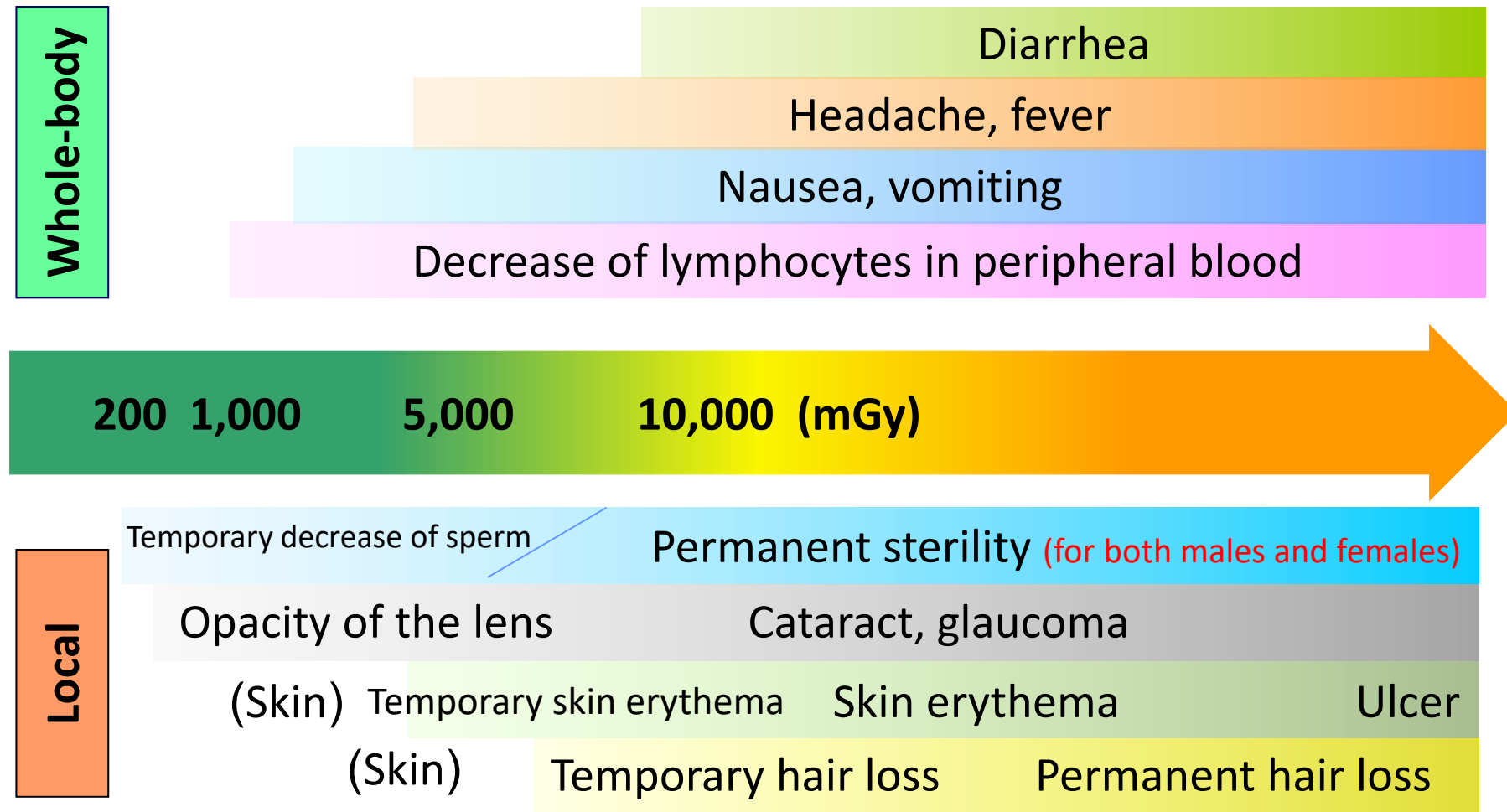


# Whole-body Exposure and Local Exposure



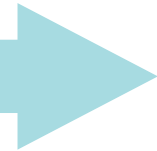
# Acute Radiation Syndromes

Time when acute radiation  
syndrome appears

Time of exposure



Lapse of time



**Prodromal phase  
- 48 hours**

**Incubation phase  
0 - 3 weeks**

**Onset phase**

**Convalescent  
phase (or death)**

Increase in exposure doses

Nausea and vomiting (1 Gy or more)

Headache (4 Gy or more)  
Diarrhea (6 Gy or more)  
Fever (6 Gy or more)  
Disturbance of consciousness (8 Gy or more)

No symptom

Skin injury (3 Gy or more)

Hematopoietic disorders (infection, bleeding) (3 Gy or more)

Gastrointestinal tract disorders (8 Gy or more)

Nerve and blood vessel disorders (tens of Gy or more)

\* Acute radiation syndromes observed in the case of a single whole-body exposure to radiation exceeding 1 Gy (1,000 mGy)

Gy: Grays

Source: Prepared based on "Basic Knowledge on Radiation" (a text for the Emergency Exposure Medical Treatment Training), Nuclear Safety Research Association

# Prodromal Phase of Acute Radiation Syndrome and Exposure Doses

## Prodromal phase and exposure dose

Symptom	Mild (1-2 Gy)	Moderate (2-4 Gy)	Severe (4-6 Gy)	Very severe (6-8 Gy)	Lethal (> 8 Gy)
Vomiting	2 hours or later after exposure (Rate of incidence) Up to 50%	1 to 2 hours 70 to 90%	Within 1 hour 100%	Within 30 minutes 100%	Within 10 minutes 100%
Diarrhea	None	None	Moderate	Severe	Severe
Headache	Very mild	Mild	Moderate	Severe	Severe
Consciousness	Unaffected	Unaffected	Unaffected	Affected	Loss of consciousness
Body temperature	Normal	Slight fever	Fever	High fever	High fever

# Threshold Values for Various Effects

## Threshold acute absorbed doses of $\gamma$ -rays

Disorders	Organs/Tissues	Incubation period	Threshold value (Gy)*
Temporary sterility	Testis	3 to 9 weeks	Approx. 0.1
Permanent sterility	Testis	3 weeks	Approx. 6
	Ovary	Within 1 week	Approx. 3
Deterioration of hemopoietic capacity	Bone marrow	3 to 7 days	Approx. 0.5
Skin rubor	Skin (large area)	1 to 4 weeks	3 to 6 or lower
Skin burn	Skin (large area)	2 to 3 weeks	5 to 10
Temporary hair loss	Skin	2 to 3 weeks	Approx. 4
Cataract (failing vision)	Eyes	20 years or longer	Approx. 0.5

\* Threshold doses for symptoms with clear clinical abnormalities (doses causing effects on 1% of people)