Radiation Safety In-service:

For Healthcare Workers SUPPORT SERVICES

Presented by: Astarita Associates, Inc. Medical Physics Consultants www.AstaritaAssociates.com

General Information about Radiation

 Often depicted by books, movies and news media as mysterious, deadly force.

> In truth:

- Nothing mysterious at all
- Radiation has been studied for over 100 years
- Detection, measurement and radiation control are extremely common events
- The more the public understands, the less frightening it becomes
- A very beneficial diagnostic tool

Radiation Units of Measurement:

Roentgen: Unit of radiation exposure in air
 Rad: Energy absorbed per gram of material/tissue
 Rem: Biological effect of a rad

Background Radiation

- Definition: Relatively constant low-level radiation from environmental sources such as the earth (or building materials), cosmic rays, and naturally occurring radionuclide found in the body.
- > Level of background radiation will vary depending upon location, altitude and the amount of natural radioactive material in the ground.
- Highest known background levels recorded in mountains of South America - 1000 millirem (1 Rem).



Background Radiation

- No known proven carcinogenic effects from radiation levels in the order of magnitude comparable to background radiation.
- Typically, exposures received from diagnostic procedures fall well within background levels.

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Typical Background Radiation Levels

- > New York City
- > Denver
- ~ 300 mRem/year
- ~ 500 mRem/year > 500 mRem/year
- Grand Central Station Andes Mountains
 - ~ 1000 mRem/year or
 - 1 Rem/year ~ 0.1 mRem
- One banana
- Flight from LA to London ~ 5 mRem

Guidelines for Security and Engineering

- Isotopes are routinely delivered to the designated area during normal business hours.
- For off our delivery, the radioactive material transporter should check in with security and be escorted to the designated area for isotope delivery.
- > Only authorized personnel are to enter Radioactive Material storage areas. Should staff need entry to these areas, the Nuclear Medicine supervisor or Radiation Safety Officer should be contacted.



- Do not enter hot lab unless authorized to do so or under direc supervision
- > Do not empty containers with radioactive label
- Conventional cleaning solvents are appropriate
- Mounted waste monitors
 - Designed to detect small quantities of radioactive material in waste/linen

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Must walk slowly through detectors – 6 seconds is ideal
When alarm is sounded, store waste in designated area

Radiation Safety Officer

- Any institution that uses radiation for diagnostic and/or therapeutic purposes must name a Radiation Safety Officer (R.S.O.).
- > This individual is responsible for the day to day safe use of radiation at the institution.
- > All unsafe conditions must be reported to the R.S.O.

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