X-ray exams produce images of the body that provide important information to your doctor. Sometimes people feel concerned about being exposed to radiation during an x-ray or a procedure that uses radiation. It’s helpful to know more about radiation and the safety measures that are taken.

**X-rays and Imaging Procedures**

Radiation is used in:
- X-rays
- CT scans (Computerized Tomography) also called “CAT Scan”
- Fluoroscopy
- Nuclear medicine procedures
- PET scans
- Bone density scans

Radiation is **not** used in:
- Ultrasound exams – uses sound waves (not X-rays) to make pictures.
- MRI (Magnetic Resonance Imaging) – uses magnetic fields and radio waves to make pictures. X-rays are not used.

**Background Radiation**

We are exposed to radiation in our daily lives. This is called background radiation. It comes from radioactive materials that are a natural part of the air, soil, and even food we eat.

**Measuring Radiation**

Radiation is measured in a unit called mSv (milliSievert). Doses of 1000 mSv or higher are believed to cause a **small** increase in the chance of getting cancer. X-rays and imaging procedures are **much lower** – 50mSv or less in most cases. The amount of exposure varies with the type of x-ray, the part of the body, and the size of the person. A chest X-ray results in about 0.1 mSv or about the same amount of exposure equal in 2 weeks of background radiation.
Typical Radiation Doses

<table>
<thead>
<tr>
<th>Exam</th>
<th>Dose (mSv)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airport x-ray scanner 2 sided scan male 5’10” 160lbs.</td>
<td>0.0000111</td>
</tr>
<tr>
<td>Dental x-rays</td>
<td>0.01</td>
</tr>
<tr>
<td>Airline Flight</td>
<td>0.02</td>
</tr>
<tr>
<td>Mammogram</td>
<td>0.04</td>
</tr>
<tr>
<td>Chest x-ray</td>
<td>0.10</td>
</tr>
<tr>
<td>Natural Background</td>
<td>3.1 / year</td>
</tr>
<tr>
<td>Average US Exposure</td>
<td>6.2 / year</td>
</tr>
<tr>
<td>Chest CT</td>
<td>7.0</td>
</tr>
<tr>
<td>Abdominal CT</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Safety Measures

Many safety measures are in place to keep patients safe:

- Doctors order only tests that are needed.
- Licensed technologists use the least amount of radiation to obtain clear images.
- Lead shielding is used to protect areas of the body not to be x-rayed as needed.
- Hospitals and other facilities follow regulations, check equipment regularly, and replace outdated equipment.
- States have licensing boards and regulations, which oversee radiation safety.

Your Part in Safety

- Talk with your doctor about the X-rays that are being ordered for you.
- Always tell your doctor and the technologist if you are pregnant or may be pregnant before having an X-ray.
- Always speak up if you have questions or concerns.

Resources

If you would like to read more:

- www.odh.ohio.gov/odhprograms/rp/Raducation/RADUCATION.aspx
- www.xrayrisk.com/index.php
- www.fda.gov/Radiation-EmittingProducts
- www.radiologyinfo.org/en/safety
- www.pedrad.org/associations/5364/ig (Image Gently - for parents)