

EVERYTHING YOU EVER WANTED TO KNOW ABOUT X-RAYS BUT WERE AFRAID TO ASK

INFORMATION FOR PATIENTS



BENEFIT VERSUS RISK

X-ray examinations are "requested" by the referring doctor in much the same way that pharmaceutical drugs and medicines are prescribed. The X-ray request is then assessed by a radiologist or radiographer. They do so on the principle that the risk of having a certain X-ray examination outweighs the risk of not having that examination. X-ray examinations are therefore only performed when absolutely necessary.

SAFETY OF X-RAY EQUIPMENT

X-ray machines and image receptors (e.g. X-ray films) are constantly being improved and updated. They have become more sensitive over the years and this ensures that doses are kept to the minimum necessary to achieve a diagnostic result.

The X-ray equipment in this department is subject to annual, independent safety tests by the Radiological Protection Centre. It is maintained regularly by the manufacturer and the staff undertake their own programme of quality control. All these steps are national requirements in the interests of patient and staff safety.

RADIATION DOSE

When X-rays are taken, some of the energy in the X-ray beam is absorbed in the body. This is called the radiation dose, often shortened to 'dose'. It can be expressed in a number of different ways. The most common quantity is the 'effective dose' measured in sievert (Sv). Because diagnostic X-ray examinations involve relatively low doses, these doses are stated in millisievert (mSv); in other words, one thousandth of a sievert.

NATIONAL STANDARDS

The use of X-rays in hospitals is subject to both national regulations and departmental rules. Doses for individual examinations are not routinely calculated for every X-ray examination but sufficient information is recorded to enable doses to be estimated if necessary.

Regulations require hospitals to check a sample of patient doses at intervals to ensure that they are below set levels.

DOSES FOR ADULTS

National studies have enabled average doses for adults for different examinations to be estimated as shown in Table 1. Doses are expressed in units of millisievert and also in terms of the equivalent number of years of background radiation. This helps to put the dose you receive from your X-ray examination into context.

BACKGROUND RADIATION

Background radiation comes from the sun, the food we eat, building materials and natural surroundings like earth and rocks. The dose varies in different parts of the United Kingdom but on average it amounts to an effective dose of about 2mSv per year. Background radiation dose in London is also about 2mSv per year, whereas in Cornwall, the background radiation dose is about 7mSv per year. A patient who undergoes a relatively complex examination, such as an intravenous urogram (IVU) receives a dose of radiation equivalent to a little more than one year of background radiation. A simpler examination, such as a chest X-ray, would involve a much smaller dose of radiation equivalent to about 10 days of average background radiation.

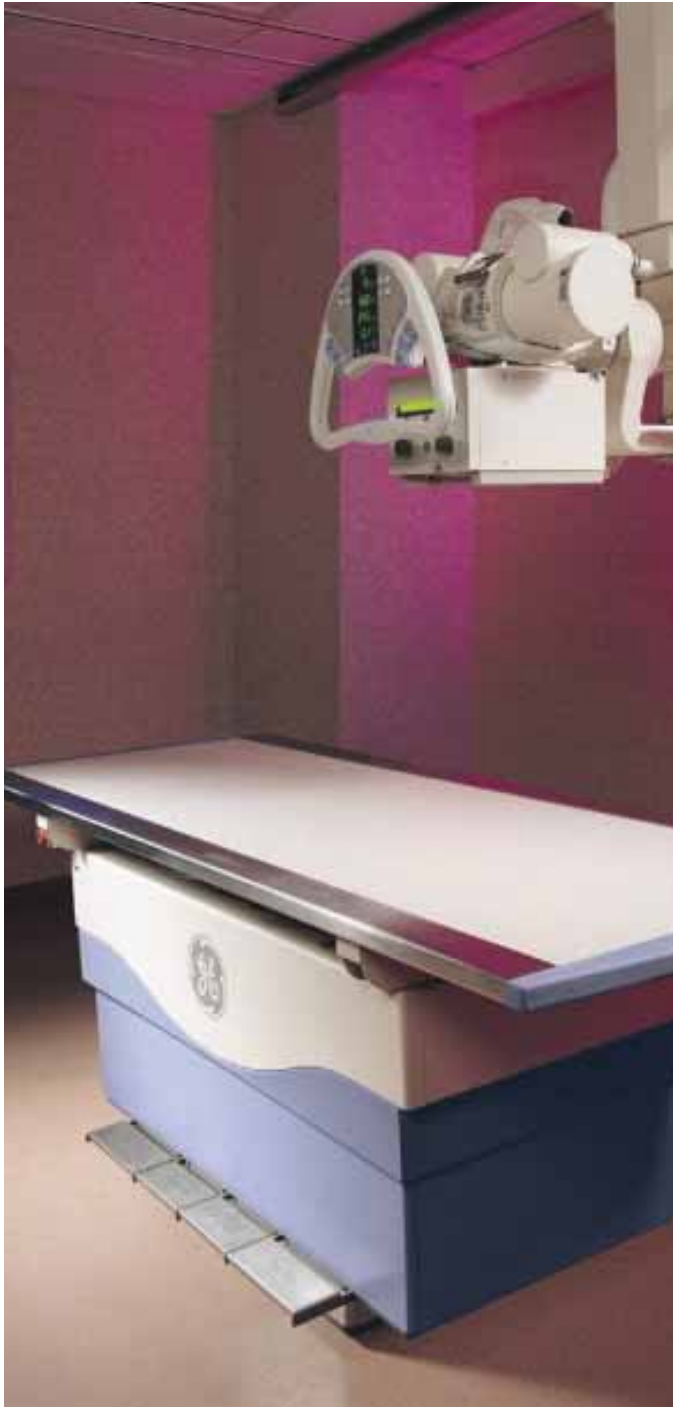


TABLE 1:

Typical Doses for Adults from Diagnostic X-ray Examinations

Examination	Effective Dose (mSv)	Equivalent time of average natural background radiation
CT Body	8.0	4.0 years
Barium enema	7.2	3.6 years
IVU	2.4	1.2 years
Barium meal	2.6	1.3 years
CT head	3.4	1.7 years
Lumbar spine	1.3	8 months
Abdomen	0.7	4 months
Thoracic spine	0.7	4 months
Mammography	0.6	4 months
Skull	0.04	8 days
Chest	0.02	6 days

FURTHER INFORMATION

We hope you find this information useful. If you would like any additional information or have any concerns, ask to speak to the Senior Radiographer in the Radiology Department.

Alternatively, you may contact the Radiological Protection Centre at St George’s Hospital whose address is :

The Radiological Protection Centre,
 St. George’s Hospital,
 London SW17 0QT
 Tel: 020 8725 1050/1

This leaflet was written by
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