

**UCAR Radiation Safety Manual  
Appendix B**

**Biological Effects of Radiation**

<b>Acute Dose (Rem)</b>	<b>Probable Effect</b>
0 – 50	No obvious effect, except possible minor blood changes.
80 – 120	Vomiting and nausea for about 1 day in 5 – 10% of exposed personnel. Fatigue but no serious disability.
130 – 170	Vomiting and nausea for about 1 day, followed by other symptoms of radiation sickness in about 25% of exposed personnel. No deaths anticipated.
180 – 220	Vomiting and nausea for about 1 day, followed by other symptoms of radiation sickness in about 50% of exposed personnel. No deaths anticipated.
270 – 330	Vomiting and nausea in nearly all exposed personnel on first day, followed by other symptoms of radiation sickness. About 20% deaths within 2 to 6 weeks after exposure; survivors convalescent for about 3 months.
400 – 500	Vomiting and nausea in all personnel on first day, followed by other symptoms of radiation sickness. About 50% deaths within 1 month; survivors convalescent for about 6 months.
550 – 750	Vomiting and nausea in all personnel within 4 hours after exposure, followed by other symptoms of radiation sickness. Up to 100% deaths; few survivors convalescent for about 6 months.
1000	Vomiting and nausea in all personnel within 1 to 2 hours. Probably no survivors from radiation sickness.
5000	Incapacitation almost immediately. All personnel will be fatalities within 1 week.

### Symptoms of Acute Radiation Syndrome

Time After Exposure	Supralethal Dose (1000 rad)	Median Lethal Dose (500 rad)	Sublethal Dose (200 rad)
First Day	Nausea and vomiting on first day	Nausea and vomiting on first day	
First Week	Nausea, vomiting, diarrhea, fever, inflammation of throat, prostration, dehydration, emaciation leading to death		
Second Week			
Third Week		General malaise, loss of appetite, loss of hair, hemorrhage, pallor, diarrhea, fever, inflammation of throat, emaciation leading to death in 50% of victims	Loss of appetite, loss of hair, inflammation of throat, pallor, hemorrhage, diarrhea  Recovery begins. No deaths in absence of complications.