

The Dental Board of California

Dental materials Fact Sheet

Adopted by the Board on October 17, 2001

As required by Chapter 801, Statutes of 1992, the Dental Board of California has prepared this fact sheet to summarize information on the most frequently used restorative dental material. Information on this fact sheet is intended to encourage discussion between the patient and dentist regarding the selection of dental materials best suited for the patient's dental needs. It is not intended to be a complete guide to dental material science.

The most frequently used materials in restorative dentistry are amalgam, composite resin, glass ionomer cement, resin-ionomer cement, porcelain (ceramic), porcelain (fused-to-metal), gold alloys (noble) and nickel or cobalt-chrome (base-metal) alloys. Each material has its own advantages and disadvantages, benefits and risks. These and other relevant factors are compared in the attached matrix titled "Comparisons of Restorative Dental Materials." "A Glossary of Terms" is also attached to assist the reader in understanding the terms used.

The statements made are supported by relevant, credible dental research published mainly between 1993-2001. In some cases, where contemporary research is sparse, we have indicated our best perceptions based upon information that predates 1993.

The reader should be aware that the outcome of dental treatment or durability of a restoration is not solely a function of the material form which the restoration was made.

The durability of any restoration is influenced by the dentist's technique when placing the restoration, the ancillary materials used in the procedure, and the patient's cooperation during the procedure, following restoration of the teeth, the longevity of the restoration will be strongly influenced by the patient's compliance with dental hygiene and home care, their diet and chewing habits.

Both the public and the dental profession are concerned about the safety of dental treatment and any potential health risks that might be associated with the material used to restore the teeth. All materials commonly used (and listed in this fact sheet) have been shown - through laboratory and clinical research, as well as through extensive clinical use - to be safe and effective for the general population. The presence of these materials in the teeth does not cause adverse health problems for the majority of the population. There exist a diversity of carious scientific opinions regarding the safety of mercury dental amalgams, The research literature in peer-reviewed scientific journals suggests that otherwise healthy women, children and diabetics are not at increased risk for exposure to mercury from dental amalgams. Although there are various opinions with regard to mercury risk in pregnancy, diabetes and children these opinions are not scientifically conclusive and therefore the dentist may want to discuss these opinions with their patients. There is no research evidence that suggests pregnant women, diabetics and children are at increased health risk from dental amalgam fillings in their mouth. A recent study reported in the JADA factors in a reduced tolerance (1/50th of the WHO safe limit) for exposure in calculating the amount of mercury that might be taken in form dental fillings. This level falls below the established safe limits for exposure to a low concentration of mercury that might be taken in from exposure to dental restorative materials, the scientific evidence does not support that claim. However, there are individuals who may be susceptible to sensitivity, allergic or adverse reactions to selected materials. As with all dental materials, the risks and benefits should be discussed with the patient, especially with those in susceptible populations.

There are differences between dental materials and the individual elements or components that compose these materials. For example, dental amalgam filling material is composed mainly of mercury (43-54%) and varying percentages of silver, tin, and copper (46-57%). It should be noted that elemental mercury is listed on the Proposition 65 list of known toxins and carcinogens. Like all materials in our environment, each of these elements by themselves is toxic at some level of concentration if they are taken into the body. When they are mixed together, they react chemically to form a crystalline metal alloy. Small amounts of free mercury may be released from amalgam fillings over time and can be detected in bodily fluids and expired air. The important question is whether any other element that may be released from dental amalgam fillings falls far below the established safe levels as stated in the 1999 US Health and Human Service Toxicological Profile for Mercury Update.

All dental restorative material (as well as all material that we come in contact with in our daily life) have the potential to elicit allergic reactions in hypersensitive individuals. These must be assessed on a case-by-case basis, and susceptible