ARIZONA COLLEGE

RADIATION SAFETY POLICY

Effective: August 1, 2009
Updated: April 15, 2015

PURPOSE

To establish protocols designed to minimize radiation exposure to patients and operators; to promote sound radiological health practices, and to promote proper infection control during radiographic procedures

GENERAL POLICY

The responsibility for clinical radiation safety and infection control lies with every individual involved with diagnostic radiology including faculty, students, clinical staff and other individuals who are responsible for the proper use and maintenance of radiation equipment and supplies (including film, darkrooms and processors). The ultimate goal of this policy is to operate under the ALARA concept (As Low As is Reasonably Achievable) with regard to radiation exposure. The principles of infection control as applied to clinical radiology and described in this policy shall be utilized in all laboratory/clinical areas.

IMPLEMENTATION

I. General Radiation Safety Issues

A. Compliance Statement: The policies and criteria outlined herein adhere to both Federal and Arizona State regulations of Radiation Protection and adopt the principles of the FDA Guidelines for Radiographic Examinations. It shall be the obligation of all students and staff at Arizona College who are involved in diagnostic radiology to:

- adhere to accepted protocols for the safe operation of radiologic equipment and supplies for their own protection and for the protection their patients.
- follow sound and logical radiological health practices and to report any suspected health hazards to the proper administrative authority.
- adhere to the infection control policy of the school during radiographic procedures.

B. Responsibility for monitoring radiation safety is placed on the Safety Coordinator

. The Coordinator is responsible for implementation of radiation safety measures and controls thereof. Annual inspections are performed including but not limited to:

- Measurements of radiation in controlled and non-controlled areas.
- Performance of x-ray units in respect to State and Federal regulatory codes.
- Identification of non-compliance with program policy or regulatory codes.
- Evaluation of radiological safety programs by observing their effectiveness in providing protection and the level of compliance.

C. Authorized Users: The use of diagnostic x-ray equipment shall be restricted to those individuals described in this section.

Students and faculty: The operation of x-ray equipment by students is authorized but limited to the following restrictions:

- The operator shall have Arizona State Radiology Certification.
- The x-ray exposures shall be authorized by a clinical instructor
- A clinical instructor shall approve the quality of the radiograph as evidenced by the instructor's signature on the record.

D. Radiation Protection Standards Occupational doses for individuals are:

- an annual limit is to be the more limiting of: total effective dose equivalent being equal to 5 rem (0.05 Sv)i or the dose equivalent to any organ, tissue, or extremity (other than the lens of the eye) being equal to 50 rem (0.5 Sv). The annual dose equivalent limit to the eye will become 15 rem (0.15 Sv).
- A pregnant worker should voluntarily declare her pregnancy in writing to her employer/campus director and include her estimated date of conception. The embryo/fetus should not receive a dose equivalent greater than 0.5 rem (50 mSv) during the entire pregnancy. Special dosimeters can be provided to declared pregnant workers to evaluate fetal doses.
- occupationally exposed minors (under 18 years of age) should not receive an dose equivalent in excess of 0.5 rem (50 mSv) Monitoring will be required for any individual who could potentially receive a dose in excess of 10% of any applicable limits. Any individual monitoring device used for monitoring the dose to the whole body shall be worn at the unshielded location of the whole body likely to receive the highest exposure. When a protective apron is worn, the location of the individual monitoring device is typically at the neck (collar). Any additional individual monitoring device used for monitoring the dose to an embryo/fetus of a declared pregnant woman shall be located at the waist under any protective apron being worn by the woman.

II. Guidelines for Prescribing Dental Radiographs

A. General Principles: The goal of every radiographic examination will be to seek information which will influence the diagnosis and treatment of the patient,

thereby providing a benefit which otherwise could not be realized. The exposure of each patient will be as individualized as feasible. There shall be no "routine" radiographic examination. Radiographic examinations shall be carried out solely based on clinical indications. Radiographs shall not be taken solely for legal, documentary, teaching, or administrative purposes. To minimize unnecessary radiation to the patient, previous radiographs of the patient should be obtained. These will serve as important guides for the ordering of new radiographs and to provide a better understanding of disease progress.

B. Prescription Guidelines: The Guidelines for prescribing dental radiographs are based on the recommendations issued by U.S. Department of Health and Human Services, Public Health Service, F.D.A., and shown in chart below.

III. Radiation Protection Measures for Patients and Personnel

A. Patient Protection from Ionizing Radiation

• The authorized user shall employ those operating parameters (kVp, mA, exposure time, film screen combinations, and collimation), which result in the lowest possible radiation dose to the patient and still produce desired diagnostic information.
• A lead impregnated apron is recommended to shield the trunk of the body and the gonads of the patient. The lead equivalent of the apron should be at least 0.25 mm.
• A thyro-cervical shield is recommended to protect the patient's neck when the use of it does not interfere with the retrieval of diagnostic information. This shield shall be provided for children. when it will not interfere with the examination.
• Before any exposure is initiated the operator shall ensure that the tube head has its proper and stable position.
• Film holders with indicators for proper x-ray beam alignment are recommended for combination with these film holders.
• Retakes should be approved by a faculty supervisor and should be taken only for a valid clinical reason, not for the purpose of improving the esthetics of the radiograph.

B. Personnel Protection from Ionizing Radiation

• In no instance shall the x-ray operator or an assistant hand-hold a film during exposure.
• During each exposure the operator shall stand behind a protective barrier. Only the patient should be in the path of the useful beam.
• Neither the tube housing nor the cone shall be hand held during exposure.
• When a patient needs assistance or reassurance during exposure, then a third party, such as a member of the patient's family, may be allowed to stay in the x-ray room to assist with the procedure, provided that the individual is issued

appropriate protective devices and instructed to stay out of the path of the primary beam. The third party shall not be pregnant or under the age of eighteen.

C. Recording of Radiographic Procedures: An entry which includes the date and type of exposure shall be made in the Radiology Log of the patient's dental record for each radiographic procedure performed. Patient records shall be reviewed by the faculty with respect to record entries in the Radiology Log and in the progress notes. All films or film mounts shall be labeled with the patient's name and date of exposure and stored in the patient's record. All intraoral films are to be mounted and labeled. Large extra-oral films are to be labeled directly on the film using identification labels.

D. Facilities Management: The management of radiology equipment and facilities shall be in compliance with state law and Arizona College environmental health and safety policy as described in Appendix B. The Intraoral Dental X-ray Unit Test and Instructions (Form RSO 404) shall be used in the evaluation of facilities as displayed in Appendix C. Darkroom equipment and procedures: In addition to the regular maintenance of darkroom equipment and change of processing chemicals regular evaluations of the performance of the processing systems shall be undertaken. The Program Administrator shall keep logs of services on file.
Viewing facilities: It is the responsibility of each department to keep viewing equipment and facilities in an adequate operating condition.

E. Radiographic Image Quality Control: In an effort to maintain radiographic image quality at a high level, each radiographic examination shall include a critical review of image quality with respect to projection, exposure, and possible processing errors or artifacts. Remedial measures such as reinforcement of instructions, individual tutorials, etc., should be employed. All radiographs are reviewed by the student and a faculty member for errors. The need for retakes is determined by the diagnostic quality of the film. Retakes are limited to 4 films for a full mouth series, and a faculty member must supervise all patient retakes.

GUIDELINES FOR PRESCRIBING DENTAL RADIOGRAPHS

Modified after recommendations issued by U.S. Department of Health and Human Services, Public Health Service, Food & Drug Administration. The recommendations in this chart are subject to clinical judgment and may not apply to every patient. They are to be used by dentists only after reviewing the patient's health history and completing a clinical examination. The recommendations do not need to be altered because of pregnancy.

ADULTS

Radiographs of recent date (1-2 years old) of sufficient quality and quantity.	low risk		bitewing
high risk			PAN + bitewing
NEW PATIENT	Previous radiographs more than 2 years old or more recent, of insufficient quality and quantity	low risk	PAN + bitewing
high risk			FMS + bitewing (PAN)
No previous radiographs	low risk		PAN + bitewing
high risk			FMS + bitewing (PAN)
RECALL	Use available previous radiographs	low risk	bitewing 24-36 month interval
PATIENT	high risk		bitewing 12-18 month interval

CHILDREN AND ADOLESCENTS

NEW PATIENT	Primary Dentition	bitewing if contacts closed
Transitional Dentition		PAN + bitewing
RECALL PATIENT	bitewing 12-24 month interval	Panoramic radiograph to assess 3rd molars and growth and development when needed.

CLINICAL SITUATIONS FOR WHICH RADIOGRAPHS MAY BE INDICATED INCLUDE:

POSITIVE HISTORICAL FINDINGS

1. Previous periodontal or endodontic therapy	2. History of pain or trauma	3. Familial history of dental anomalies.
4. Post-operative evaluation of healing	5. Presence of implants	

POSITIVE CLINICAL SIGNS/SYMPTOMS:

1. Clinical evidence of periodontal disease	2. Large or deep restorations.	3. Deep carious lesions

4. Malposed or clinically impacted teeth.	5. Swelling.	6. Evidence of facial trauma.
7. Mobility of teeth.	8. Fistula or sinus tract infection.	9. Clinically suspected sinus pathology.
10. Growth anomalies.	11. Unexplained bleeding.	12. Positive neurologic findings in the head and neck.
13. Evidence of foreign objects.	14. Unexplained sensitivity of teeth.	15. Facial asymmetry.
. Abutment teeth for fixed or removable partial prosthesis.	17. Oral involvement in known or suspected systemic disease.	18. Pain and/or dysfunction of the temporomandibular joint.
19. Unusual eruption, spacing or migration of teeth.	20. Unusual tooth morphology, calcification or color.	21. Missing teeth with unknown reason.

PATIENTS AT HIGH RISK FOR CARIES MAY DEMONSTRATE ANY OF THE FOLLOWING:

1. High level of caries experience	2. History of recurrent caries	3. Existing restoration of poor quality.
4. Poor oral hygiene.	5. Inadequate fluoride exposure.	6. Prolonged nursing (bottle or breast).
7. Diet with high sucrose frequency.	8. Poor family dental health.	9. Developmental enamel defects.
10. Developmental disability.	11. Xerostomia.	12. Genetic abnormality of teeth.
13. Many multi-surface restorations.	14. Chemo/radiation therapy.	