**RADIATION RISK**

***This table attempts to put into context the risk from ionising radiation (x-rays) of having an imaging examination;***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| EXAMINATION | TYPICAL EFFECTIVE DOSE (mSv)1 | EQUIVALENT PERIOD OF NATURAL BACKGROUND RADIATION5 | EQUIVALENT6, 7 | TOTAL LIFETIME CANCER RISK (30-39) AGE BAND2, 3 | |
| Head (Skull) X-Ray | 0.068 | 11 days |  | 1 in a million to 1 in 100,000 (B) | |
| C-spine X-Ray | 0.03 | 5 days |  | Less than 1 in a million (M) | 1 in a million to 1 in 100,000 (F) |
| Shoulder X-Ray | 0.011 | Less than 2 days |  | Less than 1 in a million (B) | |
| Chest X-Ray | 0.014 | Less than 3 days | 140g Brazil nuts/ return flight to Malaga | Less than 1 in a million (M) | 1 in a million to 1 in 100,000 (F) |
| Thoracic spine X-Ray | 0.38 | 2 months |  | 1 in 100,000 to 1 in 10,000 (B) | |
| Lumbar spine X-Ray | 0.60 | 3 months |  | 1 in 100,000 to 1 in 10,000 | |
| Abdomen X-Ray | 0.43 | 2.5 months |  | 1 in 100,000 to 1 in 10,000 | |
| Pelvis X-Ray | 0.28 | 1.5 months |  | 1 in 100,000 to 1 in 10,000 | |
| Single Hip X-Ray | 0.087 | 2 weeks | Return flight to New York | 1 in a million to 1 in 100,000 | |
| Both Hips X-Ray | 0.19 | 1 month | Return flight to Los Angeles | 1 in a million to 1 in 100,000 | |
| Femur X-Ray | 0.012 | 2 days | Return flight to Malaga | Less than 1 in a million (B) | |
| Knee X-Ray | 0.0002 | Less than 0.5 day | One way flight to Paris | Less than 1 in a million (B) | |
| Foot X-Ray | 0.0002 | Less than 0.5 day | One way flight to Paris | Less than 1 in a million (B) | |

|  |  |
| --- | --- |
| RISK LEVEL | |
| Negligible |  |
| Minimal |  |
| Very low |  |
| Low |  |

|  |  |
| --- | --- |
| B | BOTH MALE AND FEMALE |
| M | MALE |
| F | FEMALE |

References:

1. <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/340154/HPA-CRCE-012_for_website.pdf> (table 12)
2. <https://www.gov.uk/government/publications/medical-imaging-what-you-need-to-know/medical-imaging-what-you-need-to-know--2> (figure 1
3. <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/340147/HPA-CRCE-028_for_website.pdf> (table 27)
4. Natural lifetime cancer incidence in the general population is about 1 in 2 (CRUK)
5. 2.3mSv is the average natural background radiation in the UK (PHE-CRCE-026 (2010); This comes from the air we breathe, the environment, the food we eat and cosmic radiation from space
6. <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/340209/HpaRpd001.pdf> (table 1)
7. <https://www.gov.uk/government/publications/ionising-radiation-dose-comparisons/ionising-radiation-dose-comparisons>

* The mSv is a derived unit of ionising radiation dose and measures the health effects of low levels of ionising radiation on the human body
* Radiation levels in Brazil nuts can be up to 1000 times higher than other foods (Brazil nuts grown in Brazil have very deep roots which reach down into soil high in natural radium

**RADIATION RISK**

***This table attempts to put into context the risk from ionising radiation (x-rays) of having an imaging examination:***

|  |  |  |  |
| --- | --- | --- | --- |
| EXAMINATION | Typical Effective Dose (mSv)1 | EQUIVALENT PERIOD OF NATURAL BACKGROUND RADIATION2 | TOTAL LIFETIME CANCER RISK (30-39) AGE BAND3 |
| Head CT | 1.4 | 7 months | 1 in 100,000 to 1 in 10,000 |
| Knee CT | 0.1 | 0.5 months | 1 in 1,000,000 to 1 in 100,000 |
| Mako knee CT | 1.5 | 8 months | 1 in 100,000 to 1 in 10,000 |
| CT Guided pelvic and L-spine injection | 2.5 | 1 years | 1 in 10,000 to 1 in 1,000 |
| Pulmonary Angiogram  CT | 3.3 | 1.5 years | 1 in 10,000 to 1 in 1,000 |
| C spine CT | 1.9 | 10 months | 1 in 100,000 to 1 in 10,000 |
| CAP (Chest, Abdomen and Pelvis) | 10 | 4 years | 1 in 10,000 to 1 in 1,000 |
| Chest CT | 6.6 | 3 years | 1 in 10,000 to 1 in 1,000 |
| Lumbar CT | 6.9 | 3 years | 1 in 10,000 to 1 in 1,000 |
| Kidneys-Ureter and Bladder | 5.5 | 2.5 years | 1 in 10,000 to 1 in 1,000 |

|  |  |
| --- | --- |
| RISK LEVEL4 | |
| Negligible |  |
| Minimal |  |
| Very low |  |
| Low |  |

1. Dose estimates are based on National Diagnostic Reference Levels (NDRLs) from 13 October 2022 - GOV.UK (www.gov.uk) (table 2a), with the exception of Knee, Mako knee and Pelvis/L-spine injection exams, which are based on local dose data
2. Based on an average annual natural background rate of 2.3 mSv per year
3. These risks should be considered in the context of the natural background risk of cancer, which is approximately 1 in 2.
4. Medical imaging – what you need to know (UKHSA) https://www.gov.uk/government/publications/medical-imaging-what-you-need-to-know/medical-imaging-what-you-need-to-know--2