

# Fluorosis

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## In News

Fluorosis is a crippling disease resulting from **deposition of fluorides in the hard and soft tissues of the body**. It is a public health problem caused by **excess intake of fluoride through drinking water/food products/industrial pollutants** over a long period. Ingestion of excess fluoride, most commonly in drinking-water affects the teeth and bones.

## More About Fluorosis

- **Dental fluorosis** is the appearance of faint white lines or streaks on the teeth that only occurs when younger children consume too much fluoride, from any source, over long periods when teeth are developing under the gums.
- Dental Fluorosis is a **cosmetic condition, not a disease**. Often, it is so mild that only a dental professional can detect it.
- However long-term ingestion of large amounts can lead to potentially severe skeletal problems. Ingestion of excess fluoride can also affect the bones.
- Chronic high-level exposure to fluoride can lead to **skeletal fluorosis**. In skeletal fluorosis, fluoride accumulates in the bone progressively over many years.
- The early symptoms of skeletal fluorosis include **stiffness and pain in the joints**. In severe cases, the **bone structure may change and ligaments may calcify, with resulting impairment of muscles and pain**.
- **Non-skeletal forms of fluorosis** are earlier manifestations, which develop long before the onset of typical changes in teeth and skeletal bones. These are seen as:

. **gastrointestinal manifestation:** abdominal pain, excessive

saliva

. **neurological manifestation:** nervousness, tendency to urinate

. **muscular manifestation:** pain in the muscle, loss of muscle power

▪ About Fluoride:

. 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.

### Fluorosis in India

- High levels of Fluoride were reported in **230 districts of 20 States of India.**
- **Rajasthan, Gujarat and Andhra Pradesh** are the worst affected states. Punjab, Haryana, Madhya Pradesh and Maharashtra are moderately affected states while Tamil Nadu, West Bengal, Uttar Pradesh, Bihar and Assam are mildly affected states.
- In India fluorosis is mainly due to excessive fluoride in water except in parts of Gujarat and Uttar Pradesh where **industrial fluorosis** is also seen.
- The desirable limit of fluoride as per **Bureau of Indian Standards (BIS) is 1ppm (parts per million or 1 mg per litre).**
- In 2008-09, the Ministry of Health and Family Welfare, Government of India launched a **National Programme for Prevention and Control of Fluorosis** (NPPCF) with the aim for prevention, diagnosis and management of fluorosis in endemic areas.

### Combating Fluorosis

- **Using alternate sources of water**

- . surface water
- . rain water
- . low fluoride groundwater

- **Defluoridation of water**

- . Chemical precipitation: Alum coagulation, electrolyte defluoridation
- . Adsorption: Activated charcoal, activated alumina
- . Ionic separation: Reverse osmosis filtration, electrodialysis