

**King Abdulaziz University
Faculty of Dentistry**

Radiology Policy & Procedure Clinical Manual

October 2009

Oral Radiology Clinics Division

This division shall be operated by the radiology division of the faculty. The division provides the oral radiographic service for all patients who require treatment within the faculty. The division also serves to provide practical demonstration for the students and other categories of workers who require training in dental radiography. The Division shall be headed by a senior faculty member from the oral radiology division of the faculty.

The main oral radiology clinics are located on the ground level of building 11; an extension of this division is present at the Female Clinical area. The clinics are equipped with (8) Panoramic and/or Cephalometric Units, (31) wall-mounted X-ray machines and several automatic film processing units which are located in different clinical areas.

Students are taught the art, science and the practical aspects of dental radiology and they are expected to perform many radiographic examinations of their patients throughout their clinical training period.

All rooms or areas where radiation-producing equipment is used are posted with this sign.



(Magenta or black with a yellow background)

Radiation Protection at Oral Radiology Clinics of the Faculty of Dentistry

To minimize the biological effects of radiation, special rules and regulations are set forth for individuals occupationally exposed to radiation. The amount of radiation received by persons exposed occupationally should not exceed the dosages specified in the National Guidelines for Protection against Ionizing Radiation (from King Abdulaziz City for Science and Technology KACST). These regulations and other information are available at <http://www.kacst.edu.sa>.

There is, in general, minimal external radiation hazard to personnel from procedures involving radiation. Adherence to guidelines contained in this manual will help all x-ray equipment operators keep their exposures as low as reasonably achievable (ALARA), and for most students and staff members should reduce radiation exposures to levels allowable for individual members of public or in some cases, to levels indistinguishable from natural background.

Radiation safety services are provided for the Faculty of Dentistry by the KAU Radiation Safety Committee. These services include the oversight and administration of the personnel monitoring program, area surveys and x-ray equipment inspections, and training of employees. Questions regarding safety may be directed to the following Radiation Safety Officers (RSO):

Dr. Emad Khan (KAUFD RSO) at Ext. 20017, or
KAU RSO at Ext. 68280
(KAU Radiation Safety can be reached after normal working hours via Civil Defense emergency number at 998).

All operators of x-ray machines are responsible for following radiation safety procedures described in this manual.

Dose Limits/Monitoring Requirements

The average annual dose of a radiation worker at KAU Faculty of Dentistry is **less than 100 millirem**. A radiation worker is required to be monitored if he/she is **likely** to receive in excess of 10% of the dose limits. Those dose limits are:

<i>Whole Body:</i>	<i>5,000 millirem/year</i>	<i>50 mSv</i>
<i>Lens of Eye:</i>	<i>15,000 millirem/year</i>	<i>150 mSv</i>
<i>Skin/Extremities:</i>	<i>50,000 millirem/year</i>	<i>500 mSv</i>
<i>Fetus:</i>	<i>500 millirem/gestation</i>	<i>0.5 mSv/month</i>

An individual member of the public is allowed only 100 millirem per year from all licensed and registered radiation activities. Keep in mind, however, that the average Saudi citizen receives about 360 millirem of radiation each year from “background” radiation sources and medical procedures. (That’s the equivalent of about 36 chest x-rays!)

Personnel radiation monitoring will be offered to those individuals who frequently make exposures or supervise radiography students and request such service. Radiation exposure is monitored with a TLD (Thermo-Luminescence Dosimeter) (badge). If assigned a badge:

- Always wear the badge when working around radiation sources and make sure it is the badge assigned to you.
- Wear the badge on your collar. If you wear a lead apron, the badge shall be worn outside of the apron.
- When not in use, store badges at work in a low radiation area, do not wear your badge outside of the work place.

The control badge shall also be stored in a radiation-free area. An assigned radiologic technologist is responsible for the exposure records and exchanging the badges.

Action levels have been set which trigger investigations to determine if the exposures were as low as reasonably achievable. If not, recommendations are made to ensure that future exposures are ALARA.

Try to keep your personal radiation exposure as low as you can. Be aware of where you are standing and how long you stay in the radiation area. **Do not enter or remain in a radiation area unless it is necessary.** If you suspect there has been an excessive exposure or radiation incident, immediately notify the RSO.

Guidelines for Safe Operation of X-Ray Equipment

- All radiographs shall be prescribed by faculty members and/or graduate students holding the B.D.S. degree (or equivalent) and who are licensed to practice dentistry within the Faculty of Dentistry.
- Only properly completed radiographic request forms will be honored. For a request form to be valid, all spaces shall be filled in when applicable and shall be signed by requesting dentist. Any invalid request shall be denied.
- All request forms will be signed and kept with the radiology technician after image acquisition and delivery.
- Requesting dentist should ensure a progress note entry for every requested image.
- Only qualified and authorized persons shall expose patients to ionizing radiation. Students who have obtained radiographic pre-clinical competence will be allowed under faculty supervision. Students shall be closely supervised by faculty or staff during all clinical radiographic procedures conducted on patients. Exposures shall be made only after faculty authorization. The retaking of radiographs shall be authorized and supervised by a faculty member.
- Patients shall not be subjected to retakes to satisfy technical perfection.
- Students shall not serve as live technique mannequins and shall not expose each other unless clinically indicated.
- Patients shall not be subjected to administrative radiographs prior to initial screening and consultation.
- Radiographs shall be limited to the minimum number needed to obtain diagnostic information required for the patient's dental needs and should follow ADA/FDA guidelines for prescribing dental radiographs (selection criteria).
- For pregnant women, the same guidelines as with other patients shall be applied, using an appropriate leaded apron and technique.
- A lead apron with thyroid collar shall be used for all children.
- Thyroid collar is contra-indicated for panoramic radiography.
- The x-ray equipment in this facility was installed following the manufacturer's specifications. Do not alter, tamper with, or remove any of the filters or collimators, or in any way cause needless radiation exposure.
- We have established a restricted area(s) in the room in which the x-ray equipment is located when the machine is in operation. The restricted area(s) is (are) always inside the operatories or immediately adjacent to the source. There are signs found next to the exposure controls providing appropriate operational instructions.

- Do not allow anyone in the room with the patient during an x-ray examination. Use mechanical holding devices when a patient or the image receptor must be held. If other persons are needed for the examination, they **must** wear a protective lead apron. They must follow safe radiation procedures and keep out of the direct beam. The protective equipment is stored in every x-ray room and operator. Note: A lead apron of 0.25 mm lead equivalence will reduce scattered x-rays by 95%. Individuals who hold patients will be selected on the basis of skill and number of times they have held patients. The same person is not allowed to regularly hold patients, should not be pregnant or potentially pregnant, and is over the age of 18.
- Never hold the tube housing or the support housing during any exposure. The tube housing must not drift or move during the exposure. If a problem with stability of the suspension arm develops, notify the RSO.
- Stay in the control booth (station, behind the barrier, etc.) during each exposure. Always maintain visual and aural contact with the patient through the leaded glass, or mirror by providing the appropriate instructions. When operating mobile equipment, the operator should stand as far as possible (at least 6 feet) from the patient.
- For extraoral systems restrict the x-ray beam to the area of clinical interest. The beam size must not be larger than the image receptor.
- Use the technique chart or manual to determine proper exposure (time, kilovoltage, etc.). Don't depend on memory for the proper technique. The technique chart should be updated as needed.
- Portable or mobile equipment shall be used only for examinations where it is impractical for medical reasons to transfer the patient to a stationary radiographic installation.
- Film processing shall take place using the time/temperature processing method and shall be monitored on a daily basis to assure film quality. Digital imaging equipment shall be monitored on a regular basis to assure image quality.
- All significant data derived from radiographs shall be entered in the file of the patient. All radiographs shall be identified with patient's name, dated, mounted and filed in the patient's chart as they become available.

Fetal Protection Policy

King Abdulaziz University has adopted a policy to protect the fetus/embryo of pregnant employees exposed to ionizing radiation in their work. Regulations limit the occupational dose to pregnant women to 500 millirems over the course of the pregnancy if the worker declares her pregnancy in writing to the employer.

If an employee decides to declare her pregnancy, she should notify her supervisor who will arrange for her to meet with the RSO to discuss possible precautions to limit radiation exposure. The RSO will review work assignments and radiation exposure history, and may recommend limitations in work assignment if necessary. A radiation monitor will be assigned, with radiation exposures to be reviewed monthly.

Important!

Report any unusual or unsafe condition involving radiation to the Radiation Safety Officer (RSO) at 68280. Any non-emergency questions during normal duty hours may be directed to the RSO or either Dr. Emad Khan or Dr. Soad Mansour at 20017. KAU Radiation Safety Committee can be reached after normal working hours through Civil Defense emergency number at 998.

Use Time, Distance and Shielding, to keep your radiation exposure **As Low As Reasonably Achievable**.

A copy of the National Regulation for Protection against Ionizing Radiation is always available for review in the RSO office.

The KAU Faculty of Dentistry x-ray registrations, regulations, inspection reports and exposure reports are available for review in the KAU University Radiation Safety Committee.