



American Association of Oral and Maxillofacial Surgeons

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A G U I D E T O W I S D O M T E E T H H E A L T H

# Wisdom Teeth ~ RESEARCH



**Pain free does not necessarily mean disease free.**

## What are impacted wisdom teeth... and why are they a problem?

### 10 Top Ten Reasons

#### to remove your wisdom teeth

- 10.** Because there is limited space for wisdom teeth to erupt and because the surrounding gums are difficult to keep clean, infection and inflammation are common even when there are no apparent symptoms. Research shows that once inflammation takes hold, it is almost impossible to eliminate and may spread to other teeth.
- 9.** Research suggests that oral inflammation associated with wisdom teeth may contribute to pre-term or low birthweight infants.
- 8.** Even when wisdom teeth erupt through the gum tissues, they rarely provide any meaningful function and are always difficult to keep clean.
- 7.** In some cases, impacted wisdom teeth develop associated cysts and/or tumors. Removal of such lesions may require extensive procedures to repair and restore jaw function and appearance.
- 6.** With age, the chance for complications related to the removal of wisdom teeth increases.
- 5.** Gum disease and inflammation associated with wisdom teeth may lead to receding gum tissues, deterioration of the jawbone and tooth loss.
- 4.** Wisdom teeth may contribute to crowding of nearby teeth.
- 3.** Even wisdom teeth that seem to be problem-free (asymptomatic) remain a breeding ground for oral infection and inflammation. Research supports the concept that such inflammation may enter the bloodstream and contribute to the development and/or progression of a variety of diseases, including diabetes, cardiovascular disease and stroke.
- 2.** Once it has been determined that a wisdom tooth will not successfully erupt into your mouth and be maintained in a healthy state, early removal of wisdom teeth is associated with faster and easier recovery.
- 1.** *The Number One Reason for Removing Your Wisdom Teeth—Peace of Mind.*

A wisdom tooth, or third molar, that is blocked from erupting into the mouth in a normal fashion is said to be "impacted." A tooth may only be partially impacted, meaning it can erupt only partially into the mouth, or completely impacted, totally covered by bone and not likely to erupt. Nine out of 10 people have at least one completely impacted wisdom tooth, generally resulting from a lack of space in the mouth.

Impacted teeth can lead to a variety of problems including pain, infection, crowding or damage to adjacent teeth, and contribute to more significant health problems. For example, the sac that surrounds an impacted tooth may become cystic and fill with fluid that allows it to enlarge, causing damage to adjacent tissues such as the neighboring teeth, jawbone and other structures. Occasionally, a tumor may develop from the tissues surrounding the impacted tooth requiring a more involved surgical procedure to treat it.

Given that wisdom teeth rarely contribute to function in most patients, waiting for problems to develop generally makes their removal more difficult. As wisdom teeth develop, their roots grow longer and the jawbone becomes denser, making them more difficult to remove and complications more apt to occur.

It isn't wise to wait until your wisdom teeth start to bother you. Very often people are unaware of problems with their wisdom teeth because they experience few or no symptoms. The fact is that damage often occurs before you are aware of it. In fact, studies have found that even wisdom teeth that have broken through the tissue and erupted into the mouth in an apparently normal, upright position may be as prone to disease as impacted wisdom teeth.

Complications are impossible to predict. The longer the wisdom teeth remain in your mouth, the more likely they are to cause problems. Researchers strongly recommend that in order to prevent future problems, wisdom teeth, even those that appear problem free, be

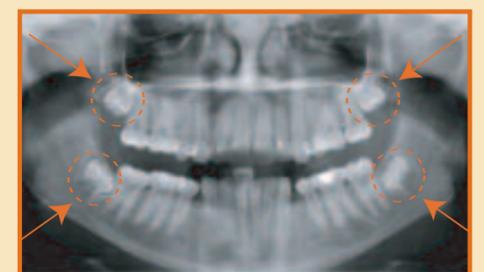
removed during early adulthood. They found that as patients age they may be at greater risk for developing disease, including bacterial infections in the tissues surrounding the wisdom teeth and adjacent teeth. As clinical trials and other research suggest, bacteria from gumline infections can enter the bloodstream and may adversely affect your general health. They may also be a contributing factor to preterm or low birthweight infants.

Impacted wisdom teeth may become painful for the patient, and may crowd the rest of the mouth. Have them removed before they become a problem.

#### Normal and impacted wisdom teeth



Wisdom teeth blocked from erupting in a normal fashion are said to be "impacted."



A Panorex x-ray will show the presence of impacted wisdom teeth and any problems they may present for neighboring teeth, the jawbone and other structures.

# Unlike you, wisdom teeth do not improve with age

Advocates of positive thinking have a saying, "Every day in every way, I get better and better." As an affirmation of personal growth, there may be some truth to the statement; but when it comes to your wisdom teeth, time may be working against you.

### Wisdom teeth growth by age

12 years      14 years

17 years      25 years



**Bacterial changes signaling the beginnings of gum disease may appear first in the wisdom tooth area.<sup>1</sup>**

Research has consistently found that even those patients whose wisdom teeth seem to be problem-free have a better chance of avoiding the complications of gum disease, adjacent tooth loss and difficult wisdom tooth extraction when they have their wisdom teeth removed prior to age 25.

Many patients believe that so long as they experience no pain, they do not have to worry about their wisdom teeth. Unfortunately reality paints a different picture. "Asymptomatic," or "pain free," does not indicate the absence of disease or pathology. In fact, the bacteria that cause gum disease may exist in clinically significant numbers in and around asymptomatic wisdom teeth and cause damage before symptoms let you know that something is wrong.<sup>1</sup>

The nine-year AAOMS Third Molar Clinical Trials found that patients who hold on to what appear to be problem-free wisdom teeth actually increase their risk for gum disease and tooth decay. Until the findings of the clinical trials were made public, it was thought that few patients under 30 years of age had gum disease. The clinical trials evaluated signs of gum disease in wisdom teeth of young adults aged 20-35,

who had no obvious symptoms. The researchers found a higher rate of gum disease related to wisdom teeth in this age group than had been expected.

Raymond P. White Jr., DDS, PhD, Dalton L. McMichael Professor of Oral and Maxillofacial Surgery at the University of North Carolina, Chapel Hill, and lead investigator of the Third Molar Clinical Trials, notes that, "Our studies show that young adults who have bacterial pockets under their gum tissue generally have them only around their third molars."

Gum disease is often a silent and pain-free inflammation or infection that can

damage the tissues that support your teeth. While daily flossing and brushing can help prevent or control the disease, for most patients the back of the mouth is a difficult area to reach and clean effectively. In its later stages, gum disease can lead to tooth loss. A recent study

of data from a U.S. population of 5,831 subjects 18 to 34 years of age indicates that the presence of wisdom teeth doubles the odds that gum disease will be found on adjacent teeth.<sup>2</sup>

Poor or inadequate oral hygiene has also been shown to lead to more cavities in erupted third molars and neighboring teeth; a 40% risk before age 40.<sup>3</sup> The cavity risk increases over time.

Patients over 25 years of age

experience more cavities than their younger colleagues.<sup>4</sup>

Impacted wisdom teeth, even though they may not cause you pain or discomfort, also present a problem as you age. In adolescents, wisdom teeth generally have undeveloped root systems. As the tooth develops, and depending on its position in the jaw, it may crowd neighboring teeth and push them out of alignment, causing bite and jaw problems. Furthermore, the longer roots of older wisdom teeth may come into contact with or grow too close to nearby nerves.<sup>5,6,7</sup>

Delaying the removal of your wisdom teeth past age 25 invites an increased chance of post-surgery complications. A study of 4,000 patients showed that those older than 25 were one-and-a-half times more likely to experience complications while having their wisdom teeth removed, with the risks increasing with age.<sup>8</sup> Such complications may include nerve damage, which may occur when the roots of the developed wisdom teeth become involved with the nerves that run through the lower jaw.

**Patients who hold on to what appear to be problem-free wisdom teeth actually increase their risk for gum disease and tooth decay.**



## Keep on smiling

It's been said that a smile is the shortest distance between two people. The surest way for your smile to reflect the best about you is to practice good oral hygiene.

Your teeth are important not only to your smile, but also by how they contribute to the structure of your face and the curve of your jaw. Teeth are critical for chewing and digesting food, and if you've ever lost one in the front of your mouth, you know how your teeth—or lack of them—affect speech.

Perhaps the greatest threat to a healthy mouth is bacterial infections that start between your teeth and gums. When bacteria infect the gums, they may cause recession of gum tissue and bone loss in the jaw.

Researchers have found that bacterial growth is particularly prevalent around your wisdom teeth, even when they appear to be problem-free. While you may brush and floss regularly, the limited space in the mouth that is available for wisdom teeth to erupt makes it almost impossible to keep them clean and healthy. This bacterial build-up often spreads and affects neighboring teeth, promotes tooth decay and even enters your bloodstream to spread infection and inflammation to other areas of your body,

## Bacterial changes to healthy gums

Healthy gum tissue is pink and does not bleed when you brush your teeth or your dentist explores with a dental probe. Healthy gums do not have "periodontal pockets" that allow the dental probe to penetrate between the tooth and gum tissue.

In the early stages of gum disease, the gums bleed when probed or brushed. The dentist's probe will penetrate up to four millimeters deep between the tooth and gum tissue.

In the later stages of gum disease, the periodontal pockets may increase to a depth greater than four millimeters or more with accompanied bone loss and loosened teeth.



Healthy Gums



Early Stages



Late Stages

potentially contributing to diabetes, heart disease, kidney disease and other health problems.

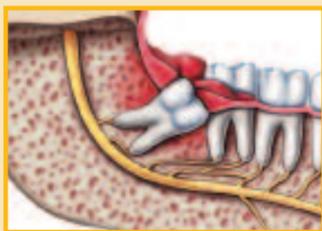
To prevent these problems, Oral and

Maxillofacial Surgeons often recommend that patients have their wisdom teeth removed before problems occur, preferably during young adulthood

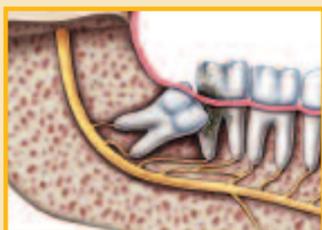
when teeth roots are small and chances of complications are minimal. The best way to determine if your teeth are likely to cause problems is to

schedule an appointment with an Oral and Maxillofacial Surgeon.

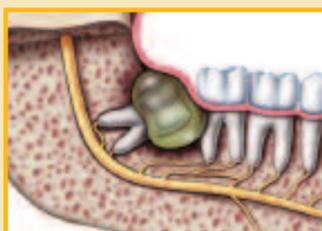
## Complications of impacted wisdom teeth



(a) Infection



(b) Crowding, damage



(c) Cyst

Complications may arise from partially impacted teeth (fig. a and b) and totally impacted tooth (fig. c).

If I don't have my wisdom teeth removed,

## what's the worst that can happen?

For young adults, wisdom tooth removal can be scheduled at a convenient time for patients and their families. While this may seem like a gift of time, it is unwise to delay surgery indefinitely. To do so may invite a variety of problems including damage to adjacent structures, such as sensory nerves, the maxillary sinus, and neighboring jawbones.

Postponed surgery may be more complicated and require a lengthier recovery. Further, damage caused by wisdom teeth to adjacent teeth may not be easily repaired.

### Tooth decay.

Keeping the back of your mouth clean with daily brushing and flossing is difficult in the best of circumstances. When wisdom teeth are present, good oral hygiene in this area is virtually impossible; a situation that often leads to cavities and tooth loss. Research has shown that more young adults have decay in the wisdom tooth area than previously thought. Of those studied between 23 and 34 years of age, over 40% had experienced cavities in their wisdom teeth, a condition difficult to treat.

### Gum disease and bacterial infection.

Wisdom teeth are not like other teeth in that they generally do not have adequate space to erupt. This is due in part to limited space and the fact that gum tissues in the area are not designed to attach to the tooth in a normal manner like other teeth. No matter how well you brush or floss, it's virtually impossible to keep the wisdom tooth area clean and bacteria free. Bacterial infection and inflammation often results in gum recession, bone loss and the possibility of loosened teeth. Of additional concern is the possibility that oral inflammation may extend to other parts of the body either directly or indirectly.

### Involvement of adjacent structures.

A young adult's wisdom teeth generally have incomplete root systems, making surgery relatively uncomplicated. As wisdom teeth mature, their roots lengthen and may become involved with the surrounding structures such as sensory

nerves and/or the maxillary sinus. In such cases, surgery may be more involved with a greater chance of complications.

### Cyst and tumor formation.

A fully impacted wisdom tooth sits in the jawbone surrounded by the sac in which teeth develop. Over time, however, this sac may enlarge and even develop unhealthy changes in the cells from which it is made. Problems occur when the sac surrounding the impacted tooth becomes filled with fluid and enlarges to form a cyst. As the cyst grows it may damage the jaw, neighboring teeth and other surrounding structures. Occasionally, tumors develop from the same tissues that surround an impacted tooth, requiring extensive surgery and reconstruction.

### What if I decide to keep my wisdom teeth?

If after discussing your situation with your family dentist or Oral and Maxillofacial Surgeon you decide to keep your wisdom teeth for the time being, it's important to agree on a long-term plan for monitoring the health and condition of the teeth and gum tissue in the third molar area. While an accepted protocol for monitoring retained wisdom teeth is still being investigated, researchers believe that, at a minimum, x-rays to see the wisdom tooth and surrounding bone and a clinical examination to determine whether an impacted wisdom tooth can be probed should be performed every two years. For your part, it is critical that you take particular care in cleaning and flossing the area as part of your oral health care regimen.

In the case of wisdom teeth, good things don't come to those who wait. A lot of bad things can happen in that time. Why wait for bigger problems later on?

## What to expect during surgery to remove your wisdom teeth

Surgery to remove wisdom teeth is relatively uneventful in most patients under 25 years of age. The frequency of complications is significantly reduced and recovery is shorter.

The actual length, complexity and type of surgical procedure required to remove your wisdom teeth will depend on several factors, including the position of the teeth; length and curvature of the roots; thickness of the bone surrounding the teeth; and so on. If the teeth have fully erupted, it may be possible to simply remove them intact from their sockets with instruments designed for this purpose. Partially or totally impacted wisdom teeth may require a more involved surgical procedure including removal of adjacent bone and, at times, sectioning of the teeth into smaller parts.



Modern anesthesia technology now makes it possible to perform even complex surgery in the oral and maxillofacial surgery office with little or no discomfort.

Oral and Maxillofacial Surgeons are specifically trained, licensed and experienced in the administration of local and intravenous anesthesia and the treatment of anxiety. Your surgeon will discuss different anesthetic options and help you decide which is most appropriate for you.

On the day of surgery, you should arrive at the office on time and wearing loose, comfortable clothing. If your surgery will require an intravenous anesthetic, be sure to follow all your doctor's instructions on how to prepare for surgery including bringing a companion who can drive you home after the procedure.

Immediately following surgery you will rest for a time in the surgeon's office. During this recovery time the surgeon or an assistant will monitor your condition before permitting you to leave for home with your companion.

Before you leave the office you will receive specific instructions to follow over the next few days. You may be asked to modify your diet for a day or two and eat soft foods and drink fluids. Medication prescribed by your Oral and Maxillofacial Surgeon will help alleviate any discomfort. In most cases, you will be able to resume normal activities within three to five days.



**Younger patients with cavities in their first/second molars were almost sure to develop cavities in their wisdom teeth within three years.<sup>1</sup>**

## Preparing to have your wisdom teeth removed

The time has come to have your wisdom teeth removed. Your Oral and Maxillofacial Surgeon has fully explained how the procedure will be handled and what you can expect to happen. Your surgeon and staff are prepared and equipped to make the experience as comfortable as possible, both during and after your surgery. There are also some things you can do to make this typically routine procedure easier on yourself:

**Clothing** Wear loose, comfortable clothing with sleeves that can be easily rolled up.

**Transportation** If intravenous anesthesia is used, you must have someone accompany you to your surgery appointment, drive you home afterward and stay with you until the effects of the anesthesia have worn off. You may be drowsy for a while after anesthesia, and driving yourself is unsafe.

**Diet** If intravenous anesthesia will be administered, do not eat or drink for at least six hours prior to your surgery.

**Medications** Follow any medication schedule prescribed by your surgeon prior to surgery. For example, at times antibiotics may be prescribed to minimize the chance of infection and provide a healthy environment for healing. Your Oral and Maxillofacial Surgeon will explain any medication schedule that may be beneficial for your specific case.

Remember, you have an important role in your recovery after surgery by following instructions that encourage healing.



## WISDOM TEETH:

# A noncontroversial source of stem cells?

Many scientists believe that stem cells harvested from the pulp of wisdom teeth could be “banked” for research and to address future health needs. Unlike embryonic stem cells, whose use has been controversial, stem cells from wisdom teeth may be harvested specifically for the donor.

The potential value of stem cells from wisdom teeth seems bright. In the past, researchers harvested stem cells taken from bone marrow to create cells of various organs, including bone and heart muscle. However research now suggests that stem cells taken from a tooth pulp, the living portion of the tooth that contains embryonic-like cells, may create organ tissues faster.

At a congressional hearing regarding program and project requests for inclusion in the 2007 Labor, Health and Human Services, and Education Bill, members of the House Subcommittee on Labor, Health and Human

Services, Education and Related Agencies, were particularly interested in testimony by the AAOMS about Dental Pulp and Derived Adult Stem Cell Research (DASC). The congressmen immediately saw potential in the use of stem cells derived from the pulp of wisdom teeth as an alternative to the controversial embryonic stem cells.

One potential application of stem cells taken from a tooth pulp may be to restore nerve cells damaged by diseases such as Parkinson's Disease.

“The stem cells from jawbone and teeth

share a common origin with nerve tissue. With the proper cues, researchers may be able to stimulate them to form nerve,” said Dr. Pamela Gehron Robey, Chief, Craniofacial and Skeletal Diseases Branch, the National Institutes of Health, Department of Health and Human Services. She noted that under appropriate conditions, this tissue may restore cells that make dopamine, but she emphasized that much more work is needed. Dopamine is a brain chemical that nerve cells need to properly function.

Dr. Robey believes that stem cells may help save injured teeth and grow jawbone. Regenerating an entire tooth may also be on the horizon. Years from now, she said, stem cells from teeth and jawbone might be used to correct cleft palate, one of the most common birth defects, sparing children multiple surgeries.

In time, individuals may be able to bank their own stem cells from baby teeth and wisdom teeth, similar to the way umbilical cord blood is now stored. At present, commercial facilities to store stem cells from teeth are not available.

## Put some teeth into that marriage proposal

A suitor gazes into the eyes of the woman he wants to spend his life with: He drops to his knees: “Will you wear my wisdom tooth?” he asks.

While no one expects human bone or teeth to replace silver or gold bands anytime soon, biojewelry has produced a flurry of interest in England. Designers at the Royal College of Arts and Sciences worked with scientists at King's College London to develop a new kind of “bling.” As the name implies, biojewelry is fashioned from human bone, usually derived from the pulp of wisdom teeth.

Tobie Kerridge designs biojewelry from his artistic base at the Goldsmiths University of London. “We wanted to create something that would engage the public and help people think about the implications of the jewelry they wear,” he said. “The ring is a symbol of a relationship, whose partners help create the ring design. Our goal was not to create a product but to develop a means for expression.”

For Dr. Ian Thompson, a research fellow in Oral and

Maxillofacial Surgery at King's College, the goal is not jewelry but bone replacement. The results apply to a wide range of medical scenarios in which bone must be replaced—for example, bone cancer, car crashes, congenital defects and support for dental implants. The jewelry may be a byproduct of this important research, but that doesn't diminish its unique charms.

Before creating this enduring symbol of love, both partners must agree to have bone removed, most often their wisdom teeth. Scientists isolate the cells, expand and seed them on a bioactive scaffold, encouraging them to grow, differentiate and mineralize. Six weeks later the resulting material can be formed into a bony band that can be embellished with precious metals.

It's a marriage made conveniently in the Oral and Maxillofacial Surgeon's office.



Your wisdom teeth:

## Can they affect your unborn baby?

**When it comes to the health of your unborn baby you watch what you eat, exercise, get plenty of rest and keep all your prenatal doctor appointments. You've got everything covered, right?**

Did you know that if you still have your wisdom teeth you might unknowingly be placing your baby at risk? Research suggests that infections in the gumline surrounding the hard to reach wisdom teeth may be associated with preterm or low-birth weight infants.<sup>1,2,3</sup>

Scientists have known for some time that certain antibodies, such as those associated with rubella, can pass from a mother through the placenta to infect her unborn child. Further study of umbilical cord blood has revealed that the same blood-borne infectious pathway can occur with oral infections, and be a contributing cause of low-weight and preterm birth.

Oral Conditions and Pregnancy, a five-year study of pregnant women, was conducted to determine whether a mother's periodontal, or gum, disease contributes to preterm birth and low-birth weight infants. Adjusting for traditional risk factors in 814 deliveries, researchers found that the presence and severity of periodontal disease in the mother were significantly associated with a higher percentage of early deliveries and significantly smaller babies.<sup>4</sup>

There are some steps that women can take to minimize the effects of oral infection.

1. Oral infections and inflammation are most prevalent and difficult to treat in the back of the mouth around the wisdom teeth. Good oral hygiene and timely removal of wisdom teeth (before pregnancy), even those that may seem to be problem-free, decreases the likelihood of problems in these hard to reach areas of your mouth.

2. See your family dentist before or early in your pregnancy to identify and address any existing oral health problems.



**Research indicates if gum disease was found only around the wisdom teeth of young adults between the ages of 24 to 35, odds were five times greater that gum disease would be detected in other teeth six years later.**



## Impacted wisdom teeth reveal:

# Stone Age “Magdalenian Girl” an adult woman

‘Magdalenian Girl’ was not a girl but a woman when she died 13,000 to 15,000 years ago. Her skeleton, excavated in 1911 in Laussel in southwestern France and acquired by the Field Museum of Chicago in 1926, has impacted wisdom teeth, and her skeleton shows the wear and tear of someone well beyond the teen years, says Robert D. Martin, PhD, Curator of Biological Anthropology at

The Field Museum. “After detailed examination, Will Pestle (former Collections Manager) and I estimated that she died between the ages of 25 and 35,” he says. Her skeleton offers the oldest recorded case of impacted wisdom teeth among modern humans.

For many years, scientists thought she was a young girl because her wisdom teeth, which usually erupt between 18 and 22 years of age, had not appeared.



Digital radiograph of the jaw of Magdalenian Girl showing impaction of the right lower wisdom tooth.



New high-quality radiographic imaging of the entire Magdalenian Girl skeleton, which is 13,000 to 15,000 years old, has made reanalysis of this skeleton possible.

Using technologically improved digital X-rays, the Field Museum in Chicago has found that Magdalenian

Girl had impacted wisdom teeth that failed to erupt at the normal time. At the time of her death, she was actually a 25- to 35-year-old woman.

Magdalenian Girl's wisdom teeth are also significant from a cultural perspective. Impacted wisdom teeth are generally believed to be the result of dietary changes. In our early ancestors, the coarse diet of the time required more chewing and higher bite

forces. This, in turn, stimulated the growth of the jawbone, which allowed more room for wisdom teeth.

“Finding impacted wisdom teeth over 13,000 years ago indicates that the human diet may have already changed—some would say deteriorated—earlier than previously thought,” said Dr. Martin.

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## How to find an Oral and Maxillofacial Surgeon

Ask your family dentist to recommend an Oral and Maxillofacial Surgeon, or go to [aaoms.org](http://aaoms.org), the American Association of Oral and Maxillofacial Surgeons' Web site, where the “Find an OMS” database will help you locate an AAOMS member to work with you and your family dentist.



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American Association of Oral and Maxillofacial Surgeons  
9700 West Bryn Mawr Avenue  
Rosemont, Illinois 60018-5701

1-800-822-6637 [aaoms.org](http://aaoms.org)

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