RADIATION DOSE EXAMPLES

Typical doses received during various routine diagnostic exams (not specific to SKG).[8]

X-RAY

Chest	Less than 0.02mSv
Arm or Leg	Less than 0.01mSv
Dental	Less than 0.01mSv

COMPUTERISED TOMOGRAPHY (CT SCAN)

Brain	2mSv
Chest	7mSv
Abdomen	8mSv

NUCLEAR MEDICINE

Brain	5.7mSv to 14.1mSv
Bone	6.3mSv
Liver	2.1mSv

MRI 0mSv

ULTRASOUND 0mSv

SKG RADIOLOGY - ALL RADIOLOGY PRACTICES ARE NOT EQUAL

SKG Radiology actively reduces radiation dose to our patients through the use of dose reduction technology on Toshiba CT scanners equipped with Boost, Quantum Denoising Software (QDS) and Adaptive Iterative Dose Reduction 3D (AIDR 3D). This technology optimises dose reduction while still producing high quality images.

SKG Radiology has the latest in digital radiography suites offering superior image quality while using up to 62% less radiation than conventional film/screen imaging methods.[9]

SKG Radiology is an accredited diagnostic imaging practice and abides by the West Australian Radiation Safety Act, adopting the guidelines of the Australian Radiation and Protection Nuclear Safety Agency (ARPNSA). All SKG technical staff are trained in radiation safety and are licensed to operate x-ray equipment.

1. Australian Radiation Protection and Nuclear Safety Agency - Ionising Radiation and Health, http://www.arpansa.gov.au/radiationprotection/Factsheets/is_ionising.cfmv
2. Health Physics Society - https://hps.org/publicinformation/ate/q8521.html
3. Australian Nuclear Science and Technology Organisation - What is Radiation?, http://www.ansto.gov.au/NuclearFacts/Whatisradiation/
4. United States Nuclear Regulatory Commission - Doses in Our Daily Lives, http://www.nrc.gov/about-nrc/radiation/around-us/doses-daily-lives.html Page last reviewed/updated Monday, October 5, 2015
5. Australian Nuclear Science and Technology Organisation - Ionising Radiation: We Live in a World of Radiation, http://www.ansto.gov.au/__data/assets/pdf_file/0017/45314/Ionising_Rad_broch_lr.pdf
6. Health Physics Society - Radiation Risk in Perspective: Position Statement of the Health Physics Society, https://hps.org/documents/risk_ps010-2.pdf Revised July 2010
7. United States Nuclear Regulatory Commission - Backgrounder on Biological Effects of Radiation, http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/bio-effects-radiation.html Page last reviewed/updated Wednesday, September 30, 2015
8. RSNA Radiology - Effective Doses in Radiology and Diagnostic Nuclear Medicine: A Catalog, http://pubs.rsna.org/doi/full/10.1148/radiol.2481071451
9. AuntMinnie.com - Study: DR Deliver Lower Radiation Dose, http://www.auntminnie.com/index.aspx?sec=ser&sub=def&pag=dis&ItemID=72998

FOR FURTHER INFORMATION, PLEASE VISIT WWW.THETRUTHBEHINDXRAYS.COM.AU.

www.skg.com.au

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YOUR GUIDE TO

RADIATION IN MEDICAL IMAGING

RADIATION

Each of us is constantly surrounded by radiation, and in fact we have lived in a world of radiation for as long as humankind has existed.

Radiation comes from many sources including the sun, rocks and soil, the buildings in which we live, the food and drink we consume and even our own bodies. This form of radiation is referred to as background radiation.

Radiation within Australia is commonly measured in millisieverts (mSv).

The average background radiation dose for Australians is 1.5mSv per year. In comparison, the dose from a chest x-ray is extremely small at 0.02mSv or approximately 1.3% of the annual background radiation dose.[1]

Common factors that increase your background radiation dose include:

Smoking: Cigarette smoke contains radioactive lead and polonium. At one pack of 20 cigarettes a day, the annual effective radiation dose to a smoker would be 0.36mSv. For comparison, 0.36mSv per year for a pack-a-day smoker gives the equivalent radiation dose of up to 18 chest x-rays.[2]

Living Indoors: Radon and Thoron are naturally occurring radioactive gases arising from decay of uranium and thorium normally present in rocks, soil, bricks, mortar tiles and concrete. Living indoors provides exposure of up to 0.8mSv per annum or the equivalent of 40 chest x-rays.[3]

Food & Drink: All organic matter (both plant and animal) contains small amounts of radioactive potassium and radium. In addition, all water on Earth contains small amounts of dissolved uranium and thorium. Humans receive an average internal dose of about 0.3mSv per year from the food and water that we eat and drink,[4] the equivalent radiation dose of 15 chest x-rays per annum.

Air Travel: Airline passengers are exposed to cosmic radiation at the rate of 0.0037mSv per hour.[3] Return flights from Perth and London exposes passengers to as much as 0.136mSv of radiation or the equivalent of 6.8 chest x-rays.

IONISING RADIATION

Ionising radiation is the radiation relating to diagnostic imaging, excluding Ultrasound and MRI which do not emit radiation. There are 4 types of ionising radiation: alpha, beta, gamma and x-ray. Ionising radiation does not build up in your body.[5]

CANCER RISK

The effects of ionising radiation are a subject of ongoing detailed studies.

At present, the associated risk of bio-harm from ionising radiation is based on the linear-threshold theory which assumes there is no safe radiation dose. This theory remains unproven with many radiation scientists questioning its validity, regarding the estimate to be grossly exaggerated.[5]

The estimates are based on information relating to cancer rates of survivors from the atomic bomb dropped in Hiroshima in 1945.

The Health Physics Society stated that the risk to health relating to doses less than 100mSv are either too small to be observed or non-existent.[6] The United States Nuclear Regulatory Commission states that although radiation may cause cancers at high doses and high dose rates, currently there is no data to establish unequivocally the occurrence of cancer following exposure to low doses and dose rates below 100mSv.[7]