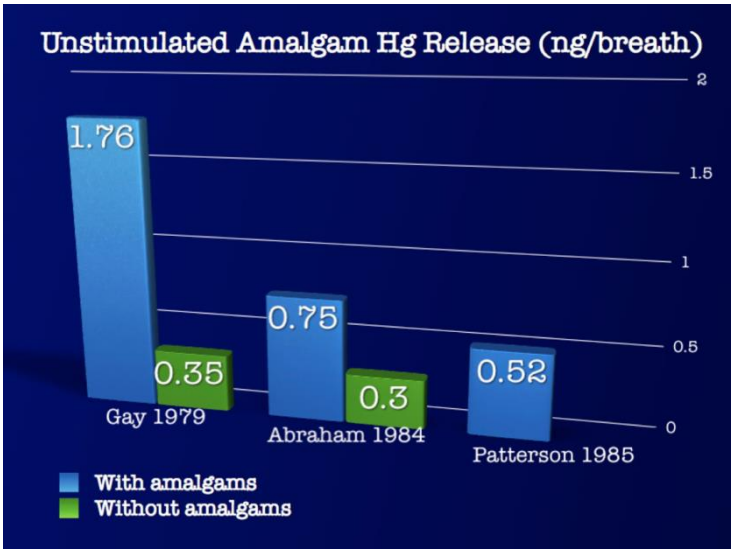
Documented Release of Mercury from Amalgams

The old dental literature is full of references that document release of mercury from amalgams.

Three classic papers from the 1970s and 1980s document how much more mercury vapor is found in the mouths of people with amalgam fillings as compared to people without fillings.

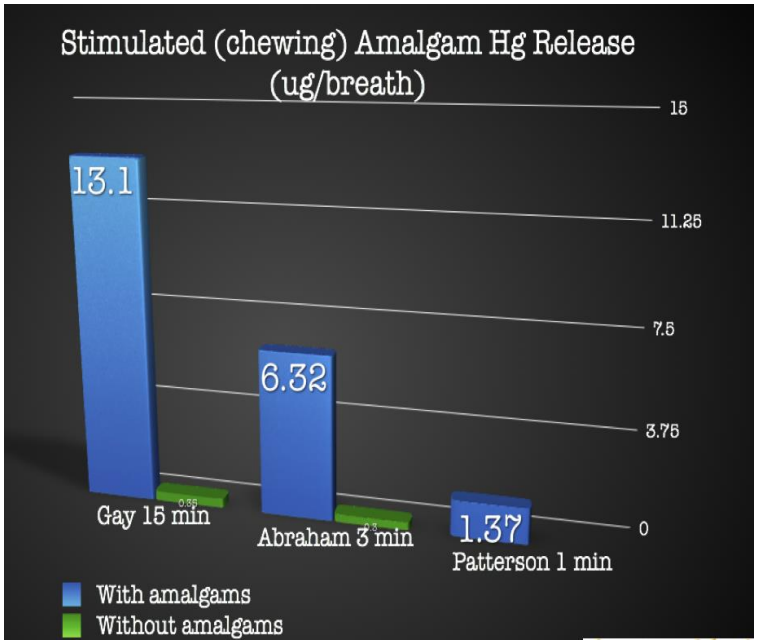
With and Without Amalgams

The following graph illustrates the results of three classic papers from the 1970s and 1980s that document how much more mercury vapor is found in the mouths of people with amalgam fillings as compared to people without fillings. The small amount of mercury noted in the mouths of people without amalgams reflects the margin of error of the instruments used in that research.



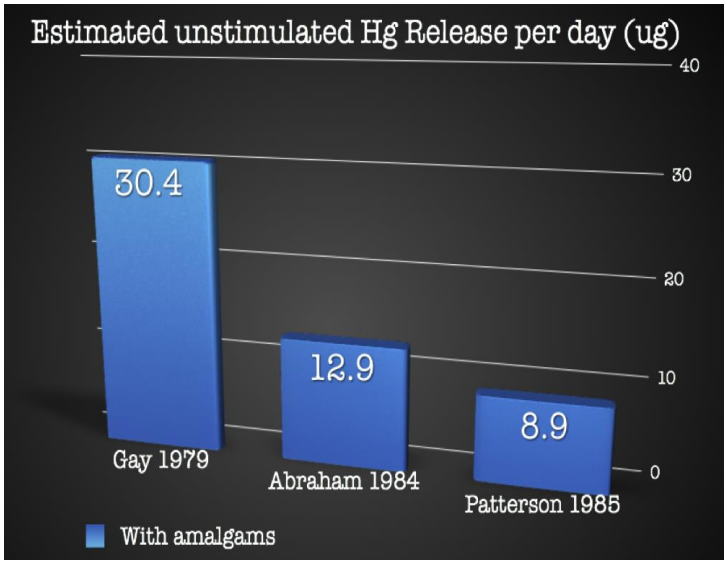
Chewing Gum

This chart illustrates how the three papers all show that chewing gum for a few minutes with amalgam fillings in the mouth raised the level of mercury release by over seven times!



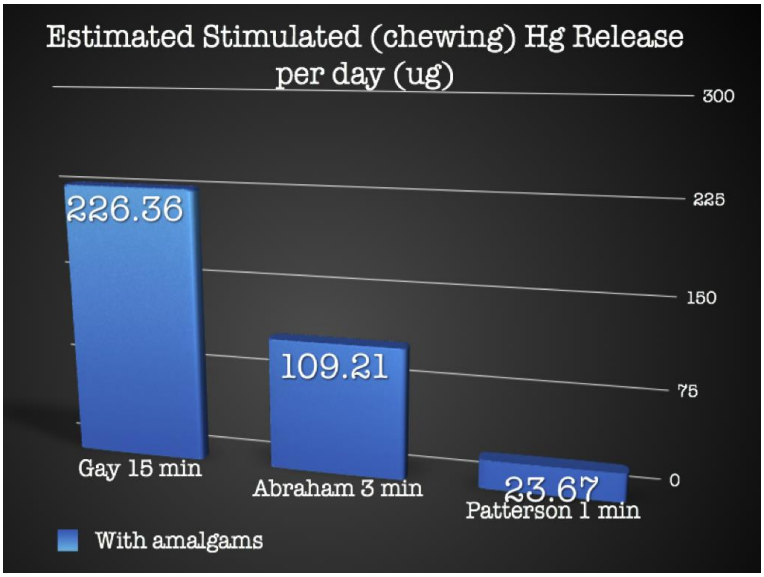
Unstimulated Release

This chart shows that without any stimulation at all, the mere presence of amalgam fillings in the mouth presents a person with real measurable quantities of mercury exposure, 24 hours a day. As we'll see in later slides, this exposure exceeds published safety limits in many cases.



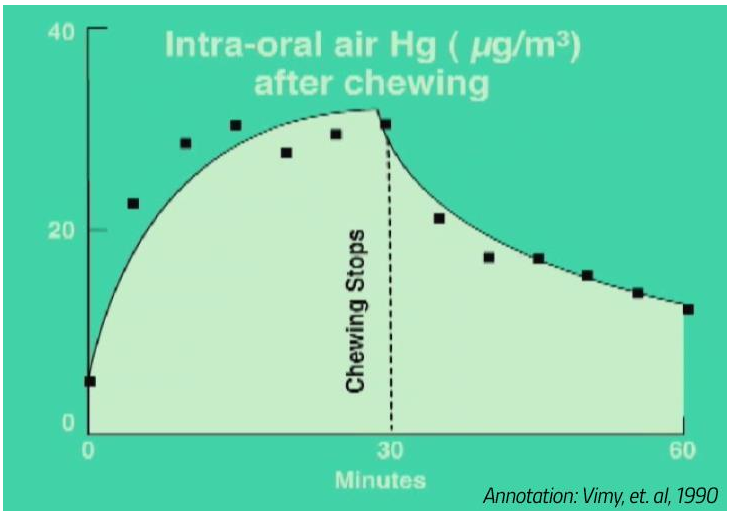
Stimulated Release

It's no secret that Amalgam fillings continuously release elemental mercury vapor into their environment. In fact it's been in the dental literature since the nineteenth century. This chart showing estimates of daily amounts of mercury exposure from amalgam fillings with chewing activity reminds us that any form of stimulation that heats an amalgam filling, like the friction of chewing gum or drinking hot drinks, will greatly increase the release of mercury vapor.

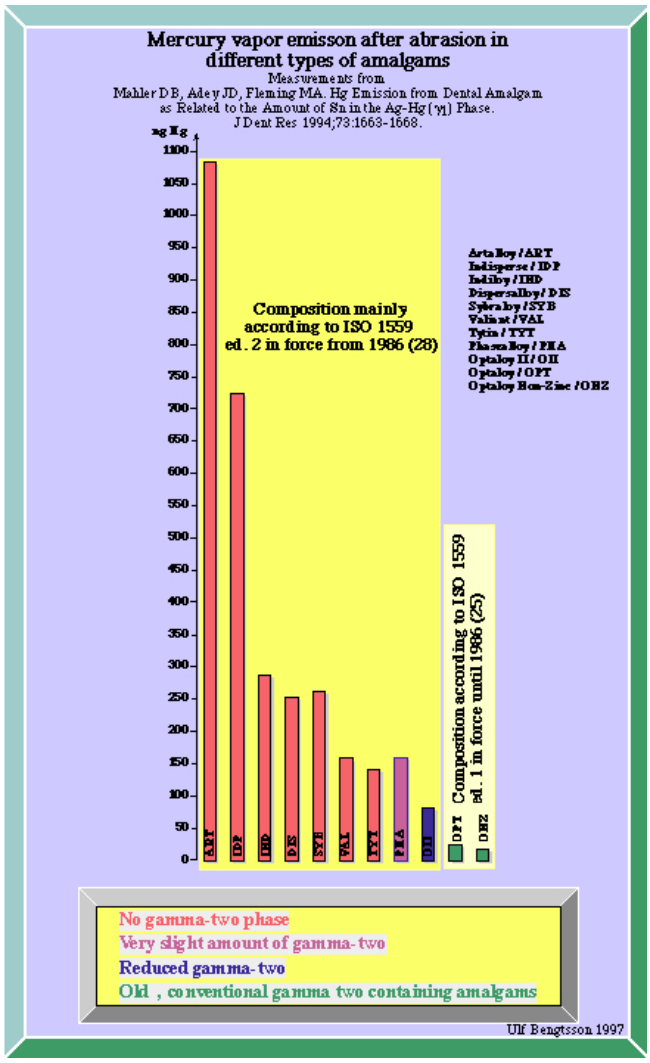


Additional Data

In this experiment, subjects with amalgam fillings had the baseline mercury levels in their mouth air measured, and then they were asked to chew gum for ten minutes. As expected, the mercury levels in their mouths shot up. But those levels took about two hours to return to baseline. The fillings kept up the excess outgassing long after the stimulation stopped.



When the release of mercury from different types of amalgam is quantified, as in this experiment, we find that the high copper, low gamma-2-phase formulas that are universally used today, actually release much more mercury than the old "conventional" types.



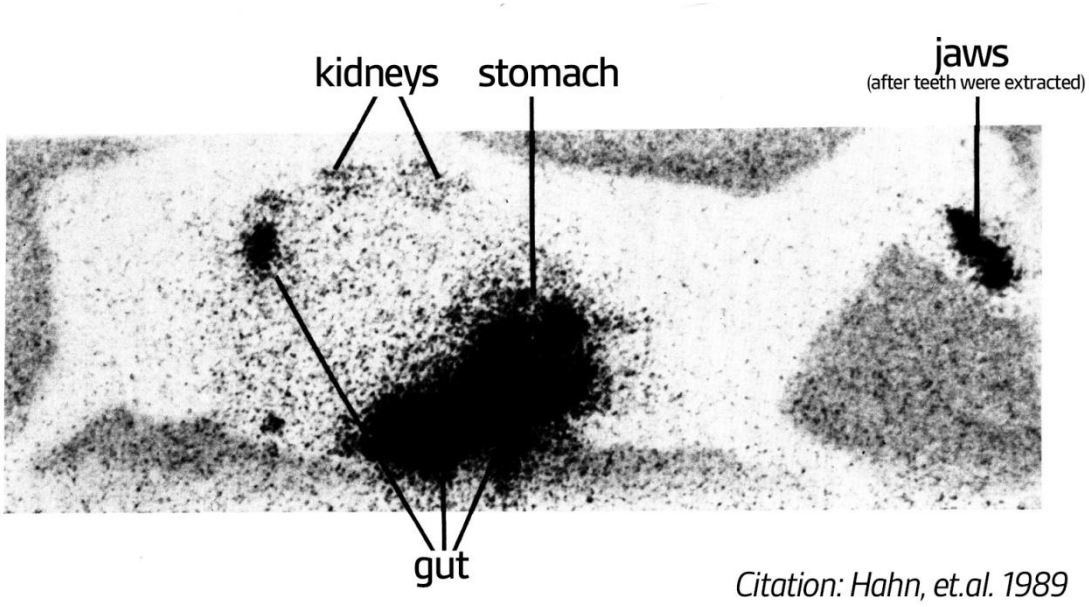
Distribution of Radioactive Mercury

In the late 1980s a research group at the University of Calgary, in Canada, including IAOMT founder Dr. Murray Vimy, did this experiment to find out if mercury from amalgam fillings could travel through the body. They placed twelve occlusal fillings in the mouth of a pregnant sheep. The amalgam was labeled with mercury-203, a radioactive isotope that is not found in nature.

After thirty days, the sheep was killed and radioactive mercury was found in all its organs, plus all the tissues of the fetus.

The Sheep's Body Scan

This picture shows the full, body scan of the animal, showing mercury concentrated in its digestive tract, kidneys, and jawbones.



Citation: Hahn, et.al. 1989

Mercury Deposit Amounts

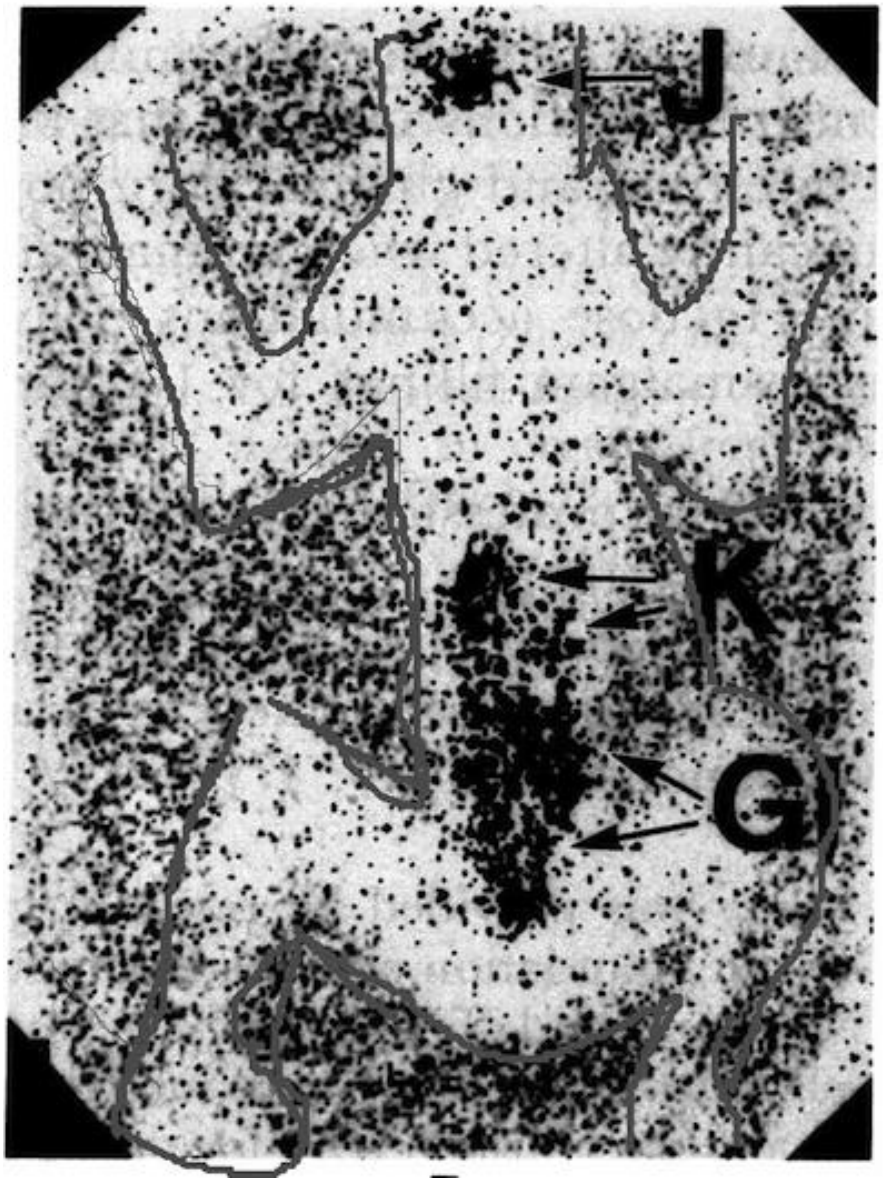
This table shows how much mercury was deposited in some of the sheep's tissues. The kidneys and digestive tract got the most, but the blood and the urine got very little. Blood and urine levels of mercury turn out to be poor indicators of the total body burden of mercury derived from amalgam fillings.

Tissue Concentrations	ng Hg/ gram
kidney	7438
feces	4489
stomach	929
liver	772
alveolar bone	318
whole blood	9.0
urine	4.7

Citation: Hahn et al, 1989

Results Duplicated in a Monkey

The Calgary group was criticized for using a sheep-an animal that eats and chews in a way very different from humans. So they repeated their experiment with a monkey, and found identical results. Radioactive mercury from the fillings distributed throughout the animal's body, and concentrated in the same organs as in the sheep.



Mercury Exposure

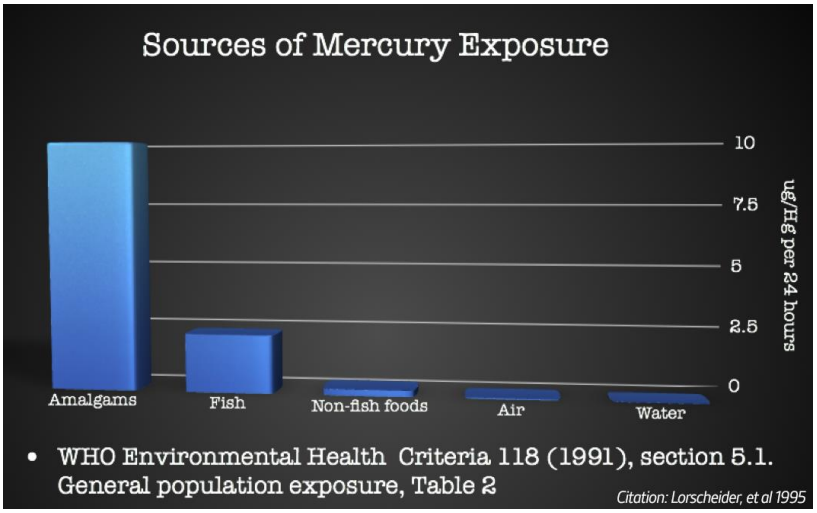
In 1991, the World Health Organization noted that when mercury amalgam was the predominant dental filling material, people were being exposed to mercury far more by their fillings than from any other source.

Documenting exposure is one thing, but to document toxic exposure, we must compare the exposure to published safety limits.

Most published estimates of amalgam-derived mercury exposure show a range exceeding those limits.

World Health Organization Mercury Amalgam Graph

In 1991, the World Health Organization published this graph, which shows that when mercury amalgam was the predominant dental filling material, people were being exposed to mercury far more by their fillings than from any other source. This is the picture we can change by eliminating the use of mercury amalgam in the future.



Exposure Exceeds Allowable Limits

Having mercury fillings in the mouth can expose people to amounts of mercury exceeding occupational exposure limits, and far exceeding limits for indoor air. In the dental office, opening an amalgam capsule or drilling out old fillings can expose dental personnel to far higher levels of mercury than is allowed for occupational settings.

The US Occupational Safety and Health Administration allows 50 micrograms of mercury per cubic meter of air in industrial settings, while the US Environmental Protection Agency allows only 0.3 micrograms per cubic meter for the general public. Exposure to amalgam under various circumstances can create mercury exposures that greatly exceed those limits.

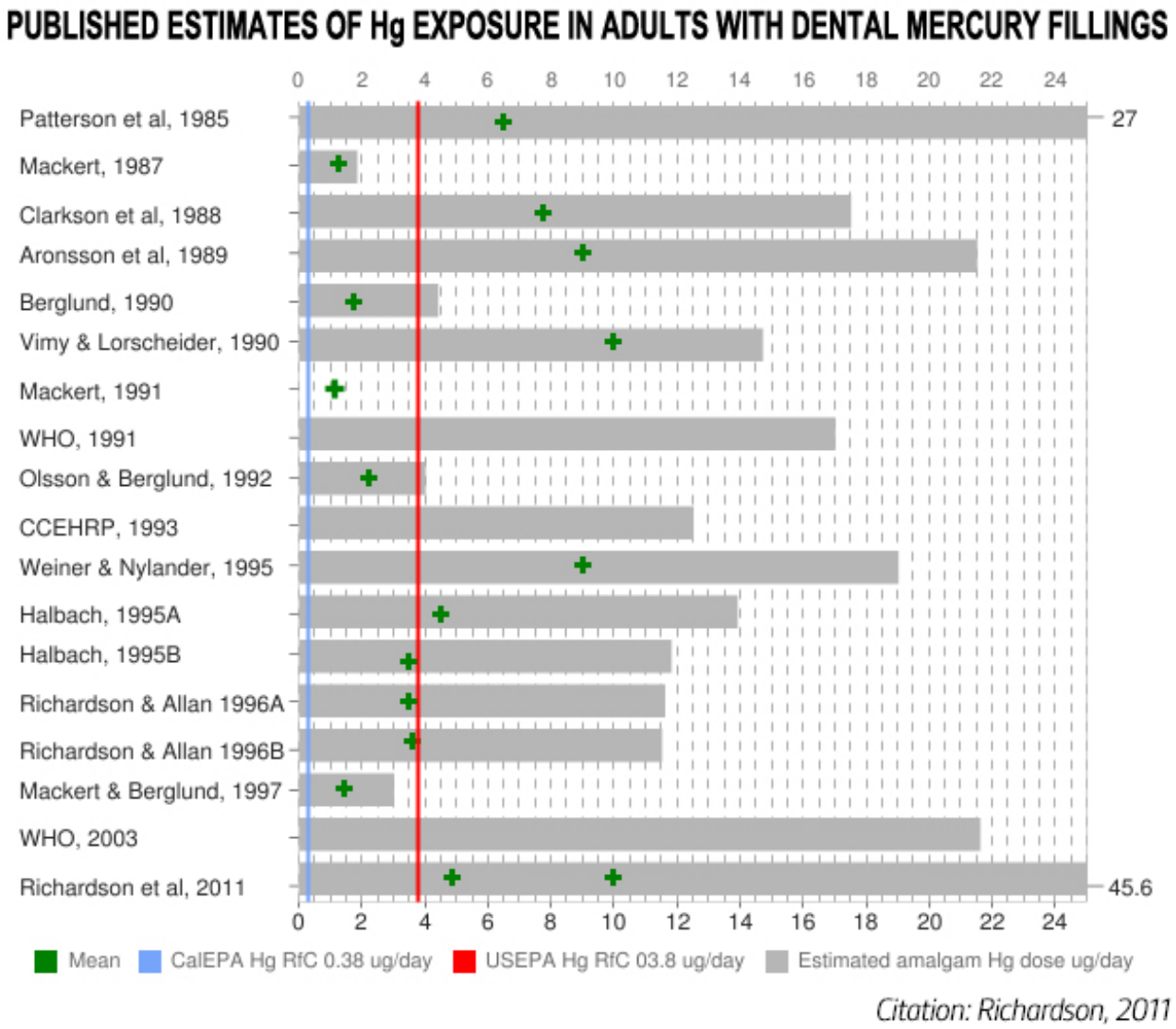
See the What the manufacturers say: an MSDS Overview for more information.

This table shows some mercury measurements taken from the scientific literature for various types of exposure to amalgam, and compares them to published safety limits.

Maximum allowable Hg vapor, µg/m3	*6 amalgam fillings, mouth air, 30-120 µg/m3*	*Opening a mixed amalgam capsule, 1000 µg/m3*	*Dry drilling old amalgam fillings, 4000 µg/m3*
OSHA: 50	*2X*	*20X*	*80X*
EPA: 0.3	*400X*	*3,333X*	*13,333X*

Published Estimates of Mercury Exposure

This graph represents 18 published estimates of the range of daily mercury exposure in adults who have amalgam fillings, as compared with the allowable limits established by various government agencies for non-occupational settings. Each gray bar represents the range of estimated exposure according to that study. The green cross is the mean. The red line represents the daily limit allowed by the US Environmental Protection Agency, and the blue line represents the limit allowed by the California Environmental Protection Agency. As you can see, most published estimates of amalgam-derived mercury exposure show a range exceeding those limits.



Citation: Richardson, 2011