2023 WORKSHOP SESSION DESCRIPTIONS & QUESTIONS

This working document proposes panelist questions that may be addressed during each session and enhanced by those of our Workshop Zoom attendees.

KEYNOTE: AI-ENABLED CHEST CT SCREENING FOR COMPREHENSIVE CARDIOVASCULAR DISEASE, LUNG CANCER & COPD PREVENTION

Morteza Naghavi, MD, Founder, *HeartLung.AI*

A leading cardiovascular researcher will review progress in extracting useful clinical information from CT scans of the thorax/heart to highlight information potentially available on low dose CT. Initial interest has focused on quantitation of coronary calcium but additional targets may be of interest.

SESSION TWO: INFECTION, INFLAMATION, CANCER – THE PATHOLOGY BEHIND THE IMAGES BEING ANALYZED BY AI & REPORTED TO CLINICIANS

An individual's peak lung function is usually reached during their third decade of life. "Normal" decline from aging as well as decline related to the development of lung disease occur at varying degrees and there is currently no good markers of lung function decline that could be identified for screening and/or targeted for modification of risk with specific interventions.

Large, Longitudinal Databases To Predict Status Of Disease Processes

What have we learned and hope to learn from interrogation of large databases of imaging and clinical information in disease states such as COPD, idiopathic pulmonary fibrosis (IPF) and lung cancer.

Infection, Inflammation, Cancer: The Pathology Behind The Imaging

The disease processes in the lung are related to the immune response we each have to insults from infection or inhaled toxins. The over or under expression of the immune response determines our outcomes—acute worsening and death, chronic inflammatory and fibrotic diseases (asthma, COPD, IPF), and a microbiome in the airway that may predispose to cancer development.

Questions for Both Topics

1. Can we postulate that pulmonary emphysema or pulmonary fibrosis can be repaired?
2. If so, are there candidate drugs that have a biological rational for lung regrowth or repair?
3. How can 'improvement' in lung repair/regrowth be measured?

SESSION THREE: THE BRIGHT FUTURE OF IMAGE ACQUISITION, CALIBRATION & ARTIFICIAL INTELLIGENCE

The Integration Of Artificial Intelligence In CT Image Reconstruction

CT image reconstruction has improved significantly over the last two decades through the introduction of increasingly sophisticated computational methods (iterative reconstruction). This has resulted in large reductions in radiation dose while maintaining or reducing CT image noise. We are now seeing increasing research on applying AI within CT image reconstruction algorithms. The session will review the state-of-the-art of this growing area as well as both the opportunities and potential limitations of these new methods.

1. What will be AI's most impactful improvements to quantitative imaging of small lung nodules?
2. Will AI improvements apply generally to all reconstruction methods or be more limited to a smaller set of recon kernels?
3. How do we prevent hallucinations from impacting CT reconstruction and quantitative measurements?
4. Are we collecting enough diverse data to avoid bias for different groups of patients (e.g., age, gender, ethnicity, lung pathology types, regional diseases, therapy types)?

Opportunities To Advance CT Lung Measurements Using CT Calibration & Artificial Intelligence

The CT scanners deployed throughout the world for CT lung cancer screening are justifiably being used to detect and measure lung nodules and airway measurements using CT image acquisition protocols that are optimized for human review and subjective measurement. However, for over a decade, CT scanners have been capable of acquiring much higher quality CT images than human review would be able to tolerate. The addition of Artificial Intelligence methods to detect focal abnormalities and guide CT image acquisition has the potential to dramatically improve lung nodule measurement accuracy. The session will review this new AI-driven approach and discuss potential improvements to CT lung screening.

1. Do you see near term potential to use AI targeting and measurement of lung nodules and small airways to lower CT scan follow up times or to visualize nodules better?
2. How would you define when/where to perform additional CT targeted acquisitions of lung nodules? Are these categories where additional radiation dose for an additional acquisition is ok?
3. Numerous image quality issues are being found with highly targeted protocols. Would your site be willing to perform many phantom scans to identify best performing protocols?

SESSION FOUR: OPTIMIZING ANNUAL LUNG CANCER SCREENING CT TO CHARACTERIZE CORONARY ARTERY CALCIFICATION (CAC) CLINICAL EVOLUTION

Clinical Optimization Of Lung Cancer Screening CT For CAC Theragnostics

Lung cancer screening CT can detect and quantify coronary artery calcification, which in turn can predict future cardiac events in currently asymptomatic subjects. However, there are some barriers to the clinical acceptance of coronary artery calcium results from lung cancer screening CT. Additional information must be collected and reviewed to make coronary calcium results useful or actionable, such as patient demographics, medications list and past medical history. Furthermore, the significance of increasing coronary calcification is unclear as it could represent either normal physiology or a harbinger of future cardiac events.

1. What clinical parameters need to be collected (if any)?
2. What are the barriers in reporting and accepting findings?
3. Gated vs non-gated, standard vs low dose, thin vs thick section?
4. How reliable are scores, which ones (e.g., Agatson score, volume, mass scores, etc.) and how much impact?
5. How do we manage change in score over time?

SESSION FOUR *(Continued)*

Reporting Non-Coronary Cardiac Findings In Lung Cancer Screening CT

Lung cancer screening CT can reveal a wide array of non-coronary cardiac findings such as enlarged chamber sizes, greater than expected amounts of adipose tissue, and enlarged vasculature. Many of these findings may predict future cardiovascular events. However, reporting these may also have adverse effects on workflow efficiency, exam costs, patient anxiety, and referring physician confidence. There are also challenges in clinically managing these incidental findings in an asymptomatic population.

1. What non-coronary cardiac findings are currently routinely assessed and what are the most likely additional candidates?
2. Major illnesses that can be predicted: atrial fibrillation (AFib), stroke, heart failure, and others.
3. Risk prediction models or stand-alone imaging findings?
4. How do we report these findings and do clinicians and/or patients want to know them?

Designing A Medicare Cardiac Controlled Observational Study

New clinical trials are needed to demonstrate cardiac outcomes data in lung cancer screening CT. The ideal patient population, recruitment strategy, target endpoints, Medicare perspectives and legal perspectives must all be considered.

1. Are findings being acted upon?
2. Current payment status for additional findings?
3. With cardiac screening would we pick up the cases outside of lung screening guidelines?
4. What should such a Coverage with Evidence Determination (CED) study demonstrate?
5. How do we continue to update necessity of including additional finding?

SESSION FIVE: POPULATION HEALTH

Payer Quality Metrics For Lung Cancer Screening – What Progress Is Being Made On This Essential Tool?

Payer quality metrics such as HEDIS© and Centers for Medicare & Medicaid Services (CMS) Star Ratings have proved very effective at increasing the use the services they measure, such as colorectal cancer screening. What are the prospects for a payer metric for lung cancer screening?

1. Session chair, Bruce Pyenson, will ask the panelists their thoughts on how important they think a Star / HEDIS© metric might be for promoting lung cancer screening.
2. What can advocates or people in this Workshop do to speed up the process?

Why Is Cost-Sharing So Often Incorrectly Billed For Preventive Services?

The recent court ruling challenging the Affordable Care Act's (ACA) no-cost sharing for certain preventive services has highlighted the existing chaos around billing patients for preventive services. Why is this so difficult and what can be done?

1. The issues we have been discussing affect screening broadly—not just lung cancer screening. Mr. Pyenson would like to propose that a national auto-authorization process could remove these headaches for providers, patients and payers. We could start discussions with radiology providers, advocacy groups, professional societies and payers. Do panelists think this effort might succeed and do they have any suggestions?
2. Each of the panelists has shown there are a few situations where screening cost-sharing is not covered. Can you think of ways to finance the cost-sharing? For example, pooling unpaid cost-sharing and funding the pool through a tax on screening.

a/o 10.30.23