



Radiation Safety in the Operating Room Q & A

Q: What is the latency period for solid cancer induction following radiation exposure of 1000mSv?

A: The latency period will depend on the type of cancer and the age of the person involved. The younger the person, the less time it takes for a cancer to develop. Cancers like leukemia and thyroid cancer have short latency periods. The latency for a solid cancer can be several years to more than a decade. Any exposure is thought to cause a small amount of increased risk, although this is still being researched. The full 1000 mSv is not required for a cancer risk of a smaller amount.

Timing for start of the latency period would be when the person is exposed to the radiation that leads to the mutation that leads to a cancer. It is not possible to determine this for chronic, low-dose exposures using any current technologies. This makes determining a latency period difficult and a matter of discussion in the field. For example, a recent paper published in the SpringerNature journal Leukemia ([Abecasis et. al., 2020](#)) concludes, "Clearly we need a new definition of cancer latency or we need to abandon the concept of cancer latency in the modern era of cancer biology." This is a strong statement, but an indicator that for cancers arising due to chronic exposures to a carcinogen, latency periods should be understood to have a large standard deviation.

Q: New lead aprons do not provide continuous protection. What are the regulations regarding the standards concerning lead aprons?

A: For nuclear sources, the specific protective equipment necessary is determined the licensing process with the CNSC and depends on the licensee's specific situation. This information will be found in the site license, which is available through the Radiation Safety Officer. The regulatory standards are dependent on the provincial regulations for x-ray sources, but in general we point to the Health Canada Safety Codes, and specifically Safety Code 35 for medical facilities.