Application for QIBA Project Funding

Title of Proposal: Low CT Dose Lung Protocols for Repeatable Quantitative Measures in Multi-Center Studies		
QIBA Committee/Subgroup: COPD/Asthma Technical Committee		
NIBIB SOW Objective which this project addresses: **Objective 2** (ground work data collection and analysis); **Objective 3** (procedures for hardware and software manufacturers and users to demonstrate compliance)		
Project Coordinator or Lead Investigator Information:		
Last Name: Fain	First Name: Sean	Degree(s): PhD
e-mail:	Tel #:	
Institution/Company: University of Wisconsin		
Amount Requested:		

Project Description

Quantitative CT (qCT) of the lungs has grown in interest with the development of large scale clinical research studies of COPD [1-3] and asthma [4-6]. Of important concern in such studies is the total x-ray dose accrued by subjects undergoing longitudinal multi-volume CT studies. Also, of important concern is maintaining image quality, specifically sufficiently low noise power to support qCT measures especially in larger subjects. Commercial methods for reducing x-ray dose and improving low dose image quality in CT, such as automatic exposure control (AEC) and iterative reconstruction (IR), have been introduced by all the major vendors. Both AEC and IR are likely to have benefit for improving quantitative CT (qCT) of the lungs, however, practical issues of standardization across platforms and validation of qCT measures have hampered the introduction of low x-ray dose protocols for clinical research studies using qCT of the lungs using the installed base of 64 slice systems.

Primary goals and objectives

- To determine the impact of AEC and IR for qCT of lung density and airway measurements across scanner platforms.
- To establish equivalent performance for the measurement of lung-parenchyma-equivalent density for dose saving protocols across the major vendor platforms represented in the installed base of 64 slice systems (e.g. GE, Siemens, Philips, Toshiba).