



Dental Amalgam Patient Information Sheet

Q. Who is responsible for judging the safety of medical devices and materials?

A. In Canada, medical devices and materials are under the regulatory authority of the Health Protection Branch (HPB) of Health Canada.

Q. Is dental amalgam approved for use in Canada and is it judged to be safe?

A. Restorative materials do not fall into a classification for which Health Canada requires pre-market approval. However, Health Protection Branch can take regulatory action on any medical device or material at any time, and HPB currently does not restrict dental amalgam in Canada.

Q. Have recent studies proven that dental amalgam releases mercury vapour and that it should not be used?

A. Scientific studies have not verified that dental amalgam is causing illness in the general population. It has been known for some time that amalgam fillings release minute amounts of mercury vapour, especially with chewing, and that this mercury can be absorbed, reach body organs, and cross the placenta. This is also true of mercury absorbed from natural sources, such as food.

Q. Isn't mercury known to be a poisonous substance?

A. As a single element, mercury is a poisonous metal to which we are all exposed through air, water, soil and food. In dental amalgam, it is bound in an alloy, which also includes silver, copper and tin. Very small amounts of mercury vapour are released from amalgam with chewing. Mercury's toxicity is related to the amount absorbed. The mercury absorbed from all sources accumulates in body organs and tissues, mostly in the kidneys, but also in the brain, lungs, liver and gastrointestinal tract.

Q. What amount of mercury does a person take into the body from natural sources and how much comes from amalgam fillings?

- A. The amount depends on a number of factors, such as the type of food you eat, your occupational exposure, environmental levels and the number of amalgam fillings you have. Health Canada estimates that for the average Canadian adult 20 to 59 years old the amount of mercury absorbed by the body from all sources is about nine millionths of a gram per day. Of this total dental amalgam is estimated to contribute about three millionths of a gram per day.

Q. Is the mercury which is absorbed into the body harmful?

- A. For the overwhelming majority of people no harmful effects are known to be caused by the average levels of mercury exposure from amalgam fillings. For those subject to high exposures, for example, in industrial settings, the severity of any scientifically validated harmful effects depends upon the duration and amount of exposure.

Subclinical effects (effects which are observable but are below the threshold of disease or illness) have been observed in groups of people with tissue mercury levels ten times higher than those in the general population. However, at the low levels of exposure associated with amalgam fillings, the relationship between levels and duration of exposure and any possible effects is not known. Scientific observation of patients over the course of 150 years of using ever-improving formulations of dental amalgam is the foundation of CDA's confidence in this material for general use.

It is the most durable and most affordable of all restorative material options. The Canadian Dental Association has been urging the government of Canada to support further research to achieve definitive scientific answers, which can better assure Canadians of the safety of amalgam as well as all other alternative restorative materials.

Q. Why does the dental profession continue to use amalgam when questions are being raised about its safety, even if there are no proven dangers?

- A. Every time a foreign substance is used in the human body for therapeutic purposes, there is an element of risk. Health professionals must constantly weigh the known risks of a particular intervention against known benefits. In the case of dental amalgam, the scientific evidence indicates that no significant risks are involved. If there were risks, they would have been clearly observed during the 150 years that this material has been in use.

Dental team members, in particular, would have shown clinically demonstrable effects due to their considerable exposure to the substance. The risks associated with the use of

dental amalgam appear to be limited, and the benefits to patients are known to be large. Dental amalgam is much stronger and more durable than alternative restorative materials, and amalgam restorations can be completed at a more reasonable cost. Recent advances, such as the development of amalgam bonding techniques, have made amalgam even more advantageous as a restorative material.

Gold alloy inlay castings would be a reasonable substitute if the material and required procedures were not so costly. It is also possible that alternative materials, subjected to the same level of scrutiny as dental amalgam, will prove to have other advantages and disadvantages. The dental profession is aware of research to find more durable alternatives to amalgam, and these materials may be available within the next decade.

Q. Can dental amalgam be safely used with every patient?

- A. No, there are patients who are sensitive to the components of amalgam, just as there are individuals who are sensitive or allergic to other chemical substances or even foods such as milk or bread. It has been estimated that the prevalence of mercury sensitivity in the general population is approximately three per cent (JADA, Vol. 122, Aug. 1991, p. 54).

Dentists may consider the use of composite fillings or other restorative materials in individual cases. Dentists routinely take a number of considerations into account in selecting a restorative material, including tooth size, location and the individual's condition and medical and dental history. For example, alternatives may be considered for individuals who are immunologically compromised, or who suffer from a neurological condition.

Health Canada suggests that alternatives should be considered for patients with impaired kidney function. Although dental amalgam itself is not linked to such conditions, there is evidence that total body burden of mercury is of particular concern with these patients. Amalgam may similarly be contraindicated for workers with known occupational exposure to heavy metals or for individuals with greater than average exposure to mercury because of a diet which is primarily seafood.

Q. Should special precautions be taken with pregnant women or with children?

- A. Dentists consider a number of factors in determining treatment for children and for pregnant patients. Assuming that they are aware of the pregnancy, and in consultation with the patient, dentists may recommend alternative restorative materials, other forms of treatment, or delay of treatment. In many instances amalgam presents the best possible option for restorative treatment.

There is no scientific evidence of ill effects, although mercury is known to cross the placenta. A stakeholder committee convened by Health Canada recently concluded that while "the research evidence did not support excluding children, pregnant or lactating women...from receiving amalgam fillings...common sense dictated that pregnant women should avoid any elective medical or dental intervention until after delivery."

Most children today have far fewer cavities than in the past, and, consequently, less exposure to mercury. Dentists give special consideration to restorative treatment for children and any concerns expressed by parents. Dental amalgam offers distinct advantages in many cases. Alternative materials are considered when suitable and recommended as indicated.

Q. Is dental amalgam safe when it rests against another metal (e.g. braces) in the mouth?

- A. It should be noted that Health Canada has taken the position that "new amalgam fillings should not be placed in contact with existing metal devices in the mouth, such as braces." Health Canada's concern is related to galvanic effect, which occurs when two different metals are in close proximity and create the potential for electric current to be generated.

Dentists are aware of the possibility of abutting metals creating a galvanic effect. It is also recognized that galvanic effect, through corrosion of metallic dental materials, may increase the release of mercury and other elements or compounds. Some recent evidence suggests that galvanic effect may also slightly increase the release of mercury vapour from amalgam.

For all these reasons, it is prudent for dentists, in suggesting a restorative material, to avoid creating a galvanic effect whenever patient care will not be compromised. It is also inadvisable to remove existing fillings unless the patient complains of symptoms which may be attributed to galvanic effect.

At the same time, the placement of orthodontic braces on patients with amalgam is often necessary and desirable, and has not been shown to be associated with ill effects. It may also be necessary, for the purpose of adequate restorative treatment, to place restorations in close proximity and to create the potential for galvanic effect.

CDA's Committee on Dental Materials and Devices notes, however, that when amalgam has been in the mouth for a small a period of time, oxidation (corrosion), through a complex process, contributes to the reduction of electrical flow. Galvanic effect, apart from its potential to contribute to heavy metal body burden, has not been demonstrated to be harmful, and concerns about galvanic effect must be considered in the context of the patient's overall oral health care needs.

CDA has asked Health Canada for an annotated scientific bibliography supporting its unconditional recommendation on galvanic effect. If this information is received, it will be reviewed immediately and, if necessary, further advisories will be sent out to the profession and made available to patients.

Q. There is a report on mercury exposure and risks from dental amalgam which was released by Health Canada on November 27, 1995. It suggested that the number of amalgam restorations should be limited to reduce the total daily average exposure of an individual to mercury from all sources (including food, water, air and dental amalgam). What does this report mean to me as a dental patient?

A. The assessment of mercury exposure and risks from dental amalgam conducted by G. Mark Richardson, PhD, is a review and analysis of the scientific literature by a scientist commissioned by Health Canada. The study involved no new research of the kind that CDA has been urging. It was a form of risk assessment using sophisticated mathematical techniques and computer modelling.

CDA arranged to have the study reviewed and assessed by an international panel of scientists, which concluded that the available mercury exposure data are not reliable enough to permit confident determination of a tolerable daily intake (TDI) for mercury. Both the CDA panel and the stakeholder group convened by Health Canada came to this same conclusion and both advocated further definitive research.

Q. What does the Richardson study say about the contribution of dental amalgam to the human body burden of mercury?

A. The study is consistent with a number of other studies in suggesting that the contribution of dental amalgam to the human body burden is in the neighbourhood of three millionths of a gram per day. The Richardson analysis and review of scientific literature has gone a step further in attempting to estimate a total daily intake from all sources and to calculate a tolerable daily intake (TDI).

Q. When will research provide more information about dental amalgam?

A. CDA continues to encourage the federal government to support further research specifically related to dental amalgam. Further risk assessment of total body burden of mercury from all sources should be undertaken, by means of an expert panel of scientists working openly and cooperatively with the scientific and professional communities. CDA has offered to cooperate on such research and to contribute to funding.

Q. Should I have my amalgam fillings replaced?

A. It does not make sense from either a general health point of view or a cost point of view to replace amalgam fillings simply on the basis of the current questions being asked about possible amalgam toxicity. Replacement may be considered for individuals sensitive to dental amalgam.

Q. Do I have the option of asking for alternative restorative materials rather than dental amalgam when I need a dental restoration?

A. Yes, dentists recognize patient concerns with respect to choice of restorative materials and the patient's right to choose a dental material or to refuse treatment with any material. You should note, however, that the dentist may be concerned about the retention, durability or strength of alternative restorations in particular applications, and advise you to choose amalgam. The final choice, however, is yours.

Q. Is the dental profession suppressing information on the dangers of amalgam?

A. No, the dental profession believes in informed patient consent and recognizes patient interest above any other considerations. Dental amalgam is still the restorative material of choice in most instances, and because of its excellent durability and low cost as a restorative material, the risk/benefit ratio is in the patient's interest.

Q. Where does all this leave me as a dental patient? What sort of attitude should I take to dental amalgam?

A. Take a common sense approach to your decisions about dental amalgam. Discuss your situation with your dentist and determine if there are special reasons to be cautious about amalgam use in your case. Your dentist wants you to be aware of the conclusions reached in the range of scientific studies on dental amalgam. And don't just decide to have your amalgam fillings removed in response to media reports focussing on selected scientific studies. If you have strong personal concerns, ask about alternative restorative materials (such as composite fillings, ceramic inlays or onlays, or gold castings) as your fillings need to be replaced.

Q. My dentist is recommending an amalgam filling but I want a white filling (or vice versa). Where does this leave me? I would also like my dentist to use a laser instead of a drill to do my filling. Is this possible?

- A. You and your dentist should decide together which filling material will work best for you. If you want one kind of material or wish to avoid a certain type, tell your dentist. He or she will advise you if the material that you want will work.

The most common materials for restoring (or filling) teeth are amalgam (sometimes called silver), composite resin (sometimes called plastic or white), gold, ceramic and glass ionomer. Each material has pros and cons. Some materials may better meet your needs than others.

It depends on the size of your cavity and its location. If your cavity is in a molar, for example, the filling will receive a lot of biting force or stress, so a strong material is needed. If it is in the front of your mouth where there is less biting force and people will see it, a different material may be better.

There are also new and different ways to prepare a cavity for a filling. Lasers are a fairly new tool in dentistry. They have been used for several years on soft tissues, like the gums. Some dentists are starting to use lasers in place of drills to remove tooth decay. Lasers work best on decay close to the tooth's surface. Over the next few years, lasers will likely be refined and more dentists may be using them instead of drills.

Air abrasion is another new way to remove tooth decay. It uses a fine, sand-blasting spray and works best on surface decay. If you are interested in having air abrasion, call your local dental society or a few dentists in your area to find out which dentists are using it.