



# Dental Products

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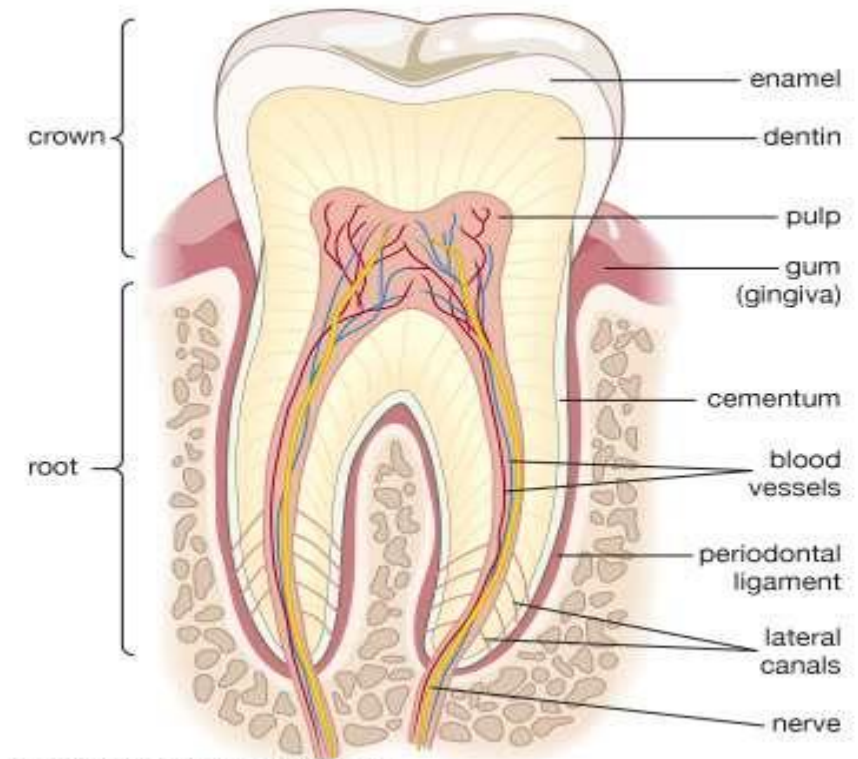
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# TOOTH

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Tooth consists of 3 layers of calcified tissue-

1. Dentine-which surrounds the pulp cavity and extends throughout the entire portion of tooth.
2. Cementum-a layer covering the the portion of tooth lying buried in the gum
3. Enamel-a white, hard material covering the portion of tooth projecting above the gum



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# Dental products

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A wide variety of inorganic compounds are used as dental products in dental care and treatment.

Dental products include

1. Anticaries
2. Cleaning or dentifrices
3. Polishing agents



# Anticaries agents

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Dental caries or tooth decay is caused by acids produced by the action of microorganism on carbohydrates.

It is believed that food particles containing carbohydrates lodged between the teeth undergo decay because of bacterial action and produce acids.

This disease is characterised by decalcification of tooth (calcium deposition) accompanied by foul mouth odour.

To prevent dental caries and to maintain clean and healthy teeth, it becomes necessary to use dentifrices, which clean the surface of teeth.

Example-Ammoniated toothpaste, urea ammonia containing powders, antibiotic containing mistures.



# Cleaning agents or dentifrices

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A **dentifrice** is a substance used with a tooth brush for the purpose of cleaning the surface of teeth. It is available in the form of pastes and powders. Many dentifrices contain flavours and soap or detergent.

The powders and pastes contain abrasive such as calcium carbonate, calcium sulphate, insoluble sodium metaphosphate, hydrated aluminium oxide, magnesium carbonate and phosphates, sodium bicarbonate and sodium chloride

. Toothpaste contain liquids such as glycerine, propylene glycol, sorbitol solution, water, alcohol and thickening agents such as starch, tragacanth, algin and cellulose derivatives.

Example-Calcium carbonate, Calcium phosphate dibasic and tribasic, Sodium metaphosphate

# Polishing agents

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Polishing is achieved by abrasive action (polishing and cleaning the hard surface) of dentifrices. It provides whiteness to the teeth.

Example- sodium metaphosphate





# Desensitising agents

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Usually teeth are sensitive to heat and cold especially during tooth decay.

Therefore some desensitising agents are used in dental preparations to reduce sensitivity of teeth to heat and cold.

They act as local anaesthetic.

Example- Strontium chloride, Zinc chloride



# Role of fluoride

Fluoride ion is a trace material which occurs in our body. It is generally adequate in food and water. In some parts of the world, ground water is totally lacking fluoride. In such places dental caries is a common problem.

Addition of fluoride to the municipal water supply, known as fluoridation, is able to help in reducing and preventing dental caries.

But this is not true because those who take continued ingestion of fluoride may suffer from mottling of teeth (excess fluoride in teeth), increased density of bones, gastric problems, muscular weakness and even heart failure.

When a fluoride salt or solution is taken internally, it is readily absorbed, transported and deposited in the bone or developing teeth and the remaining gets excreted by kidneys. The deposited fluoride does not allow the action of acids or enzymes in producing lesions.

A small quantity of fluoride (1ppm) is necessary to prevent caries. But when its amount becomes high it gives rise to mottled enamel.

Fluoride is administered by 2 routes

- i. Orally
- ii. Topically.

The use of fluoridation is the way of oral administration. Alternatively it can be given in drinking water or juice of about 1ppm per day. Sodium fluoride tablets or sodium fluoride in a dose of 2.2mg per day are used. Topically 2% of solution is used on teeth



# Calcium carbonate (CaCO<sub>3</sub>)

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It is the most abundant and widely distributed calcium salts. It occurs as chalk, marble, calcite, corals, pearls. It is prepared by precipitation by mixing the boiling solutions of calcium chloride and sodium carbonate and allowing the precipitation to cool.



Properties- it is a fine white crystalline powder, odourless, tasteless, stable in air, insoluble in water. It is also insoluble in alcohol but dissolves in most common dilute acids.

It furnishes both abrasive and antacid effect in the mouth. The precipitated calcium carbonate when dried at 200°C for 4hrs is having calcium equivalent to not less than 98% of calcium carbonate.

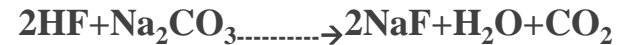
The preparation is used externally as a dentifrice because of its abrasive quality because of its crystalline nature. Calcium carbonate is used as a dental cleaning-polishing agent for most tooth paste and powders.

It is incompatible with fluoride salts because it forms insoluble calcium fluoride.

# Sodium fluoride (NaF)

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**Preparation-** it may be prepared by neutralising HF with sodium bicarbonate



Double decomposition of calcium fluoride with sodium carbonate where insoluble calcium carbonate can be removed by filtration



**Properties-**

It forms colourless, odourless crystals or as white powder. It is soluble in water but is insoluble in alcohol. Its aqueous solution corrodes ordinary glass bottles and hence the solution should be prepared in distilled water and stored in dark, pyrex bottles.

**Uses-**

It is used in dental practice for retarding or preventing dental caries. A 2% solution of sodium fluoride in water may be applied to childrens' teeth after preliminary cleaning.

It is a constituent of some insecticides.

Dose-2.2mg once a day

# Cements and fillers

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Dental cements are used to temporarily cover protect areas that have undergone operation as in dental surgery.

The cementing material is applied as a paste which gets hardened in a short while it can be removed by the dentist.

The temporary cement is also medicated usually with eugenol which is antiseptic and local anaesthetic.

The consistency of the cement can be controlled by additives. Noble metals and their alloys are used as permanent filling materials for cavities. Gold and silver find use as permanent filling materials.

# Zinc oxide eugenol

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It is considered as the best cementing material in dental practice.

When zinc oxide is made to mix with a strong solution of zinc chloride, it yields a mass which hardens within a short time which forms zinc oxychloride.

A similar product can also be prepared by mixing zinc oxide with phosphoric acid resulting zinc oxyphosphate cement. Medicated cements can be prepared by adding suitable amounts eugenol or clove oil. This is used for temporary filling

