

## Denture adhesives can cause zinc overdose, study says

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The simple act of trying to keep dentures in place can trigger serious health problems, including neurological damage, a new study by University of Maryland researchers warns.

Preliminary studies link the [zinc](#) in some adhesives to [neurological damage](#) and blood abnormalities, at least among patients who squeeze out too much denture cream, too often, trying to keep their teeth anchored.

A review of the scientific literature by faculty members at the University of Maryland Dental School has concluded that these health risks "should be a matter of concern for all [dentists](#) caring for denture patients. ... Dentists should admonish their patients to limit their use of denture adhesives in accordance with manufacturers' instructions."

The paper, "What Every Dentist Should Know about Zinc," appears in the April 1 edition of the journal *General Dentistry*. It cites cases in which patients have been exposed to as much as 200 times the recommended daily allowance of zinc from their abuse of denture adhesives.

Such reports began appearing in 2008. Last month, the U.S. [Food and Drug Administration](#) acknowledged it has received "numerous reports" of "local and systemic symptoms consistent with zinc toxicity."

The FDA urged manufacturers to revise their labeling to identify

products that contain zinc, or to replace the zinc with "an ingredient that presents less health risks in situations of overuse."

The American Dental Association said the link between excessive use of some denture adhesives and [health problems](#) is not yet proven. It suggested some patients may be going overboard in a struggle to get ill-fitting dentures to stay put.

In a statement, the FDA urged such patients to see their dentists for refitting. "Denture cream ... is not the solution for ill-fitting dentures," the ADA said.

The legal profession has already latched onto the issue as a potential source of new liability lawsuits. The law firm of Peter G. Angelos in Baltimore is among those now advertising for clients who may have suffered "zinc poisoning" from their dental adhesives.

Symptoms include unexplained weakness, numbness or tingling in the hands and feet or balance problems.

In the meantime, some adhesive makers have moved to head off problems. Glaxo Smith Kline, makers of Super Poligrip, last year voluntarily stopped using zinc in their Original, Ultra Fresh and Extra Care varieties.

The zinc was part of a polymer salt that enhanced the product's adhesive properties, the company said. It's been replaced with a salt based on calcium, sodium and cellulose gum.

The products "have always been safe and effective when used as directed," the company said in a statement. "However, we know that some used excess product over the long term, and this is associated with potential [health risks](#)."

All denture adhesives currently made by Glaxo Smith Kline no longer contain zinc, and are labeled "Zinc Free Formula."

Dr. Nasir Bashirelahi is a professor at the UM Dental School and a co-author of the General Dentistry paper, with Amar Patel, a dental student, and J. Anthony von Fraunhofer.

"As far as dental adhesives, definitely you should not use the one that has a zinc base in it," Bashirelahi said. "And the manufacturers are now making one without zinc."

Bashirelahi said he has been working, through continuing education, to bring dentists up to speed on the risks of zinc overdoses from dental products. "They are very, very receptive ... They are really very anxious to find out about it."

Dr. Radi M. Masri, a practicing dentist who also teaches at the Maryland dental school, said he wasn't aware of any patient in the school clinics with zinc toxicity symptoms. Nonetheless, he said, "This does not mean we can continue to use these creams; their use should be stopped."

He teaches his students that denture adhesives are not the solution for ill-fitting dentures, and "should never be used on a long-term basis."

"We always recommend avoiding these materials because they may increase the incidence of intra-oral fungal infection," Masri said. In addition, patients are now being queried about their use of adhesives and asked about possible symptoms of neuropathy.

Dr. K. Michael Murphy, a Baltimore prosthodontist, said he thinks the issue has been "blown out of proportion. ... In 30 years I've never seen a patient who had these (neurological) problems." On the other hand, he said, "Maybe I've missed it. Now we're all looking for it."

Zinc is a dietary trace metal that plays a critical role in human nutrition.

Adequate zinc is normally available from a balanced diet, and is especially abundant in such foods as oysters, red meat, yogurt, fish and eggs. But deficiencies can occur in developing countries where food sources are limited, or among vegetarians and athletes on diets rich in carbohydrates. Deficiencies may contribute to oral cancers, gum disease and cavities, and some patients may require supplements.

Excessive zinc intake is rare, the General Dentistry report said, but overdoses can be serious. Zinc in the body tends to displace copper, another essential nutrient. And too much zinc has been shown to produce copper deficiencies that lead to neurological problems and blood abnormalities.

"Zinc deals with over 300 enzymes in our body, which means it's going to touch every aspect of our lives, from metabolism to the immune system, to the endocrine system. You name it, it's going to be involved," Bashirelahi said.

Zinc has long been a common additive in toothpaste and mouth washes. It has been shown to reduce inflammation, bacteria and plaque formation. It is also present in dental amalgams and cements used by dentists to restore their patients' teeth.

But denture adhesives are the most worrisome source of excess zinc for dental patients. While they're in the mouth, Bashirelahi said, the zinc "leaches out, and we absorb it. Everything you eat, everything you drink takes some of that inside the digestive tract and into the bloodstream." The more adhesive you use, the more zinc you absorb, he said.

The makers of Fixodent say their adhesive, used properly, delivers less zinc to the user daily than is contained in most multivitamins, or in six

oysters.

The [General Dentistry](#) article says a denture wearer following the manufacturer's instructions would apply "a thin film, or a series of dots" on the dentures' surface, amounting to 0.5 to 1.5 grams of adhesive.

The estimated daily zinc exposure from dental adhesive misuse like that described in the study was 350 to 1,700 mg per day. The recommended daily allowance of zinc for adult males is 11 milligrams per day, for females 8 mg per day.

Just how common copper deficiencies induced by high zinc intake may be is unknown, the paper said, but it "may be higher than anticipated if patient use of adhesives greatly exceeds recommended dosages."

Quick diagnosis and immediate treatment "are critical in preventing irrevocable neurologic changes," the report said. When patients suffering from zinc overdoses were taken off their denture adhesives, their blood levels for both zinc and copper returned to normal.

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