



## Radiation Safety Manual

Office of Radiation Control, X-Ray Compliance Branch  
Alabama Department of Public Health

[www.adph.org/radiation](http://www.adph.org/radiation)

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# Dental Radiation Protection Program Guide

Each registrant is required to develop, document, and implement a Radiation Protection Program. This is a guide to assist in constructing a Radiation Protection Program specific for each dental facility. A registrant may not use this document as a substitute for their Radiation Protection Program. 420-3-26-.03(5)(a)(b)(c)

## ITEMS TO INCLUDE IN A RADIATION PROTECTION PROGRAM

### General Information

#### Required Documents 420-3-26-.05, 420-3-26-.06, 420-3-26-.10

- Plan Review and Letter of Acknowledgement
  - Please note this is only for facilities that have a Cone Beam C/T unit (3D Panoramic).
- Current Notice of Registration Form
- FDA 2579 forms for each dental unit
- Rules of State Board of Health, Office of Radiation Control State of Alabama
- Written Safety Policies and Procedures
- Documented review of Written Safety Policies and Procedures

#### Required Postings 420-3-26-.10(2)

- Notice to Employees
- Form 100

### Facility Safety Policies & Procedures not limited to, but include:

#### Safety Procedures 420-3-26-.06(8)(c)

- What procedures are performed and auxiliary equipment used in this facility to minimize patient and personnel exposure?
- Is the speed of the film or screen and film combinations the fastest speed consistent with the diagnostic objective of the exams performed?
  - \*\* The speed of radiographic film represents the sensitivity of the film to x-rays. The faster the film, the less radiation exposure that is required. Letters of the alphabet denote film speed. D, E, E/F and F speed film are commercially available. F speed is the fastest film currently available and its use can significantly decrease the exposure to the patient without diminishing image quality.
- How are radiation exposures to the patient minimized to produce images of good diagnostic quality?
  - \*\* An example, for a facility that uses digital radiography, is to monitor the exposure index, after making an exposure. Monitoring the exposure index ensures it is within range with the technique specifications provided by the manufacturer of the equipment.

### **Personnel Training Policy** 420-3-26-.06

- Describe the initial and annual education or training requirements for each operator.
  - If it is required for operators to be registered or certified, a statement to this fact is sufficient.
  - If it is not required for operators to be registered or certified, document name of trainer, name of trainee, and topics covered during training.
- Describe how written safety procedures are available to all operators.
- Describe exposure techniques for the different exams performed.
- What is required for a person, other than the patient, to be in the x-ray room during exposures?
- Who can order x-rays and re-takes in this facility?
- Describe the location of the operator during an exposure, and how the operator is able to maintain visual contact of the patient during an exposure.
- Describe the visual indicator and audible signal that is observable at, or from the operator's protected area during an exposure.
- Identify when closure of doors or controlling hallways are required to prevent unnecessary exposure to staff and/or public.

### **Lead Shielding Policy** 420-3-26-.03(5)(b)

- How and when is lead shielding used on patients?
- It is recommended that a protective thyroid collar and lead apron be used whenever possible and strongly recommended to be used when imaging children, women of childbearing age, and pregnant women.
- Lead shields should have at least .25 mm of lead or lead equivalent.
  - \*\*Since lead is a very soft metal, care should be taken when handling or storing lead shields. Avoid bending, creasing, or folding shields, and use apron hangers to allow the shield to hang flat and properly distribute its weight.

### **Pregnancy Policy** 420-3-26-.03(13)

- Describe your declared pregnancy policy for employees.
  - \*\* A declared pregnant woman is defined as a woman who has voluntarily informed the registrant, in writing, of her pregnancy and the estimated date of conception. The declaration remains in effect until the declared pregnant woman withdraws the declaration in writing or is no longer pregnant.
- How is it determined if a patient may be pregnant?
- What precautions are taken if the patient is pregnant?

### **Handheld Policy** 420-3-26-.03(5)(b)

- Handheld Exams; the following documents are required:
  - A layout of where the mobile or portable machines are used.
  - REQUEST FOR HANDHELD EXEMPTION form.
  - A statement of training for the proper use of the hand-held device, for each operator.

### **Personnel Monitoring Policy** 420-3-26-.03(46)(a)

- There are a number of companies that offer personal monitoring. Please note dental facilities are not required to have personnel monitoring.
- If your facility does have dosimetry, all monitoring reports should be retained with your documents.

## Quality Assurance Procedures

### **ALARA: As Low as Reasonably Achievable** 420-3-26-.03(5)(b)

- A Quality Assurance program helps to consistently produce high quality imaging and optimize processing conditions. QA helps minimize the need for unnecessary retakes which contributes to unnecessary patient exposure to radiation. An important aspect of a quality assurance program is to maintain a log of all QA procedures including date, procedure, results and corrective actions taken.

### **Digital Image Acquisition & Phosphor Sulfur Plate Acquisition** 420-3-26-.03(5)(b)

- Specific quality assurance and quality control procedures are provided by the manufacturer.

### **X-ray Tube Warm Up** 420-3-26-.06(8)

- Specific warm up procedures are provided by the manufacturer of the x-ray unit.  
\*\*Floating tube heads should never be held by a patient or operator.

### **X-ray Filtration Quality Control** 420-3-26-.06(8)(a)4

- X-ray filtration of 1.5mm for machines that operate at less than 70 kVp.
- X-ray filtration of 2.5mm for machines that operate at 70 kVp or greater.  
\*\*The x-ray beam generated inside the x-ray tube contains both high and low-energy photons. The purpose of filtration is to remove low-energy photons that will be absorbed by the patient and, thus, decrease exposure. Aluminum is the most typical metal used for beam filtration. This can be checked by your state inspector and/or service provider.

### **Processor and Darkroom Quality Control** 420-3-26-.06(3)(h)1-3

- Chemical and film storage.
- Inspect Darkroom for light leaks.
- Check condition of safelights; appropriate wattage, and condition of filter.
- Inspect condition of screens.
- Compatibility and speed of films/screens.

### **Manual processing; time and temperature** 420-3-26-.06(3)(h)1-3

- Thermometer available in processing area.
- Timer available in processing area.
- Time and temperature chart posted in processing area.
- Properly prepared chemistry. Specific preparation instructions are provided by the manufacturer.

### **Protective Equipment Integrity** 420-3-26-.03(5)

- It is recommended that lead shields be visually inspected for defects on an annual basis, and more frequently if damaged.
- A fluoroscopic examination of the protective equipment can reveal hidden defects.

### **Service Providers** 420-3-26-.03(5)

- Service providers can perform some QA activities regarding service to x-ray machines and processors, or the facility can develop their own QA activities. Describe any QA activities performed in the facility.
- If service providers are performing the QA tasks in the facility, document the following:
  - Name of service provider, service provided, frequency of service, and location of service records.