

Research Project

Name of Institution and department:

- Guy's and St Thomas' NHS Foundation Trust (GSTT)
Department of Radiology, Cardiothoracic Imaging
- South East London Lung Cancer Alliance (SELCA) Lung Cancer Screening Programme (LCS)

Link to website:

<https://www.guysandstthomas.nhs.uk>

<https://www.selca.nhs.uk>

City and Country of Institution: London, United Kingdom

RESEARCH GROUP

The South East London Lung Cancer Alliance (SELCA) Lung Cancer Screening Programme (LCS) and the cardiothoracic department at Guy's and St Thomas's research group focuses on improving population health outcomes through early detection and prevention of lung cancer. Lung cancer screening offers also a unique opportunity to screen for cardiovascular disease, particularly with detection of incidental Coronary Artery Calcification and Aortic Valve Calcification. The group aims to evaluate imaging data and clinical records to better understand cardiac disease burden and inform evidence-based preventative cardiovascular strategies. Its mission is to translate research findings into practical interventions that enhance early diagnosis, reduce morbidity and mortality, and support integrated, patient-centred care.

TITLE OF PROPOSED RESEARCH PROJECT

Coronary Artery Calcification in Lung Cancer Screening: Prevalence, Clinical Impact, and Preventive Opportunities

Background and Rationale

Coronary artery calcification (CAC) is frequently identified incidentally on low-dose CT scans performed for lung cancer screening (LCS) and is a well-established marker of atherosclerotic cardiovascular disease risk. Emerging data suggest that up to 60% of individuals undergoing LCS demonstrate CAC, with approximately 20% exhibiting moderate-to-severe disease requiring clinical intervention. Despite this, the integration of CAC reporting into routine clinical pathways remains variable. Similarly, presence of aortic valve calcifications (AVC), can be a sign of significant valve disease (often aortic stenosis), but often is not actioned.

This project aims to characterise the burden of CAC and AVC within an LCS population and evaluate its clinical implications, including subsequent management and association with cardiovascular outcomes. It also seeks to assess the potential role of LCS programmes as an opportunistic platform for cardiovascular risk stratification and prevention.

This is a large-scale lung cancer screening programme: 100.000 eligible individuals (aged 55–70, ever-smokers) invited across multiple boroughs across South-East London have been identified, of which approximately 15.000 have performed a baseline CT thorax.

In this study, we aim to review data on a single borough (single south-east geographical location), with an expectation of approximately 5.000 baseline CT scans completed. Review of a subgroup of these 5.000 scans will be of extreme interest.

OBJECTIVES

- To collect baseline patients' data (before performing LCS CT thorax): demographics (age, sex, ethnicity), cardiovascular risk factors (smoking status, BMI), comorbidities (hypertension, diabetes mellitus, COPD),

medication history (including statins), symptoms where available (chest pain, dyspnoea).

- To determine the prevalence and severity of CAC (mild, moderate, severe) and AVC in patients undergoing LCS CT thorax.
- To evaluate associations between CAC and AVC burden and baseline clinical characteristics of this high-risk population cohort.
- To assess the impact of CAC detection on clinical management, including potential preventive therapies (e.g. statins).
- To assess the impact of AVC detection on clinical management, including echocardiogram.
- To examine cardiovascular outcomes, including major adverse cardiovascular events (MACE), hospital admissions, and mortality.
- To compare outcomes between participants with and those without CAC
- Reviewed against demographic insights compared population health context for the South East London population.
- Data will be obtained from electronic health records (EPIC), Lung Screening Programme and integrated care datasets (London Care Record).

APPLICANT'S DUTIES

- Clinical data extraction and curation
- Imaging data interpretation support
- Preparation of abstracts and manuscripts
- Presentation of findings at scientific meetings
- Presentations at local LCS meetings

APPLICANT'S BENEFITS

- Experience in clinical research within a large population-based screening programme
- Contribution to peer-reviewed publications and conference presentations

- Exposure to lung cancer meetings involving radiologists, respiratory physicians and the whole SELCA team
 - Development of skills in cardiovascular and respiratory epidemiology
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- **Project Leader:** Dr Giulia Benedetti, Consultant Cardiothoracic Radiologist, Guy's and St Thomas' NHS Foundation Trust
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- **Members:**
 - Dr Kimuli Ryanna, Consultant Respiratory Physician, Guy's and St Thomas' NHS Foundation Trust
 - Vicky Stewart, SELCA LCS Senior Programme Manager
 - Dr Michelle Mak, Consultant Cardiothoracic Radiologist, Guy's and St Thomas' NHS Foundation Trust
 - Dr Nishanth Sivarasan, Consultant Cardiothoracic Radiologist, Guy's and St Thomas' NHS Foundation Trust