



# MECHANICAL PLAQUE CONTROL

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- Microbial plaque is the major etiology of periodontal diseases
- Plaque control is the regular removal of microbial plaque and the prevention of its accumulation on the teeth and adjacent gingival surfaces.
- Patient cooperation in daily plaque removal is critical to long-term success of all periodontal health.

- In 1965 - Loe et al conducted the study on relationship between plaque accumulation and the development of experimental gingivitis in Humans by stopping of brushing and other plaque control procedures, resulting in the development of gingivitis in every person within 7 to 21 days.

# Plaque control

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graph TD; A[Plaque control] --> B[Mechanical method]; A --> C[Chemical method];
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Mechanical method

Chemical method

# Mechanical method

- Tooth brushes:
  - ❖ Manual toothbrush
  - ❖ Powered toothbrush
  - ❖ Sonic toothbrush
  - ❖ Ionic toothbrush



- Interdental cleansing aids:
  - Dental floss
  - Interdental toothbrush
  - Wooden or rubber tips
- Aids for gingival stimulation:
  - Gingival massage
  - Oral irrigation
- Others:
  - Tongue scrapers
  - Gauze strips

## Chemical plaque control:

- FIRST GENERATION:  
Eg: antibiotics, phenol, quaternary ammonium compounds & sanguinar
- SECOND GENERATION:  
Eg: Bisbiguanides (chlorhexidine)
- THIRD GENERATION:  
Eg: delmopinol





# HISTORY:

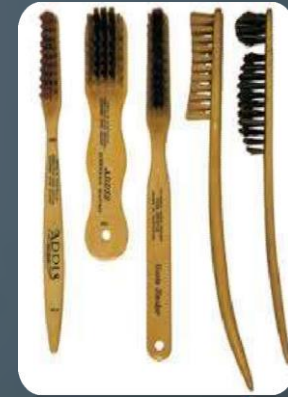
- In 1600 BC - Chinese used Chewstick as tooth brush
- In 460-377BC – Hippocrates recommended removing deposits from teeth by means of wool ball soaked in honey.
- First bristle toothbrush was introduced by Chinese in sixteenth century using soft horsehair or feathers.



- William Addis (1780) designed modern toothbrush by carving the handle of the toothbrush with cattle bone and swine bristles.

- H. N. Wadsworth in 1857 – First person to patent the toothbrush

- DuPont de Nemours in 24 FEB, 1938 – First nylon bristle toothbrush.



## MANUAL TOOTHBRUSH:

According to American Dental Association Council on Dental Therapeutics 'The toothbrush is designed primarily to promote cleanliness of teeth & oral cavity.'





## ADA specification:

- Length of the brushing surface - 1 – 1 ½ inches (25.4 – 31.8 mm)
- Width of the brushing surface – 5/16 – 3/8 inches (7.9 – 9.5 mm)
- Rows of bristles - 2 – 4.
- Tufts per row - 5 – 12
- Bristles per tuft - 80 – 86.



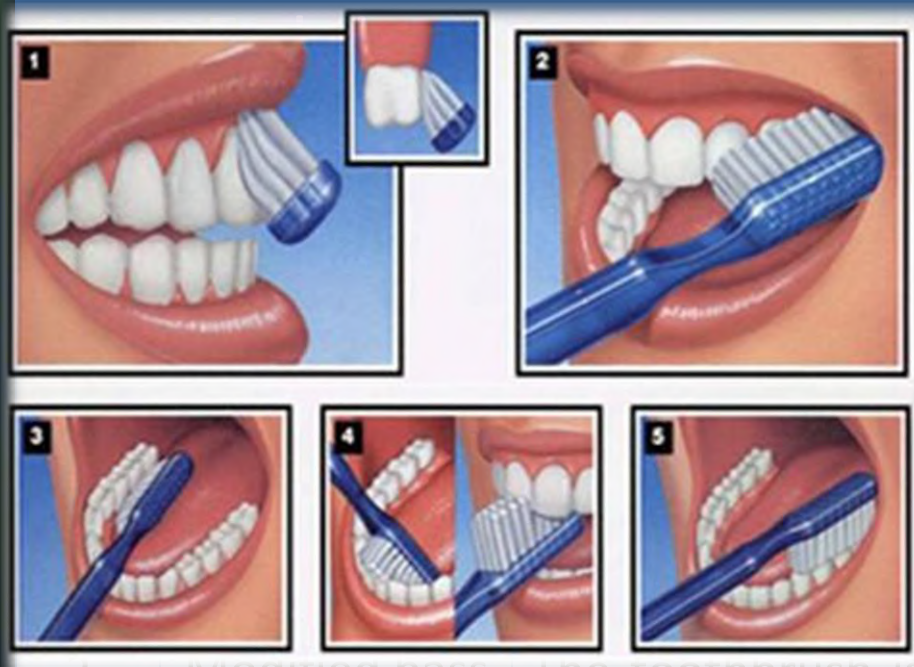
Hardness: Depends on material, diameter and length.

Nylon bristles are more flexible.

- **Soft:** 0.007 inches to 0.009 inches(0.2 mm)
- **Medium:** 0.010 inches to 0.012 inches(0.3 mm)
- **Hard:** 0.013 inches to 0.014 inches(0.4 mm)
- **Extra hard:** 0.015 inches



# BRUSHING TECHNIQUES



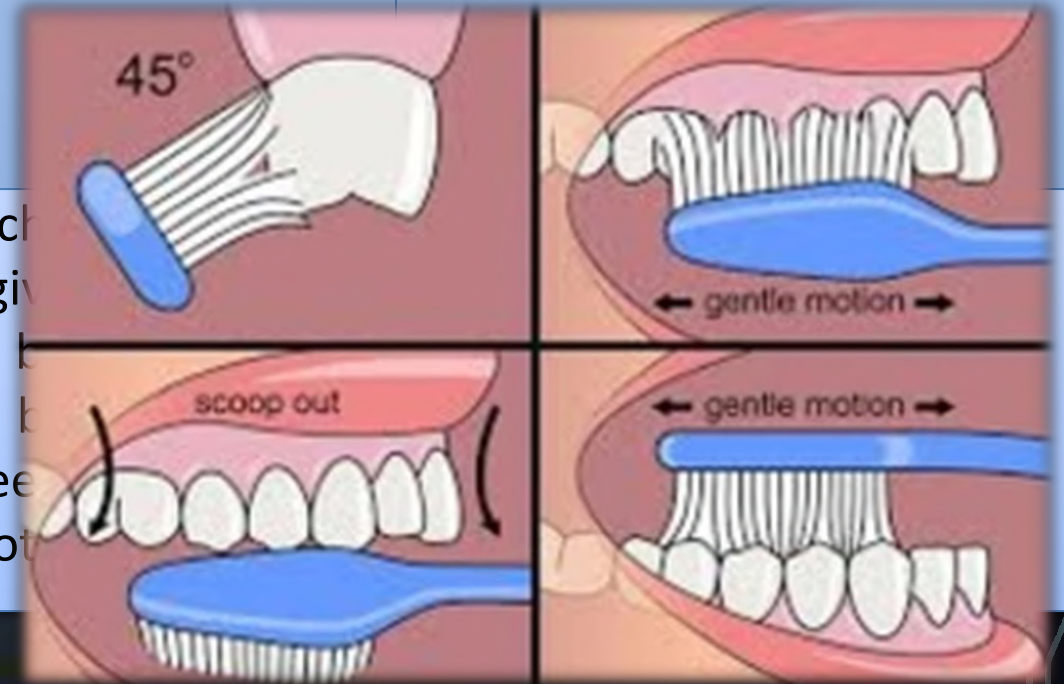
## Method

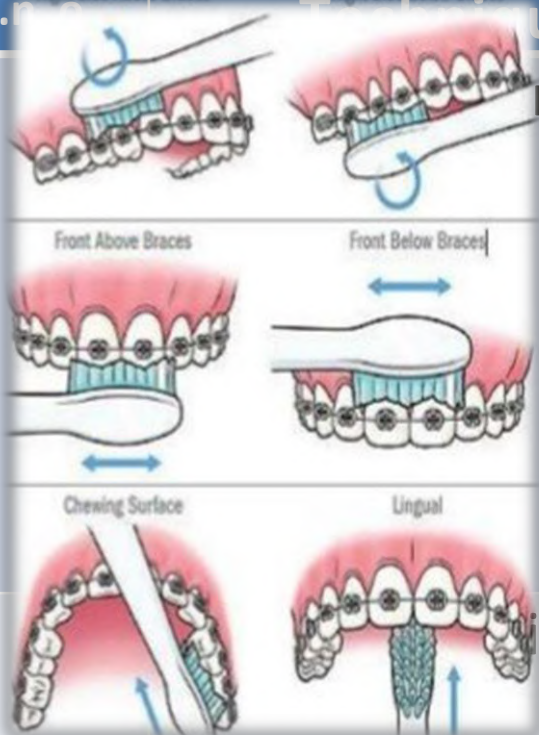

usually at a 45° angle to tooth, 3 teeth at a vibratory pressure using forth motions.

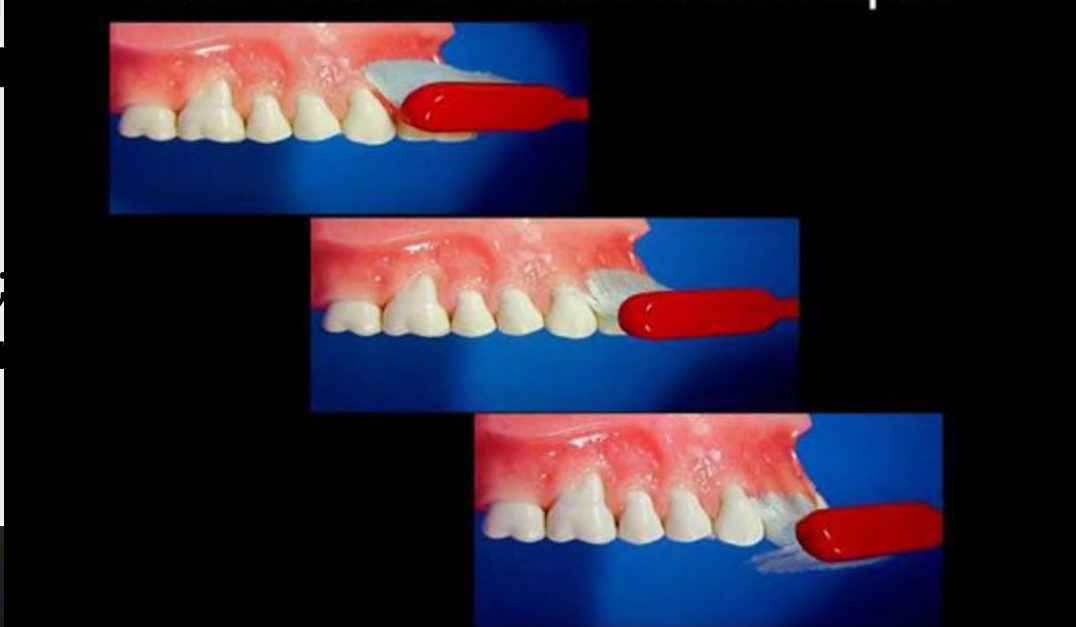
## Indications

- Sulcular cleansing
- Periodontal maintenance

2. Modified bass The toothbrush is held in such bristles are at 45° to the gingiva gently vibrated by moving the back & forth motion. • The swept over the sides of the teeth occlusal surfaces in a single motion



S.	Technique	Method	Indications
3		<p>Bristles are placed at an angle of 45° to the gingiva with the bristles directed coronally. The bristles are activated by mild vibratory strokes with the bristle ends lying interproximally.</p>	<ul style="list-style-type: none"> <li>• Orthodontics</li> <li>• Temporary cleaning of surgical site</li> </ul>
4		<p>Directed apically &amp; angle similar to Bass method placed partly on cervical portion of teeth and on adjacent gingiva; back&amp;forth vibratory &amp; moved occlusally pressure.</p>	<ul style="list-style-type: none"> <li>• Progressive gingival</li> </ul>



# POWERED TOOTHBRUSHES

- They were introduced in 1939.
- Powered toothbrushes are recommended for:
  1. Individuals lacking fine motor skills.
  2. Small children or handicapped or hospitalized patients
  3. Patients with orthodontic appliances.
  4. Patients who prefer them.





Various types of motions used in powered toothbrushes are:

1. Reciprocal or back and forth.
2. Circular.
3. Elliptical or combination.



# Power v/s Manual :



- Biofilm removal & reduction of gingivitis
- Current power brushes move in speeds & motions that cannot be duplicated by manual brushes.
- Safety of powerbrushes as compared to manual-brushes has been well established.
- Self-included timers.

*McKendrick, A.J.W., et al. : A Two-year Comparison of Hand & Electric Toothbrushes, J.Periodontol. Res., 3,224,1968*



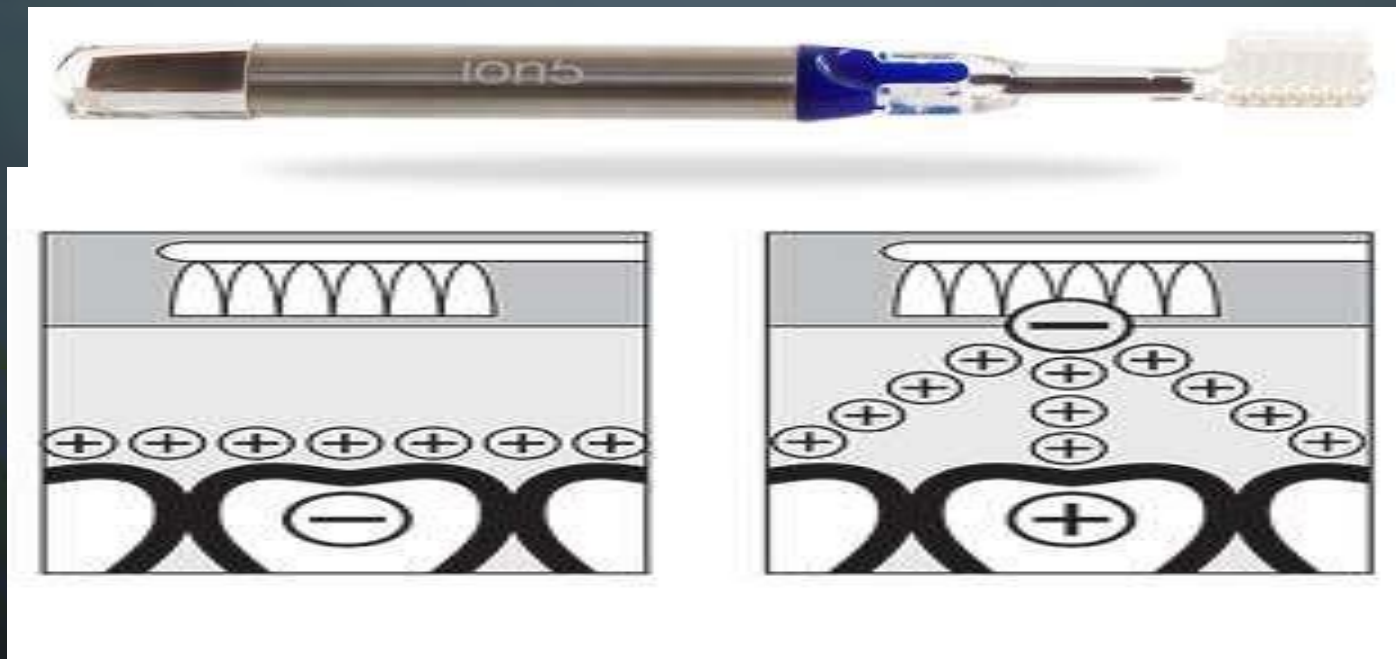
## Sonic Toothbrushes :

These types of toothbrushes produce high frequency vibrations (1.6MHz) which leads to the phenomenon of cavitation and acoustic microstreaming. This phenomenon aids in stain removal as well as disruption of the bacterial cell wall (bactericidal).



# Ionic Toothbrushes :

- Ionic toothbrushes change the surface charge of a tooth by an influx of positively charged ions.
- The plaque with a similar charge is thus repelled from the tooth surface & is attracted by the negatively charged brush.



- ✓ ADA recommendsthat individuals brush twice daily.
- ✓ tooth brushes should be replaced every 3-4 months.

## DENTIFRICES

- These are the aids for cleaning and polishing of teeth surfaces.
- They are used in the form of powders, pastes and gels.

Composition:

- **Abrasives:**  $\text{CaCO}_3$ ,  $\text{Ca}_3(\text{PO}_4)_2$
- **Humectants:** glycerine, sorbitol, mannitol, propylene glycol
- **Thickening agents:** sodium carboxy-methyl cellulose



- **Preservatives:** benzoic acid
- **Foaming agents:** sodium lauryl sulphate.
- **Flavoring and sweetening agents:** peppermint, saccharine, sorbitol, mannitol.
- **Desensitising agents:** sodium fluoride, potassium nitrate.
- **Anticaries agents:** sodium monofluorophosphate, sodium fluoride.
- **Anticalculus agents:** pyrophosphates or zinc compounds.



# INTERDENTAL CLEANING AIDS

- Toothbrush does not completely remove interdental plaque
- Dental floss and interdental cleaners such as wooden or plastic tips and interdental brushes.

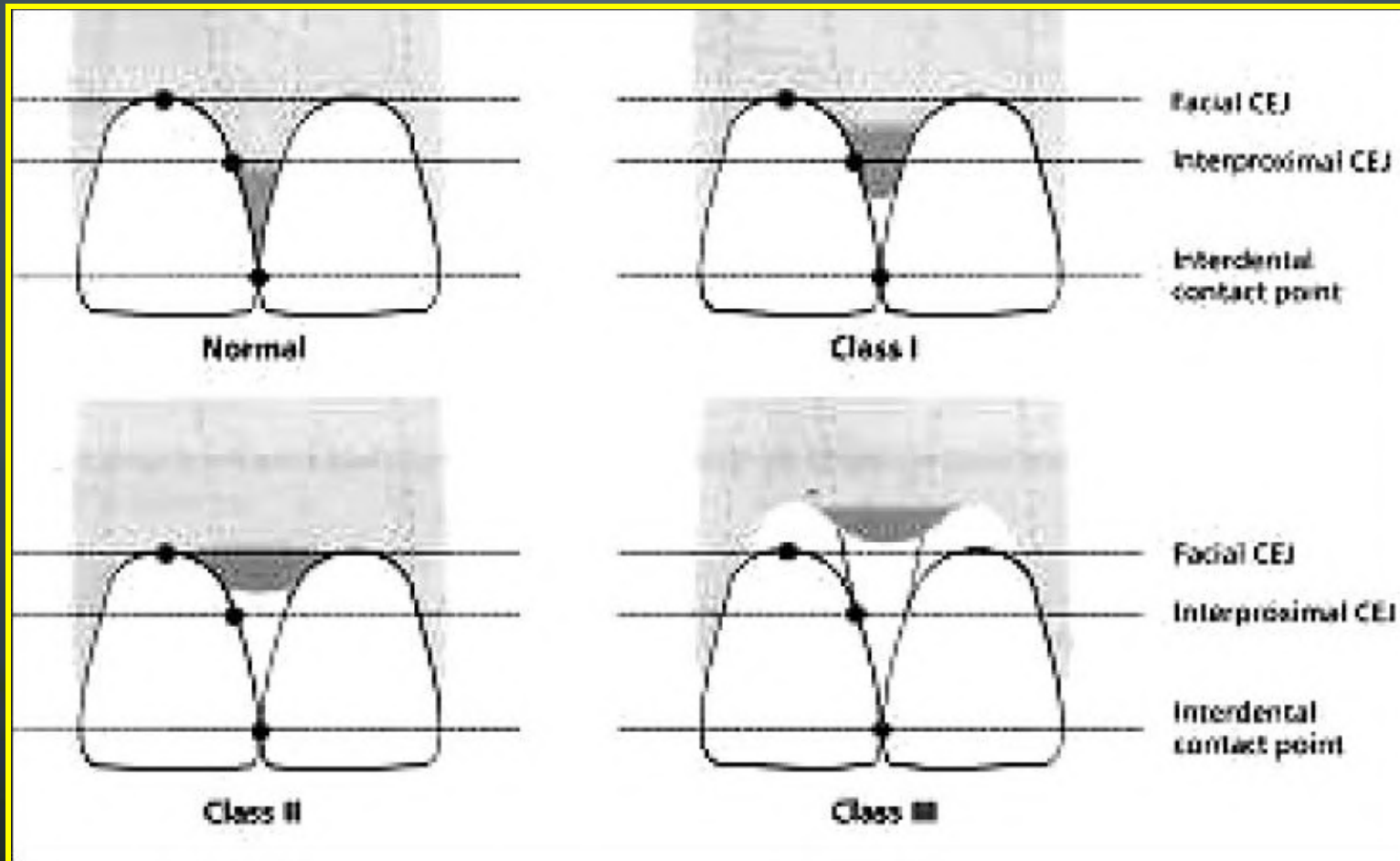
## *Nordland & Tarnow (1998)*

**Normal:** The interdental papilla occupies the entire embrasure space apical to the interdental contact point / area.

**Class I:** The tip of the interdental papilla is located between the interdental contact point and the level of the CEJ on the proximal surface of the tooth.

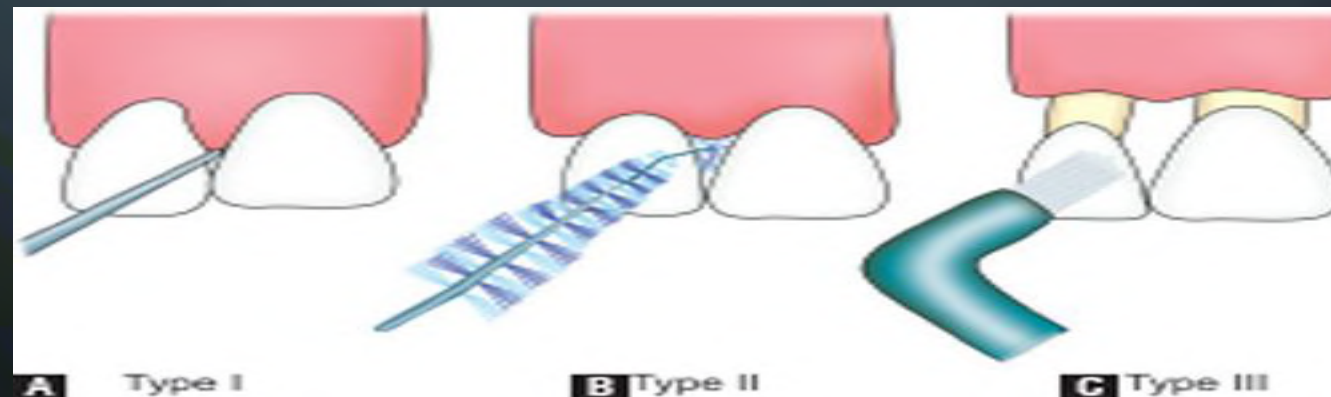
**Class II:** The tip of the interdental papilla is located at or apical to the level of the CEJ on the proximal surface of the tooth but coronal to the level of the CEJ mid-buccally.

**Class III:** The tip of the interdental papilla is located at or apical to the level of CEJ mid-buccally.



## Factors determining the selection of interdental aids:

- Type 1: The interdental papilla fills up the embrasure. **Dental floss** is advised
- Type 2: Moderate papillary recession, **miniature interdental brushes and wood tips** are recommended.
- Type 3: Complete loss of papilla (seen in diastema). **Unitufted brushes** are recommended.

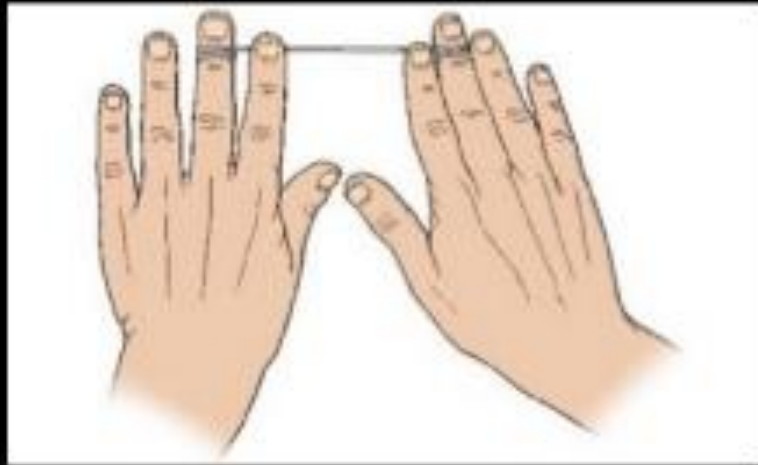




# DENTAL FLOSS

- Most commonly recommended method of removing plaque.
- Made from nylon filaments or plastic monofilaments, and can be waxed, unwaxed, thick, thin, and even flavored.
- Unwaxed floss is preferred over waxed.

## There are two common methods for flossing



“spool method”



“loop method”

**The Aim** for both methods is to clean area that can not reach with your toothbrush without damaging your gum .

# METHOD

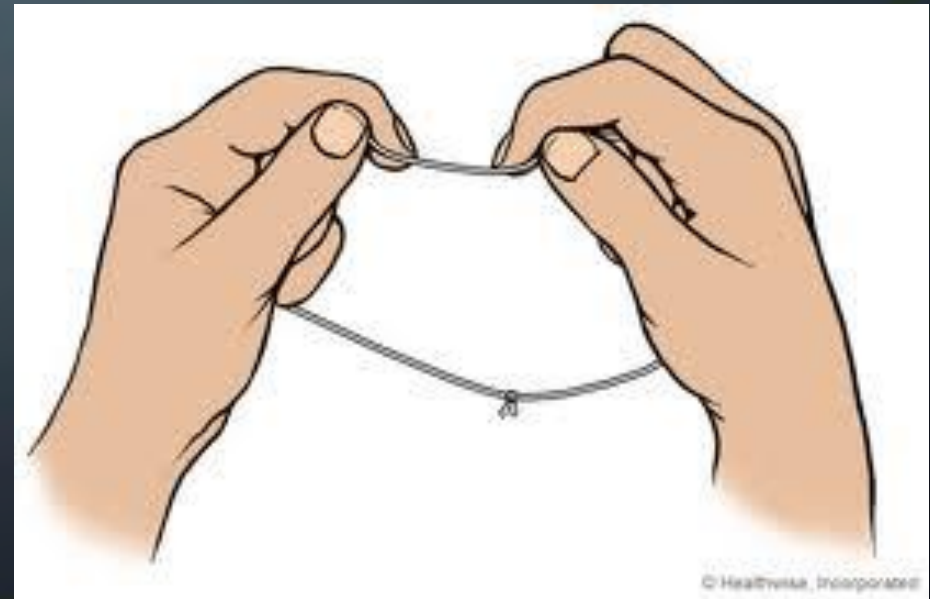
Spool method:

- 12-18 inches taken
- About 4 inches wound around middle finger
- 1-2 inches held tightly between index fingers.



## Loop method:

- Loop of floss is made about 12-18 inches with 3 knots.
- Passed through contact area, firm back and forth motion.
- Lack of dexterity, old age..





Floss holders are also available



# INTERDENTAL BRUSHES

- Interdental brushes are available in various sizes and shapes.
- Conical or tapered (like an ever- green tree)
- Designed to be inserted into a plastic, reusable handle that is angled to facilitate interproximal adaptation.
- Interproximal brushes are equal to or more effective than floss for plaque biofilm removal.

- Insert bristles into embrasure at a 90-degree angle to tooth surface (long axis of the tooth).
- Move brush using in and out motion from facial and/or lingual surfaces of appropriate area.



# WOODEN TIPS

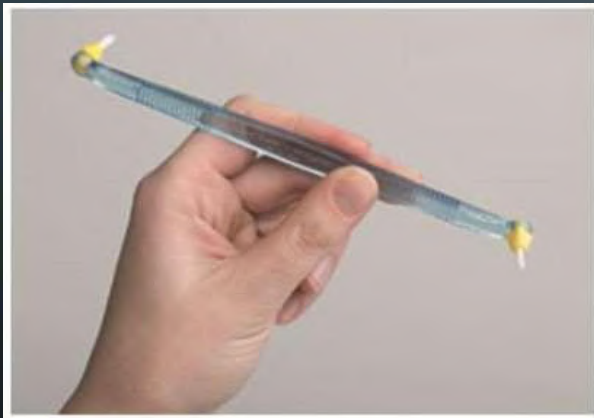
- Manufactured from orange wood
- Triangular in cross section.
- Base of the triangle oriented towards the gingiva
- Repeatedly moved in and out of the embrasure.
- Restricted to facial aspects of anterior teeth.





# UNITUFTED BRUSH

- Small brush with single, short tuft of bristles.
- Indicated in type 3 embrasures.
- Used with a rotatory motion similar to Bass technique.



# GINGIVAL MASSAGE

- Massaging the gingiva with a rubber tip or other device can lead to:

1. improved circulation
2. increased keratinization
3. epithelial thickening.



- Place side of rubber tip interdentally and slightly pointing coronally( $45^{\circ}$ ), Move in and out with a slow stroke, rubbing the tip against the teeth.

## Oral irrigation:

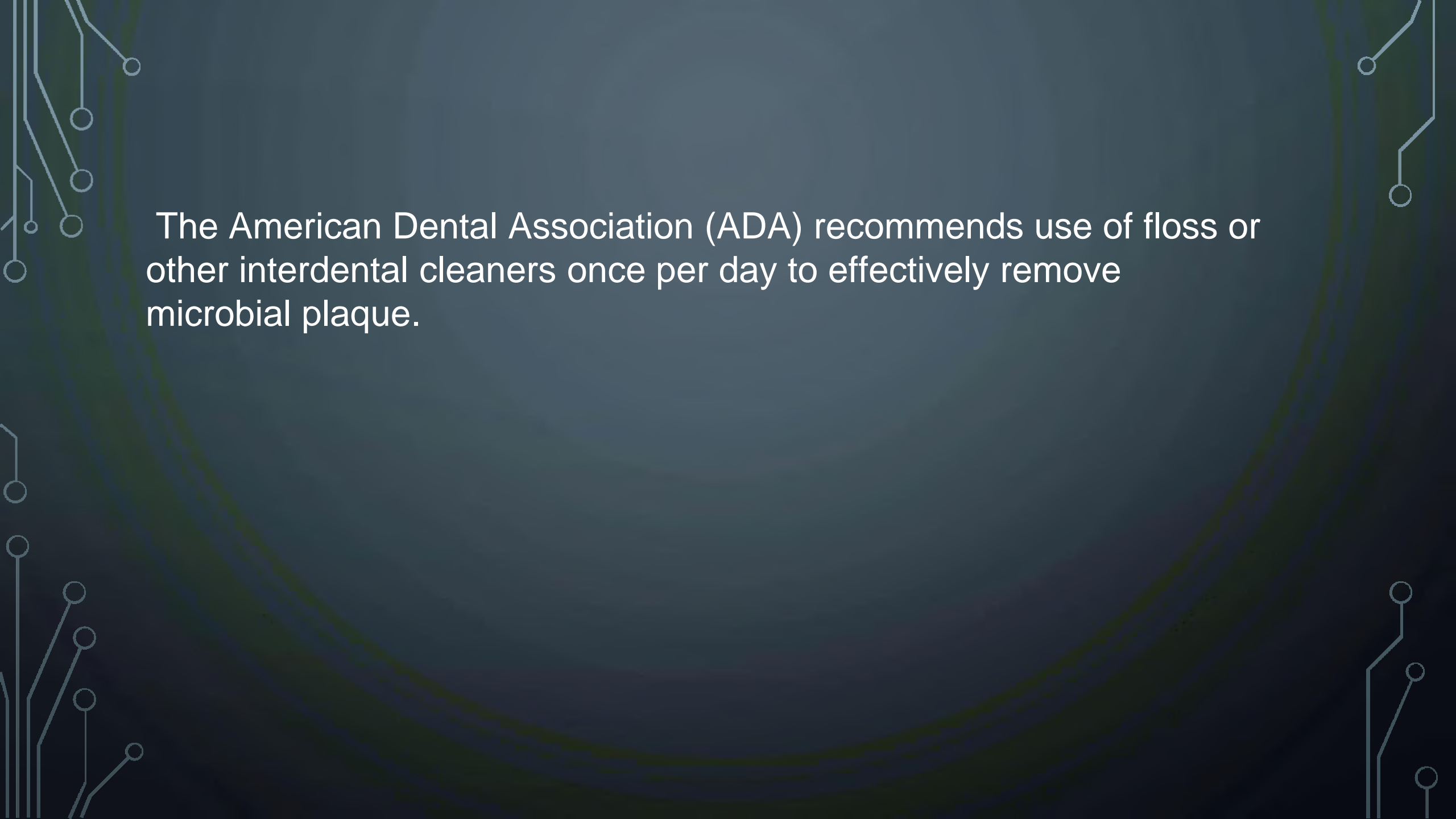
- Supragingival irrigation – plastic nozzle with 90-degree bend at the tip attached to a pump providing pulsating beads of water.
- Subgingival irrigation – soft rubber tip

# WATER IRRIGATION DEVICES

- Valuable supplement for mechanical plaque control
- Removes unattached plaque and debris.
- Built in pump and reservoir
- Also used with antimicrobial agents.



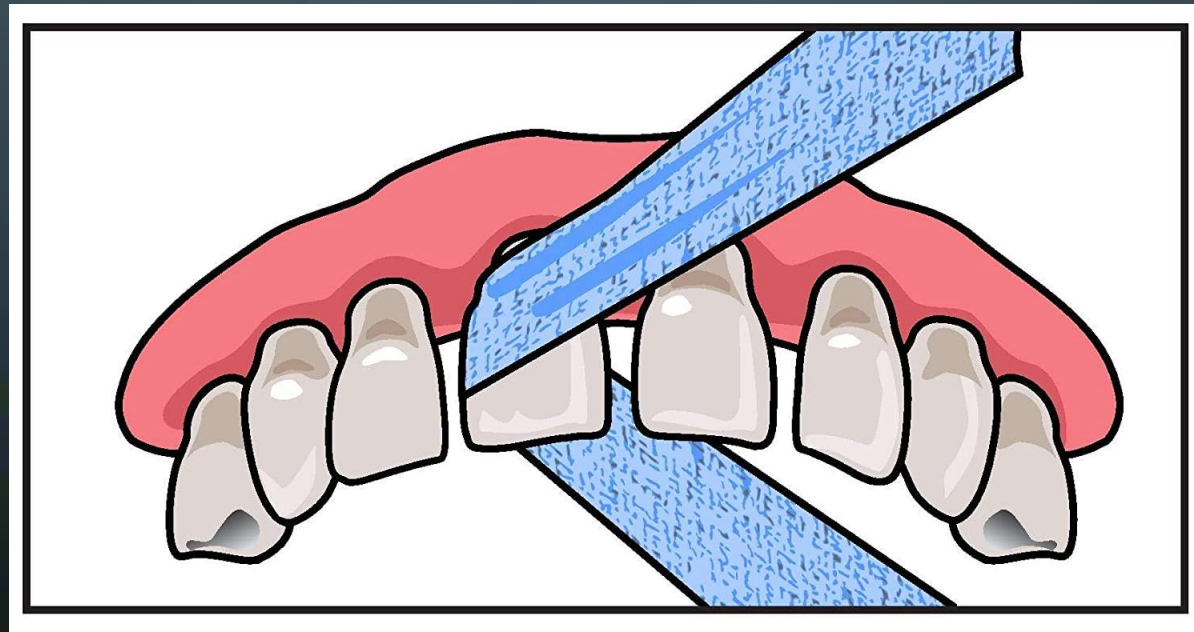




The American Dental Association (ADA) recommends use of floss or other interdental cleaners once per day to effectively remove microbial plaque.

## Gauze strips

The gauze is adapted by wrapping it around the exposed proximal surface to the facial and tongue side of the tooth in a c- shape. A shoeshine store is used to loosen and remove plaque and debris.



## Tongue scrapers:



## Oral hygiene instruction:

- brushing ( brushing 2 twice daily with proper brushing method)
- Use of interdental aids
- Proper diet
- rinsing
- Regular dental visit



# CONCLUSION

- Periodontal disease- majority of missing teeth
- Only possible solution to the problem is prevention.
- Proper oral hygiene practices- controls periodontal disease.
- Patient education.



THANKYOU

# REFERENCES

- Clinical periodontology and implant dentistry- *Jan Lindhe* (5<sup>th</sup> edition)
- Carranza's clinical periodontology- 11<sup>th</sup> edition