

## Cone Beam Computed Tomography or 3-dimensional X-rays

Advances in technology continue to provide new ways to see structures that cannot be seen by the naked eye. One of the newest of these imaging technologies is cone beam computed tomography (CBCT).

CBCT uses rotating x-ray equipment, combined with a digital computer, to capture clear, 3-dimensional pictures of soft tissue, bone, muscle, and blood vessels.

Your dentist may recommend use of CBCT or other new imaging technologies when she feels additional imaging is necessary for proper diagnosis or treatment.

## How much radiation is there with dental X-rays?

- A bitewing set consisting of four X-rays exposes the patient to 22 to 51 microSv (microsievert).
- A panoramic examination results in exposures of about 5 to 25 microSv.
- Cone-beam X-rays result in a wide variety of exposure ranging from a little as 20 microSv to as much as 700 microSv depending on image size and the brand of cone-beam machine used.

To understand what this means, this can be compared with the average amount of background radiation (radiation occurring in the environment) a person is exposed to in a year.

That average, worldwide, is 2400 microSv per year.

## Are there things my dentists can to do limit my dental X-ray exposure?

Yes. Your dentist can take several steps to ensure you receive the least amount of exposure possible when X-rays are taken.

- 1) Place a leaded shield over your body. A thyroid collar that shields your neck, while not mandatory, is recommended.
- 2) Use a collimator, which is a long tube that extends from the X-ray machine. Collimators limit the size and shape of the useful x-ray beam reaching the patient.

- 3) Use the fastest type of film (E/F) or digital sensors.

In recommending X-rays, dentists follow the ALARA principle (As Low As Reasonably Achievable), to reduce radiation exposure to their patients by: determining the need for and type of X-rays to take; using "best practices" when taking X-rays, including the application of quality control procedures; and reading the images completely and accurately.

X-rays are an important diagnostic tool for your dentist. Early detection and treatment of disease is the best way to ensure a healthy mouth over a lifetime. Your dentist should recommend only the X-rays needed to ensure your optimum oral health.

**If you have questions or concerns about the types or frequency of the X-rays your dentist recommends, be sure to ask your dentist questions.**

© 2021  
South African Dental Association  
Private Bag 1  
Houghton, Gauteng  
South Africa  
T: +27 11 484 5288  
E: [info@sada.co.za](mailto:info@sada.co.za)  
[www.sada.co.za](http://www.sada.co.za)

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**Dental  
Radiographs  
(X-rays)**

Early dental decay does not always show physical signs in your mouth and you may not be aware that you have a problem.

A tooth may look healthy, but an x-ray can be used to show the dental surgeon if any dental decay is going on under the enamel surface of the tooth, if there is any infection present, or any bone loss around the tooth. X-rays can help the dentist see between the teeth and around the edge of fillings. Finding and treating problems early can save treatment and money later.

## Why are X-rays important?

Radiographs, commonly known as X-rays, are an important tool to help your dentist properly diagnose your oral health needs.

They allow your dentist to see beyond what the naked eye can see.

X-rays help the dentist determine if you have dental caries (cavities), periodontal (gum) disease, abscesses or abnormal growths, such as tumors or cysts. They also show the location and condition of impacted or unerupted teeth.

## How often should X-rays be taken?

How often X-rays are taken and what types your dentist recommends is based on his or her responsibility to do a complete exam and to ensure that problems are detected early to minimize damage to your teeth and/or gums. It also depends on the condition of your mouth, the degree of problems present and what parts of your mouth your dentist needs to see.

If you are a new patient, unless you have had dental x-rays very recently, your dental surgeon will probably suggest that you have x-rays taken in order to assess the condition of your dental health and to check for any hidden problems.

After that, x-rays are usually recommended every 6-24 months depending on the person, their history of dental decay, their age and the current condition of their mouth.

In children, x-rays can be used to show where the second teeth are and when they will come through. This also applies to adults when their wisdom teeth start to come through.

X-rays are an essential part of your health records and must be kept with your personal dental file. As dental records work differently to normal health records, your dentist must keep your dental records for at least six years from the date of your last course of treatment. You are entitled to copies of your x-rays under the Promotion of Access to Information Act, but you usually have to pay for these. If you have paid for the x-rays, you are entitled to the originals and the dentist will keep a copy in your file.

The amount of radiation received from a dental x-ray is extremely small. With modern techniques and equipment, risks are kept to a minimum.

## Types of X-rays

There are different types of radiographic equipment and these produce different types of dental x-rays.

Some show one tooth, some show more than one tooth and each tooth root, some show below the gum level and the bone structure that supports the teeth.

Some systems now use electronic imaging systems that use a sensor rather than an x-ray film. The picture is sent directly to a computer and displayed almost simultaneously on a screen so that both the dental surgeon and patient can view it there. This practice has digital x-ray facilities.

The dentist will leave the room when your x-ray is taken. The dental team take hundreds of x-rays and therefore to minimize the amount of radiation they are exposed to; they leave the room to move away from the x-ray beam.

You should always tell your dentist if you are pregnant. Dental radiographs, when needed, should be taken normally in pregnancy, unlike years ago when they had to be avoided. However, our dentists will be very cautious before advising a radiograph or dental treatment in pregnancy.

## Bitewings

Bitewings are one of the most common sets of X-rays. Bitewings show teeth above the gum line and the height of the bone between teeth.

Bitewings help diagnose gum disease and cavities between teeth. The bitewing X-ray is placed on the tongue side of your teeth and held in place by biting down on a cardboard tab.

Normally four bitewings are taken as a set. They may be taken as often as every six months for people with frequent cavities or every two or three years for individuals with good oral hygiene and no cavities.

## Full Set

A "full-set" of X-rays shows all of your teeth and all of the surrounding bone, helping to diagnose cavities, cysts or tumours, abscesses, impacted teeth, and gum disease.

A full set usually consists of 14-20 individual X-rays and is generally recommended during the first visit with a new dentist to aid in proper diagnosis and treatment planning.

## Panorex

A panorex is a full-mouth X-ray that is taken without ever putting an X-ray film into your mouth. Instead, as you sit still, the X-ray head rotates around you, providing one large image of your jaws and teeth.

This type of X-ray is particularly helpful for seeing the upper and lower jaws at one time and can show impacted teeth or other hidden structures that could be hard to see on the small, individual film used for a "traditional" full-set.

## Periapical (PA)

A periapical (PA)X-ray refers to a single X-ray that is taken to show a specific area of concern. If you have a tooth ache, your dentist is likely to recommend a PA film to see that whole tooth including the root.