

The Minamata Convention: the beginning of the (amalgam-free) future?



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For more than a century, amalgam has been a successful and durable dental filling material, which has offered good clinical effectiveness up to the present day. However, for almost as long as it has existed, amalgam has been the subject of many controversies. Presently, against the backdrop of a possible ban on the processing of mercury, dental amalgam has once again become the focus of attention of scientists and dental practitioners. This development has been triggered by the recent adoption of a global treaty,¹ initiated by the United Nations Environment Programme (UNEP), which seeks a lasting reduction of environmental mercury. The treaty is named after a place where thousands of people were poisoned by mercury – Minamata. The Minamata Convention, also welcomed by the World Health Organization (WHO),² aims to bring down emissions and releases of mercury to protect human health and, in particular, the environment. The provisions of the treaty include the gradual reduction (“phase down”) of the use of mercury in dental fillings.

From a dental point of view the question arises: How may the dental community support these efforts and, at the same time, meet the associated challenges? While the treaty mainly focuses on environmental issues, the phase down of mercury alloys can be firmly linked with the paradigm shift from the historical (and meanwhile obsolete) concept of “drill and fill” to the timely and generally accepted modern “heal and seal” concept (including resin infiltration).³ This embraces minimal intervention techniques and preventatively orientated care, based on the state of the art application of tooth-colored restorative systems.⁴ The aim of these approaches is, wherever possible, to replace the

use of amalgam, not with substitute materials of similar qualities, but with the application of suitable alternatives, such as adhesively bonded resin systems.

Posterior composite resins have faced long-running, deep-seated skepticism and challenge over issues of, in particular, longevity. However, practice-based surveys indicate that the success of posterior composite resins can match and, in many situations, exceed that of restorations of dental amalgam.⁵ Composite resins offer unquestionable advantages when compared to amalgam, including adhesion to natural tooth tissue, preventive effects through fissure sealing, enhanced biomechanical properties of the restored tooth, minimally invasive preparation, ease of subsequent refurbishment and repair, and high patient acceptance given their esthetic appearance.

In addition to composite resins, other alternative filling materials are available, including compomers, conventional glass ionomers, and modern resin-modified glass-ionomer-based systems. These systems have a range of advantages, including biocompatibility and caries-preventive effects linked to fluoride release. However, these materials have some limitations in load bearing situations of extended cavities, and further high-quality research seems mandatory.⁶

So the challenge of providing alternate treatments to the provision of restorations of dental amalgam is now upon those of us who have not yet made this fundamental shift in the selection of restorative material.⁷ Phasing down the use of amalgam is no longer a question to be debated, but rather a task to be completed. In this process necessary changes in dental education must be implemented, with increased awareness of the



importance of prevention.^{7,8} This challenge needs to be addressed now, not next year, or in 5 to 10 years' time: the future is now, and the future will not wait!

Experiences of phasing down and no longer using dental amalgam in countries such as Japan and Norway are encouraging, but they cannot readily be transferred to other regions. Therefore, the World Dental Federation (FDI) encourages us to "Recognize and respect the differences between countries" with different "ability to phase-down . . . the safe use of dental amalgam."⁹ This leads us to one of the main preconditions and challenges in achieving the objectives of the Minamata Convention – effective cooperation and collaboration beyond the borders of nations and associations of sovereign national states in regions such as the European Union (EU). The EU states that "Co-ordinated international action is . . . needed to address the mercury problem in a globally effective manner."¹⁰ Similarly, the WHO points out: ". . . national, regional and global actions, both immediate and long-term, are needed to reduce or eliminate releases of mercury and its compounds to the environment."²

Following ratification, the Minamata Convention has been put into force. To date, the treaty has been

signed by 94 nations, with the United States of America (USA) being the first ratifying country.¹¹ An important step forward has been taken, but there is still a long way to go in the Minamata process. The phasing down of dental amalgam and phasing in of a modern, alternative approach to the restoration of posterior teeth will be a challenging but essential process, in particular for those who continue to find widespread application for dental amalgam. Practitioners and dental schools as well as providers and funders of dental care must move on and embrace this new reality without delay to minimize any disruption in the continuity of dental care involving the use of dental amalgam for patients.

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