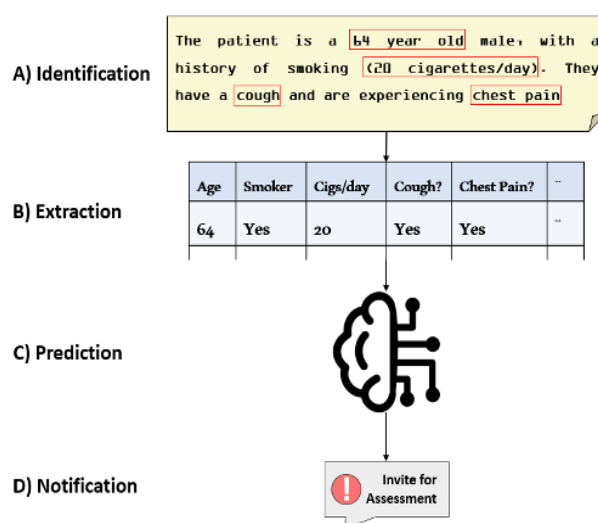


Screening for Lung Cancer using Artificial Intelligence

What are we doing?

When you attend an appointment with a doctor, they will write their notes into the computer. These notes will be very detailed and may contain information such as what symptoms you are experiencing, when the symptoms started, how severe they may be etc. This information is difficult to analyse because it is not organised sensibly and what is written varies from patient to patient. Recently, new technology has been developed which allows us to extract meaningful information from these notes, opening the door to new ways to use our data. Therefore, we aim to understand how we can use this technology to scan doctors' notes and extract useful information about patients which can be used to screen for lung cancer.



The image to the right shows how the screening process will work. This study will work on the first three stages, A) Identification, B) Extraction and C) Prediction, to understand how well we can predict lung cancer risk. If successful, the final stage, D) Notification, will form part of a separate study.

Why are we doing it?

The most recent statistics from Cancer Research UK show that around 48,500 new cases of lung cancer are diagnosed each year. Compared to all other cancers, death from lung cancer is the most common, with only 10% of patients surviving for ten or more years after their diagnosis.

Most lung cancer is diagnosed in the later stages of the disease, making treatment more difficult and putting strain on the NHS. However, when diagnosed sooner, treatment is much more effective, with survival rates increasing to 30-80% from 2-15%. Therefore, we need better ways to identify lung cancer in its early stages.

Lung cancer is known to be caused by smoking, but not every smoker will develop lung cancer. Other factors are also known to influence someone's risk of developing lung cancer like age, sex and ethnicity. However, these factors are generic, making the definition of a 'high-risk' person limited. By using the notes written by doctors, we will gain access to information which we believe will improve the definition of a 'high-risk' individual and allow us to run screening tests on people who are most likely to develop cancer. We hope this work will help to enable earlier diagnoses, improved treatment outcomes and reduced strain on the NHS.

Whose data will be used?

We will be using data from patients within the North-East London area, aged 40 and older, who have had a chest x-ray between 01/01/2016 – 31/12/2019 and 01/01/2022 – 31/12/2022. For each patient, we will extract the information we believe might be relevant to lung cancer from the notes written by their doctor during GP appointments, hospital appointments and X-ray results. Although data will not be anonymous when we first obtain it, we will seek to anonymise all aspects of the data at the earliest possible opportunity. Additionally, only members of the study team, will have access to identifiable

data as part of this study. More information about how your data is used within Barts Health can be found here: <https://bartslifesciences.org/wp-content/uploads/2022/09/FAQs.pdf>

Because members of the research team who are not clinicians will be accessing your confidential information without your consent, this study is supported by the health research authority, on advice from the Confidentiality Advisory Group, for the use of this data. The support is time-limited and ensures any personal data obtained is handled fairly and not for longer than required.

Who is carrying out the research?

The research is being carried out by a team of researchers working in the Life Science program of Barts Health. The project is supported by Clinithink, the developer of the technology for extracting information for medical notes and is being funded by AstraZeneca UK.

The study team members involved in this research are:

- Mr Andrew Houston – Research Data Scientist
- Dr Sophie Williams – Health Care Scientist
- Dr Charles Gutteridge – Chief Clinical Informatics Officer
- Dr William Ricketts – Consultant Respiratory Medicine
- Dr John Conibear – Consultant Clinical Oncology

How you can get involved

Patient and public involvement and engagement (PPIE) is an important part of all research we conduct within the Life Science team. We want our processes for carrying out research to be transparent and trustworthy. To get involved, you can join the NE London Cancer Alliance by emailing nelondon.pvc@nhs.net. Additionally, we will be speaking about our work and holding focus groups at AgeUK events, such as the Over 50s Friday Forum and at neighbourhood forums across Hackney and City.

Don't want your data to be used?

Although the use of your data for this study and the results will not influence your care or treatment, we understand that you may not wish for your data to be included. Therefore, the study will respect any registered National Data Opt-Outs. Additionally, if you do not wish for your data to be used for this specific piece of research, you can opt out by emailing bartshealth.bartslifesciences@nhs.net with the subject line: 'Opt-Out Lung Cancer', or by calling 020 3765 8579.

Should you wish to see what data of yours has been accessed and by who you can download the 'Patient Access' app.