
Don’t eat your
toothpaste !

"Don't eat the toothpaste", is a warning most of us have heard whether it is from a grandparent or parent. Have you stopped to think what is the reason for this warning? Most kids would say they do not do it. However, it is the sweet taste or a little of the mint flavour that tempts any youngster to swallow a bit of the toothpaste.

What is it that makes you want to taste the toothpaste?

• It may be some ingredient which acts as a mouth freshner – mint or clove

• The visual impact of the product – a bright coloured gel on a bright coloured brush which helps to liven the brushing experience

It is often recommended to brush our teeth twice a day, but most people whom I know brush their teeth, first thing in the morning, but never before going to bed.

The bed coffee, wherein one has the privilege of sipping the coffee in bed just after waking up without brushing the teeth is considered an indulgence or privilege by many!!

When so much fuss is being made about the toothpaste you use, and the type of brush you use, the most important aspects, which are right brushing technique, the duration and the frequency of brushing , are often compromised.

A study reveals that an average Indian brushes his teeth once a day, for 20 seconds, when the recommended duration is 2 minutes and twice a day. Needless to say, he is nowhere close to the right brushing technique.

What is Toothpaste?

Toothpaste is a paste or gel dentifrice used with a toothbrush as an accessory to clean and maintain the aesthetics and health of teeth

HISTORY OF TOOTHPASTE

Toothpaste has a history that stretches back nearly 4,000 years. Until the mid-nineteenth century, abrasives used to clean teeth did not resemble modern toothpastes. People were primarily concerned with cleaning stains from their teeth and used harsh, sometimes toxic ingredients to meet that goal.

In the middle Ages, fine sand and pumice were the primary ingredients in teeth-cleaning formulas used by Arabs who realized that using such harsh abrasives harmed the enamel of the teeth. Concurrently, however, Europeans used strong acids to lift stains. In Western cultures, similarly corrosive mixtures were widely used until the twentieth century. Table salt was also used to clean teeth.

A Miswak is a twig which a majority of people from Muslim countries use daily to brush their teeth. Although it might sound outdated to use twigs from trees for cleaning your teeth, studies conducted on the Miswak prove otherwise.

Studies have inferred that Miswak is better than toothpaste for preventing gum disease. It is known as chewing stick in the western world and is being looked upon as a form of alternative medicine.

A few important benefits of Miswak
- Kills Gum disease causing bacteria.
- Fights plaque effectively.
- Fights against caries.
- Removes Bad breath and odor from mouth.
- Creates a fragrance in the mouth.
- Effectively cleans between teeth due to its parallel bristles.
- Increases salivation and hence inhibits dry mouth

Development of Toothpaste:
Modern toothpaste was invented to aid the removal of foreign particles and food substances, as well as for cleaning the teeth. When originally marketed to consumers, toothpaste was packaged in jars. Chalk was commonly used as the abrasive in the early part of the twentieth century.

The next big milestone in toothpaste development happened in the mid-twentieth century (1940-60). After studies proved that fluoride aided in protection from tooth decay, many toothpastes were reformulated to include sodium fluoride. Fluoride's effectiveness was not universally accepted. Some consumers wanted fluoride-free toothpaste, as well as artificial sweetener-free toothpaste. The most commonly used artificial sweetener is saccharin.

Many of the innovations in toothpaste after the fluoride breakthrough involved the addition of ingredients with "special" abilities for toothpastes and toothpaste packaging. In the 1980s, tartar control became the buzzword in the dentifrice industry. Tarter control toothpastes claimed they could control tartar build-up around teeth. In the 1990s, toothpaste for sensitive teeth was introduced. Bicarbonate of soda and other ingredients were also added in the 1990s with claims of aiding in tartar removal and promoting healthy gums.

A few dental terms explained

Dentifrice – A paste , powder or gel used to clean the teeth

Caries – Cavity or decay of the teeth

Gingivitis- Early gum disease, marked by inflammation and bleeding.

Plaque - A soft, sticky, readily removable substance composed of bacteria and their by products that accumulate on the teeth.

Tartar- Plaque that has hardened over time. It's what the dentist scrapes off during a cleaning.

Abrasive – Harsh and rough material used for cleaning

Whitening- With toothpastes, this generally means stain removal, not lightening the base colour of teeth.

Re-mineralising- Minerals are returned to the teeth.

Binders - Thickens toothpastes and prevents separation of the solid and liquid components, especially during storage

Sudsers- Foaming agents, help in removing particles from teeth.

Humectants- Retain water to maintain the paste consistency of the toothpaste

Fluorides – Fluorine containing compounds that reduce decay by increasing the strength of teeth.

Desensitizing - Reduces the hypersensitivity.

MAIN INGREDIENTS OF TOOTHPASTE

Toothpaste contains the following ingredients: *(1)* Binders, *(2)* abrasives, *(3)* sudsers, *(4)* humectants, *(5)* flavors *(*unique additives*)*, *(6)* sweeteners, *(7)* fluorides, *(8)* tooth whiteners, *(9)* a preservative, *(10)* water, and *(11)* colouring agents. In addition, they also contain special ingredients like *(a)* desensitizing agents, *(b)* anti plaque agents, *(c)* anti-tartar ingredients, *(d)* remineralizing and herbal agents

CLASSIFICATION OF TOOTHPASTE

Depending on how one defines toothpastes, there are currently as many as 9 to 12 separate categories from which a patient can choose toothpastes – toothpastes with whitening or gingivitis toothpastes with caries protection or baking soda toothpastes with peroxide for gum care.

1.Caries prevention–cavity protection

2.Anti-tartar activity *(*reduction of calculus formation*)*

3.Gingivitis reduction

4 Plaque formation reduction

5 Re-mineralizing–calcium-phosphate-fluoride containing

6.Cosmetic effect–tooth whitening, stain removal

7.Reduction in tooth sensitivity

8.Multi-care toothpastes

9.Natural toothpaste also called as Herbal toothpaste–natural ingredients

10.Toothpastes for patients with dry mouth

FUNCTIONS OF TOOTHPASTE

- Reduces plaque build up
- Anti caries action
- Removal of extrinsic stains
- Mouth freshener

Toothpastes are effective in removing extrinsic*(*caused externally*)* stains, those that occur on the surface of the tooth. These stains, which are often the end products of bacterial metabolism, range in colour from green to yellow to black. Stains may also result from foods, coffee, tea, cola-containing drinks, red wines, tonics, and medicines.

Comparative testing

Comparative Testing is a formal process by which different brands of a product category are tested for Quality, for conformance to the minimum standards laid down by Bureau of Indian Standards. Such a test also reveals, if a particular tested brand exceeds such minimum standards, whether there can be potential health and safety hazards and verification of special claims by manufacturers, if any. The results for all the tested brands are published in a Comparative Test Report which would provide consumers information to make an informed choice.

CONCERT has undertaken this project of Comparative Testing for Southern Region under a grant from Department of Consumer Affairs, Government of India. In the first year, Concert will be testing 7 products

and 3 services. One of the products selected for testing is the tooth paste.

Selection of Brands for Comparative Testing

The toothpastes in three categories were tested. Gel, opaque and herbal

Under each category the following brands were tested.

GEL:

COLGATE Max Fresh with cooling crystals (Spicy fresh)

CLOSE UP Active Gel Menthol Chill

CLOSE UP Fire Freeze

HERBAL:

HIMALAYA Herbals

DABUR MESWAK Non fluorinated

K.P.N AMBOODIRI

OPAQUE:

PEPSODENT Germi Check plus whitening

COLGATE Total Clean Mint

COLGATE Sensitive Pro Relief

COLGATE Active Salt

The tests were carried out as per BIS Standards in a NABL accredited Laboratory.

CRITERIA TESTED

PACKAGING AND LABELLING

Packaging:

Packaging and labelling have increasingly gained popularity as competitive marketing weapons. In the present day of crowded retail shelves, packaging designs must be crafted to cut through such clutter, differentiate brands from competitive offerings, and stimulate the desire to purchase. Packaging and labelling act as the silent salesmen, influencing the consumer to buy a particular product.

Advertising and packaging claims made by toothpastes are based upon their ingredients. When a therapeutic claim is made by a toothpaste, e.g., reducing caries, desensitizing teeth or for the treatment of gingivitis, it must be substantiated using controlled research studies to make this claim.

Toothpaste shall be packaged in containers that shall neither show defects nor contaminate the toothpaste during the normal shelf life of the product. The containers shall be further packed in individual carton boxes or other protective materials.

Labelling:

A complete label should contain the following:

a) Name of the toothpaste and registered trademark if any.

b) Name, in chemical nomenclature, of any ingredient for which special therapeutic claims are made together with the concentration present in the toothpaste

c) Name, in chemical nomenclature, of any ingredient, together with

the concentration present in the toothpaste

d) Nominal volume of contents or weight of contents

e) Lot/ batch (in Code or number)

f) Name and address of manufacturer

g) In the case of fluoridated toothpaste, the words "FLUORIDATED TOOTHPASTE" shall be given in letters of height at least 3 mm in a colour which affords a distinct contrast with the background and the levels.

h) Manufacturing date and expiry date (year, month, day)

i) Storage conditions

j) Country of origin (if imported)

k) Instructions for use on outer container or inserted paper

l) MRP- Maximum retail price.

PHYSICAL (QUALITY) PARAMETERS

(a) Fineness:

Fineness denotes the size of the abrasive particle used in the toothpaste formulation. The abrasives are insoluble organic salts that enhance the abrasive action of tooth brushing as much as 40 times. The effectiveness depends on the inherent hardness of the abrasive, the size of the abrasive particle and shape of the particle. Several other variables can also affect the abrasive potential of the dentifrice: brushing technique, pressure on the brush, hardness of the bristles, direction of the strokes, and number of strokes.

In practice, most abrasives will remove plaque without removing significant amounts of enamel.

When choosing toothpaste, the dental professional needs to understand how the hardness of the abrasive can have a direct effect on the tooth surfaces. For patients needing toothpaste to remove plaque, stain and for whitening, the abrasive particle in the toothpaste plays an important role.

(b) Foaming Power:

Foaming power refers to the ability of toothpaste to create foam. Foaming is created by detergents that are put in toothpaste that cause the bubbling action and suds-like action in toothpastes

As toothpastes containing strongly foaming surface active detergents, soften the gums by dissolving important substances out of the cells and, on the other hand, promoting the penetration of dissolved substances, it is of advantage to use only non-foaming surface active substances in the toothpaste.

(c) Spreadability:

Spreadability was another characteristic of toothpaste that was considered. It characterizes the consistency of paste. The toothpaste should be of homogenous (uniform) mixture and should not separate in to liquid and solid ingredients.

SAFETY AND HEALTH

(a) pH of aqueous suspension:
An alkaline pH greater than 7 is preferred since it helps in neutralizing the pH changes in the mouth, thereby causing preventing caries. Acidic toothpaste will only worsen the oral environment making it conducivee for the acid uric bacteria to act on thereby causing caries.

(b) Heavy Metals such as Lead (less than 2 ppm) and Arsenic (less than 20 ppm) ppm- (parts per million)

(c) Available Fluoride Ion

The therapeutic claim by toothpastes that have fluoride to help prevent dental caries is well proven and accepted.

Fluoride Ion must be available in the amount of 1000 to 1100 parts per million (ppm) to achieve caries reduction effects (as per a dentifrice research article). However, in India

BRAND NAME / PARAMETER	PACKAGING & LABELLING		PHYSICAL	
GEL	Score	Rating	Score	Rating
Colgate Max Fresh	21	Good	12	Good
Closeup Fire – Freeze	21	Good	12	Good
Closeup Active Gel Menthol chill	21	Good	12	Good
OPAQUE				
Pepsodent Germi check Whitening	21	Good	12	Good
Sensodyne fresh mint with fluoride	21	Good	12	Good
Colgate Total Clean Mint	21	Good	12	Good
Colgate Sensitive Pro-Relief	21	Good	12	Good
Colgate Active Salt	21	Good	12	Good
HERBAL				
K.P. Namboodiri's (Ayurvedic Toothpaste)	21	Good	12	Good
Himalaya Herbals	21	Good	12	Good
Dabur Meswak Non-fluorinated	21	Good	12	Good

Each criterion and parameter is rated individually on a 5-point scale. The rating given is 1 (Poor), 2 (Fair), Any parameter, which in our tests meets the defined standards it is given the scoring of Good. When it We present the results against these criteria, which in our opinion is fair and without any subjective decisions based on their requirements and judgment.

the Drug and Cosmetic Act, 1940 and Rules, 1945 stipulate 1000 ppm as the max permissible limit

Fluorides reduce decay by increasing the strength of teeth. Sodium fluoride is the most commonly used fluoride. Other common fluorides in toothpastes include stannous fluoride and sodium monophosphate fluoride. Fluoride's primary action is to be incorporated into the tooth substrate (enamel and dentin) making the tooth more resistant to acid attack by carcinogenic bacteria. Fluoride is also bactericidal and has additional antiplaque effects.

(d) Microbiological examination- Tested for the presence of disease causing microbes.

PRICE - MRP (Maximum retail Price) per unit weight is tabulated. It is not used for rating the product.

The result is tabulated below:

SAFETY AND HEALTH		Total Score*	PRICE (MRP in Rs)		COST in per (100 Grams)
Score	Rating		Grams	Rs	
22	Good	55	80	35	43.75 (Regular)
22	Good	55	80	35	43.75 (Regular)
21	Fair	4	80	33	41.25 (Regular)
22	Very Good	55	80	35	43.75 (Regular)
1	Good	54	80	80	100 (Value Added)
21	Good	54	75	40	45.3 (Regular)
21	Good	54	80	120	150 (Value Added)
20	Fair	53	100	40	40 (Economy)
21	Very Good	54	50	15	30 (Economy)
19	Good	52	100	40	40 (Economy)
17	Fair	50	200	65	32.5 (Economy)

3 (Good), 4 (Very Good), and 5 (Excellent).
exceeds the standards significantly and shows appreciable innovation it is rated as Excellent.
element. The consumers are encouraged to study these results and make their buying

The special claim by the manufacturer was assessed by our Consultant Orthodontist, Dr. Issa Fathima Jasmine.

An evaluation was carried out by her for three weeks, on 90 patients who participated in a survey. They were divided into groups of 30 each, all having the same problem or dental condition.

Bad Breath, Sensitivity and Removal of Dental Plaque were the conditions (Problems) chosen for the evaluation and a questionnaire was given to each one of the patients, to record their experiences (with the use of the given toothpaste) in getting relief for the current problems (or dental conditions) that they have.

BRANDS USED FOR PATIENT – DENTIST EVALUATION

The claims verified are (1) Bad Breath and Freshness, (2) Sensitivity, and (3) Effective Plaque Removal.

BAD BREATH:
1.COLGATE Max Fresh with cooling crystals (Spicy fresh)
2.CLOSE UP Fire Freeze

SENSITIVITY:
1.COLGATE Sensitive Pro Relief
2.SENSODYNE fresh mint with fluoride

PLAQUE REMOVAL/WHITENING:
1.PEPSODENT Germi Check plus whitening
2.COLGATE Total Clean Mint

Patient - Dentist Evaluation Results

CLAIM	BRAND NAME
BAD BREATH	COLGATE Max Fresh with cooling crystals (Spicy fresh)
	CLOSE UP Fire Freeze
SENSITI-VITY	COLGATE Sensitive Pro Relief
	SENSODYNE fresh mint with fluoride
PLAQUE REMOVAL/ WHITE-NING	PEPSODENT Germi Check plus whitening
	COLGATE Total Clean Mint

OBSERVATION

All 15 patients who participated in this survey gave a positive response. They all found great improvement after using this toothpaste. They revealed that it took 17 days on an average to get relief. The patients were extremely satisfied and they said they would recommend this paste to their relatives and friends.

Overall Score: 128/150

All 15 patients participated in this survey gave a positive responses. They all found great improvement after using this toothpaste. They revealed that it took 17 days on an average to get relief. The patients were extremely satisfied and they said they would recommend this paste to their relatives and friends.

Overall Score: 128/150

All 15 patients who participated in this survey gave a positive response. They all found great improvement after using this toothpaste. They revealed that it took 14 days on an average to get relief. The patients were extremely satisfied and they said they would recommend this paste to their relatives and friends.

Overall Score: 142/150

13 out of 15 patients participated in this survey gave a negative response. They found no improvement after using this toothpaste. They suggested using clove was a better option than this toothpaste. Sensitivity to cold persisted even after using this toothpaste for 3 weeks. The patients were not satisfied and they said they would not recommend this paste to their relatives and friends. Only 2 patients found relief after using this toothpaste and said they would recommend this to their friends/relatives and it took 18 days to obtain relief.

Overall Score: 58/150

10 out of 15 patients participated in this survey gave a positive response. They found improvement after using this toothpaste. It took 19 days to obtain relief. The patients were satisfied and they said they would recommend this paste to their relatives and friends. 5 patients did not find relief after using this toothpaste and said they would not recommend this to their friends/relatives and they felt the fragrance was not retained for a long time.

Overall Score: 106/150

13 out of 15 patients participated in this survey gave a positive response. They found improvement after using this toothpaste. It took 18 days to obtain relief. The patients were satisfied and they said they would recommend this paste to their relatives and friends. 2 patients did not find relief after using this toothpaste and said they would not recommend this to their friends/relatives and they felt the fragrance was not retained for a long time.

Overall Score: 111/150

BRAND	CLAIM	FLUORIDE in ppm	SLS	VEG LOGO	SILICA Hydrated
Colgate Max Fresh	Prevents tooth decay Foaming fluoridated	787	present	present	present
Closeup Active gel menthol chill	Foaming fluoridated	999.7	present	present	present
Closeup Fire freeze	Foaming fluoridated	999.95	present	present	present
Pepsodent Germin check plus whitening	Fights germs Whiter teeth in two Weeks Foaming fluoridated	783	present	present	present
Colgate total	Foaming fluoridated Complete 12 hr Pro-tection.	617		present	
Colgate Senstive Pro relief	Foaming fluoridated Rapid and long lasting relief from sensitivity	916			
Colgate Active Salt	Foaming fluoridated	326		present	
Sensodyne fresh Mint	Foaming fluoridated Relief and daily prote-ction to sensitivity	1000		present	
Dabur Meswak	Non Fluoridated Foaming Herbal extract Complete oral care	398.61			

Dabur Meswak contains 398.61 ppm of fluoride ion though it claims to be non Flouridated toothpaste.

OTHERS

To prevent tooth decay the tooth paste must contain 1000ppm fluoride ions.

SLS – Sodium lauryl Sulfate used as foaming agent – Can irritate gums, ingested in higher concentration can be harmful to liver and Kidney

Cfu/gm - Colony forming units per gram.

Hydrated Silica is used as a whitener and abrasive. It can damage gums. Patients with gum disease, tooth decay and sensitivity and receding gums should avoid it.

Vegetarian logo – It is misleading as all the ingredients present is not of plant origin

Choosing a tooth paste

- ✓ Pick a product that cleans well.
- ✓ Consider a product claiming plaque or tartar control if needed.
- ✓ Consider a gentle toothpaste in special cases.
- ✓ Go for fluoride. Some evidence suggests that even adults with healthy teeth can benefit from them.
- ✓ For sensitive teeth, seek specially formulated toothpaste.
- ✓ Don't worry about the sweeteners. Research has found no danger from ingesting the sweeteners in up to four diet sodas a day, let alone the tiny quantities you might swallow in toothpaste. "It would take about three months of brushing to get the amount you'd put in just one cup of coffee,"

We'll let you decide whether or not you want to go for the fluoride, but as for the rest of the ingredients, we urge you to shop for brands that do not contain SLS, silica, triclosan, and lead—especially if you're going through radiation or chemotherapy.

1200cfu/gm
Standard
1000cfu/gm

Tips for cleaner teeth

Whichever brand of toothbrush, toothpaste, or floss you choose, using proper brushing and flossing techniques is critical for adequately removing plaque, which causes cavities and gum disease.

Brush up on brushing

What to use: Choose a brush with soft or medium bristles, which are gentler on the gums and may clean better because they're more flexible. The brush design does not appear to influence effectiveness, so choose any one you like.

How often: Brush twice a day, 2 minutes each time. And rinse your mouth after sugary or starchy snacks.

How to brush: Hold the brush with the bristles angled 45 degrees toward the gum line, so one row of bristle tips can slip slightly under the gums. Jiggle the brush head with a short, vibrating motion, then move on to the next spot. Finally, scrub the chewing surfaces.

Brush gently to avoid harming the gums; removing plaque doesn't require much pressure. Brush both the outer and inner surfaces of your teeth and the tops of molars. Brush your tongue, too, to remove bacteria and freshen breath.

Flossing fundamentals

What to use: All flosses clean effectively. But if you find flossing uncomfortable, consider a slippery one like Glide.

How often: Floss once a day to remove plaque and food particles your brush can't reach.

How to floss: Break off about 18 inches of floss and wind most of it around a finger; wind the rest around the same finger on your other hand. Use a careful sawing motion to slide the floss between your teeth down or up to the gum line; then gently move the thread slightly under the gums. Next, curve it into a "C" shape against the side of one tooth and sweep it up and down. Repeat for both sides of each tooth, unwinding clean floss from the first hand.

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