

Sample Pages from Antinuclear Nutrition's chapter on Biological Effects

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exposures of around 100 to 200 rads; higher doses to parts of the body may occur and still permit survival. Below about 100 rads of exposure, survival is virtually certain, since none of the body's organ systems are seriously impaired (Bond, Fliedner, & Archambeau, 1965, pp. 115-158).

Individuals receiving acute whole-body doses of ionizing radiation may show certain signs and symptoms of illness. The time interval to onset of these symptoms, their severity, and their duration generally depend upon the amount of radiation absorbed, although there may be significant variation among individuals. Within any given dose range the effects manifested can be divided into three time phases: initial, latent, and final.

During the initial phase, exposed individuals may experience nausea, vomiting, headache, dizziness, and a generalized feeling of illness. The onset time decreases and the severity of these symptoms increases with increasing dose. During the latent phase exposed individuals will experience few, if any, symptoms and most likely will be able to perform useful tasks. The final phase is characterized by illness that requires hospitalization of people receiving the higher doses. In addition to the recurrence of the symptoms noted during the initial phase, skin hemorrhages, diarrhea, and loss of hair may appear, and, at higher doses, seizures and prostration may occur. The final phase is consummated by recovery or

death. (Glasstone & Dolan, 1977, p. 579) (see Table 1)

Radiation doses of 500 to 600 rads or above may produce death within a few days to about two weeks, depending on the dose received. Lower doses may produce death either due to the radiation effects or to infections brought on by a lowering of resistance. If the early stages of radiation sickness are very severe, death is likely. Those who survive to three or four months after exposure will almost certainly recover completely, and the length of the recovery period is proportional to the severity of the radiation sickness experienced.

The degree of radiation injury from internal emitters is not very likely to amount to a fatal dose or even immediate injury. Food and environmental contamination would have to be so large for that to happen that external sources would be massive and constitute the decisive factor in mortality long before a fatal internal burden could be accumulated. An exposure to internal emitters is more likely to result in the later development of delayed effects (Loutit & Russell, 1966, p. 9).

Late Effects

Those who survive an acute exposure to radiation may years later be more prone to developing cataracts, leukemia, various kinds of cancer, and nonspecific life shortening. Children exposed in utero, have a greater risk of stillbirth or early mortality. Some of those surviving may be mentally retarded or have other malformations (Glasstone & Dolan, 1977, pp. 593-594).

Examinations done during 1966-68, more than 20 years after the [Japanese] bombings, showed that those who had been exposed to doses of 100 or more rads at ages