

Scan Optimisation of Single Heartbeat Computed Tomography Coronary Angiography

Patient information: SCOTSH-CTCA study

Keeping patients safe

Any exposure to ionising radiation carries a risk of cancer induction several years or decades after the exposure. The additional risk is very small compared to natural rates of cancer in the general population. Although the additional risk is very small, all exposures to radiation must be optimised with an aim to use the lowest amount of radiation possible to answer a specific clinical question. Any exposure to radiation must be carefully justified by a radiologist to ensure the benefit of the exposure significantly outweighs any risk.

Using the latest technology

Computed Tomography Coronary Angiography (CTCA) is a front line test for coronary artery disease which uses radiation to take pictures of the heart. The latest generation of single heartbeat acquisition CT scanners are still relatively new to clinical practice and offer a wide range of tools to produce diagnostic images for all patients whilst keeping radiation dose as low as possible. These scanners make use of state of the art technology to acquire diagnostic scans at a lower radiation dose than ever before, but only if they are used appropriately. The first national audit of CTCA in the UK, published in 2017 showed significant variation in radiation dose levels received by patients at hospitals using different CT scanners. One goal of this study is to publish optimised technical parameters to share with other hospitals to help reduce radiation dose levels nationally.

Improving care for all

This study will review radiation dose, image quality and scan acquisition settings for large groups of patients undergoing CTCA as part of standard of care imaging. The study will aim to optimise CTCA scans on three state of the art scanners from different manufacturers which are capable of single heart beat acquisition. Following each audit, recommendations to incrementally reduce radiation dose will be reviewed with a medical physics expert, radiographers, radiologists and cardiologists as part of a multi-disciplinary image optimisation team before any protocol changes are made.

Image quality will be reviewed continually with radiologists and cardiologists reporting the images. Measurements will be also performed using scans of an artificial chest. Several audit and review cycles will take place on each of the scanners included in this study before a final scan protocol is established.

Patients will be recruited at:

- [East and North Hertfordshire NHS Trust](#)
- [Royal Brompton and Harefield Hospitals](#)

- [West Hertfordshire Hospitals NHS Trust](#)

Once a final protocol has been established, the information on radiation dose level and technical parameters on how to use each scanner will be shared with other NHS Trusts. This will help improve patient care at a number of hospitals nationwide.

Your data

The data for each patient will be accessed by Medical Physics Experts (MPEs) appointed by each hospital to advise on safety of patients undergoing X-ray imaging. MPEs are a legal duty holder under patient safety legislation called the [Ionising Radiation Medical Exposure Regulations 2017](#). One of the requirements of these regulations is for hospitals to optimise the way X-ray imaging is carried out, with a goal of using the right level of radiation dose for the clinical task required.

Data will only be accessed by NHS Employees working as part of the care team to make best use of CT scanners used for X-ray imaging. The data will be stored securely on an NHS computer network with restricted access to only those staff involved in the study.