

# Time/Dose Effects in Acute Radiation Syndrome - Acute Clinical Effects of Single-Dose Exposure of Whole-Body Irradiation

## Symptoms/Signs for Dose Range 3.0 to 5.3 Gy in Free Air

Symptoms/Signs	Hours						Days							Weeks						
	4	8	12	16	20	24	2	3	4	5	6	7	2	3	4	5	6	7		
Nausea													70-90%							
Vomiting (retching)													50-60%							
Anorexia													90-100%							
Diarrhea (cramps)													~10%							
Fatigue	60-90%																			
Weakness	60-90%																			
Hypotension																				
Dizziness																				
Disorientation																				
Bleeding													(a) 0-50%							
Fever													(b)							
Infection													(c) 10-80%							
Ulceration													(d) 30%							
Fluid loss/electrolyte imbalance																				
Headache																				
Fainting																				
Prostration																				
Death													<5 - 50%							

**Severity Scale**

mild to moderate	moderate to severe
unspecified or mild	severe

Colors used to improve visualization only.

**Management and Treatment**

**Performance:**

- o DT:PD from 3 hours until death or recovery.
- o UT:PD from 4 to 40 hours and from 2 weeks until death or recovery.

**Hospitalization Percentage/Duration**

- o At 2 to 5 weeks medical care for 10 to 80%.
- o At low end of range less than 10% deaths.
- o At high end, death may occur for more than 50%.
- o Survivors return to duty.

**Therapy**

- o Blood transfusion, antibiotics, rest.
- o Treatment with antiemetics

(a) Moderate drop in platelets: from  $3 \times 10^5 / \text{mm}^3$  to  $0.8-0.1 \times 10^5 / \text{mm}^3$   
 (b) Moderate drop in granulocytes: from  $6 \times 10^3 / \text{mm}^3$  to  $2.0-0.5 \times 10^3 / \text{mm}^3$   
 (c) Moderate to severe drop in lymphocytes: from  $3 \times 10^3 / \text{mm}^3$  to  $1.0-0.4 \times 10^3 / \text{mm}^3$   
 (d) Epilation.

CI = Combat Ineffective (less than 25% performance)  
 PD = Performance Degraded (25-75% performance)  
 DT = Demanding Task  
 UT = Undemanding Task

Adapted from NATO Handbook on the Medical Aspects of NBC Defensive Operations AMedP-6(B), Chapter 6, General Medical Effects of Nuclear Weapons: Diagnosis, Treatment, and Prognosis, 1 February, 1996.