Element-specific biokinetic models are used to reconstruct radiation doses to systemic tissues from internally deposited radionuclides. These models typically represent explicitly only those tissues that tend to dominate the systemic behaviour of the element over time. The remaining tissues are aggregated into a pool called *Other tissue* in which activity is assumed to be uniformly distributed. Explicitly identified tissues usually consist of some subset of the tissues liver, kidneys, bone, bone marrow, gonads, thyroid, spleen, and skin.

The brain is included explicitly in systemic biokinetic models for a few elements but typically is addressed as an implicit mass fraction of *Other tissue*. There is increasing interest in the potential adverse effects of internal emitters, particularly alpha emitters, on the brain as limited analogues for galactic cosmic ray exposures during space travel and for possible assessment of radiogenic effects on brain in nuclear medicine patients and radiation workers. The Million Person Study is estimating brain doses from exposure to radionuclides and evaluating dementia, Alzheimer’s disease, Parkinson’s disease, and motor neuron disease as possible adverse outcomes of combined high- and low-LET exposures to brain tissue.

This paper summarizes an assessment of potential improvements in brain dosimetry for internal emitters from explicit modelling of brain biokinetics in place of treating the brain as an implicit mass fraction of *Other tissue*. Comparisons are made of dose coefficients for selected radionuclides based on alternate versions of the systemic biokinetic model for each radionuclide, differing only in the handling of brain tissue.

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