QIBA CT Coordinating Committee Update

Annual QIBA Meeting
Wednesday, May 17, 2017

Modality Committee Structure

- **CT Coordinating Committee**, Rudresh Jarecha, MBBS, DNB, DMRE; Lawrence Schwartz, MD; David Lynch, MD

- **CT Volumetry Biomarker Committee**, Gregory Goldmacher, MD, PhD, MBA; Ehsan Samei, PhD; Jenifer Siegelman, MD, MPH
  - **Volumetry Algorithm Challenge Task Force**, Maria Athelogou, PhD
  - **Small Lung Nodule Task Force**, Samuel Armato III, PhD; David Gierada, MD; James Mulshine, MD

- **Lung Density Biomarker Committee**, Sean Fain, PhD; Matthew Fuld, PhD; David Lynch, MD
  - **Airway Measurement Task Force**, Sean Fain, PhD
Current Status: Profile Development

- Feasibility testing performed at Rush, Duke, Columbia, Brigham
- For each requirement:
  - Conformed: Yes, No
  - Opinion: Routine, Feasible - Will conform, Feasible - will Not, Not Feasible
  - Extensive comments from site and committee members
- Collated all feedback into Google sheet for review & resolution
- Small BC subgroup (3-4) doing first pass, for each requirement:
  - No action needed
  - Simple profile edits needed
  - Discussion in full BC needed
- Anticipate Technically Confirmed later this year

Listing of “Round 6” Funded Projects

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<th>YR</th>
<th>Code</th>
<th>Committee</th>
<th>CT Projects</th>
<th>Lead</th>
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<td>2016-S</td>
<td>CT Vol</td>
<td>Methodology and Reference Image Set for Lesion Characterization in Terms of Texture and Morphology</td>
<td>Samei</td>
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<tr>
<td>2015-U</td>
<td>Lung Density</td>
<td>CT Lung Density Biomarker: Translating Phantom Harmonization to Clinical Practice</td>
<td>Humphries</td>
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Example Results of Funded Projects

Portal venous phase Arterial phase

Phantoms for CT Volumetry of Hepatic and Nodal Metastasis  Binsheng Zhao, DSc – Columbia University

Recon

Inputs:

- Projection data
- Starting & desired mAs

Determine signal levels, based on scanner properties and patient attenuation
Determine location for lesion insertion
Add lesion to raw data
Output: Projection data, ready for prep/recon scan

Projection space lesion addition

a: attenuation
b: background
c: contrast
d: edge blur

Methodology and Reference Image Set for Volumetric Characterization and Compliance  Ehsan Samei, PhD – Duke
Example Results of Funded Projects

Which lesions are real?

Methodology and Reference Image Set for Volumetric Characterization and Compliance
Ehsan Samei, PhD – Duke

Key Highlights for Discussion

• Next stage for advanced disease is technically confirmed, and for small nodule, public comment. Both expected in next few months.
• The next major area is variously referred to as texture, morphology, or sometimes radiomics:

This area is of potential very interest, but fundamental questions related to its definition as a biomarker are being worked out.
• There is substantial opportunity for cross-organizational or international engagement in order to address the question of new CT biomarkers.