

## MEDICINE AND NUCLEAR POWER

*Modern medicine does not depend on nuclear power. All electricity producing reactors could be shut down permanently with little or no impact on best medical practices.*

- 1) X-rays & CAT-scans are by far the most common forms of “radiation” used by doctors, dentists & nurses in hospitals & clinics. These have nothing to do with radioactivity or nuclear reactors.
- 2) When X-ray machines and CT scanners are turned off, they are completely harmless. There is no more radiation emitted. There is no radioactivity at all associated with such machines.
- 3) Some radioactive materials are used in medicine for diagnosis or therapy. In addition, some are used to sterilize instruments & equipment such as masks, needles, and other paraphernalia.
- 4) Radioactive materials for medical use are called “medical isotopes” or “radiopharmaceuticals”. Some of them emit gamma radiation (similar to X-rays, but stronger). Some emit fast-moving subatomic projectiles – electrically charged alpha particles, beta particles, or positrons,
- 5) All radioactive emissions are harmful to living cells, especially rapidly dividing cells. They can therefore be used to destroy malignant growths or kill microorganisms so as to sterilize equipment.
- 6) Radioactivity is hazardous, and it cannot be turned off like an X-ray machine. So the use of radioactive materials in medicine requires careful control at all times – before, during & after use.
- 7) Some radioactive materials that are used in medicine, such as radium, radon and thorium, are extracted from naturally-occurring ores and have nothing at all to do with nuclear reactors.
- 8) Some radioactive materials used in medicine are created in a “particle accelerator” such as a cyclotron or linear accelerator. These devices have nothing in common with nuclear reactors.
- 9) Some radioactive materials used in medicine are created in small research reactors that do not generate electricity. They are typically 20 to 300 times smaller than nuclear power reactors.
- 10) A few medically useful radioactive isotopes are produced in large power reactors, but they can equally well be produced in research reactors. Sometimes the same radioactive material, or an alternative material that serves the same purpose, can be produced in a particle accelerator.
- 11) Damage to healthy cells by radioactivity may lead to cancer years later or to undesired genetic mutations. Infants and foetuses are more readily harmed than adults because cell growth is rapid.
- 12) Some medical procedures that once relied on radioactivity have been replaced by procedures that are just as good or better and do not require handling radioactive sources.
- 13) Many hospitals that have used X-rays or gamma emitting cobalt-60 therapy to destroy cancerous tumors are now using beams of charged particles as well. This more modern medical technology is very effective and has nothing to do with radioactivity or with nuclear reactors.
- 14) Powerful gamma-emitting cobalt-60, created in a reactor, is often used to sterilize medical equipment. But sterilization can be done in other ways that use no radioactive materials at all.

*Hospitals do not need nuclear power, and never have. Any isotopes (radioactive materials) that are considered medically required can be produced by accelerators or small research reactors. Medical procedures that do not involve radioactivity are increasingly preferred.*