King's College Hospital
NHS Foundation Trust

Computed tomography (CT) neuroradiology (adult patients)

Information for patients

This sheet aims to provide you with information about your computed tomography (CT) neuroradiology examination. If you have any other questions or concerns, please do not hesitate to speak to the team caring for you.

Confirming your identity

Before you have a treatment or procedure, our staff will ask you your name and date of birth and check your ID band. If you do not have an ID band we will also ask you to confirm your address. If we do not ask these questions, then please ask us to check. Ensuring your safety is our primary concern.

Background

Your doctor or healthcare professional has referred you for a computed tomography (CT) examination, based on your clinical details. CT produces a 3-dimensional (3D) X-ray image. This is done so that they can make a diagnosis or monitor the progress of your treatment.

You can discuss with your doctor or healthcare professional how information from the examination will help them in your diagnosis or treatment.

X-rays are a type of radiation like visible light, but with more energy. As they pass through the body, varying amounts of different bodily tissues block them. The resulting shadow builds a picture on the other side.

X-rays are part of a group known as 'ionising radiation'. This means they have enough energy to disrupt an atom's normal state, which has the potential to cause damage to health. Special systems are in place regulating the use of ionising radiation to safeguard anybody exposed to them. The *Ionising Radiation (Medical Exposures) Regulations 2017* govern the safe use of ionising radiation in hospitals and ensure your CT image is justified before it goes ahead.

This means the benefits from having the examination and making the right diagnosis or providing the correct treatment outweigh the low risk involved with the radiation.

The CT machine

The CT scanner is a ring-shaped machine, which produces a 3D picture of inside the body. It does this by rotating an X-ray beam very fast around the body, which is measured by detectors on the opposite side of the ring. A computer builds a composite 3D image from the results.

You will lie on a narrow table that passes through a circular hole in the middle of the machine. You are moved slowly through the hole to take pictures of different slices of your body to build the 3D picture. You may be injected with a contrast dye to help improve the visibility of the body's tissues and organs.

The CT scanner is regularly serviced and checked to make sure that it is safe and works correctly.

The neuroimaging radiographers are trained to take the best possible images using the lowest amount of radiation practicable. They will also explain the benefits and risks of the scan you are undergoing.

You do not usually need to prepare for a CT examination. Someone on the team providing your care will explain what to do if you do need to prepare.

Will I be exposed to radiation?

Each CT image involves exposure to radiation but the amount of radiation is kept to a minimum. CT examinations are higher dose than basic X-ray examinations producing a single picture. The amount of radiation received varies with the type of examination, ranging from the equivalent of a few months of natural background radiation to a few years. Typical doses are stated below under, 'Dose and risk examples'.

The radiation doses associated with CT examinations are too low in any one area of the body to produce immediate harmful effects such as skin burns.

At these low doses, there is a very small increase in the risk of cancer occurring many years or decades after the CT examination. However, these risk levels are very small when compared to the natural risk of getting cancer (1 in 2 people). Additional risk levels are stated below under, 'Dose and risk examples'.

CT doses in perspective

We are all exposed to radiation from the natural environment every day of our lives. This 'background radiation' comes from the earth and building materials around us, the air we breathe, the food we eat, and even from outer space (cosmic rays). Radiation exposure is measured in a unit called sieverts (Sv). The average annual radiation dose a person in the UK receives is 2.7 millisieverts (mSv) (source: Public Health England, 2016). Of this, around 2.3 mSv comes from natural background radiation.

For example, a one-way transatlantic flight can provide a radiation dose of about 0.08mSv, or approximately 11 days of the average annual radiation dose. Each medical examination involving radiation adds a small dose on top of this natural background radiation.

Results of your CT image

The radiographers performing the CT imaging will not know the results straightaway. A trained radiographer or radiologist will need to examine the image and report the results. The results will then be sent to the doctor looking after you, who will discuss them with you.

Dose and risks examples

<table>
<tr><th>Exam</th><th>Typical effective doses (mSv)</th><th>Equivalent natural background radiation</th><th>Lifetime additional risk of fatal cancer per examination</th></tr>
<tr><td>Chest X-ray</td><td>0.02</td><td>A few days</td><td>Negligible risk
(less than 1 in 1,000,000)</td></tr>
<tr><td>Abdomen
X-ray</td><td>0.7</td><td>A few months</td><td>Very low risk
(1 in 100,000
to 1 in 10,000)</td></tr>
<tr><td>CT head</td><td>2</td><td>1 year</td><td rowspan="4">Low risk
(1 in 10,000
to
1 in 1000)</td></tr>
<tr><td>CT chest</td><td>8</td><td rowspan="2">A few years</td></tr>
<tr><td>CT abdomen
and pelvis</td><td>10</td></tr>
</table>

For more information, please visit

- Patient dose information: guidance (www.gov.uk)
- CT scan (www.nhs.uk)
- Neuroradiology (www.kch.nhs.uk)
- Medical radiation: uses, dose measurements and safety advice (www.gov.uk)

Before the CT procedure

If you are, or think you may be pregnant, please tell the radiographer before you have the examination.

If you have had a previous reaction to X-ray contrast injections, please let the radiographer know.

Useful contacts

If you have any further questions, please ask a member of staff:

Neuroradiology department (telephone): 020 3299 4595

Sharing your information

We have teamed up with Guy's and St Thomas' Hospitals in a partnership known as King's Health Partners Academic Health Sciences Centre. We are working together to give our patients the best possible care, so you might find we invite you for appointments at Guy's or St Thomas'. To make sure everyone you meet always has the most up-to-date information about your health, we may share information about you between the hospitals.

Care provided by students

We provide clinical training where our students get practical experience by imaging patients. Please tell your doctor or nurse if you do not want students to be involved in your care. Your imaging will not be affected by your decision.

PALS

The Patient Advice and Liaison Service (PALS) is a service that offers support, information and assistance to patients, relatives and visitors. They can also provide help and advice if you have a concern or complaint that staff have not been able to resolve for you. They can also pass on praise or thanks to our teams.

PALS at King's College Hospital, Denmark Hill, London SE5 9RS
Tel: 020 3299 3601
Email: kch-tr.palsdh@nhs.net

PALS at Princess Royal University Hospital, Farnborough Common, Orpington, Kent BR6 8ND
Tel: 01689 863252
Email: kch-tr.palspruh@nhs.net

If you would like the information in this leaflet in a different language or format, please contact our Communications and Interpreting telephone line on 020 3299 4826 or email kch-tr.accessibility@nhs.net

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