STANDARD OPERATING PROCEDURE

Dental X-Ray SOP

Document no.	SOP-DEN-004
Revision	1.0
Owner	Radiation Safety Officer
Effective date	September 15, 2026
Review cycle	Every 12 months

1. Purpose

To capture diagnostic-quality dental radiographs while minimizing radiation exposure to patients and staff, and to keep equipment and technique consistent across the practice.

2. Scope

Applies to intraoral and panoramic dental radiographs taken in the practice. Cone beam computed tomography imaging is covered by a separate SOP.

Definitions

ALARA	As low as reasonably achievable, the principle of using the lowest radiation dose needed to get a diagnostic image.
Thyroid collar	A lead or lead-equivalent shield placed around the patient's neck to protect the thyroid during exposure.
Retake	A repeated radiograph needed because the first image was non-diagnostic due to positioning, exposure or movement.

3. Responsibilities

Dental Assistant	Positions the patient and sensor, sets exposure settings and captures the radiograph.
Dentist	Orders the radiograph, reviews image quality and interprets the diagnostic findings.
Radiation Safety Officer	Maintains equipment calibration records, staff dosimetry and radiograph retake tracking.

RACI matrix

Activity	Dental Assistant	Dentist	Radiation Safety Officer
Order the radiograph and confirm necessity	I	R/A	-
Shield and position the patient	R/A	I	-
Capture and review image quality	R	R/A	-
Maintain equipment calibration and dosimetry	I	C	R/A

R = Responsible, A = Accountable, C = Consulted, I = Informed

4. Materials and PPE

Materials, tools and systems

- Digital radiography sensor or film and processor
- Lead or lead-equivalent apron and thyroid collar
- Sensor positioning devices
- Practice management system for image storage
- Retake and equipment calibration log

Personal protective equipment

- Disposable gloves
- Disposable sensor sheath or barrier

5. Procedure

Step	Task	Owner	Done
5.1	**Confirm the radiograph order** Confirm which radiographs the dentist has ordered and why, checking the patient's radiograph history to avoid an unnecessary repeat exposure.	Dental Assistant	☐
5.2	**Explain the procedure to the patient** Explain what the patient can expect, including the use of a shield and sensor or film, and answer any questions before beginning.	Dental Assistant	☐
5.3	**Apply patient shielding** Place a lead or lead-equivalent apron and thyroid collar on the patient according to facility policy and the type of radiograph being taken. **Checkpoint:** Shielding is applied and positioned correctly before the sensor or film is placed.	Dental Assistant	☐
5.4	**Prepare the sensor or film with a barrier** Cover the sensor with a disposable barrier sheath, or prepare the film packet, changing the barrier between every patient.	Dental Assistant	☐
5.5	**Position the sensor or film** Position the sensor or film using a positioning device for the specific view ordered, aligning it to capture the target teeth and surrounding structures.	Dental Assistant	☐
5.6	**Set the exposure settings** Select the exposure settings appropriate to the patient's size and the view being taken, using the lowest setting that will produce a diagnostic image.	Dental Assistant	☐
5.7	**Step behind the barrier and expose** Step behind the protective barrier or leave the room as required by facility policy before triggering the exposure, and confirm the patient remains still. **Warning:** Never remain in the room without protective shielding while triggering an exposure.	Dental Assistant	☐
5.8	**Review the image for diagnostic quality** Check the resulting image for correct positioning, contrast and coverage of the target area before removing the shielding from the patient. **Checkpoint:** Image quality is confirmed as diagnostic before the patient is released from positioning.	Dental Assistant	☐

Step	Task	Owner	Done
5.9	**Retake only when necessary** If the image is non-diagnostic, retake it using corrected positioning or settings, keeping shielding in place and minimizing the number of retakes.	Dental Assistant	☐
5.10	**Remove shielding and clean up** Remove the lead apron and thyroid collar, dispose of the sensor barrier, and clean the sensor or holder according to infection control procedures.	Dental Assistant	☐
5.11	**Interpret and document findings** Review the radiograph, document diagnostic findings in the patient chart, and discuss relevant findings with the patient.	Dentist	☐
5.12	**Log retakes and maintain equipment records** Log any retake with the reason, and keep equipment calibration and staff dosimetry records current according to facility policy and local regulations.	Radiation Safety Officer	☐

6. Quality checks

- Retake rate stays at or below the practice's target.
- Shielding is documented as applied for every radiograph taken.
- Equipment calibration records are current for every X-ray unit.
- Staff dosimetry badges are worn and results reviewed on schedule.

7. Records

- Radiograph images and interpretation notes in the patient chart
- Retake log with reasons
- Equipment calibration records
- Staff radiation dosimetry reports

8. KPIs

- Radiograph retake rate
- Average radiation dose per exposure type
- Equipment calibration compliance rate
- Percentage of radiographs with documented shielding

9. Common mistakes

- Skipping the thyroid collar to save time on a routine bitewing series.
- Remaining in the room without protection during exposure.
- Retaking an image repeatedly without correcting the positioning error first.
- Reusing a sensor barrier between patients.

10. Revision history

Revision	Date	Description	Reviewed by
1.0	September 15, 2026	Initial release	Ilia Pirozhenko

Approval

Prepared by	Approved by	Date

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