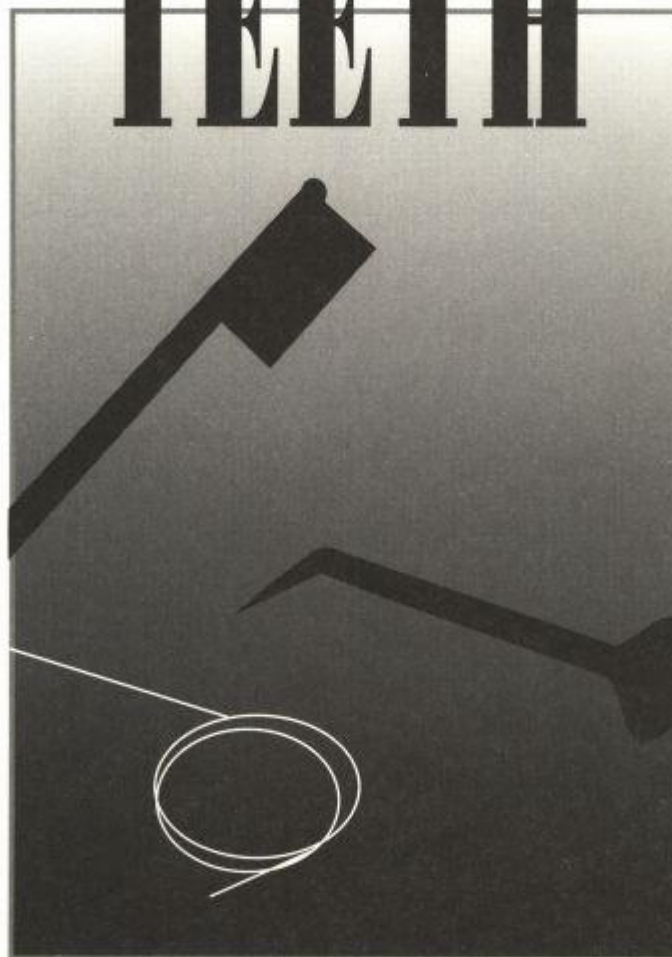


HOW TO SAVE YOUR TEETH



Toxic-Free Preventive Dentistry

David Kennedy D.D.S.

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This book is dedicated to my father Ted A. Kennedy, D.D.S. whose life long love of dentistry inspired my career and this book. There are dozens of individuals who have assisted me in preparing the manuscript for publication. I would like to express my sincere thanks to all of those who have helped.

Preface

Gum disease and tooth decay are the major causes of tooth loss. Both result from bacterial infections and poor nutrition and are entirely preventable. This book gives a step-by-step approach for restoring teeth and healthy gums and maintaining them, with a major emphasis on prevention. Prevention is the only practical and cost-effective way to keep your teeth all your life.

This year, Americans will spend over \$37 billion on dental care.¹ Sixty percent of all 15-year-olds and ninety percent of adults over age 35 will have some degree of progressive gum disease. Some 12 percent of American children will be receiving orthodontics to correct the effects of an under-formed dental arch. Tooth decay is still a major problem, especially among less educated, lower income groups. In 1986-1987, the average 17-year-old had over five decayed, missing, and filled teeth. And, contrary to popular belief, there is no scientific proof that fluoride can be credited with decreasing tooth decay.²

This book also deals in detail with three of the major controversies facing the dental consumer today: "silver" fillings, non-surgical treatment for gum disease and fluoride.

An environmentalist viewpoint is emphasized throughout: materials used in dentistry should not contribute to the proliferation of toxic chemicals in the environment — especially in the very intimate environment of your mouth!

¹ Waldman, B. H. "Who is Paying for Dental Care?" *Compendium Continuing Education in Dentistry*, Vol. XIII, No.7 July 1992.

² Yiamouyiannis, J.A. "Water Fluoridation and Tooth Decay: Results from the 1986-1987 National Survey of U.S. Schoolchildren", *Fluoride* 1990; 23: 55-67.

Introduction

Modern preventive medicine has two distinct historical predecessors.

Ancient traditional healing techniques emphasized a non-invasive approach encompassing spiritual, nutritional and natural herbal remedies to stimulate the body's innate recuperative capabilities.

The allopathic drugs-and-surgery-cures-all approach Americans embraced early in this century has failed miserably with degenerative diseases such as dental disease.

The field of modern dentistry originated from the allopathic approach, drilling out decay and cutting away infected gums, neglecting holistic healing practices, and failing to promote a life-style that fosters and supports health. The newly emerging field of preventive dentistry, on the other hand, maintains a primary focus on eliminating the causes of dental disease rather than concentrating on treatment of the symptoms alone.

One month after the first edition of ***How To Save Your Teeth*** was published, Dr. Harold Loe, the director of the U.S. National Institute for Dental Research stated that

"The first filling is a critical step in the life of a tooth. Using amalgam for the first filling requires removing a lot of the tooth substance, not only diseased tooth substance but healthy tooth substance as well. So in making the undercut you sacrifice a lot, and this results in a weakened tooth. The next thing you know the tooth breaks off, and you need a crown. Then you need to repair the crown . . . and so it continues to the stage where there is no more to repair and you pull the tooth.

"With the first filling you should do something that can either restore the tooth or retain more health tooth substance. Use new materials — composites or materials you can bond to

the surface without undercuts. You can do this with little removal of the tooth substance so that the core of the tooth is still there."

Dr. Løe agrees that amalgam is an unacceptable restorative material. In Sweden, his home country, amalgam has not been acceptable for children since 1987 from a toxicological point of view. I find it interesting that the head U.S. scientist in dental research can find many good mechanical reasons for not using mercury fillings but still must avoid saying anything about the toxic effects of amalgams and the carcinogenicity of fluoride. In Sweden both mercury fillings and water fluoridation are no longer used.

I've come to the ideas that you will read in this book — slowly — and over a number of years. When I graduated from dental school I thought silver/mercury fillings were safe. Science does not support that view. I believed my professors and the opinions that were ground into us through the education process. I once prescribed fluoride for my patients. I no longer think the use of a hazardous carcinogen for toothpaste and disposal of it through the fluoridation of water supplies of this nation is wise. In each area where my ideas now differ substantially from what I was taught in dental school, I have cited some of the key scientific literature. I have not written this book to convince other dentists to change their ways. That will be up to you, the consumer. I am writing this book to give you enough knowledge to become informed and to make wise choices about your own dental health and the health of your family.

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Dental Health

Good dental health is more than the absence of disease or tooth decay in your mouth. It is an integral part of overall well-being. People with exceptionally healthy bodies usually have healthy teeth and gums. On the other hand, chronic infection and disease in other parts of the body take their toll on the dental health. Even therapeutic treatment of various diseases can cause problems, e.g. AIDS patients and cancer patients undergoing radiation or chemotherapy commonly experience rampant tooth decay and deterioration of the gums.

Bad health habits also take their toll. Smokers are twice as likely as nonsmokers to develop gum disease. What does that mean? That cigarette smoke may cause gum disease? Maybe. But it is also likely that smoking is bad for the body in general and undermines its ability to maintain the conditions necessary for good dental health.

Teeth should be sparkling white and free from decay. Gums should be pink and firm and snug around each tooth. They should almost never bleed, unless cut, of course. The upper dental arch should be slightly larger than the lower arch, and back teeth should meet snugly and grind together efficiently. The jaw should be large enough for all the teeth to fit in evenly.

Breath should be free of offensive odors. At one time, physicians were trained to diagnose a variety of illnesses (for example, pyorrhea, diabetes, ulcers, and cancer) from

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the odor of a patient's breath. Your breath provides a clue to how healthy you are.

Achieving a state of overall health and well-being might require us to think hard and ask some difficult questions that we'd rather not deal with.

Our environment: for example, is it possible to be radiantly healthy in a business environment that's congested with unrelenting stress? In a job that allows no time for exercise or relaxation? In a city where the air is full of toxic pollutants? Spending our time doing things we hate, or with people we don't get along with? Eating a diet of fast foods on the run? All these factors — physical, psychological, emotional, and environmental — impact our health and well-being in important ways.

Consider the kinds of foods so many children and adults today love. Monkeys fed on sweets and pastries develop bones which become porous, weak, and brittle — a condition now known as osteoporosis. If this kind of bone damage is caused by a sweet-rich diet, we can expect that the same diet results in similar damage to teeth and that they will be more susceptible to tooth decay. This damage, coupled with the devastating effects sweet-rich diets have in helping bacteria form acids in the mouth, provides a one-two punch that must be avoided in any serious preventive program.

As early as 1938, evidence of the devastating effects of sweet-rich diets was documented. A dentist, Dr. Weston Price, set out on a world expedition to discover the reason why, as a general rule, societies untouched by modern civilization had excellent teeth, whereas civilized societies had comparatively poor teeth. Dr. Price found that diet was the answer. In traveling to the far ends of the earth, he compiled a photographic record of his observations.

In addition to increased tooth decay, he found the progressive 'degeneration' of the dental arch following the introduction of the modern general store into more primi-

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tive cultures. He concluded, "It is remarkable that regardless of race or color, the new generations born after the adoption by primitives of deficient foods develop in general the same facial and dental arch deformities and skeletal defects . . . the characteristic narrowing of the dental arches and crowding of the teeth."



Left, boy living largely beyond contact with white civilization. *Center and Right*, boy and man in contact with white civilizations.

Courtesy of Weston A. Price

In the 1930s the 'sophistication' of white rice devastated a generation of East Asians who fell victim to the 'plague' known as beriberi, caused by a simple deficiency of the vital nutrient thiamin, or vitamin B1, which is contained naturally in the bran and germ layers of whole-grain rice. Vitamin pills can't make up for this deficiency or similar deficiencies in white bread, sugar-laden ready-to-eat cereals, soft drinks, candy, and other refined foods. If in refining wheat flour, we take 58 nutrients out and put 12 back in, can we call the resulting white flour 'enriched'? Think about it, if, as many Americans do, you eat at least one teaspoon of white sugar (which contains no vitamins and minerals) every half hour, 24 hours a day, how can you get the vitamins and minerals you need for a strong and

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healthy body, when you have wasted so much of your daily caloric budget on 'empty calories'? You can't — and the results show — not only in bad teeth, but in overall poor health as well.

And if you feel that you don't eat very much sugar, consider this. A regular soft drink contains 10-12 teaspoons of sugar. A candy bar contains 5-6 teaspoons of sugar. A heaping teaspoon of ice cream contains a level teaspoon of sugar. A milkshake can contain 20 teaspoons of sugar. Ready-to-eat cereals, jams, and jellies contain over 50% sugar. Even catsup contains 35% sugar.

It is only lately in human history that we have come to regard cooked-to-death, fat-laden, concentrated heavy foods as components of 'good meals'. Again, fats add many calories to our diet with very few vitamins and minerals in return. While there are some very high quality fats found in sunflower seeds, fish oils, avocados, and other natural sources, you can be sure that the axle grease fast food service establishments use is well worth avoiding.

Even more recently, we have chemically processed foods and added substances to artificially color, flavor, and embalm them to give them the right color, the right flavor, and the right shelf-life. Are we really eating 'right' if we have a nation where the vast majority our citizens die of heart disease and cancer?

Even the hormones we feed to cattle and chickens to speed up their growth may have an adverse effect on our children. By feeding hormone-saturated meat to our children, we may be interfering with their normal growth patterns.

While organically grown chicken and beef avoid the problem of hormone residues, you may ask whether or not meat is even needed in the diet. You don't have to be an anthropologist to figure out that the teeth of humans are different from the teeth of a dog or a cat. Nature gave dogs

and cats sharp teeth for piercing and tearing meat. Gorillas, humans and monkeys have flat, grinding teeth designed more for a vegetarian diet.

Our teeth are similar to those of vegetarian animals, and the question may be raised as to whether humans themselves should even eat meat — if so, what is the effect of meat residues in the mouth on teeth and gum tissue.

We have strayed from the diet and environmental conditions that result naturally in optimal health and well-being, so it's no great surprise that our teeth have become increasingly vulnerable to the abuse we've been heaping on them. But, short of time warping back into a previous millennium, we can do something to protect our precious teeth.

We have the knowledge and the means available, if we only decide to apply them. Today, we understand a great deal about the biochemistry inside our mouths. So let's use it to take a closer look at the source of the problem we're combating.

The Sources of Dental Dis-Ease

There is a war raging in your mouth, that you don't even know exists if you're like the 90% of the patients who walk into my office. The enemy is entrenched in your mouth, silently destroying your teeth, gums, and the underlying bone support. The objective of this army of bacteria is to invade, colonize, and devour your tooth, gum, and bone tissues. If not controlled, this germ warfare can spread and eventually attack other areas and organs throughout your body.

The war going on in your mouth is between your body's defense system and the attacking bacteria. Germs continually attack at your weakest, most vulnerable point, and your defense system attempts to resist by

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destroying the bacteria before they can do harm. Because the mouth is wet, dark, and frequently full of food, it is a good place for bacteria to invade and multiply. Only with sufficient knowledge and effective weapons can you protect yourself and win the war.

“But how can he say this? — he hasn’t seen *my* mouth” — you may be silently protesting now. “I take good care of my teeth!”

Well, the fact is that when plaque samples from around the tooth gum collar are taken from the mouths of patients who walk into my office, I find the nine out of ten have quantities of the kinds of bacteria associated with gum disease.

Some of these microscopic critters may be seen zooming wildly across the field of vision. Others twirl or wiggle, and some seem to drift idly in any direction. The visual impact is enough to make many a patient recoil in horror, exclaiming, “Ugh! Get those awful things out of my mouth!” The individual properties of these spirochetes, spinning rods, gliding rods, clock arms, and others will be introduced in greater detail in Chapter 2 on gum disease.

Tartar is that hard crusty stuff that grows on our teeth. Wherever bacteria live, they pile up and eventually become hard. After several generations grow one on top of another you can actually feel the roughness. I call these expanding tartar colonies ‘bacteria condominiums.’ They are actually the calcified residue left by several bacterial generations, not too different from barnacles left on pier pilings. The surface of the tartar is still alive and the gum collar below it is teeming with activity. The infected site lies beneath the gums. This is why surface brushing may not be able to reach down where bacteria continue to thrive and multiply. A dentist or hygienist must use anti-bacterial cleansers and skillful techniques to get rid of all the living plaque so the bacteria won’t simply relocate and return as strong as ever.

Fifty years before Louis Pasteur discovered that bacteria existed, a Hungarian doctor named Semmelweis heeded the midwives' advice, and noticed that more babies and mothers were spared child-bed fever if, between all deliveries, he washed his hands and changed the bed sheets and wore a clean apron. For bringing this finding to the medical community, he was ridiculed, ostracized by irate fellow physicians, who were accustomed to walking around in leather butcher aprons stained with accumulated blood. His struggle was not so different from the one going on today.

Similarly, dentists, whose training focused on the surgical treatment of disease, ridicule the use of a microscope to diagnose gum disease. Yet without a microscope we lack the ability to find out specifically what the problem is and determine appropriate treatment — and to evaluate the success of whatever treatment is prescribed. Is it better to know what we are trying to remove or should we go about our treatment blindly?

Bacteria Are a Symptom

Bacteria are usually identified as the enemies of our teeth. They are what scientists point to as the cause of tooth decay and gum disease. Many of the specific kinds of bacteria associated with disease have been identified, and treatment aimed at removal of the offending bacteria often yields excellent temporary results.

Your body was designed to resist attack from all kinds of invading bacteria. Your immune system defends you from bacterial invasion and, as long as it works, you stay healthy. Only when your immune system fails to do its job, do bacteria gain inroads into your body and begin upsetting its fine-tuned balance. The bacteria are not the real enemy; rather, they are mere opportunists whose presence is a sure indicator of a weak immune system. When your defenses

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are weak, bacteria will attack. Bacterial plaque control can thus be quite effective for temporary symptomatic relief. However, permanent dental health requires an optimally functioning defense system.

If your immune system were working at peak efficiency, there would be no disease of any kind in your body. Failure of this defense system leaves us open to diseases such as cancer, heart attack, flu, colds, and gum disease. Therefore the real question is, what causes the immune system to fail, thus allowing the bacteria to invade and multiply?

Poor nutrition or the failure of your body to assimilate the components that are necessary to maintain health can damage your immune system. Lack of sleep will prevent your body from having the time it needs to fortify and rebuild. Lack of exercise will fail to stimulate it and even a sour-puss attitude can depress it. The immune system can also be depressed by various environmental hazards as well as exposure to various drugs, such as cortisone.

The immune system is also kept busy by having to repair damage being done to the body by continual exposure to toxic substances. One class of these substances is called free radicals.

Free radicals are highly reactive atoms or molecules that will bind with and attach to almost anything. Free radicals can be formed by sunlight, ultraviolet rays, radioisotopes, ionizing radiation, other chemicals, and heat. They are present in increasing amounts in our environment and the foods we eat. For example, frying foods in unsaturated oils that have been overheated will produce free radicals.

Free radicals can also be produced in our tissues; the white blood cells of our immune system use them to destroy bacteria. Here, the free radicals are stored in cell compartments until they are needed. Even when free radicals are used to destroy bacteria, they are compartmentalized so

that surrounding cell structures and tissues are left intact.

The body neutralizes free radicals with substances called free radical scavengers, such as vitamins A, C, and E.

I suppose that when Columbus sailed the ocean blue in 1492, he did not know he needed to take along vitamin C. Vitamin C is essential for building a strong and healthy immune system and it also has the ability to neutralize free radicals. Before he reached the New World, I would guess that all of his crew had bleeding gums as a result of scurvy. Scurvy is caused by vitamin C deficiency. The initial symptom of scurvy is bleeding gums.

The British navy solved the scurvy problem on long sea voyages by carrying along lots of limes, which are high in vitamin C. That is why the British sailors were referred to as "limeys."

The immune system defends you against bacteria. By enhancing it through good nutrition, exercise, proper mental attitude, and rest, and avoiding chemical and radiation exposures that can cause damage, you prevent not only tooth decay and gum disease, but also thousands of other health problems as well.

Dental health is vital to your overall health and is a good indication of the general condition of your body too. From a holistic perspective, it is clear that we must deal not only with the symptoms, but also with their ultimate causes as well. Merely repairing the teeth and gums without identifying the cause of the problem will inevitably allow the disease to spread to other areas of the body. Beyond good nutrition and maintaining a strong immune system, I recommend the following:

Step 1

First, read this book. You are acquiring one of the most important tools of holistic dental health: knowledge. Armed with understanding and solutions, you can start to create a

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healthy smile yourself. If dental work is needed you certainly will also need the help of a skilled dentist. But the more you do for yourself, the greater success you will have in preventing a return of further problems. Your home care program will be the key ingredient in preventing future disease.

Step 2

I recommend a complete and thorough evaluation by a conscientious dentist. Most people are unaware of the presence of dental disease until it is advanced. For example, a cavity does not generally ache until it is very close to or has penetrated into the nerve. Sometimes it does not hurt at all until it is too late to save the tooth. Waiting for pain to remind you it's time for a checkup will cost you both in terms of dental health and money.

The initial evaluation should include a microscopic analysis of your bacterial plaque, gums, teeth, and fillings. You should also find out what metals, e.g. mercury or nickel, you have in your mouth. (See Chapter 5: The Mercury Controversy)

If for some reason you cannot go see a dentist right now, do not despair. There's still a lot you can do to help yourself.

Step 3

Follow a conscientious regimen of regular brushing and flossing. (See the section on Dental Hygiene in Chapter 2, and refer to that chapter also, for more complete information on cleaning aids and appliances.)

Step 4

Once you have achieved dental health, you will want to keep what you have worked for. If you have had problems in the past, frequent thorough professional cleanings to

remove deep tartar deposits (four times a year) are the best way to keep bad bacteria from growing around your teeth. Once every 12 months you should also have a comprehensive examination by the dentist. This isn't just the 'quick peek' so common in the busy days of many dentists, but should include microscopic plaque examination and a serious sit-down evaluation of your dental condition. You should ask such questions as, "How are my gums looking?" and "Do you see any problems that might arise in the future?"

How to Select a Dentist

You will need to select a dentist to help in evaluating your dental health. But beware: all dentists are not equally concerned about the safety of their dental materials and the prevention of dental disease. We all went to dental school, but many of the skills required to be a good dentist are in attitude, not in education. Unfortunately, attitudes are harder to teach.

There is no sure-fire way to instantly evaluate all aspects of this complex subject, but there are lots of hints about the dentist's attitude you might notice: How clean is the office? Does the staff seem professional and happy to work there? Are they on time for you? Are they comfortable answering questions? Do they maintain good eye contact when they respond to you?

Your dentist should be a dedicated, caring person, devoted to fine dentistry. One question you might ask is whether or not the dentist still uses mercury/silver fillings. How concerned is he or she about preventive dentistry? These are just a few of the signals you should look for when selecting a dentist for yourself or your family.

If you don't have a referral to a prevention-oriented dentist, you can still find one on your own. The telephone

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book will help you begin to locate dentists near you. You might as well start close to home. Call the International Academy of Oral Medicine and Toxicology (IAOMT), the International Dental Health Foundation (IDHF) (see appendix), or even the local dental society and ask for the names of the dentists in your area who practice preventive dentistry and non-surgical periodontics.

And just because the dental society or academy refers you to a dentist does not necessarily mean that that dentist is right for you. Plan to interview several dentists. Set up an appointment for a new patient exam. As a new patient, you should expect the dentist to sit down and talk with you about your current dental needs and past experiences. Ask questions like, "What preventive dental techniques do you practice? Have you read much about the Keyes method of periodontal disease control?"

Another aspect to investigate is whether or not the dentist has a regular recall program of cleaning and microscopic evaluation. While the number of dentists with microscopes for plaque evaluation is currently small, they are around and are generally more informed than the average dentist about the subjects covered in this book.

The IDHF keeps a list of all member dentists who practice the Keyes method. However, not every dentist who has taken the course is a member of their referral list. Conversely, not every dentist who is on these referral lists is as concerned about the use of toxic substances as they should be. For example, many of the doctors using the Keyes protocol use high doses of fluoride to try to kill the bacteria. I do not recommend the use of fluoride but I do recommend the use of the Keyes method.

The IAOMT is a group of dentists and physicians concerned about the quality and safety of dental materials. They offer continuing education to dentists and physicians on numerous topics related to the biocompatibility of dental

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materials. They offer advanced training through a certification and fellowship program. In 1985, the IAOMT reviewed all of the available scientific literature on the use of mercury in dentistry and found no evidence of safety, but did find a number of studies indicating that mercury from dental amalgam fillings caused serious health problems. The IAOMT recommended that the use of mercury in dental fillings should stop. Since that time they have conducted numerous seminars on the safety of various dental materials and funded further research into the possible hazards. Their experts have developed a protocol for the removal of dental amalgam which minimizes patient exposure to mercury during the removal process.

Many of the members of the IAOMT are also leaders in the effort to promote toxic-free dental health care in their communities. The IAOMT maintains a patient referral process that you may contact by writing,

IAOMT

P.O. Box 17597, Colorado Springs, CO 80935

The Preventive Dental Health Association is an excellent source of information and oral hygiene tools. They can be contacted at 2425 Third Avenue, San Diego, CA 92101; by phone (800) 728-3833 and through their internet Home Page <http://emporium.turnpike.net/P/PDHA/health.htm>.

Dr. Jerry Mittelman is a leader in the preventive dental health movement. He maintains a referral data base to help you find a preventive dentist.

Jerry Mittelman, D.D.S.

263 West End Ave. #2A, NY, NY 10023.

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Louise Herbeck suffered from mercury poisoning for more than a decade before she found out that it was causing her to have multiple sclerosis-like symptoms. In fact, her disease was so advanced that she was in a wheelchair before she had her silver/mercury fillings removed. She is now almost fully recovered. In December 1991 she appeared on CBS's "Sixty Minutes" to tell her story. She has organized a patient support group to help others find a concerned dentist and also to lobby lawmakers to pass informed consent legislation to protect patients' rights.

The group is called DAMS which is short for Dental Amalgam Mercury Syndrome.

DAMS

P.O. Box 9065, Downers Grove, IL 60515

The answers to look for in interviewing a new dentist are not as important as the attitude. Notice if the dentist tends to rush about and not sit down to spend time with you. There should be enough time for you to talk with the dentist without interruption at your first meeting. If you are not satisfied with the dentist's communication, orientation, or personality — leave.

The school they graduated from makes little difference. Schools merely provide the student an opportunity to learn dentistry. They all graduate both good and bad students. Since federal aid to education, only a tiny percentage of dental students fail to graduate. (More students with lower grades are now enrolled than ever before. Why is that? Because schools stand to lose federal funds by flunking even the worst students of course.)

If x-rays are taken on your first visit, I recommend a separate consultation appointment be set up for you to find out the results of the x-rays. I find that this is better than

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having your dentist try to make the diagnosis off the cuff at the time of your first visit. To arrive at a complete and thorough diagnosis usually requires some careful review and study and cannot be completed in a few minutes.

Find out the cost of treatment and how payment is to be made. Have these items spelled out clearly prior to the start of treatment.

Determine whether you get answers you can understand when you ask the doctor questions.

Dentistry is a very personal service and no one dentist will be good for everyone. You must decide if a dentist is right for you. If you're not satisfied, continue the selection process until you find one with whom you are satisfied.

Once you have found the right dentist, there are many services that he or she can provide for you which will greatly improve your chances of success with the program presented in this book. Though the control of bacteria would seem possible by your efforts alone, I have seldom seen anyone, no matter how carefully they try, eliminate severe gum disease on their own. The most certain way to success is through the combined efforts of you and your dental team.

Your initial examination will provide the opportunity to evaluate more closely the dentist and the thoroughness of his or her approach.

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In the initial exam, the dentist should evaluate the following items:

1. Do your gums bleed at all during flossing, brushing or cleaning?
2. Have periodontal pockets started to form? If so, where are they and how deep are they?
3. Is there any tartar on the roots?
4. Is the soft tissue of your mouth healthy and free of lesions or sores?
5. Are your teeth healthy and in good repair, free from decay and defective dentistry?
6. Do you have any areas of ragged, broken fillings or decay?
7. What types of metals were used in your previous restorations?
8. What kinds of fillings do you have and in what condition are they?
How many occlusal (biting) and total surfaces of mercury fillings do you have?
9. Do you have any bluish areas on the gums around the teeth ("amalgam tattoos")?
10. Are any of your teeth loose or mobile or have they drifted out of place?
11. Are all your molar and bicuspid teeth that have not decayed adequately sealed?
12. Are there any areas where you have receding gum that leave root surfaces exposed?
13. Is the dentistry you have cleanable? Do any spaces seem to catch food? Can each tooth be flossed? Does it have good contact with its neighbor, and is it smooth?
14. Do you have bad habits, e.g. do you grind your teeth at night or clench your jaws?
15. Does the dentist have ultra-high-speed x-ray film and modern equipment to keep your radiation dosage to a minimum?

X-rays

X-rays of the teeth tell us many things. We can see the bone around the teeth and estimate how hard it is. If major pockets of gum disease are present, they can also be detected. We can detect many cavities that are not visible to the naked eye. It is estimated that over 50% more decay is visible through the use of x-rays than by visual exam alone. For diagnostic purposes, it is generally desirable to have a full-mouth series of 14 to 18 small dental x-rays taken. The large single scanner-type full-mouth x-ray (one film shows the whole mouth) is not of sufficient clarity to detect early problems and decay.

On the other hand, x-rays are not totally benign. When I was in school I was taught that the amount of radiation received from a full mouth series of x-rays was less than a day in the sunshine. This may well be true but if I put a full day of sunshine radiation into a tube and focused it on a 2 inch area in a fraction of a second, you'd receive a very high dose rate to that area. Researchers have found that brain and salivary gland tumors may be the result of too many dental radiographs.^{1,2} These new findings shocked the conscientious dentist.

In dental school, I was taught to take 4 cavity check x-rays every 6 months and a full 18-film survey every 6 to 8 years. Often when children start orthodontics, they are x-rayed to determine the alignment of their jaws and the presence of unerupted teeth. The individuals most susceptible to intercranial meningiomas (brain tumors) are young women who have had full-mouth radiographs before the age of 20.

The FDA now recommends limiting dental radiographic examinations for children in good dental health to once every two years and every two or three years for adults. Film speed has dramatically increased over the last 20

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years, reducing exposure by 97%.

One of the ironies of this is that dentists who have traditionally tried to take only minimal x-rays were often destroyed in malpractice trials if they failed to catch a cavity or missed a problem that might have been detected earlier with x-rays. Prosecutors found no shortage of supposed 'experts', usually dental school radiology professors, who were willing to testify that the safety minded but ignorant dentist had been told in school to take pictures every six months. Failure to do so has been deemed to be below the standard of care and has been used to convict many of malpractice. I am aware of no cases regarding situations where a dentist was convicted of having caused salivary gland tumors through the use of x-rays.

Standard of care is a fearful thing to most dentists. If a prosecutor can show that your care fell below the mystical 'standard of care', the jury most likely will find you guilty of malpractice and can award the plaintiff more money than you could ever earned in your entire life. Consequently, most dentists try as hard as they can to practice within this 'standard of care.'

In effect, the courts have ruled that you are not to be allowed any voice in the question of care. If the 'experts' feel that such and such is required for good care, the dentist is compelled by circumstance to follow this 'expert' advice. Is this stupid or what? After a few of the conservative dentists were convicted of malpractice simply because they heeded the patients wishes and consequently didn't have enough x-ray evidence to prove the care they provided was good, the rest of the dental profession quickly modified their heretical ways. Many x-rays that are taken are unnecessary from a dental point of view but are absolutely necessary for the prevention of successful malpractice prosecution. Even today, insurance companies refuse to pay for fillings unless the dentist can send along a current x-ray. I've even had 12-

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month-old x-rays returned with a demand for newer ones. They are willing to expose you to unnecessary radiation just so they can verify a problem.

X-rays are valuable and necessary diagnostic tools. However, their use should be limited to areas that cannot be seen by the dentist. Every two or three years, four cavity check (bite-wing) x-rays will allow detection of cavities in-between the back molars. A post-treatment check of root canaled teeth is also advisable.

Alternatives

There is no substitute for a good thorough visual mirror and explorer (pick) exam. I have a good blow-up camera and we photograph any teeth that have visible defects for the record. It is very helpful to be able to see the teeth and gums in full color. In addition a bright light source can be used to shine light through teeth. This is called trans-illumination. By using a light and a good mirror, tooth decay can be seen as a dark spot within the tooth.

We often make study models of the teeth to see alignment and bite. There is no danger that I am aware of in taking photographs and shining light through the tooth. These procedures will help reduce the need to use so many diagnostic x-rays.

Quality Dentistry: One Time When Cheap Isn't Better

Fees charged vary from dentist to dentist and from one area of the country to another. It is unwise to judge a dentist by the fees that are charged except when they are extremely low or when they are so high you can't afford them. If the fees are too low, then the focus is on cheap dentistry, not quality materials and workmanship. High quality materials, well-trained staff, and up-to-date equip-

How To Save Your Teeth

ment are expensive. Many foreign countries offer dentistry at fees well below the average U.S. cost. In some instances, such reduced fees may be attributed to lower overhead costs and profits to the dentist, but in many cases, attention to detail and overall quality is sacrificed.

The U.S. has one of the highest standards of dental care in the world, and it is impossible to predict what quality you will find in some other countries. For example, two young dentists from Germany stopped by my office one afternoon as I was reviewing my patient charts for the day. They asked if they could see the office since it had an attractive reception area visible from the sidewalk. I gladly gave them the cook's tour, ending in my laboratory where they examined a few of the routine crowns and bridges being fabricated. Both dentists exclaimed that they could never do that kind of dentistry for their patients back home, solely because the government program would not pay for it. Since, in Germany, free dentistry is provided by the government, the whole program is designed to furnish inexpensive fillings, extractions, and simple prefabricated crowns, much like our own public welfare dental program: mass service at minimal cost.

That's the essential error in allowing a government agency to be in charge of your health. They simply cannot afford to spend adequate time or money on everyone's health, so they treat symptoms rather than going beyond them to improve health and prevent disease. They rebuild the engine after it has fallen apart instead of following a regular preventive maintenance program. Dentists could fill teeth all day and all night, and there would still be more work to do next year than this. All repairs will fail in time without preventive dentistry. The irony is that minimal initial expenditures directed toward prevention can eliminate the necessity for costly remediation later.

Home Care

Ancient cultures lacked the technology to invent toothbrushes and toothpastes, but many of these cultures did recognize the importance of cleaning their teeth and discovered effective natural materials for protecting against bacteria in the mouth. American Indians used fresh bark from the Prickly Ash tree to clean their teeth. The sap from this bark kills bacteria. Mojave desert Indians used twigs from the Creosote bush as toothpicks. Rural villagers in India chew on a stick from the Neem tree until its bitter-tasting, antiseptic fibers separate into a brush of sorts for cleaning their teeth. Many societies have discovered tooth cleaners that worked.

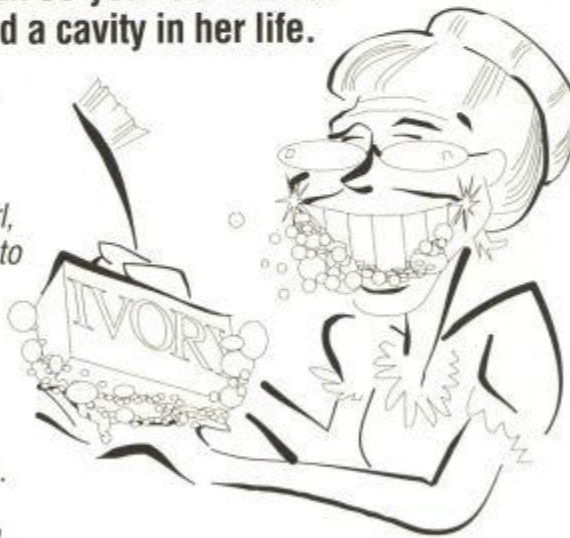
I once examined an 86-year-old woman who had never had a cavity in her life.

"What's your secret?"
I had to ask.

*"When I was a little girl,
my mother taught me to
brush my teeth with
Ivory soap,"
she replied brightly.*

"Doesn't that taste
pretty bad?" I inquired.

*"Well," she responded,
"in eighty-six years . . . you get used to it."*



How To Save Your Teeth

In the early 1900s, people began using chemical powders such as baking soda and salt to brush their teeth. These powders are among the most effective disinfectants (germ killers) available even today, but they don't taste very good.

Capitalism and big industry entered the picture in the 1930s, with the manufacture of pleasant-tasting tooth powders. And it wasn't long before sweet, foaming, mint-flavored toothpastes came along in an ever-expanding array of tempting choices.

Toothpastes: Do They Help?

In general, toothpastes are often just a cosmetic product with limited decay-preventive value. If you stain your teeth with smoke or tea, then a toothpaste may help reduce the staining. Pleasant flavored toothpastes seem to help motivate children and adults to brush. However, kids may be tempted to swallow the good-tasting stuff, and if it contains preservatives, saccharin, lead, colorings, or fluoride, they will receive a dose of a questionable or toxic substance. The fact that a tube of toothpaste contains a lethal dose of fluoride for a small child has been discreetly obscured from the general public's knowledge!³

And remember when toothpaste tubes stayed rolled up? Many of those tubes contained lead which the toothpaste absorbed and thus gave you an additional daily dose of lead every time you brushed. Until manufacturers furnish complete evidence that their products are effective and harmless, I refuse to recommend them.

Many dermatologists are aware that some of the additives in toothpaste can cause a rash or sores inside the mouth. Fluoride is particularly notorious in this respect. One patient came to me after going to see a dermatologist about an irritation at the corners of her mouth. She had

always had beautiful skin, but for the previous several months, she had a persistent rash. The doctor correctly identified her toothpaste as the culprit, and as soon as she switched to a nonfluoride brand her problem cleared up.

The abrasiveness of toothpaste can help polish teeth, but too much abrasion will wear away the enamel and especially the root. Many of the gritty products sold as smokers' toothpastes are overly abrasive. In time, they may actually cause yellowing of the teeth by wearing down the enamel. Gritty toothpaste should not be used around the root surfaces, since even the mildly abrasive products can damage this area. That does not mean you should not brush around the gums. I'd rather see a root worn down by brushing than rotted away by neglect. Wear is usually a minor problem but root decay can destroy teeth quickly. Baking soda should not wear away enamel, but if it is improperly applied, it can scratch the gums.

Other toothpastes contain bleaching agents that are supposed to whiten your teeth. Teeth can be whitened through the use of a mouth guard which holds the whitener against the tooth surface for several hours, but the topical application of a paste has only little effect on the brightness of teeth.

Several companies have advertised new toothpastes designed to prevent the buildup of tartar in the hopes that they will reduce gum disease. These tartar-control toothpastes apparently interfere with the remineralization of teeth. Several of my patients have reported increased root sensitivity after using tartar-control toothpaste. There is little evidence at this time that the tartar itself is the cause of gum disease. It is but one of several factors that contribute to the spread of the disease. Since I am concerned about the long-term effects of demineralization, I do not recommend the use of tartar-control toothpastes.

Where root sensitivity is a problem, there are tooth-

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pastures designed to help remineralize root surfaces. These pastures are best applied after brushing just before bed. That way they will stay on the tooth longer. Just dab a spot on the sensitive root and go to bed. It usually takes six weeks to feel the improvement.

Why haven't any reliable scientific studies been carried out to determine the comparative safety and effectiveness of different toothpastes? Maybe because there is no money to be made from such a study. Maybe because large toothpaste manufacturers don't want you to know that fluoride-containing toothpastes cause allergic-type reactions and gum damage and that a family-sized tube of fluoridated toothpaste contains enough fluoride to kill a small child.

Many believe the pronouncements and recommendations made by the American Dental Association and leading consumer magazines, but few realize that these organizations have not done the scientific research necessary to show safety. In fact, in many cases, just the opposite has been found — the products they have recommended have been shown to be unsafe!

For now, the most reliable approach is to use the common, time-tested agents: baking soda and salt or a mixture of both with hydrogen peroxide. Other natural products and options are listed in the chapter on gum disease.

Toothpaste is good to the extent that it encourages kids to brush. It is bad if it discourages dry brushing anywhere and anytime. Only a few commercial toothpastes are helpful in controlling tooth decay or gum disease. Feel free to brush without toothpaste; don't get fixated on the idea that you must have it in order to clean your teeth.

Cleaning your teeth properly is as easy as 1, 2, 3:

1. Brush your teeth
2. Clean between your teeth with floss, toothpick, or proxybrush.
3. Irrigate the gum collar with a Water Pik™ or ViaJet™.

Plaque is waterproof and, therefore, without first dislodging it from your teeth, rinsing alone will have little positive effect. The plaque must be first scrubbed loose and then rinsed away. The most effective tools for rinsing are the oral irrigators, since they can apply the rinse in between the teeth and into the gum collar where it can do the most good.

A word of caution, however, about mouthwashes. Many mouthwashes contain fluoride. Fluoride has been linked to oral cancer.⁴⁻⁶ Therefore if you prefer to use a mouthwash, use one without fluoride, dilute it, and use it in an oral irrigator like the ViaJet™ or Water Pik™.

Summary

An effective program of preventive dental health requires a holistic approach that combines a healthy lifestyle, good nutrition, minimizing exposure to pollutants, effective dental hygiene, and the professional care of a dental team using microscopic bacterial analysis, deep cleaning, and antibacterial agents.

'Progress' in dentistry in our generation has focused on three main areas: high-speed drilling and reparative technology allowing for faster, more efficient treatment of a greater number of patients; insurance to provide economic access to dental care to larger segments of the population; and mass medication through the introduction of fluoride.

All these approaches are ultimately doomed to fail,

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because they are based on wrong thinking. They attack the problem, not its cause, and eventually contribute to the problem.

Tooth decay has declined over the last three decades in most industrialized countries. The decline is attributed to better education and enhanced oral hygiene. Sugar intake has also declined in many areas.

Prevention ideally means we prevent future generations from falling into the same pitfalls we did. Modern techniques of preventive and restorative dentistry can help us correct the mistakes of the past. *Cavity-free* kids and adults are the promise of the future.

Gum Disease: The Silent Epidemic

Gum disease is the major cause of tooth loss in our adult population. It is an epidemic. If you're over 30 years old, chances are better than 90% that you have some form of gum disease.

Currently, general dentists do little if any treatment of gum disease; in fact, most dentists have the malady themselves.

Despite training to the contrary, many dentists feel that surgical procedures simply do not work. Many family dentists are disappointed with cosmetic results and the frequent necessity for repeated surgery. Eventually, many patients lose their teeth anyway.

As a result, not knowing which way to turn, their patients ignore the problem until it forces extractions. Extractions always cure the symptoms. As my oral surgeon friend says, "Smooth gums are healthy gums."

Gum disease is so common and unobtrusive that you are not likely to recognize its symptoms in their early stages, and most dentists don't bother to diagnose or treat it at that time. Even at the age of 15, gum disease has already begun in 60% of the children. At this point it is relatively easy to treat and reverse. Gum disease is usually not "discovered" until it is chronic and advanced. At this stage treatment is more difficult, costly, painful, and far less effective. Inevitably, advanced gum disease allows bacteria

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to enter the bloodstream and spread throughout the body, leading to even more serious consequences including damage to internal organs.

You probably cannot tell if you have gum disease by looking in the mirror. The most accurate way to assess your dental health is by professional inspection and microscopic evaluation. The dentist or hygienist can carefully graph the level of the bone and gum around each tooth and record the kinds of bacteria found. Problems start in the back of the mouth where you can't see and don't notice. They usually begin about age 12 and gradually progress throughout life. Only after it is very advanced do the signs become visibly apparent. A rarer form of childhood gum infection is more aggressive and can destroy a child's mouth before he or she reaches twenty. Both types of gum disease are caused by bacteria and are contagious, but they are preventable and controllable.

Seventy percent of all tooth extraction is a result of gum disease. The result of this disease can be a cigar box full of perfectly good teeth that may not even be decayed at all! To stop or prevent this disorder, you need to know enough about it to cure it — the earlier the better. In this chapter I will begin by describing the normal mouth, how gum disease modifies that healthy picture, and what the early symptoms are. Many of the bacteria that cause infected heart valves and grow on prosthetic hip replacements can be traced to the oral flora (germs). Because of this I have two recommendations for those reading this book who have any kind of artificial joint, scarred heart valves, rheumatic fever, heart murmur, severe heart conditions, or by-pass surgery:

- 1) Please check with your doctor to see if you should be placed on an antibiotic before you begin the new program.

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- 2) Follow this program and heal up those gums so they never bleed again. Bleeding gums mean that there is no skin in that area to protect you against bacterial invasion of the bloodstream.

Dental cleaning, brushing your teeth, and even chewing can spread bacteria to your blood stream if your gums are infected. With all of our high-risk patients and most of our low-risk patients, we first clean the mouth with anti-bacterial agents before we start our procedures. This has been shown to reduce the bacteria-in-the-blood problem. We also recommend that our patients follow the American Heart Association prophylactic antibiotics protocol before dental cleanings or work.⁷

If you allow bacterial invasion through the gums, you also risk a bacterial infiltration in other parts of your body. Once these organisms penetrate the skin, there is no telling exactly where they will go. Heart valves are frequently damaged by bacteria that originate in the mouth. At one time, physicians recommended that patients with damaged heart valves have all their teeth removed if gum disease was present. Fortunately, such drastic measures are no longer necessary. However, it is important to realize that whenever you're dealing with any kind of infection, you have a potentially dangerous problem.

Surgery vs. Non-Surgery: A Historical View

Until this century, gum disease was not considered an appropriate condition for a dentist to treat. Physicians traditionally treated all infections and still do in many parts of the world. They approached gum disease in the same way they treated any other bacterial invasion, by cleaning and disinfecting the area. This approach was sometimes successful in relieving acute symptoms but seldom produced the desired long-term result.

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Early in the 1900's, the medical community agreed to have the dental schools teach more about gum problems and place more emphasis on the care and treatment of gums. Up to that time all treatment had been non-surgical. Soon, the surgically oriented dentists began to experiment with a more radical approach to treat gum infections. The famous dental scholar, Dr. G.V. Black, wrote that teaching the patient how to clean and irrigate the gums around the teeth was the most effective way to control gum disease. Many schools of dentistry only taught this cleansing approach for periodontal disease. Others, believing that the infection could be cut out, much like their earlier success with tooth decay, began to search for the proper technique for amputating diseased tissues. This search is still going on today. Clinical failures are blamed not on technique or approach, but on their patients' inability to maintain oral hygiene. Unfortunately, the surgical approach seems to accelerate the disease in the absence of carefully monitored, repeated frequent professional cleaning visits.⁸⁻¹³

Periodontal (gum) surgery has gone through several phases, and we are currently in the midst of another revival. The present approach is toward longer office and hospital procedures with extensive bone and tissue re-contouring. With the aging of the post-war baby boomers and the wide-spread development of gum problems in that population, it is estimated that future dentists will be very busy treating gum disease.

Based on significant evidence in the published research, there are two main reasons to undergo gum surgery:

1. To give the doctor better access to the diseased root surface so the tartar can be removed quickly and the pocket cleaned out.
2. To attempt a bone or skin graft to restore tooth attachment.

Gum Disease: The Silent Epidemic

I usually do not recommend surgery unless the bacterial problems are well under control and then only for the more advanced problems.

Early in the 1970's, along with the advent of dental insurance, periodontists (specialists in gum therapy) developed bone transplants. The current rage is bone grafts. These procedures are experimental, although a few studies do show some benefit. Unfortunately, when the therapy is evaluated with respect to tooth longevity, time and expense, the results often do not justified the surgery.

Today, less radical surgeries have been developed which do much less harm and leave a more cosmetically acceptable result. The most frequently utilized of these procedures is called the modified gum flap. It is used primarily for assisting the dentist or hygienist in rapidly cleaning tartar and bacteria from deep pockets. This technique involves raising gum tissue from the bone; cleaning the teeth, and resuturing the tissue back in place. The limited success of surgery leaves much to be desired since it tends to accelerate bone loss, and, unless meticulously maintained, can cause the disease to progress even faster.

The Alternative

The alternative is early intervention with a conservative, non-surgical approach that relies on bacterial identification, the continuous use of anti-bacterial agents to irrigate pockets, and frequent professional deep-root cleanings to eradicate the bacteria which cause gum infections. After diagnosis and classification, the initial therapy typically includes home care training and several visits for deep cleaning with anti-bacterial irrigation. Once controlled, frequent follow-up visits and periodic microscopic checks are required to make sure that the bad bacteria do not return. A maximum recall frequency of 90 days is mandatory for those with advanced problems.

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In 1978, science reporter Judith Randal wrote an article on the Keyes technique. Her article discussed the use of baking soda, salt, and hydrogen peroxide for control gum disease. She was a victim herself of gum disease and diagnosed as needing thousands of dollars worth of surgery. She learned of Dr. Keyes' research project and sought him out. After she learned how to control the bacteria in her own mouth, and brought her gum disease under control, she wrote several articles about the benefits of his approach.

The Randal article excited the imagination of the public; however, it recounted only her personal experience. It was not a comprehensive account of the procedures used in the Keyes technique, and it deeply disturbed many periodontal specialists. They firmly believed surgery was always necessary, and because of their mind-set, they attempted to discredit Dr. Keyes and his work. To Dr. Keyes credit, he has stood his ground, and today many studies confirm that the correction of periodontal problems correlates with the removal of bacterial pathogens from the mouth. Progressive periodontists have incorporated the anti-bacterial approach into their practices and have found the results very rewarding. I have, my patients have, and you will, too.

While getting rid of oral bacteria, it is necessary to evaluate the bacteria present, and the use of a microscope is essential. If, under microscopic examinations, it looks like rush hour on the freeway, then you are definitely in trouble. On the other hand, if it resembles the Sahara desert at high noon on a hot day, you're all right. As treatment progresses, the harmful bacteria are killed off, and only the normal healthy flora return. Normal flora do not wiggle and squirm, and by evaluating the activity of your bacteria, your dentist can tell if the approach you and he or she are using is sufficient to control your gum infection.

Gum Disease: The Silent Epidemic

Three hundred years ago the Dutch scientist Antonj van Leeuwenhoek invented the microscope. Searching for something interesting to look at with his new invention, Leeuwenhoek chose a plaque sample from one of his own teeth. What he saw made him exclaim, 'animals', and after a moment's reflection, he realized how tiny these living organisms were. He decided to call them animalcules, for tiny animals. He sprinkled salt on the plaque and observed that the animalcules died. Leeuwenhoek therefore suggested that people should brush their teeth with salt.

The periodontists claim that gum disease, regardless of the cause, cannot be stopped with anti-bacterial treatment alone, and that surgery is a very necessary part of treatment. They also warn that the patient can injure their gums by using baking soda and a toothbrush.¹⁴ Injury does occur when you brush vigorously on soft gum tissue with baking soda so I would advise against doing that. You should use a soft brush and work the bristles into the gum collar. Do not scrub vigorously on the side of your jaw. That will scrape the fragile skin and will feel like a pizza burn for a few days.

Gums often do get sore when you start this program. Just as when you work out, your body often gets sore before it gets stronger. If you feel soreness from this program back off for a day or two and more gradually increase the pressure. The gums will toughen as they heal and eventually you can apply as much pressure as necessary to rout all the bad bugs.

It is sometimes difficult for you to tell the difference between the discomfort of brushing wrong and the disease process itself. It is not hard for a dentist. They simply look at the tissue to determine if it is raw and abraded. If that is the case, then you're brushing too hard. If, on the other hand, it is red and swollen, you probably have an infection.

Overall, current research does not support the use of

How To Save Your Teeth

surgery as a primary treatment for gum disease. I do occasionally recommend some special surgical procedures for my patients. However, before we make a surgical incision we make sure that we have exhausted the non-surgical approach and that the pockets are free from harmful bacteria. Surgery in the presence of bacteria appears to accelerate bone loss.

Dr. Keyes insists that, regardless of the approach, the removal of bacteria should be the primary target of treatment, and that this can be done in most instances without resorting to surgery.

The Ultimate Cause

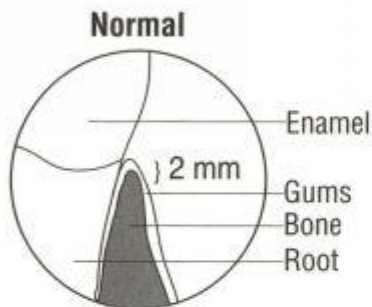
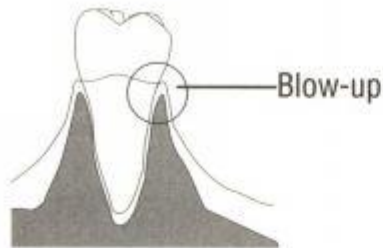
There is no single cause of gum disease, but rather a multitude of factors which all affect the progress of periodontal disease. Bacteria are the target of the Keyes therapy. The removal of the bacteria will unquestionably improve your dental health, but there are other more serious reasons for the problem which must be corrected in order for you to stay well.

The Picture of Health

Normally an adult has 32 permanent teeth. They are smooth and almost glassy to the touch. The front teeth are narrow for incising and smiling, while the back teeth are wider for grinding. Like icebergs, only a small portion of a tooth shows above the gumline, while the remainder lies below the surface.

The root of each tooth is surrounded by a pink turtle-neck collar of gum tissue and is attached to the bone by an immovable ligament. The normal gum collar is usually one to two millimeters deep in all areas. The root structure of your mouth is engineered to spread the enormous forces of biting over a large bony area. The result is a strong,

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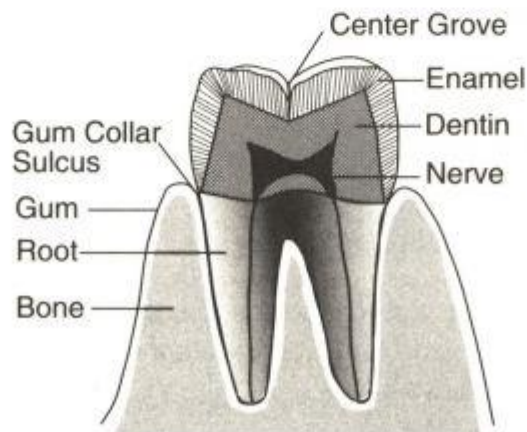
healthy, functioning system of mastication that can last throughout your lifetime and teeth that can bite easily with over 100 pounds of force.

The gums (or gingiva) closely surround the bone that holds the tooth in place. Healthy gum tissue is firm and fits snugly against the teeth in all areas. It normally is not sensitive or tender and will not bleed unless traumatized. It is pink (or possibly pigmented in dark-skinned people), and shows no signs of redness, swelling, or bleeding. A micro-

scopic plaque sample shows few active forms of bacteria or white blood cells.

The picture of health is 32 solid, smooth teeth embedded in hard bone and surrounded by firm pink gums.

Tooth Anatomy



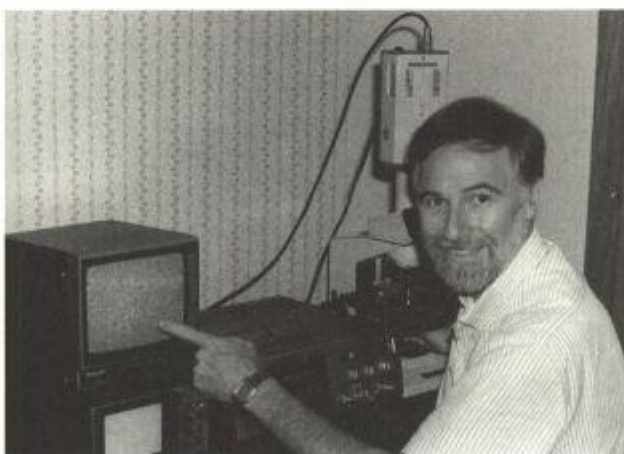
How To Save Your Teeth

How It Happens

Gum disease, or periodontal disease, has had many names over the centuries. You may know it as pyorrhea, gingivitis, trench mouth, or periodontitis. It has existed throughout the history of humankind. The earliest human skeletal remains clearly show the bone destruction caused by this disease.

Periodontal disease works like this. Bacteria line your mouth and digestive tract all the time. Some reproduce every 20 minutes. That means that in 24 hours millions of bacteria will coat your teeth, gums, tongue, and mouth with a sticky film called *plaque*. Some of these microscopic 'bugs' may creep along the side of the tooth and penetrate beneath the gumline and may be missed even by careful brushing and flossing.

A close look at oral samples taken under the microscope may show a variety of creatures propelling themselves around. Seeing them would probably convince you that you



don't want them multiplying uncontrollably inside your mouth! A dentist using a microscope should know exactly what kind of organisms

are present to help determine the diagnosis, treatment plan, and type of antibacterial agents most effective in eliminating the disease.

Gum Disease: The Silent Epidemic

What Do These Microorganisms Look Like?

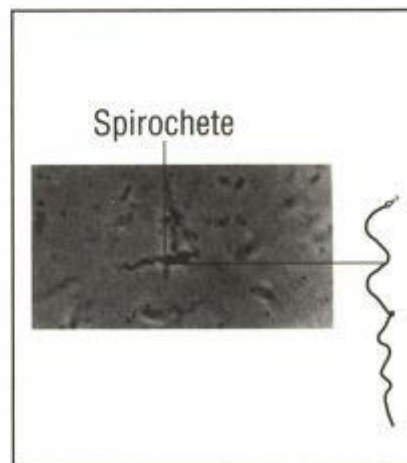
There is a tremendous difference between the picture of health and disease. Examination of samples from healthy gums under the microscope reveals barely any bacteria with a few white blood cells on guard duty. There is little or no movement.

On the other hand, examination of samples from unhealthy gums reveals a markedly different picture. Here one sees disease-causing aggressive organisms that are all highly mobile. They zoom and spin around with great speed. The greater the disease, the more motion and the greater the number of organisms present.

Eight different kinds of single-celled microorganisms are commonly present in gum disease.

(There are a few rare bad bacteria that are not as the mobile. If problems persist after preliminary treatment we recommend a culture be taken to identify non-mobile organisms that could be the cause. This is necessary in only about 10% of the cases.^{15,16})

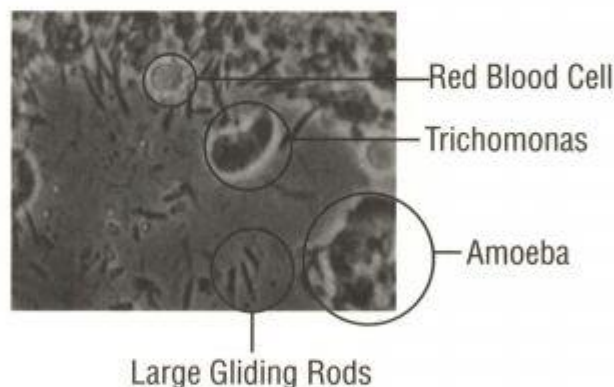
Spirochetes are like snakes. They wriggle and worm their way into the tissues of the mouth. They are one of the few bacteria we know that can eat through skin. They feast on blood and fibrin. Wherever I see bleeding gums, I suspect the presence of spirochetes. Fortunately, they are fairly easy to kill.^{17,18}



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Small gliding rods: these short cigars cruise about rapidly in samples taken from people with gum disease. They are among the tougher bacteria to kill. They have been photographed growing on bone, and it is currently thought they actually destroy bone. Often this tough guy remains after the initial antibacterial therapy. However, it will eventually perish if you persist.¹⁹

Large gliding rods are longer and more graceful in motion. However, they are not your friends either. They too are thought to contribute to gum disease by destroying the bone around the teeth.



Spinning rods are the whirling dervishes of germs, since they twirl and spin with no apparent direction. They are easy to spot since they are so active and colorful. Their favorite delicacy is not known, but they are another risk factor frequently associated with progressive gum disease.

Clock arms: Cytophaga look like they're always busy telling you what time it is. These long slender rods are often fixed at one end and swing around like the hands of a clock in a time warp movie. Their role is not completely under-

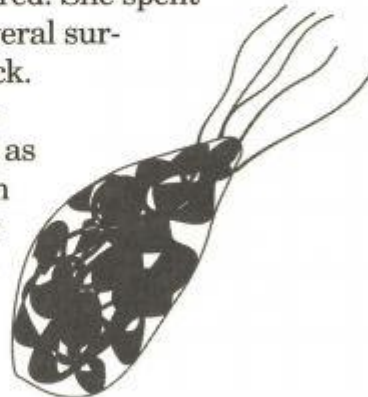
Gum Disease: The Silent Epidemic

stood, but you can be sure they are up to no good.

Motile cocci are tiny dots that buzz about the picture. I often see this critter in children, especially those not using an antibacterial toothpaste. They will make the gums red and cause occasional bleeding. They are not thought to present any threat to dental health, except to indicate that the mouth is not being cleaned well. Such a lack of cleanliness may eventually result in a worse infection, so we feel this bug, too, should be controlled.

In addition to bacteria, one-celled animals are also found in the mouth

Trichomonas tenax look like tiny mice, with five long filaments thrashing about in front allowing them to tromp around all over the bacteria. They are much larger than bacteria. Dr. Keyes once related the story of a young model whose gums became very red. She spent thousands of dollars and had several surgeries to try to get her health back. Finally she found Dr. Keyes who correctly identified *Trichomonas* as the problem and treated her with antibiotics and his program. Her gums healed in just a few weeks but because of the aggressive surgery her career was lost.



Amoebas are boring to watch. They are formless blobs that appear to slink slowly about. I call them snails. One way to increase their rate of movement is to cool one end of the slide and warm the other. They will migrate toward the warm end. They creep from place to place, taking on the shape of whatever food they eat. Sev-

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eral scientists have rated this one-celled animal as one of the greatest risk factors in treating gum disease. It is thought that it eats white blood cells.²⁰



White blood cells are on your side. These cells are your primary immune defense fighters. They rush to the rescue wherever bacteria begin to invade. The battle is between these soldiers and the bacteria. When many white blood cells are present we know that the battle is on. By counting them, we can tell how upset your body is about the plaque invasion. If there are wall-to-wall white blood cells, I always suspect rapid progression of the attack and rapid bone loss.

Colonizing your Gums

Organization, that essential business tool that many of us so desperately lack, is no problem for microorganisms. Bacteria have it, if left to their own devices. A single spirochete will multiply approximately every 8 hours. Take your calculator. Begin with just one and try doubling the number 3 times a day for three months to see how many would be present. This is one reason we always recommend that if you have these problems you receive a deep cleaning every three months.

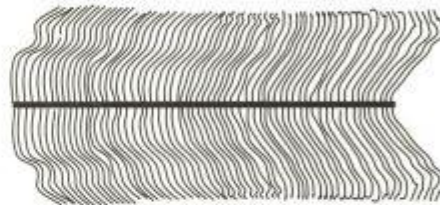
When the bacterial numbers grow very large, the

Gum Disease: The Silent Epidemic

gingival crevice becomes too crowded to accommodate them. So instead of dying off from excess pollution, they begin to organize.

The spirochetes apparently line themselves up on an innocent bystanding bacillus (a long rod-shaped bacteria) and attach to it. They then wave in a rhythmic motion similar to a heartbeat.

Think of a zillion tiny creatures waving together to and fro like “the wave” at the football stadium. This creates circulation of the fluid in the gum collar, thus allowing the bacteria to continue to thrive



Pump creates circulation

at your expense. Such a formation is called a spirochete pump. Interestingly enough, the white blood cell will not readily enter this turbulent fluid. Even if it did try, the spirochetes often overwhelm it and destroy it. On rare occasions, the spirochete pump may be lifted out intact and viewed on a microscope slide. It is a sign of severe infestation.

If bacterial growth is left uninterrupted, gum disease will have progressed through the following stages.

Stage I: Early or Potential Gingivitis

After nine days of undisturbed activity beneath the gum collar, the outer layer of skin is sloughed off. There is no pain or discomfort to this process; however, the tissue may bleed easily at this point. The plaque will then begin to inch downward along the root between the tooth and its bony socket and generate a pocket-shaped crevice in the bone.

During the early stages of gum infection, there are few

How To Save Your Teeth

obvious symptoms. It is generally painless, and nothing appears out of the ordinary. In fact, the symptoms are seldom noticed by the people who have them: a little dragon breath, unpleasant taste in the mouth, and occasional tender, bleeding gums.

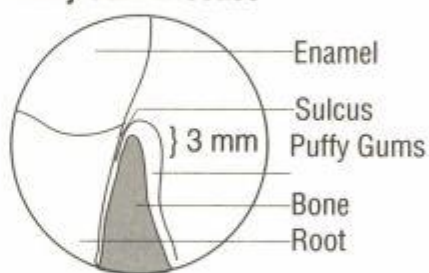
The bleeding is caused by bacteria stripping away the protective skin lining of the gum. Gums may take on a bluish-red tint. However, as the enemy digs in deeper, they become entrenched in between your back teeth. The areas of invasion are so deep within the gum collar they are seldom disturbed even during flossing. Frequently, patients tell me that their gums don't bleed at all. But when I brush and floss them, it looks like a red volcanic eruption.

During Stage I, we often see spirochetes, spinning rods, spiraling rods, gliding rods, and sometimes even a few clock arms. We also notice that a moderate number of white blood cells have arrived on the scene to do battle.

Bad breath is another common sign of gum disease and is the result of sulfur-containing by-products in the bacterial wastes that come from the breakdown of gum tissue. Grocery stores and mini-marts are well stocked with breath mints and fresheners to cover up the symptoms of this insidious disease. These products only serve to hide the smoke while feeding the fire, since many contain sugar which actually nourishes the bacteria and accelerates the problem.

However, breath odor is not a reliable symptom for self-diagnosis, because you usually can't detect your own bad

Early Gum Disease



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breath, even when it knocks over your friends. This point was illustrated by a lady who wrote to Ann Landers stating that she and her husband had always had a great sex life. However, over the last several years his breath had become so bad she wanted to throw up when he breathed on her. Ann correctly advised her to have him see a dentist. (Would that she had received that advice years earlier!)

As you have no way of knowing for sure whether gum disease is making inroads into your mouth, regular checkup visits to your dentist are necessary. There you should be carefully instructed on how to properly clean your teeth and gumlines and will receive the professional cleanings you need to get to the areas you may not be able to reach. This is the most reliable way of keeping bacterial invasion under control. Unattended, the disease will gradually and predictably develop into:

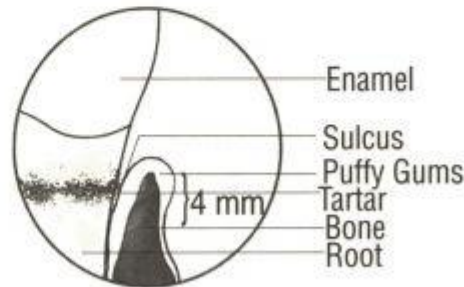
Stage II: Moderate Periodontitis

Once the bacteria have found a place to work, they begin to multiply and destroy, intent on eating up as much bone and tissue as possible. A pocket has begun to form, and the disease perpetuates itself. The pocket area grows larger (3-4 mm deep)

and harbors more bacteria. This will usually occur first between the molars because they are wider, more difficult to reach, and harder to clean adequately. Unstopped, the continued action of bacteria over several years will destroy the foundation support for the teeth.

Tartar deposits also contribute to this disease process.

Moderate Gum Disease



How To Save Your Teeth

After bacteria have remained on the teeth for 48-72 hours, they begin to calcify into a rocky deposit whose presence may prevent adequate home care. Teeth not professionally cleaned of this residue will develop a ring of deposits in the gum collar much like a ring of barnacles around a pier piling. Tartar or calculus itself does not cause gum disease, but it is certainly a contributing factor. Bacteria live within the honeycomb deposits and below them inside the gum collar. Larger deposits prevent even the most diligent oral hygiene efforts from being effective.

At this point you might notice some tenderness, redness, and/or recession of the gums. Redness, tenderness and inflammation are caused by the progressive invasion of bacteria into the tissue around the teeth. The body resists, and the result is a chronic infection of the gum tissue. Neither side wins, and a stalemate results. As long as your immune system stays healthy, you can remain at this stage for many years.

Stage III: Advanced Gum Disease (Periodontitis)

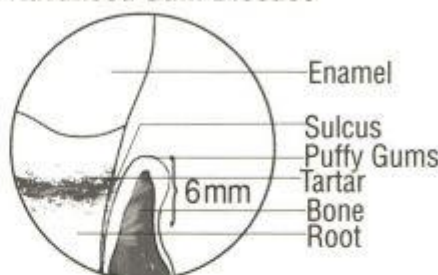
Gradual recession is one of the more obvious symptoms of periodontal disease. As the gums shrink, the teeth appear longer because more of the root surface is exposed. Recession is caused by bacteria invading around the tooth collar, causing inflammation which eats away the gum. Not content with just eating away at the soft tissue around the teeth, once through the gum surface, the bacteria begin to work their way down along the root of the tooth and out into the bone. As they progress, they induce more inflammation which begins to eat away at the bone. As the bone erodes, sometimes the gums at first puff up and mask the bone loss. Eventually, the gums begin to shrink away from the tooth. This kind of receding gum is very common in advanced gum problems and can sometimes be seen to a lesser extent in

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the earlier stages too.

As such areas move deeper into the bone, they often do not bleed, and they cannot be reached and cleaned by ordinary brushing. The result is an accelerating disease with no symptoms except for slight tenderness and bad breath — until the teeth actually become loose in their sockets. Such looseness will occur only after about two-thirds of the bone support is lost or an abscess occurs.

Advanced Gum Disease



There are situations in which the bone can be almost completely destroyed, and the gums do not recede. So do not rely on recession to tell if you have gum problems.

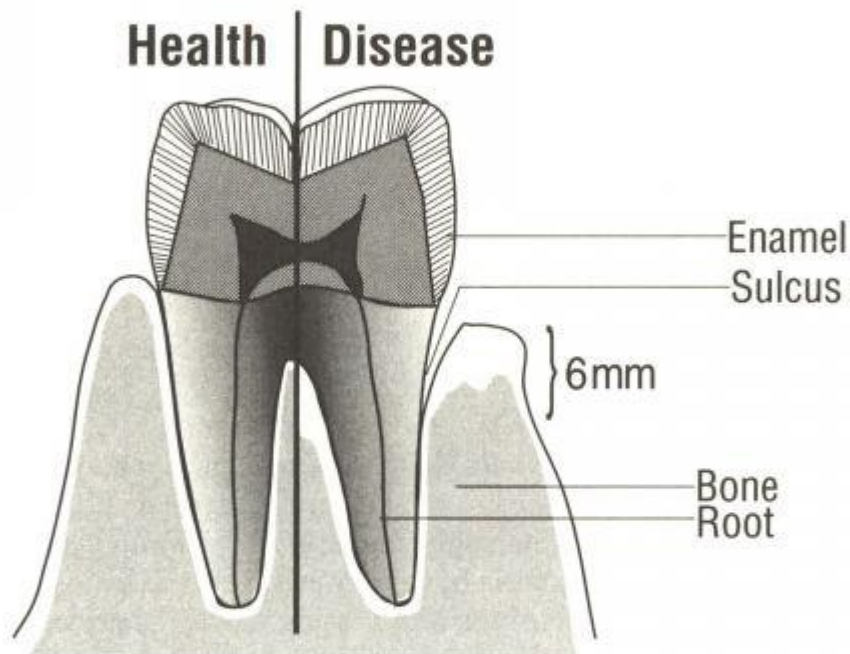
As the bacteria advance downward along the roots of the teeth, the bone begins to weaken and disappear. If your dentist were to check, he might find some 4- to 6-mm deep pockets where the bacteria have burrowed into the bone in between the teeth. Brushing and flossing will no longer be very effective in controlling the problem, because the bacteria are entrenched and too deep for you to reach with only a brush and floss.

The symptoms come and go as the disease moves through cycles and is active or in remission. Stress, poor nutrition, and other factors that adversely affect your immune system allow the bacteria to multiply and advance deeper into your gums. Hormone imbalance can cause a depressed immune system, and consequently, many women notice that their gums bleed during pregnancy. Once the temporary stress is over, the immune system returns to normal and the disease retreats into remission. This Stage

How To Save Your Teeth

III 'yo-yo' vacillation from health to sickness and back to health again can go on for years.

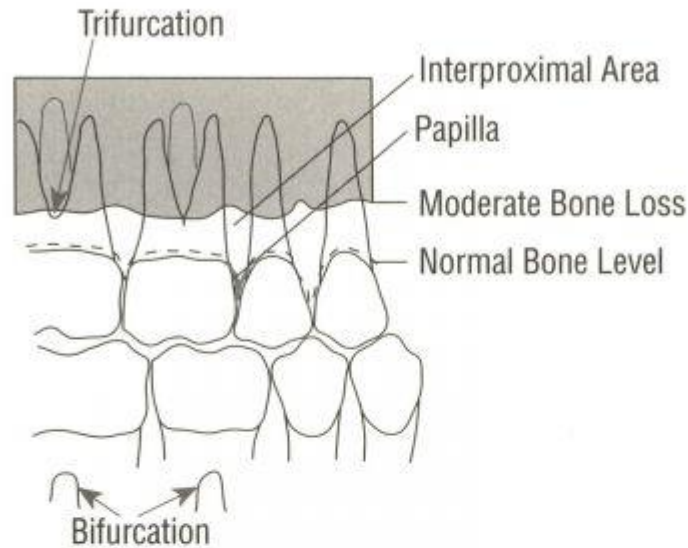
Stage IV: Severe Periodontitis



In the advanced stage your close friends are complaining about your breath, and some of your teeth might have begun to drift out of place and/or wobble in their sockets. The bacteria embed themselves deep in the gum collar and by now many of the pockets of infestation are over 6 mm deep and are advancing much more rapidly. If allowed to continue they will destroy the jaw bone so much that the teeth loosen and literally fall out. Abscesses and acute infections of the gums might begin to occur.

Gum Disease: The Silent Epidemic

Gum Disease Progress



Attacking the Problem: The Sooner the Better

Like a train, once it gets going, periodontal disease is hard to stop. The best approach is to not let it get started in the first place. However, if it has already begun, the sooner you act to control it the better.

I have a patient whose wife dragged him into my office shortly before his retirement. He had complained to her that a tooth had moved when he tried to bite hard bread. Prior to that he was aware of no symptoms and, because he saw no need, had not seen a dentist for over thirty years. He was blessed with excellent teeth and had only needed two fillings in his entire sixty-five years. As he expressed it, "I didn't know anything was wrong."

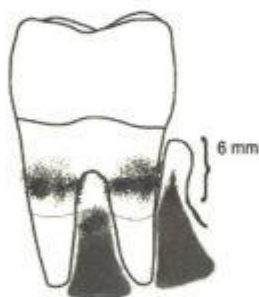
When I examined his mouth, I found there was very little bone left around most of his teeth, and all of the roots were covered with extremely hard tartar. Fortunately, the

How To Save Your Teeth

bone which remained was exceptionally hard, and after extensive therapy and his diligent home care, the progressive bone loss was curtailed. He is now a regular in my office and has said it best: "If I had known this was going on, I'd never have let it happen."

The most common features of this advanced stage are the loss of bone and the depth of the pockets. These large pockets are breeding grounds for a myriad of different bacterial organisms. Often the pockets will reach all the way to the apex of the tooth. The bacteria can even invade

Advanced Bone Loss Between Roots



and kill a tooth and live inside the tooth where the nerve use to be, or in-between the roots. Pus (large numbers of white blood cells) is evident around some or all of the teeth, and a foul odor is sometimes present. Disease in this advanced stage is quite serious and can lead to other systemic health problems. Some 60% of all heart valve infections can be traced to oral bacteria.

Time to Take Charge

The problem with prevention is that it takes knowledge, skill, and dedication. Without adequate training, education, and feedback, the average person has no way of knowing if success is achieved in controlling the disease in their own mouth.

The good news is that *you* are in charge. Prevention requires a team approach that simply entails education, daily home care, and routine professional cleaning. If you

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make the effort, you can be successful.

Control is not difficult. The easiest way is to start early. It is infinitely easier to clean a healthy mouth than one with deep pockets and large bone defects. With good training, four minutes a day should be all it takes. Training is important. For example, the up-and-down brushing motion that dentists once recommended will not adequately clean the gum collar or in between the teeth. However, if you can develop a technique that reaches all areas of your mouth, the complete control of early gum disease takes only a few days. If all organized bacteria are removed from the surface of the teeth once every 24 hours for five days, new skin tissue will grow and bone loss will progress no further. *The trick is to remove those bacteria daily.*

I was in the third year of my personal control program when a fellow dentist asked me while examining my teeth, "Don't you ever floss?" He was concerned because he could see I had missed plaque in-between my teeth. My reply was, "Of course! Every day." The problem was that I hadn't had adequate coaching in how to stop my own disease. After a few visits where he showed me where I was missing, I developed a technique that to this day allows me to maintain healthy teeth and gums.

I also realized something from that experience. Healthy *feels* good. Your teeth are smooth and your breath stays fresh all day without breath mints. And your gums don't bleed even when you work them over thoroughly.

What causes gum disease and tooth decay? As we discussed earlier, bacteria appear to be the cause; however, they need help. After twenty years of teaching my patients to control problems through bacterial plaque control, I am certain that bacteria are merely symptoms of a larger problem. The microorganisms associated with gum disease and tooth decay have been studied, named, and classified, and we know a great deal about them. They don't attack

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everyone, just certain people. So the question you may ask is, "Why me?" They chose you for a variety of reasons, but primarily because your immune system has failed to adequately defend you. By fighting bacteria alone you might win a temporary victory, but eventually you will lose the war unless you restore the effectiveness of your immune system.

Your immune system is your body's only real defense against many disorders, including heart disease and cancer, as well as gum disease. Later on, I will give you specific recommendations about how you can improve your immune system. The most effective approach is an all-out effort combining good nutrition, reduced stress, elimination of smoking and alcohol consumption if at all possible, exercise, adequate sleep²¹, and carefully following your prescribed dental cleaning regime.

How the Process Begins

One early sign of a bacterial attack is bleeding gums. As bacteria progressively work their way down the surface of the root, deeper into the gum collar, they form tartar deposits on the roots. The most harmful kind of tartar is below the gums in deep pockets below the surface. These rough jagged deposits gradually spread over the roots and facilitate the growth and destructive capacity of the bacteria. At first the bacteria and tartar deposits are soft and easily removed, but if allowed to harden, your dentist or hygienist must scrape them off your teeth for you. Sometimes you can feel the roughness as it begins to form on the smooth surfaces of the lower front teeth.

As time passes the number of bacteria gradually increases and the character of the plaque changes. The bacteria begin to invade the supporting bones of the teeth and eat away at the foundation. As disease becomes entrenched

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it creates destructive inflammation of the tissues. This inflammation can be acute or chronic. The symptoms come and go as the process speeds up and slows down.

The Best Defense

Instead of allowing the bacteria to attack you unhindered, counterattack with a health program of your own. Design it to fit your life-style, and custom tailor it so it does not interfere with your normal life. Fight with modern tools, and use antibacterial weapons that are effective and safe. Don't surrender your health to these invaders. Instead, learn about them and how to get rid of them before they get you.

I have seen literally hundreds of men and women take responsibility for their own health and develop firm and healthy gums. You can expect to keep your teeth all of your life if you control the bacteria and keep your immune system's defenses up. The smile you save will be yours.

Shortly after the turn of the century a famous physician Dr. C. C. Bass went to see his dentist about a gum problem. His dentist correctly diagnosed "gum disease or pyorrhea" and told to have all his teeth extracted. Dr. Bass inquired as to what the cause of this disease might be and the dentist replied that no one knew for sure.

Dr. Bass was the youngest man ever to be the dean of a medical school (Tulane) and the first person to carry a microscope west of the Mississippi river. He had correctly diagnosed and treated numerous endemic parasitic problems in the south and had a long and meritorious career. He wasn't too interested in losing his teeth to an unknown enemy, so he returned to his laboratory and began to look at the plaque around his teeth with a microscope. He easily identified the same kinds of organisms we still see today.

He attempted to treat his disease by brushing with a

How To Save Your Teeth

variety of toothbrushes and repeatedly checked the results with his microscope. Unfortunately, none of the brushes commercially available were able to reach deep into the gum collar and brush out the bacteria. He began to pull out bristles in different patterns and worked at brushing into the gums where he found bacteria living. He finally designed a three-row brush that had staggered bristles. He found that this dug the deepest into the problem areas. Just like the bed of nails under a circus performer, a brush with too many bristles will only hit the outer surface of the gum, but will not be able to penetrate under the collar where disease exists. But if you advertised for a circus performer to lie on a bed of only one nail I don't think you'd get too many applicants. Dr. Bass went on to describe a technique of brushing with the new brush remarkably different from what was being taught by dentists both then and now.

The article he sent to the *Journal of the American Dental Association* about this new technique was refused. He then sent it to the *Louisiana Dental Journal* where it was published in 1936. In 1972, the Bass technique of brushing was officially approved by the American Dental Association (ADA). Interestingly enough, they have never approved his brush. Trying to brush using the Bass method without the Bass brush still doesn't work very well. That is why I recommend both the brush and the method. The brush, and all the other supplies recommended in this book, are available from the Preventive Dental Health Association. (See Appendix.)

Dr. Bass wasn't totally satisfied with the results of brushing alone. He began to experiment with other cleaning devices. He wasn't the first person to invent floss but he was the first one to write up a protocol for controlling gum disease with this new method. It is told that his wife's sewing basket finally yielded the best cleaning floss of that day. A fine nylon multi-filament thread. This floss is still

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useful today but there are some drawbacks to it. If you have old fillings that are rough it shreds badly and gets balled up on the contact. On the other hand, it is ideal if you have smooth surfaces you wish to floss. More on floss later. Just a final note on Dr. Bass. He lived well into his nineties and never lost his teeth.

Preventive Periodontal Maintenance or How You Can Have Healthy Teeth and Gums in Four Minutes a Day

The best anti-bacterial tooth cleanser is one which is affordable, non-toxic, and effective. There are many good products which qualify. We recommend that you switch cleansers frequently. That way no resistant organisms can develop. Therefore, select several anti-bacterial products from the list of dental accessories at the end of this chapter and proceed to the next step.

A comparison of the brushing habits of 11- to 13-year-olds and 18- to 20-year-olds found that the younger group brushed 60 seconds while the older group brushed 39 seconds. These were people who were told to brush and knew they were the subjects under investigation. Other studies have found even shorter brushing times. Many of the subjects repeatedly brushed one area again and again and omitted other areas. Some missed brushing the inside surfaces entirely.²² The pattern that you follow during your brushing may need examination for you to be successful.

I recall several years ago trying to find a plaque sample on my little niece. I searched the back molars diligently but couldn't find a bit of plaque to examine under the microscope. When I remarked on the difficulty I was having finding plaque, Kathy smirked: "You showed me how to brush that off last year, Uncle Dave."

In the past, few periodontists routinely examined the

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organisms which cause the problems, and, as a consequence, they did not know the bacterial result of their therapy. Statistics show that less than twenty percent of surgically treated patients return for the required follow-up every 3 months. Treatment with surgery yields a quick clinical 'cure' which will generally relapse in time and eventually require more surgery as well as extractions. The disease is intermittent; it comes and goes. The object of surgery is to make it go, which it usually does, for a while.

Without the use of a microscope, the best way to tell if the disease has returned is to probe the bone level around the teeth. Probing will only uncover further damage that has already happened, but cannot anticipate recurrence. Using a measuring probe to see if pockets are present is like using a ruler to see if your house is on fire. It has to burn before the size changes. Early detection is not as good as prevention but it is better than waiting. Today there are new diagnostic tools available. The dentist can probe with a tiny thermometer to see if inflammation is present. They can sample the gums and send it to a laboratory for culture. The simple microscope is far quicker, easier and just as effective except in the few cases that do not respond to therapy. In those cases we recommend you have a culture and sensitivity test for dental pathogens.²³

In summary, the problem with the past approach to gum disease is that it (brushing, flossing, and surgery) does not eliminate the underlying causes. In advanced gum disease, brushing and flossing alone are ineffective because you can no longer reach the deeper recesses of the pockets. The rationale behind surgery is to open up the pockets of bacteria so that they are accessible. The patient is then instructed to brush and floss in order to maintain a mouth free from periodontal disease. However, since brushing and flossing do not kill bacteria, the invasion soon starts all over again. Many people repeatedly go through surgical treat-

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ment of this infection until their teeth are ultimately lost. Gum surgery without a build-up of the immune system and bacterial control will hasten the progress of gum disease and enhance the probability and severity of its recurrence. In my opinion, surgery should only be used in extreme situations and never without thorough bacterial removal prior to treatment.

The cause of gum disease is said to be multi-factorial. That means no one knows for sure what exactly causes gum disease, but it appears that a lot of things can bring it on: smoking, excessive alcohol, fluoride, poor diet, stress, birth control pills, diabetes, heavy metal poisoning, age, puberty, pregnancy, improper care, infrequent care, poor dentistry, and orthodontics. Each of these factors may adversely affect your dental health. Although problems often seem to spring up overnight, they are usually a slow, life-long process for most of us.

Contagious

The pathogens which inhabit the mouths of people with gum disease have been classified as a special kind of plaque called type IV. These germs have spread world-wide. Today the bacteria associated with gum disease can be found in almost everyone's mouth. Gum disease is contagious in that a person who is harboring a mouthful of these germs can pass them onto another. Those who have the actual symptoms of gum disease have a weak immune system, poor dental hygiene habits, or both, and, as a result, have far greater numbers of bacteria in their mouths than those who do not. However, millions of people already have small numbers of these germs ready to attack, should their immune systems leave them vulnerable.

Root decay takes place after gum disease destroys the surrounding bone leaving the root surfaces exposed. Since

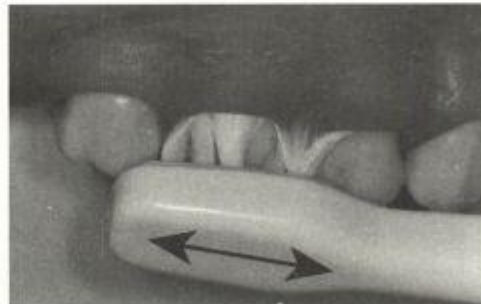
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the root area was never meant to resist bacterial attack, roots can degenerate rapidly. This kind of decay is particularly difficult and expensive to repair since it often forms a wide band around the tooth, penetrating into inaccessible areas, even between the roots. Dental researchers at the Centers for Disease Control, predict an increase in root decay as we live longer, keep our teeth longer, and suffer the ravages of gum disease.

Recipe For Periodontal Health

A conservative approach to controlling the organisms that can cause disease is through the use of antibacterial toothpastes and mouthrinses. We have found that both mechanical brushing and chemical irrigation methods are needed to fully eradicate the organisms. Varying the type of dentifrice used is advisable so that the bacteria will not develop resistance. The following recipe combines some recommended ingredients. The program describes how you first apply the paste then rinse away all the loose bacteria with an irrigator.

1. Twice a day for 2 minutes, Bass brush all areas with a Bass brush or brush with a Rotadent™ or an Interplak™ Electric toothbrush (for those with gum problems) and an anti-bacterial toothpaste or mouthwash. Aim the brush at a 45° angle toward the tooth and push gently so that the bristles go into the gum collar and count to five for each tooth.



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2. Keep the bristles aimed at only one small area at a time. Feel the bristles pushing into the gums at least 1/8th of an inch. The object of this brushing is to work the bristles deeply into the gum collar and stir up the bacterial colonies. If brushing by hand you should wiggle the brush back and forth in short 1/4-inch strokes.
3. Begin in the back and gradually move forward. Be sure to spend the most time on the back molars both on the outside and the inside since the back teeth are usually the first to develop gum problems.
4. To clean in between the teeth where most plaque is missed, use a Proxabrush™, Superfloss™, or dental floss that has been dipped in an antibacterial mouthrinse. Push the Proxabrush™ in and out to clean in between the teeth. Do not try to force the brush where the teeth are too tight together.



Brush in and out to clean large spaces



How To Save Your Teeth

5. If there are special problem areas, we recommend that you 'gum groove' with a toothpick and holder (Perio-Aid™) or a rubber tip, to carry the tooth cleanser under the gum collar and into the problem pockets. Rub the toothpick or rubber tip all around the tooth root inside, outside, and in between, placing the point into the pocket and rub the tooth surface with an antibacterial paste.
6. An irrigator is a must for periodontal problems. It is the most effective way of delivering solutions beneath the gums. Fill the irrigator chamber with your antibacterial solution, e.g. salt water, aloe vera, mouthwash, etc., and use the small (restricted) tip to direct the solution into the gum collar around each tooth. Be certain to irrigate the inside collars as well as the outside and concentrate on the back teeth since that is where gum damage most frequently occurs.



The Water Pik Pick Pocket is the easiest to use. Hold it like a pencil and trace lightly around each tooth and point it into deep pockets.



If you have very deep pockets that cannot be reached with the standard tip, a special cannula attachment is available. I feel that this tool should be used at first under the supervision of your dentist or hygienist. It will reach

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deeply into the pockets but pushing too vigorously would obviously injure the tissue.

Cannula



Warning: Never turn the full force of the water jet with a large tip into an infected pocket. That will blast bacteria into your blood stream. The object is to gently rinse all of the loosened bacteria from the collar and leave the tooth bathed in a strong anti-bacterial solution, not to blast them off like a car wash.

Baking Soda/Peroxide Method

Ingredients:

Water	1/8 teaspoon
Hydrogen peroxide 3%	1/8 teaspoon
Table salt	a dash
Baking soda	1 teaspoon

Tools:

POH soft, 3-row, staggered bristle toothbrush (Bass)
Floss
Rubber-tip stimulator

Preparation:

Mix approximately one teaspoon soda to 1/8 teaspoon peroxide and add enough water to make a moist paste then sprinkle a dash of salt.

Directions:

Manual application of antibacterial paste

How To Save Your Teeth

1. Dip Bass brush into the paste and begin to apply it to $\frac{1}{4}$ of your mouth. Aim the brush at the gum line and jiggle the brush forward and back about $\frac{1}{4}$ inch to work the paste into the gum collar. Do this on both the cheek side and tongue side of the teeth.
2. Floss the residual paste into the gum collar.
3. Dab some paste on the gum with a finger or the toothbrush and use the tip of the rubber stimulator to gently work the mixture into the gum groove around each tooth. Wiggle tip in between and around each tooth, one by one, in the gum groove and especially behind the last molars.
4. Rinse out and repeat in the next $\frac{1}{4}$ of your mouth, until all areas have been medicated. Rinse out again.

Electric Toothbrushes

Interplak™ and Rotadent™

The Interplak™ Home Plaque Removal instrument²⁴ is one of the most effective weapons you can use against plaque. The bristles rotate 4,200 times per minute, reversing direction forty-six times per second. This vibrating action removes plaque from tooth surfaces, in between teeth, and under the gum line for a cleaner healthier mouth.

The instrument has literally saved many of my previously hopeless cases. One friend had only limited hand function and simply could not do the procedures we recommended to stop the disease. The Interplak™ stopped the disease. But then it broke. The first generation of these marvelous tools was a mechanical nightmare. The company was good about replacing them in the first 90 days but after that they charged for repairs. I was very disappointed since it was so badly needed.

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I wrote the company a five-page letter detailing the problems I had experienced with their product. To their credit, they quickly responded that they had addressed each concern in their latest model and had corrected them all.

The new Interplak™ has a ribbed handle to prevent rolling when you lay it down. The handle tells you that this is a new 'smart' brush. Now it knows when it is charged up and doesn't overcharge and die like the first ones did. They still have not corrected one annoying problem. The brush head is not sealed and frequently clogs when used with any kind of gritty toothpaste. Use a liquid mouthwash instead of a gritty toothpaste.

If you have severe gum problems and have to use salt and soda, just change the head often and follow the Interplak™ maintenance instructions below.

Instructions

Start using the brush on speed 1. This low setting will enable you to feel the proper amount of pressure to use. If you push too hard, the Interplak™ instrument has a built-in feature which stops the brush. Over the next few weeks, as your gums heal, you should gradually increase the power setting. Eventually you will be able to apply lots of pressure on the highest setting and find it feels good!

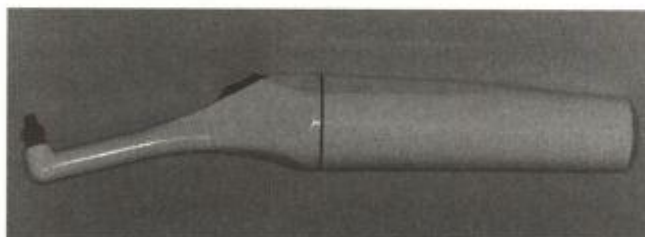
Brush for two minutes spending equal time on the inside, outside, and chewing surfaces of your teeth. Simply hold the brush parallel to your teeth and guide it slowly around the curvature of the arch. Establish a careful pattern so that all areas of your mouth are reached. I recommend pressing the longer tufts of bristles in between the back molars and behind the wisdom teeth. It is great for teenagers when they are just getting their wisdom teeth.

How To Save Your Teeth

Interplak™ Maintenance

1. After each use, leave the instrument running and thoroughly rinse the cleaning ports (on the back of the head) with warm water.
2. Towel dry the power handle before returning it to the base. Be sure to keep it on the base otherwise it will lose its charge.
3. Lubricate weekly with a few drops of olive oil through the cleaning ports
4. Once a month place the Interplak™ upside down in a glass of water and let it run for several minutes. You'll be surprised how much gook comes out of the head.
5. To achieve maximum performance, change the brush head at least every six months. If the brush seems to be losing power try changing the head. If the head is clogged it can ruin the motor.

Rotadent™



The Rotadent™ toothbrush is also an excellent help in cleaning your teeth. Like its name says it rotates. The brush head is only about the size of a pencil eraser. It rotates rapidly in only one direction. The mechanism has proven very reliable. I have had one for several years and so far have had no problems. I charged up the power handle and went on a three week tour of Europe. With two of us using it (separate heads of course), we still had power left over by the time we returned. The single rotating head is

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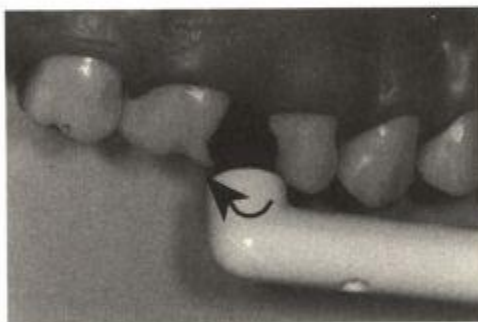
slower and requires a more precise touch but many of my patients swear by this tool. It is lighter and quieter than the Interplak™. You can use toothpaste with it without damaging it.

The brush comes with changeable heads and two changeable tips. One tip is flat and one is pointed. For most of the periodontal control program I prefer the pointed tip since you can get it into the areas better.

I like and use both of these appliances. The Rotadent™ can be used like a dentist's polishing cup and will remove tough stains or plaque the Interplak™ might miss.

Rotadent™ Instructions

1. Apply the paste to the gum with a finger or the hand toothbrush and use the pointed brush tip of the Rotadent™ to gently work the mixture into the gum groove around each tooth. Wiggle the tip in between and around each tooth, one by one, in the gum groove and especially behind the last molars and the gumline.
2. Rinse the head under running water and proceed to the next step.



How To Save Your Teeth

Mechanical Irrigation Method

The most effective way to remove bacteria is through a combination of manual and mechanical methods. The oral irrigator offers a major improvement in dental care. Bacterial collection areas around and in between the teeth should be thoroughly flushed out twice a day while a problem exists. After control is achieved (as evidenced by microscopic evaluation), you may reduce the frequency to once a day.

Tools:

Oral Irrigator (Water
Pik™)
Empty quart bottle (or
blender)

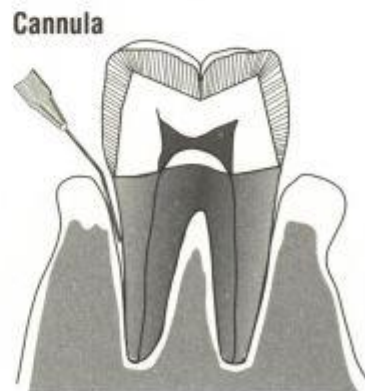
Ingredients:

Baking soda 1/2 cup
Water 1 quart
Salt 2 teaspoons

Preparation:

Fill blender or quart bottle with 1/2 cup baking soda, 1 quart water, and 2 teaspoons of salt.

Blend or shake until completely dissolved. Let the remaining particles settle to the bottom before pouring the liquid into the irrigator.



Gum Disease: The Silent Epidemic

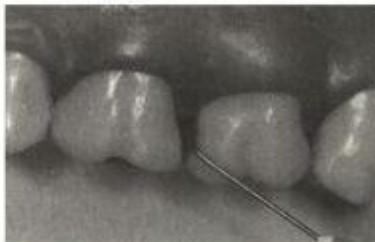
Fill irrigator halfway with solution and the other half with hot water to warm the solution and dilute it further. Add 2 capfuls hydrogen peroxide or Peroxyl.

Place the irrigator setting at the 3 to 4 range. The solution should squirt out but not blast. You are not trying to use the pressure to blow the bacteria off your teeth.

Directions:

Using the small irrigator tip lightly trace along the gum line. Pretend that the irrigator is a pencil and you are drawing a line around the collar of each tooth. Be sure to flush the rinse in between the back molars. Do this slowly and pause for a few seconds each time you point it in between the teeth.

If you have very deep pockets you may need to use a cannula. The thin blunt tube will deliver the solution to the bottom of the deepest pocket. Before you begin be sure to consult with your dentist.



Cannula Insertion

Maintenance:

After each use remove the small tip and put on the large tip. Then flush warm water through the irrigating

How To Save Your Teeth

device to prevent clogging of the motor. Last, replace the small tip and rinse it with pure water.

Other Recommended Products

A variety of dentifrices and devices are available to control the bacterial colonies that infect the mouth. When we are confronted with a severe problem we rely upon the soda and salt method. Once the disease is under control, less aggressive and better tasting products are acceptable. The following is a list of our favorites. I do not recommend any toothpastes which contain fluoride. (For more information on fluoride, see Chapter 7.)

Dentifrice

Baking Soda and Salt

IpsabTM

Denti ToothpasteTM

Nature's GateTM

Mer-flu-anTM

Propolis

Atomidine

RevelationTM

Tea Tree Oil

Aloe Vera Gel

Peri-dentTM

Auromere

Mouth rinse

Cranberry Juice (unsweetened)

Glyco-Thymoline

Peroxyl

Peri-Dent

Calendula Tea

Tea Tree Oil

Prickly Ash Bark Tea

Therasol

Apple Cider Vinegar

Aloe Vera Gel

Gum Disease: The Silent Epidemic

Toothbrushes

Interplak Toothbrush™

POH™ 3-row staggered soft

Rotadent Toothcleaner™

Oral Irrigators

Water Pic™

Hydrofloss™

Interdental Brushes

Butler Proxabrush™

Lactona™ End Tuft

Oral B™ Interproximal

The Tooth Decay Problem

Growth and Development of Healthy Teeth: What You Should Know

Many factors, including prenatal nutrition and postnatal illness, affect the growth and formation of healthy teeth. Adequate nutrition is extremely important to support the growth of the jaw to a size large enough to accommodate the teeth. Crowded, narrow dental arches and impacted wisdom teeth are increasingly prevalent symptoms of the nutritional depletion of the typical American diet.

The Anatomy of a Tooth

Each tooth can be divided into two parts. The top visible part called the *crown* is covered with white enamel. The bottom part, the *root* is buried in bone and its outer surface is covered with a layer of a bone-like substance called cementum. Both the inner core of the crown and the root are composed of dentin. In the very center of the tooth is the pulp or nerve.

Enamel is the hard outer covering of the tooth and its function is protection. This is necessary because the dentin under the enamel is very soft and sensitive. Enamel is the hardest substance found in living beings. It is estimated that at the current normal rate of abrasion from our food, it would take more than 450 years of chewing to wear through the enamel to the dentin.

The Tooth Decay Problem

Enamel can be dissolved by acid, however. Enamel wear can also be accelerated by an uneven bite, night grinding, opposing porcelain teeth, or clenching. Other factors contributing to enamel erosion are phosphoric acid soft drinks, such as Pepsi Cola and Coca Cola, and frequent self-induced vomiting, known as bulimia.

During preparation for the 1986 Olympics, several of the swimmers found that the enamel on their front teeth was dissolving. The acidity of their practice pool combined with many hours of practice daily were determined to be the cause.

Continual sucking on lemons or other acid fruit can have the same effect. Chewing Vitamin C tablets (ascorbic acid) can also dissolve away the enamel. While enamel is extremely hard, it is susceptible to acid dissolution.

Dentin is the inner core of the tooth and supports the outer enamel. It is similar in density to hard wood and is full of nerve branches. These branches originate in the nerve pulp which makes up the center of the tooth. In contrast to enamel, dentin will decay rapidly when exposed to the oral bacteria.

The formation of dentin does not stop when teeth mature. Throughout life, the nerve/pulp continues to wall itself in with more and more dentin. If an area of dentin becomes exposed through fracture or decay, the nerve cells retreat into the pulp chamber and begin to stimulate the formation of new dentin to protect themselves from the outside attack. This new formation is called reparative or secondary dentin. It is harder and more irregular than the original and not nearly as sensitive.

Both wear and tooth decay can stimulate the formation of repair dentin. If it goes slowly enough, the nerve or pulp will recede. Chewing ice, clenching or grinding teeth will stimulate reparative dentin. We are saved from much painful discomfort by this repair mechanism, and, in some

How To Save Your Teeth

cases, injured teeth can actually heal themselves.

I once treated a young man from Chicago who had spent seven years as a POW in the Hanoi Hilton in Vietnam. He said he was on top of the world riding in the back seat of an attack jet until a missile shot him down. His service records show that he had several large cavities a few months before he crashed. They were deep but not into the nerve. When I saw him the dentin was brown and hard but the decay did not appear to have progressed at all since the x-rays were taken 7 years earlier. The nerve had receded into a tiny thread but was still alive. We concluded his diet of rotten rice and bugs did not promote tooth decay thus giving the dentin adequate time to repair itself.

The Nerve

In the center of the dentin is the nerve or pulp. This pulp is made up of nerve cells, blood vessels, and the chamber is lined with dentin-forming odontoblasts. The nerve branches extend from the very center of the tooth all the way out through the dentin to the enamel. The nerve fibers branch as they reach the enamel/dentin junction. There are many times more nerve fibers there than deeper into the tooth. It is these branches which relay the feeling of hot, cold, or pain to the nerve center inside the pulp and on to your brain. These nerves are simple on/off mechanisms, and they only conduct one sensation for all kinds of feelings. That is, they send the brain the same electrical signal for cold as they do for hot. That is why a chipped tooth will react to both cold and hot in the same way.

If I touch my drill to enamel and not the dentin, there is seldom any feeling. But once I begin to invade through the enamel and touch dentin, there can be a lot of discomfort. Many people find dental drilling extremely painful; others do not find it painful at all.

The other sensitive area is where the root and enamel

The Tooth Decay Problem

join. The connection between enamel and root is where nerve fibers on the surface of the root are not protected. The sensitivity of these gumline areas is often increased by toothbrushing with an abrasive toothpaste, using the wrong kind of brush, or receding gums. Also, some patients have reported increased sensitivity from using tartar control-type toothpastes. These areas can be desensitized at home through the application of desensitizing pastes.

The root is the foundation of the tooth. Its outer surface is composed of cementum and is fastened to the jawbone by a very short ligament which keeps the tooth in place. This ligament is attached to the root cementum on one side and to the bony socket of the jaw on the other. The gums form a collar which is also attached to the top of the root cementum. The front teeth have only one root. The bicuspid and lower molars usually have two, and the upper molars have three. Larger roots provide greater stability for the molar grinders. In the corners of the dental arch are the cuspids which have very long large roots. The cuspid is called the eyetooth. In other animals, especially those which eat meat, the cuspid becomes a powerful fang, as it once did with the saber-toothed tiger.

One local root-canal specialist was called to the San Diego Zoo to treat the broken fang of one of the large cats. The tiger had refused to eat because of an abscess which had formed around the root of its cuspid. Fortunately, all went well, and the tiger did not wake up before the tooth was repaired.

The jawbone surrounds and supports the roots of the teeth and is one of the hardest bones in the body. The hardness is necessary in order to withstand the enormous forces and pressures of chewing.

The single greatest reason for tooth extraction is bone loss from around the roots. The cause and prevention of this problem can be found in Chapter 2.

How To Save Your Teeth

Growth and Development

In the embryo there are two types of cell lines in a back-to-back configuration which form teeth. One cell line, called ectoderm, differentiates into cells called ameloblasts which make enamel. The other cell line, called mesoderm, differentiates into cells called odontoblasts which make dentin. Once the outer coat of enamel is finished, ameloblasts stop functioning and no more enamel can be made. But the odontoblasts, which make the dentin core of the tooth, keep on working throughout the life of the tooth.

At birth, the tops of your baby teeth have already formed, although some of these temporary teeth will not begin to erupt until around age two. Sometimes a newborn baby will have a tooth or two at birth (neonatal tooth). This was once thought to be a sign the child was possessed by the Devil, probably a rumor started by the baby's mother, as it can be a real annoyance when nursing. If it is an extra tooth, it can be removed with no problem. If it is one of the baby teeth, it should be retained to preserve space for the permanent teeth and subsequently, the shape of the mouth.

Some of the permanent teeth start to form before birth although they won't begin to erupt for 6 more years. The enamel of the permanent teeth continues to form until the child is about 12 years of age. Its function is to protect the soft inner dentin, resist bacterial invasion, and prevent teeth from wearing down during chewing.

Whoops! Missing Teeth?

There are normally twenty baby teeth and 32 permanent ones. Genetically, the most frequently missing are the wisdom teeth. I myself had 34, two extra wisdom teeth. One or two teeth more or less is not as unusual as you might think. Also, one or both laterals are often missing. The tendency to have missing teeth or have extra permanent

The Tooth Decay Problem

teeth is an inherited trait.

Any interruption in the production of enamel in permanent teeth can cause a visible line on the face of the tooth. Illness or high fever will halt the formation of the enamel. The body attends to the urgent problems of getting well before returning to the less vital work of making teeth. Thus, a severe fever will leave a line of porous enamel if it occurs during enamel formation. In the same way that rings in a tree indicate summer/winter cycles of growth, an individual's health history is reflected in their teeth and bones.

Baby teeth are important to the growth and development of the permanent teeth. Baby teeth maintain spaces for the adult teeth and the roots of the baby teeth guide permanent teeth into place. Premature loss of the baby teeth can result in the adult teeth getting stuck under the gums, impacted, or coming out in the wrong place. It is important for optimum growth and development for children to keep all their teeth healthy, not just the permanent ones.

A child's face often looks somewhat like the adult he or she will someday become. Photos of ourselves as children look similar to the way we look today, except the lower face has changed. As we grow up, the face grows downward and forward. The teeth and jaws of a baby are tiny, while the skull and brain are quite large (approximately three-quarters of their adult size). During the first 15 to 20 years, the jaws grow continuously downward and forward. Without adequate nutrition, the jaws will not grow to the normal size. This is the primary cause of crooked teeth. The teeth are formed early in life, and their sizes are determined at that time. The shape of the face depends on an adequate, continuous supply of vital nutrients for it to grow to full size.

If all the right nutrients are present, the jaw will grow normally, but if something is lacking in the diet, it will not. The typical American diet is so deficient that it produces jaws that are often narrower than their genetic potential.

How To Save Your Teeth

Impacted wisdom teeth and crowded narrow arches are symptoms of our nutritional deficiencies. Impacted wisdom teeth occur because there is not enough room for the third molar. One in five children today will need orthodontic care to straighten their crooked teeth, and the problem is getting worse. This problem which is common today, was a rare occurrence in times past.

Tooth Decay: An Insidious Disease

Currently, the average 17-year-old already has 5-6 decayed, missing, or filled teeth.²⁵ Decay progresses along a steady pattern as bacteria invade first the tiny wrinkles on the chewing surfaces of teeth, undermining the enamel and then burrowing down into the softer dentin beneath. Though prevalent, tooth decay is a needless and entirely preventable disease. Cavity-free kids and adults is a realistic goal. Children today need never experience the pain and suffering of dental decay or tooth loss — if the proper preventive measures are taken.



Highly magnified surface of a permanent molar
Courtesy of
Johnson & Johnson

Although over the last twenty years there has been a gradual decrease in the amount of tooth decay, the children of today still have a significant decay problem. The pattern of decay has shifted away from in between the teeth. Now, 84% of the decay seen in children's teeth is detected in the natural grooves in the center of the molar and bicuspid

The Tooth Decay Problem

teeth. At birth, a child is already forming permanent teeth, which begin to erupt by the age of six.

A common approach to prevent groove decay is a technique, developed in 1900, which drills away substantial portions of a good healthy tooth to insure that all the groove is removed. Thus, fillings have to be much larger than the actual areas of decay to insure that the leaky grooves are totally drilled away. Unfortunately, it is the excessive drilling which

greatly weakens the teeth and leaves them prone to later fracture.

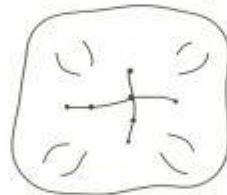
All fillings have only a limited average life span.

Mercury/silver fillings last between 5 and 10 years, before recurrent decay seeps around the edges. Conse-

quently, this well-intentioned repair work leaves the teeth at risk for fracture and recurrent decay. The 6-year molar, the first permanent molar to arrive, is the most frequently filled, root-canaled, pulled, or bridged tooth in the whole mouth. This tooth seems particularly susceptible to decay. The reason is that in many, the grooves go all the way through the enamel into the softer core of the tooth.



Groove Decay



Amalgam Filling



Tooth decay in groove

How To Save Your Teeth

To prevent these problems I recommend a three-step approach.

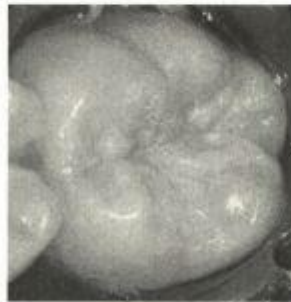
1. The first step is nutritional. The amount of decay is proportional to the length of time the teeth are in contact with sugar. Diet is very important. I can recall the surprise on a very health-conscious mother's face when she found out that apple juice is a common cause of children's tooth decay. "But it is natural," she protested. Decay germs grow faster and produce more acid to damage teeth if sugar is present. Any kind of sugar will do, even the sugar found in dried fruit such as raisins.
2. The second step is easy. I call it antibacterial. The germs that eat teeth are removed by baking soda. They can be washed away after soda is applied. The soda also helps neutralize any acid present.

The method of brushing is important as well. Until a child reaches the age of 8, they probably lack the dexterity to do an adequate job alone. That is one reason why I often recommend an electric toothbrush. My favorites are Interplak™ and Rotadent™. I think the Interplak™ does the best job but requires frequent maintenance. The Rotadent™ is slower but seems quite reliable. (See Appendix for ordering information.)

To brush a small child's teeth, I like to sit with the child standing between my legs and facing the same direction I am. That way they can put their head on my shoulder and I can see into the mouth. I sing and carry on, having so much fun that the job is done before they know it. They come back for more! Cleanliness stops decay. For small children, it is important to sing a song or say a rhyme so that you can train your child to accept the brushing. Say a different verse for each area and tell the child we can't quit until each area has had the tooth-brushing verse.

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3. The third step may be the most important. The weak grooves in a child's permanent molar teeth can be completely protected. By sealing them with a bonding material, tooth decay can be sealed out before it begins. If left unsealed, more than 50% of these grooves will decay within just a few years. The twelve permanent molars erupt four at a time at ages 6, 12, and 18. Other permanent teeth may have a significant groove defect that may need sealants but the six and twelve year molars are the critical ones. Sealants do not require any drilling and therefore are non-invasive and painless. This is an excellent way for your child to get to know the dentist or the dental hygienist. In California both of these professionals can apply the sealant. Once sealed, a tooth is protected only so long as the sealant stays intact. The seals should be checked at each recall visit.



Unsealed

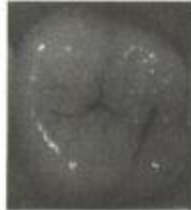


Sealed

Only 10% of the children ages 5-8 have sealants. The percentage creeps up to 15% by age 15-17. All of my nieces and nephews had sealants and there was only one tiny

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Six Year Molar



Decay



Decay removed



Conservative composite

cavity in the lot. Despite the safety and effectiveness of sealants, most parents choose to wait until they can see a defect in the tooth. By then it is too late to prevent decay but, even after decay begins, there is another choice. That is to place a conservative composite plastic filling in the decayed area, and seal over the remaining groove. (See diagram) This treatment removes only the decayed part of the tooth and no more than is absolutely necessary.

By age 17, eighty-four percent of youth have at

least one cavity. However, it is no surprise to parents of cavity-prone children to learn that only 20% of the children have 60% of the problems.^{26,27} Once the tooth is filled it will need to be refilled over and over throughout adult life. Prevention is priceless. If you can raise your children past the age of 20 without significant decay they will spend far less money on their teeth over their lifetime.

The Tooth Decay Problem

Drilling vs. Sealants



Cavities are Permanent

For me, there was never a question which is better. If you are really interested in the dental health of children, I would advise you to seal up and protect the child's new permanent molars and bicuspid. For the last 20 years it has been theoretically possible to raise a child free from tooth decay.



6 Year Molar
Sealed

12 Year Molar
Unsealed

How to Prevent Other Areas of Decay

Many problems of old age, such as gum disease and tooth loss, are preventable if we start early. The problem is that each succeeding generation spends its youth discovering the pleasures of sugar, alcohol, and junk food before realizing the necessity for good nutrition. As they reach their parent's age, they discover that the infirmities of old age have indeed crept upon them. Certainly no one claims that we can be immortal through proper diet and exercise, but through early nutritional training and correct home

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care, we can eliminate most of our dental problems.

With junk food and nutritional misinformation fed to our children by television and the food processing industry, it is no wonder that this nation has one of the most overfed-undernourished populations in the world. Only through truthful nutritional education will we be able to teach our next generation the lessons we have learned about health and well-being. We must begin to pay attention to the needs of the body before the symptoms of disease arrive. That way we can prevent illness rather than try to correct the damage, brushing alone will not create healthy minds, bodies, or teeth.

Chapter 4

Tooth Restorations

Most front teeth are restored with composites that are tooth-colored and natural-looking. Most posterior or back teeth restorations are restored with potentially disease-producing ugly mercury/silver amalgams which should be avoided (see Chapter 5). While posterior composites have, in many cases, provided attractive tooth-colored, conservative, and cost-effective restorations, their longevity is limited under certain conditions.^{28,29} This book presents an alternative technique to the use of direct posterior composite restoration which helps eliminate many of the weaknesses of the earlier approach. The technique is called the indirect composite inlay.³⁰

Composite Inlay

In most of the cases when direct resin restorations fail, it is for one or more of three specific reasons:

1. Shrinkage

Shrinkage is due to the inherent physical characteristics of the material. For example, all composites shrink upon setting. In some cases this shrinkage may be as much as 3%.^{31,32} The bond of the resin to the enamel can be greater than the force developed by the shrinkage of the resin. Therefore, shrinkage may actually pull the cusps together. The bond to dentin or cementum, however, is weaker than the bond to enamel, and consequently, the

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bond to these surfaces will separate upon setting. Shrinkage may lead to open margins, leakage, and recurrent decay wherever the filling rests on cementum or dentin.

2. Strength.

At the present time, most direct-placement composite materials cannot withstand the heavy chewing forces commonly generated in the posterior quadrants of the mouth. This is especially true of those who clench heavily, grind their teeth at night, or brux. Therefore, the bite relationship is very important in selecting the best restoration. Heavy chewing habits can cause the resin to fracture, develop a chunk-hole, or wear down rapidly. If the opposing cusp is a sharp 'plunger' or the existing tooth or mercury/silver restoration shows signs of excessive wear, deep indentation, or abrasion, then a more durable indirect inlay material should be used.

3. Contacts

The third problem with posterior composites is related to their low viscosity before they are cured. The soft sticky composite material is difficult to place firmly in the tooth and, as a result, the contacts are often open or only lightly touching. I call these snack teeth or food magnets. Stuff seems to leap into the areas the instant you start to chew. This condition can lead to decay and even gum problems.

Solution:

By moving critical fabrication of the restoration from the mouth to the laboratory, durability and contour can be enhanced and shrinkage problems resolved.

Indirect Inlay

The use of Indirect Inlays avoids the problems of direct inlays because they are preshrunk, stronger, and contoured correctly. The disadvantages of the indirect inlay procedure are that it takes more time to fabricate and place the restoration and it costs more.

1. Preshrunk

Since the composite is preshrunk, the bulk of the material is completely set and dimensionally stable before being placed into the tooth. The cementation process is similar to the cementing of a crown or inlay. The inlay is seated in a sea of composite or glass ionomer cement and is bonded firmly in place. The resulting seal reduces water and bacterial penetration and consequently reduces post-treatment sensitivity, marginal staining and recurrent decay.

2. Stronger

Second, indirect composites are significantly stronger and therefore better able to resist the forces of chewing. Lab processing increases the degree of cure from approximately 70% to over 90%. This increase in polymerization results in a dramatic increase in stability of the physical properties of the composite.³³ Added strength also reduces fracture and truly allows a tooth to be restored to its natural strength.

3. Contour

Third, the interproximal and facial contour is consistently optimal, and contacts can be as tight as desired. In addition, ideal occlusion is restored. By eliminating the three drawbacks to traditional direct posterior composites, the indirect composite has added greatly to our ability to confidently restore dentition that previously contained a large number of posterior amalgams.

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IAOMT approved Amalgam Removal Protocol

Many dentists warn that the removal of an amalgam will expose you to excessive levels of mercury vapor. This can be true if the same careless attitude toward patient and staff exposure is utilized during the removal as is often seen during placement. Remember all those loose amalgam particles left in your mouth after you received a filling. Feeding the patient the ground up remnants of their fillings is simply not acceptable by today's standards. High exposure to mercury occurs every time a mercury/silver filling is drilled out and another one is put in its place. Therefore, if and when you have your mercury/silver fillings drilled on, you may be exposed to high levels of amalgam dust or mercury vapor unless proper safety precautions are followed.

There are a number of documented cases of adverse reactions to careless amalgam removal and placement.³⁴ Your dentist should make every effort to prevent or minimize your exposure. Levels much higher than the Environmental Protection Agency (EPA) allows are routinely measured in and around the area of your face if certain precautions are not taken.³⁵⁻³⁸ In addition, dentists may be exposing themselves and their staff to unacceptably high levels of mercury vapor.^{39,40} This is not only unwise — it is also against the law.⁴¹⁻⁴³

There are two major routes of exposure. The first and most obvious is through the lungs. Mercury is rapidly absorbed from the lungs into the bloodstream. You should be given an alternative source of air to prevent this exposure. A simple nasal hood connected to an open hose extending 3 to 6 feet away will be sufficient, provided, of course, that the entire office is not contaminated. Since 14% of dental offices checked are in excess of U.S. Occupational Health and Safety Act (OSHA) regulations for mercury

Tooth Restorations

vapor all the time, mercury contamination of a dental office is a definite possibility and you should ask if the office is routinely monitored for mercury.

Avoidance of amalgam particle ingestion is more difficult to address. Until the recent work of Hahn, this route was thought to produce only minor exposure.⁴⁴ Now there is renewed concern about this problem. A rubber dam will partially prevent you from swallowing the ground-out particles and from accidentally inhaling fumes. However, high levels of mercury vapor have been measured underneath the rubber dam, and residual amalgam particles often escape around it. Therefore, as a patient, you should be instructed **not to breathe** through the mouth during the removal process. Following amalgam removal, your mouth should be thoroughly washed and evacuated. Some dentists feel that the patient is better served if no rubber dam is used during the removal process, and the area is instead constantly washed with water. Both techniques are approved by the International Academy of Oral Medicine and Toxicology as being effective in reducing patient exposure.

Drilling out your old fillings should be done in such a manner that as little mercury escapes as possible. Large amounts of cool water should be used during this procedure along with a high-volume evacuator positioned next to the tooth at all times. When an amalgam filling is drilled or polished, it emits fumes constantly for hours unless cooled down by the dentist. The vacuum evacuates these fumes from the area. Once the removal process begins, the vacuum tip should not be taken out of your mouth until the old restoration has been completely cleaned out. After all this is done, your mouth should be washed thoroughly for sixty seconds. What happens next depends on which materials you have selected to have placed into your teeth.

My practice has been completely mercury-free since 1984. Consequently, I have had to utilize many different

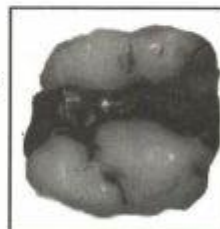
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alternative materials and techniques over the years to restore teeth. At first I used mostly gold. Later, as better composites appeared, I began to use them in some selected areas. The patient acceptance of the natural color is excellent. I have long been disappointed in the seemingly high failure rates of direct composites in stress bearing areas. The indirect technique for multisurface restorations now offers excellent results for most stress-bearing fillings although crowns and gold inlays are still sometimes required.

If your dentist is still using mercury or not familiar with how it can be safely removed, it is absolutely essential for you to have him/her contact the IAOMT (see appendix) for future courses or for details on the procedures for safely removing amalgam. If he or she refuses or says it is not necessary, think about a different dentist.

Conservative Composite Restorations

In 1908, Dr. G.V. Black noticed that the center grooves of most molar teeth were very susceptible to decay. His solution was to drill away all of the groove and with it about 1/3 of the center of the tooth.



That kind of radical drilling is no longer necessary. The only drilling necessary is to remove the rotten spot, so that a new filling can be bonded into the hole. Over twenty five years ago, Dr. Bonocore discovered that you could attach plastic or composite to enamel if the surface was etched first with dilute phosphoric acid. The acid removed the surface layer and left the enamel slightly rough. The thin plastic was flowed into the texture on the surface and set. Bonding is the common term for this procedure today. The first bonding was only to the enamel. Dentin was too flexible and wet to obtain a lasting bond.

Tooth Restorations

The current materials have overcome many of the weaknesses of the earlier system. If the procedures are followed exactly, a strong bond to the core of the tooth can be obtained.

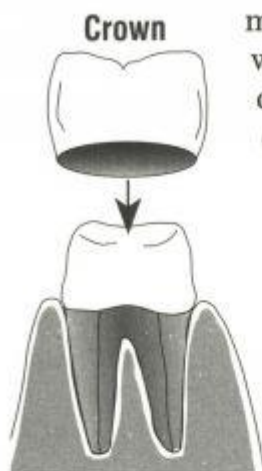
Today, small cavities can be cleaned out and bonded back together. The old-style large preparations advocated by Dr. G.V. Black are now nothing more than a needless mutilation of valuable tooth structure. The only truly biocompatible surface that we know will last a lifetime is enamel, therefore, my advice is to conserve enamel wherever possible. Dr. Miles Markley, in 1957, described a more conservative approach to the preparation of teeth for the placement of restorations. These miniature preparations are more difficult and time-consuming, but there is no question that they save enamel. With bonded restorations even weak areas can be reinforced with the adhesion of the restoration to the remaining tooth structure.

Drilling a large cavity into a tooth dramatically weakens the tooth. Placement of an amalgam in the large preparation does not return any strength to the tooth. Bonding a composite restoration into the hole apparently returns the strength of the tooth to normal. How long does it last? No one knows. No one has volunteered to let us pound on their teeth with a hammer to find out, consequently, these experiments have been confined to the laboratory.

Crown

The top of a tooth is referred to as the crown. When dentists drill off all of the enamel and replace the missing enamel with a restoration that, too, is referred to as a full crown. The process of making a crown is intricate and costly. However, a crown can repair conditions that may not be restored any other way. But, it should be a treatment of last resort. A partial crown that only covers the damaged areas is often a less drastic possibility. These partial crowns are

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much more conservative of tooth and work just as well, if not better. Partial crowns are either called three quarter crowns or onlays.

Crowns can be made out of metals, porcelain, composite, or combinations of them. The least toxic metal for crowns is gold. Pure gold is too soft for dentistry so the manufacturers add other metals to the crown. Also, dentists often drill teeth with old mercury/silver fillings down for crowns but leave much of the old filling under the new crown. Research shows that

this practice drives several times more mercury into the jawbone.⁴⁵ When metal crowns are placed in the mouth, there should be no old fillings left underneath. Some dentists try to repair a defective crown by placing a mercury/silver filling in the defect. This should not be allowed. The crown will quickly extract the mercury component from the filling and release it into your body.

The metals that the fewest people react to are gold and platinum. You can make good dental crowns with these metals. Titanium is popular at the moment, but I do not feel we know enough about the long-term biocompatibility of this material. By far the most common metal used in over seventy percent of dental castings today is nickel. Some dentists call nickel-containing stainless steel crowns white metal. The question you should ask is, "What are the exact percentages of each metal in the crown?" I do not recommend any non-precious metal, e.g. nickel, steel, or copper, be used in the mouth. These are long-term restorations and prolonged contact can cause sensitization.

Many women cannot wear stainless steel pierced earrings due to systemic reactions to the nickel. If a nickel

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crown is placed on the tooth of a sensitive individual, the gums can deteriorate rapidly and become inflamed. Even if this does not occur, you are swallowing the dissolved nickel. I can assure you that few health-conscious physicians would recommend you swallow a daily dose of nickel, no matter how small, if you can avoid it.

Fixed or Permanent Bridges

A bridge is one way to replace missing teeth. Of course it is best to keep your teeth if possible, but if one is lost it can be replaced. The bridge is a standard approach to the problem of missing teeth where good solid teeth are on either side of the gap. A fixed bridge must go from one good tooth to another. The teeth on either end of the bridge should be strong enough to do the work required. If only one tooth is missing then each abutment tooth must support fifty percent more chewing forces. This is a strong bridge. If on the other hand ten teeth are missing and only two are left you should not try to cement a fixed bridge to this weak foundation (see the next section).

The dentist generally crowns the teeth on either end of the bridge and makes a one-piece unit that is cemented to both teeth. It is made to stay on the teeth permanently. To clean it, you can pass floss or Super-Floss or a bridge threader under the missing tooth and polish off the plaque like a towel on your back. The most common reason for failure of a fixed bridge is tooth decay. The crown will never rot but the edges of the tooth that meet the crown might. The solution is to keep the edges clean.

Crowns can be made out of gold with porcelain bonded to the surface so that they look like natural teeth. The additional room needed for the porcelain covering is about one millimeter. This is a waste of good tooth if it is not necessary for cosmetic reasons. If you cannot see the tooth

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then don't have a full porcelain crown placed. One further drawback to a porcelain-covered gold crown is that the porcelain is harder and more abrasive than natural enamel. Consequently, you often see excessive wear of the teeth that chew against a porcelain crown. Another option is the all porcelain or glass crown. These crowns have no metal substructure and look quite natural. They are not as strong as the porcelain-covered gold and will not hold up in every situation. In certain situations where the opening to be filled has been appropriately selected, they do work well.

One promising new type of crown is the all composite laboratory processed crown. These have not been around for long and they do have some drawbacks. The fit is not accurate. The most common solution is to fill the crown with composite cement and bond the crown to the tooth. If done properly (that is a big if) they fit beautifully. This is a very promising area that needs more research. I do recommend it, in specific situations, for those patients with special health care needs.

Partials and Dentures

If all of the teeth are missing, the replacement prosthesis is called a full denture. Extraction of teeth and the use of dentures was the most common solution to tooth decay and gum disease fifty years ago. Many seniors today have kept their teeth and do not require full dentures. However, many have lost some or even most of their teeth. A solution to the partial loss of teeth is a partial denture. This is a much more sophisticated appliance than many people realize. It holds on to the remaining teeth with clasps or special hidden attachments. They can be almost invisible.

Partial dentures are not as strong as teeth, but they are much stronger than full dentures. The remaining teeth stabilize the denture and keep it in place. In situations

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where natural teeth are on either side of the missing tooth space, the partial denture is held rigidly in place. If all of the back teeth are missing on one or both sides then a different approach is needed. This partial is rigidly attached to the teeth but the replacement teeth are allowed some movement to cushion the bite and preserve the remaining teeth. The clasps of the partial should be cast with high quality gold.

The denture or partial base is made of acrylic or vinyl plastic. Many of the components used in the manufacture of these plastics are not good for you. New research shows that some of the solvents and dyes leach out of the denture base into the saliva. Plastics also wear away as you chew. If you know you are sensitive to plastics, I recommend the Clifford biocompatibility test before you place new material in your mouth (see appendix). If you are uncertain, make sure the laboratory does a twenty-four-hour processing of the denture rather than a two- or three-hour fast process. The additional time allows more of the chemicals that are not tightly bound to the denture to escape. By the way, don't try to do this in you oven. You'll ruin the denture.

Tooth Bleaching

Many things stain teeth. Smoking, coffee, and tea are the most common. The antibiotic, tetracycline, given during enamel formation, will severely gray or discolor the teeth. The bleaching I am about to describe works well on coffee and tea stains, but has only partial effect on tetracycline stain. Bleaching is a new area that has become very popular. Dentist make a thin plastic guard that fits closely over the surface of the teeth. By wearing this guard the bleaching solution is retained on the tooth for almost an hour. The time is necessary for the dilute carbamide peroxide to bleach out the stain. The most common bleaching agent is a

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gel form of peroxide. These are available over the counter at most drug stores.

The process is simple. At the start the color of the teeth is recorded. Then you apply a dab of carbamide peroxide gel to the plastic guard around the gum line and wear this for forty minutes once a day. In a few weeks you can see the difference and in about six weeks the teeth are as white as they are going to be.

There are two distinct problems with this procedure. The peroxide oxidizes gum tissue as well as the surface of the tooth. In teeth, this inhibits bonding, so, if you intend to have new bonded restorations placed, have it done before you bleach. If you have been bleaching and need a bonded filling be sure to stop for a few weeks before the bonding appointment. Some commercial tooth bleaching agents are too acidic in my opinion. Unsupervised bleaching with these agents can actually erode enamel and turn the tooth yellow. Others contain large amounts of fluoride. The Food and Drug Administration has questioned the long-term use of peroxide in the mouth. Although you can readily purchase these agents over the counter, they were approved for short-term use not daily for six weeks or more. At this time I suggest you consult with your dentist about the procedure and discuss the risks and benefits for your individual situation.

The Mercury Controversy

Mercury has been used in dentistry for 150 years, and since its very inception, serious questions have been raised about its safety. In the early days there was no scientific research on the potential harmful effects of mercury. Today ample evidence shows that mercury can poison any cell or tissue in the body, as well as numerous enzymes. Mercury can also interfere with hormonal activity, is a strong suppressor of the immune system, and alters the bacterial composition in the mouth and intestines.

How Toxic Is Mercury?

Mercury was once used extensively in medicine as an antiseptic (Mercurochrome was a staple in every medicine cabinet) and a diuretic. From the sixteenth century on, it was used to treat syphilis. It was extremely toxic and often, if the disease didn't kill a victim, the medication would.

Mercury is the most highly toxic of all the heavy metals. We are exposed to mercury all around us today — in pesticides and in industrial wastes that contaminate our air, water, and the very foods we eat. The combined presence in our environment of mercury with other poisonous compounds amplifies its toxic effects.⁴⁶

Some people are highly sensitive to the presence of even tiny amounts of mercury. Others are truly allergic to the metal and experience immediate or delayed allergic reactions when exposed to it. Still others seem completely

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unaffected by it.

One man told me he worked next to three open bowls of mercury as a weatherman in the close confines of a World War II aircraft carrier. The exact barometric pressure was critical for the pilots to accurately set their altimeters. The mercury fumes there were so intense that no one else could withstand the duty for longer than three months, but he seemed completely unaffected for more than three and a half years. This is a clear example of the wide variation in susceptibility to mercury poisoning.

People who show no immediate reaction to mercury often slowly accumulate enough of the poison in their bodies to have long-term, highly damaging effects. And some groups are at higher risk from toxic exposure than others, most notably: pregnant women, women of childbearing age, infants, children, the elderly, and those exposed to additional amounts in the workplace.

Why So Potent?

Mercury is a white-silver metal with some very unusual features: it is liquid at room temperature, and it is highly volatile and vaporizes readily. The fumes from elemental mercury are made up of uncharged atoms that are easily absorbed into lung and nasal tissues.⁴⁷ Once absorbed, these uncharged atoms may enter the bloodstream and penetrate cell membranes, the blood-brain barrier, major organs of the body, the placental membrane, and fetal tissues.⁴⁸ Mercury in some forms is also absorbed readily through the skin, mucous membranes, and digestive tract.

The heart is one of the critical areas affected by mercury. The heart's pacemaker (the sinoauricular node) produces the impulse that stimulates the heart to beat. It is affected by mercury.⁴⁹ As a result, people chronically ex-

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posed to mercury may experience an irregular or erratic heartbeat. For a complete discussion of the relationship between mercury and heart disease I highly recommend Mike Ziff's new book, *The Missing Link*. (See Reading List Appendix for more information.)

Obviously, mercury atoms and mercury-containing molecules of such a poison migrating freely throughout the body have the capability of doing great damage in many areas — from major organs and systems down to the level of single cells. The effects may be subtle and insidious, completely unnoticeable as the poison silently accumulates for many years until it finally causes serious health problems. For a more detailed summary of the toxic effects of mercury, the interested reader is referred to Sam Ziff's *Silver Dental Fillings: The Toxic Time Bomb*⁵⁰.

Less than one part per million of mercury absorbed into the bloodstream can impair the blood-brain barrier (the membrane that keeps intruding substances from passing from the blood into the brain) within hours, permitting substances that would normally be excluded to enter the cerebrospinal fluid.⁵¹⁻⁵³

When mercury atoms attach to a protein, they alter the physical shape of these molecules. The immune system appears to be disrupted by mercury.⁵⁴⁻⁵⁶ Mercury causes the chromosomes of white blood cells to break, resulting in the inability of chromosomes to reproduce themselves properly.⁵⁷ To study autoimmune disease (in which the immune system begins to attack the body's own cells), scientists give mercury to laboratory rats to alter the structure of their protein molecules, thus causing the immune system to identify them as a foreign substance and producing an autoimmune response.

Mercury also accumulates in the heart, lungs, liver, thyroid, pituitary, adrenals, red blood cells, intestinal wall, skeletal muscle, and bone marrow — just about every vital

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tissue. Everywhere it settles, mercury destroys healthy body tissue. The World Health Organization has concluded that there is *no* totally safe level of mercury in the human body.⁵⁸

What Are the Symptoms?

Mercury has long been (and still is) heavily used industrially. Remember the Mad Hatter in *Alice in Wonderland*? The expression 'mad as a hatter' came from makers of hats, who once used mercury salts in the manufacture of hats and touched it with their hands. They would absorb these salts through their skin and, as a result of mercury poisoning, would become highly erratic, often acting quite mad.

Because of mercury's accumulation in the central nervous system,⁵⁹⁻⁶¹ many psychological symptoms are commonly found. These include confusion, memory loss, and irritability (documented and cataloged as early as 1926 by Dr. Alfred Stock, who conducted meticulous experiments on himself).⁶²⁻⁶⁴ Mercury is also associated with headache, fatigue, mood swings, depression, suicidal thoughts, nervousness, fits of anger, shyness, and emotional outbursts.

Besides the psychological problems, physical symptoms also abound. The job of the kidneys is to filter the blood. But the kidneys are not well equipped to filter out mercury. It accumulates in the kidneys, causing kidney damage and dysfunction.⁶⁵⁻⁶⁷ A 1988 study by Verschoor, et al.⁶⁸ discovered that dentists and dental assistants working with mercury amalgam have an even higher risk of kidney function disturbances than do workers exposed to toxic lead, cadmium, and chromium.

The pituitary gland, whose function it is to regulate the production of hormones in the entire body, is another site where mercury accumulates and insidiously begins to

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distort the body's delicate hormonal balances.⁶⁹ Menstrual disorders and infertility, for example, have been correlated with exposure to mercury. Studies show that 25-50% of the women working in mercury-polluted environments suffer from reproductive disorders due to excess mercury exposure at work.⁷⁰⁻⁷³ The most common symptoms are painful menstruation, excess or diminished flow, and infertility.

A relationship between mercury exposure and spontaneous abortions and stillbirths has also been confirmed.^{74,75} The U.S. Environmental Protection Agency states that "Women chronically exposed to mercury vapor experience increased frequencies of menstrual disturbances and spontaneous abortions; a high mortality rate was also observed among infants born to women who displayed symptoms of mercury poisoning."⁷⁶⁻⁷⁸ Dentists and dental assistants have three times as many spontaneous abortions as the general population, despite the 'no touch' technique of handling mercury that is now almost universally practiced.⁷⁹

Other effects of mercury poisoning on the nervous system and the rest of the body are legion: bleeding gums and gum infections; loose teeth due to loss of bone; skin inflammations; joint pain; chest pains; irregular heartbeat; anemia; numbness and tingling of fingers, toes, nose, and lips; narrowing of the field of vision; hearing loss; lack of muscle coordination; brain tumors; gastrointestinal disturbances; and tremors eventually leading to an inability to perform fine motor functions with the hands. Causal links between mercury and Alzheimer's disease⁸⁰⁻⁸³ and multiple sclerosis^{84,85} are documented but have not been conclusively proven as yet. Evidence abounds of "anecdotal" recoveries from these diseases following removal of amalgam fillings, but such after-the-fact evidence is not generally accepted as scientifically valid because it has not been produced according to standard experimental design, with all variables controlled and with a control subject popula-

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tion to test for unforeseen variables. For more information on this subject, see the referral appendix Dental Amalgam Mercury Syndrome (DAMS) and Foundation for Toxic Free Dentistry (FTFD).

Most devastating of all are the effects of mercury on babies and unborn children: spontaneous abortion, stillbirths, brain damage, physical deformities, speech and learning difficulties, mental retardation, and high mortality rates. A positive link between mercury and cerebral palsy has been established.^{86,87}

Research published in 1993 demonstrated that mercury from fillings produces antibiotic resistant bacteria in the gut and mouth.⁸⁸ Although the evidence of mercury poisoning continues to mount, diagnosis of mercury toxicity remains very difficult due to several complicating factors. In the first place, the symptoms most often do not develop for three to ten years, making it hard to identify long-past dental work or other mercury exposures as their source. And many of the general symptoms overlap with those of countless other diseases and environmental poisons: fatigue, weakness, congestion, diarrhea, mood changes, headaches, bleeding gums. So it is not so simple as if we could see trembling hands, for example, and immediately recognize: "Aha! Mercury poisoning!" No one knows how many people are walking around today with diseases caused by undiagnosed mercury poisoning.

So What About "Silver" Fillings?

A physician once remarked to me, after seeing a report on the dangers of mercury fillings, that he was sure glad he only had the silver kind! 'Silver' fillings actually contain about 50% mercury upon placement. His confusion may not have come about by accident. In 1833, there were few laws regarding who could and could not practice dentistry. As a

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result, two nondentists, the Crawcour brothers, began placing a new kind of crude filling in the mouths of their patients.

The chief component of the new filling material was mercury, but a contrived name, 'Royal Mineral Segundum,' was invented to disguise the fact that it contained the poison. The name 'silver filling' or 'silver amalgam' soon came into use and is still erroneously used today. The BIG LIE is this: only about 30% of the filling material is actually silver; the rest consists mostly of mercury, plus small amounts of copper, zinc, and tin. Even the term *amalgam* is confusing: many people aren't aware that *amalgam* simply means a mixture or blend of one or more other metals and mercury.

The new compound was quick to catch on: dentists who used mercury fillings could provide their services much less expensively than their colleagues who used gold (which, at that time, was the only good material available to repair decayed teeth). Low cost then was the original reason for the selection of this toxic filling material and it remains one of the principal reasons for its use today.

The Mercury/Silver Amalgam Wars

Dentists have been arguing from the very first about the safety of putting so-called silver fillings in the mouths of their patients. As a matter of fact, more than 2000 years ago, Hippocrates remarked on the toxicity of mercury. Part of the Hippocratic oath taken by every physician and dentist is, "*I will give no deadly medicine to anyone if asked, nor suggest any such counsel.*" Hippocrates knew as early as 300 BC. that too much medicine could be a dangerous thing, and he cautioned doctors first and foremost to do no harm. He realized the real curing power lay in the tremendous healing powers of the *body*, not in medicines or the physician.

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In 1830, the American Society of Dental Surgeons, the original professional dental association in the United States, attempted to put a stop to the use of mercury fillings by requiring member dentists to sign a pledge: *"It is my opinion and firm conviction that any amalgam whatever . . . is unfit for the plugging (filling) of teeth."* Every member was asked to agree not to use poisonous materials in the mouths of their patients for profit. But large numbers of dentists violated this pledge. Because the public demand for cheaper fillings was so great, they felt they had to use them in order to compete.

By the mid-1800s the dispute came to a head. So many dentists had been kicked out of the American Society of Dental Surgeons that the organization collapsed. In its place, the ousted members formed the American Dental Association (ADA) in 1859.

So the ADA was really born out of the amalgam controversy. And it has resolutely touted the safety of mercury/silver fillings ever since.

Today the ADA is the best-funded dental organization in the world. It receives not only \$27,594,141 in annual dues from its 140,000 members (representing an estimated 78% of all licensed dentists), but also considerable revenues from grants (\$2,748,748) and from dental products manufacturers and advertisers (\$7,009,416) proudly displaying its lucrative 'seal of approval'. It lobbies heavily for legislation that will favor its members. Its Washington-based Political Action Committee (PAC) channeled \$897,000 to Democratic and Republican candidates in the 1988 federal elections, ranking it number 30 among the largest PAC contributors in the nation.

One of the ADA's staunchest and most controversial positions has been its unqualified endorsement of mercury amalgam fillings. Surely, the trusting public would presume, the position statement of this large prestigious orga-

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nization of professional dentists would be backed up by reliable scientific research on a question so vital as the use of toxic mercury in patients' mouths! Unfortunately, it isn't.

In lieu of any scientific basis, then, what exactly does the ADA have to say in its defense of mercury amalgam fillings? The organization's position is explicitly set forth in pamphlet W186, an information brochure provided for dentists to pass out to their patients. This position was reiterated in a Special Report titled "When Your Patients Ask About Mercury in Amalgam", published in the April 1990 issue of the *ADA Journal*. Here are some examples of their statements:

According to the ADA:

"Scientific studies of dental amalgam in tooth restoration have been carefully conducted for more than 100 years."

This would lead you to believe that the ADA, or other reputable agencies, have been diligently studying amalgam safety, right? Wrong. No such studies exist. While studies of the strength and durability of amalgam fillings have been conducted, studies of their safety have not! To the contrary, hundreds of studies by other scientists have found that the major component of these fillings, mercury, is unsafe.

According to the ADA:

"Amalgam restorations continue to be shown safe for the vast majority of dental patients . . . indeed for the vast majority of patients the benefits of using amalgam restorations far outweigh any risks"

This statement is false because no one has shown mercury fillings to be safe. And even if mercury fillings were safe for the 'vast majority,' what is a vast majority, 75% (?), and if so, what about the dentist's responsibility to

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the remaining minority, for whom the fillings are not safe?

Most medical prescriptions come with explicit warnings about possible adverse reactions. The ADA, however, neglects to give its members any guidance in this area, saying only that:

"If there were any proven health hazard, dentists would immediately stop using amalgam."

One would surely hope so. I certainly have. But what about the other dentists? A recent study by Gordon Christensen and Associates⁸⁹ showed that while 39% of the 10,000 dentists surveyed in their study are 'concerned' or 'highly concerned' about the toxic effects of placing amalgam fillings, 94% continue to place them.

A 1990 survey by the ADA found that 50% of Americans think mercury from amalgam is dangerous.⁹⁰

According to the ADA:

"After more than a century of thorough testing, no scientifically reliable study has found the mercury component of amalgam to present a threat to the general health of dental patients."

The statement goes on:

"There is no scientifically sound evidence linking amalgam restorations to any general medical disorder."

In fact, mercury from dental amalgam has now been directly linked to specific physiological damage including changes in kidney function⁹¹, and gut flora.^{92,93} Mercury, quite possibly from dental amalgam, has been linked to Alzheimer's disease. The Sanders-Brown Center on Aging at the University of Kentucky Medical Center in Lexington has conducted extensive research into the cause of this disorder.⁹⁴⁻⁹⁶ Duhr, et al. regarding their research state

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that "These results suggest that certain complexes of mercury . . . must be considered as a potential source for the etiology of Alzheimer's Disease."^{97,98} (Alzheimer's Disease is the fourth leading cause of death in the elderly and is the leading cause of dementia. The average cost of the illness is over \$200,000 per patient and average survival time from diagnosis to death is 4 years. There is no effective treatment. In this degrading disease, mothers no longer recognize their children and parents forget how to feed themselves.)

The University of Kentucky Center researchers measured the levels of eighteen minerals in Alzheimer's Disease brain vs. age-matched controls. Of these minerals, they found only two in the Alzheimer's Disease brain that were different from the controls. Mercury levels were four times higher and selenium were significantly lower in the Alzheimer's Disease brain.

Previous research has clearly demonstrated that the predominant source of human exposure to mercury is from dental amalgam. Researchers are now reviewing the dental records to determine if they can find a pattern to determine whether Alzheimer's Disease is linked to mercury fillings.

Dr. Boyd Haley of the University of Kentucky College of Pharmacy has found that mercury at extremely low levels interferes with a critical cell process — the production of tubulin microtubules. Without tubulin microtubules the nerves grow into neurofibril tangles and new memory and thought ceases. That condition renders its victims senile.

Their work has been further expanded to investigate other neurological disorders and look specifically for the role of heavy metals in their etiology. They have implicated heavy metals in Amyotrophic Lateral Sclerosis, Parkinson's and Multiple Sclerosis. Reduced intelligence offspring occurs when pregnant rats are exposed to mercury vapor — much like that observed in lead poisoning. One theory is

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that all of these diseases are essentially the same disease and genetic predisposition accounts for the variation in clinical symptoms from patient to patient.

Carefully structured research experiments proving mercury is safe have not been conducted by the ADA or anyone else. Instead the ADA has used its massive power to discredit those studies showing harm and to sway public opinion and government regulators. For more than 2000 years, mercury has been known to be a poison — one of the most toxic substances known to humankind.

Does the ADA certify dental amalgam as safe and effective? Not at all. Mercury could never pass the safety test. So how can the ADA defend its endorsement of mercury?

Cleverly. They maintained that certification *“is only for the alloy of dental amalgam. The amalgam does not form until the dentist mixes the alloy with mercury. Therefore, dental amalgam per se cannot be certified. We cannot certify a reaction product made by the dentist.”*⁹⁹

So the ADA evades accountability by concluding that it is the responsibility of the individual dentist to determine the efficacy and safety of the materials and their appropriateness for each patient.

According to the ADA:

“Mercury is made virtually harmless when it combines with the other metals used to produce amalgam.”

This is an out-and-out lie. Yet the ADA instructs dentists, when their patients ask, *“Isn’t mercury poisonous?”* to answer:

“Not when used in dental amalgam. Alone, in the form scientists call elemental mercury and the public sometimes calls quicksilver, mercury is toxic at high concentrations. However, when mercury is combined with other metals, such

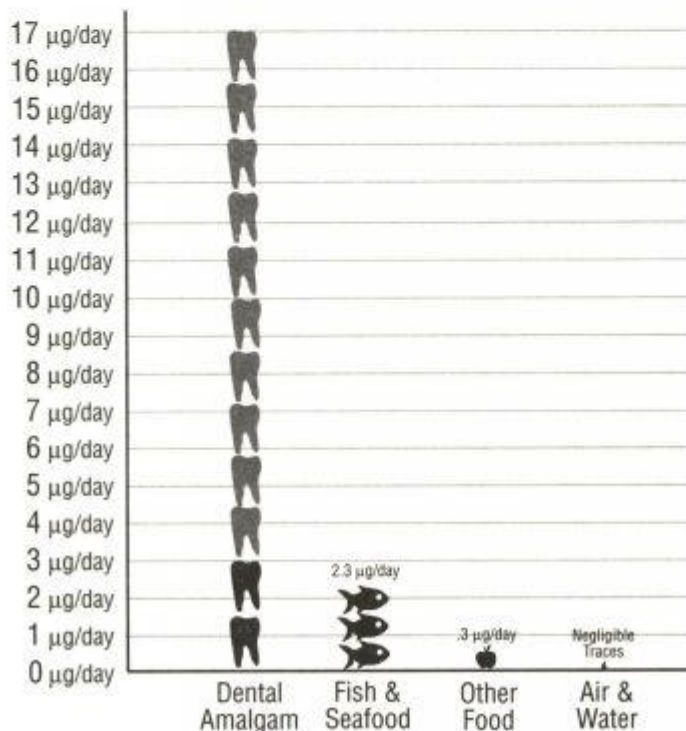
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as silver, tin, and copper, it reacts with them to form a biologically inactive substance."

It is a fallacy that mercury is neutralized when combined with other components of dental amalgam.¹⁰⁰ Research has shown that chewing, toothbrushing, drinking hot liquids, and tooth grinding all release mercury vapor into the mouth. And mercury, as documented earlier in this chapter, even in extremely small amounts, has toxic effects.^{101,102}

According to the ADA:

"It [mercury] enters the body primarily through the foods we eat, as well as through the air we breathe and through our drinking water."



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Not according to the World Health Organization.¹⁰³ Their expert committee on mercury estimated that dental fillings are the primary source of exposure to mercury in the general population, greatly exceeding the total exposure from all other sources (see following figure).

Vimy, et al. calculated the amount of mercury absorbed by the average person from fillings. Their results estimate that mercury from food amounts to only one-fourth to one-third of the amount the person absorbs from their fillings.^{104,105} (It is important to note that many factors could affect how much mercury from amalgam fillings an individual is exposed to including the number of fillings, how much the person breathes through their mouth, their diet, their gum chewing habits, and the drinking of hot fluids.¹⁰⁶)

According to the ADA:

"Eventually, the body rids itself of mercury through the urine, but there is always a very low level of mercury present in the human system."

Autopsies of humans indicates that about eighty percent of the mercury trapped in your body is collected in the kidneys.¹⁰⁷ Human studies have shown that merely having mercury fillings in your teeth reduces the capacity of the kidney.¹⁰⁸ Animal studies indicate that this damage may result in as much as a sixty percent reduction in the kidney's filtering capacity.^{109,110}

Vimy, et al. concluded that mercury vapor released from dental amalgam fillings is readily absorbed into the lungs, gastrointestinal tract, and jawbone, and progressively accumulates in maternal and fetal tissues with the passage of time. Newborns are further exposed through mother's milk. They stated emphatically, *"Our laboratory findings in this investigation are at variance with the anecdotal opinion of the dental profession, which claims that*

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amalgam tooth fillings are safe."¹¹¹

Numerous scientists have proven that mercury from fillings is not stable and that mercury undoubtedly does escape and accumulate in various tissues. These findings have now been replicated in two different species of monkeys and by other laboratories.¹¹²⁻¹¹⁵

According to the ADA:

"an allergic reaction to amalgam is so uncommon that it involves less than 1% of the general population. . . . unless a patient is truly allergic to dental amalgam, dental researchers caution concerned patients not to have their amalgam restorations replaced"

This misleading statement is worded to imply that amalgam safety depends primarily on the absence of an *allergic* reaction. Apparently, the unnamed authors of the ADA position statement do not read their own curriculum-approved textbook, which stated back in 1974: "A toxic reaction from absorption of mercury from dental amalgam has been reported in a number of cases."¹¹⁶ In fact, the main problem with mercury is not that it produces allergies, but that it chronically poisons people.

Even the statement's figure of "less than 1%" allergic reactions is in stark contrast to the published scientific literature. Studies show allergy rates anywhere from 2% to 35% with the proportion increasing dramatically with the length of time of exposure.¹¹⁷⁻¹¹⁹ Djerassi and Berova found that none of their experimental subjects tested allergic to mercury unless they had fillings present in their mouth.¹²⁰ Miller, in a follow-up study of dental students, found that the percentage of students who tested allergic to mercury steadily increased with the length of time the fillings were present.¹²¹

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What Is Allergy?

Allergies are an immune system reaction. Allergies first require a sensitization to an irritating substance called an allergen (pollen or dust mites, for example). Once this sensitization develops, subsequent exposures to the allergen will activate the immune system's defense capabilities to destroy the allergen. When the allergen induces the immune system to attack its own body or over-react, you have what is called an autoimmune or allergic reaction. It may come in the form of a mild rash, acne-like skin lesion, headache, dizziness, or an anaphylactic shock severe enough to kill you. All allergic reactions take their toll in discomfort and lessen the ability of the immune system to fight other invaders.

Numerous health problems have been related to allergic reactions to mercury, including dermatitis, sores and burning in the mouth, as well as more generalized allergic reactions. Contact dermatitis is considered an occupational hazard among dentists, with approximately 11% of all dentists displaying an allergic hypersensitivity to surgical gloves, a condition that has forced many out of practice.¹²² Yet to this day, few of these facts about mercury are common knowledge among practicing dentists. New dental graduates are often equally unfamiliar with the substantial body of evidence that has accumulated.

Research shows that a number of people are allergic to the different metals in their fillings. The longer the fillings are present, the greater the number of people who will react to the metal. Over 22% of the dental students tested reacted to the materials in their fillings when the fillings had been in place for as little as five years.¹²³ Immediate allergic reactions are, of course, more readily diagnosed.

The majority of dental work done today involves removing and replacing amalgam fillings — which, after all,

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have a relatively short life and constantly undergo critical deterioration. The problem of toxic fillings would go away in just a decade or two with no major upheaval if we could just stop more teeth from being filled with this mercury-amalgam filling.

Think of the risk that could be avoided if dentists were:

- 1) Banned from placing new amalgam
- 2) Taught how to use of safer materials
- 3) Properly trained in amalgam removal

It is true that removing amalgam fillings can be quite expensive. Dental insurance frequently does not cover the new materials. The massive U.S. Welfare system *mandates* the use of amalgam only — even for pregnant women and nursing mothers. Dentists have been prosecuted for fraudulently billing for amalgam while actually filling a tooth with a more expensive composite. The government contends that their program will only pay for mercury/silver fillings. Anything else, regardless of cost or need, is not payable under the current welfare laws. The principal material used in all branches of the military is amalgam. The real heart of the issue is one of massive economic and political forces conspiring to your detriment to prevent any move away from toxic amalgams — professional dental organizations, state and federal programs, and dental insurance companies have a very big stake in the continuing use of this poison.

The ADA further states:

“The strongest and most convincing support we have for the safety of dental amalgam is the fact that each year more than 100 million amalgam fillings are placed in the United States.”

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In the past, numerous common products such as asbestos, lead, and DDT were thought to be safe. In each of these cases, scientific concerns were long discounted by industries that produced and used the material, and often the claims of safety were initially supported by 'responsible' government agencies. Only after evidence became overwhelming, and the legal liability was impossible to ignore, was the material finally regulated or withdrawn from the market. Each of these products demonstrated a delayed pathology after a period of chronic exposure — as it is with mercury. Moreover, the resulting pathology from mercury tends to be of a medical nature and would not be apparent to most dentists. Thus, in the case of amalgam mercury exposure, if a health problem should exist, most dentists are not trained or qualified to diagnose it, and most physicians would not be aware of the possibility of mercury from fillings as its cause!

Five references are given in support of the ADA position.

- 1) Reinhardt, J.W.; "Risk Assessment of Mercury Exposure from Dental Amalgams". *J. Public Health Dent* 48: 172-77, 1988.
- 2) Langan, D.C.; Fan, P.L.; Hoos, A.A. "The Use of Mercury in Dentistry: A Critical Review of the Recent Literature". *JADA* 115: 867-880, 1987.
- 3) Fan, P.L.; "Safety of Amalgam". *Canadian Dent Assn J.* 15:34-36, 1987.
- 4) "The Mercury Scare". *Consumer Reports*, March 1986.
- 5) "Council on Dental Materials, Instruments, and Equipment and Council on Dental Therapeutics. Safety of Amalgam — An Update". *JADA* 119: 204-5, 1989.

It is interesting to note that none of these articles contain original research. They are merely lay media re-

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ports or review articles discussing other people's research papers. However, the review articles frequently cited primary research papers that did not conclude that amalgam was safe.

Additionally, these review articles and lay reports rely almost exclusively on blood and urine measurements to support their conclusions. Yet even the ADA has admitted:

*"There appears to be little correlation between (mercury) levels in urine, blood, or hair, and toxic effects."*¹²⁴

By and large, the ADA thereby negates the validity of the very references they cited.

Investigators who have studied the subject are in almost unanimous agreement that there is poor correlation between the urinary excretion of mercury and the demonstrable evidence of poisoning.¹²⁵ In fact, the opposite may be the case: the less mercury excreted, the more remains in body tissues and organs, and the more mercury that is excreted, the less remains!

The International Academy of Oral Medicine and Toxicology (IAOMT) has reviewed the ADA position in depth and states: "It is the conclusion of this Academy that the ADA Special Report misinforms dental patients regarding the potential risks . . . and could leave dentists at risk of legal liability and guilty of negligent misrepresentation."¹²⁶

The IAOMT went even further, stating: "Given the inconsistencies between the scientific facts and this ADA Special Report, the International Academy of Oral Medicine and Toxicology has serious concerns regarding the ADA's lack of scientific rigor and the tendency to misinform the dental profession and, thereby, the public at large, regarding the established scientific facts about amalgam safety. . . . This failure has resulted in inadequate protection to the public and inadequately protects the membership of the ADA from personal liability due to amalgam usage."¹²⁷

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The ADA Principles of Ethics and Code of Professional Conduct was recently changed to say,

"The removal of amalgam restorations from the non-allergic patient for the alleged purpose of removing toxic substances from the body, when such treatment is performed solely at the recommendation or suggestion of the dentist, is improper and unethical."

What a dilemma for the conscientious dentist! Scientific documentation has clearly proven that chronic exposure to low levels of mercury from amalgam fillings results in biological accumulation and delayed adverse immune response; yet dentists who makes a sincere effort to go beyond the ADA propaganda and find out the results of concrete scientific research are prohibited from making any recommendations based on this knowledge. By promoting the use of its position statement, the ADA is apparently suggesting that dentists deliberately violate their own code of ethics and withhold vital information from their patients and the public. Such action intentionally violates the patient's right to fully informed consent. California recently passed legislation to require that dentist give written informed consent before placing any toxic materials.

The Government Regulators Vacillate

The ADA position paper also claims

"The Food and Drug Administration in 1987 classified mercury amalgam as a Class I dental device."

U. S. Food and Drug Administration (FDA) rules state that all dental devices must be certified as safe and effective. There are only three categories. The first is the safest, Class I. The second requires only general performance standards, Class II. The third category is Class III for which special controls are necessary to assure a reasonable

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degree of safety.

The FDA has not classified mixed dental amalgam as safe. Instead they chose to certify liquid mercury, a known poison, as a safe Class I device!!! How can that be? And how could it be that metallic powder was put into the more restricted (Class II) category than mercury?

The Health & Human Services (HHS) Research Work Group concluded "*the available research evidence is not specific enough or strong enough to make sound pronouncements about human health risks from dental amalgam*" (IV-8). The HHS Risk Assessment Committee's concluded: "*the potential for effects at levels of exposure produced by dental amalgam restorations has not been adequately studied*". They then recommended amalgam be classified as Class II.

But FDA rules state that, "*a Class III device is one for which insufficient information exists to assure that general and special controls provide reasonable assurance of safety and effectiveness*". Thus, amalgam should be in Class III, not Class II.

Why all the fuss about classification? Simple. As long as amalgam remains unclassified, the manufacturer is not required to furnish proof of safety as they are with other similarly classified devices. Without scientific proof, those concerned about safety have no one to complain to. Essentially it is a substance that dentists use of which they have no proof of safety except that they use it a lot.

In March 1991, the FDA Dental Products Panel agreed with the HHS determination that sufficient scientific data does not exist to allow a conclusion as to whether or not dental amalgam is a health risk to patients. These committees have recommended further study. The document readily admits there is a paucity of human scientific research on the question of amalgam safety, and yet years have passed since the 1984 National Institute of Dental Research (NIDR) Workshop on the Biocompatibility of

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Metals in Dentistry recommended almost identical research undertakings. What assurance does the American public have that this state of affairs will not continue? None.

The recent Health Human Services report also referred casually to the hundreds of adverse reactions reported by Americans to the FDA as **bogus**,¹²⁸ but they gave no explanation for this most unusual remark.

Is the Mercury in Amalgam Stable and Unchanging?

Published experimental evidence as early as 1926 demonstrated that mercury is not locked in, but is released from fillings.¹²⁹ More recent research has shown that both chewing and tooth brushing release mercury vapor into the human oral cavity.¹³⁰⁻¹³⁶

In 1981 Dr. Carl Svare made a discovery that shocked the dental community.¹³⁷ He was conducting experiments measuring the amount of mercury in the air we exhale. One of his subjects waiting at the end of the line saw that it would be some time before her turn came to be tested. She went across the street for pizza. When she returned, the line was gone and Dr. Svare tested her. Her mercury level was so high that it blew out his equipment! He asked what she had just been eating and was able to sample some of the pizza — but found no mercury contamination there. With repeated testing, he noticed that the subject's mercury level gradually began to drop. He then gave her a piece of rubber tubing and instructed her to chew on it for a while. He was amazed to see the mercury level shoot right back up again. He went on to retest the other subjects after they chewed sugarless gum, and was able to replicate these results consistently among subjects who had mercury amalgam fillings in their teeth.

This study became the basis for our current knowledge that the release of mercury from fillings increases from six- to tenfold for up to 90 minutes¹³⁸ whenever the fillings are

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stimulated by chewing, brushing, hot fluids, or teeth grinding. What's more, we now know that mercury is also released continuously in the absence of any stimulation, in lesser but still significant amounts, around the clock. And not only is it absorbed through breathing, but it also filters directly into the tissues and bone.

Low doses of mercury are almost completely absorbed from the lungs. Therefore, when mercury is measured in exhaled air, this measurement represents only a small fraction of the dosage the individual will have *absorbed* before exhaling. Measurements of mercury in urine are also misleading as indicators of how much mercury has accumulated in the body tissues and still remains there. Experiments have verified that the average person with twelve amalgam fillings would receive a daily dose of approximately 10 micrograms of mercury per day, from the fillings alone.¹³⁹ Another 2.27 micrograms would be obtained from food.

The amount of measurable mercury in the breath is a quantity that varies greatly from one person to another, but the evidence is conclusive that, on the average, people with amalgam fillings absorb 100% to 550% more mercury than those without amalgam fillings do.¹⁴⁰ Amalgam fillings have become our predominant source of exposure to mercury — not the food we eat, nor the air, nor the environment, as the ADA would lead us to believe.

We can now definitely state that as a direct and persistent result of mercury/silver amalgam fillings, a person's immune system is altered. Their gum tissues and jawbone around the filled tooth become impregnated with mercury, and the mercury in their brain increases by three-to fourfold.

In 1987 an expert committee was instructed by Sweden's Department of Health to review the safety of dental amalgam. The committee's conclusion did not mince words: *"From a toxicological point of view, mercury is too*

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toxic for use as a filling material, and dentists should use other materials as soon as they are available." The Swedish Parliament confirmed this position and gave dentists until the end of 1997 to phase out mercury entirely.¹⁴¹

In England, from 1939-1948, there were 585 deaths reported from acrodynia; most of the victims were children. In 1952, 3.6% of all visits to Children's Bristol Hospital were due to acrodynia. How was this horrible epidemic stopped?

In 1953, a court action removed mercury-containing preparations from the market. It was discovered that the children were exposed in the womb to mercuric chloride from an ointment used during pregnancy and/or used for diaper rash. Some children were poisoned by mercury used in teething powders or chocolate worm medications. This insidious and often fatal illness completely disappeared when the use of mercury was banned.¹⁴²

Acrodynia is one of the few diseases we can definitely say is caused solely by mercury. In 1989, a young woman dentist gave birth to a child who was mercury poisoned and had acrodynia. She was shocked and sued her dental school. She maintained that she was never told not to practice dentistry while pregnant or that any harm might come to her baby from her professional contact with mercury. The ADA contends to this day that there is no danger — but they offer no proof.

The FDA has received several hundred adverse reaction reports for mercury/silver amalgam documenting the recovery of ill patients following removal of their mercury fillings. All are completely discounted by the ADA as simply coincidences or "the power of suggestion." Still, no warnings are required before it is placed in your mouth. Many local dental boards and state regulatory agencies will prosecute dentists for removing this material to treat the adverse effects. It seems that dentists can make their

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patients sick by implanting mercury fillings, but they cannot legally correct the problem once it is discovered unless a physician, the next door neighbor, or the patients themselves make the diagnosis.

Bio-Probe compiled clinical case reports of 1,569 patients who elected to have all of their mercury fillings removed. When 24 symptoms were analyzed, an astounding 83% were improved or cured completely. The results are tabulated on the following page with the most frequently reported symptoms listed first.¹⁴³

Treating any disorder by removal of mercury fillings has been called quackery by executives of dental associations — but not by the recovered victims of mercury poisoning. It is a curious that the term 'quack' supposedly originated over two centuries ago when Swedish immigrants recognized that a physician who indiscriminately used mercury to treat illness was not providing legitimate medical care. "Don't see that doctor; he only gives quicksilver," the rumor would pass around. The popular name for mercury was *quicksilver*, which the Swedish immigrants pronounced *quacksilver*, in time shortened to simply 'quack'. Today the very people who are indiscriminately approving the use of mercury in the practice of dentistry are ironically labeling quicksilver's greatest foes as quacks!

The ADA has grown increasingly aggressive in their determination to silence the anti-mercury outcry. They have issued several press releases, public statements, and pamphlets unequivocally proclaiming the safety of this material. They will furnish an articulate spokesperson to any state licensure trial to testify against a dentist who has been legally challenged for removing mercury fillings. Consequently, some dentists advocating mercury removal have already lost their licenses to practice and others have had to fight costly court battles to prevent the loss of their license and retain their right to practice.

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Symptom	Number reporting	Cured or improved	%Cured or improved
Fatigue	796	691	87
Headaches	576	499	87
Vision	462	289	63
Depression	347	315	91
Dizziness	343	301	88
Oral ulcers	338	290	86
Skin Lesions	310	251	81
Memory Loss	265	193	73
Metallic Taste	260	247	95
Irregular Heartbeat	256	207	81
GI problems	231	192	83
Allergy	221	196	89
Irritability	213	178	88
Urinary problems	189	162	86
Insomnia	187	146	78
Nervousness	158	131	83
Sore gums	129	121	94
Muscle tremor	126	104	83
Numbness	118	97	82
Multiple Sclerosis	113	86	76
Blood pressure	99	53	54
Bloating	88	70	88
Chest Pain	79	69	87
Thyroid	56	44	79



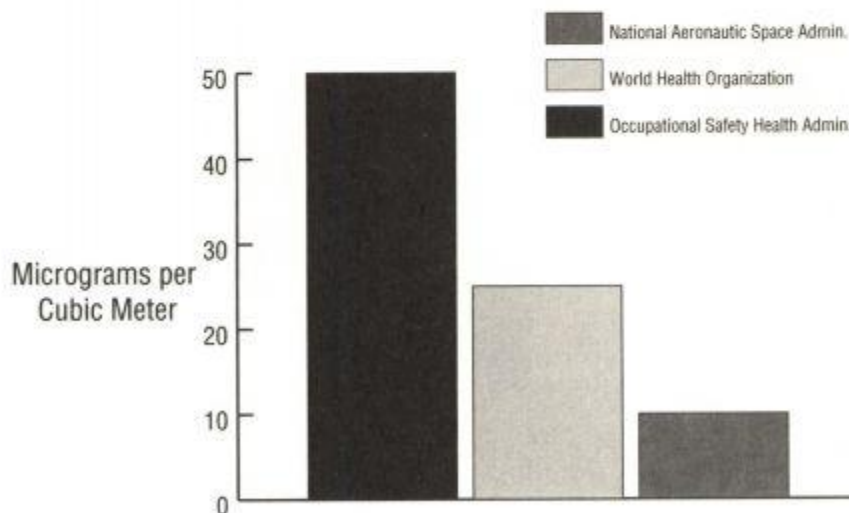
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How Much Mercury Is Too Much?

No amount of mercury is considered beneficial. Mercury is not essential to life — it is a poison. And the EPA points out that no amount of exposure can be considered totally harmless, since standards are based only on the appearance of overtly observable signs and symptoms. The effect of poisons always depends on three factors: concentration, action time, and extent of other exposures. Both increased quantities and increased time of exposure accelerate the development of visible side effects.

While several countries have established a maximum safe exposure level for workers during a 40-hour week, there is wide disagreement even on these industrial safety standards. The following graph displays the enormous differences between government agencies.

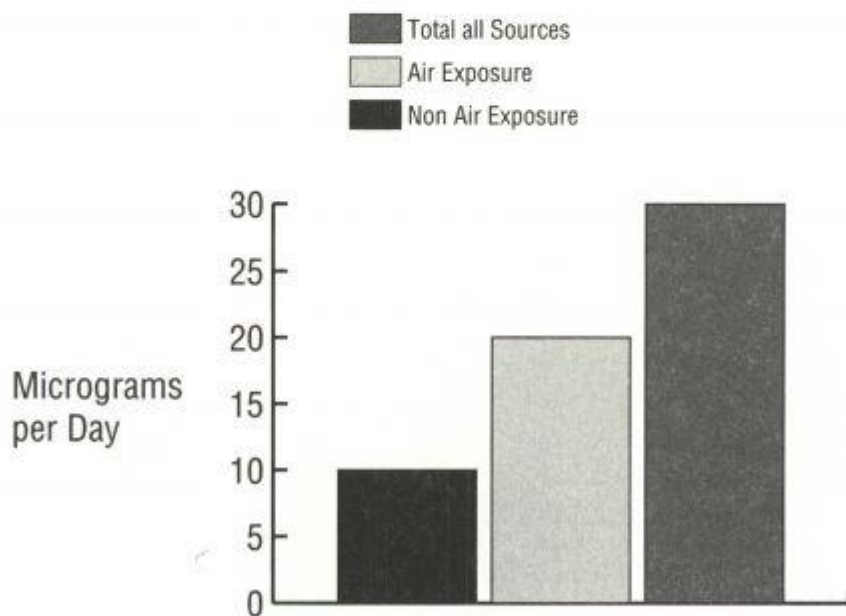
Maximum Average Worker Mercury Vapor Exposure Standards



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The amounts in dispute are very minute quantities: they are measured in micrograms. (A microgram is 1/28,000,000th of an ounce.) The symbol for micrograms is μg . The Environmental Protection Agency (EPA) has set 30 $\mu\text{g}/\text{day}$ as the maximum allowable daily intake from all sources combined, with no more than 10 μg coming from sources other than the air we breathe.¹⁴⁴ As pointed out before, the World Health Organization estimated that mercury/silver amalgams contributes 3 to 17 $\mu\text{g}/\text{day}$ and this alone ranges to well above the EPA 10 $\mu\text{g}/\text{day}$ maximum.

EPA Maximum Daily Mercury Intake



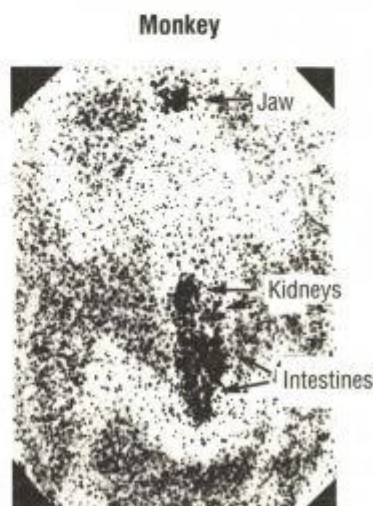
Are You Being Affected?

At the present time there is no direct way to measure (while you are still alive) exactly how much mercury has accumulated in your body tissues. All laboratory tests for urine, blood, hair, feces, and nails are subject to large error and interpretation when used on an individual basis. Here's an analogy: imagine that your blood is a freeway and your body is a football stadium. Measuring the number of cars (amount of mercury) on the freeway does not give you accurate information on how many cars are parked at the stadium. Similarly, the exit routes of urine, hair, feces, and nails can be misleading in diagnosis, since those who retain more mercury may be those who have less ability to eliminate it. One experiment with garlic demonstrated that you can actually raise the amount of mercury in your hair by eating powdered desiccated garlic. Garlic apparently helps the body rid itself of mercury.¹⁴⁵

At any rate, the best available tests show a consistent pattern related to the age and surface area of amalgam fillings in the mouth: the more fillings, the more mercury accumulated in the kidneys, liver, brain, and other organs.¹⁴⁶⁻¹⁴⁸

The picture to the right was made by inserting radioactively tagged silver/mercury fillings in a monkey for 30 days. The fillings were removed and the distribution of the mercury which had leaked from the fillings was recorded with a whole-body image scan.

The amount of mercury given off and absorbed into the



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body is directly related to the size and number of fillings and the length of time the fillings have been present in the teeth. That means the more mercury/silver fillings you have and the longer you've had them, the more mercury you are likely to have in your body.

Drs. Stock, Svare, Abraham, Frykholm, and Vimy have all demonstrated that mercury is released from dental fillings. The amount released is directly related to chewing and the number of filling surfaces used for chewing.

Drs. Vimy and Lorscheider¹⁴⁹ demonstrated that subjects with amalgam fillings had nine times as much mercury in the air in their mouths — with no prior stimulation — as subjects with no amalgam fillings. After chewing, the subjects with amalgam fillings had 54 times more mercury in the air inside their mouths than did those with no amalgam fillings.

Mercury released in the mouth is absorbed nearly 100 percent from lungs into the blood when inhaled in small doses. Once absorbed from the lungs, the blood will circulate through the entire body 12 to 15 times in the next 4 minutes before mercury is oxidized. This allows ample time for the diffusion of mercury throughout the entire body. Once absorbed, it is very hard to get out. Consequently, almost every organ and system in the body can be harmed by the effects of this poison.

Once mercury is absorbed into brain tissues, 50% of it is still retained there after 27 years, where it can cause neurological and psychological problems. Damage can be particularly significant in the reproductive organs of both men and women, and may produce birth defects and stillbirths.

Are you in danger of suffering from any of these symptoms as a result of your mercury fillings? No one can answer that question for certain at this point: there are simply too many variables involved to be able to make accurate

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individual predictions.

There is no easy way to tell if you have mercury poisoning but there are some good tests to estimate how much is in your body. A physician knowledgeable in the use of chelation therapy can administer a *challenge* with a mercury chelating agent, a drug that will attach to mercury and then pull it out through the kidneys. By measuring the urine level both before and after the challenge, the body burden can be estimated. If you're interested in having your body's mercury level checked, you can find a physician who can test it with a challenge by contacting the American College for the Advancement of Medicine (ACAM) (see referral appendix).

The easiest way to determine the amount of mercury being released from your fillings is to have the mercury vapor in your mouth measured both before and after chewing. However, the mercury vapor analyzer cannot be used to diagnose mercury poisoning. It is only a tool to measure your relative exposure.

Should I Have My Mercury Fillings Removed?

At present, this decision is one you and you alone can make. If you have fillings of mercury and silver, you are receiving some mercury all the time and more every time you eat a meal or drink hot fluids. There is no such thing as a five-year-old filling that hasn't leaked moisture around the edges and mercury into your system. How much you personally can tolerate depends on how healthy you are.

In addition to the poisonous action of mercury, allergic reactions can also occur from mercury exposure or from exposures to many of the other metals used in fillings. A safe and prudent approach to avoiding or reversing the hazards of toxic metals is simply to have these metals removed from your mouth as soon as possible. A more

conservative approach is to wait until they require replacing, and gradually change over to non-toxic materials. In either case, if the mercury/silver fillings are not carefully removed (and I recommend that your dentist follow the IAOMT protocol), you will be exposed to extremely high levels of mercury.

You should understand, however, that removal does not guarantee alleviation of any specific symptoms or recovery from irreparable cell and organ damage. Although many have experienced life-changing improvement of persistent health problems, such results cannot be predicted with certainty. You are the only one who can decide if it makes sense to you to remove a source of continued poisoning to your body.

Pregnancy Precautions

Removal of mercury amalgam can be hazardous to both the patient and to dental personnel.

The gradual “normal” continuous release of mercury from fillings may be responsible for a portion of birth defects seen today.²⁷⁵ However, Germany has specifically banned mercury removal for pregnant and lactating women because of the threat of increased mercury levels that sometimes occurs during this procedure.

When amalgam fillings are removed or an amalgam-filled tooth is extracted, a surge of mercury is released into the bloodstream. For approximately 57 days after removal, mercury levels are higher than prior to removal. We call this the 57/214 rule.²⁷² It takes time for the body to eliminate this extra burden of mercury: after 7 months (214 days) have elapsed, the mercury level in the blood will have dropped to about 10 percent of the pre-removal level. In the absence of further exposure, mercury in the body will gradually continue to be eliminated, eventually approaching zero. The new level de-

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depends both on how much mercury has been absorbed and dietary intake.

Women who are pregnant or intend to become pregnant in the near future, should *not* get their amalgam fillings removed! While you might wish to avoid further exposure to this material by having your fillings removed, an unborn baby is very much at risk from mercury in its mother's blood. Routine removal of an amalgam filling causes a release of additional mercury into the bloodstream. There have been numerous instances in which pregnant women exposed to mercury showed no overt ill effects, yet delivered a mercury-damaged baby.^{273 274} These children were born with smaller than normal heads, mental retardation, and susceptibility to serious or life-threatening illnesses such as cerebral palsy and sudden infant death syndrome.

And What About Nickel, Lead, Copper, Zinc . . . Etc.?

While the focus of this chapter has been on mercury, several other commonly used dental materials have failed to pass even the most elementary tests for biocompatibility. Among these are copper, zinc, silver, nickel, lead, cobalt, beryllium, tin, and many others. We also apply sterilizing agents such as formocresol and chlorine directly into root canals. All these substances are considered toxic to some degree, and further study is recommended. I have meticulously tried to eliminate them from my office.

Nickel is a common restorative material used in stainless steel crowns for children and orthodontic wire and braces. Seventy percent of the partials, bridges, and crowns made in the U.S. last year contained nickel.

Lead was the original dental filling material. As the nation becomes alerted to the dangers from lead in paints, the issue of lead in dentistry has arisen again too. Though lead is not an ingredient commonly found in many dental

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materials, it is used in some root canal filling preparations. The so-called Sargenti technique or N2 material contained both lead and formaldehyde. Numerous adverse reactions to this material have been reported and litigated.

I read of a lady in England who had a mysterious illness of many years. An alert doctor noticed that one of her teeth had turned green. On removal and examination, it was discovered that arsenic had been used in the root canal filling. As a young child living in India she had had the tooth treated by a local dentist. The tiny amount of arsenic that escaped daily was enough to accumulate over time and cause adverse effects. The green color was due to leakage of arsenic. Fortunately, arsenic is not commonly used in dentistry today. But the example is indicative of the kinds of responses possible when poisons are implanted in teeth.

Copper is commonly added to many gold alloys and to mercury/silver amalgam. Many people react to copper. Unlike mercury and lead, small amounts of zinc and copper are essential for life. But too much can make us ill, and we can have allergic reactions to them.¹⁵⁰ I prefer to use a no-copper alloy when making a gold partial or crown.

The bottom line is that no material should be implanted in anyone's body without proof of its safety. The problem of delayed and latent reactions needs to be the focus of much further study.

As Alfred Zamm, M.D. points out in the booklet by Sam Ziff and Michael Ziff, D.D.S., titled *Dentistry Without Mercury*: How many people would smile and peacefully acquiesce if their dentist correctly informed them, "I am now going to put 50% mercury, a known poisonous substance, into your mouth"?¹⁵¹

I see no justification for the continued placement of toxic materials in the mouth, especially in children, women who are pregnant and those with special health care needs.

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The nervous systems of children and babies are growing and, as a result, are highly susceptible to such toxic substances. Suitable alternative filling materials now exist which are superior to amalgam in strength, durability, appearance, and in just about every other way except that they are not as cheap or easy to use.^{152,153}

Many of the new materials offer remarkable advantages, and all (unlike mercury, despite its 150 years of use) have passed biocompatibility testing prior to being approved.¹⁵⁴ Solid porcelain crowns, composite resins (essentially, mixtures of quartz or glass and plastic), crowns and inlays, composite bonding, and traditional gold are some of the substitutes. However, gold and amalgam should not be used in the same mouth, as gold can increase the release of mercury. In my opinion, no toxic metals should be used in the mouth.

U.S. dentists annually use over 100,000 pounds of mercury in their practices! That is enough to give every man, woman, and child in this country a lethal dose if it were released all at once. Considering the known toxicity of mercury and the presence of numerous safe substitutes, the further placement of mercury fillings should be stopped.

Nutrition for Dental Health and Recovery

Most dental problems stem from nutritional imbalances. Any treatment for dental problems that fails to address this underlying cause is doomed ultimately to fail. For this reason, many dentists are advocates of good nutrition. A renewed resolution to cut down on the intake of sweets is a frequent outcome of many dental visits.

The traditional theory is that repeated exposure to sugar provides an optimal environment for decay bacteria to thrive. A more holistic theory holds that many factors are responsible for the onset of dental disease: bacteria is only one of them. Other factors such as quality of the overall diet and the integrity of the immune system are of primary importance, along with genetic makeup, current health status, environmental pollution, and the effects of toxic and psychological stresses.

The mind can and does affect the whole body. Fear and anxiety depress the immune system. Stress, noise, tension, a competitive society, and crowded living often lead to serious dental problems. A body under stress will not assimilate food, absorb nutrients, or resist disease as well as a relaxed, healthy one.

The wise diet today emphasizes whole grains, vegetables, and fruits, while substantially or completely eliminating meat, dairy, and other animal products. A new Basic Four has been suggested: whole grains, legumes, veg-

Nutrition for Dental Health and Recovery

etables, and fruits. To fight a winning war against gum disease, your body will need extra supplies of protein, vitamin C, zinc, and calcium. These nutrients are lost rapidly in the battle against infection, injury, or stress.

Most natural foods will help support life if prepared properly. Natural foods come naturally rich in the nutrients our bodies require. Modern society has gone to great lengths to alter and 'improve' upon the natural, however, and many of these 'improvements' involve removing the vitamins and minerals and/or destroying the enzymes. What remains is the calories. As a result, people eat a lot of empty-calorie processed food and become fat and sick.

Chemical fertilizers — miracles of modern agriculture — have precipitated a nutritional crisis whose full impact remains to be seen. Chemical fertilizers have revolutionized farming techniques, making it possible to grow season after season of the same crop in the same soil by artificially replenishing phosphates and nitrates. The old-fashioned wisdom of crop rotation allowed trace elements to be replenished naturally. New methods deplete the soil so that the food it produces is of progressively lower nutritional value. Many trace elements, formerly present in minute quantities, have been depleted from the soil — and from the crops grown in it — to the extent that it may be difficult to get enough of all the trace nutrients our bodies need from food alone.

Along with soil depletion, we have used pesticides on food crops and during their shipment, and we have added chemicals to process and preserve food products and enhance their appearance and flavor. A declining portion of the food we eat is real, good-for-us, food. Fortunately, the emerging organic foods movement offers viable alternatives.

Since cooking and processing remove and destroy a large portion of the nutrients in raw foods, a good proportion of your diet should consist of lightly cooked or raw foods.

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There is no question that sugar and other food additives do cause harm. Every year as a nation, we eat loads of chemicals and additives, some of which were never found in nature. As our bodies are forced to deal with more and more of these empty foods and foreign chemicals, our over-worked systems gradually begin to lose the battle, at first in a few vulnerable spots here and there, and then perhaps in the hard-to-reach areas between your teeth. As breakdown persists, other symptoms such as joint pain, gray hair, etc., develop.

Even tap water invariably contains a variety of poisons such as chlorine, chloramine, asbestos, pesticides, fluoride, copper, mercury and lead.

The best way to remove all these contaminants is by distilling. Certain pesticides and halogenated hydrocarbons may require a pre-charcoal filter. I recommend distilled water stored in glass containers.

Food can be used to nourish the body and help rid itself of poisons such as mercury. For a comprehensive discussion of the nutritional approach to mercury detoxification I recommend Ziff's booklet *Detoxification*. I have prepared the following chart of recommended nutrients from that booklet.

Nutrition for Dental Health and Recovery

Table of Nutrients

Item	Amount	Breakfast	Lunch	Dinner	Bed
Amino Acids and Peptides					
Glutathione Pre	50 mg	1hr b4		1 hr b4	
Glutathione Post	100 mg	1hr b4	1hr b4	1 hr b4	
Methionine	500 mg	1hr b4	1hr b4	1 hr b4	
Amino acid complex		1hr b4	1hr b4	1 hr b4	
Minerals					
Zinc	15-30 mg			after	
Selenium	50 mg	with	with	with	
Magnesium	100 mg	1hr b4	1 hr b4		
Vitamins					
Vitamin B1	50 mg	with	with	with	
B Complex	15-25 mg	with	with	with	
Pantothenic acid	100mg	with		with	
Vitamin C	500 mg	with	with	with	
Vitamin E.		with	with	with	
Vit C Post removal	1000 mg	with	with	with	at bed
Nutrients					
Acidophilus	2 cap		before	before	
Cultured milk	Serving	with	with	with	
Fiber		with	with	with	
Sulfur foods		with	with	with	

Added note about Vitamin E.

If you have previously taken vitamin E and experienced no blood pressure changes, then you can supplement with 200 IU capsules, one capsule after each meal. If, however, you have previously experienced adverse reactions with vitamin E, then you should start with the lowest potency available and take no more than 50 to 100 IU per day for the first 30 days. Discontinue taking Vitamin E if at any time you experience adverse reactions such as increased blood pressure.

How To Save Your Teeth

This information provided as an information service to our readers. It is not a prescription for the treatment of mercury poisoning. There is not complete agreement in the scientific community about which nutrients are best. You and your health care provider should discuss these recommendations and decide which would be best for you.

Fluoride: Panacea or Plague?

Let me tell you about how I have arrived at the conclusions I have come to before we get into all the scientific stuff. At first, I thought it was wonderful that the miracle of fluoride would prevent tooth decay. Well not exactly wonderful. You see my father was a dentist and when he was told topical applications of fluoride stopped tooth decay and hardened enamel, all of us kids got it . . . this awful-tasting purple gook that just about ruined a Saturday. Well, that was the 50's. What the government said, we believed.

Then I read about the child who had died from a topical application of fluoride. I knew we always thought we were going to die from the taste but here was a documented fatality from topical fluoride alone.

On January 20, 1979, the *New York Times* ran the following story:

\$750,000 Given in Child's Death in Fluoride Case — Boy, 3, Was in City Clinic for Routine Cleaning

A State Supreme Court jury awarded \$750,000 to the parents of a 3-year-old Brooklyn boy who, on his first trip to the dentist in 1974 was given a lethal dose of fluoride at a city dental clinic and then ignored for nearly five hours in the waiting rooms of a pediatric clinic and Brookdale Hospital while his mother pleaded for help, and he lapsed into a coma and died.

Mrs. Kennerly testified that she took William, born

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on Feb. 7, 1971, for his first dental checkup on May 24, 1974 to the Brownsville Dental Health Center, a city clinic at 259 Bristol Street.

"There, he was examined by Dr. George, who found no dental caries and turned the boy over to Miss Cohen, a dental hygienist, for routine teeth-cleaning. After cleaning William's teeth, witnesses explained, Miss Cohen, using a swab, spread a stannous fluoride jell over the boy's teeth as a decay-preventive.

"According to Mrs. Kennerly, Miss Cohen was engrossed in conversation while working on William and, after handing him a cup of water, failed to instruct him to wash his mouth out and spit out the solution. Mrs. Kennerly said William drank the water.

"According to a Nassau County toxicologist, Dr. Jesse Bidanset, William ingested 45 cubic centimeters of 2 percent stannous fluoride solution, triple an amount sufficient to have been fatal.

"William began vomiting, sweating and complaining of headache and dizziness. His mother, appealing to the dentist, was told the child had been given only a routine treatment. But she was not satisfied, and was sent to the Brookdale Ambulatory Pediatric Care Unit in the same building.

"Mrs. Kennerly testified that she had waited there two and a half hours, appealing for help, as her son became progressively more sick, lapsing into what she thought was sleep, but actually was a coma.

"Finally taken into an examination room, the boy was seen by Dr. Bathia, who summoned a supervisor. "They injected adrenalin into the boy's heart to revive him. An ambulance took him to Brookdale Hospital, a

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five-minute drive away.

"There, William and his mother waited more than an hour. By then, he had lapsed back into a coma, and as doctors attempted to pump his stomach, he went into cardiac arrest, and died at 2:10 p.m."

I remember Dad always said to not swallow but I thought that was because he wanted the purple gook to stay on the teeth longer. I'd have really taken the warning to heart if he'd said, "Don't swallow or you'll die."

When I began to look into the question of effectiveness and safety I obtained a large stack of scientific literature from the ADA library on fluoride. After reading the many articles I was more than just a little puzzled. There is not one well-done study that has ever found a benefit from adding fluoride to the water supply. They all referred to each other as the source of the documentation but none of them had any hard data. When I began to question the wisdom of adding this substance to my patients diet, I found more and more information that questioned the use of this toxic substance.

Today there is no longer any question in my mind about this issue. The following facts are now known:

FACT #1 Studies show cancer death rates increase when fluoride is added to the community drinking water.

In 1977 Dr. Dean Burk, former chief chemist of the U.S. National Cancer Institute and Dr. John Yiamouyiannis, president of the Safe Water Foundation showed a fluoridation-linked increase in cancer death rate¹⁵⁵. On the basis of these studies, the United States Congress called for animal studies to confirm or disprove these results. When the studies^{156,157} were released in 1990, Dr. William Marcus, senior scientist at the Office of Drinking Water of the U.S.

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Environmental Protection Agency admitted that these studies showed some or clear evidence that fluoride caused cancer.¹⁵⁸ Though he was fired as a result, he won his job back in a whistleblower lawsuit against the U.S. Environmental Protection Agency plus over \$250,000 in punitive damages, back pay, and legal expenses. The judge found that the only reason he was fired was that he gave his expert opinion and that opinion differed with preconceived policy of the U.S. Environmental Protection Agency.

FACT #2 Fluoridation causes a dramatic increase in bone cancer in young men.

One of the cancers that was linked to fluoride in the studies mandated by Congress was osteosarcoma in male rats. Subsequent studies by the New Jersey Department of Health,¹⁵⁹ the National Cancer Institute,¹⁶⁰ and the Safe Water Foundation¹⁶¹ confirmed this link in humans.

FACT #3 Fluoride drops and tablets are not approved by the U.S. Food and Drug Agency as safe or effective.

This admission came in a letter to New Jersey Assemblyman John Kelly from Frank R. Fazzari Chief, Prescription Drug Compliance Food and Drug Administration, dated June 8, 1993.

FACT #4 Hip fractures rates are substantially higher in both women and men who reside in fluoridated communities.

Since 1990, four articles published in the *Journal of the American Medical Association* (which is now referred to as *JAMA*) reported that people living in fluoridated areas experience higher hip fracture rates.¹⁶²⁻¹⁶⁵

FACT #5 All of the recent large studies of tooth decay found no evidence that fluoridation significantly reduces tooth decay.

A national survey in Canada¹⁶⁶ and national surveys using 39,000 schoolchildren in the U.S.²⁵ and 60,000 school-

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children in New Zealand¹⁶⁷ all showed that fluoridation was ineffective in reducing the decay rate of permanent teeth. No large studies published since the time these studies were published have shown that fluoridation reduces tooth decay as of the printing of the second edition of this book.

FACT #6 According to a 1993 report from the U.S. National Research Council, dental fluorosis (which can be seen in the form of white chalky areas on the teeth which become yellow or brown in the more advanced cases), the first visible sign of fluoride poisoning in children, affects from 8% to 51%, and sometimes up to 80% of the children drinking water containing 1 ppm fluoride. This is the same level of fluoride which the United States Public Health Service recommends we add to our public drinking water supplies.

The opaque white spots and brown ugly discoloration on the teeth is dental fluorosis resulting from fluoridation. The cosmetic damage can only be corrected by replacing the fluorotic enamel with porcelain veneers and crowns at a cost of about \$600 per tooth. Replacement of crowns and reapplication of the veneers increases the cost of repairing this damage to much more over a lifetime. This only corrects for cosmetic damage — not the psychological damage that results from these unsightly teeth. And remember, the structural damage resulting from dental fluorosis can never be repaired. Fluoride damages teeth by interfering with the proper formation of collagen and collagen-like proteins in the tooth during the tooth formative stages. These proteins also comprise the structural component for skin, ligaments, muscles, cartilage, and bone. Fluoridated water leads to a breakdown of these proteins.¹⁶⁸⁻¹⁷⁶

As little as 0.7 part per million fluoride in the water has been associated with skeletal fluorosis.¹⁷⁷ In addition to bone damage, reports of prematurely wrinkled skin¹⁷⁸ and arthritis,¹⁷⁹ as well as the possibility of a greater frequency

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of torn ligaments and tendons in fluoridated areas result from the effect of fluoride on collagen.

To make things worse, we have known for years that malnourished and minority children are most susceptible to dental fluorosis. In 1952, Maury Massler and Isaac Schour, two of the most prestigious dentists in the United States at that time, published a paper showing that while well-nourished children drinking fluoridated water experienced a dental fluorosis rate of 25%, poorly nourished children experienced a fluorosis rate of 60% .

Fluorosis is occurring more frequently than ever before in unfluoridated communities due to the prescription of fluoride-containing vitamins and the use of toothpaste containing fluoride. One family in Tacoma Washington learned the hard way that children swallow the tasty toothpaste. Their two girls would dutifully brush their teeth before going to bed and soon after retiring they had stomach aches. Many trips to the doctor found nothing wrong until finally the parents suspected the tooth paste. They called the Poison Control Center and were told that such adverse reactions are quite common. Gastric upset and nausea are listed in the *Physicians Desk Reference* as common side effects of fluoride ingestion.

The best way to avoid fluorosis is to avoid drinking fluoridated water and not to eat or use fluoride-containing products. That is more difficult than you might think since water-containing foods and beverages processed in fluoridated communities contain substantial amounts of fluoride.

The above statements are all well documented. The injuries from fluoridated water vary from subtle bone damage and changes in the immune system to deadly cancers. It is a tragedy that this drug was not adequately tested to see if it was safe or effective before it was added to our public drinking waters. The US Public Health Service was and is responsible for promoting fluoridation and still

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today ignores virtually all of the documented peer reviewed medical research showing that fluoridation is ineffective and harmful.

*What follows are excerpts taken in large part from the **Life-savers Guide to Fluoridation** which is published by the Safe Water Foundation. If you want more information, there are several good books that deal exclusively with fluoridation in the reading appendix. If you want to be kept current on the scientific developments, I recommend that you become a patron of the Safe Water Foundation and start or join a local chapter. They are a wealth of information.*

What is fluoride?

Fluoride is a poison. According to the 1984 issue of **Clinical Toxicology of Commercial Products** (Williams & Wilkins), it is more poisonous than lead and just slightly less poisonous than arsenic.¹⁸⁰ It has been used as a pesticide for the control of mice, rats, and other small pests. Procter and Gamble, the makers of Crest, acknowledges that a family-sized tube of fluoride toothpaste “theoretically, at least, contains enough fluoride to kill a small child.”¹⁸¹ While no one is going to die from drinking one glass of fluoridated water, just as no one will die from smoking one cigarette, it is the longer-term chronic effects of glass after glass of fluoridated water that takes its toll in human health — and life.^{182,183}

What is fluoridation?

Fluoridation is the addition of fluoride to the public water systems, at the rate of about 1 part fluoride for every million parts of water. Industries stuck with fluoride as a waste-product originally promoted it as a means of reducing tooth decay.

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What are some of these harmful effects?

According to the estimates of the Safe Water Foundation, fluoridation is responsible for the chronic poisoning of over 130,000,000 Americans, of a substantial number of the 40,000,000 Americans suffering from arthritis, of over 8,000,000 American children who are so badly poisoned that their teeth are discolored, of about 2,000,000 Americans who suffer allergic or allergic-like reactions from fluoride, of about 35,000 Americans who die from fluoridation each year, and of about 10,000 Americans who die from fluoridation-induced cancers each year.

Have these harmful effects been proven?

Yes. In a court case in Pennsylvania lasting 20 days, it was proven that fluoridation is harmful.¹⁸⁴ The presiding judge, John P. Flaherty, pointed out that he was “compellingly convinced” of the harmful effects of fluoridation. In a court case in Illinois lasting 40 days, Judge Ronald A. Niemann ruled that fluoridation “created a risk . . . of serious health hazards”.^{185,186} Allergic-type reactions have been reported by top physicians, including Nobel Prize winner Dr. William Murphy.¹⁸⁷⁻¹⁹² With regard to the amount of fluoride found in a quart of fluoridated water, the *Physicians’ Desk Reference*¹⁹³ points out: “Dental fluorosis (mottling) may result In hypersensitive individuals, fluorides occasionally cause skin eruptions such as atopic dermatitis, eczema, or urticaria. Gastric distress, headache, and weakness have also been reported. These hypersensitive reactions usually disappear promptly after discontinuation of the fluoride.”

Does fluoride cause genetic damage?

Yes. A recent study by Procter and Gamble showed that as little as half the amount of fluoride used to fluori-

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date public water supplies resulted in a sizable and significant increase in genetic damage.¹⁹⁴ Researchers from Columbia University, Texas A & M University, the Japanese Dental University, the Russian Research Institute of Industrial Health and Occupational Diseases, and others have also shown that fluoride causes genetic damage.¹⁹⁵⁻²²⁴ Substances which cause genetic damage are mutagens, and it is generally agreed that mutagenic activity of such substances is a warning of possible cancer-causing activity.

Does fluoride weaken the immune system?

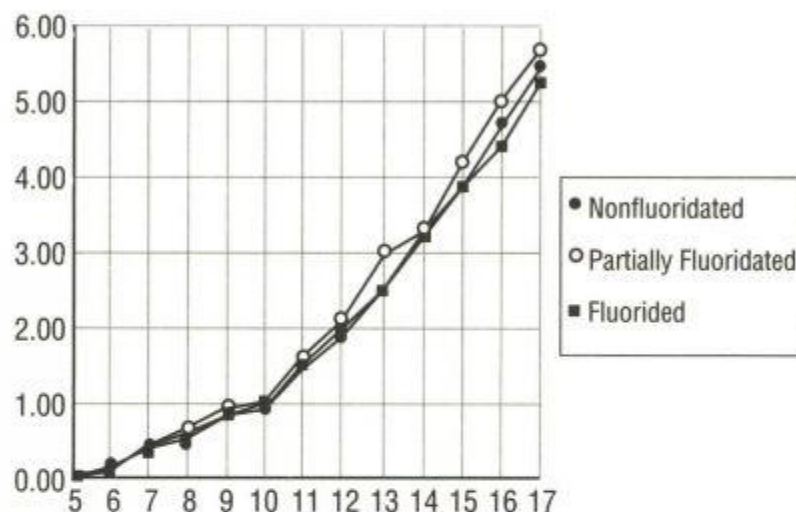
Yes. Studies by both proponents and opponents of fluoridation confirmed that fluoride does weaken the immune system.^{225,226} In 1985, Japanese researchers confirmed that as little as 10% of the amount of fluoride used to fluoridate public water supplies is capable of weakening the immune system.²²⁷ In 1987, Russian investigators confirmed suppression of the immune systems among children drinking fluoride in their water.²²⁸ This fluoride-induced damage to the immune system can lead to chronic problems such as colds which never seem to go away, to cancer in individuals whose immune system is too weak to arrest the growth of 'precancerous' cells, and to other immune deficiency diseases.

Doesn't fluoridation reduce tooth decay?

In the largest U.S study examining the effect of fluoridation on tooth decay, Dr. Yiamouyiannis found that fluoridation does not reduce decay in permanent teeth.¹⁶⁶ Examination of the dental records of 39,207 schoolchildren, ages 5-17, from 84 geographical areas around the United States showed the number of decayed, missing, and filled permanent teeth per child was 2.0 in fluoridated areas, 2.0 in non-fluoridated areas, and 2.2 in partially fluoridated areas.²²⁹

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Decayed, Missing and Filled Permanent Teeth (DMFT) Per Child



Other recent large-scale studies by public health dentists in New Zealand, Canada, and the United States have also reported similar tooth decay rates in fluoridated and nonfluoridated areas.

Dr. John Colquhoun, former Chief Dental Officer of the Department of Health for Auckland, New Zealand, investigated tooth decay statistics from 60,000 12 to 13-year-old children; he found no significant difference in tooth decay rates between fluoridated and nonfluoridated areas in New Zealand.¹⁶⁶ In the major cities of New Zealand, the number of decayed, missing, and filled permanent teeth per child was 2.7 in fluoridated areas and 2.4 in nonfluoridated areas. Because of this and the damage he found fluoride was doing to teeth (dental fluorosis), he has begun campaigning against fluoridation.²³⁰⁻²³²

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The October, 1987 issue of the *Journal of the Canadian Dental Association* published an article¹⁶⁵ admitting that fluoridation isn't doing the job that dentists have been claiming it could do. According to the article: "Survey results in British Columbia with only 11% of the population using fluoridated water show lower DMFT [tooth decay] rates than provinces with 40-70 per cent of the population drinking fluoridated water" and "school districts recently reporting the highest caries-free rates in the province were totally unfluoridated."

In 1989, researchers from Missouri examined the tooth decay records of rural 6th grade schoolchildren and again found no significant difference in tooth decay rates between those living in fluoridated areas (who averaged 2.2 decayed, missing, and filled teeth per child) and those living in nonfluoridated areas (who averaged 2.0 decayed, missing, or filled teeth per child).²³³

And the teeth of people drinking low-fluoride water aren't falling out?

No. In primitive societies whose drinking water contains negligible amounts of fluoride, such as the Otomi Indians in Mexico,²³⁴ the Bedouins in Israel,²³⁵ and the Ibos in Nigeria,²³⁶ 80-90% of the people go throughout life without tooth decay. When we look at their diets, we find that their consumption of refined carbohydrates, such as white sugar, is extremely low. It is quite evident that proper diet — not fluoridation — is necessary for good dental health.

What other sources of fluoride should I stay away from?

1. Fluoride treatments at the dentist's office use 5,000 to 20,000 ppm fluoride, which is hazardous, even deadly

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(consider the January 20, 1979 *New York Times* article cited above).

2. Fluoride toothpastes use 1000-1500 ppm fluoride, which can cause gum damage, sickness — or even death if a small child consumes a family-sized tube.
3. Fluoride mouthrinses sold in stores or administered in schools containing 500 ppm fluoride, will often cause sickness — and can in rare cases cause death.
4. Fluoride tablets or drops usually prescribed for children or infants have as bad and sometimes worse effects than fluoridated water. In 1992, the Canadian Dental Association recommended that children under the age of 3 should not be given fluoride tablets or drops because of the damage it does to teeth. In 1993, the U.S. Food and Drug Administration admitted that they had no studies showing that fluoride tablets and drops are safe or effective in reducing tooth decay and will probably have to pull them off the market.
5. Fluoride tablets for the treatment of osteoporosis contain about 50 times as much fluoride as children's tablets and are very hazardous. Studies published in the *New England Journal of Medicine* (cited above) show that they do more harm than good.
6. Foods contain fluoridated water which has been added during food processing (for example soft drinks, freeze-dried coffee). Concern over the safety of fluoridated water has led infant formula manufacturers to remove fluoride from the water they use to make their formulas.
7. The use of fluoridated water for the preparation of foods (such as rice, spaghetti, or coffee) in which the water used is consumed with the food.

Is there any danger from malfunctioning fluoridation equipment?

Yes. In 1979, 50,000 people were poisoned when up to 50 ppm fluoride was dumped into the Annapolis, Maryland public water system.²³⁷⁻²³⁹ A number of other spills have also been reported.²⁴⁰⁻²⁴⁵

If all this is true, why are some pushing fluoridation more than ever?

Apparently officials of the U.S. Public Health Service, the American Dental Association, and Procter & Gamble, as well as others, are more concerned with their reputations than they are about the health and welfare of the very people they claim to serve. In 1983, one member of a blue ribbon committee called together by the Surgeon General of the U.S. Public Health Service stated that "You would have to have rocks in your head, in my opinion, to allow your child more than 2 ppm [fluoride in their drinking water]." Added another member: "I think we all agree on that." Their conclusions were published by the U.S. Public Health Service as recommending that up to 4 ppm fluoride should be allowed in the drinking water.

In 1980, the U.S. Public Health Service contracted with Battelle Research Institute to do studies to find out whether fluoride could cause cancer. When, in 1988, the results showed that fluoride caused a rare form of liver cancer, oral cancers, and possibly bone cancer, the U.S. Public Health Service covered up the most significant results and only acknowledged that fluoride might cause bone cancer. Then, in an attempt to water this down even further, Under Secretary of Health James Mason assigned former FDA commissioner Frank Young to reevaluate fluoride to whitewash this already watered-down conclu-

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sion. Despite additional information that they collected from the National Cancer Institute that bone cancer rates were almost 50% higher in men living in fluoridated areas and data from Procter and Gamble showing a dramatic increase in bone tumors as a result of fluoride exposure, they claimed that fluoride did not cause cancer.

It seems that Procter and Gamble has tried to cover up studies that they performed showing that as little as one-half the amount of fluoride added to public water supplies causes genetic damage¹⁹⁴ and that fluoride causes tumors and precancerous growths.²⁴⁶⁻²⁴⁸

(Reprints of a similar question and answer report can be obtained by sending \$1 for one or \$10 for 30 copies to: The Safe Water Foundation, 6439 Taggart Road, Delaware, Ohio 43015.)

My review of the issue indicates that there are two additional problems with fluoridation.

1. Uncontrolled random dosages

The dosage of any medication, poison, or drug should be proportional to the weight of the individual. There is wide variation in individuals with regard to the amount of water consumed. The amount consumed fluctuates both from winter to summer and with age. One percent of the population consumes over 5 liters of water per day. Others consume very little. Accurately supplying any medication through the water supply is simply impossible.

Certain groups are at higher risk of excessive exposure than others, e.g. people with poor diets, the elderly, and those in poor health. The athlete or physical laborer who drinks large quantities of water will obviously be dosed with far more fluoride than the elderly. Infants, due to their small body weight and total dependence on fluid nourish-

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ment, will receive a disproportionately larger dose than the adult. Human breast milk is relatively low in fluoride. Consequently, the infant fed on formula prepared from tap water is at higher risk. The La Leche League does not recommend that breastfeeding mothers take or give their infants fluoride.

2. Excessive Fluoride Intake

Americans are consuming far more fluoride than previous generations.²⁴⁹ In a 1969 study, H. Spencer, M.D. found adults in the Chicago area consumed 3.6 to 5.4 mg/day, 5-10 times as much as consumed twenty years before.

The Manipulation of Science

Our research institutions have become prostituted by the huge financial grants furnished by companies with but one goal. Our political system is enslaved by its addiction to Political Action Committee (PAC) funds available from industries with excess hazardous waste. We owe ourselves more than just being the willing puppets of these political hacks and industrial waste generators. Dentists should research very carefully the claims about any material they recommend. They should be certain not only of its benefits, but also of its absolute safety for everyone. If a product fails to pass biocompatibility tests, then I for one, will refuse to recommend that it be used. Fluoride will not pass my test.

There is a fierce and lasting controversy around fluoride. Fluoride occurs naturally in the water of certain areas of this country. Damage to the teeth in the form of a disease known as dental fluorosis has been found in these areas. Chemical companies that produce fluoride as a by-product convinced dentists and public health officials that people who live in areas with high natural fluoride have less tooth decay. They persuaded public officials to buy their toxic

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waste product and add it to the drinking water of over 50% of all Americans.

Most at risk are infants whose entire diet consists of home-cooked baby foods or formula prepared with fluoridated water, kidney dialysis patients, athletes and those who drink a lot of water, and individuals who are older or in poor health. In most of the other advanced western European countries, fluoridating water is not considered a safe nor acceptable public policy.

The mystique behind many 'miracle' drugs is the belief that, like heat-seeking missiles, they will zoom right to the enemy symptom and zap it neatly out of existence. So with fluoride our bodies should deliver all the fluoride directly to our teeth, where it will supposedly harden the enamel and form an indestructible barrier to tooth decay. Such magical thinking bears little relationship to biochemical reality, unfortunately.

Politics and Profits

Fluoride is a toxic waste by-product of the manufacture of fertilizers and aluminum. It is a major world pollutant. So it was eminently convenient when the problem of disposal was solved quite profitably through launching a massive PR campaign aimed at convincing the public that fluoride was a safe and effective wonder drug for the prevention of tooth decay, and aimed also at identifying critics of fluoridation as paranoid wackos out of step with the flow of progress at the expense of our poor kids' teeth. The marketing campaign is powerful and political, and filled with scientific fraud and public deception.

Appendix

How To Save Your Teeth

You may order any of the following tools, books, and supplies found in this book from:

The Preventive Dental Health Association,
a nonprofit educational corporation
2425 Third Avenue
San Diego, CA 92101
(800) SAVE TEETH or (800)728-3833
or stop by our Home Page:
<http://emporium.turnpike.net/P/PDHA/health.htm>

HYGIENE TOOLS

Interplak electric toothbrush
by Bausch & Lomb

Rotadent electric toothbrush
by Pro-Dentec

Water Pik oral irrigator or
Water Pik Plus (oral irrigator plus an electric toothbrush)
by Teledyne Water Pik

Bass Toothbrush
by POH Oral Health Products

Sonicare
by Sonicare

Proxibrush
by Butler

BOOKS

On Heart Disease

The Missing Link by Michael Ziff

Live Longer Now by Nathan Pritikin

Bypassing Bypass The New Technique of Chelation Therapy by Elmer Cranton

Nutrition

Fit For Life by Harvey & Marilyn Diamond

Sugar Blues by William Dufty

Dr. Berger's Immune Power Diet by Stuart Berger

High Performance Health by John Yiamouyiannis

Fluoride

Fluoride: The Aging Factor by John Yiamouyiannis

Fluoridation: Poison On Tap by Glen Walker

Fluoride the Great Dilemma by George L. Waldbott

Mercury Poisoning

Toxic Time Bomb by Sam Ziff

Detoxification by Sam and Michael Ziff

Infertility and Birth Defects
by Sam and Michael Ziff

How To Save Your Teeth

SUPPLIES

Chloramine T

TheraSol without fluoride

Mer-flu-an

REFERRALS AND SOURCES

To Report Adverse Reactions to Amalgam

Foundation for Toxic Free Dentistry

P.O. Box 608010

Orlando, FL 32860-8010

Executive Director for IAOMT

Michael Ziff

International Academy of Oral Medicine and Toxicology

P.O. Box 608531

Orlando, FL 32860-8531

(407) 298-2450 Phone/Fax

How to Find a Dentist Who Knows about Non-Surgical Gum Treatment and the Keyes Technique

International Dental Health Foundation

11484 Washington Plaza West, Suite 30

Reston, Virginia 22090

1-800-368-3396 or 703-471-8349

Mercury-Free Dentist Referral

International Academy of Oral Medicine and Toxicology

P.O. Box 17597

Colorado Springs, CO 80935

Appendix

Jerry Mittelman, D.D.S.
263 W. End Ave. #2A
New York, NY 10023
(212) 874-4212

Price-Pottenger Foundation
2667 Camino del Rio South
Suite 109
San Diego, CA 92108
(619) 574-7763

Foundation for Toxic Free Dentistry
P. O. Box 608010
Orlando, FL 32860

Fluoride

The Safe Water Foundation
6439 Taggart Road
Delaware, OH 43015

Chelation and Challenge Test for Mercury Poisoning

ACAM American College for the Advancement of Medicine
23121 Verdugo Drive (800) 532-3688
Suite 204
Laguna Hills, CA 92653

Allergy to Dental Materials

Walter Jess Clifford (719) 550-0008
Clifford Compatibility
P.O. Box 17597
Colorado Springs, Colorado 80935

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New Research Confirms Efficacy of IAOMT Protocol.

In 1985, the International Academy of Oral Medicine and Toxicology warned against the continued use of mercury/silver amalgam fillings and their careless removal. On page 84, you will find the protocol that the IAOMT developed to minimize patient exposure. As I prepared the second edition of this book, new research emerged in the literature which confirms the safety of our protocol.

Molin, et al. (*Journal of Dental Research*, volume 74, page 420 (1995), IADR Abstract number 159) found, by following our protocol exactly, that blood mercury concentrations did not significantly increase after amalgam removal. Six days after amalgam removal, the blood plasma concentration was significantly reduced. The red blood cell mercury level was also significantly lower after eleven days and remained low for the rest of the year. The mean urinary mercury level was significantly reduced one month after amalgam removal and after six months, mercury levels were reduced by 80%.

This research shows that when amalgams are very carefully removed temporarily-increased exposures to mercury can be avoided.

Molin's previous research in 1990 (*Acta Odontol. Scand.*, volume 48, pages 189-202 (1990)) showed dramatic increases in blood mercury and urinary mercury levels after amalgam removal. These high values declined to pre-removal levels within a month. One year after amalgam removal, plasma and urinary mercury levels were reduced by 50% to 75%.

Earlier research prompted many experts to caution nursing mothers and pregnant women against amalgam removal. While much more research needs to be conducted, these most recent findings, if confirmed, might allow amalgam removal at anytime if the IAOMT rubber dam protocol is followed.

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