

To: X-ray facility registrants with dental intraoral imaging systems  
From: Katherine Liberman, X-ray Certification Unit Supervisor  
Subject: Rectangular dental collimator rule implementation - Guidance

Date: February 25, 2021

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### **Basis and Purpose:**

There have been questions regarding the interpretation of 6 CCR 1007-1, Part 6, Section 6.7.2.3 (b) of the *Rules and Regulations Pertaining to Radiation Control* which was amended in late 2019. The Colorado Department of Public Health and Environment, X-Ray Certification Unit (Department) has issued this guidance document to help interpret the new rule.

Part 6, Section 6.7.2.3 (b) states “Excluding hand-held units, endodontic procedures, and those procedures which require a broader exposure field, after January 1, 2025, only rectangular collimators shall be used for routine intraoral dental imaging.”

This guidance is intended to clarify any misunderstanding of the meaning of this section of the Regulation.

### **Scope:**

The following is guidance regarding the amended regulation effective January 14, 2020. Part 6, 6.7.2.3(b), will apply to all dental facilities in possession of dental intraoral imaging units at the time the new regulation takes effect (January 1, 2025). Enforcement of this requirement shall begin on January 1, 2025.

### **Interpretation:**

The adopted rule specifies a requirement to phase in the use of rectangular collimators by January 1, 2025. The implementation of this rule was initially based on stakeholder suggestion. Through careful deliberation, the department added the requirement to the Part 6 regulation. The regulation aligns with the overall purpose of the program to reduce radiation exposure and uphold radiation safety within the State of Colorado. The use of rectangular collimators is supported by various professional organizations. Rectangular collimators for intraoral dental imaging helps to match the shape of the x-ray beam to the image receptor shape in order to reduce patient dose from radiation that travels outside the imaging area. Modern dental intraoral imaging systems most commonly use a rectangular image receptor (digital or film), but the most common x-ray collimators are often round, resulting in a mismatch of x-ray beam to receptor. This mismatch in shapes allows unnecessary radiation to expose the patient with no benefit.



It has been the recommendation of national radiation protection organizations and the American Dental Association for a number of years to use rectangular collimators in dental imaging. Studies have shown that use of matching the shape of collimators and image receptors through use of rectangular collimation can result in a significant reduction in patient dose. A 2006 report by the American Dental Association Council on Scientific Affairs (ADA 2006) suggested that use of rectangular collimator decreases the radiation dose to the patient by up to fivefold for the most common radiographs. A 2019 retrospective study published in the International Dental Journal (Shetty 2019) indicated that radiation dose reduction ranged from 40% to 92% when using a rectangular collimator in lieu of a circular collimator, which suggested that this provides sufficient justification for implementation in clinical settings.

In summary, the Department implemented the use of rectangular dental collimators taking a phased in approach. The rule will not become effective until January 1, 2025. This allows a period of 5 years for affected dental facilities to budget and implement the requirement over time. This approach allows facilities to plan for barriers that may exist during the implementation process. These barriers include, but are not limited to, obtaining equipment compatible with current units that meets the regulatory requirement, training of staff on proper use, and cost considerations.

The department is responsible for periodic reporting updates, regarding this rule implementation to the Colorado Board of Health.

Any questions or comments regarding this document should be addressed to the X-Ray Certification Unit at 303-692-3448, or by sending an email to:

[cdphe.hmxraycomments@state.co.us](mailto:cdphe.hmxraycomments@state.co.us)

Authorized by:  Date: February 25, 2021

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