

Cremation of Corpses containing Bone-seeking Radionuclides following Medical Treatment

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Use of bone-seeking radioisotope therapy is now in routine clinical use as an effective palliative treatment of bone metastases in selected patients.

Strontium-89 therapy is not normally administered unless the patient has a life expectancy of at least 3 months. However, the patient may die before this time. Also, with high uptake in skeletal metastases, it can take up to a year for decay of the strontium-89 to 1 MBq (the IAEA Exempt Quantity). Storage of such a corpse is impractical given the 50.5 day half-life.

Monitoring of several cremations in Western Australia of corpses with estimated strontium-89 activities ranging from 20 to 90 MBq and analysis of the radioactive content of the "ashes" (which are in fact finely pulverised bone) has established that most, if not all, of the strontium-89 remains in the bone fragments after cremation. This gives rise to contaminated bone dust during the processing of the cremated remains and to contamination of furnace, tools and working area.

A UK report (NRPB-M193, 1989) calculated minimal committed doses to crematorium workers from the processing of a corpse containing 200 MBq strontium-89. The figures however depended on assumptions of low dust levels in the immediate working environment, which may not be met in all crematorium situations.

Measurements of inspirable dust in the working environment of Western Australia's main crematorium have shown that dust levels can exceed the ACGIH Threshold Limiting Value of 10mgm^{-3} although with the most recently installed exhaust system, the assumptions of lower dust levels as used in the NRPB report are applicable. Nevertheless, certain basic handling procedures by the crematorium workers are deemed desirable during the processing of the remains from such cremations. It is also most desirable to prevent cross-contamination of other cremation ashes.

There is also the question of release of the processed ashes to the family when these contain radioactive material in excess of regulation Exempt Quantities. Some storage of the ashes for radioactive decay may be involved, depending on the family's intention for disposal. Consideration of the international Transport Regulations may also be required.

A system of notification of the administration of bone-seeking radioisotope treatment and of the subsequent death of these patients, has been developed in Western Australia, so that these precautionary measures can be implemented where appropriate.