## Fluoride Warnings

## Since 1997, the FDA has required a warning label on toothpaste to prevent fluoride poisoning, but what about foods and beverages?

For some time now, the American Dental Association has been recommending we use no more than a pea-sized amount of toothpaste for brushing our children's teeth.

"Parents and caregivers should ensure that young children use an appropriate size toothbrush with a small brushing surface and place only one pea-sized amount of fluoride toothpaste on the toothbrush at each brushing." <u>http://www.ada.org/prof/resources/positions/statements/fluoride\_community\_enamel.asp</u>

The toothpaste manufacturers continue to ignore this recommendation and show pictures of full size strips of toothpaste on toothbrushes in their national advertising.

Since 1997, the FDA has required the following warning on all fluoridated toothpaste, without stating that this is limited to only very small children.

"If you accidentally swallow more than used for brushing, seek professional help or contact a poison control center immediately" http://www.ada.org/prof/resources/positions/statements/fluoride.asp

What do they mean by 'more'? Another pea-sized amount? One half of a pea-sized amount more? What about 10% of a pea-sized amount more? What if someone placed a full strip of toothpaste on their children's brush because they saw the advertisement and didn't read the warning label (in fine print) on the toothpaste tube? Anyone using more than a 'pea-sized' amount and anyone not rinsing properly after brushing with this amount will be swallowing "more than (what is) used for toothbrushing". Even the toothpaste manufacturers themselves have published studies dating as far back as the 1960's that show that the younger the child, the higher the percentage of the toothpaste that is swallowed. And adults, no matter how efficient their rinsing is after brushing, will end up swallowing a portion of the toothpaste each time they brush. I really don't think the FDA has carefully considered the liability issues that the warning label has created. A pea size amount of toothpaste is approximately 0.25 gm. This has been known, at

least in research circles and by the ADA for over 10 years. See the following article from a well known dental fluorosis researcher.

DenBesten P, Ko HS. Fluoride levels in whole saliva of preschool children after brushing with 0.25 g (pea-sized) as compared to 1.0 g (full-brush) of a fluoride dentifrice. Pediatr Dent. 1996 Jul-Aug;18(4):277-80.

Now let's use an example of fluoride content in toothpaste. We'll use Colgate toothpaste as an example, since not too many people know how much fluoride is in Colgate when they read the label and it lists the active ingredient as "sodium monofluorophosphate 0.76% w/w". We'll use the short form, Na2MFP.

Sodium monofluorophosphate (MFP) is actually disodium monofluorophosphate a chemical with the formula Na2PO3F. Its molecular weight is 143.95 g/mol. http://en.wikipedia.org/wiki/Sodium\_monofluorophosphate

If Colgate contains 0.76% Na2MFP (w/w), it contains 0.76 gm MFP/100 gm

toothpaste

which translates to  $0.76 \times 0.132$  (the proportion by weight of fluoride in NaMFP = 19/143.95=0.132) gm of F/100 gm toothpaste

- = 0.1003 gm F/100 gm toothpaste
- = 100.3 mg F/100 gm toothpaste
- = 1003 mg F/1000 gm toothpaste [or 1003 parts per million (ppm)]
- = 1.003 mg F/gm of toothpaste

Therefore a pea size amount of Colgate contains 1.003 mg F/gm toothpaste x 0.25 gm = 0.251 mg F

Now let's compare that to how much is in water and other beverages.

Fluoridated water contains (usually) 1.0 mg F/L drinking water. In most fluoridated cities, beverages are made with fluoridated city tap water.

To be consistent with the FDA toothpaste warning, you should really contact a poison control center immediately if you swallow

1. a cup (250 mL) of fluoridated tap water, or

2. one third of a cup of tea made with fluoridated tap water (depending on the brand), or

3. one quarter of a can (335 mL) of iced tea, or

4. two thirds of a can of soda pop made in a fluoridated city, or

5. less than a small bottle (335 mL) of beer made in a fluoridated city, or

4. a juice box (250 mL) containing 'from concentrate' fruit juice (Concentrated fruit juice is usually reconstituted with fluoridated city water. Read the label where the manufacturer is located to confirm the concentration of fluoride in the water that was used make the product, or phone the manufacturer for more information on the water used to reconstitute the product), or

5. a large bottle (1.0 L) of naturally fluoridated spring water (containing 0.25 ppm fluoride), or

6. one half of a bottle of formula (500 mL) made with fluoridated tap water (depending on the brand),

But 1.0 L of pure milk contains only approximately 0.01 mg F.

Therefore, a small child has to consume 25 or more liters of cow's milk at one time, or mother's breast milk, to even come close to the levels of fluoride ingestion reached in the examples above.

Unless the FDA starts to require clear fluoride labeling on foods, consumers should be limiting their choices to the safest beverages containing fluoride for their children to consume.

These are

1. milk (human breast milk, un-concentrated cow's milk),

2. pollution-free rain water (preferably filtered and germ-free), or bottled spring water (rain water that has been naturally filtered through the ground without picking up too much fluoride ....e.g. less than < 0.1 ppm fluoride),

3. purified tap water (reverse osmosis, distillation, some ion-exchange columns) and

4. any fluoride-free foodstuff made with liquids in 1, 2 or 3 above.

The FDA should require fluoride content labeling on all foodstuffs. If the FDA wants to protect children from dental fluorosis caused by swallowing 'more' than a pea size amount of fluoridated toothpaste, it should at least provide some kind of warning label on foods and beverages with too much fluoride, since these are just as capable of causing dental fluororis in children.

The above is the opinion of the author, who just completed three years of studying fluoride toxicology with the National Academy of Sciences.

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