



**DENTAL ASSISTING
RADIATION SAFETY
HANDBOOK**

*Guidelines and Policies Regarding the
use of Ionizing Radiation*

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GUIDELINES AND POLICIES REGARDING THE USE OF IONIZING RADIATION

The policy of Lawson State Community College Dental Assisting program regarding the use of ionizing radiation follows the American Dental Association, American Association of Dental Schools, and Alabama Department of Public Health, Radiation Safety.

INTRODUCTION:

Radiographic examination(s) must be ordered only after a complete review of the medical, oral and dental histories and following a thorough clinical examination. Diagnostic radiographic examinations provide essential information for diagnosis, treatment and prevention of oral and dental diseases. Diagnostic radiographs are thus an indispensable and integral component of dental practice authorized at the discretion of the dentist to benefit the patient based on specific selection criteria.

The use of x-radiation for diagnostic purposes carries with it the responsibility to ensure that our patients, co-workers and the public-at-large are protected. In simple terms, this means that no one should receive any unnecessary radiation, and that the patient receives only the minimum amount of radiation necessary to obtain required diagnostic information not reasonably available through other safe means. All College members must strive to keep exposure to radiation at ALARA (**A**s **L**ow **A**s **R**easonably **A**chievable) levels.

Radiographs may only be requested by a licensed dental or medical practitioner, and only for conditions that he/she might treat or refer for treatment. No radiographs are to be made solely for administrative or teaching purposes. Guidelines for exposure are posted by each unit, but do not relieve the operator from considering factors that might require change

The purpose of this manual is to limit radiation exposure and ensure the proper and safe utilization of all radiographic equipment in the Dental Assisting Program. It will promote safety awareness of the faculty, staff, and students and benefit the patients by instructing all associated dental personnel in the applicable rules for protection from unnecessary exposure and overexposure to ionizing radiation.

RADIATION SAFETY POLICIES & PROCEDURES

In the interest of safeguarding faculty, staff, students and patients the following policies and procedures have been developed. These policies and procedures must be strictly followed for the safety of everyone.

ALL FACULTY, STAFF, AND STUDENTS WHO EXPOSE AND PROCESS RADIOGRAPHS IN THE DENTAL ASSISTING FACILITY MUST:

1. Read and practice the Safe Operating Procedures
2. Read and follow this Radiation Safety and Instruction Manual
3. Tour and receive instructions for using the LSCC Dental Assisting Program's x-ray facility
4. Verify compliance with all of the above by placing a signature on file.
5. Hold and maintain current CPR certification.

CHANGE IN MEDICAL CONDITIONS(S)

Clinicals are an integral part of your learning experience. Therefore, the importance in attending clinicals is very important. If you have a change in your medical condition since acceptance into the program (for example, pregnancy, infectious disease, interference with mobility, emotional instability, etc.), we need to make sure it is medically safe for you to return to clinicals.

Before returning to clinicals, you will be required to submit a letter from your physician/healthcare provider stating no limitations (the letter must be on the healthcare provider's letterhead) AND a signed copy of the Essential Functions/Eligibility Criteria document from your physician to both the program director and the clinical practice supervisor.

Further details in Dental Assisting Student Handbook

ALARA Policy:

Exposure to the patient and operator can be kept to a minimum by keeping the exposures “As Low As Reasonably Achievable” (ALARA) using the following Safe Operating Procedures:

Safe Operating Procedures (SOP):

1. Study the standards and the program’s safe operating procedures prior to initially operating the x-ray machine.
2. Use digital sensors or the fastest film speed available.
3. Use proper filtration (2.5mm when over 70kVp)
4. Use proper collimation for small beam size
5. Use only open-ended, lead lined position indicating device (PID)
6. Use the long position indicating device when possible
7. Use a film holder (no human finger)
8. Pregnant Patient - No radiographs will be exposed on a pregnant patient or one suspicious of being pregnant unless those radiographs are deemed absolutely necessary for emergency treatment.
9. In every case, final determination for prescribing radiographs is by the authority of a licensed dentist and is based on the patient’s needs.
10. Lead Apron Use - Shielding is required for all intraoral exposures on all patients regardless of age or number of exposures. The thyroid collar must also be used. Since lead is a very soft metal, care should be taken when handling and storing lead aprons. Avoid bending, creasing or folding these shields. Aprons must be hung and inspected on a routine basis for cracks.
11. During each exposure, the individual operating the x-ray machine will stand at least six feet from the patient, outside of the enclosed radiology room. Only the patient will be in the useful beam. When exposing radiographs in the Dental Clinic, the operator must exit the radiography operatory. The exposure switch location for all x-ray equipment prohibits activation inside the room.
12. Dead Man Switch – The dead man switch is located outside the radiology room on the wall. The switch is designed to be on only when pressed by the operator. If the switch is not being pressed, the equipment is on standby and not generating x-rays.
13. Each individual operating the x-ray machine will read for themselves and be instructed in the applicable provision of the Alabama Public Health Dental Radiation Safety Procedures.
14. Exposure of a student’s ‘real ‘patients will be performed only under the direct supervision of a licensed dentist. Exposures on a manikin may be under direct supervision of a licensed dental health professional.
15. The American Dental Association (ADA) Guidelines will be followed regarding exposure of radiographs on patients (after review of the current medical and dental history). In all cases, final determination for radiographs will be based on individual patient needs and the principles of ALARA.
16. An exposure technique chart and additional notices are posted in each radiography room.

17. In the case of an unusual event, the program director and radiation protection supervisor should be notified immediately. These same individuals should be notified in an employee or student has questions concerning these policies.

Alabama Department of Public Health Radiation Safety Procedures for Use Of x-rays in a Dental Practice

1. No x-ray exposure will be permitted of any patient unless ordered directly or verbally by a practitioner of the dental arts. Routine standing orders are acceptable if approved by the practitioner.
2. The clinician shall position the x-ray tube and the patient so that the x-ray beam will not be pointed at the clinician when the exposure is being made.
3. The clinician will stand behind a protective barrier or a minimum of six feet away from the patient when any x-ray exposure is being made.
4. No clinician shall hold a film in the patient's mouth, or the x-ray tube during any x-ray exposure.
5. Patients will be shielded with a lead apron whenever possible during x-ray exposures.
6. No one other than the patient, shall be allowed in the room during x-ray exposures.
7. All x-ray films will be processed either manually by the time temperature method or in a properly maintained automatic processor.
8. All darkrooms will be lightproof and if safelights are present, they must emit light only in the wavelengths that the films used are not sensitive to.
9. The dentist shall be informed of any pregnant patients that x-ray examinations are ordered on. At this point the dentist will decide if the x-ray examination will be performed, modified, delayed, or cancelled.

Scan X (Phosphor plates)

Lawson State uses intraoral phosphor plate x-ray which eliminates the need for traditional film processing for dental radiography. Phosphor storage plates can convert exiting film-based imaging systems to a digital format that can be integrated into a computer.

How to takes FMX with phosphor plates: <https://www.youtube.com/watch?v=hz1q92VDVDk>

Using Patterson Imaging Software

1. Select the Patterson Dental icon on computer desktop
2. Provider should be: **SEVENTEEN STUDENT**
3. NO PASSWORD
4. Select '**LISTS**' at top of screen
5. Select '**PATIENTS**'
6. Entering Patient Name:
 - a. IF EXPOSING DEXTER/MANIKIN, THE IMAGES WILL BE FILED UNDER YOUR NAME.
 - i. First time using: Enter your name as new patient.
 - ii. After initial time-Find your name and double click.
 - b. IF EXPOSING 'REAL' PATIENT, ENTER PATIENT NAME.
7. Select '**New Exam**'
8. Select '**Lawson FMX Series**'
9. Make sure ScanX is on and connected to computer.
10. Select '**Image**' at top of screen
11. Select '**Acquire**'
12. Select 'Start' to start the processor.
13. Make sure the blue light on scanner is NOT flashing. Wait for green light to load phosphor plates.
14. Put phosphor plate in processor **1 at a time**. Wait until light turns form orange to green before putting the next phosphor plate in processor.
15. Place barriers on scanned film as it comes out of processor.
16. Select 'Finish' when complete.
17. Arrange film on mount as needed.

If Adding to Existing FMX

Be sure to select highest number on FMX **BEFORE** placing phosphor plate in processor.

Patterson Imaging Software

Printing Radiographs

1. Find patient from **'LIST'**
2. Select set of radiographs to be printed.
3. Go to **'FILE'**
4. Select **'PRINT ALL'**
5. Select **'LANDSCAPE'**
6. **PRINT**

Remember: Patient signed permission sheet is required before printing and providing to any patient, even fellow student.

Using Phosphor Plates (Scan X)

1. Know the sides of the phosphor plate.

- a. X-ray side (side to expose to x-rays)



Remember: any exposure to light will darken the image

- b. Identification side (side away from x-rays)



2. Putting phosphor plate in barrier.

- a. Place plate in barrier so that you see the identification side.



3. Placing on RINN

- a. Place so black side of barrier is toward the x-ray beam.
- b. Place so “ a “ on plate is at incisal edge of tooth OR if bwX, a will show on mandibular teeth.



Rinn Assembly

BWX

Color: red

1. Place bite block in left hand and metal bar in right hand
2. Make sure the side of the bite block that holds the film is facing **away** from you
3. Insert metal bar into bite block using the correct color coded inserts
4. Place plastic ring on bar using the correct color coded end
5. Make sure ring is centered over bite block



ANTERIOR PA

Color: blue

1. Place bite block in left hand and metal bar in right hand
2. Make sure the side of the bite block that holds the film is facing **toward** you
3. Repeat steps 3, 4, and 5 (see above, BWX)



POSTERIOR PA

Color: yellow

(Same steps as anterior PA)

** ALWAYS MAKE SURE THE METAL BAR IS ON THE OUTSIDE OF THE MC



Vertical Angulation for Exposure Chart

Maxillary Arch	Average (+) Vertical Angulation Settings
Incisor	+ 50*
Canine	+ 45*
Premolar	+ 30*
Molar	+ 20*
Mandibular Arch	Average (-) Vertical Angulation Settings
Incisor	- 15*
Canine	-20*
Premolar	-10*
Molar	-5*
Bitewings	Average (+) Vertical Angulation Settings
Premolar	+5* to +10*
Molar	+5* to +10*

Exposure Guidelines:

1. All potential patients will complete LSCC medical/dental history form before radiation exposure.
2. All potential patients will sign an informed consent before radiation exposure.
3. In every case, final determination for prescribing radiographs is by the authority of a licensed dentist and is based on the patient's needs
4. Lawson will follow the ADA Guidelines for Exposure-only adult patients will be exposed.
 - a. Four Bitewings (BWX)
 - i. Patient has not had bitewings in over 1 year-BWX indicated
 - ii. Patient has no or low caries risk; BWX-every 24-36 month interval
 - iii. Patient has moderate to high caries risk, BWX every 6-18 month interval
 - b. Full Mouth (FMX)
 - i. Patient has never had full mouth series – FMX indicated
 - ii. Patient has not had full mouth series in over 3 years – FMS indicated
 - iii. Patient has contributing circumstances including but not limited to, implants, craniofacial pathoses, multiple restorative/endodontic needs *clinical judgement of dentist.*
5. Bitewings may be taken either as a separate entity or as part of a full mouth series, but not both.
6. Radiographs must be arranged correctly and saved in patient's chart with proper documentation.
7. Upon signed request by patient, radiographs may be securely sent to patient's dentist.

Retake Policy:

A “retake” is a radiograph that is taken a second time after the initial exposure. The following information outlines the policy to limit radiation exposure to the patient.

A. Mannikin:

1. **Retakes are not permitted without radiology lab instructor approval and signature on competency form.**
2. Retakes are required when:
 - a. Bitewings:
 - i. Teeth not in occlusion
 - ii. Interproximal of teeth are not visible and caries could not be detected
 - iii. Crest of interproximal alveolar bone is not visible.
 - iv. Radiology lab instructor recommends for improvement of student technique.
 - b. Periapical:
 - i. The targeted tooth’s apex and 2-3 mm of alveolar bone is not visible in image.
 - ii. Crest of interproximal alveolar bone is not visible.
 - iii. The elongation or foreshortening is extremely exaggerated.
 - iv. Radiology lab instructor recommends for improvement of student’s technique.
3. Retakes are never made to improve the student’s grade, but to improve the student’s learning and technique.
4. Retakes are limited in number and are based upon which series of radiographs the student is exposing. (see individual competency sheet for numbers)

B. ‘Real’ Patient:

1. **Retakes are not permitted without radiology dentist approval and signature on competency form**
2. Retakes are required when:
 - a. Bitewings:
 - i. Teeth not in occlusion
 - ii. Interproximal of teeth are not visible and caries could not be detected
 - iii. Crest of interproximal alveolar bone is not visible.
 - b. Periapical:
 - i. The targeted tooth’s apex and 2-3 mm of alveolar bone is not visible in image.
 - ii. Crest of interproximal alveolar bone is not visible.
 - iii. The elongation or foreshortening is extremely exaggerated.
3. Retakes are never made to improve the student’s grade, but for diagnostic purposes.
4. Retakes are limited on patients. If the supervising dentist prescribes a re-take, the dentist will directly assist the student in achieving a diagnostic image. If a student is deemed incompetent in exposing radiographs on a patient, the supervising dentist will dismiss patient and student and student will be required to attend remediation.
5. All retakes on patients will be recorded in Radiology Retakes Log.
6. The Radiology Retake Log can be found in Radiology Lab near Scan X machine.

EQUIPMENT:

Students are instructed in proper use of equipment and patient care according to state laws and regulation. The equipment is maintained by the Lawson State Community College Dental Assisting Program. For equipment malfunctions notify the Dental Assisting Program Director.

Equipment Use:

1. Handouts explaining the use of extraoral equipment are found in proximity of the respective machines.
2. Scan X phosphor plates are dispensed by faculty and must be treated carefully, do not bend or scratch plates.
3. Tubeheads must be folded tightly against the wall when not in use.

Location of Equipment and Supplies:

1. Intraoral xray machines are located in the Dental Assisting clinic Radiography Room #11 and 13.
2. Two adult radiology practice manikins located in the Radiography rooms.
3. Scan X phosphor plates are stored in the locked cabinets near the radiology rooms and will be dispensed by faculty.
4. Lead aprons with a thyroid collar are located in each radiology room.
5. RINNS are located in the Sterilization Room in drawer marked 'Radiology Supplies'
6. The master copy of Lawson State's Guidelines and Policies Regarding Ionizing Radiation is located in the Resource Room (Room #3 in the Dental Assisting Clinic). The manual is also made available to each student in DAT 112: Dental Radiology.
7. The current equipment registration certificate is posted in the radiology area of clinic.

X-RAY MACHINE NOT FUNCTIONING:

In the event of notification through a professional inspection by The Alabama Department of Public Health, that a radiation generating equipment unit does not meet safety standards, the following steps will be taken:

1. Cease exposing radiographs with the problem unit until safe operation is validated. Continue exposing radiographs with units that are not problematic.
2. The Dental Assisting program director will schedule an immediate service call and authorized repair or replacement, as necessary.
3. The findings, repair notes and/or evidence of the purchase of new equipment will be filed. (if new equipment is required, program director will file with Alabama Department of Public Health)
4. In the event a x-ray machine can not be used due to safety issues, a sign will be posted on door of radiography room reading "DO NOT USE THIS X-RAY UNIT".



**EXPOSING PATIENTS
POLICY & PROCEDURES**

INFECTION CONTROL GUIDELINES IN DENTAL RADIOLOGY

Each student must take utmost care to follow all guidelines pertaining to infection control. As a health professional it is your responsibility. Infection control is made easier if you think about what you are doing and the things that you touch. In order to prevent disease transmission in the radiology lab use the following guidelines when:

Preparing the Operatory:

1. Don your PPE (jacket, safety glasses, mask, utility gloves)
2. Use a disinfectant to wipe items on any potential surface that will be touched. Including but not limited to: tube head, extension arm, control panel and exposure switch
3. Remove gloves, wash hands
4. Place barrier covers on headrest, control panel, exposure button.
5. Place tray cover on counter to hold supplies, RINN, cotton rolls, scan X etc.
6. Label a sterilization bag for RINN so it is ready for use after you finish.

During Patient Exposure:

1. Complete all paperwork required prior to treatment and obtain necessary signatures.
2. Position patient in chair and cover patient with lead apron and thyroid collar.
3. Explain to patient the need for radiographs and the process.
4. Ask patient to remove any jewelry, removable dental appliances, lip/tongue rings that may interfere with image.
5. Wash hand, don PPE.
6. Open sterilization bags and prepare RINN and sensors
7. Expose radiographs
8. Dry barrier with scan x phosphor plate inside.
9. Open barrier, drop scan x plate in clean disposable cup (be sure to cover cup and not allow light to hit phosphor plate.
10. Expose all scan x plates and prepare for processing as above.
11. Process all phosphor plates and arrange.
12. View images with supervising dentist prior to patient dismissal in order to expose retakes and allow dentist to inform patient of significant findings.
13. Dismiss patient when approved by faculty dentist.

Breakdown of Operatory After Exposure:

1. Don PPE (see above)
2. Place RINN or other x-ray aids in autoclave bags and send to sterilization processing.
3. Remove barriers and dispose.
4. Use a disinfectant to wipe items on any potential surface that will be touched. Including but not limited to: tube head, extension arm, control panel, exposure switch and lead apron.
5. Store lead apron
6. Remove PPE and wash hands
7. Complete all required documentation.

CHECKLIST OF PROCEDURES FOR TAKING RADIOGRAPHS ON PATIENTS

Student: _____

Date: _____

Prior to Exposing Radiographs:

- ___ Dentist Rx
- ___ Reason for radiographs and type requested (FMX, BWX)
- ___ Date and number of most recent radiographs
- ___ Medical/Dental health history, Vital Signs recorded (signed by patient)
- ___ Consent forms completed and signed by patient (Consent for X-ray and HIPAA form)
- ___ Consent to print patients x-ray images. (Patient X-Ray Request & Release Form - signed by patient)
- ___ Placed phosphor plate in plastic barrier with print visible in window.
- ___ Set Up RINN correctly for desired image.

After Exposure, but Prior to Patient Dismissal:

- ___ View radiographs and consult with clinical dentist to discuss improvements, possible pathologies, and if retakes are necessary for diagnosis.
- ___ Retakes as prescribed by clinical dentist
- ___ If dentist finds need for referral for care, complete 'Referral for Treatment' form and signed by dentist.
- ___ Print radiographs for patient if they requested after prior permission by dentist.

After Patient Dismissed:

- ___ X ray log signed, and retakes entered
- ___ Student self-assessment form completed
- ___ Appropriate evaluation sheet with all information at top completed
- ___ Treatment Record completed and signed by clinical dentist/faculty.

Faculty Signature: _____

Comments: _____

Lawson State Community College Dental Clinic

Bessemer, AL 35077

MEDICAL/DENTAL HEALTH HISTORY FORM

Name: _____ / _____ / _____

Last
First
Initial
Date of Birth

_____ / _____ / _____ / _____ / _____

Address
City
State
Zip Code
Home Phone
Work Phone

CHECK THE APPROPRIATE ANSWER

Are you currently under a physician's care? **Yes** **No**

Physician's Name: _____ Address: _____

Date of Last Physical Exam: _____

Please circle Yes or No:

Yes or No- Are you taking medication? Birth control pills? *If yes, please explain:* _____

Yes or No- Have you taken steroids within the past two years? *If yes, please explain:* _____

Yes or No- Are you sensitive/allergic to any metals or latex? *If yes, please explain:* _____

Yes or No- Are you pregnant or suspect you may be? *If yes, please explain:* _____

Yes or No- Have you ever been hospitalized or had a serious illness within the past five (5) years?
If yes, please explain: _____

Yes or No- Do you regularly use tobacco or tobacco products? *If yes, please explain:* _____

Do you have or have you had any of the following conditions? *please check yes or no*

	No	Yes: <i>please comment</i>		No	Yes: <i>please comment</i>
CARDIOVASCULAR			ENDOCRINE		
Hypertension			Diabetes		
Mitral Valve Prolapse					
Heart Murmur			NEOPLASM/IMMUNO COMPROMISED		
Congenital Heart Defect			Chemo/Radiation Therapy		
Artificial Heart Valve			HIV infection		
Heart Attack			Otherimmuno-compromised		
Stroke					
			BLOOD		
RESPIRATORY			Anemia		
Asthma			Blood Disorder(s)		
Emphysema					
Tuberculosis			LIVER		
			Hepatitis A/B/C		
MUSCULOSKELETAL			Liver Disease		
Arthritis					
Artificial Joints/Implants			NEUROLOGIC		
			Epilepsy/Seizures		
			Fainting/Dizzy Spells		

Do you have any disease, condition, or problem not listed?

If yes, explain: _____

DENTAL HISTORY

Chief Dental Complaint: _____

Date of Last Dental Visit: _____ Last Cleaning: _____

Date of Last X-Rays: _____ Type (if known) _____

Dentist's Name _____

Please circle Yes or No:

Yes or No Do you see a dentist regularly?

Yes or No Are you having pain or discomfort at this time?

Yes or No Are you wearing removable dental appliances?

Yes or No Have you ever had a bad experience in the dental office?

Yes or No Are any of your teeth sensitive to hot/cold/sweets/biting or chewing?

Yes or No Do your gums bleed or hurt?

Yes or No Have you experienced any pain/clicking/popping of the jaw joints?

Yes or No Have you had periodontal treatment?

Yes or No Is your drinking water fluoridated?

How often do you brush? _____

How often do you floss? _____

To the best of my knowledge, all of the preceding answers are true and correct. If I ever have any changes in my health or medicine(s), I will inform the dental health care provider at the next appointment without fail.

Patient (Guardian) Signature: _____

Date:

Instructor Signature: _____

Date:

PLEASE DO NOT WRITE BELOW (to be completed by dental health care provider):

MEDICATIONS: List all medications taken in the past six months.				
Date	Drug Name	Dosage	Indications	Dental Concerns

VITAL SIGNS			
Date	Heart Rate	Respiration Rate	Blood Pressure



DENTAL X-RAY CONSENT & HIPAA FORM

Dental x-rays allow the dentist to diagnose conditions that cannot be detected during a clinical examination. Dental x-rays detect much more than just cavities. For example, x-rays may be needed to diagnose bone disease, evaluate injuries, or plan orthodontic treatment. If dental problems are found and treated early, before that become visible or painful, dental care is much more comfortable and affordable.

Dental x-rays do expose patients to radiation. The radiation is a very small dose, similar to all day in the sunshine. Every protection is provided to the patient and exposure is purposely small.

Please select which option is appropriate for you with a check mark and then signing and dating below.

Dental x-rays may be taken on me today.

I do not wish to have dental x-rays taken on me today.

Patient HIPAA Information:

I understand that I have certain right to privacy regarding my protected health information. These rights are given to me under the Health Insurance Portability and Accountability Act of 1996 (HIPAA).

I have also been informed of and given the right to review and secure a copy of any radiograph taken in the office.

Patient Name (please print) _____

Patient Signature (or Parent/Guardian) _____

Date _____



X-RAY REQUEST AND RELEASE FORM

DATE _____

Patient Name: _____

Requested by (if other than patient i.e., parent or guardian): _____

- Relationship to patient: _____

Exam Date(s) Requested: _____

Radiographs to be printed and given to patient or requestee.

I, _____ authorize the release of the X-Rays and am in receipt of said x-rays.

Signature of Patient or Requestee: _____

Release by: (faculty signature) _____



DENTAL ASSISTING DEPARTMENT
205.929.3440

Date: _____

_____ was seen at the Lawson State dental clinic on _____ (date) for
limited dental x-rays exposure.

Upon evaluation of the radiographs, the person stated above should seek dental care for:

T. Ray, DMD

Clinical Dentist

trayconnell@lawsonstate.edu