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VISTA Imaging Services, Inc.

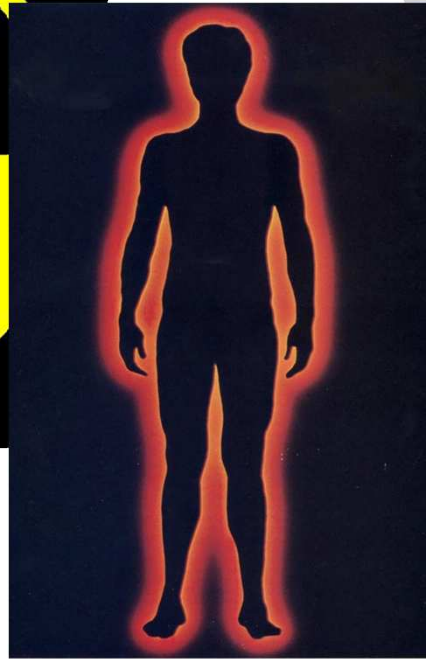
The proper care and grooming of your mobile C-arm



 **VISTA**
Imaging Services, Inc.

- X-rays – a reality check
- Lead aprons and other protective measures
- Proper cleaning of C-arms
- Proper testing/set up/use of C-arms

X-rays – a reality check

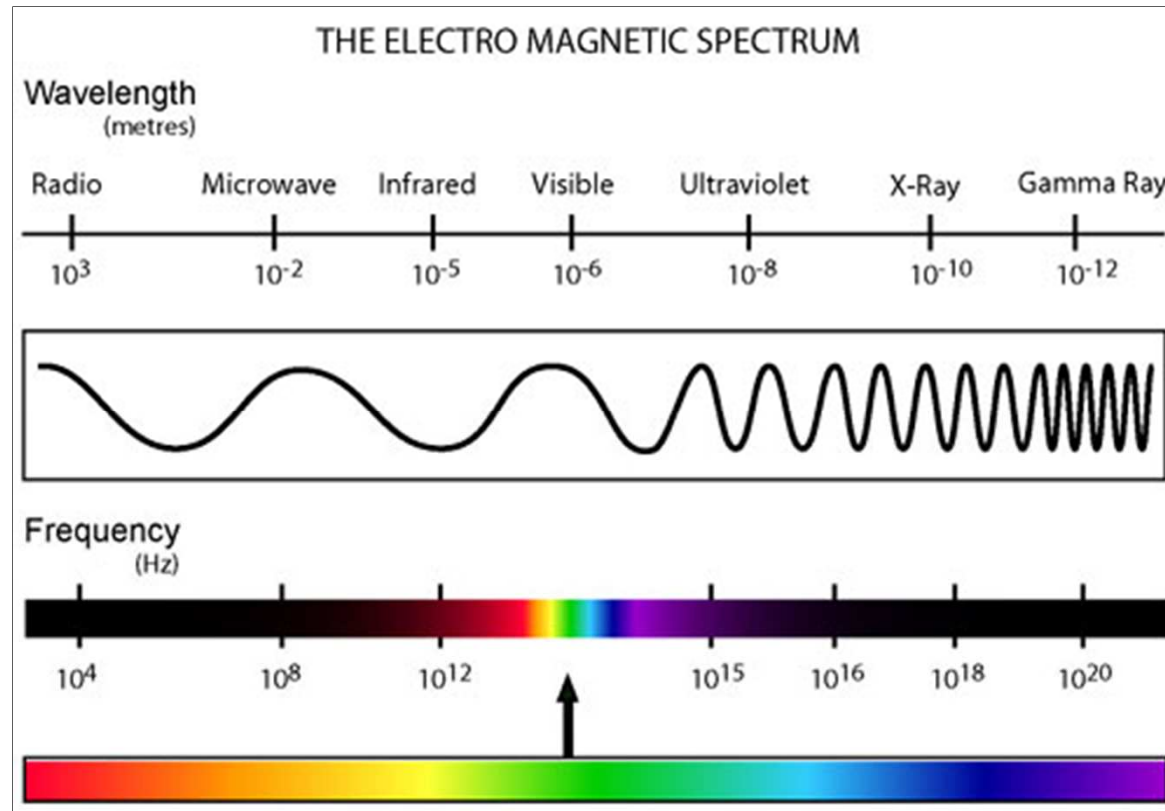


Fact Vs. Fiction

FICTION

- They don't turn lizards or spiders into monsters
- They don't make you "glow in the dark"
- They don't chase you around corners
- They don't stay in the room after the exposure
- They don't damage your wristwatch

X-rays – a reality check



FACTS

- They behave like light
- They travel in a straight line
- When the X-ray switch is off they're gone
- They increase risk of cancer – like UV light and other forms of radiation
- Quickly dividing cells are the most sensitive to radiation

Common Sources of Radiation

A Part of our natural environment

- Cosmic – 26 mrem at sea level, 52 in Denver
- Terrestrial – 16 – 63 mrem
- Stone, adobe, brick or concrete buildings – 7 mrem
- Food and water (from radon in water) -40 mrem
- From air (radon) – 228 mrem
- Air travel – 0.5 mrem/hour
- CRT computer screens – 1 mrem
- Smoke ½ pack/day for 1 year – 18 mrem



Medical Sources of Radiation

- Chest X-ray – 10 mrem
- Mammogram 42 mrem
- Hip X-ray – 70 mrem
- Lumbar spine 600 mrem
- Head CT scan – 200 mrem



- Avg. dose from all sources \approx 620 mrem/year
- International standards allow up to 5,000 mrem/year for health workers

Radiation protection

- Shielding
- Distance
- Time

Radiation Protection

– *Policy considerations*

Shielding

- Lead Aprons
- Front or wrap-around?
- Thyroid collars?
- Leaded glasses?



- Light weight aprons?
 - Must be 0.5 mm lead equivalent



Radiation Protection

— *Policy considerations*

Storage

- Flat, not folded
- On proper hangers

Testing

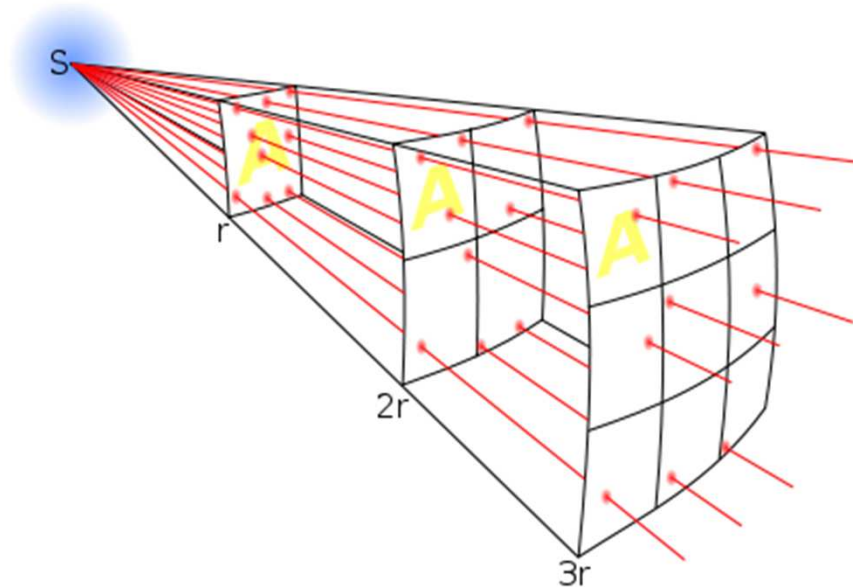
- Visual, Tactile
- X-ray check for cracks
 - Consider frequency of testing for your policy
 - Consider handling, frequency of use, etc.
- Wear at all times while in room
 - (why?)
- Cleaning protocols
 - How often? With what solutions?



Radiation protection

Distance

- Inverse square law
 - *“intensity (of radiation) is inversely proportional to the square of the distance from the source”*



Radiation Protection

-Policy considerations

- Time – *does your c-arm have:*
 - Pulse Mode
 - Low-dose mode
 - Laser positioning device
 - 5 minute timer
 - X-ray “on” lamp
 - Optional warning tone



Radiation Protection

-Policy considerations

- Does a licensed RT operate your C-arm?
 - OR Experience
 - RT's understand commonly requested projections
 - Understand radiation safety

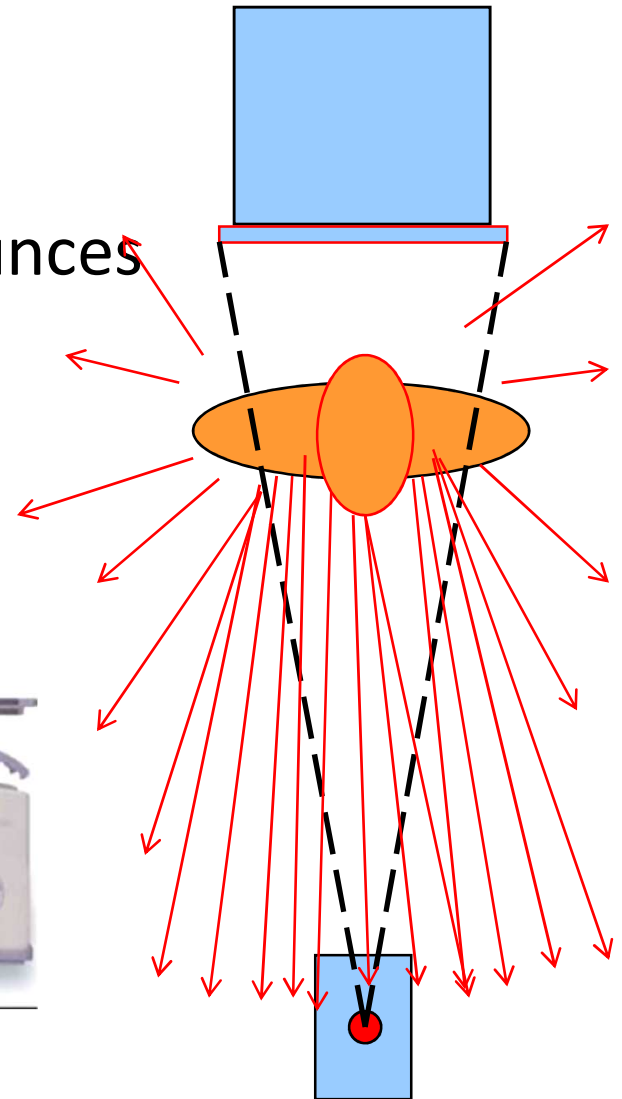


- Do Physicians operate the exposure switch?



Radiation Protection

- Q: Why is the X-ray tube usually positioned under the table?
- A: Most of the scatter radiation bounces back toward the X-ray tube.
- Best practices:
 - Make sure I.I. is positioned on top
 - Consider tables with lead aprons



Radiation Protection

- Where is the safest place to stand in this photo?



Proper care and grooming



Power requirements

- Dedicated Plug – NO power strips!
- Avoid extension cords

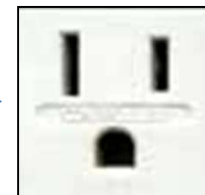
115 VAC, 20 Amps

Required for some high-power vascular or 3D C-arms



115 VAC, 15Amps

Required for basic orthopedic or general surgery C-arms



Cleaning & Disinfection

-Policy considerations

Common Cleaning products

- P.D.I. Super sani-cloth
- Cavi-wipes
- 3M HB Quat Disinfectant Cleaner
- Alcohol and Hydrogen peroxide
- Some cleaners are too caustic for C-arm monitors (consult operator's manuals)



Consider bloodborne pathogen policy

(i.e. 10% bleach solution for 3 minutes for spills?)

Always clean before the C-arm leaves the lab

Question: What if the C-arm is draped?



Testing, Set-up

-Does your C-arm provider provide these services?

- Long term installations

- Vendor service engineer installation
- Vendor Periodic Maintenance
- Annual physicist testing
- Registered with state
- Weekly QA test
- State Registration

- Short term loaners

- Preventative Maintenance every 6 mos.
- Annual physicist testing
- Weekly QA test
 - Should be logged in case of inspection
- Licensed RT's check mechanical & imaging functions prior to each procedure
- State Registration

STATE OF NEVADA
HEALTH AND HUMAN SERVICES
HEALTH DIVISION
RADIATION CONTROL PROGRAM

NUMBER: 00-10-3917-01

THIS IS TO CERTIFY That... VISTA IMAGING SERVICES
3941 PARK DR STE 20-463
EL DORADO HILLS, CA 95762

MAKE: N/A
MODEL: N/A
SERIAL NO: N/A
TUBES: N/A
TYPE: INST

HAS REGISTERED AS AN X-RAY MACHINE INSTALLER OR SERVICE COMPANY IN ACCORDANCE WITH NEVADA ADMINISTRATIVE CODE 459

CONDITIONS

1. REGISTERED ACTIVITIES MAY BE CONDUCTED ON ANY X-RAY MACHINE STATEWIDE.
2. THE REGISTRANT SHALL NOTIFY THE NEVADA STATE HEALTH DIVISION BEFORE MAKING ANY CHANGE WHICH RENDERS THE INFORMATION CONTAINED IN THIS REGISTRATION NO LONGER ACCURATE.
3. NO PERSON, IN ANY ADVERTISEMENT, SHALL REFER TO THE FACT THAT A SOURCE OF RADIATION IS REGISTERED WITH THE NEVADA STATE HEALTH DIVISION AND NO PERSON SHALL STATE OR IMPLY THAT ANY ACTIVITY UNDER THIS REGISTRATION HAS BEEN APPROVED BY THIS AGENCY.
4. THE REGISTRANT SHALL COMPLY WITH ALL PROVISIONS OF NEVADA ADMINISTRATIVE CODE 459.
5. THIS REGISTRATION CERTIFICATE AND NEVADA ADMINISTRATIVE CODE 459 SHALL BE POSTED IN ACCORDANCE WITH NEVADA ADMINISTRATIVE CODE 459.710.

DATE ISSUED: 3/11/11
DATE EXPIRES: 1/31/12

Karen K. Beckley
KAREN K. BECKLEY, M.P.A., M.S.
MANAGER, RADIATION CONTROL PROGRAM

THIS DOCUMENT IS NONTRANSFERABLE

THIS DOCUMENT MUST BE PROMINENTLY DISPLAYED

STATE OF NEVADA - HEALTH DIVISION

NOTICE TO EMPLOYEES

STANDARDS FOR PROTECTION AGAINST RADIATION, NOTICES, INSTRUCTIONS AND REPORTS TO WORKERS, INSPECTIONS

The Nevada State Board of Health has established standards for the protection from exposure to radiation for all persons who are working under a license or registration issued by the Health Division authorizing the use of radioactive material or X-ray machines. These standards are included in regulations defined in Sections 459.010-459.995, inclusive, of Chapter 459 of the Nevada Administrative Code.

YOUR EMPLOYER'S RESPONSIBILITY

Your employer is required to:

1. Apply these regulations to work involving sources of radiation.
2. Post or otherwise make available to you a copy of the Health Division regulations for protection from radiation, a complete copy of the license or certificate of registration, and the operating procedures which apply to work you are engaged in and explain their provisions to you.
3. Post Notices of Violation or order involving noncompliance with regulations for protection from radiation in the work place.
4. Post your letter of reply to notices of noncompliance with the regulations.

YOUR RESPONSIBILITY AS A WORKER

You should familiarize yourself with the provisions of the Health Division regulations for protection from radiation and the operating procedures that apply to your job. You should strictly comply with all the provisions of the regulations for your own safety and for the safety of those persons who work with you.

WHAT IS COVERED BY THESE REGULATIONS

1. Limits on exposure to radiation and radioactive material in restricted and unrestricted areas.
2. Measures to be taken after accidental exposure.
3. Personnel monitoring, surveys and equipment.
4. Caution signs, labels and safety interlock equipment.
5. Exposure records and reports.
6. Options for workers regarding Health Division inspections, and
7. Refused matters.

REPORTS ON YOUR RADIATION EXPOSURE HISTORY

1. The Health Division regulations for protection from radiation require that your employer give you a written report if you receive an exposure in excess of any applicable limit set forth in the regulations. The limits in the regulations apply both to external exposure to radiation and internal exposure to airborne radioactive materials.

INSPECTIONS

All licensed or registered activities are subject to inspection by representatives of the Health Division. In addition, any worker or representative of workers who believes that there is a violation of the Nevada Revised Statutes, Chapter 459, the regulations issued thereunder, or the terms of the employer's license or registration with regard to radiological working conditions in which the worker is engaged, may request an inspection by sending a notice of the alleged violation to the Health Division. The request must set forth the specific grounds for the notice and must be signed by the worker or the representative of the workers. During inspections, Health Division inspectors may confer privately with workers, and any worker may bring to the attention of the inspectors any past or present condition which he/she believes contributed to or caused any violation as described above.

INQUIRIES

Inquiries dealing with matters outlined above can be sent to the Radiation Control Program, Bureau of Health Care Quality and Compliance, 4150 Technology Way, Reno, NV, Carson City, NV 89706.

POSTING REQUIREMENT

COPIES OF THIS NOTICE MUST BE POSTED IN A SUFFICIENT NUMBER OF PLACES IN EVERY ESTABLISHMENT WHERE EMPLOYEES ARE WORKING WITH SOURCES OF RADIATION THAT ARE LICENSED OR REGISTERED BY THE HEALTH DIVISION TO REMIND EMPLOYEES WORKING IN OR FREQUENTING ANY PORTION OF A RESTRICTED AREA TO OBSERVE A COPY ON THE WAY TO OR FROM THEIR WORK STATION.

Thank You!



Radiographic & Fluoroscopy Services

www.vistaimagingservices.com