

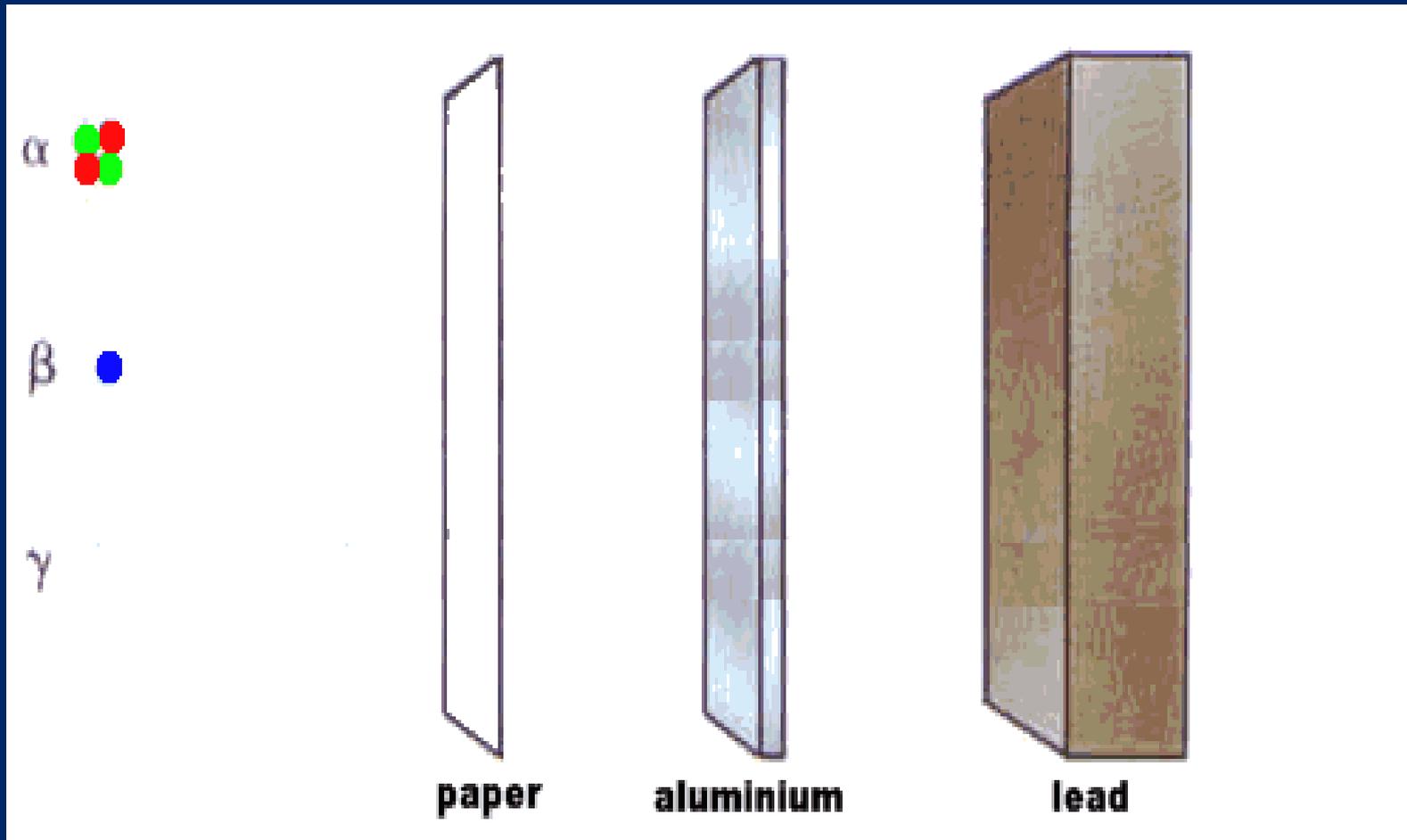


Radiation Safety in an Emergency Response

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Emissions

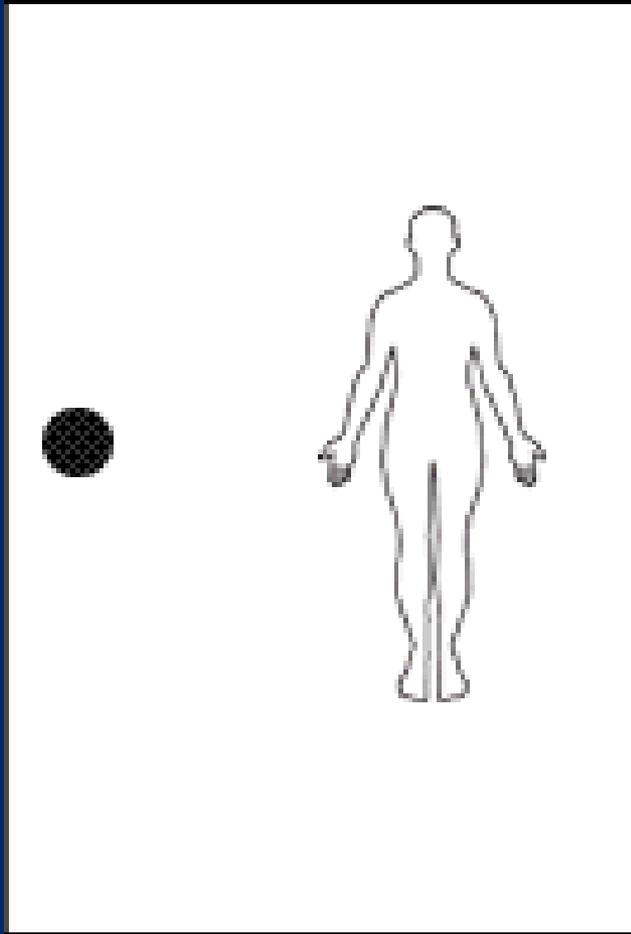


Exposure and Contamination

- Exposure
- Contamination
 - Internal
 - External



Exposure



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Exposure Units

For emergency responders

– 1 Roentgen = 1 rem = 1 rad
(for Gamma and X-rays)

– 1 milliRoentgen = 1 millirad = 1mR

- rem (roentgen equivalent man)
- *Roentgen*
- *Rad (radiation absorbed dose)*

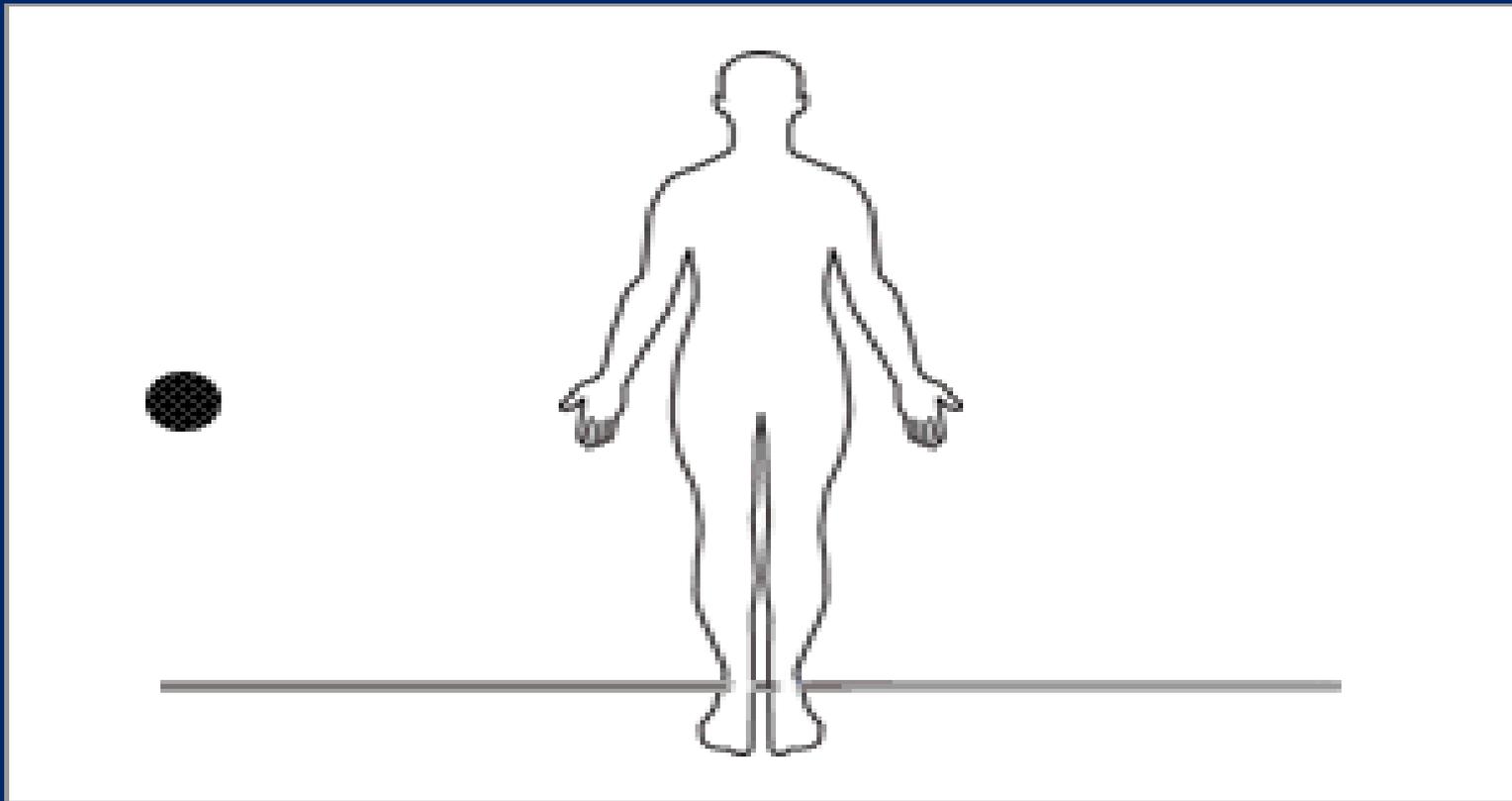


Contamination

- Radioactive dirt
- External contamination
- Internal contamination



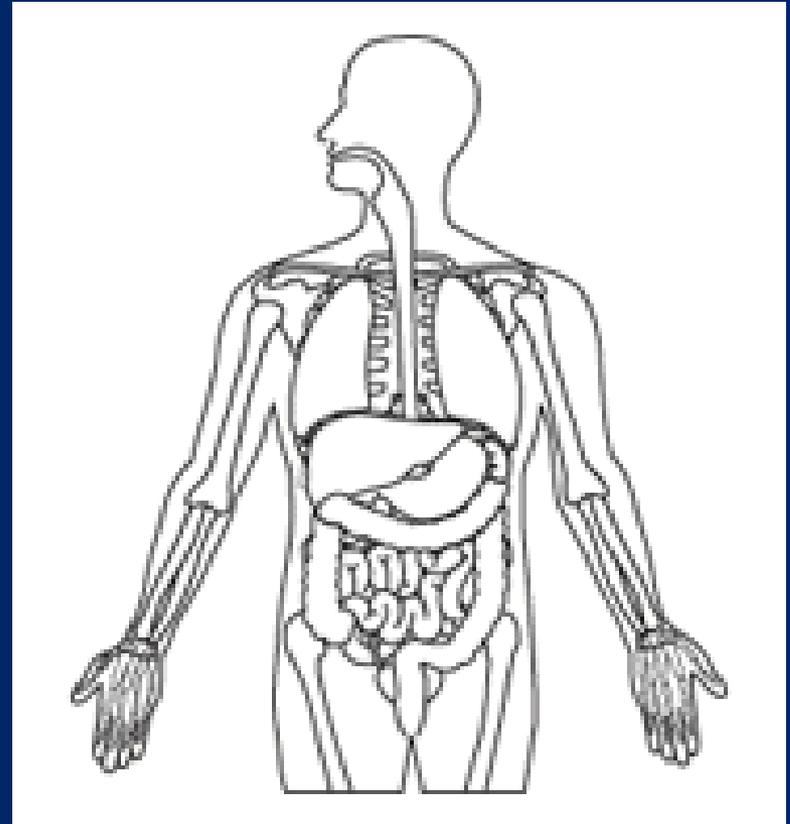
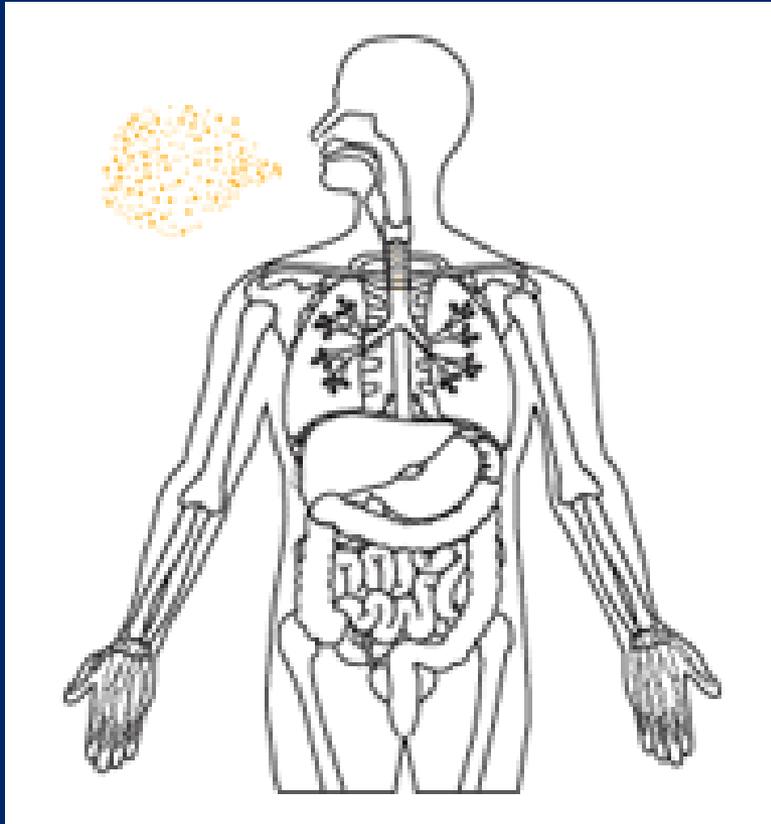
Whole Body Contamination



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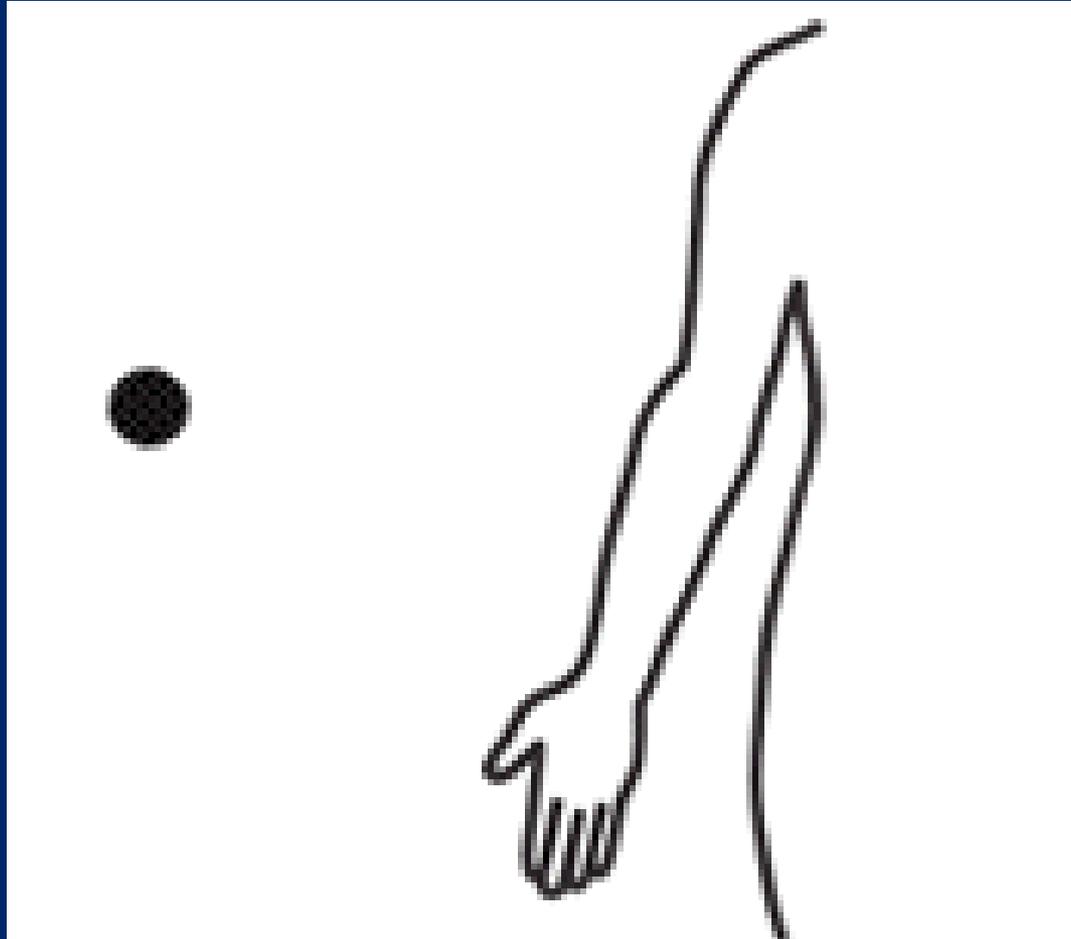
Inhalation and Ingestion



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Shrapnel Contamination



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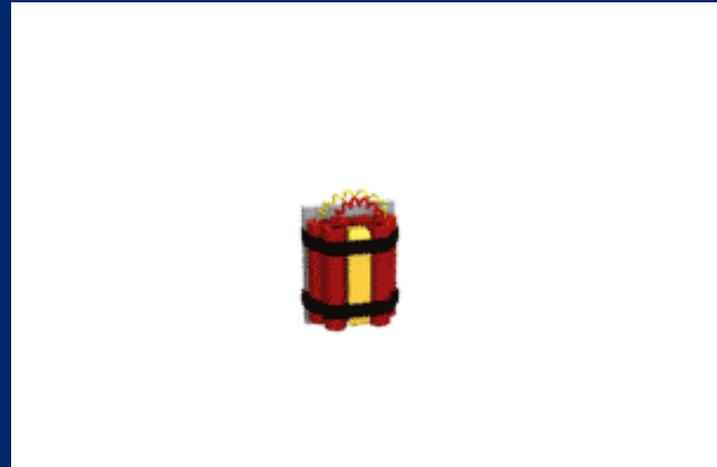
Scenarios

- Radiological Dispersion Device
- Radiological Exposure Device
- Improvised Nuclear Weapon



Radiological Dispersion Device aka Dirty Bomb

- Explosion/Blast
 - Leading cause of casualties
- Airborne radiological contamination
- Radioactive shrapnel
 - Rare
 - Easily detectible



Possible Fragments



Smith JM, Ansari A, Harper FT. Health Physics 89(5), 513-20; 2005.



Radiological Exposure Device

- Easy to visually conceal
- Detection
 - Device
 - Source
- Exposure rate and dose
- No contamination



Improvised Nuclear Weapon

- Very difficult to produce
- Highly destructive
- Likely to be used against a high value target



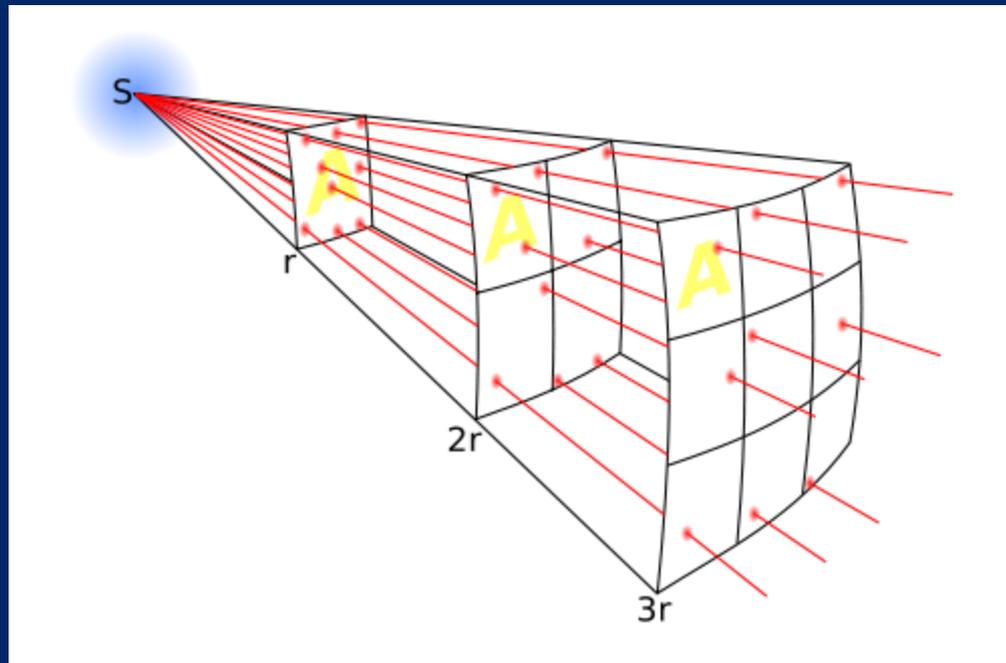
Protection

- As Low As Reasonably Achievable
- Personal Protective Equipment
- Facility Contamination Control
- Administrative Dose Limits
- Dosimetry



ALARA

- Time
- Distance
- Shielding



PPE

- Treat public as contaminated
- Swap PPE regularly
- Gloves and booties are a minimum
 - Other barriers may be implemented as needed



Facility Contamination Control

- Conducting area surveys of facility to identify and remove contamination
- Control foot traffic and use floor plan efficiently
 - Trash removal
 - Signs
 - Runners



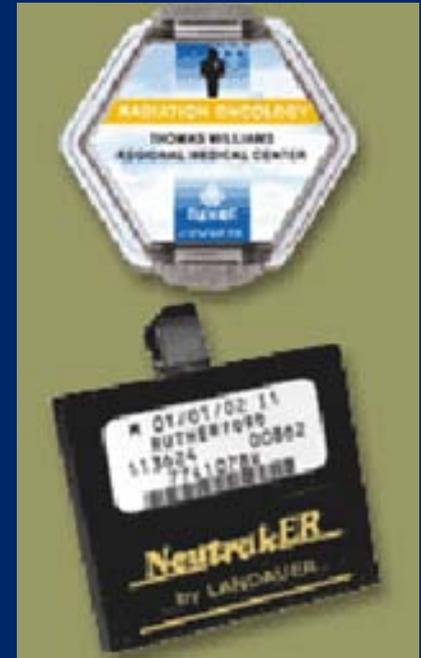
Administrative Limits

- Dose
 - Call in: 500mR (0.5R)
 - Turn back: 1000mR (1R)
- Exposure Rate
 - Call in: 1R/hr
 - Turn back: 5R/hr



Dosimetry

- Types of dosimetry
- How dosimetry will be used in response operations
- Tracking dose of responders

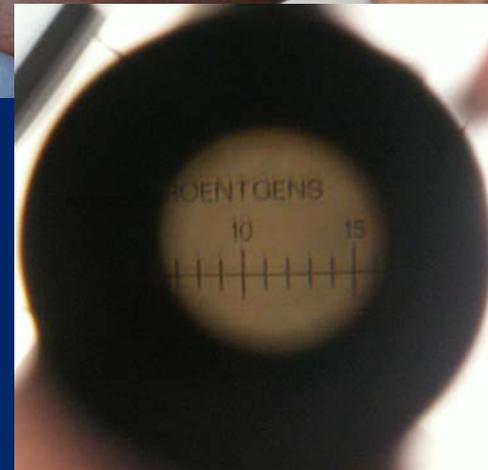


How to Use a Direct Read

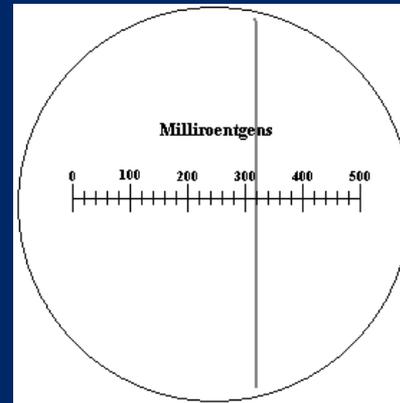
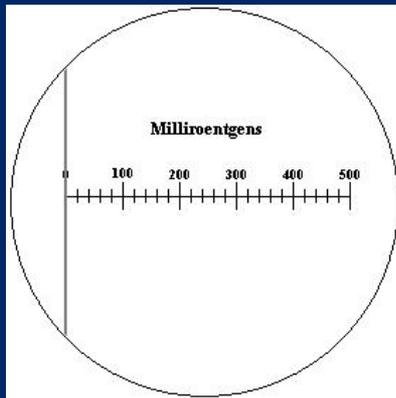
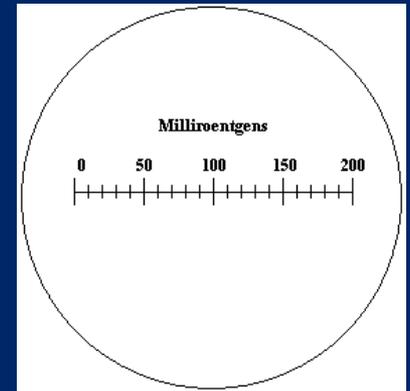
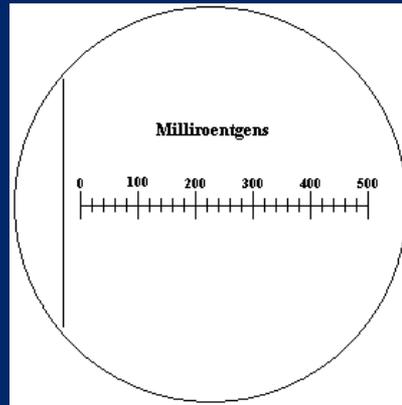
- Inspect
- Charge
- Read
- Record
- Recharge



Charge the dosimeter



Read the dosimeter



Dose Card

EMERGENCY WORKER CHECKLIST

Before beginning your assignment check and make sure you have the following:

- Dosimeter (Low Range)
Any scale up to 2R (2000mR)
- Dosimeter (Mid Range)
Any scale from 2R to 20R
- Permanent Record Dosimeter
- Individual Dose Record Card

Record reading at least once an hour

Recharge dosimeter when it reaches ¾ scale.

IMPORTANT:

Notify your supervisor immediately if:

1. Your dosimeter hairline has gone off-scale or is not visible.

2. You have reached your exposure limits:

- 500 mR** call-in limit
(Call your supervisor)
- 1 R** (1000 mR) turn-back limit
(Leave area, call supervisor)

POTASSIUM IODIDE (KI)

The State Radiological Assessment Manager (SRAM) makes the recommendation for KI ingestion for State and local emergency workers. Coffey County Radiological Officer notifies Coffey County emergency workers of this decision.

INGESTION IS VOLUNTARY

Those who elect to take KI need to fill out the "Potassium Iodide Issue record" form.

Potassium Iodide (KI) is used in certain situations to protect the thyroid gland from absorbing radioactive iodine. If taken before or within an hour of exposure to radioactive iodine, KI can block about 90 percent of radioactive iodine from being absorbed by the thyroid gland.

The dosage for emergency workers is one tablet of KI (130 mg) once a day for the duration of exposure and following the exposure for a maximum of 10 days total.

RADIOLOGICAL EMERGENCY WORKER



INDIVIDUAL DOSE RECORD

Please Print

Name _____

Organization _____

Work Phone Number _____

Date and Time _____

DOSIMETRY SERIAL NUMBER:

Low Range _____

Mid Range _____

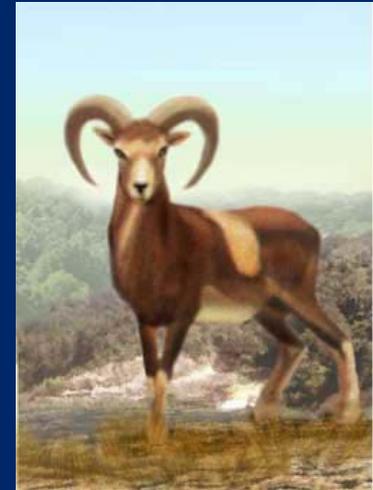
Permanent Record Dosimeter
(Serial Number) _____

Prepared by:
Kansas Department of Health & Environment

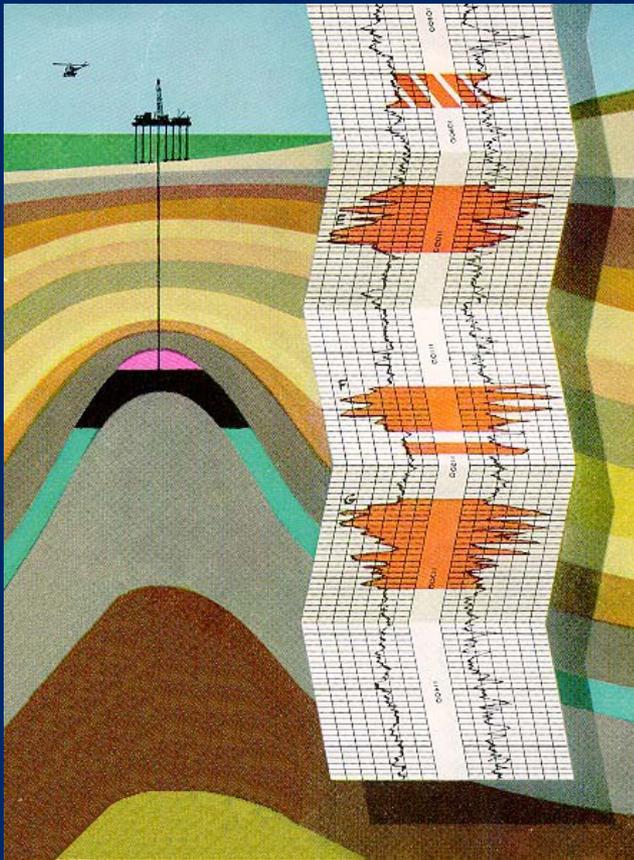


What is RAM

- RadioActive Material



Well Logging



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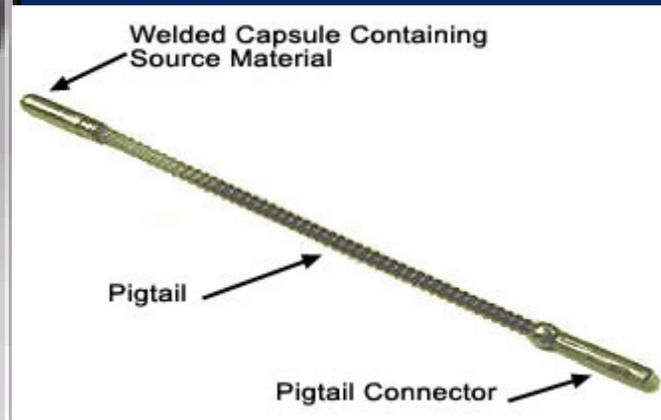
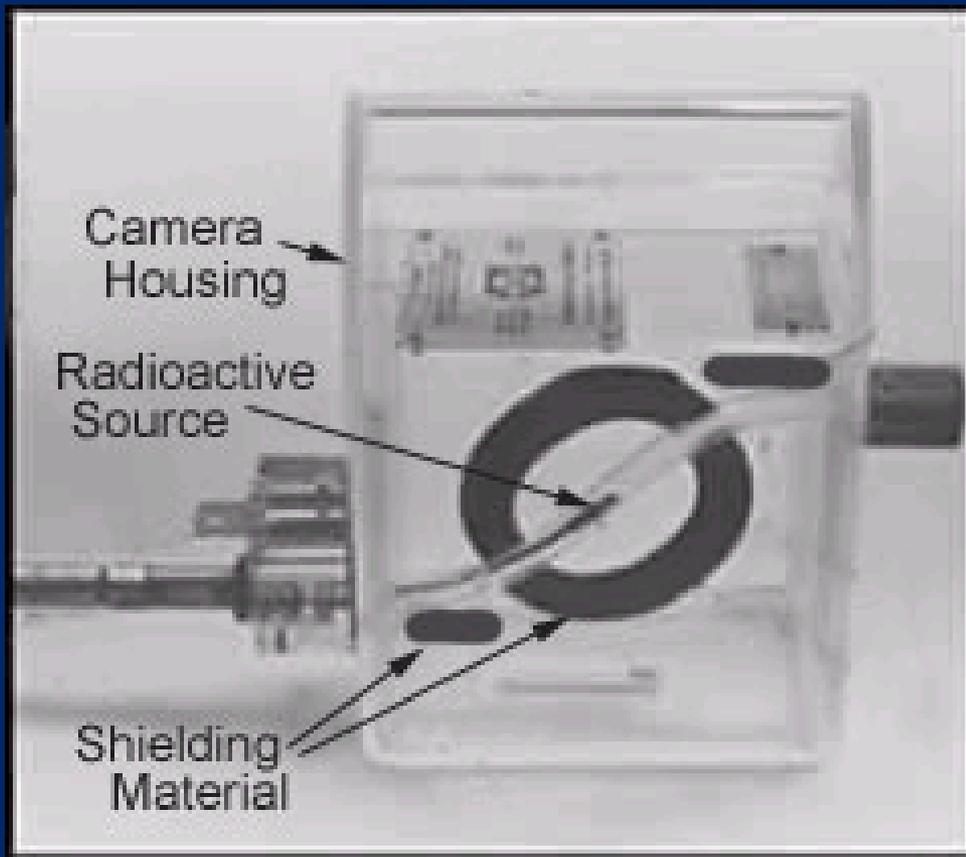
Radiography



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Radiography Camera and Source



Soil Density Guage



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Medical Sources

- Therapy Sources
- Gamma Knife
- Blood Irradiators
- Moly Generators
- Xray Devices



House Hold Sources

- Lantern
- Fiesta
- Glass
- Tile
- Smoke detector





www.kdheks.gov

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