

Dental ethics case 18:

Use of amalgam for dental restorations

SADJ February 2012, Vol 67 no 1 p36 - p39

S Naidoo: BDS(Lon), LDS.RCS (Eng), MDPH (Lon), DDPH.RCS (Eng), MChD (Comm Dent), PhD (US), PG Dipl Int Research Ethics (UCT). Senior Professor and Principal Specialist, Faculty of Dentistry, University of the Western Cape. Department of Community Dentistry, Private Bag X1, Tygerberg 7505. E-mail: suenaidoo@uwc.ac.za

CASE SCENARIO

I occasionally have patients who request that I remove perfectly serviceable amalgam restorations and replace them with composite or tooth-coloured materials. Their reasons for this request are varied – health concerns, aesthetics etc. What are my ethical obligations in this regard?

COMMENTARY

Dental amalgam has been used as a restorative material for over 150 years and its use continues to be monitored for safety. In the past decade, however, the awareness and recognition of the environmental implications of mercury have increased and dentistry has come under the spotlight as being a source of contamination of the environment.¹ Some high-income countries have introduced a ban on the use of dental amalgam as tooth-coloured dental materials become more accessible alternatives. Others have required or recommended dental practices to manage amalgam wastes so that they are not released to the environment. Many countries still use dental amalgam extensively and the choice of material usually depends on a number of factors such as the tooth; site and size of the caries lesion; as well as healthcare provision and financing; patient preference; healthcare provider preference; technology; cost, and environmental factors.¹ Evidence-based scientific studies have confirmed that amalgam is a safe restorative material and may be used without health concerns except for less than one percent of the population who are allergic to it.²

Balancing the risks and benefits

There are no risk-free invasive dental procedures – each and every act of the dentist must weigh the risks and benefits. There is a possibility that the patient may be allergic to dental amalgam but the act of removing amalgam may itself result in potential damage to the tooth structure and the loss of sound tissue in the process.³ There are also risks and benefits involved with the alternative restorative materials and the extra costs incurred. While many patients are now more informed, articulate and questioning, many still seek the advice of dental professionals because they lack the training and knowledge needed to make a diagnosis, evaluate treatment needs and balance the associated risks and benefits. Patients trust that their health professionals are competent and have the integrity to discuss these matters without bias and with mutual respect. Health professionals must demonstrate to the public that the trust placed in them is justified and founded on sound science. The profession earns the respect of society by continually reinforcing the foundation of science, expertise and new knowledge to benefit the health of the patient.

A European Commission Scientific Committee^{4,5} that addressed the use of dental amalgam and available alternative restorative materials concluded that dental amalgams are effective and noted that none of the dental materials - amalgam and alternative - was without clinical limitations and toxicological hazards. Because dental amalgam is neither tooth-coloured nor adhesive to tooth tissues, its use has been decreasing in recent years and the alternative tooth-coloured filling materials have become increasingly popular. A sustained reduction in the use of dental amalgam in oral healthcare provision is expected in several countries of the European Union, the rate of which is dependent on trends in dental education towards the increasing use of alternative materials to amalgam and the possible reduced availability of mercury products in general.¹

In addition, there have been clear statements made by two major dental organizations on the use of amalgam. The World Dental Federation (FDI) (www.fdiworldental.org) at its General Assembly 2009 stated that “*amalgam is a safe, widely used and affordable dental filling material and currently serves the oral health needs of the majority of communities around the world, particularly those most disadvantaged and in need of dental treatment*”. Furthermore, it “...acknowledges its responsibilities with regard to mercury and dental amalgam in terms of global health and the environment” and “reaffirms its commitment to upholding best environmental practices with regard to dental amalgam”. The International Association for Dental Research (IADR) (www.iadr.org) policy states that “*Dental amalgam has a well-documented history of safety and efficacy in dentistry. Its advantages include ease of handling, durability, and relatively low cost. Dental amalgam has numerous indications for use, especially for restorations in stress-bearing areas. Its main disadvantages are poor aesthetics and the necessity for sound tooth structures to be removed in order for retention to be obtained*”.... “*Scientific evidence indicates that currently used restorative materials, including dental amalgam, cause no or very few significant side-effects*”. The IADR endorses the use of best management practices for the use of amalgam restorations in dental offices.

The American Dental Association (ADA) has taken a firm stand on the removal of amalgam restorations and the ADA Code of Ethics states clearly: “Based on current scientific data, the ADA has determined that 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. The same principle applies to the dentist’s recommendation concerning the removal of any dental restorative material.”⁶

Table 1: Best management practices for dental surgeries using amalgam

Do	Don't
Do use pre-capsulated alloys and stock a variety of capsule sizes	Don't use bulk mercury.
Do recycle used disposable amalgam capsules.	Don't put used disposable amalgam capsules in biohazard containers, infectious waste containers or regular garbage.
Do salvage, store and recycle non-contact amalgam (scrap amalgam).	Don't put non-contact amalgam waste in biohazard containers, infectious waste containers or regular garbage.
Do salvage contact amalgam pieces from restorations after removal and recycle the amalgam waste.	Don't put contact amalgam waste in biohazard containers, infectious waste containers or regular garbage.
Do use chair-side traps, vacuum pump filters and amalgam separators to retain amalgam and recycle their contents.	Don't rinse devices containing amalgam over drains or sinks.
Do recycle the amalgam from teeth that contain an amalgam restoration.	Don't dispose of extracted teeth that contain amalgam restorations in biohazard containers, infectious waste containers, sharps containers or regular garbage.
Do manage amalgam waste through recycling as much as possible.	Don't flush amalgam waste down the drain or toilet.
Do use line cleaners that minimize dissolution of amalgam.	Don't use bleach or chlorine-containing cleaners to flush wastewater lines.

Table 2: Practical guide to integrating best management practices into dental practice

<p>Non-contact (scrap) amalgam</p> <ul style="list-style-type: none"> Place non-contact, scrap amalgam in a wide-mouthed container that is marked "Non-contact Amalgam Waste for Recycling". Make sure the container lid is well sealed. When the container is full, send it to a recycler.
<p>Amalgam capsules</p> <ul style="list-style-type: none"> Stock amalgam capsules in a variety of sizes. After mixing amalgam, place the empty capsules in a wide-mouthed, airtight container that is marked "Amalgam Capsules Waste for Recycling". Capsules that cannot be emptied should likewise be placed in a wide-mouthed airtight container that is marked "Amalgam Capsules Waste for Recycling". Make sure the container lid is well sealed. When the container is full, send it to a recycler.
<p>Disposal chair-side traps</p> <ul style="list-style-type: none"> Open the chair-side unit to expose the trap. Remove the trap and place it directly into a wide-mouthed, airtight container that is marked "Contact Amalgam Waste for Recycling". Make sure the container lid is well sealed. When the container is full, send it to a recycler. Traps from dental units dedicated strictly to hygiene may be placed in with the regular garbage.
<p>Reusable chair-side traps</p> <ul style="list-style-type: none"> Open the chair-side unit to expose the trap. Remove the trap and empty the contents into a wide-mouthed, airtight container that is marked "Contact Amalgam Waste for Recycling". Make sure the container lid is well sealed. When the container is full, send it to a recycler. Replace the trap into the chair-side unit (Do not rinse the trap under running water as this could introduce dental amalgam into the waste stream).
<p>Vacuum pump filters</p> <ul style="list-style-type: none"> Change the filter according to the manufacturer's recommendations. Remove the filter. Put the lid on the filter and place the sealed container in the box in which it was originally shipped. When the box is full, the filters should be recycled.
<p>Amalgam separators</p> <ul style="list-style-type: none"> Select an amalgam separator that complies with ISO 11143. Follow the manufacturer's recommendations for maintenance and recycling producers.
<p>Line cleaners</p> <ul style="list-style-type: none"> Use non-bleach, non-chlorine-containing line cleaners, which will minimise amalgam dissolution.

Ethical considerations

The ethical obligations regarding this case are manifold. Autonomy relates to the right of patients to self-determination or to make their own informed choices by involvement in treatment decisions in a meaningful way, with due consideration given to their needs, desires and abilities.⁷ Dentists should always inform patients of the proposed treatment and any reasonable alternatives that are available. Therefore it is an ethical duty to discuss not only amalgam use but all treat-

ment options, and to ensure that the recommendations are based on valid scientific evidence and standards of care.

Non-maleficence is the principle related to the duty to protect the patient from harm. We can do this by keeping our knowledge and skills current and knowing one's limitations (HPCSA, 2008).⁷ There is also the ethical duty to promote the patient's welfare – the services performed should be in the best interest of the patient. This duty of beneficence applies to every clinical situation with the competent and

timely delivery of dental care within the bounds of the clinical circumstances presented by the patient, with due consideration given to the needs, desires and values of the patient. All members of the dental team should always be in a position to justify the trust which has been placed in them and this small burden comes with the many advantages and privileges of having a professional status. The principle of veracity implies a duty to be honest and trustworthy in dealings with patients and to respect the position of trust inherent in the dentist-patient relationship, communicate truthfully and without deception and maintain intellectual integrity.

Concluding remarks

Not only do patients have a right to the information, but they also have the right to participate fully in treatment decisions, including the choice of materials to restore their teeth. Discussions with patients about amalgam should be factual, balanced and based on valid scientific evidence. Practitioners are often in a dilemma when they decide that amalgam is indeed the best restorative choice for the particular clinical presentation, but the patient has concerns about the mercury it contains. In this instance, one may then use another clinically acceptable (though perhaps less optimal) replacement restorative material. This treatment decision should be clearly documented in the patient's records that after you discussed the risks and benefits of all the options the patient decided on the less optimal, but clinically acceptable restorative material. If on the other hand, you do not wish to place another restorative material as you feel it would put the patient's health at risk, you could then recommend that the patient seek a second opinion.

Best management practices for amalgam waste¹

Best Management Practices (BMP) are a series of amalgam waste handling and disposal practices that include, but are not limited to, initiating bulk mercury collection programmes, using chair-side traps, amalgam separators compliant with ISO 11143 and vacuum collection, inspecting and cleaning traps, and recycling or using a commercial waste disposal service to dispose of the amalgam collected. Using amalgam separators, together with other measures of BMP, can significantly reduce mercury discharge to the environment. Recycling is one of the BMP for dental surgeries (Table 1) and a practical guide for the dental practice is given in Table 2 (WHO, 2009).¹

References

1. WHO. Future use of materials for dental restoration: Report of the meeting convened at WHO HQ, Geneva, Switzerland 16th to 17th November 2009. WHO, Geneva.
2. Dodes JE. The amalgam controversy an evidence based analysis. *J Am Dent Assoc* 2001; 132: 348-56.
3. Sifkas PM. Can a dentist ethically remove serviceable amalgam restorations? *J Am Dent Assoc* 1996; 127: 685-7.
4. Scientific Committee on Emerging and Newly Identified Health Risks - SCENIHR. The safety of dental amalgam and alternative dental restoration materials for patients and users EU: Health and Consumer Protection. Directorate General; 2008. 6 May 2008.
5. Scientific Committee on Health and Environmental Risks - SCHER. The environmental risks and indirect health effects of mercury in dental amalgam EU: Health and Consumer Protection. Directorate General; 2008. 6 May 2008.
6. ADA Council on Scientific Affairs. Dental amalgam: Update on safety concerns. *J Am Dent Assoc* 1998; 129: 494-503.
7. Health Professions Council of South Africa. General Ethical Guidelines for the Health Professions. Booklet 1. Guidelines for good practice in the healthcare professions. Pretoria, May 2008.