Radiation in the bereavement industry

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(Parts of the bereavement industry)

Death Care

– Autopsy , embalmment

Funeral Services

– Burial , Cremation etc

Expressive Support

– scattering of ashes , loved one jewelry

How (and why?) do we engage in the bereavement industry ?

(In terms of radiation)

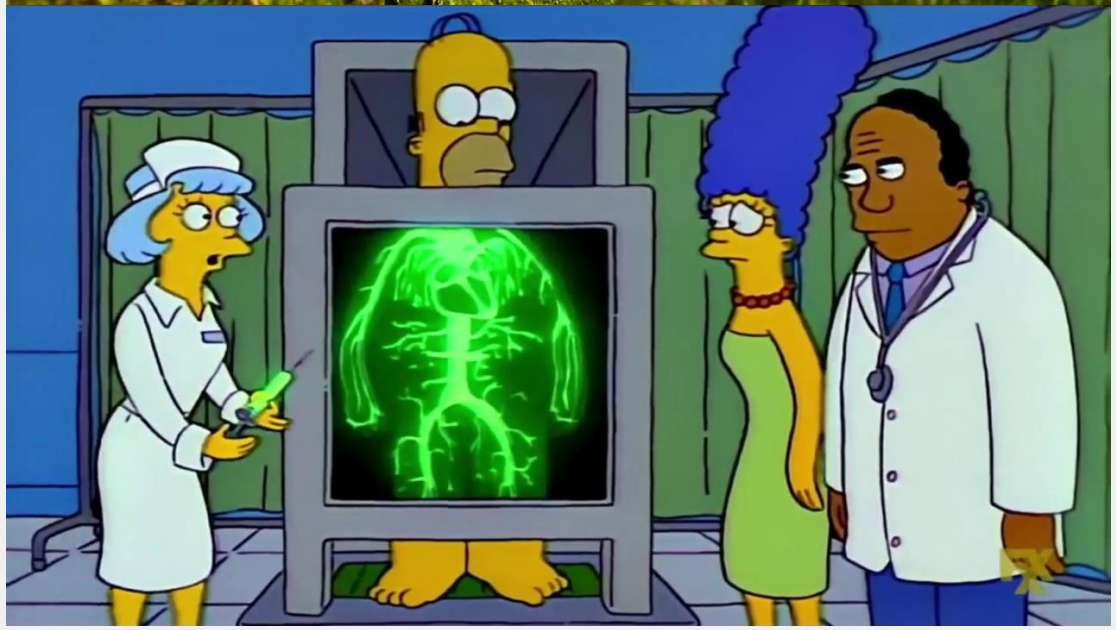
1. **Awareness campaigns on radiation regulations and safety**

2. **Advice to novice and experts (both in-house and external) on regulatory and safety matters**

3. **Training and recommendations for those who are not experts but find themselves immersed in effects of radiation**

4. Why ?

Radioactive deceased people

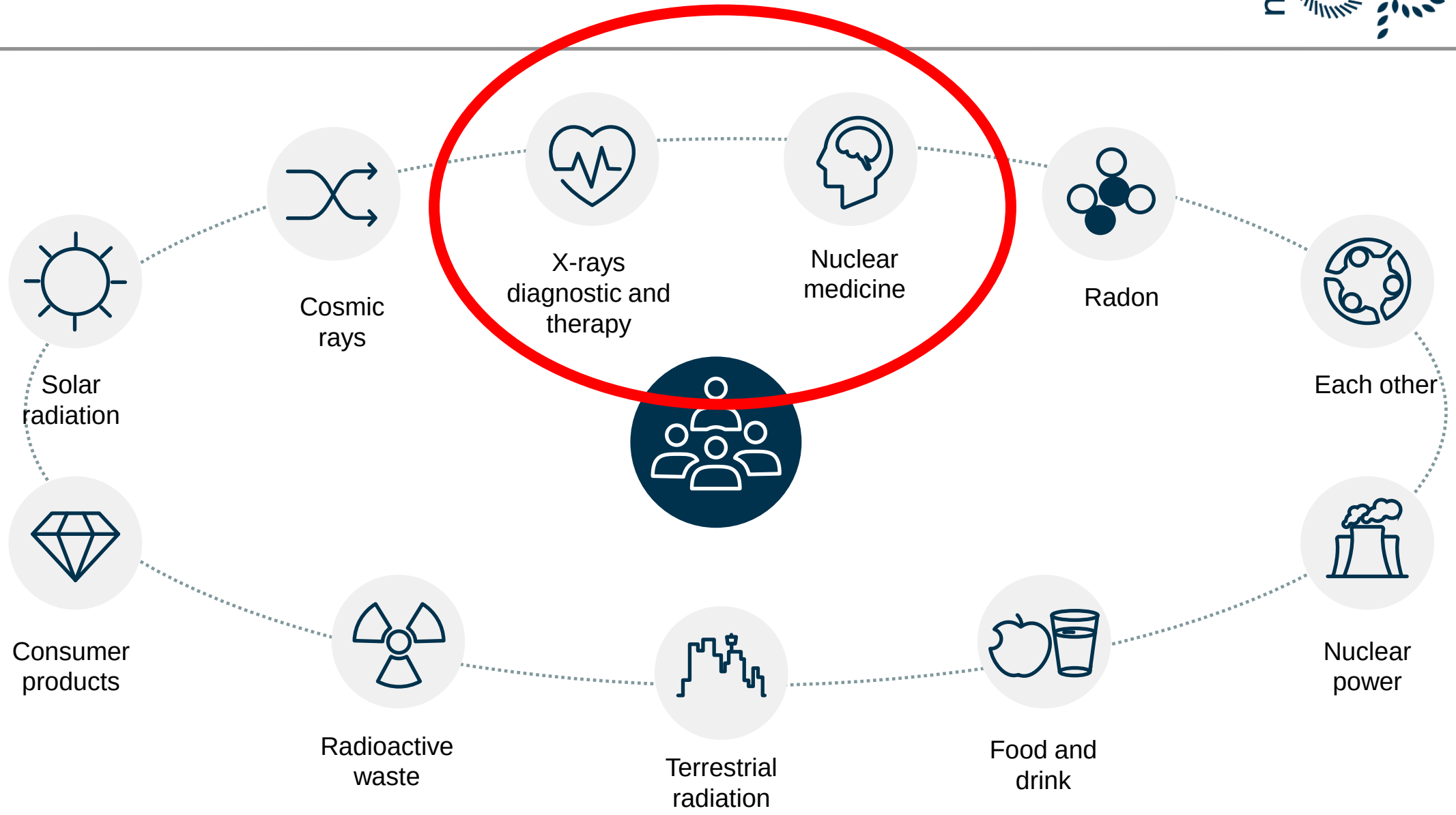


Agenda

1. **Radiation sources – the fundamentals**

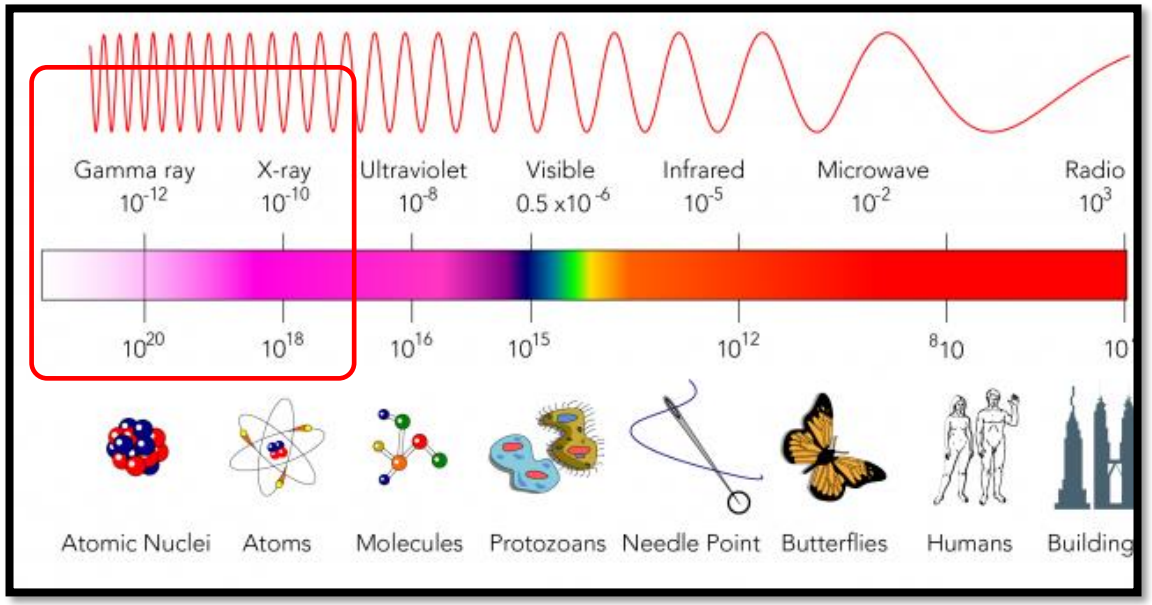
2. **Radiation protection and safety**
   - **–issues for the bereavement industry**
   - **– a specific example**

Where can we get radiation from?

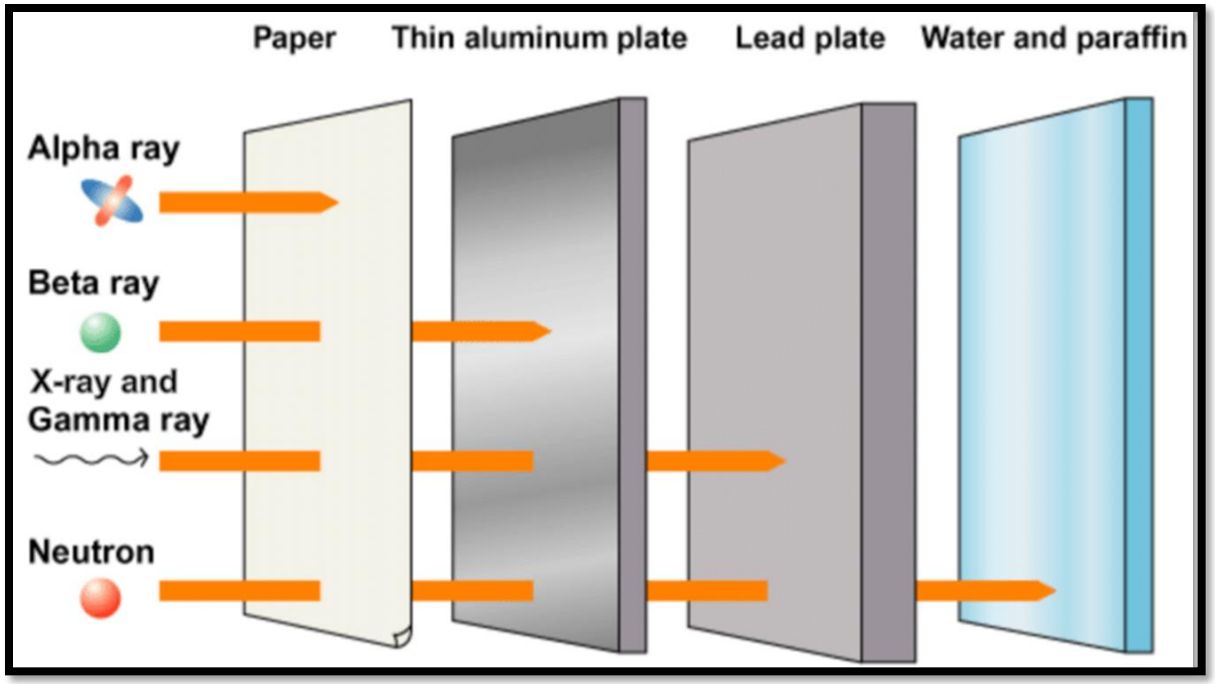


What type of radiation / radioisotopes?

1. Ionising Electromagnetic Radiation



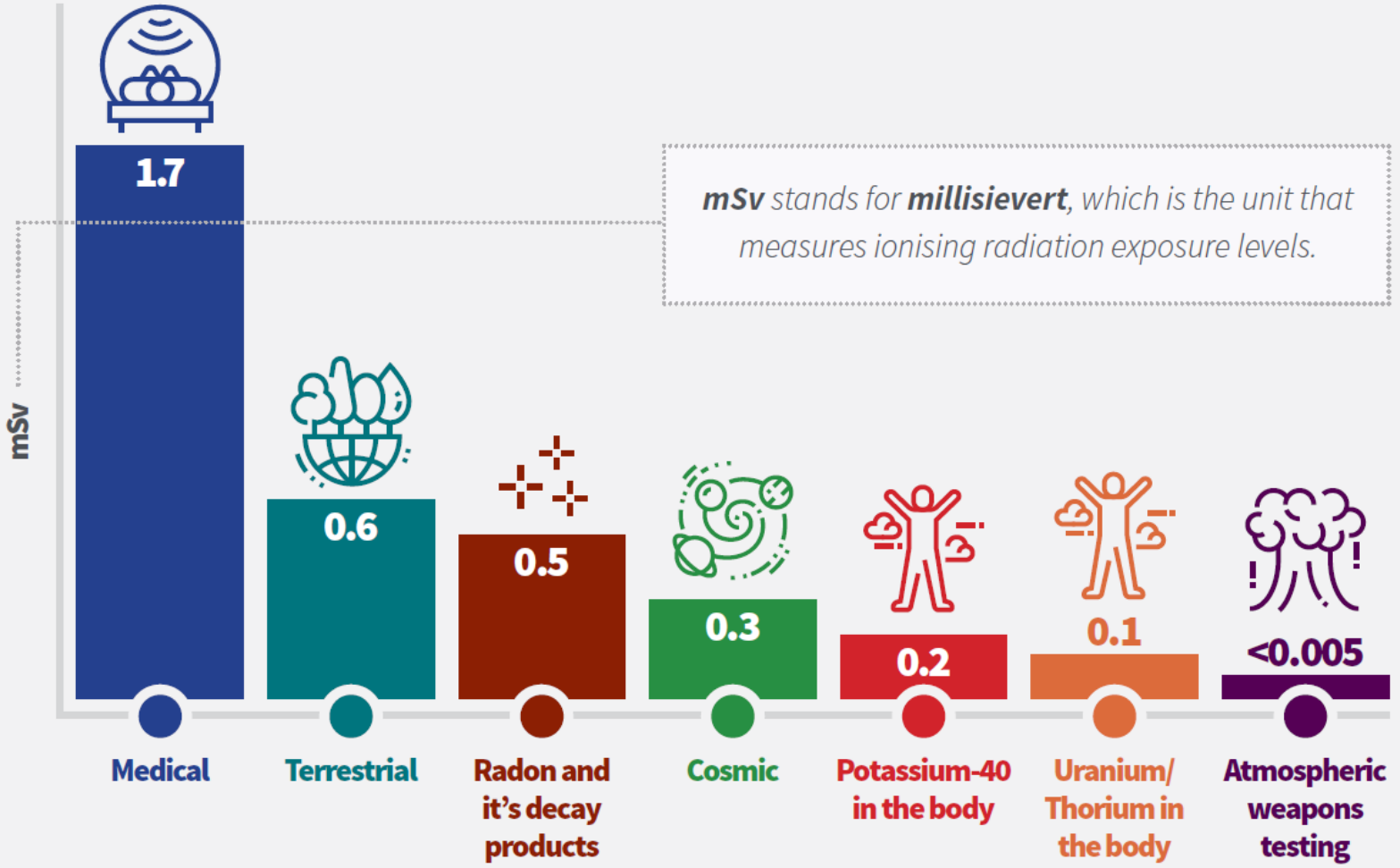
2. Particle Radiation



Average radiation levels

What are our average levels in Australia?

1.7 milliSieverts per year

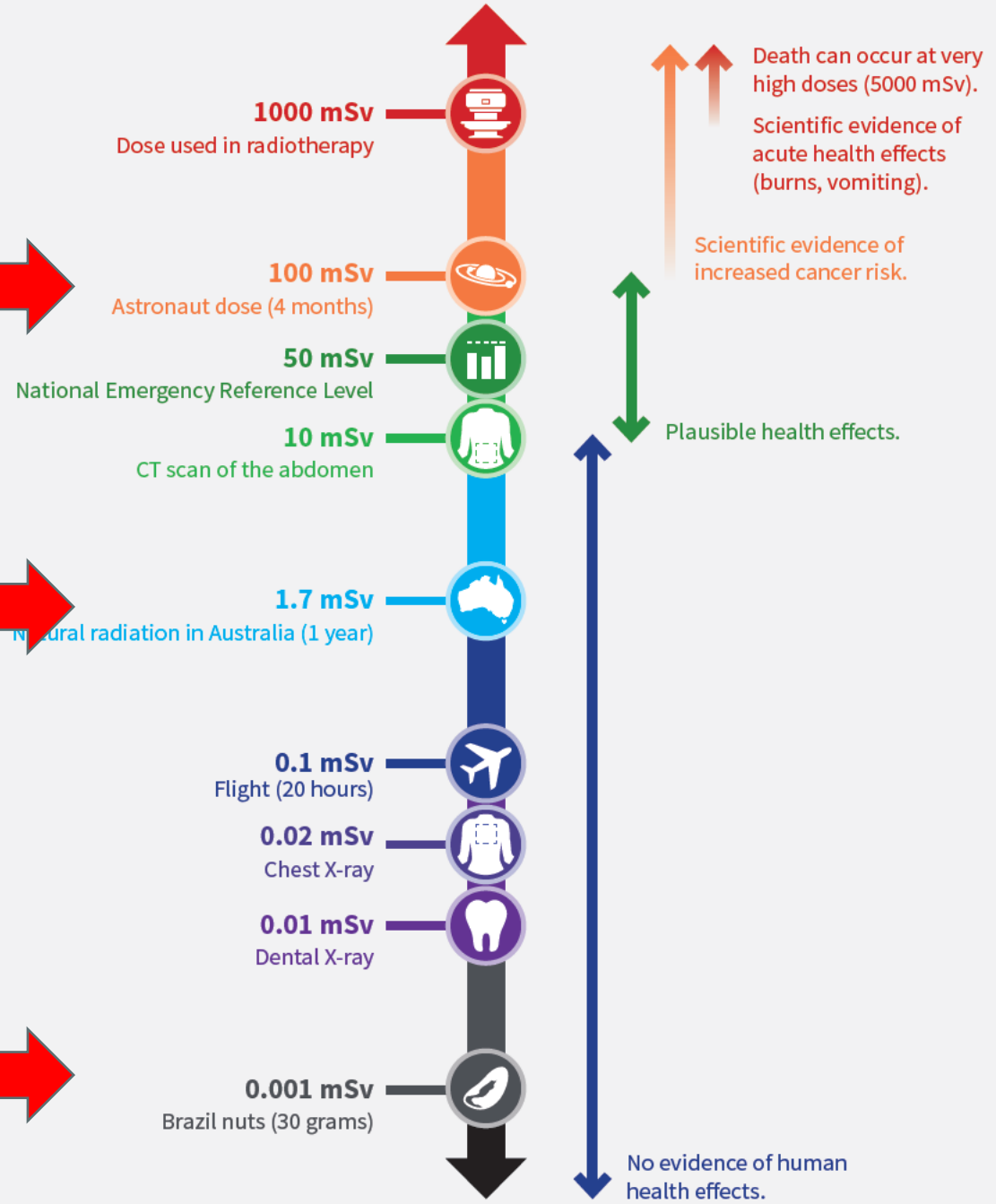


Effects of radiation on human health

Levels that cause a measurable effect

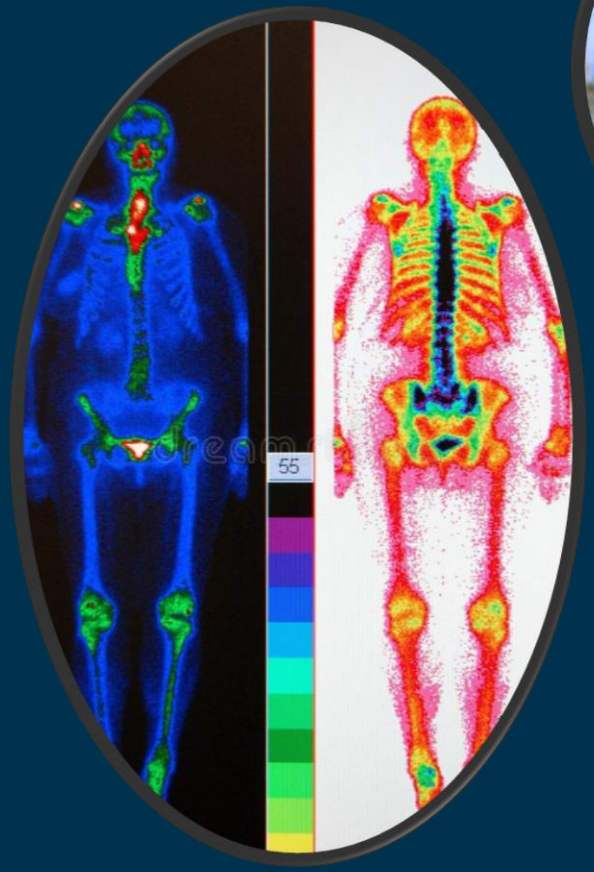
Average background in Australia and average medical exposure per year

One “Banana Equivalent Dose” - 1 BED



Radioactive risk example

Bereavement Industry



Environmental and Personal

Negligible risk from all diagnostic procedures

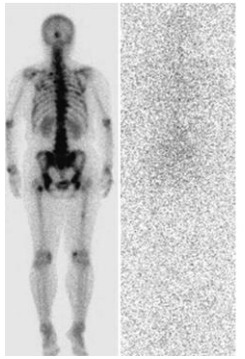
After X-rays / CTs, external beam RT there is no radioactivity in the body at any time

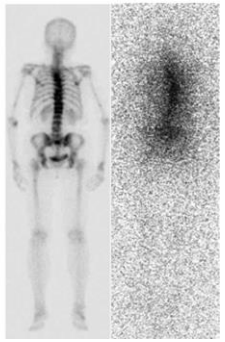
After nuclear medicine diagnostic procedures there are short-lived radioactive products which will decay away after several hours to a day.

Therapeutic Nuclear Medicine Strontium – 89
Bone Cancer Therapy / Pain Relief

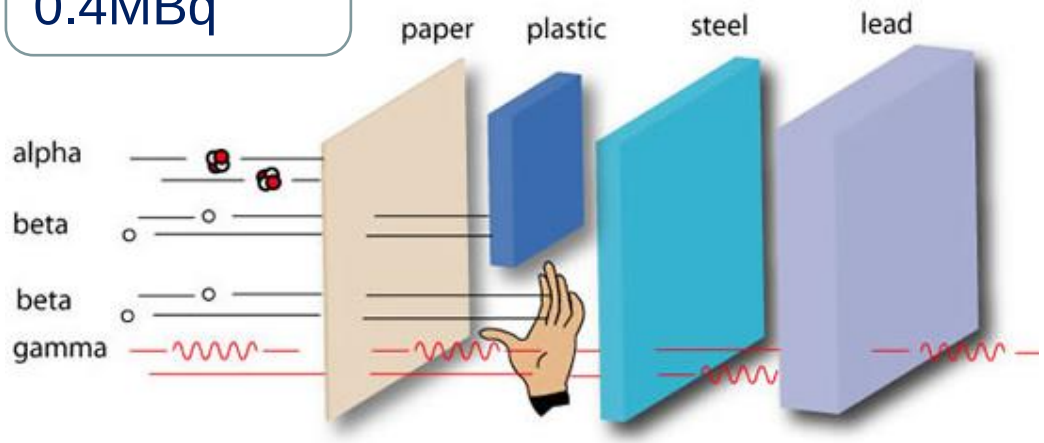
- STRONTIUM-89 (Metastron)
- Given to cancer patients for pain relief near end of life
- Average dose given around 150 MBq

148000 kBq / 148 MBq





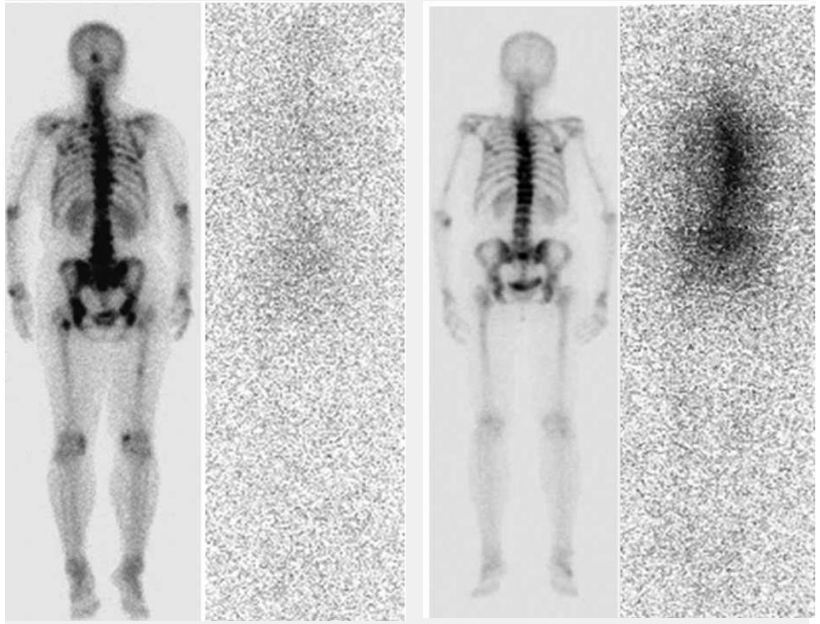
400 kBq / 0.4MBq



- STRONTIUM-89
- ½ life 50 days – by Beta decay (electrons)
- Average range of radiation 5 mm in water
- Safe when in the patient (goes to the bones)
- Can be of concern for cremation or other bereavement care activities

What is the radiation exposure?

When in the body – negligible.
The body absorbs all the radiation.

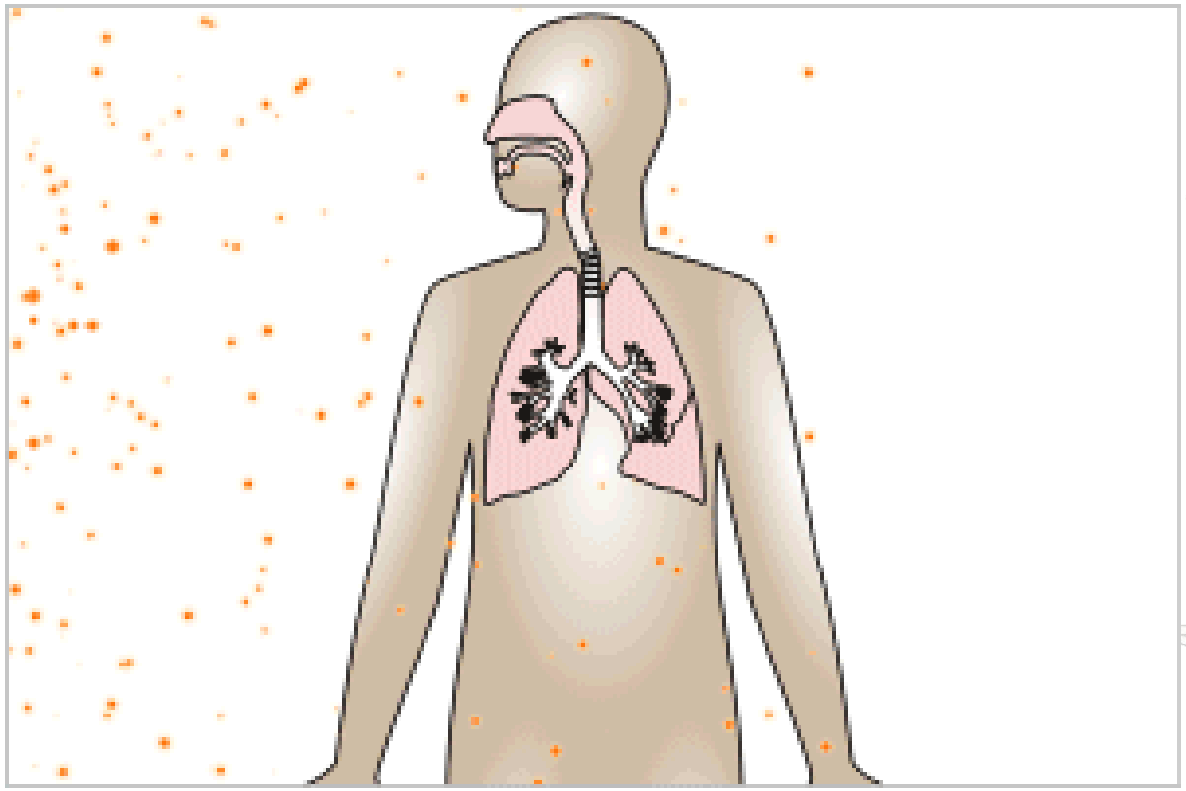


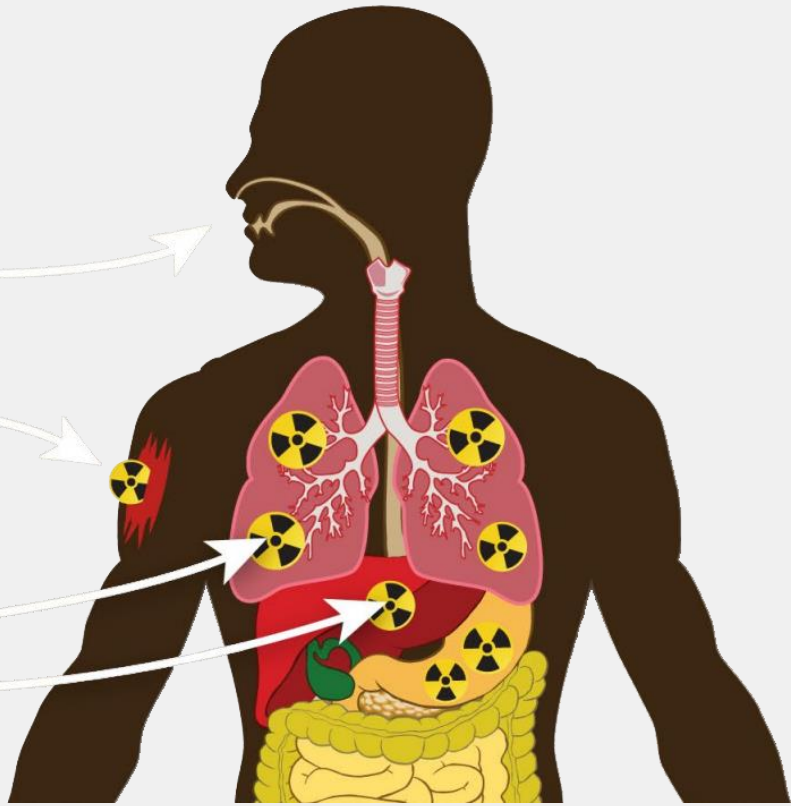
How about **Cremation (or Aquamation)**

- Day 1 – maximum exposure
- Dose of 150 MBq = 0.0017mSv/hr @ 10 cm away.
- @ 1m 100 x less @ 1cm – 100 x more @1mm – 10000 x more
- (ie 17mSv per hour at full strength - in your lungs/or stomach)
- These values change every day as the radioactivity decays away to negligible levels.

Dose of 150 MBq. 13 months till no longer radioactive by regulations (if all is kept in body), but normal uptake is 20% to 80%.

Ingestion or inhalation of radioactivity





Strontium – 89 bone therapy

1	Handling of the coffin	No restrictions are normally needed.
2	Cremation	After one year – no restrictions. Before one year – seek advice on current exposure levels.
3	Embalming	As far as practical, maximize distance– use suitable tools – tongs forceps etc.
4	Direct burial / mausoleum entombment	No restrictions are normally needed.

Alkaline hydrolysis

Not recommended before one year as radioactivity levels may be regulated. Also there are sewerage trade agreements with Sydney Water requirements.

Recommended time frames for taking precautions when handling decedents containing therapy nuclear substances (from administration)

Nuclear substance used in prior medical procedure	Recommended time frame for taking precautions*			
	Autopsy	Embalmment	Cremation	Alkaline hydrolysis
Strontium-89	1 year	2 weeks	1 year	1 year
Yttrium-90	6 weeks	1 month	6 weeks	6 weeks
Phosphorus-32	6 months	6 weeks	6 months	6 months
Iodine-131	4 months	1 month	4 months	4 months
Samarium-153	3 weeks	2 weeks	3 weeks	3 weeks
Lutetium-177	3 months	2 weeks	3 months	3 months
Radium-223	3 months	2 weeks	3 months	3 months
Iodine-125	1 year	1 month	1 year	1 years
Palladium-103	3 months	1 month	3 months	3 months

Summary :

Radiation regulations

are enforced to protect

the environment

as well as

the health of people

exposed to radiation

Aquamation

1800 mSv WORST CASE SCENARIO / STRONTIUM LUNG DOSE

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