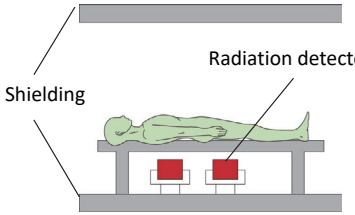
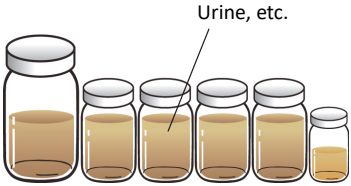
Dose Measurement and Calculation

Comparison of Methods of Assessing Internal Radioactivity

Direct counting	Bioassay
Directly measure the human body	Indirect measurement
Need to spare time to receive direct measurements	Submit samples (urine, feces, etc.)
Mainly target materials that emit γ-rays	Able to measure all radioactive materials
Short measuring time using the apparatus	Chemical analysis takes time.
Accurate dose assessment	Large margin of error in results of dose assessment
	

In direct counting, the longer the measuring time, the more accurate values can be obtained. However, external measuring instruments also measure radiation from the environment while measuring radiation from the human body, so if measurements are carried out in locations with high ambient dose rates, sufficient shielding against environmental radiation is required. These instruments cannot measure radioactive materials that do not emit γ-rays.

Bioassays can measure all kinds of radioactive materials but cannot provide accurate numerical values after a single sampling and it is necessary to prepare samples for several days (urine, feces, etc.). Given that the amount of radioactive materials discharged varies depending on individuals and on their health conditions and amounts of food consumption, the margin of error is considered to be larger than for direct counting.

For both methods, if the time when a detected radioactive material was taken in cannot be clearly determined, calculation results will have a larger margin of error.

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