

# Paediatric Dental Imaging Recommendations

Foundational Articles and Consensus Recommendations, 2024

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### Background

Visual inspection is always the starting point of a clinical examination and needs to be done before taking radiographs. Dental radiographs may be indicated for accurate diagnosis of dental caries, dental eruption problems, assessment of dental treatment response, periodontal pathology, dentoalveolar trauma, dentofacial development, and oral pathology. Although there are some radiation-free methods for caries diagnosis, for other indications, radiographs remain the only means of obtaining the information needed for appropriate treatment. When radiographs are indicated, ALARA

(As Low As reasonably achievable) and ALADA (As Low as Diagnostically Achievable) need to be considered. The general recommendations regarding adequate timing, selection, and frequency of dental radiographs/imaging for the pediatric population are specified below. These may vary individually and minimally depending on the country's dental imaging guidelines. For each recommendation, minimizing radiation exposure for the pediatric population and accurate assistance for diagnosis should be prioritized, while the indication for each radiograph should be tailored to each patient's requirements.

#### IAPD Consensus Recommendations

**1.** Clinicians should base the frequency of radiographic examination for the patient in the primary, mixed, or permanent dentition on their clinical examination, oral diagnosis, caries risk assessment, periodontal risk assessment, past medical history (including medications, previous surgical and dental history), trauma experience assessments and in accordance with national / local regulatory guidelines. (Consensusbased statement, Global agreement: 97%)

**2.** Follow-up radiographic exams after the initial radiographic examination should be based on oral diagnosis, caries risk assessment, presence of an eruption concern, bony pathology, dental anomalies, trauma diagnosis or the need to assess dental

treatment response or monitor periodontal condition. (Consensus-based statement, Global agreement: 97%)

**3.** Radiographic examination of dental trauma is indicated in addition to clinical examination. **(Consensus-based statement, Global agreement: 93%)** 

**4.** In case of dental trauma, clinicians may follow International Association of Dental Traumatology (IADT) guidelines on follow-up radiographic examination in primary dentition (after 1-year post-endodontic treatment or after 4 weeks and 1 year in case of an alveolar fracture), and in the permanent dentition (after 2, 4 and/or 6, weeks, 3 or 4 and 6 months, 1 year and after that yearly follow-up up to 5

#### years after trauma). (Evidence-based recommendation)

**5.** Based on IADT guidelines, clinicians should first use a periapical radiograph to diagnose dental trauma. Based on the extent and type of dental trauma, a second periapical radiograph, or other radiographs such as occlusal radiograph, an orthopantomogram (OPT)/panoramic radiograph or even a cone beam computed tomography (CBCT) may be needed for diagnosis and evaluation of the treatment. **(Evidencebased recommendation)** 

**6.** For individuals in the primary, mixed, or permanent dentition with periodontal disease that is a result of systemic conditions (neutropenia's, Papillon Lefèvre Syndrome, Leukocyte Adhesion Disorder, etc.), maxillary and mandibular occlusal films along with bitewing radiographs should be obtained as part of the initial assessment. When permanent teeth have erupted, vertical bitewings should be used to assess bone levels in this population and OPT /panoramic film is taken in special cases. **(Consensus-based statement, Global agreement: 82%)** 

7. The initial OPT/panoramic film should be obtained after complete eruption of permanent first molars and all lower incisors, unless needed earlier to assess an oral pathosis including dental trauma to assess possible alveolar fractures and condylar neck fractures. (Consensus-based statement, Global agreement: 78%)

8. Extraoral bitewings should be taken judiciously because they provide a radiation dose that is three times higher than traditional bitewings with lower diagnostic quality. They may be used for children with special health care needs or who lack the cooperative ability when needed for a diagnosis. They are considered after clinical examination, oral diagnosis and caries risk assessment and periodontal risk assessment. (Consensus-based statement, Global agreement: 78%)

**9.** The evidence does not support CBCT for replacement or adjunctive to 2D imaging for caries detection in children. (Consensus-based statement, Global agreement: 87%)

10. A CBCT may be considered when conventional

radiography does not provide adequate information, such as during suspected oral pathosis, trauma, or localization of impacted teeth or in cases where the roots show an unusual root or root canal morphology that needs to be studied more in detail and for surgical planning. (Consensus-based statement, Global agreement: 97%)

**11.** Patient cooperation (or ability to participate) should be considered when prescribing radiographs, especially as it relates to longer exposure times for OPT or CBCT. (Consensus-based recommendation, Global agreement: 95%)

**12.** Children and young adults are more susceptible to the effects of radiation, so radiographs should be ordered judiciously.

- Rectangular collimation is recommended for intraoral projections. (Consensus-based recommendation, Global agreement: 97%)
- Evidence regarding the use of full-body lead shields and thyroid shields is evolving. Patient radiation doses can be minimized most effectively through the proper use of rectangular collimation, optimal patient positioning during imaging procedures, and the implementation of appropriate dose-reduction techniques. Several professional associations and expert groups, including the International Commission on Radiologic Protection (ICRP), Image Gently Alliance, American College of Radiology (ACR), American Association of Physicists in Medicine (AAPM), European Academy of Paediatric Dentistry (EAPD), have endorsed the paradigm shift away from routine shielding in radiographic imaging. However, clinicians should monitor and adhere to the shielding regulations applicable in their geographic area of clinical practice. (Consensusbased recommendation, Global agreement: 83%)

**13.** Clinicians should perform a comprehensive review and interpretation of any radiographic image obtained along with documentation of the type of radiation exposure and summary of findings in a timely manner. (Consensus-based recommendation, Global agreement: 90%)

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