# Delta Dental of Virginia Clinical Policy # 100

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<th>Subject</th>
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<td>Dental Director</td>
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**Type:** [ ] New  [ ] Replacement  [ ] Revision  [ ] Clarification

**Date:** November 15, 2013  **Revision Date:** 01/16/2016

## Preamble:

The Clinical Policy Bulletin is an expression of Delta Dental of Virginia’s (DDVA) determination regarding whether certain services or supplies are medically or dentally necessary. DDVA bases its conclusions on a review of currently available clinical literature. This includes, but is not limited to, clinical outcome studies published in the peer-reviewed medical and dental literature, regulatory status of the technology, evidence-based guidelines of public health and health research agencies, evidence-based guidelines and positions of leading national health professional organizations, views of physicians and dentists practicing in relevant clinical areas, and other relevant factors. DDVA reserves the right to revise these policies as new clinical information is available and we welcome submission of further relevant information.

Each group defines covered dental services under their dental plan, as well as those services that may be subject to dollar caps or other limits. The plan documents outline covered benefits, exclusions and limitations. DDVA advises dentists and enrollees to consult the plan documents to determine if there are exclusions or other benefit limitations applicable to the service request. The conclusion that a particular service is medically or dentally necessary does not constitute an indication or warranty that the service requested is a covered benefit payable by DDVA. Some plans exclude coverage for services that DDVA considers either medically or dentally necessary. When there is a discrepancy between DDVA’s clinical policy and the group’s plan documents, DDVA is to defer to the group’s plan documents as to whether the dental service is a covered benefit. In addition, if state or federal regulations mandate coverage then DDVA will adhere to the applicable regulatory requirement.

## History:

A dental radiograph is an image of oral structures made on a digital receptor or sensitized film by a form of electromagnetic radiation known as an “X-ray.” The exposed digital image or film is commonly referred to as a “dental X-ray.”

Electromagnetic radiation X-rays are able to penetrate anatomic tissues and structures, which are represented on the X-ray image as differences in densities. A structure which is very dense, such as tooth enamel or a silver amalgam filling, appears as a very light or white area on the X-ray image. A void or a structure that is not dense, such as the pulp chamber of a tooth or decay in a tooth, appears as a dark area. These different densities on the image are interpreted as either normal...
or abnormal and aid in determining possible pathologic entities which can then be addressed with an appropriate treatment plan(1).

Dental X-rays are a useful and necessary adjunct in the diagnosis of oral diseases and abnormalities. Among other indications, dental X-rays aid in diagnosing tooth decay, diseases of the bone, abscesses or cysts, periodontal bone loss, developmental abnormalities, tumors, damage from trauma, and evidence of some systemic illnesses(2).

A primary tenet and principle of accession of dental radiographs is that radiographs should be taken only when there is an expectation that the diagnostic yield will affect the patient care(3,4). Additionally, dental radiographs should be taken only after the dentist has evaluated the patient’s status and made a determination of the need for exposure to X-ray radiation. The preceding evaluation should include a review of the patient’s health and dental histories, a clinical examination, evaluation of the patient’s susceptibility to dental disease, and examination of any previous X-rays, if available(2,5). The American Dental Association recommends that radiographic screening for the purpose of detecting disease before clinical examination should not be performed, and that all X-rays should be examined for evidence of decay, periodontal bone loss, developmental anomalies and occult disease(3). A US Public Health Service recommendation states that “Radiographs are not to be taken until the doctors hands or eyes have been in the patient’s mouth”(6). Dentists should be prepared to discuss the benefits and risks of an X-ray examination with the patient(3).

The most common types of dental X-rays are(1):

1. Bitewing
2. Periapical
3. Occlusal
4. Panoramic

Bitewing X-ray films or receptors are placed between the teeth, and the patient then bites on a tab to hold the receptor in place. These X-rays show the clinical crowns of upper and lower teeth simultaneously and are primarily used to detect decay in and between teeth. Changes in supporting periodontal bone levels between teeth may sometimes be evident on bitewing X-rays.

Periapical X-rays show the structure of a tooth from the clinical crown to the end of the root, or apex. These X-rays allow examination of the entire tooth as well as the bone structure surrounding the tooth root. Although a periapical X-ray shows more of the tooth structure, a bitewing x-ray may more accurately reflect the periodontal bone level due to a more horizontal angulation of the X-ray beam relative to the X-ray film/receptor. Periapical X-rays are useful for diagnosing pathology associated with the tooth root, particularly at the root end or apex, such as cysts and abscesses. Supernumerary or impacted teeth may be evident on periapical X-rays.

An occlusal X-ray film or receptor rests on the lower or upper teeth and captures
A picture of the entire arch including the floor of the mouth or palate. Occlusal X-rays are useful for diagnosing supernumerary, impacted or unerupted teeth as well as indicating palatal clefts, cysts, growths and foreign objects. Occlusal X-rays are not commonly used to detect tooth decay.

A panoramic X-ray is an extra-oral image that simultaneously captures the upper and lower teeth and jaws. Other areas of the skull may be shown as well, including sinuses, nasal cavities, and temporomandibular (jaw) joints. Panoramic X-rays are useful for diagnosing impacted teeth, bone abnormalities, possible tumors, infections, and fractures. Panoramic X-rays may occasionally indicate areas of carotid artery calcification. The resolution, or clarity, of the panoramic X-ray is often insufficient to diagnose small or moderate areas of decay.

A “full mouth series” of dental X-rays will consist of approximately 14-20 individual x-ray images and may include both periapical and bitewing x-rays. Dentists may often consider a panoramic X-ray in conjunction with additional bitewing X-rays as a “full mouth series”.

Although the dose of radiation associated with dental X-rays is very small(7,8), exposure to any radiation is considered accumulative over time(3,4) and should be minimized as much as possible. Careful consideration should be given to the concept of risk versus reward when evaluating the need for dental X-rays on individual patients. Dentists should be aware of and follow the “ALARA” principle of radiation exposure(5,9). “ALARA” is an acronym that represents the concept of “as low as is reasonably achievable”. The American Dental Association states, “There is little evidence to support radiographic exposure of all dentulous areas of the oral cavity in search of occult pathoses in the asymptomatic patient”(10). The ADA further cites studies that show appropriate clinical evaluation of asymptomatic patients, combined with selected periapical X-rays for symptomatic patients, can result in a 43% decrease in the numbers of X-rays taken without a clinically consequential increase in undiagnosed pathology(10). Good radiographic practices which can limit radiation exposure include the following guidelines(3):

1. Use of the fastest image receptor available commensurate with the diagnostic task. This guideline includes use of “F” speed film or digital imaging.
2. Appropriate collimation of the radiation beam to the receptor size.
3. Proper exposure of the receptor or film and proper processing procedures.
4. Limiting the number of images to the minimum necessary for essential diagnosis.
5. Use of optimal kilovoltage settings between 60 kvp and 70 kvp.
6. Use of lead aprons and thyroid collars.
7. Periodic surveys of X-ray units for quality assurance.
8. Use of technique charts/protocols indicating appropriate settings on an X-ray unit for a specific anatomical area.
9. Radiation risk communication with the patient.
10. Appropriate training and continuing education of all dental personnel.
who may be responsible for taking dental X-rays

The US Food and Drug Administration, in conjunction with the American Dental Association, publishes a guide for patient selection for dental radiographs(10,11,12). The recommendations are dependent on clinical judgment and consideration must be given to individual needs for each patient. The guidelines for patient selection make recommendations based on age, new versus recall patients, disease risk, periodontal status, growth and development stages, and other criteria. Providers should be familiar with the detailed and specific recommendations, which can be accessed at the referenced material.

Some of the more salient recommendations include the following:

1. For a new pediatric patient with primary or transitional dentition individualized and selected periapical/occlusal views and/or posterior bitewing X-rays may be appropriate if proximal surfaces cannot be visualized or probed. Pediatric patients with visible contacts and without evidence of disease may not require radiographs.

2. For a new pediatric patient with a transitional dentition an individualized radiographic exam may consist of posterior bitewings with a panoramic exam or selected periapical images depending on the clinical need.

3. For new adolescent or adult patients with permanent dentitions individualized and selected periapical and posterior bitewing X-rays may be appropriate. A full mouth series may be indicated if the patient has evidence of generalized dental disease or a history of extensive dental treatment.

4. Pediatric and adolescent recall patients with clinical caries or with an increased risk for caries may require posterior bitewing x-rays on a 6-12 month basis if proximal surfaces cannot be visualized or probed. The appropriate interval for bitewing X-rays for at risk adult recall patients may be 6-18 months.

5. For recall patients with no clinical caries or increased risk, posterior bitewings may be appropriate for pediatric patients on a 12-24 month basis, for adolescents on an 18-36 month basis, and for adults, a 24-36 month basis.

6. For recall patients with periodontal disease, individual consideration should be given to the need for selected bitewing and periapical X-rays where periodontal disease, other than nonspecific gingivitis, can be clinically identified.

7. For evaluation or monitoring dentofacial growth and development in pediatric and adolescent patients, clinical judgment should be exercised as to the need and type of radiographic images. Adolescents may require a panoramic or periapical radiographic exam to assess developing third molars. These radiographs are usually not appropriate for adult patients.

8. An individualized radiographic examination may be appropriate as part of an initial evaluation of edentulous patients. Additional radiographs are not applicable except in extraordinary instances.

9. Clinical judgment regarding the need for and type of radiographs should be exercised for patients who require evaluation or monitoring of other
circumstances. These circumstances include, but are not limited to, implant placement, suspected pathology, restorative and endodontic needs, periodontal disease, etc.

The FDA/ADA recommendations list the following “Positive Historical Findings” and “Positive Clinical Signs/Symptoms” as clinical situations for which radiographs may be indicated(12): 

Positive Historical Findings include, but are not limited to:
1. Previous periodontal or endodontic therapy
2. History of pain or trauma
3. Familial history of dental anomalies
4. Postoperative evaluation of healing
5. Remineralization monitoring
6. Implant presence or placement evaluation

Positive Clinical Signs and Symptoms include, but are not limited to:
1. High level of caries, recurrent caries or demineralization
2. Large restorations
3. Deep carious lesions
4. Malposed or impacted teeth
5. Swelling
6. Evidence of dental/facial trauma
7. Tooth mobility
8. Sinus tract/fistula
9. Clinically suspected sinus pathology
10. Growth abnormalities
11. Oral involvement in systemic disease
12. Positive neurologic findings in the head and neck
13. Evidence of foreign objects
14. Temporomandibular joint pain/dysfunction
15. Facial asymmetry
16. Evaluation of abutments for fixed or removable prosthesis
17. Unexplained bleeding
18. Unexplained tooth sensitivity
19. Unusual eruption, spacing or migration of teeth
20. Unusual tooth morphology, calcification or color
21. Unexplained absence of teeth
22. Clinical erosion

In summary, when making a decision to obtain dental radiographs, clinicians and auxiliary personnel must be familiar with and follow the latest guidelines and take into consideration the risk-reward equation for each individual patient. Exposure to dental X-rays should be kept to a minimum commensurate with the diagnostic needs of the patient, and each dental radiograph should serve a specific diagnostic purpose specific to a patient’s age and medical and dental condition.
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**References:**