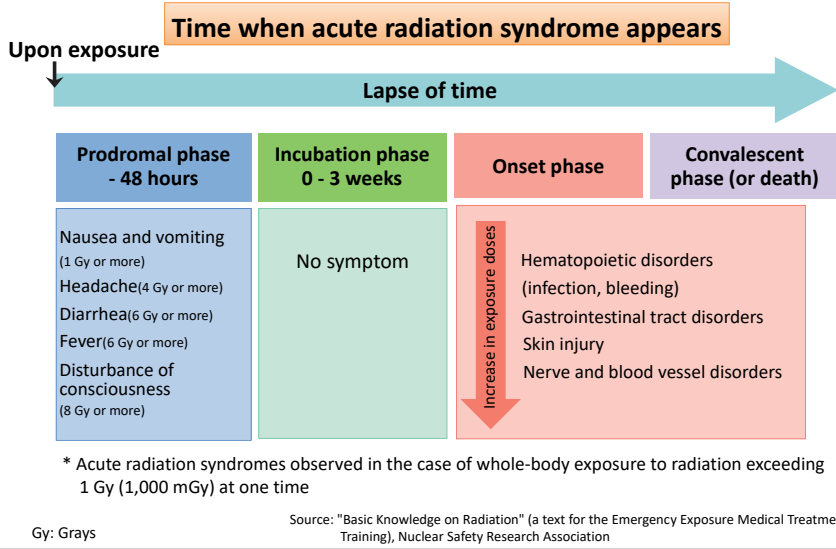


# Acute Radiation Syndromes



Whole-body exposure to radiation exceeding 1 Gy (1,000 mGy) at one time causes disorders in various organs and tissues, leading to complicated clinical developments. This series of disorders in organs is called acute radiation syndrome, which typically follows a course from the prodromal phase to the incubation phase, the onset phase, and finally to the convalescent phase or to death in the worst case.

From prodromal symptoms that appear within 48 hours after the exposure, exposure doses can roughly be estimated. Exposure to radiation exceeding 1 Gy may cause loss of appetite, nausea and vomiting, and exposure to radiation exceeding 4 Gy may cause headaches, etc. When exposure doses exceed 6 Gy, such symptoms as diarrhea and fever may appear.

In the onset phase after the incubation phase, disorders appear in the hematopoietic organ, gastrointestinal tract, and nerves and blood vessels, in this order, as doses increase. Disorders mainly appear in organs and tissues highly sensitive to radiation. In general, the larger an exposure dose, the shorter the incubation phase.

Skin covers a large area of 1.3 to 1.8 m<sup>2</sup> of the whole body of adults. Epidermis, which is the result of repeated division of basal cells that are created at the basal stratum, finally becomes a stratum corneum and is separated from the body surface as scurf.

It is said to take approx. 20 to 40 days until basal cells move from the basal stratum to the skin surface, which means\* that two to more than four weeks is required for exposed subcutaneous cells existing in the stratum corneum to the basal stratum to come up to the skin surface. Therefore, skin erythema sometimes appears immediately after exposure depending on radiation intensity, but skin injury generally appears after the lapse of a few weeks (p.25 of Vol. 1, "External Exposure and Skin").

\*Source: United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) 1988 "Radiation Sources, Effects and Risks," translated by the National Institute for Radiological Sciences (Jitsugyo-koho Co., Ltd.; March 1990)

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