Participant information leaflet

APPLIED-LUNG: Transforming Lung cancer screening
Full title: Artificial intelligence-integrated Plasma Proteomic anaLysis to Improve risk Evaluation and Decision-making in LUNG cancer screening (APPLIED-LUNG)
REC Reference Number: 25/LO/0807

1 What is the purpose of this study?

To improve early diagnosis and lung cancer survival, the NHS has introduced Lung cancer screening for people at high risk using low dose computed tomography (CT) scans. While CT scans can detect lung cancers, the widespread rollout of CT screening requires many resources and may not reach everyone who would benefit from Lung cancer screening.

Oxford Cancer Analytics (OXcan) have developed a blood test capable of detecting lung cancer by analysing proteins in the blood. The OXcan blood test has been shown to be effective in early studies.

OXcan is working with the Cheshire and Merseyside Lung cancer screening programme run by Liverpool Heart and Chest Hospital NHS Foundation Trust, and the University of Liverpool. We are asking 11,000 people undergoing a low dose CT scan as part of the NHS Lung cancer screening programme to participate in this study to see if the OXcan blood test can accurately identify people who do and do not need a CT scan.

2 Why have I been chosen?

You have been chosen because you are having a low dose CT scan as part of the NHS Lung cancer screening programme.

3 Do I have to take part?

No, it is up to you whether you take part. If you decide to take part, you are still free to change your mind at any time without giving a reason. If you decide to stop your participation or decide not to take part, this will not affect your care.

4 What will happen to me if I take part?

If you decide to take part and all your questions have been answered, you will be given this information leaflet to keep and asked to sign a consent form. If you would like to discuss this study further, please contact the team (details at the end of this form).

If you are having a low dose CT as part of the NHS lung cancer screening programme, we would like to take a one-off blood sample from you for research. If you agree to take part, up to 60 ml of blood (4 tablespoons) will be taken when you attend for your low dose CT scan.

We will also ask for optional samples of sputum, saliva, a mouth swab (oral swab) and a sample from the inside of your nose (nasal swab/scraping) at the same time (if possible) to test other

methods that may help screen for lung cancer and other diseases (such as head and neck cancer and chronic lung diseases) in the future.

You will be asked if you have eaten, drunk, smoked or chewed gum in the 30 minutes prior to sample collection. You will be asked to rinse your mouth with water before these samples are taken.

- Sputum will taken by asking you cough into a clean container. You may be asked to take some deep breaths and force deep coughs to loosen the sputum. Sputum is mucus from the lungs and is usually thick and sticky. Possible uses of sputum include understanding how the microbiome (community of naturally occurring microscopic organisms including bacteria and viruses) in the lungs affects diseases such as chronic lung diseases.

- Saliva will be taken by asking you to spit up to 2mL of saliva (not including froth) into a clean container. Saliva is runny and clear.

- Mouth and nose swabs will be taken by rubbing a swab inside both cheeks 3-5 times and another swab from the wall of each nostril 3-5 times. Possible uses of saliva, mouth and nose swabs include analysis of DNA, RNA and proteins to help develop tools to screen for diseases such as lung cancer, head and neck cancer and other chronic lung diseases as the cells in the nose and mouth are exposed to the same risk factors for diseases as the cells further down the nose, throat and lungs.

The research team will look at your current and past medical records and may ask you additional questions about your health. The research team will also look at your medical records in the future (for up to 10 years) to check for any changes in your health. This will include any new diagnoses of conditions such as cancer, heart and lung diseases and the treatment and outcome of these diseases. The follow up period of 10 years is important to assess the long-term outcome of screening and identify factors that predict outcome. This data will be stored in secure access-controlled research databases at the NHS Trust and Liverpool University Biobank.

Participation in this research will take around 20-30 minutes of your time when you attend for your CT scan.

If you agree your GP will be informed of your participation.

5 What are the risks and side effects of taking part?

Taking a blood sample causes mild discomfort and occasionally bleeding where the needle for the blood test is inserted into the vein. There is minimal risk from giving sputum and saliva samples. Oral swabs and nasal swabs/ scrapings cause very little if any discomfort when the sample is taken from the lining of the inside of the mouth and nose.

Radiation risk: Low dose CT scans are part of your routine care in the NHS Lung cancer screening programme. If you take part in this study, you will not undergo any additional CT scans. Low dose CT scans use ionising radiation to form images of your body to provide the NHS Lung cancer

screening programme with clinical information. Ionising radiation may cause cancer many years or decades after the exposure. The chances of this happening to you are the same whether you take part in this study or not.

6 What are the possible benefits of taking part?
Although there are no direct benefits to you from taking part in this study, you will be helping us to develop better tests to screen for lung cancer and possibly other diseases in the future.

7 What happens after I take part?
All your care will continue as usual.

8 What happens to my samples?
Your samples will be processed in the Liverpool University Biobank which is tightly controlled and supervised. Some of these samples will be sent to OXcan to help develop their blood-based Lung cancer screening test. As this is a research study, the results are for research only and the OXcan blood test result will not be fed back to you or used in your medical care.

Samples collected from you may also help to develop other ways to screen for lung cancer and other diseases in the future. The tests on the samples may include the study of DNA, RNA and protein.

Your samples are very precious. If there is any material left over after the laboratory tests, we ask permission to use it in future research. You may withhold your consent for future use. If there is material left over after our research is complete, we will transfer it to a Human Tissue Authority Tissue Bank.

In the future, samples can only be used for other projects if they have been approved by the Tissue Bank management committee or by the NHS Research Ethics Committee.

Your samples may be transferred outside of the UK to partners for research. Strict safety measures (UK data protection legislation) are in place to protect the privacy of your information both in the UK and outside of the UK.

If you have consented that leftover samples will be stored in the Liverpool University Biobank, your consent record, samples, and any related data will be under the care of the University of Liverpool. These samples and data will be stored indefinitely for future research. The study data will be stored with a code number in a secure, access-controlled environment following the University of Liverpool Data Retention Policy.

9 What if something goes wrong?
It is very unlikely that you will be harmed by taking part in this research project. The University of Liverpool, the Research Governance Sponsor of the study has indemnity (insurance) arrangements in place for negligent harm, in the event that something does go wrong and you are harmed as a result of taking part in the research study. If you are harmed due to someone's negligence, then you may have grounds for legal action but you may have to pay for it. Your

hospital where you receive your treatment has a duty of care to you whether or not you agree to participate in the study and the study Sponsor accepts no liability for negligence on the part of your hospital's employees. However, if you are harmed and this is due to someone's negligence at the hospital, then you may have grounds for a legal action for compensation against the NHS Trust where you are being treated but you may have to pay for your legal costs.

If you have a concern you should ask to speak to one of the research team who will do their best to answer your questions. If you remain unhappy and wish to complain formally you can do this by contacting The Liverpool Heart and Chest Hospital Patient & Family Support team: Tel: 0151 600 1517 (https://www.lhch.nhs.uk/patient-family-support).

10 How will we use information about you?

We will need to use information from you, your medical records, your GP and your blood and samples for this research project.

This information will include your:

- Name
- NHS number
- Date of birth
- Demographics

People will use this information to do the research or to check your records to make sure that the research is being done properly.

People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead.

The University of Liverpool is responsible for looking after your information. We will share your information related to this research project with the following types of organisations:

- Academic and Research Institutions
- Commercial partners

We will keep all information about you safe and secure by:

- Ensuring the handling, processing, storage and destruction of study information and data will follow privacy laws (General Data Protection Regulation (GDPR) 2018).
- Ensuring all identifiable data is received and stored securely.
- Ensuring only authorised individuals from the University of Liverpool and regulatory organisations may look at your medical and research records to check the accuracy of the research.
- Ensuring that people who do not need to know who you are will not be able to see your personal identifiable information. Your data will have a code number instead and will be stored on secure data systems that can only be accessed by trained, authorised staff.

- Ensuring appropriate data sharing agreements are in place with all parties involved in processing your data.

International transfers

We may share or provide access to data about you outside the UK for research related purposes to:

- further our understanding of screening of lung cancer and other diseases in the future.

If this happens, we will only share the data that is needed. We will also make sure you cannot be identified from the data that is shared where possible. This may not be possible under certain circumstances – for instance, if you have a rare illness, it may still be possible to identify you. If your data is shared outside the UK, it will be with the following sorts of organisations:

- Public Healthcare providers
- Government agencies and Public Health Institutions
- Academic and Research Institutions
- Commercial partners

We will make sure your data is protected. Anyone who accesses your data outside the UK must do what we tell them so that your data has a similar level of protection as it does under UK law. We will make sure your data is safe outside the UK by doing the following:

- The countries your data will be shared with have an adequacy decision in place. This means that we know their laws offer a similar level of protection to data protection laws in the UK
- We use specific contracts approved for use in the UK which give personal data the same level of protection it has in the UK. For further details visit the Information Commissioner's Office (ICO) website: https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/international-transfers/
- We do not allow those who access your data outside the UK to use it for anything other than what our written contract with them says.
- We need other organisations to have appropriate security measures to protect your data which are consistent with the data security and confidentiality obligations we have. This includes having appropriate measures to protect your data against accidental loss and unauthorised access, use, changes or sharing.
- We have procedures in place to deal with any suspected personal data breach. We will tell you and applicable regulators when there has been a breach of your personal data when this is legally required. For further details about UK breach reporting rules visit the Information Commissioner's Office (ICO) website: https://ico.org.uk/for-organisations/report-a-breach

How will we use information about you after the study ends?

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

We will keep your study data for a maximum of 25 years. The study data will then be fully anonymised and securely archived or destroyed.

What are your choices about how your information is used?

- you can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have
- If you choose to stop taking part in the study, we would like to continue collecting information about your health from central NHS records, your hospital and your GP. If you do not want this to happen, tell us and we will stop.
- You have the right to ask us to access, remove, change or delete data we hold about you for the purposes of the study. You can also object to our processing of your data. We might not always be able to do this if it means we cannot use your data to do the research. If so, we will tell you why we cannot do this
- If you agree to take part in this study, you will have the option to take part in future research using your data saved from this study. This will be stored in the Liverpool University Biobank.

Where can you find out more about how your information is used?

You can find out more about how we use your information, including the specific mechanism used by us when transferring your personal data out of the UK:

- at www.hra.nhs.uk/information-about-patients
- by asking one of the research team
- by sending an email to Information Governance infogov@lhch.nhs.uk or
- by ringing us on 0151 600 1845
- in the Health Research Authority leaflet available from www.hra.nhs.uk/patientdataandresearch
- by contacting the University of Liverpool Data Protection Officer on LegalServices@liverpool.ac.uk

If you are not happy with the way your information is being handled, or with the response received from us, you have the right to lodge a complaint with the Information Commissioner's Office at Wycliffe House, Water Lane, Wilmslow, SK9 5AF (www.ico.org.uk).

11 What will happen to the results of the research?

The results will be published in peer-reviewed medical/scientific journals. The results will form part of the evidence to help bring the OXcan blood test into routine clinical use.

12 Will I be informed about the outcome of the research?
Yes. If you would like to be informed of the outcome of the broader research, please let the research team know this. We will communicate the results of the research to participants and the wider public with the help of the Cheshire and Merseyside Cancer Alliance.

13 Who is organising and funding the study?
This study is being organised by doctors and scientists from Liverpool Heart and Chest Hospital NHS Foundation Trust, University of Liverpool and Oxford Cancer Analytics Ltd (OXcan) which is a private company. The study is being funded by the National Institute for Health and Care Research (NIHR) and OXcan.

Conflict of interest disclosure: two members of the direct study team are employed by OXcan and hold employee stock options in OXcan.

14 Will there be any payment for taking part?
No payment will be made to you for taking part in this study.

We are working together with commercial partners now and in the future to help us learn the most that we can from our research. These partners may be in the UK or outside of the UK. If a sample that you have gifted is tested in this way, there is a chance that this information might be valuable to the University or the commercial partner. It is important that you know that we will not offer you any payment or rights to any invention that comes from the study of your samples.

15 Who has reviewed the study?
This study has been reviewed and approved by the University of Liverpool and by the London - Dulwich Research Ethics Committee.

16 Contact for further information
If you require any further information or have any concerns while taking part in this study, please contact your research team:

Study Senior Research Nurse: Mrs Jennie Chedotal Telephone: 0151 600 1876
If you take part in this study, you will be given a copy of this information sheet and a copy of the signed consent.

Thank you for taking the time to read this information sheet