Medical College of Georgia
School of Dentistry

Radiation Use Policy

The following policy has been developed in the interest of establishing a consistent standard concerning the use of ionizing radiation within the School of Dentistry. This radiation use policy complies with the Federal Radiation Control for Health and Safety Act of 1969, the Consumer-Patient Radiation Health and Safety Act of 1981 and the Rules and Regulations for X-rays of the Georgia Department of Human Resources. The primary goal of this policy is to assure the safe effective use of ionizing radiation and to minimize the potential risk from adverse biological effects to patients, students, faculty, and staff.

1. Deliberate exposure of an individual to dental radiographic procedures for training or demonstration purposes shall not be permitted unless there is a documented diagnostic need for the exposure by a member of the Medical College of Georgia School of Dentistry faculty.
2. No operator (faculty, student or dental auxiliary) shall hold the film in place for the patient during the exposure. The use of film holding devices, bite tabs, or other positioning devices should be used to position the film during exposure.
3. The operator must stand at least 1.8 meters (6 feet) from the patient and behind the barrier provided for each x-ray exposure cubicle in the School of Dentistry. The operator shall be positioned outside the path of the useful beam and be able to directly observe the patient during each exposure.
4. The tube housing, the cone, or the position indicating device must never be hand held during the exposure. If equipment is not stable, report the problem to the radiation protection supervisor for the School of Dentistry, and use another unit.
5. Radiographic machines designed for use with an intraoral image receptor shall limit the source-to-skin distance to not less than 18 centimeters (7 inches).
6. Only shielded open-end position indicating devices will be used in order to minimize scatter radiation.
7. When a cylindrically collimated x-ray machine is being used, the circular beam shall be limited to no larger than 7.0 centimeters (2.75 inches) at the end of the cylinder. When rectangular collimation is used, the useful beam at the end of the collimator shall not have a diagonal measurement of greater than 7.0 centimeters (2.75 inches).
8. Only film of ANSI (ASA) speed group rating of "D" or faster shall be used. "F" speed film or Digital Receptors are preferred.
9. Each dental x-ray machine shall contain filtration of 2 mm of aluminum equivalent if operated at less than 70 kilovolt peak (kVp), and 2.5 mm of aluminum equivalent if operating at 70 kVp or above.
10. Leaded aprons will be used on all x-ray patients of the Medical College of Georgia School of Dentistry as an additional precaution to prevent unnecessary scatter radiation exposure to the body of the patient. Thyroid shields shall be used in all situations, except when diagnostic information will be lost by their use (panoramic and some extraoral radiographic procedures).
11. Periodic radiation protection surveys and inspections will be made by the radiation safety officer, Medical College of Georgia. All recommendations by the radiation safety officer concerning collimation, filtration (HVL), beam alignment, roentgen output, radiation leakage, etc., will be implemented immediately.
12. All operators will follow prescribed exposure techniques. Appropriate exposure procedures and values will be mounted on the wall of each x-ray exposure cubicle. Instructions for processing x-ray film will be displayed in each darkroom or processing area. Films will be processed using time-temperature processing procedures when using manual processing or automatic film processing equipment. If radiographic density is inappropriate (film is not diagnostic), the exposure technique and the processing procedure will be evaluated and corrected immediately by the faculty dentist or supervising staff member on duty.

13. As a general policy, all newly admitted patients to the School of Dentistry must have adequate oral and maxillofacial radiographic examinations to assist in diagnosis prior to treatment in the school's clinics. In all situations, the need for radiographs shall be determined by using high-yield selection criteria as the basis of professional judgment. The following shall be adhered to in regards to criteria for exposure:
    a. All radiographs shall be prescribed in writing by a licensed dentist.
    b. Radiographs ordered on a routine basis or for screening purposes will not be permitted.
    c. A radiographic examination shall not be ordered before the patient's medical and dental history has been reviewed and an initial extraoral and intraoral evaluation has been completed.
    d. If prior radiographs are available, they should be evaluated by a faculty member before new radiographs are prescribed. Only those additional views needed for complete diagnosis and treatment planning should be exposed. The faculty member will determine if sufficient time has passed, since the patient's last radiographic examination, to warrant a new examination.
    e. Radiographs should be made only on patients capable of compliance or under appropriate sedation.
    f. Subsequent follow-up (recall) radiographic examinations for School of Dentistry patients will be based on the diagnostic need of the patient as determined by the faculty dentist after a thorough health history review and oral examination of the patient.
    g. Radiographs obtained for administrative purposes only, including those for insurance claims or legal proceeding, should not be made.
    h. Radiographs of patients shall not be made merely for the purpose of training or demonstration.
    i. The following shall apply to dental board examination patients:
        1) Request for radiographs for all board examination patients shall be signed by a licensed dentist.
        2) Radiographs should not be made for testing purposes alone. Radiographs acquired should contribute to the proper diagnosis and treatment of the patient.
        3) Radiographs made on site for, or as part of, board examinations shall be made in compliance with the Medical College of Georgia School of Dentistry's radiation use guidelines.
        4) The type and number of radiographs needed shall be dictated by the oral and maxillofacial disease clinically evident or suggested by the history or other tests.
        5) Radiographs should not be required at specific time intervals to document treatment progress for board certification purposes. Rather, the clinical progress as monitored by the candidate (and his or her mentor in the case of a student) should be used as a guide to the need for radiographs.
    j. Newly admitted adult patients will generally receive a radiographic examination to determine a base-line for the patient. This may include a panoramic radiograph, bitewings, selected periapicals, or a series of full mouth radiographs (FMX).
    k. Edentulous patients may receive a complete edentulous periapical series, a panoramic radiograph, or a combination of occlusal and periapical radiographs as deemed appropriate by the faculty dentist. Nevertheless, edentulous surveys will usually contain fewer films than a comparable FMX of dentate patients.
    l. Patients under 12 years of age may receive a complete child periapical survey and bitewings, a panoramic radiograph with bitewings and selected periapical views (if indicated), bitewings only, bitewings and selected periapicals and occlusals, or no radiographs if none are indicated. The complete child periapical survey will vary depending on the age of the child; however, all child surveys will contain fewer films than the adult periapical survey.
    m. The radiation exposure of endodontic patients for pre-operative and post-operative radiographs will be kept to a minimum level consistent with clinical requirements. The limits of exposure in each case will be determined by the professional judgment of the faculty dentist. Where possible, a single radiograph at each stage of the endodontic procedure will be acquired. Multiple radiographs from different angles may

be acquired on a restricted basis and only when the information to be gained is considered to significantly enhance the diagnosis and treatment. When multi-angle projections are required, documentation of their need will be made in the treatment record by the supervising faculty.

n. Emergency patients will receive only those radiographs needed to diagnosis and treat the immediate emergency problem.

o. The Dental Radiographic Selection Criteria Panel's recommendations shall be followed in regards to radiographic examination of pregnant patients. Quoting directly, "Accordingly, there appears to be no rationale to preclude a properly justified dental radiographic examination because of pregnancy. In some cases, radiography may be arbitrarily deferred during pregnancy for purely psychological reasons." Appropriate protective shielding of the patient will always be used.

14. Radiation monitoring of operator exposure will include the following:

    a. All members of the faculty and staff who regularly use x-ray equipment will wear film badge monitors at all times while at work.

    b. Records of monthly, quarterly, yearly, and total cumulative exposures will be kept as a permanent record and will be available for inspection by the employee.

    c. These employees should not receive more than 50 mSv (5 rem) each year, the radiation protection guide value. Quarterly readings above 10 percent of the radiation protection guide or 1.25 mSv (125 mrem) will be investigated.

    d. Operators who are pregnant should not be exposed to more than 5 mSv (500 mrem) during the term of their pregnancy.

15. Documentation of all radiographs and radiation exposures will be maintained in the patient's record. The patient's treatment record should include the date, prescription detailing type and number of radiographs and any remakes necessary. The number of radiographs acquired should also be entered into the radiographic log sheet.

16. All intraoral radiographs will be mounted and labeled with the patient's name and date exposed. No loose or unmounted intraoral radiographs will be stored in the patient's chart. All extraoral radiographs will be labeled with the patients name, the date exposed, the patient's date of birth and the right/left side orientation.

17. The School of Dentistry will have a Quality Assurance Program designed to produce radiographs of consistently high quality with minimal exposure. This program will consist of the following:

    a. Projection Techniques

        1) Before students will be allowed to acquire radiographs on a patient, they will have didactic instruction in oral and maxillofacial radiology plus laboratory instruction in acquiring radiographs on a mannequin.

        2) There will be direct supervision of all students during their first clinical experiences in radiology.

        3) All radiographs will be reviewed for errors by departmental faculty or staff immediately after they have been processed. When practical, the patient will not be dismissed until indicated remakes have been completed. Students who must remake 4 or more films will be directly supervised and instructed by faculty and / or appropriate staff member.

        4) A variable intensity illuminator ("hot light") will be used so that radiographs with greater density than optimally diagnostic may be viewed without necessitating a remake.

        5) Film holders and alignment devices will be used to aid students in the correct alignment of the position indicating device, the film, and the area of interest.

    b. The x-ray equipment in the School of Dentistry will be inspected by members of the Radiation Safety Office at a frequency that complies with current federal and state regulations. The results of these tests and any corrective measures taken will be maintained by the School of Dentistry radiation supervisor. If during the routine use of any x-ray machine, an error is noted in its operation, the machine will immediately be put out of service until the appropriate corrective repairs can be made. Any suspected

malfunction should be reported to the radiation supervisor so that appropriate corrective measures may be instituted.

c. All radiographic film will be stored in a refrigerator according to manufacturer's instructions, and used according to age sequence. Outdated film will not be used on patients and will be discarded according to current environmental regulations.

d. All radiograph processing systems shall be maintained and operated in such a manner that insures optimum diagnostic quality of radiographs. The following information shall be maintained for each automatic processor or manual developing system:

   1) The correct processing time and temperature.

   2) A description of daily solution evaluation and maintenance activities, including replenishment, solution change, and cleaning.

   3) Dates and description of any repairs, upgrades, or relocation of the processor.

   4) Charted densities taken from sensitometer images.

e. Disposal of radiographic waste shall comply with current environmental regulations. Specifically, this includes the following:

   1) Lead foil from intraoral radiographs will be collected and disposed of through the institutional hazardous waste management program.

   2) Fixer, a processing chemical, will be collected and disposed of through the institutional hazardous waste management program. This will apply to all processors except those that have silver recovery units attached to the fixer discharge.

18. Radiographic procedures will be completed following institutional infection control guidelines. All patients will be treated as potentially infectious and the following will be adhered to:

    a. Since potentially infectious patients may have no evidence of a problem, the patient's medical history will be evaluated for indications of infectious disease.

    b. Protective gloves, masks, and eye wear will be worn during film and tube placement and during film processing to minimize risks to the operator and the patient.

    c. Operators will wash their hands as they enter the clinic and after removing their gloves to handle processed radiographs, film mounts, and records.

    d. Supplies and film packets will be kept on a covered work surface. Charts and other types of forms will be kept away from the work area.

    e. Film holders will be sterilized prior to patient use and left unopened until the procedure begins. Disposable items and supplies will be used whenever practical.

    f. The control panel, tubehead, exposure button, and position indicating device will be covered with disposable plastic wrap. Any other surface likely to be touched during the radiographic examination will also be covered. At the completion of the procedure, all surfaces will be wiped down with 0.5 percent sodium hypochlorite or an equivalent disinfectant.