

RADIATION SAFETY AND EMERGENCY PROCEDURES

FOR FLUOROSCOPY

EMERGENCY PROCEDURES

Notify Radiation Safety Officer of all emergencies immediately at 628-777-6888.

1. If unusual sounds, liquids or smoke come from the unit, stop the unit immediately, safely remove the patient, and call supervisor, clinical engineering or vendor as appropriate. Red tag the unit.
2. Contact Radiation Safety if there is concern for overexposure to patients or staff.

GENERAL

3. Keep your radiation exposure "as low as reasonably achievable"
 - a. **Time:** Only have the radiation on for as long as necessary
 - b. **Distance:** Increase your distance from the radiation source when possible.
 - c. **Shielding:** Use lead aprons, thyroid collars, leaded goggles and mobile shields if possible.
4. Dosimetry badges are for those operating x-ray equipment, in high radiation areas or who might receive 10% of the annual limit.
 - a. Wear your badge at chest or collar level exterior to any x-ray protective garments
 - b. When not wearing your dosimeter, store it in a non-radiation area at work (not on a lead apron).
 - c. Take good care of your dosimeter and protect it from extreme humidity/temperature.
 - d. Check your radiation exposure at www.mylDR.com by entering the username "UCSFmedical" or "UCSFcampus" and the password "ALARA&me". Answer security questions for your results.
5. Pregnancy: If you are pregnant and work around radiation, please contact Radiation Safety for a confidential consultation on how to reduce radiation risks to you and your baby.
6. Training: Obtain training on the machine you are using, and take annual Radiation Safety training.

MACHINE OPERATOR INSTRUCTIONS

7. Machine Registration: Notify Radiation Safety of new, moved, replaced or disposed machines.
8. Maintenance: If the radiation output is affected, notify Radiation Safety to evaluate the machine.
9. Only individuals who possess a valid certificate/permit may operate the machine to image patients. For a non-human use machine, keep a current list of trained and authorized user.
10. Ensure non-essential personnel are cleared and essential personnel are adequately shielded.
11. Keep hands out of x-ray beam unless needed, then only with lead glove on beam exit side of patient.
12. Secure a machine from unauthorized use by password protection or key.
13. In an emergency a person can hold a patient during imaging, but must wear protective garments.
14. Shutter mechanisms and interlocks shall not be tampered with.
15. Audible or visible warning signals must automatically engage when x-rays are being generated.

HUMAN-USE FLUOROSCOPY-SPECIFIC INFORMATION

16. A physician with a valid fluoro permit (record in procedure note) must supervise each fluoro case.
17. Use cineradiography only when necessary, and take advantage of last-image hold.
18. Follow the 3-6-9 rule to discuss the risk/benefit of continued radiation at 3 Gy intervals. Saving a person's life is more important than limiting radiation exposure.
19. Perform weekly fluoro output checks and notify Radiation Safety if 25% from baseline.
20. Spacer cones must be used unless they would compromise the procedure.

See <http://safety.ucsf.edu/radiation-safety> for detailed information and Title 17 radiation regulations.

RADIATION SAFETY AND EMERGENCY PROCEDURES

FOR X-RAY AND CT

EMERGENCY PROCEDURES

Notify Radiation Safety Officer of all emergencies immediately at 628-777-6888.

1. If unusual sounds, liquids or smoke come from the unit, stop the unit immediately, safely remove the patient, and call supervisor, clinical engineering or vendor as appropriate. Red tag the unit.
2. Contact Radiation Safety if there is concern for overexposure to patients or staff.

GENERAL

3. Keep your radiation exposure "as low as reasonably achievable"
 - a. **Time:** Only have the radiation on for as long as necessary
 - b. **Distance:** Increase your distance from the radiation source when possible.
 - c. **Shielding:** Use lead aprons, thyroid collars, leaded goggles and mobile shields if possible.
4. Dosimetry badges are for those operating x-ray equipment, in high radiation areas or who might receive 10% of the annual limit.
 - d. Wear your badge at chest or collar level exterior to any x-ray protective garments
 - e. When not wearing your dosimeter, store it in a non-radiation area at work (not on a lead apron).
 - f. Take good care of your dosimeter and protect it from extreme humidity/temperature.
 - g. Check your radiation exposure at www.mylDR.com by entering the username "UCSFmedical" or "UCSFcampus" and the password "ALARA&me". Answer security questions for your results.
5. Pregnancy: If you are pregnant and work around radiation, please contact Radiation Safety for a confidential consultation on how to reduce radiation risks to you and your baby.
6. Training: Obtain training on the machine you are using, and take annual Radiation Safety training.

MACHINE OPERATOR INSTRUCTIONS

7. Machine Registration: Notify Radiation Safety of new, moved, replaced or disposed machines.
8. Maintenance: If the radiation output is affected, notify Radiation Safety to evaluate the machine.
9. Only individuals who possess a valid certificate/permit may operate the machine to image patients.
10. Ensure non-essential personnel are cleared and essential personnel are adequately shielded.
11. Keep hands out of x-ray beam unless needed, then only with lead glove on beam exit side of patient.
12. Secure a machine from unauthorized use by password protection or key.
13. In an emergency a person can hold a patient during imaging, but must wear protective garments.
14. Shutter mechanisms and interlocks shall not be tampered with.
15. Audible or visible warning signals must automatically engage when x-rays are being generated.

X-RAY AND CT-SPECIFIC INFORMATION

16. When repeat images are needed, the technologist will document the reason.
17. Use gonadal shielding whenever possible.
18. Perform daily QC on the equipment before imaging patients.
19. Limit the x-ray field to the area of interest.

See <http://safety.ucsf.edu/radiation-safety> for detailed information and Title 17 radiation regulations.

RADIATION SAFETY AND EMERGENCY PROCEDURES

FOR DEXA

EMERGENCY PROCEDURES

Notify Radiation Safety Officer of all emergencies immediately at 628-777-6888.

1. If unusual sounds, liquids or smoke come from the unit, stop the unit immediately, safely remove the patient, and call supervisor, clinical engineering or vendor as appropriate. Red tag the unit.
2. Contact Radiation Safety if there is concern for overexposure to patients or staff.

GENERAL

3. Keep your radiation exposure “as low as reasonably achievable”
 - a. **Time:** Only have the radiation on for as long as necessary
 - b. **Distance:** Increase your distance from the radiation source when possible.
 - c. **Shielding:** Use lead aprons, thyroid collars, leaded goggles and mobile shields if possible.
4. Dosimetry badges are for those operating x-ray equipment, in high radiation areas or who might receive 10% of the annual limit.
 - d. Wear your badge at chest or collar level exterior to any x-ray protective garments
 - e. When not wearing your dosimeter, store it in a non-radiation area at work (not on a lead apron).
 - f. Take good care of your dosimeter and protect it from extreme humidity/temperature.
 - g. Check your radiation exposure at www.mylDR.com by entering the username “UCSFmedical” or “UCSFcampus” and the password “ALARA&me”. Answer security questions for your results.
5. Pregnancy: If you are pregnant and work around radiation, please contact Radiation Safety for a confidential consultation on how to reduce radiation risks to you and your baby.
6. Training: Obtain training on the machine you are using, and take annual Radiation Safety training.

MACHINE OPERATOR INSTRUCTIONS

7. Machine Registration: Notify Radiation Safety of new, moved, replaced or disposed machines.
8. Maintenance: If the radiation output is affected, notify Radiation Safety to evaluate the machine.
9. Only individuals who possess a valid certificate/permit may operate the machine to image patients.
10. Ensure non-essential personnel are cleared and essential personnel are adequately shielded.
11. Never place your hand in the x-ray beam, unless necessary, and then only wearing a lead glove.
12. Secure a machine from unauthorized use by password protection or key.
13. In an emergency a person can hold a patient during imaging, but must wear protective garments.
14. Shutter mechanisms and interlocks shall not be tampered with.
15. Audible or visible warning signals must automatically engage when x-rays are being generated.

DEXA-SPECIFIC INFORMATION

16. Perform daily QC on the equipment before imaging patients
17. Optimize image quality and processing techniques
18. Limit the x-ray field to the area of interest
19. Prevent patient motion by giving clear instructions

See <http://safety.ucsf.edu/radiation-safety> for detailed information and Title 17 radiation regulations.

RADIATION SAFETY AND EMERGENCY PROCEDURES

FOR DENTAL MACHINES

EMERGENCY PROCEDURES

Notify Radiation Safety Officer of all emergencies immediately at 628-777-6888.

1. If unusual sounds, liquids or smoke come from the unit, stop the unit immediately, safely remove the patient, and call supervisor, clinical engineering or vendor as appropriate. Red tag the unit.
2. Contact Radiation Safety if there is concern for overexposure to patients or staff.

GENERAL

3. Keep your radiation exposure “as low as reasonably achievable”
 - a. **Time:** Only have the radiation on for as long as necessary
 - b. **Distance:** Increase your distance from the radiation source when possible.
 - c. **Shielding:** Use lead aprons, thyroid collars, leaded goggles and mobile shields if possible.
4. Dosimetry badges are for those in high radiation areas or who might receive 10% of the annual limit.
 - d. Wear your badge at chest or collar level exterior to any x-ray protective garments
 - e. When not wearing your dosimeter, store it in a non-radiation area at work (not on a lead apron).
 - f. Take good care of your dosimeter and protect it from extreme humidity/temperature.
 - g. Check your radiation exposure at www.mylldr.com by entering the username “UCSFmedical” or “UCSFcampus” and the password “ALARA&me”. Answer security questions for your results.
5. Pregnancy: If you are pregnant and work around radiation, please contact Radiation Safety for a confidential consultation on how to reduce radiation risks to you and your baby.
6. Training: Obtain training on the machine you are using, and take annual Radiation Safety training.

MACHINE OPERATOR INSTRUCTIONS

7. Machine Registration: Notify Radiation Safety of new, moved, replaced or disposed machines.
8. Maintenance: If the radiation output is affected, notify Radiation Safety to evaluate the machine.
9. Only individuals who possess a valid certificate/permit may operate the machine to image patients.
10. Ensure non-essential personnel are cleared and essential personnel are adequately shielded.
11. Never place your hand in the x-ray beam, unless necessary, and then only wearing a lead glove.
12. Secure a machine from unauthorized use by password protection or key.
13. In an emergency a person can hold a patient during imaging, but must wear protective garments.
14. Shutter mechanisms and interlocks shall not be tampered with.
15. Audible or visible warning signals must automatically engage when x-rays are being generated.

DENTAL-SPECIFIC INFORMATION

16. Perform daily QC on the equipment before imaging patients.
17. Optimize image quality and processing techniques.
18. Prevent patient motion by giving clear instructions.
19. These devices usually don’t put off enough radiation to require staff to wear personal dosimetry badges. Contact Radiation Safety if you are concerned about exposure risks.

See <http://safety.ucsf.edu/radiation-safety> for detailed information and Title 17 radiation regulations.

RADIATION SAFETY AND EMERGENCY PROCEDURES

FOR CABINET X-RAY/X-RAY IRRADIATORS

EMERGENCY PROCEDURES

Notify Radiation Safety Officer of all emergencies immediately at 628-777-6888.

1. If unusual sounds, liquids or smoke come from the unit, or if you believe the shielding integrity may be compromised by an accidental impact, stop the unit immediately, and call supervisor, clinical engineering or vendor as appropriate. Red tag the unit.
2. Contact Radiation Safety if there is concern for overexposure.

GENERAL

3. Keep your radiation exposure “as low as reasonably achievable”
 - h. **Time:** Only have the radiation on for as long as necessary.
 - i. **Distance:** Increase your distance from the radiation source when possible.
 - j. **Shielding:** The unit provides adequate shielding when not compromised.
4. Pregnancy: If you are pregnant and work around radiation, please contact Radiation Safety for a confidential consultation on how to reduce radiation risks to you and your baby.
5. Training: Obtain training on the machine you are using, and take annual Radiation Safety training.

MACHINE OPERATOR INSTRUCTIONS

6. Machine Registration: Notify Radiation Safety of new, moved, replaced or disposed machines.
7. Maintenance: If the radiation output is affected, notify Radiation Safety to evaluate the machine.
8. Secure a machine from unauthorized use by password protection or key.
9. Shutter mechanisms and interlocks shall not be tampered with.
10. Audible or visible warning signals must automatically engage when x-rays are being generated.

MACHINE-SPECIFIC INFORMATION

11. Cabinet units and x-ray irradiators are well shielded while the chamber door is closed, providing adequate protection from radiation exposure, and do not put off enough radiation to require staff to wear personal dosimetry badges. Contact Radiation Safety if you are concerned about exposure risks.
12. Operation of the unit must be under the control of a timer.

See <http://safety.ucsf.edu/radiation-safety> for detailed information and Title 17 radiation regulations.

RADIATION SAFETY AND EMERGENCY PROCEDURES

FOR ELECTRON MICROSCOPES, NON-HUMAN USE DEXA AND X-RAY

DIFFRACTION

EMERGENCY PROCEDURES

Notify Radiation Safety Officer of all emergencies immediately at 628-777-6888.

1. If unusual sounds, liquids or smoke come from the unit, stop the unit immediately, and call supervisor, clinical engineering or vendor as appropriate. Red tag the unit.
2. Contact Radiation Safety if there is concern for overexposure.

GENERAL

3. Keep your radiation exposure "as low as reasonably achievable"
 - a. **Time:** Only have the radiation on for as long as necessary
 - b. **Distance:** Increase your distance from the radiation source when possible.
 - c. **Shielding:** Use lead aprons, thyroid collars, leaded goggles, ring dosimeter and mobile shields if recommended by the manufacturer or Radiation Safety.
4. Dosimetry badges are for those in high radiation areas or who might receive 10% of the annual limit.
 - a. Wear your badge at chest or collar level exterior to any x-ray protective garments, ring dosimeter on a dominant hand that might come into close proximity with the direct beam.
 - b. When not wearing your dosimeter, store it in a non-radiation area at work (not on a lead apron).
 - c. Take good care of your dosimeter and protect it from extreme humidity/temperature.
 - d. Check your radiation exposure at www.myldr.com by entering the username "UCSFmedical" or "UCSFcampus" and the password "ALARA&me" followed by account and serial numbers.
5. Pregnancy: If you are pregnant and work around radiation, please contact Radiation Safety for a confidential consultation on how to reduce radiation risks to you and your baby.
6. Training: Obtain training on the machine you are using and take annual Radiation Safety training.

MACHINE OPERATOR INSTRUCTIONS

7. Machine Registration: Notify Radiation Safety of new, moved, replaced or disposed machines.
8. If maintenance/modification could affect the radiation output notify Radiation Safety for evaluation.
9. Ensure non-essential personnel are cleared and essential personnel are adequately shielded.
10. Secure a machine from unauthorized use by password protection or key.
11. Shutter mechanisms and interlocks shall not be tampered with.
12. Audible or visible warning signals must automatically engage when x-rays are being generated.

ELECTRON MICROSCOPE SPECIFIC INFORMATION

13. These devices are well shielded to protect from radiation exposure and usually don't put off enough radiation to require staff to wear personal dosimetry badges. Contact Radiation Safety if you are concerned about exposure risks.
14. A potential source of x-ray exposure is the viewing port. If cracked or broken it should be replaced with similar glass to ensure continued protection.

X-RAY DIFFRACTION SPECIFIC INFORMATION

15. Caution - Exposure to high intensity x-ray beam is possible in x-ray diffraction machines if the safety controls/device are compromised and/or a user is not properly trained.
16. Some devices are well shielded to protect from radiation exposure and usually don't put off enough radiation to require staff to wear personal dosimetry badges. Contact Radiation Safety if you are concerned about exposure risks.

DEXA PIXImus SPECIFIC INFORMATION

17. When the x-ray unit is active, maintain a distance of 6' or more from Lunar PIXImus to reduce radiation exposure.

See <http://safety.ucsf.edu/radiation-safety> for detailed information and Title 17 radiation regulations.

RADIATION SAFETY AND EMERGENCY PROCEDURES

FOR MAMMOGRAPHY

EMERGENCY PROCEDURES

Notify Radiation Safety Officer of all emergencies immediately at 628-777-6888.

1. If unusual sounds, liquids or smoke come from the unit, stop the unit immediately, safely remove the patient, and call supervisor, clinical engineering or vendor as appropriate. Red tag the unit.
2. Contact Radiation Safety if there is concern for overexposure to patients or staff.

GENERAL

3. Keep your radiation exposure “as low as reasonably achievable”
 - a. **Time:** Only have the radiation on for as long as necessary
 - b. **Distance:** Increase your distance from the radiation source when possible.
 - c. **Shielding:** Use lead aprons, thyroid collars, leaded goggles and mobile shields if possible.
4. Dosimetry badges are for those operating x-ray equipment, in high radiation areas or who might receive 10% of the annual limit.
 - a. Wear your badge at chest or collar level exterior to any x-ray protective garments
 - b. When not wearing your dosimeter, store it in a non-radiation area at work (not on a lead apron).
 - c. Take good care of your dosimeter and protect it from extreme humidity/temperature.
 - d. Check your radiation exposure at www.mylDR.com by entering the username “UCSFmedical” or “UCSFcampus” and the password “ALARA&me”. Answer security questions for your results.
5. Pregnancy: If you are pregnant and work around radiation, please contact Radiation Safety for a confidential consultation on how to reduce radiation risks to you and your baby.
6. Training: Obtain training on the machine you are using, and take annual Radiation Safety training.

MACHINE OPERATOR INSTRUCTIONS

7. Machine Registration: Notify Radiation Safety of new, moved, replaced or disposed machines.
8. Maintenance: If the radiation output is affected, notify Radiation Safety to evaluate the machine.
9. Only individuals who possess a valid certificate/permit may operate the machine to image patients.
10. Ensure non-essential personnel are cleared and essential personnel are adequately shielded.
11. Keep hands out of x-ray beam unless needed, then only with lead glove on beam exit side of patient.
12. Secure a machine from unauthorized use by password protection or key.
13. In an emergency a person can hold a patient during imaging, but must wear protective garments.
14. Shutter mechanisms and interlocks shall not be tampered with.
15. Audible or visible warning signals must automatically engage when x-rays are being generated.

MAMMOGRAPHY-SPECIFIC INFORMATION

16. When repeat images are needed, the technologist will document the reason.
17. Perform daily QC on the equipment before imaging patients.
18. Limit the x-ray field to the area of interest.

See <http://safety.ucsf.edu/radiation-safety> for detailed information and Title 17 radiation regulations.

RADIATION SAFETY AND EMERGENCY PROCEDURES

FOR MOBILE UNITS (X-RAY AND MINI C-ARM)

EMERGENCY PROCEDURES

Notify Radiation Safety Officer of all emergencies immediately at 628-777-6888.

1. If unusual sounds, liquids or smoke come from the unit, stop the unit immediately, safely remove the patient, and call supervisor, clinical engineering or vendor as appropriate. Red tag the unit.
2. Contact Radiation Safety if there is concern for overexposure to patients or staff.

GENERAL

3. Keep your radiation exposure "as low as reasonably achievable"
 - a. **Time:** Only have the radiation on for as long as necessary
 - b. **Distance:** Increase your distance from the radiation source when possible.
 - c. **Shielding:** Use lead aprons, thyroid collars, leaded goggles and mobile shields if possible.
4. Dosimetry badges are for those operating x-ray equipment, in high radiation areas or who might receive 10% of the annual limit.
 - a. Wear your badge at chest or collar level exterior to any x-ray protective garments
 - b. When not wearing your dosimeter, store it in a non-radiation area at work (not on a lead apron).
 - c. Take good care of your dosimeter and protect it from extreme humidity/temperature.
 - d. Check your radiation exposure at www.mylDR.com by entering the username "UCSFmedical" or "UCSFcampus" and the password "ALARA&me". Answer security questions for your results.
5. Pregnancy: If you are pregnant and work around radiation, please contact Radiation Safety for a confidential consultation on how to reduce radiation risks to you and your baby.
6. Training: Obtain training on the machine you are using, and take annual Radiation Safety training.

MACHINE OPERATOR INSTRUCTIONS

7. Machine Registration: Notify Radiation Safety of new, moved, replaced or disposed machines.
8. Maintenance: If the radiation output is affected, notify Radiation Safety to evaluate the machine.
9. Only individuals who possess a valid certificate/permit may operate the machine to image patients. For a non-human use machine, keep a current list of trained and authorized user.
10. Ensure non-essential personnel are cleared and essential personnel are adequately shielded.
11. Keep hands out of x-ray beam unless needed, then only with lead glove on beam exit side of patient.
12. Secure a machine from unauthorized use by password protection or key.
13. In an emergency a person can hold a patient during imaging, but must wear protective garments.
14. Shutter mechanisms and interlocks shall not be tampered with.
15. Audible or visible warning signals must automatically engage when x-rays are being generated.

MOBILE X-RAY/MINI C-ARM SPECIFIC INSTRUCTIONS

16. Only use mobile units in an area cleared of all nonessential personnel. In no case shall nonessential personnel be closer than 6 feet to the mobile unit.
17. The operator shall ensure that all persons within 6 feet wear a protective apron or step behind an adequate shield.
18. The operator shall clearly announce to all in the area every time x-ray is generated.
19. For mini c-arms only:
 - a. A physician with a valid fluoro permit must directly supervise each mini c-arm case.
 - b. Whenever possible, position the x-ray tube on the opposite site of the patient from essential personnel.
 - c. Spacer cones must be used unless they would compromise the procedure.
 - d. Perform weekly fluoro output checks for mini c-arms and notify Radiation Safety if 25% from baseline.

See <http://safety.ucsf.edu/radiation-safety> for detailed information and Title 17 radiation regulations.