Lung Cancer Workshop X
Breakout Group A

May 3, 2013

Understanding and Controlling for Sources of Variation

- We are getting our arms around the sources of acquisition variation
  - Scanners: We can handle a small number of scanners in a controlled setting (n<=5)
  - Parameters are not well defined across scanners (e.g slice thickness, iterative recon)
  - No public database of small lung cancers with longitudinal scanning – need to address
  - Performance is not well defined for scanners
  - Quantitative standards are needed to understand image quality for quantitative imaging tasks (NIST internal proposal)
- Tumor presentation: issue is highly dependent on size and biology of tumors
- Software methods: We need a more systematic understanding of common algorithms and methods.
- Need machine-driven image acquisitions (as opposed to for human reading)

Gaps in Public Databases

- We have not kept up with technology advances
- Need a new mechanism for obtaining continuous and current data (dynamic database, imaging SEER)
  - Proposal: A set of studies prospectively provide a small % of their data to a common pool of public data.
  - Make sure to obtain links to top medical institutions to get some of the best data.
  - Could start with sites and/or studies to approach
  - We need goals and standards for collecting the latest data from current technology.

Prime Needs for Public Databases

- Detection cases
- Diagnosis cases - Set of lesions, time intervals, known diagnosis, outcomes,

CT Image Quality Standards

- Mammography took the MQSA regulation approach.
- We could tie required IQ to reimbursement as a mechanism (also tie to public donation)
- Scanners could report image quality
  - In terms of fundamental image quality characteristics
  - This is a major undertaking to define
- Proposed Characteristics (with upper/lower bounds)
  - 3D PSF
  - Sampling rate (already there)
  - Noise (e.g. NPS)
  - Iso-center
  - CT linearity
  - Level of edge enhancement