Fluoride and Oral Health

By

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For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.
Fluoride and Oral Health

- It is the most effective method in dental caries prevention and control
- At all ages, fluoride is so important to achieve an optimum oral health
- Can be made available on tooth surface by two means:
  - Systemically
  - Topically
Introduction

**As a systemic nutrient:**

* Community drinking water (fluoridation or naturally)

From prescribed dietary supplements or in small amounts from certain food
How Does Fluoride Work..!!

**Systemic Effect:**
“F” is ingested into small amount during teeth formation and gets built into enamel structure.

**Topical Effect:**
“F” is concentrated in saliva that bathes teeth. Remineralizes teeth enamel and decreases bacterial activity in oral cavity.
Fluoride and Tooth Development

• An essential nutrient to the formation of sound teeth and bones as calcium.

• Teeth can be acquire fluoride during three periods:
  • Mineralization stage
  • After mineralization and before eruption
  • After eruption
Fluoride Metabolism

• Fluoride intake: fluoridated water, supplemental tablets, and in a small amount of food
• Absorption: gastrointestinal tract and blood stream
• Distribution and retention: distributed by plasma: the teeth store small amounts with highest level on the tooth surface
• Excretion: through the kidneys and with a small amount excreted by the sweat glands
Fluoride Action

- Other fluoride preparation: professionally administered and/or self–applied, effective on both enamel and the root surface of the erupted tooth.
• Prevent demineralization: when preparations with a high content of fluoride are applied to teeth, calcium fluoride ($\text{CaF}_2$) precipitates out to provide free fluoride ions that act as a reservoir of fluoride during demineralization and remineralization
Effects of Fluoride

Enhance remineralization of incipient dental lesion
Aid posteruptive maturation of the enamel surface
Reduce enamel solubility and increase enamel resistance
Fluoride in Food

- Food: certain foods contain fluoride but not enough
  - Meat
  - Eggs
  - Vegetables
  - Cereals
  - Fruits
  - Tea and fish (have larger amounts)

- Salt: fluoridated salt has been used
Available Forms of Fluoride Supplements

- Tablets: may be chewed, rinsed and swallowed or dissolved slowly in the mouth.

- Mouth rinse

- Drops

- Fluoride dentifrices: dental caries prevention, caries – risk patient and desensitization
Fluorosis..!!
Acute Toxicity

- Rapid intake of an excess dose over a short time
- An accidental ingestion of a concentrated fluoride preparation: leads to a toxic reaction
- Acute fluoride poisoning is rare
Signs and Symptoms of Acute Toxic Dose

- Gastrointestinal tract: nausea, vomiting, diarrhea, abdominal pain, increased salivation and thirst

- Systemic involvement: if not treated may lead to death in few hours if patient has cardiovascular and respiratory depression
Emergency Treatment

• Induce vomiting: mechanical, digital stimulation at back of tongue or in throat, or by drug: Ipecac syrup

• Call emergency services, transport to hospital

• Administer fluoride – binding liquid when patient is not vomiting: milk or lime water: (CaOH₂ solution 0.15%)

• Support respiration and circulation