

# EMERGENCY PREPAREDNESS

During Nuclear Disasters

By Daniel Tan

# Types of Radiation

- ▣ Non-ionizing radiation
- ▣ Ionizing radiation
  - $\alpha$  (alpha) particles
  - $\beta$  (beta) particles
  - $\gamma$  (gamma) rays

# Annual Exposure to Radiation

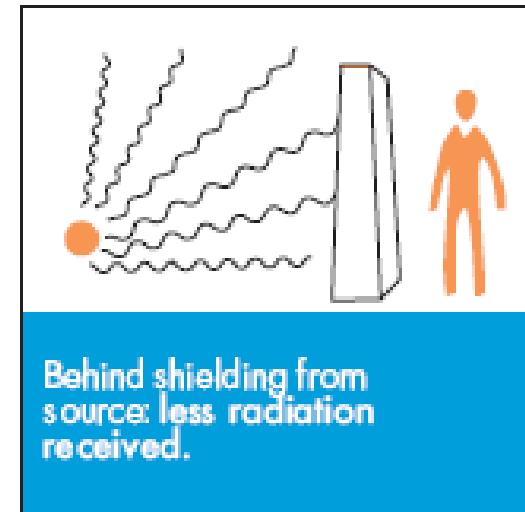
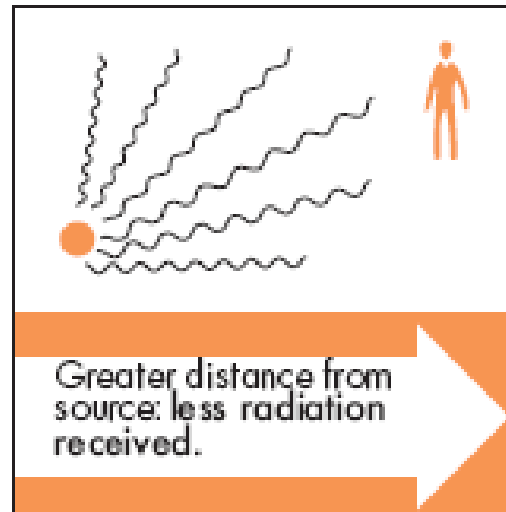
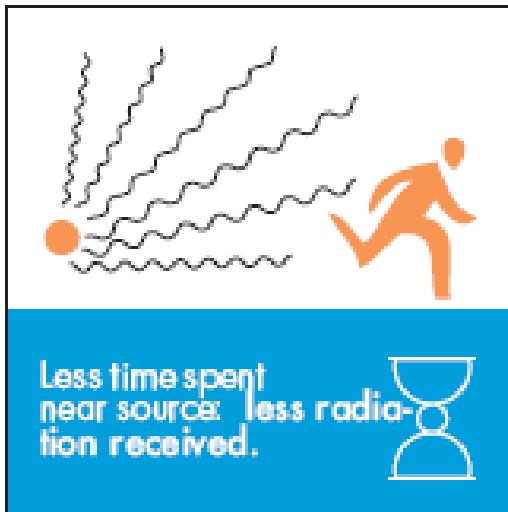
- ▣ Annual exposure: 620 mSv (millisieverts)

Medical Procedure	Amount of Radiation
Dental x-ray	0.015 mSv
Chest x-ray	0.10 mSv
Abdominal x-ray	0.60 mSv
Full-body CT scan	10 mSv
Chest CT scan	7 mSv
Head	2 mSv

- ▣ Amount for death: 6 Sv (6000 mSv)

# 3 Steps to Reducing Radiation Exposure (based off EPA)

- ▣ Time
- ▣ Distance
- ▣ Shielding





# Shielding

- ▣ Rule of thumb: about 125 per sq. ft. of shielding reduces radiation by 10 times
- ▣ Effective shielding reduces radiation by 1000 times

Substance	Halving Thickness	Effective Thickness
Lead	0.4 in	4 in
Concrete	2.4 in	24 in
Steel	0.99 in	10 in
Packed soil	3.6 in	36 in (3 ft)
Water	7.2 in	72 in (6 ft)
Wood	11 in	114 in (9 ft 2 in)

# Important Emergency Supplies

1. Supply of food and water
2. Radio with batteries
3. LED flashlights or chemical glow sticks
4. First-aid kit
5. 5-gallon bucket and plastic trash bags

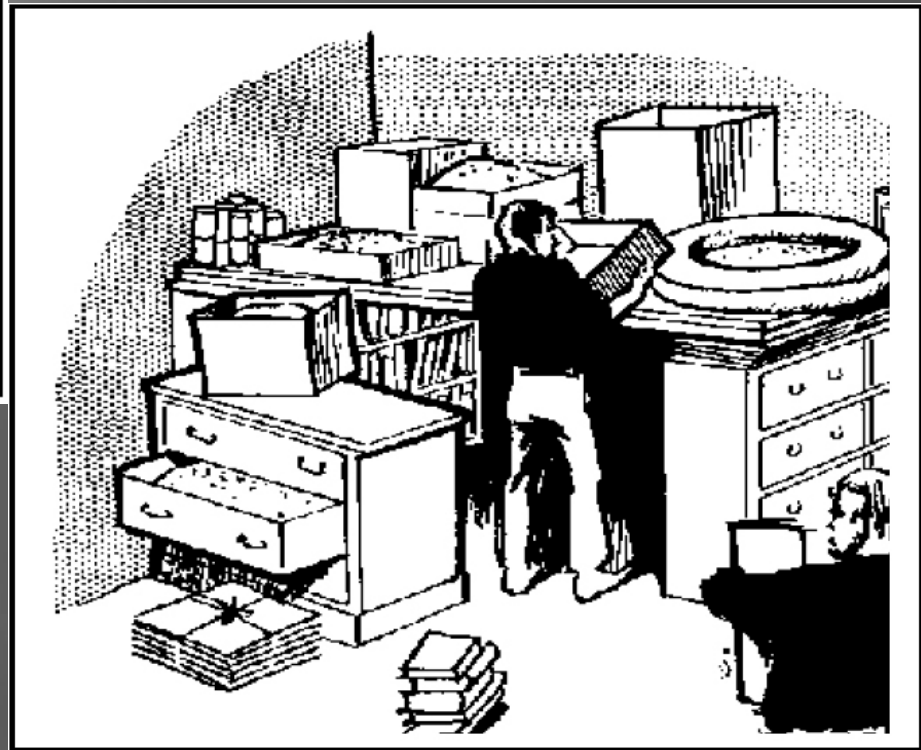
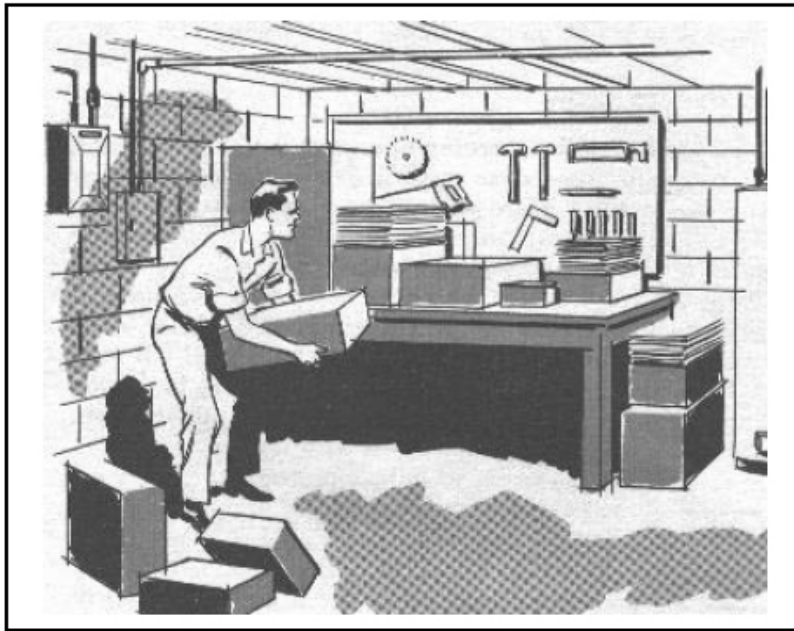
# Preventing Radiation Poisoning

- ▣ Eat foods and supplements high in antioxidants
- ▣ Get rid of heavy metals from system
- ▣ Taking tablets of or liquid potassium iodide (KI) or potassium iodate ( $\text{KIO}_3$ )
- ▣ Eating radiation-free supplies of foods

# How to Respond to Nuclear Emergencies

- ▣ Don't panic
  - Radiation strength halves after 7 hours, reduces to 1/100<sup>th</sup> of strength after 2 days
- ▣ Decide whether or not to evacuate
  - Only evacuate if success is certain
- ▣ Prepare a fallout shelter
  - Seal windows, turn off air conditioning
  - Hide farthest away from outside world
  - Create makeshift shelter

# Proper Makeshift Shelters



# If Exposed to Radiation....

1. Take off clothes and put in sealed plastic bag
2. Shower, wash skin and hair gently
3. Take iodine pill
4. Contact authorities about exposure



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