
    - Perc15 is the fifteenth percentile of the HU distribution and is normally distributed in COPD populations

- Next potential biomarkers for a Chronic Obstructive Pulmonary Disease (COPD) Profile include:
    - Physical measurements:
        - **Airway measurements**: Airway inflammation, scarring, and narrowing. Lumen area, airway wall thickness, wall area percentage etc.
        - **Vascular measurements**: Captures vascular remodeling and pruning. Measurements of total vessel volume, small vessel volume, vessel CSA, etc.
    - Deep learning-based classification:
        - Image→COPD severity (i.e. GOLD stage)
        - Image→Fleischner visual emphysema sub-type
    - Compositional data
    - Lung texture mapping:
        - Voxel-wise classification of ILD textures
            - Compositional array of ILD sub-type percentages.
    - Gas-trapping:
        - Densitometry applied to expiratory scans to quantify % gas-trapping
        - % High Attenuation Areas (HAA)
    - Densitometry applied to inspiratory scans to quantify inflammation or pneumonia

Options include:

- Use case #2: Combine to predict COPD phenotypes:
    - Spirometric
    - Symptomatic
- Use case #3: Combine for risk prediction:
    - Progression in spirometry or symptoms
    - Mortality
    - Exacerbation frequency
    - Lung cancer

Significant standardized data are available including the following:

- Chronic Obstructive Pulmonary Disease, Genetic Epidemiology Study *(COPDGene® Study)*
    - o Inspiratory and expiratory CT
    - o 10,000 phase 1; 4,500 phase 2; 2,000 phase 3
    - o Fleischner visual emphysema scores
    - o Spirometry
    - o Mortality
    - o Exacerbation frequency
    - o Symptoms
- The National Lung Screening Trial (NLST), National Cancer Institute
    - o Inspiratory CT
    - o 12,000
    - o Lung cancer diagnosis and mortality
    - o Spirometry

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

Next call: Use case #1 (Dr. Raunig) on Wednesday, Nov 4th at 10 am CT

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

Date:	Topic:	Lead:
Wednesday, Nov 4 (10 am CT)	**Use case** 1: Multi-dimensional descriptor	Dr. Raunig
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