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## Review in Effect of Fluoride on Teeth in Medicine

Dr. Zainab Mahmood Aljammali\*

Ass. Lecture in Medicine ,Dentistry Department ., College of Dentistry

\*Corresponding author's Email: [dr.nagham\\_mj@yahoo.com](mailto:dr.nagham_mj@yahoo.com)

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### Abstract

Fluoride is a mineral that occurs naturally in all water sources, including the oceans. Research has shown that fluoride not only reduces cavities in children and adults, but it also helps repair the early stages of tooth decay, even before the decay is visible. Fluoride is the best cavity fighter to help keep the whole family's teeth strong — no matter their ages

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### 1. Introduction

Fluoride's main benefit is in helping reduce the risk of tooth decay, which is why it's added to many brands of toothpaste and, in some areas, to the water supply through a process called fluoridation

### 2. How does fluoride protect teeth

Fluoride disrupts the process of tooth decay by

- changing the structure of developing enamel, making it more resistant to acid attack – these structural changes occur if a child consumes fluoride during the period when enamel develops (mainly up to seven years of age)
- encouraging better quality enamel to form that's more resistant to acid attack
- reducing plaque bacteria's ability to produce acid, which is the cause of tooth decay

### 3. Fluoridation

Most water supplies contain some fluoride and around half a million people in the UK receive naturally fluoridated water. Another 5.5 million people receive water that has had the fluoride concentration raised to around one part per million (1ppm). This level of fluoridation has been shown to have the most benefit for reducing decay levels. The maximum amount of fluoride permitted in drinking water is 1.5 mg/l (milli grams per liter). The West Midlands has the biggest water fluoridation scheme in the UK, which serves over three-quarters of the local population. There are also smaller schemes in operation in other parts of the country, including the North East, the East Midlands, Eastern England, the North West and Yorkshire and Humber. In the early 20th century, levels of tooth decay were found to be associated with fluoride levels in drinking water. This led to the introduction of water fluoridation schemes to add fluoride to water supplies where the level was low. The first fluoridation scheme was introduced in the US in 1945, in the city of Grand Rapids, Michigan. Following pilot schemes, the first substantive UK scheme was in Birmingham in 1964. There are extensive schemes in Australia, Ireland and the US.



**Fig.1. Fluoridation**

### **3.1. Facts About Fluoride**

#### **3.1.1. Most Developed Countries Do Not Fluoridate Their Water**

More people drink fluoridated water in the US alone than in the rest of the world combined. In Western Europe, for instance, 97 percent of the population drinks non-fluoridated water.

#### **3.1.2. Fluoridated Countries Do Not Have Less Tooth Decay Than Non-Fluoridated Countries**

According to the World Health Organization (WHO), there is no discernible difference in tooth decay between developed countries that fluoridate their water and those that do not. The decline in tooth decay the US has experienced over the last 60 years, which is often attributed to fluoridated water, has likewise occurred in all developed countries (most of which do not fluoridate their water).



**Fig.2. Non-Fluoridated**

#### **3.1.3. Fluoride Affects Many Tissues in Your Body Besides Your Teeth**

Many assume that consuming fluoride is only an issue that involves your dental health. But according to a 500-page scientific review, fluoride is an endocrine disruptor that can affect your bones, brain, thyroid gland, pineal gland and even your blood sugar levels.

#### **3.1.4. Fluoridation is Not a "Natural" Process**

Fluoride is naturally occurring in some areas, leading to high levels in certain water supplies "naturally." Fluoridation advocates often use this to support its safety, however naturally occurring substances are not automatically safe (think of arsenic, for instance). Further, the fluoride added to most water supplies is not the naturally occurring variety but rather fluorosilicic acid, which is captured in air pollution control devices of the phosphate fertilizer industry. As FAN reported

*"This captured fluoride acid is the most contaminated chemical added to public water supplies, and may impose additional risks to those presented by natural fluorides. These risks include a possible cancer hazard from the acid's elevated arsenic content, and a possible neurotoxic hazard from the acid's ability--under some conditions--to increase the erosion of lead from old pipes."*



**Fig.3. Natural Fluoridation**

#### *3.1.5. 40% of American Teenagers Show Visible Signs of Fluoride Overexposure*

About 40 percent of American teens have dental fluorosis,<sup>4</sup> a condition that refers to changes in the appearance of tooth enamel that are caused by long-term ingestion of fluoride during the time teeth are forming. In some areas, fluorosis rates are as high as 70-80 percent, with some children suffering from advanced forms. It's likely this is a sign that children are receiving large amounts of fluoride from multiple sources, including not only drinking water but also fluoride toothpaste, processed beverages/foods, fluoride pesticides, tea, non-stick pans and some fluorinated drugs. So not only do we need to address the issue of water fluoridation, but how this exposure is magnified by other sources of fluoride that are now common. It's also important to realize that dental fluorosis is NOT "just cosmetic." It can also be an indication that the rest of your body, such as your bones and internal organs, including your brain, have been overexposed to fluoride as well. In other words, if fluoride is having a visually detrimental effect on the surface of your teeth, you can be virtually guaranteed that it's also damaging other parts of your body, such as your bones.

#### *3.1.6. For Infants, Fluoridated Water Provides No Benefits, Only Risks*

Infants who consume formula made with fluoridated tap water may consume up to 1,200 micrograms of fluoride, or about 100 times more than the recommended amounts. Such "spikes" of fluoride exposure during infancy provide no known advantage to teeth, but they do have plenty of known harmful effects. Babies given fluoridated water in their formula are not only more likely to develop dental fluorosis, but may also have reduced IQ scores. In fact, a Harvard University meta-analysis funded by the National Institutes of Health (NIH) concluded that children who live in areas with highly fluoridated water have "significantly lower" IQ scores than those who live in low fluoride areas.<sup>5</sup> A number of prominent dental researchers now advise that parents should not add fluoridated water to baby formula.

#### *3.1.7. Fluoride Supplements Have Never Been Approved by the FDA*

The fluoride supplements sometimes prescribed to those who are not drinking fluoridated water have not been approved by the US Food and Drug Administration (FDA) for the prevention of tooth decay. In fact, the fluoride supplements that the FDA has reviewed have been rejected.

*"So with fluoridation, we are adding to the water a prescription-strength dose of a drug that has never been approved by the FDA,"* FAN noted.



**Fig.4. FDA**

### 3.1.8. Fluoride is the Only Medicine Added to Public Water

Fluoride is added to drinking water to prevent a disease (tooth decay), and as such becomes a medicine by FDA definition. While proponents claim this is no different than adding vitamin D to milk, fluoride is not an essential nutrient. Many European nations have rejected fluoride for the very reason that delivering medication via the water supply would be inappropriate. Water fluoridation is a form of mass medication that denies you the right to informed consent.

### 3.1.9. Swallowing Fluoride Provides Little Benefit to Teeth

It is now widely recognized that fluoride's only justifiable benefit comes from *topical* contact with teeth, which even the US Centers for Disease Control and Prevention (CDC) has acknowledged. Adding it to water and pills, which are *allowed*, offers little, if any, benefit to your teeth.



**Fig.5. Swallowing Fluoride Provides Little Benefit to Teeth**

## Conclusion

In Conclusion, our study revealed an Review in Effect of Fluoride on Teeth in Medicine to be an Efficient Method. Fluoride is the best cavity fighter to help keep the whole family's teeth strong — no matter their ages.

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