

Community Dentistry

Lec1

Public Health (P.H.)

- Winslow (in 1920) defined P.H. as: the art and science of preventing disease, prolonging life, and promoting physical and mental efficiency through organized community effort.

Dental Public Health (D.P.H.)

- ▶ The American Board of D.P.H. modified the Winslow definition and defined D.P.H. (in 1970) as: the science and art of preventing and controlling dental disease and promoting dental health through organized community effort.

Procedural pattern:

The foregoing analogy between the procedure employed by the dental clinician and the public health worker may be summarized as follows:

Patient	Community
Examination	Survey
Diagnosis	Analysis
Treatment planning	Program planning
Payment for services	Finance
Evaluation	Appraisal

Survey

- 1. Extent of dental problem must be determined.**
- 2. Carefully choose random sample that validity reflects the experience of the population as whole.**
- 3. Measure the disease existence in the population by using indices.**

Analysis

It is analysis of the information that been collected from the population in certain statistical methods in order to define the characteristic of specific community health problem, this analysis indicated a need for the services.

Program planning

1. Once the analysis has been made, one can proceed to make plans effective.
2. Decision making for solving the particular health problem.

Program operation

Preventive and curative services, Dental health education (D.H.E.), fluoridation.

Finance

Operational finding is usually provided by government agencies.

Appraisal (Evaluation the program)

To assess the effectiveness of the program.

Prevalence

❖ It is proportion of a given population that exhibits the disease or condition at a given time.

e.g. prevalence of dental caries in the population was 60% or the population showed 60% caries.

Prevalence means simply that on average out of every 100 individual in the population, 60 showed evidence of D.C. in one or more teeth.

Incidence

- ❖ The number of new cases of disease or condition originated between two points of time.
- ❖ practical difference between prevalence and incidence is that
- ❖ for prevalence only one examination is needed,
- ❖ whereas for incidence two examination are needed one at the beginning and one at the end of prescribed time period.

Increment

Is the number of new cases of a disease occurring over a given period of time.

Mortality

In people death divided by the population raised by a power of 10 (100 or 1000 depending on the circumstances).

In teeth

lost teeth divided by the total number of teeth possible in the group or alternatively missing teeth per person.

Lost teeth

Total No. of teeth

Fatality

In people

death divided by cases of a disease raised by a power of 10

$$\left[\frac{\text{death}}{\text{Cases of a disease}} \right]^{10}$$

In teeth

missing teeth divided by total decays, missing and filled teeth (DMF)

$$\frac{M}{DMF}$$

Thank you

The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the right side of the frame, creating a modern, layered effect. The rest of the background is plain white.

PRESENTATION OF DATA

Learning Objectives

Given a set of data,

1. Identify the mode
2. Determine the median
3. Calculate the mean
4. Choose which measure of central location is most appropriate for the data

Types of Measures

Central Location / Position / Tendency –

a single value that represents an entire distribution of data

Spread / Dispersion / Variability –

how much the distribution is spread or dispersed from that from its central location

Measures of Central Tendency

- *Parameter:* Descriptive measurement computed from data of population
- *Statistic:* descriptive measurement computed from data of a sample

Measure of Central Location

Definition: a single value that represents (is a good summary of) an entire distribution of data

Also known as:

“Measure of central tendency”

“Measure of central position”

Common measures

Arithmetic mean

Median

Mode

MEAN

- **Arithmetic mean:** all of sumthe value of a set of observation divided by the number of these observations

MEAN

Characteristics of the Mean:

- A single value
- Simple, easy to compute and to understand
- It take in consideration all values in the set (did not exclude any single value)
- Greatly affected by extreme values

MEAN

Calculated by this equation:

- Mean of population $\mu = \frac{\sum x}{N}$

Obs	Age
1	27
2	27
3	28
4	28
5	28
6	29
7	29
8	29
9	29
10	30
11	30
12	30
13	30
14	30
15	31
16	31
17	32
18	34
19	36
20	37

Arithmetic Mean

$$N = 20$$

$$\sum x_i =$$

$$605$$

$$= \frac{605}{20} = 30.25$$

Median

Definition: Median is the middle value; also, the value that splits the distribution into two equal parts

- *50 % of observations are below the median*
- *50 % of observations are above the median*

Method for identification

Arrange observations in order

Find middle position as $(n + 1) / 2$.

Identify the value at the middle

MEDIAN

- After creating ordered array (arranging data in an ascending or descending order), the median will be the middle value that divides the set of observations into two equal halves.

MEDIAN

Characterized by:

- A single value
- Simple, easy to compute , and easy to understand
- Did not take in consideration all observations
- Not affected by extreme values

MEDIAN

Steps in computing the median:

- Create ordered array
- Find position of the median which depends on the number of observation in the set:
- If it is odd no.:
- position of median = $(n+1)/2$, the median value is then specified

MEDIAN

- If it is even no.
- we will have 2 positions of the median:
 - $n/2$ & $n/2+1$, the median will be the mean of the two middle values

Obs	Age
1	27
2	27
3	28
4	28
5	28
6	29
7	29
8	29
9	29
10	30
11	30
12	30
13	30
14	30
15	31
16	31
17	32
18	34
19	36



Median:
Odd Number of Values

N = 19

$$\begin{aligned}
 \text{Median Observation} &= \frac{N+1}{2} \\
 &= \frac{19+1}{2} \\
 &= \frac{20}{2} \\
 &= 10
 \end{aligned}$$

30 = Median age years

Obs	Age
1	27
2	27
3	28
4	28
5	28
6	29
7	29
8	29
9	29
10	30
11	30
12	30
13	30
14	30
15	31
16	31
17	32
18	34
19	36
20	37

Median:
Even Number of Values

$$N = 20$$

$$\begin{aligned} \text{Median Observation} &= \frac{N+1}{2} \\ &= \frac{20+1}{2} \\ &= \frac{21}{2} \\ &= 10.5 \end{aligned}$$



Average value Median age =
between 10th and 11th observation

$$\frac{30+30}{2} = 30 \text{ years}$$

MODE

- The most frequently occurring value in a series of observations.
- Data distribution with one mode is called **unimodal**; two modes is called **bimodal**; more than two is called **multimodal** distribution. Sometimes the data is **nonmodal**

Mode

Definition: Mode is the value that occurs most frequently

Method for identification

1. Arrange data into frequency distribution or histogram, showing the values of the variable and the frequency with which each value occurs
2. Identify the value that occurs most often

MODE

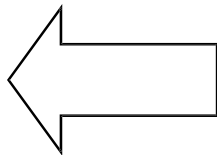
- To determine the mode in a set of large number of observations, it may be mandatory to create a table showing the frequency distribution of observations values. The most frequent value will be the mode.

Obs	Age
1	27
2	27
3	28
4	28
5	28
6	29
7	29
8	29
9	29
10	30
11	30
12	30
13	30
14	30
15	31
16	31
17	32
18	34
19	36
20	37

Mode

Age	Frequency
27	2
28	3
29	4
30	5
31	2
32	1
33	0
34	1
35	0
36	1
37	1
Total	20

← Mode



Mode – Properties / Uses

- Easiest measure to understand, explain, identify
- Always equals an original value
- Insensitive to extreme values (outliers)
- Good descriptive measure, but poor statistical properties
- May be more than one mode
- May be no mode
- Does not use all the data

Measures of Central Location – Summary

- Measure of Central Location – single measure that represents an entire distribution
- Mode – most common value
- Median – central value
- Arithmetic mean – average value
- Mean uses all data, so sensitive to outliers
- Mean has best statistical properties
- Mean preferred for normally distributed data
- Median preferred for skewed data

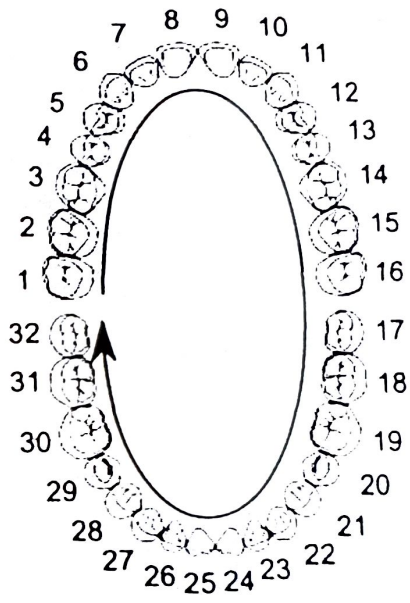
THANKS

DENTAL NUMBERING SYSTEMS

There are three common different numbering systems used to identify the teeth in dentistry.

1. The universal numbering system
2. The Palmer Notation Numbering System.
3. The Federation Dentaire Internationale Numbering System (FDI).

The universal numbering system was adopted by American Dental Association ADA. Although it is named the "universal numbering system", it is also called the "American system" as it is only used in the United States. The uppercase letters A through T are used for primary teeth and the numbers 1 - 32 are used for permanent teeth.



The tooth designated "1" is the maxillary right third molar (wisdom tooth) and the count continues along the upper teeth to the left side. Then the count begins at the mandibular left third molar, designated number 17, and continues along the bottom teeth to the right side. Each tooth has a unique **number** or **letter**, allowing for easier use on keyboards.

Permanent Dentition

upper right										upper left					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
lower right										lower left					

A	B	C	D	E	F	G	H	I	J	upper left
T	S	R	Q	P	O	N	M	L	K	lower left

Alternate system for Primary Dentition

										upper right	upper left
1d	2d	3d	4d	5d	6d	7d	8d	9d	10d		
20d	19d	18d	17d	16d	15d	14d	13d	12d	11d		
										lower right	lower left

The Palmer Notation Numbering System is used by some orthodontists, pedodontists, and oral surgeons. Originally called the Zsigmondy system after an Austrian dentist of that name who developed the idea in 1861.

The Palmer notation consists of a symbol (┘ ┌ ┐ └) designating in which quadrant the tooth is found and a number indicating the position from the midline. Permanent teeth are numbered 1 to 8, with deciduous teeth indicated by a letter A to E. Hence the left and right maxillary central incisor would have the same number, "1", but the right one would have the symbol, "┘", underneath it, while the left one would have, "┌".

Permanent teeth

Primary teeth

87654321 | 12345678

EDCBA | ABCDE

Permanent Dentition

upper right								upper left							
8J	7J	6J	5J	4J	3J	2J	1J	L1	L2	L3	L4	L5	L6	L7	L8
87	77	67	57	47	37	27	17	F1	F2	F3	F4	F5	F6	F7	F8
lower right								lower left							

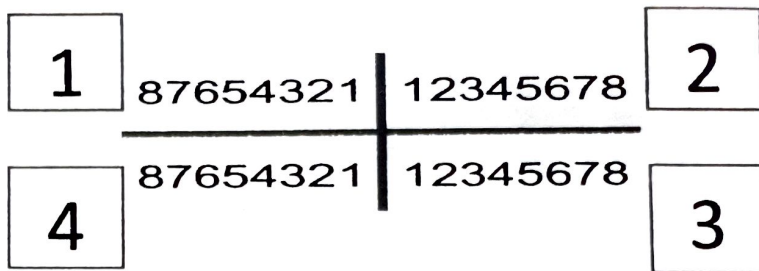
Primary Dentition

upper right					upper left				
EJ	DJ	CJ	BJ	AJ	LA	LB	LC	LD	LE
E7	D7	C7	B7	A7	FA	FB	FC	FD	FE
lower right					lower left				

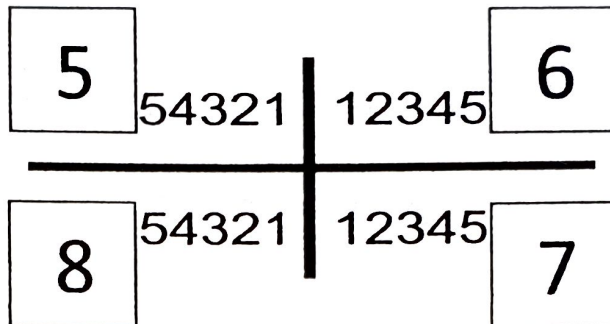
The Federation Dentaire Internationale Numbering System (FDI). Internationally the two-digit system is used worldwide. Every branch of dentistry uses this system. It is also known the International Standards Organization Designation System (ISO System).

Thus the ISO System uses a two-digit numbering system in which the first digit represents a tooth's quadrant and the second digit represents the number of the tooth from the midline of the face. For permanent teeth, the upper right teeth begin with the number, "1". The upper left teeth begin with the number, "2". The lower left teeth begin with the number, "3". The lower right teeth begin with the number, "4". For primary teeth, the sequence of numbers goes 5, 6, 7, and 8 for the teeth in the upper right, upper left, lower left, and lower right respectively. When speaking about a certain tooth such as the permanent maxillary right central incisor, the notation is pronounced "one, one". Beware of mixing up the teeth in written form such as 11, 12, 13, 14, 15, 16, 17, 18 between the Universal and ISO systems.

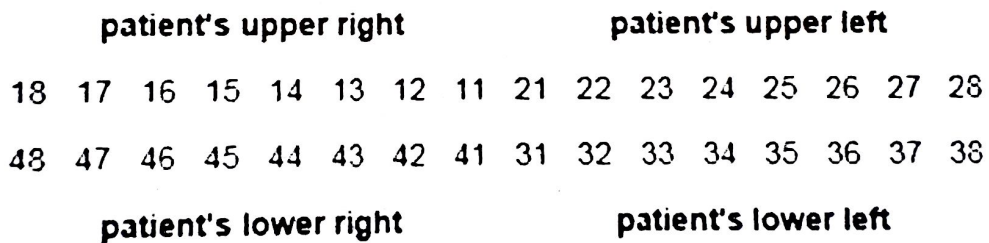
Permanent teeth



Primary teeth



Permanent teeth



Deciduous teeth (baby teeth)



Diagnosis of dental caries

LEC. 4

Is the localised destruction of susceptible dental hard tissues by acidic by-products from bacterial fermentation of dietary carbohydrates.

It can be defined as the microbial disease of the calcified tissues of teeth characterized by demineralization of the inorganic portion and destruction of organic substance of the tooth.

According to (WHO)

Caries is defined as a localized post eruptive, pathological process of external origin involving softening of the hard tooth tissue and proceeding to the formation of a cavity .

— For the WHO caries assessment system , the examiner recorded a surface as decayed only if it presented with detectably softened floor, undermined enamel or a softened wall.

— According to this criterion, all the stages that precede cavitation as well as other conditions similar to the early stages of a carious lesion were considered sound.

— Code Description Sound tooth : A crown is recorded as sound if it shows no evidence of treated or untreated dental caries. The stages of caries that precede cavitation as well as other conditions similar to the early stages of caries are considered sound because they cannot be reliably diagnosed.

— Decayed crown Caries is recorded as present when a lesion in the pit and fissure or on a smooth tooth surface has an unmistakable cavity, undermined enamel, or a detectably softened floor or wall. Where any doubt exists, caries should not be recorded as present

— The word diagnosis (plural, diagnoses) is derived from the Greek “dia” meaning “through” and “gnosis” meaning “knowledge”.

Thus, “to diagnose” implies that it is only through knowledge about the disease that a diagnosis can be established.

— The examination and evaluation of carious lesions has traditionally been limited to physical criteria such as size, depth, and presence or absence of cavitation. The term for this is caries lesion detection.

— The assessment of lesion activity together with lesion detection is essential to arrive at the disease diagnosis and the appropriate clinical treatment decision.

— In addition to caries lesion detection, lesion or disease activity assessment must also consider etiologic factor evaluations, such as oral hygiene, count of cariogenic micro-organisms in plaque and saliva, use of fluoride, sugar intake, and also some socioeconomic aspects, such as family income and parents’ level of education.

— The primary objective of caries diagnosis is to identify those lesions that require restorative treatment, those that require non-surgical treatment, and those persons who are at high risk for developing carious lesions.

— **conventional methods of caries detection:**

— 1. visual-tactile method

— 2. radiography

— 3. caries detecting dyes

—

Some decades ago, visual diagnosis (light and mirror) and probing, supplemented by bitewing radiographs were the only tools available for clinical diagnosis of caries. For epidemiologic surveys and for examination of most patients, these are still useful tools.

— The traditional method of detecting caries signs is by visual inspection of dental surfaces, with the aid of a bright light and dental mirror if necessary to see teeth from all angles.

— Reflecting light onto the mouth mirror also can be done to search for dark shadows that could indicate dentin lesions.

— While the use of a dental probe continues to be controversial, it is extremely helpful when used correctly and judiciously. A probe is unnecessary if visual inspection detects a cavity.

— Visual methods:

— 1. Detection of white spot, discoloration / cavitations

— 2. Without aids, unreliable

— 3. Magnification loupes- Head worn prism loupes (X 4.5) or surgical microscopes(X 16) may be used

— *comfort, relatively inexpensive, available in various*

— *magnification*

— 4. Use of temporary elective tooth separation.

Tactile methods:

— Explorers are widely used for the detection of carious tooth structure

— - Right angled probe- no.6

— - Back action probe- no.17

— - Shepherd's crook- no. 23

— - Cow horn with curved ends- no.2

— *Use of explorer is not advocated because;*

1. Sharp tips physically damage small lesions with intact surfaces
2. Probing can cause fracture & cavitation of incipient lesion. It may spread the organism in the mouth
3. Mechanical binding may be due to noncarious reasons

— Shape of fissure

— Sharpness of explorer

— Force of application

— Path of explorer placement

Use of explorer:

- Explorer is useful to remove plaque and debris and check the surface characteristics of suspected carious lesions.
- gentle pressure just required to blanch a fingernail without causing any pain or damage
- All surfaces of a tooth are cleaned of debris and plaque, using an air syringe and examined visually.

Suspicious areas are explored to check for the surface texture.

All discolored areas should be explored using gentle pressure.

Caries in Pit or Fissure Surfaces:

1. All discolored areas should be explored using gentle
2. *There is no need to penetrate a suspected lesion with an explorer.*
3. If a discolored and non-cavitated area is soft when explored, it is recorded as *non-cavitated carious pit or fissure.*

4. *A cavity is detected when there is an actual hole in the tooth in which an explorer could easily enter the space.*
5. An active cavity has soft walls or floors (detected using gentle exploring).
6. If there is visual enamel opacity under an ostensibly sound or stained pit or fissure, then the enamel is undermined because of dental caries and the tooth surface is classified with *a non-cavitated carious lesion in dentin.*

Root Caries

Root surface caries comprises of a continuum of changes ranging from minute discolored areas to cavitation that may extend into the pulp For diagnostic purpose; they may be:

Active root surface lesion:

well-defined area showing yellowish or light brown discoloration covered by visible plaque

presence of softening/ leathery consistency on probing with moderate pressure.

Inactive root surface lesion (arrested):

- well-defined dark brown/ black discoloration
- smooth and shiny
- hard on probing with moderate pressure

Active lesion

Arrested Caries:

Arrested (remineralized) lesions can be observed clinically as intact, but discolored, usually brown or black spots.

The change in color is presumably due to trapped organic debris and metallic ions within the enamel.

These discolored, remineralized lesions are intact and are highly resistant to subsequent caries .

The arrested caries need not be removed.

Recurrent caries:

It is diagnosed whenever there is softness due to caries at a defective margin, and when the tip of a periodontal probe can enter the defect without any resistance.

A restoration with a discolored margin or a small marginal ditch (<0.5 mm or the head of the probe) is recorded as an early recurrent carious area. A larger defect should be classified as advanced recurrent carious area

There are two valid indicators of recurrent (secondary) caries:

- softness at the margin of a filling that is detected using an explorer or
- presence of a large defect (a minimum diameter of 0.4 mm) at a margin of a filling with softness in the area.

Large defects are associated with a high level of colonization with cariogenic bacteria. Marginal discoloration by itself is not a valid sign for dental caries.

RADIOGRAPHY:

Cariious lesions are detectable radio graphically when there has been enough demineralization to allow it to be differentiate from normal

They are valuable in detecting proximal caries which may go undetected during clinical examination.

On average they have around 50% to 70% sensitivity in detecting carious lesions. 40% demineralization is required for definitive decision on caries

§ Radiographic examinations include;

Bitewing radiographs

IOPA radiographs using paralleling technique

The two important decisions related to radiographic examination are

- (1) when to take a radiograph and
- (2) how to evaluate a radiograph for presence of signs of dental caries.

Limitations of radiography:

1. Exposure of child to ionizing radiation
2. Limitations of dental film
3. Physical limitation based on anatomic consideration
4. High degree of inter- examiner variability
5. Amount of labor time required for processing
6. Variability in the image produced

3. Tooth separation

Separating the teeth for visualizing the posterior a proximal surfaces has been known since the last century. this method uses orthodontic modules or bands and achieves slow separation b

Detection with chemical dyes:

Dyes are a diagnostic aid for detecting caries in questionable areas (i.e., for locating soft dentin that is presumably infected).

Fusayama introduced a technique in 1972 that used a basic fuchsin red stain to aid in differentiating layers of carious dentin.

Because of potential carcinogenicity, basic fuchsin was replaced by another dye, acid red 52, which showed equal effectiveness.

Some caries detection products contain a red and blue disodium disclosing solution (e.g., Cari-D-Tect, Gresco Products, Stafford, Texas).

These products stain infected caries dark blue to bluish-green.

Technique:

1. The area to be tested is rinsed with water and then blotted dry (excess water dilutes a stain).
2. The tooth is treated with a 1% acid red 52 solution for 10 seconds
3. The tooth is rinsed with water and suctioned and then excess water is removed.

After rinsing with water for 10 seconds, some tooth structure shows Discoloration

4. Stained decay is removed with a spoon excavator and evaluated by tactile sensation.

When removing stained caries, it is important to be conservative near the pulp.

Any questionable stained dentin should be left in place; remineralization will occur in this area, and the bacterial activity will be arrested once the tooth is restored.

They selectively complex with carious tooth structure which is later disclosed with the help of fluorescence

Aids in both quantitative & qualitative analysis of the lesion

DISADVANTAGES

- Dye staining and bacterial penetration are independent phenomena, hence no actual quantification
- They also stain food debris, enamel pellicle, other organic matter
- Dye aided carious removal- laborious
- Stains DEJ

Newer Methods of Caries Detection and Assessment

DIGITAL IMAGING

A digital image is an image formed & represented by a spatially distributed set of discrete sensors & pixels

2 types of non- film receptors

Direct digital imaging – digital image receptor

Indirect digital imaging – video camera for forming

Advantages:

1. Images are available in seconds
2. Exposure is reduced 50-90%
3. Image size, contrast and density can be manipulated to improve interpretation
4. Record keeping is vastly improved. All films are labeled, filed and retrieved easily. Duplicate hard copies are the same as originals and simple to make.

Fiber-optic transillumination

Fiber-optic transillumination FOTI as a caries detection technique is based on the fact that carious enamel has a lower index of light transmission than sound enamel.

The light is absorbed more when the demineralization process disrupts the crystalline structure of enamel and dentin. In essence this gives that area a more darkened appearance.

This method of caries detection uses a light source, preferably bright, to illuminate the tooth.

Caries or demineralised areas in dentin or enamel show up as darkened areas with this technique.

Posterior approximal caries can be diagnosed with the light probe positioned on the gingivae below the cervical margin of the tooth, whereby the light passes through the tooth structures and approximal decay produces a dark shadow on the occlusal surface.

Although this device has the advantage that the examination is done with an operating light source already available in general practice, it is only useful for approximal and occlusal lesions;

its sensitivity and specificity are not sufficient for detection of very early caries.

Besides, it is not quantitative and therefore not useful as a caries monitor over time. However, studies on the diagnostic efficacy of this device present conflicting results.

Quantitative Light-induced Fluorescence:

Another dental diagnostic tool for detection of early carious lesions is quantitative light-induced fluorescence (QLF), which is based on autofluorescence of teeth.

When the teeth are illuminated with high intensity blue light, the resultant autofluorescence of enamel is detected by an intraoral camera which produces a fluorescent image.

The emitted fluorescence has a direct relationship with the mineral content of the enamel.

Thus, the intensity of the tooth image at a demineralised area is darker than the sound area.

QLF uses a blue light (488 nm) to illuminate the tooth, which normally fluorescence a green colour.

Teeth should be dried before its application.

Laser fluorescence—DIAGNODent:

The DIAGNODent (DD) instrument (KaVo, Germany) is another device employing fluorescence to detect the presence of caries.

Using a small laser the system produces an excitation wavelength of 655 nm which produces a red light. This is carried to one of two intra-oral tips; one designed for pits and fissures, and the other for smooth surfaces.

The tip both emits the excitation light and collects the resultant fluorescence.

Unlike the QLF system, the DD does not produce an image of the tooth; instead it displays a numerical value on two LED displays.

DIAGNODent pen:

Ø Due to this limitation, a new version of the method was designed and introduced, named DIAGNODent pen.

Ø This new version permits the assessment of both occlusal and proximal surfaces.

Ø The device works on the principles of the old version, but the design is different. The tip is rotatable around the axis of its length, enabling the operator to assess mesial and distal surfaces from both sides (buccal and lingual).

Another cylindrical tip is recommended for occlusal surfaces, and the direction of its light is perpendicular to the axis of the length of the tip.

After excitation, the tip collects the fluorescence and translates it into a numerical scale from 0 to 99.

Electrical Conductance Measurement:

In this method of detecting Dental Caries, the main motive is to measure the electrical conductance by the various teeth. In this method the teeth with affected part was supposed to show high electrical conductivity and the other with low. In this method all the teeth are cover with conducting media and then the electrical conductance has to be measured to detect Dental Caries.

— But the problems in this method are the differences that come when A.C. Or D.C. current is used

— *Factors affecting electrical measurements*

— 1. Porosity

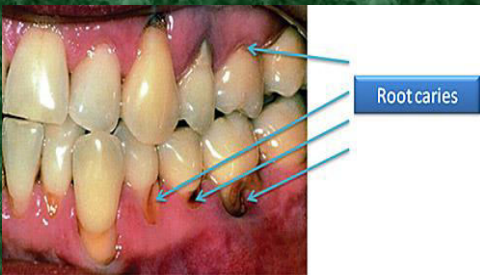
— 2. Surface area

- 3. Thickness of the tissues
- 4. Hydration of enamel
- 5. Temperature
- 6. Concentrations of ions in the dental tissue fluids

Other advance diagnostic method

- Xeroradiography
- Optical caries monitor
- Magnetic resonance micro-imagery
- Ultrasound

Indices for caries



Dental caries

Dental caries can be defined as demineralization of the tooth surface caused by bacteria. The term dental caries is used to describe the results of a localized chemical dissolution of the tooth surface caused by metabolic events taking place in the biofilm (dental plaque) covering the affected area. The destruction can affect enamel, dentin and cementum.

- **Dental caries** lesions may develop at any tooth site in the oral cavity where a biofilm (Dental plaque) develops and remains for a period of time.

Root caries is a common problem among the **elderly**. Root caries, by definition, **occurs on the root** of the tooth. It is initiated on a root surface **exposed** to the oral environment.

Root caries can be **defined** as a soft irregularly shaped lesion either totally confined to the root surface or involved the enamel at the cemento- enamel junction but clinically indicating that the lesion is initiated on the root surface.

The most commonly used **clinical signs** to describe root caries utilized visual (color, contour, surface cavitation) , and tactile (surface texture) specifications. There are no reported clinical symptoms of root caries although **pain** may be present in advanced lesions.

Etiology of the Root caries

- The microflora responsible for root caries consists of Streptococcus mutans, Lactobacillus and Actinobacillus.
- Micro-organisms metabolize sugars into organic acids, these acids then pass through the root structure and start the process of demineralization. This process takes place at the pH of 6.4 (5.5 for demineralization of enamel). The rate of demineralization of root occur at higher pH and is much faster than that of enamel because the root has much less mineral content (55%) than that of enamel (99%).



Clinical features of Root caries

- Root surface caries is initiated when there is periodontal attachment loss exposing the root surface to the oral environment.
- There are no reported clinical symptoms of root caries although pain may be present in advanced lesions.
- An area where root caries has taken place may appear as irregular or round or oval in shape which then may spread radially and join other areas of root caries.
- Root caries are more common in males than females. Most commonly they are seen in mandibular molars, followed by premolars, canines and incisors. This order is reversed in the maxilla. The buccal and interproximal surfaces are more susceptible than the palatal or lingual surfaces.

- Root caries can occur in the areas of abrasion, erosion, and abfraction, or as primary root caries and recurrent decay.



- The term “primary” as it is used with root caries refers to new dental caries occurring in the absence of a restoration. Secondary (recurrent) root caries refers to caries occurring adjacent to an existing restoration.



The criteria for diagnosis of root caries:

Banting et al (1980) identified root caries as:

- 1.** A discrete well defined and discolored soft area.
- 2.** An explorer enters easily and displays some resistance.
- 3.** The lesion is located either in the cemento-enamel - junction or wholly on the root.

Risk factors for Root surface caries (RSC)

Intra- Oral Factors:

- Diminished salivary flow.
- Diminished salivary buffer capacity.
- High plaque score.
- Periodontal pocketing.
- Sever attachment loss.
- Gingival recession.
- Calculus.
- Elevated salivary S. mutans.
- Elevated salivary Lactobacillus counts.

- Elevated salivary *Candida albicans* counts.
- Unrestored and restored coronal caries.
- Unrestored and restored root caries.
- Over denture abutments.
- Retained root tips.
- Eight or more missing teeth.
- Reduced masticatory ability.
- Removable partial denture.
- Clenching, grinding, compressive and disclusive forces.

Extra- oral factors:

- Advanced age.
- Infrequent use dental services.
- Lower educational level.
- Gender .
- Race.
- Smoking.
- Physical debility.
- Lack of a social support network.
- Use of medications that decrease salivary flow.
- Limited exposure to fluoridated water.
- Frequent ingestion of sucrose containing food.
- Limited ingestion of milk product (particularly cheese).

Index

- **Definition**

“A numerical value describing the relative status of a population on a graduated scale with definite upper and lower limits, which is designed to permit and facilitate comparison with other populations classified by same criteria and methods.”

- **Objectives of an Index**

1. To increase understanding of the disease process along with measurement of the disease prevalence and incidence, thereby leading to methods of control and prevention.
2. It attempts to discover populations at high and low risk, and to define the specific problem under investigation.
3. The results of different populations can be compared.

Classification of indices²

Which is based upon the:

A. Direction in which the scores can fluctuate:

- Irreversible index - DMFT index

measures conditions that will not return to the normal state.

Once established cannot decrease in value on subsequent examinations.

- Reversible index - GI (Loe & Silness)

Index that measures conditions that can be return to the normal state.

Reversible index scores can decrease/increase in value on subsequent examinations.

B. The extent to which areas of oral cavity are measured:

- Full mouth index - Dean's fluorosis index, PI

These indices measure the patients entire dentition/periodontium

- Simplified index - OHI-S (Greene & Vermillion)

These indices measure only a representative sample of teeth.

C. The entity which they measure:

- Disease index - DMF ('D' exemplifies a disease index)

- Treatment index - DMF ('F' exemplifies a treatment index)

- Symptom index - PBI (papillary bleeding index)

D. The special categories:

- Simple index – dental caries severity index, Silness and loe plaque index

Index that measures the presence/absence of a condition

- Cumulative index – D MFT index for dental caries Index that measures all the evidence of a condition, past and present.

DMFT Index1

- This index was advocated by Henry Klein, Carole E Palmer & Knutson JW in 1938.
- Universally accepted this index is based on the fact that the dental hard tissues are not self-healing; established caries leaves a scar of some sort. The tooth either remains decayed or if treated, it is extracted or filled.

The DMFT index is therefore an irreversible index, meaning that it measures total lifetime caries experience.

- D - Refers to decayed tooth.
- M - Refers to missing due to caries only.
- F – tooth that has been filled due to caries (permanent restorations).

CALCULATION OF INDEX

Individual DMFT: Total each component D,M and F separately, then

$$\text{total D+M+F} = \text{DMF}$$

Group average: Total the D,M, and F for each individual. Then, divide the total 'DMF' by the number of individuals in the group.

Percentage needing care:

$$\frac{\text{Total No. of decayed teeth} * 100}{\text{total number examined}}$$

Advantages of the DMFT index

- Caries experience - (past and present) and prevalence of an individual and community can be found out.
- By using caries experience, oral health status can be estimated indirectly.
- It gives a broad overview of caries experience in a population over a period of time.
 - D - component gives tooth status affected by dental caries (caries morbidity)
 - M - component gives tooth lost (caries mortality)
 - F - component gives the account of fillings done among the population.

Limitations of DMFT index

- DMF values are not related to the number of teeth at risk. So, it does not directly give an indication of the intensity of attack of caries.
- DMF index is invalid in older adults, as teeth can be lost for reasons other than caries.
- Reaches saturation level at particular point of time when all teeth are involved and prevents further registration of caries attack even when caries activity is continuing.
 - Cannot be used for root caries.
 - Even under extreme conditions, the scores are the same .
 - Rate of caries progression cannot be assessed in terms of how fast caries is progressing or how fast caries has progressed.
 - Does not gives the account for treatment needs.

DMF(S) Index1

- When the DMFT index is employed to assess individual surface of each tooth rather than the tooth as a whole, it is termed as “decayed missing filled – surface index” (DMFS index).
- The principles, rules and criteria for DMFS index are the same as that for DMFT index, which is described previously along with description of DMF index. The only difference is that all surfaces of tooth are examined.
- Calculation of index:
Individual index
 - Total number of decayed surfaces= D
 - Total number of missing surfaces = M
 - Total number of filled surfaces = F

• Advantages:

1. More sensitive.
2. More precise.
3. Gives true status of caries attack.

• Limitations:

1. Takes longer time.
2. May require radiographs.
3. The prevalence of caries is expressed as percentage of population showing any evidence of caries and this measure is useful while caries is low.

Caries index for primary dentition (def index)1

- Given by Grubbel in 1944
- • d- decayed primary teeth
- • e- primary teeth indicated for extraction /extracted due to caries only
- • f- primary teeth with permanent restoration due to caries.
- The basic principles and rules for 'def' index are the same as that for DMFT index.
- Calculation of 'def' index:
- For an individual, Total 'def' score – $d+e+f$ (max. score – 20)
- Total 'defs' score – $d(s)+e(s)+f(s)$ (max. score – 88)

Root Caries Index (RCL)

The root caries index (RCI) was developed by Ralph V Katz in 1979 intended to make the simple **prevalence** measures for root caries more specific by including the concept of teeth at risk for root caries .

The RCI is specifically designed for **analytical epidemiological studies** in which risk factors and causes of disease are being studied ; it is also appropriate for **basic descriptive epidemiology**.

A tooth was considered “ **at risk** ” if enough gingival recession had occurred to expose part of the cemental surface to the oral environment.

Root Caries Index (RCI)

The root caries index was calculated for each subject (Only root surfaces exposed to the oral environment are at risk ; the data are recorded) as follow:

$$RCI = \frac{(R-D)+(R-F)}{(R-D)+(R-F)+(R-N)} \times 100$$

R-D: recession with decay root surface.

R-F: recession with filled root surface.

R-N: recession with a sound root surface.

Root surface caries severity Index

According to **severity** it is classified in to:

Grade 1: is characterized by an incipient lesion, the surface texture is soft and irregular and can be penetrated with a dental explorer, there is no surface defect and pigmentation variable light tan to brown.

Root surface caries severity Index

Grade 2: is characterized by a shallow lesion, the surface texture is soft, irregular and rough and can be penetrated with a dental explorer, there is surface defect (less than 0.5 mm in depth) and pigmentation variable from light tan to dark brown.

Root surface caries severity Index



Grade3:

is characterized by cavitation of the surface texture which is soft and can be penetrated with a dental explorer. There is a penetrating lesion and cavitation is present (greater than 0.5 mm in depth) however there is no pulp involvement, pigmentation is variable ranging from light brown to dark brown.


Root surface caries severity Index

Grade4:

is characterized by pulpal involvement, there is a deeply penetrating lesion pulpal or root canal involvement, pigmentation is variable ranging from brown to dark brown.

THANK

YOU

A dark, atmospheric photograph of a building at night. The building's lights are reflected on a body of water in the foreground. The overall scene is dimly lit, with a blue and black color palette. The text 'Indices of periodontal diseases' is overlaid in white, centered in the image.

Indices of periodontal diseases

The most common or popular indices have evaluated the following parameters:

1. Extent of supra-and sub- gingival plaque.
2. Gingival inflammation.
3. Bleeding of gingiva.
4. Supra- and sub-gingival calculi.
5. Contour of gingiva.
6. Color of gingiva.
7. Pocket depth.
8. Tooth mobility.
9. Loss of epithelial attachment measured from cemento-enamel junction

There are four main categories in periodontal disease for which indices are needed:

Dental plaque: It is soft non mineralized, bacterial deposit formed on the tooth surface.

Gingivitis: It is an inflammation of gingival tissue mainly caused by dental plaque.

Periodontitis: It is an inflammation of periodontal ligament which mainly followed untreated gingivitis.

Calculus: It is a hard deposit that forms by mineralization of dental plaque.

A dark, atmospheric photograph of a body of water at night. In the background, a multi-story building with lit windows is visible. The water is dark blue with some ripples. In the foreground, the dark silhouette of a boat with a person is visible on the right side. The overall mood is quiet and somewhat somber.

Indices used for plaque and debris assessment:

I. Plaque Index by Löe and Silness (1964).

This index measures plaque thickness.

Selection of teeth and scoring:

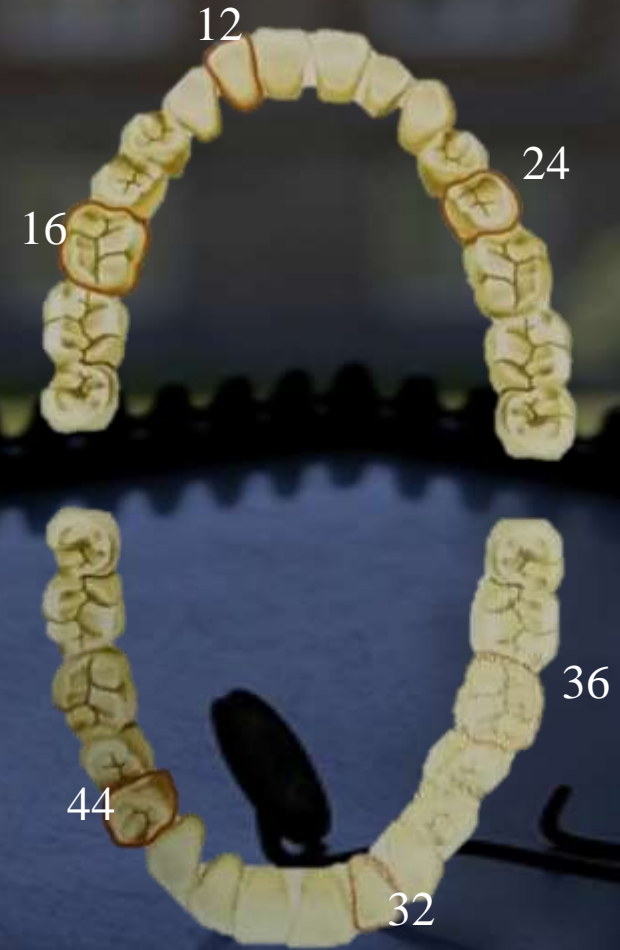
Six teeth are selected: 16, 12, 24, 36, 32, and 44 (FDI).

6	2	4
4	2	6

Each of the four surface of the tooth near the gingival margin is scored from “0” to “3”, then the mean score, first for each tooth, then the individual and finally the group, is calculated.

Plaque index

- Loe and Silness in 1964
- Assesses the thickness of plaque at the cervical margin of the tooth closest to the gums
- All four surfaces are examined
 - Distal
 - Mesial
 - Lingual
 - Buccal



6	2	4
4	2	6

Scoring Criteria

Score	Criteria
0	No Plaque
1	A film of plaque adhering to the free gingival margin and adjacent area of tooth the plaque may be seen in situ only after application of disclosing solution or by using probe on tooth surface
2	Moderate accumulation of soft deposits within the gingival pocket, or the tooth and gingival margin which can be seen with the naked eye
3	Abundance of soft matter within the gingival pocket and/or on the tooth and gingival margin

Calculation of plaque index

For Individual:

$$PI = \frac{\text{Total scores}}{\text{No. of surfaces examined}}$$

For Population:

$$PI = \frac{\text{Total scores}}{\text{No. of subjects examined}}$$

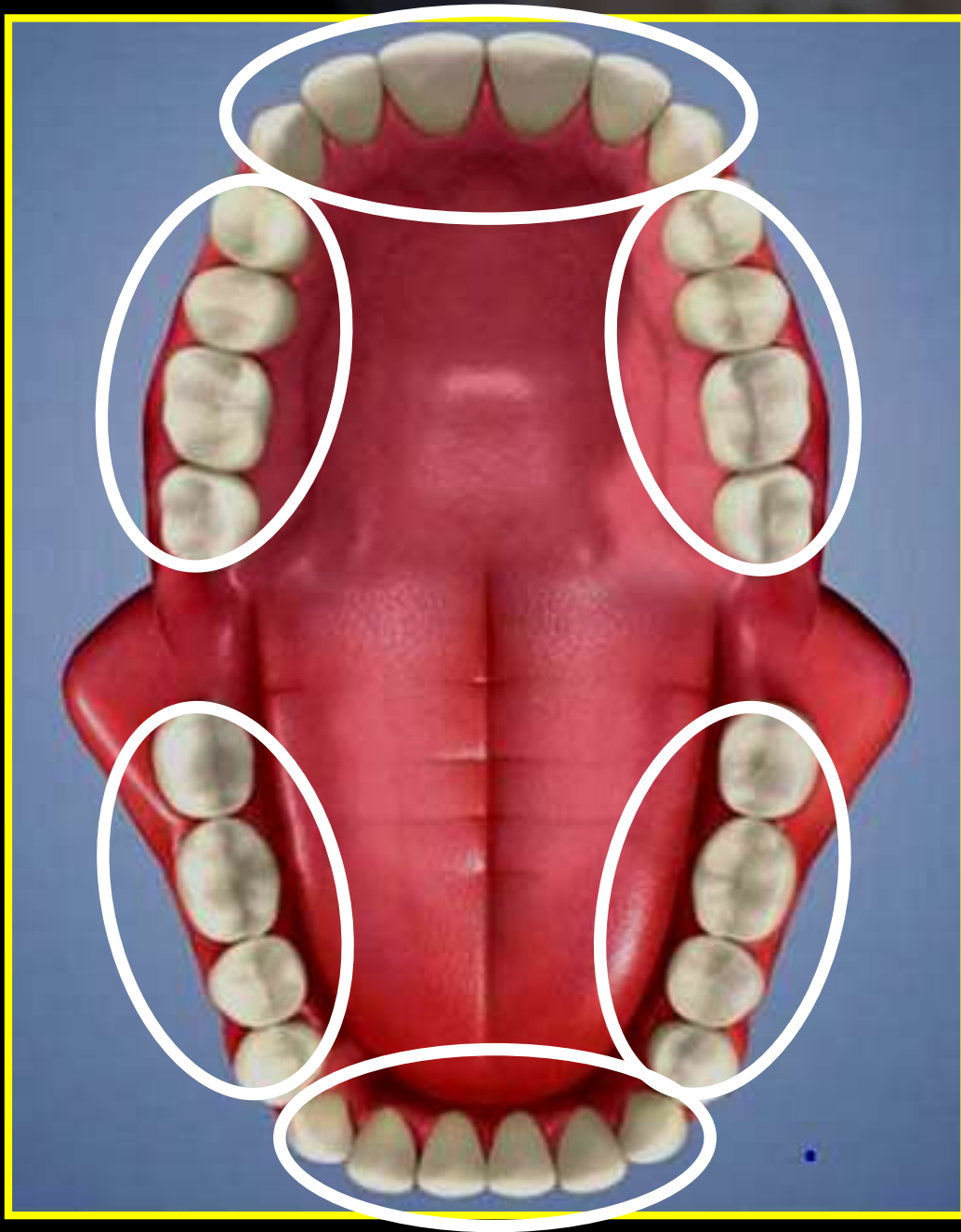
Interpretation of Plaque index

Rating	Scores
Excellent	0
Good	0.1-0.9
Fair	1.0-1.9
Poor	2.0-3.0

II. Oral Hygiene Index (OHI) by Green and Vermillion (1960).

This index has 2 components: The debris index (DI) and the calculus index (CI).

The scores for each are added to give the total score for the OHI.



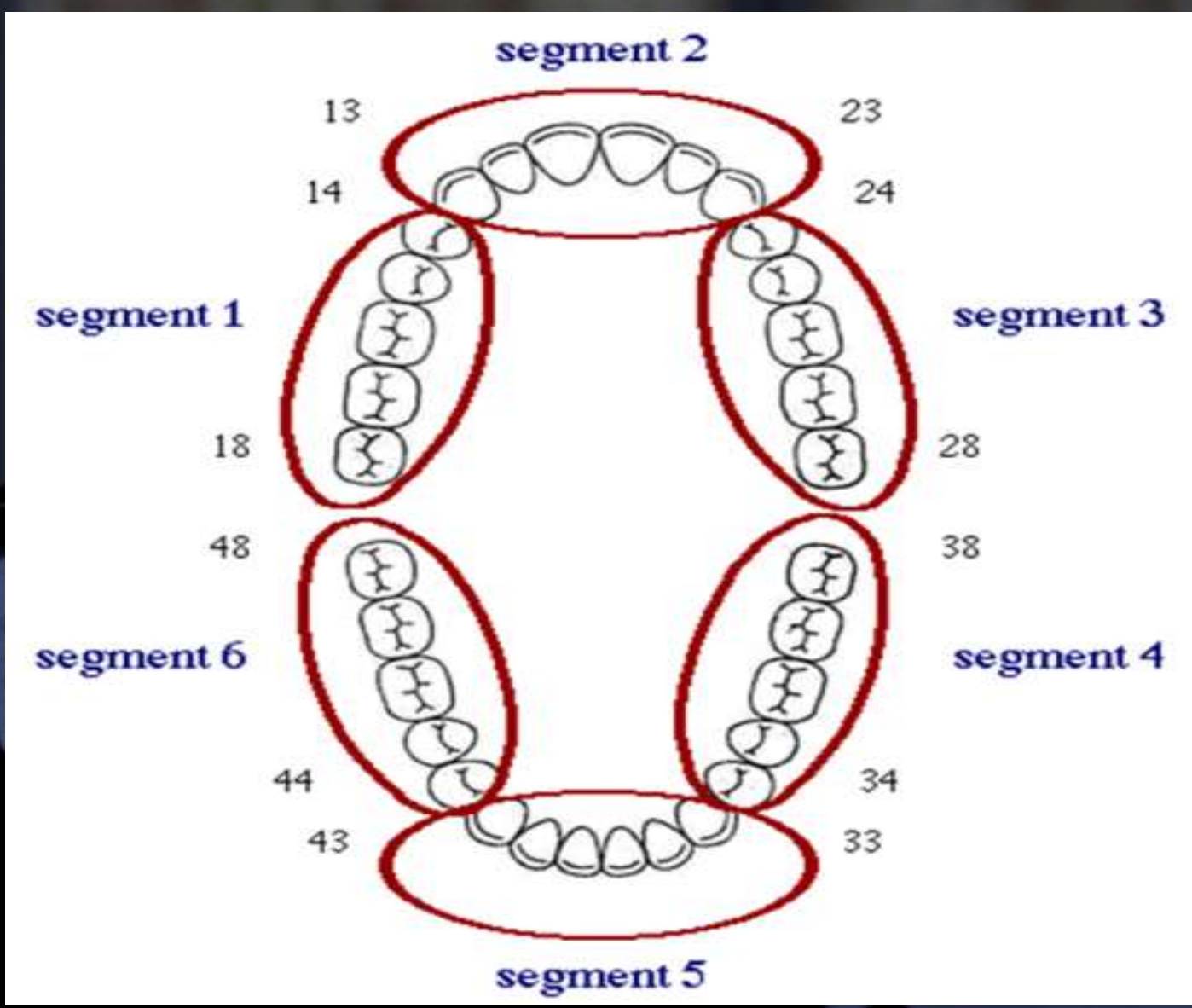
RULES OF ORAL HYGIENE INDEX

- 1 Only fully erupted permanent teeth are scored.
- 2 The buccal and lingual debris scores are both taken on the tooth in a segment having the greatest surface area covered by debris.
- 3 The buccal and lingual calculus scores are both taken on the tooth in a segment having the greatest surface area covered by supragingival and subgingival calculus.
- 4 Maximum score = 3×6
segments = 18×2 (buccal and lingual) = 36 is the maximum score
Then divided by 6 thus the maximum score is 6.

Selection of teeth and scoring:

The mouth is scored in 6 segments: Anterior and right and left posterior in each jaw.

The teeth are examined buccally and lingually in each segment, giving 12 scores in all.



The score for the buccal of an entire segment is the highest score for the buccal surface of an individual tooth in that segment.

The lingual surface scored similarly and not necessarily be on the same tooth.

DEBRIS INDEX



0 – no debris or stain present

1 – soft debris covering not more than 1/3rd the tooth surface, or presence of extrinsic stains without other debris regardless of the area covered

2 – soft debris covering more than 1/3rd, but not more than 2/3rd, of the exposed tooth surface

3 – soft debris covering more than 2/3rd of the exposed tooth surface

III. Oral Hygiene Index simplified (OHI - S) by Green and Vermillion (1964):

This index was devised because the OHI was found to be very time consuming as all teeth to be examined.

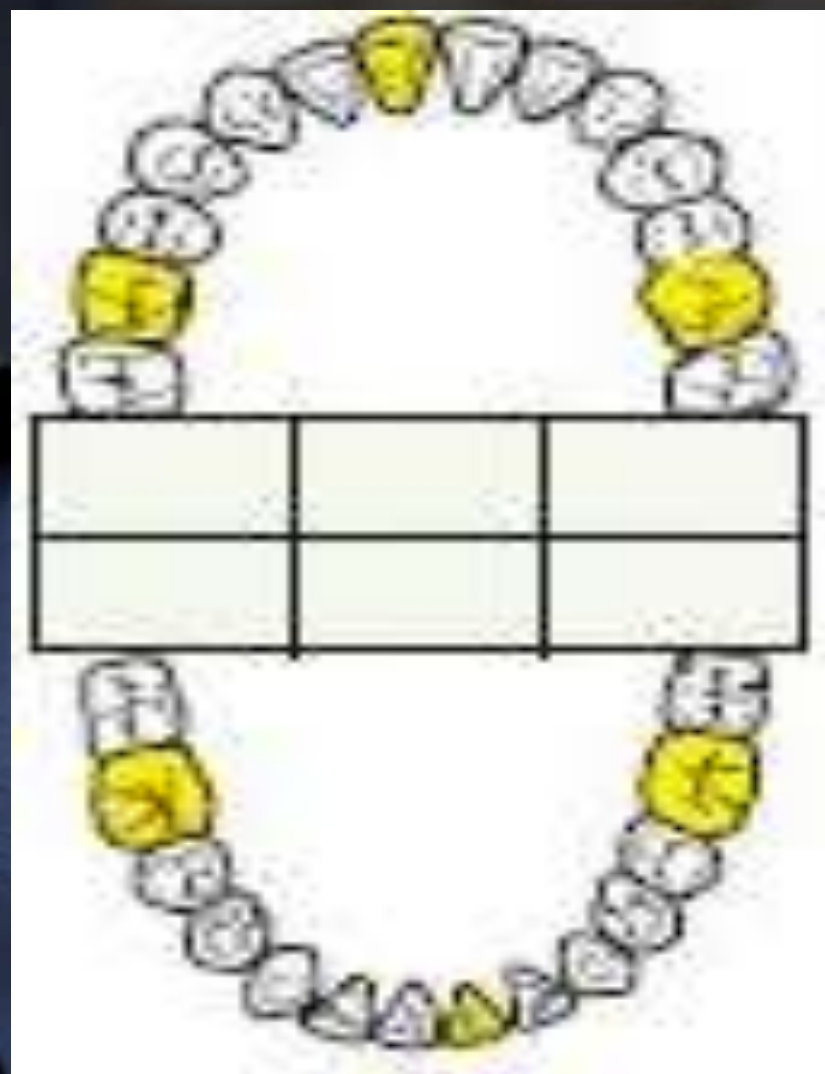
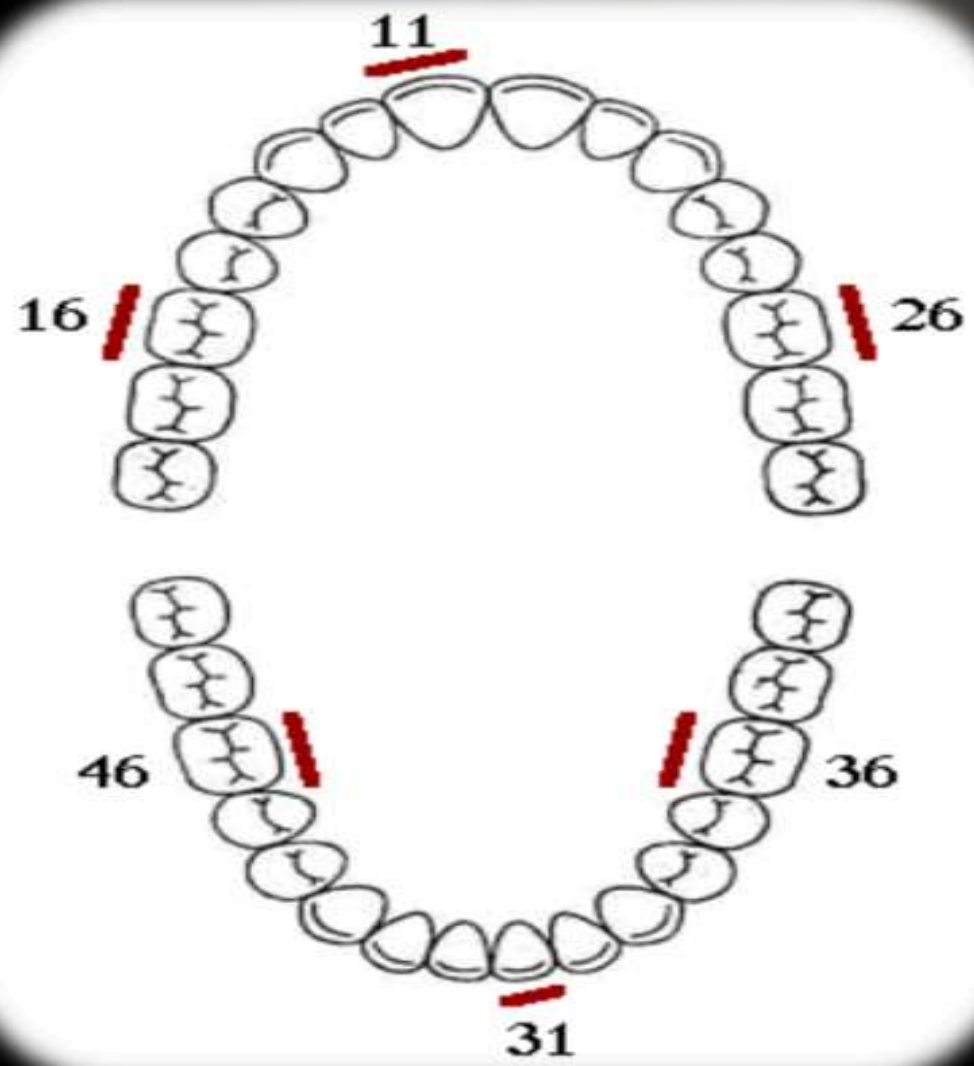
A dark, atmospheric photograph of a lake at night. The water is dark blue, and the sky is black. In the background, there are silhouettes of buildings and trees. In the foreground, a person is sitting on a boat, their silhouette visible against the dark water. The overall mood is quiet and mysterious.

This index has 2 components:
the debris index simplified (DI-S) and the
calculus index simplified (CI-S).

The scores for each added to give the total
score for the OHI-S.

Selection of teeth and Scoring:

The surface examined are the buccal surface of 16, and 26, the lingual surface of 36 and 46, and the labial surface of 11 and 31 (FDI).



The DI-S for individual is calculated by dividing the total score by the number of surface examined which gives a range of 0-3.

Criteria of DI-S: The same as DI.

0: No debris or stain.

1: Soft debris covering up to 1/3rd of the tooth surface or the presence of extrinsic stains without debris regardless of surface area covered.

2: Soft debris covering 1/3rd – 2/3rd of the tooth surface.

3: Soft debris covering over 2/3rd of the tooth surface.

IV. Patients Hygiene Performance Index by Podshadley and Haley (1968).

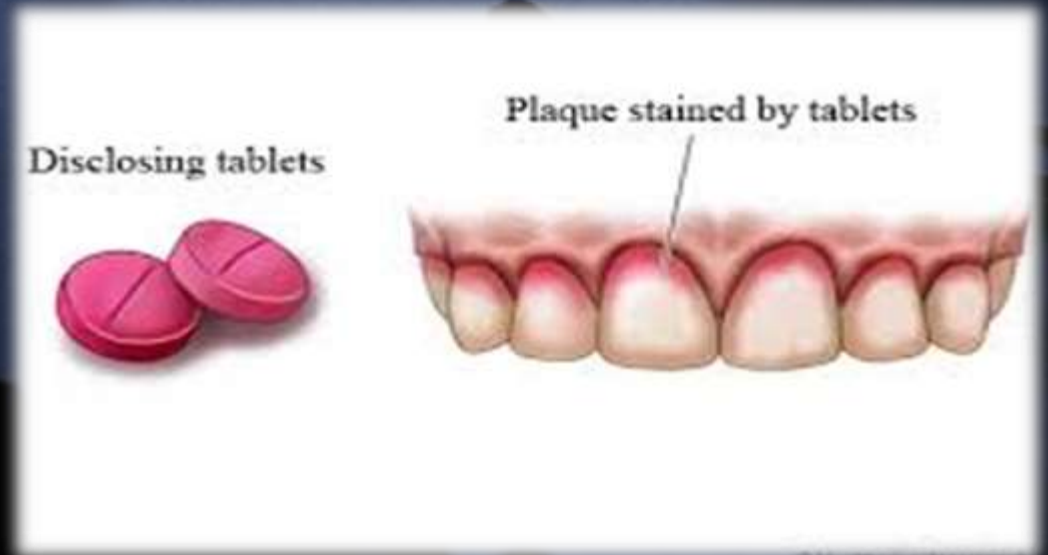
This index was the first developed for the purpose of assessing an individual performance in removing debris after tooth brushing instruction.

Selection of teeth and Scoring:

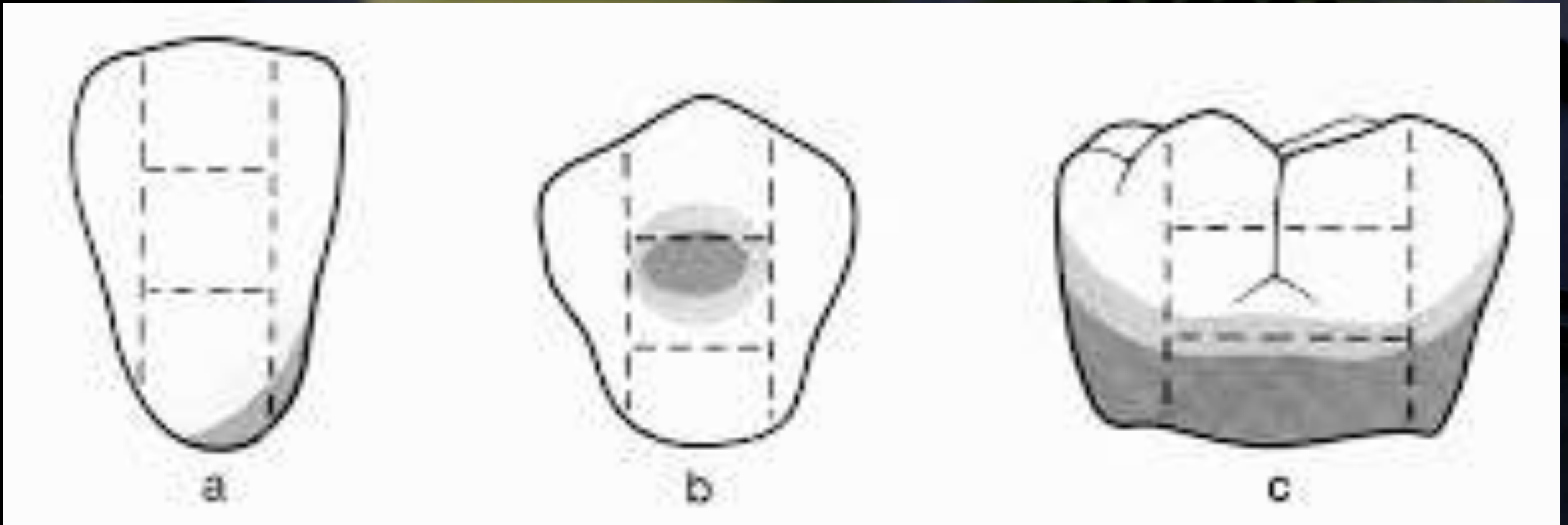
Same as OHI-S index teeth. The surface examined are the buccal surface of 16, and 26, the lingual surface of 36 and 46, and the labial surface of 11 and 31.

The scoring is preceded by use of a disclosing agent (tablet or solution).

The tooth is divided into five areas: Three longitudinal thirds (distal, middle, mesial) with the middle third subdivided horizontally into (incisal, middle, gingival thirds).



The assess of debris presence or absence is 1 or 0.



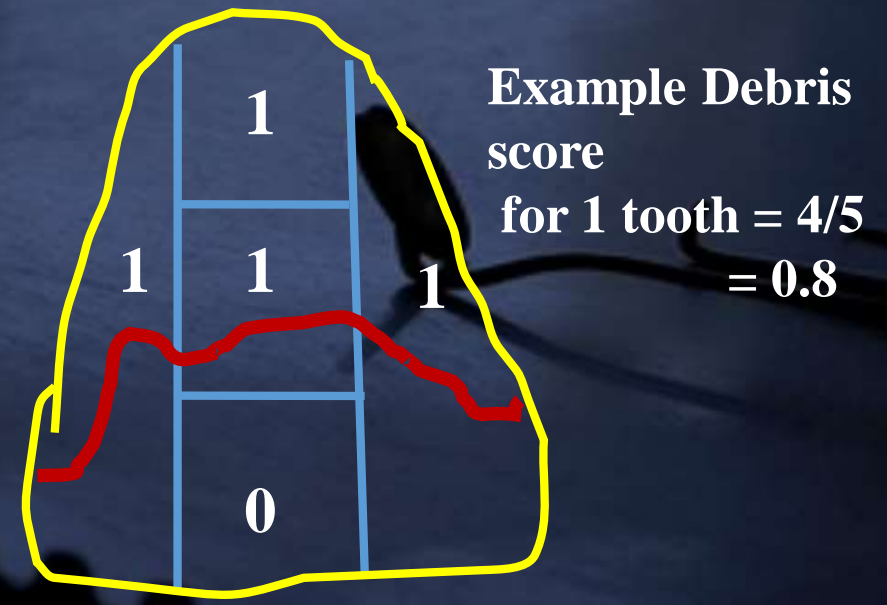
Calculation of score:

The patient hygiene performance index score per person is obtained by totaling the five subdivision scores of each teeth surface and dividing the total by the number of tooth surface examined.

- Debris score for individual tooth:
- Add the scores for each of the 5 subdivisions.
- PHP index for an individual :
- Total score for all the teeth divided by the number of teeth examined.

• **RATING SCORES:**

- Excellent : 0 (no debris)
- Good : 0.1-1.7
- Fair : 1.8 – 3.4
- Poor : 3.5 – 5.0



Advantages of Patients Hygiene Performance Index

1. Patients Hygiene Performance Index is relatively more sensitive than OHI-S because it divides each tooth surface into five areas.
2. It can be used in group studies of dental health education.
3. Its chief value lies in its application as an education aid.

V. WHO System (1977):

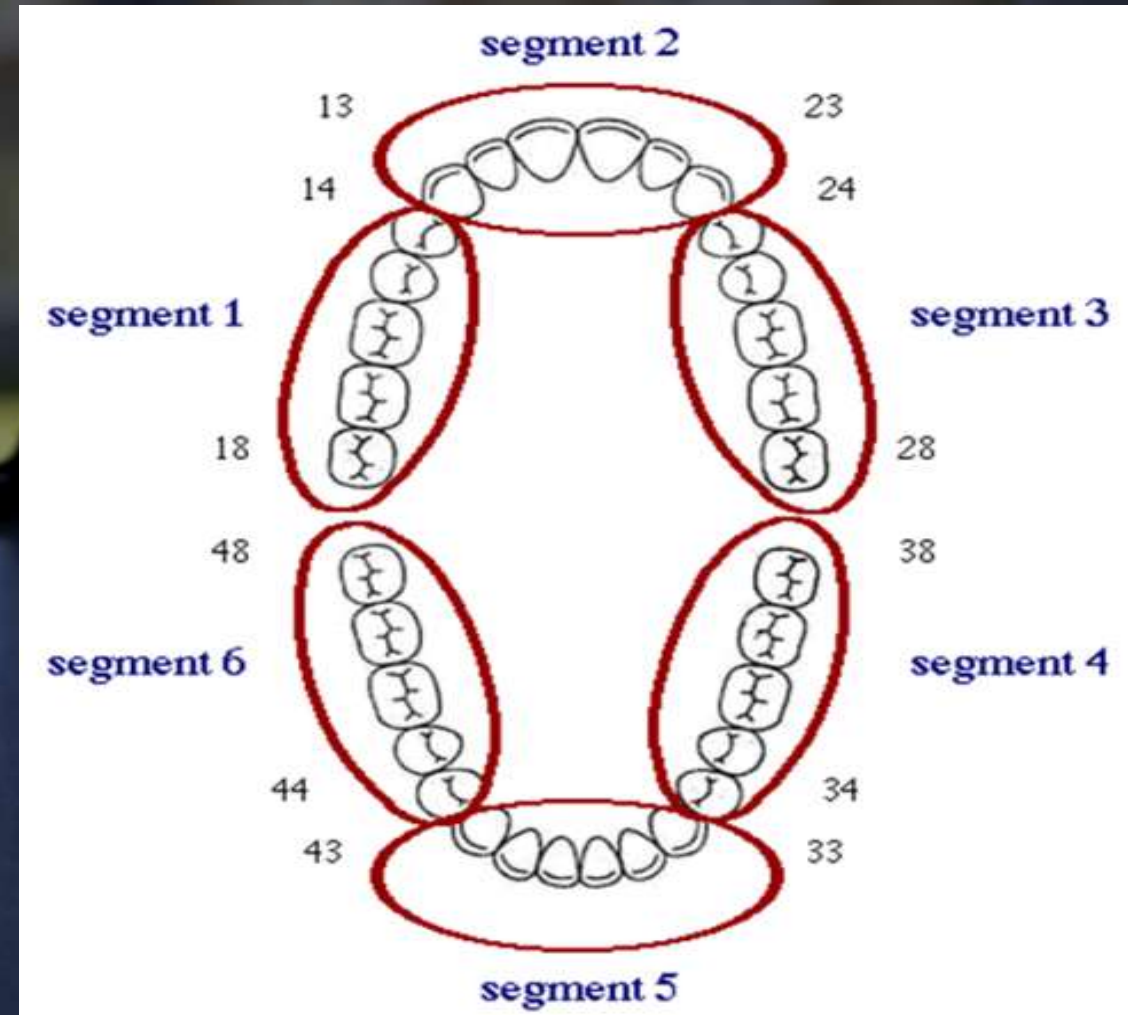
This is a simple prevalence index. That teeth are not dried or stained, and no probe is used.

Selection of teeth and scoring:

The mouth is divided into 6 segments: posterior right and left, and anterior, in each jaw.

All surface are examined; each segment is scored as one unit.

The maximum score for an individual is 6.



The background of the slide is a photograph of a sunset over a body of water. The sky is a mix of orange, yellow, and blue, with the sun partially obscured by a dark, jagged silhouette of a crowd or trees in the foreground. The water is dark blue, and a small boat is visible on the right side, its reflection on the water. The overall mood is serene and atmospheric.

Criteria of WHO system:

0: no soft deposit visible

1: any soft deposit on any surface clearly visible by the naked eye.

A night scene with a building and water, featuring the text "Thank you" in a glowing white cursive font. The text is reflected in the water below. The background is dark with some lights from the building.

Thank you

Indices for measurement of calculus

The background image is a dark, atmospheric photograph. It shows a building at night with several windows illuminated from within, casting a warm glow. The building is reflected in a body of water in the foreground. The water is dark blue and shows ripples. On the right side of the water, there is a small, dark boat or structure. The overall mood is quiet and contemplative.

I. Oral Hygiene index (OHI) by Greene
and Vermillion (1960) Calculus index.

The background of the slide is a dark, atmospheric photograph of a lake at night. In the upper portion, a building with several lit windows is visible, its light reflecting on the water's surface. The water is dark blue with subtle ripples. In the lower right, the dark silhouette of a tree branch with a few leaves is visible against the water.

Selection of teeth and scoring:

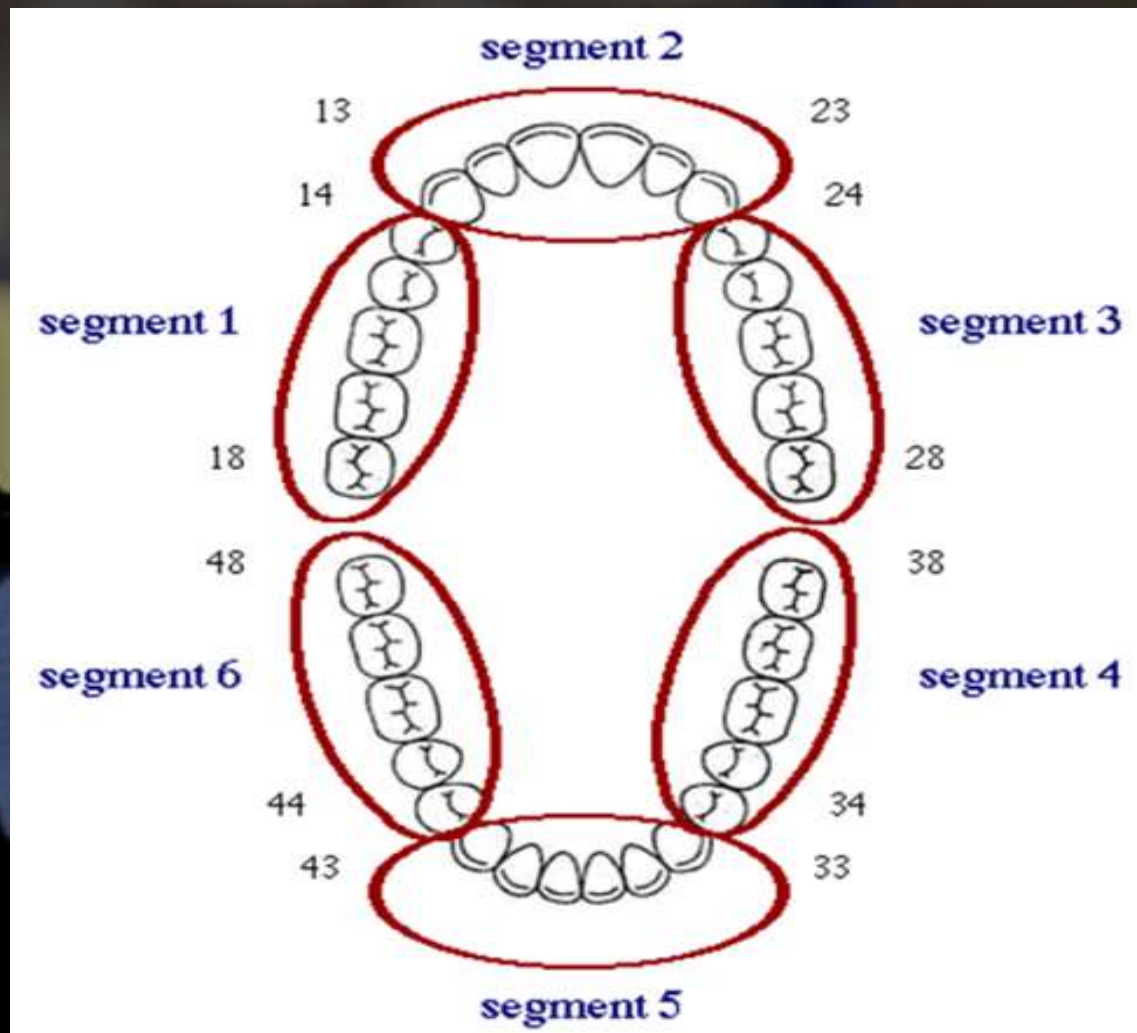
The same as DI.

The mouth is scored in 6 segments: Anterior and right and left posterior in each jaw.

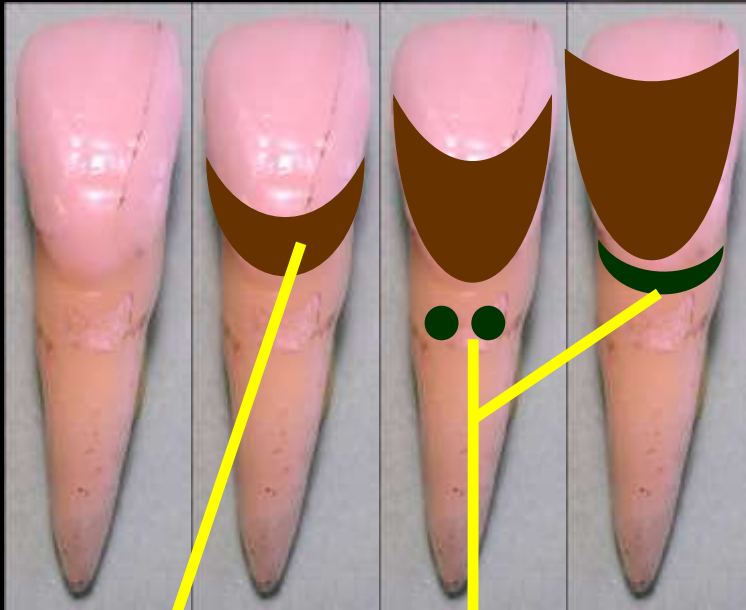
The teeth are examined buccally and lingually in each segment, giving 12 scores in all.

The score for the buccal of an entire segment is the highest score for the buccal surface of an individual tooth in that segment.

The lingual surface scored similarly and not necessarily be on the same tooth.



CALCULUS INDEX



Supragingival calculus

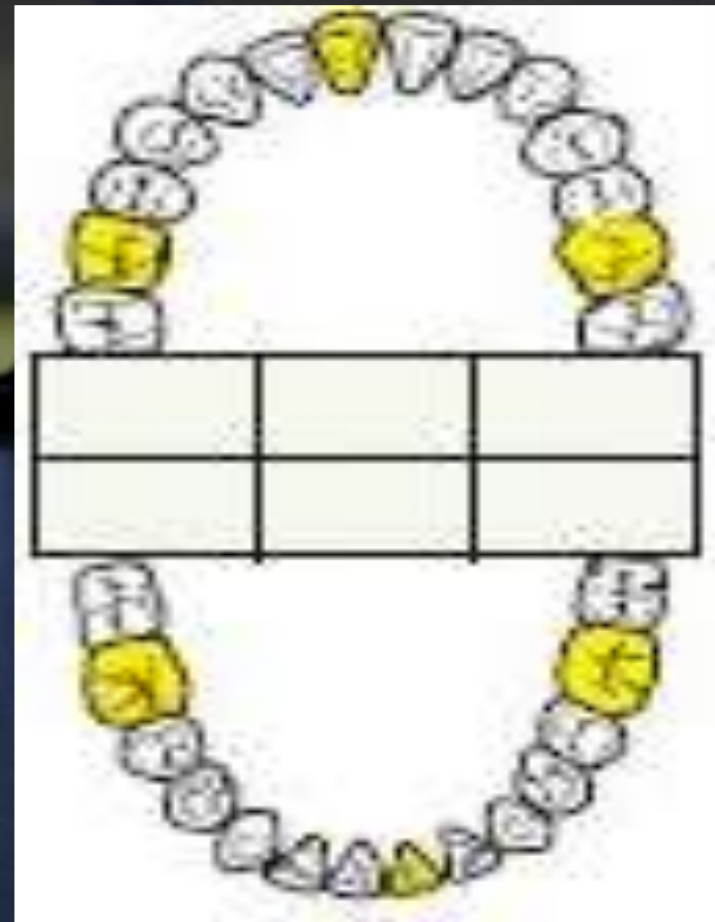
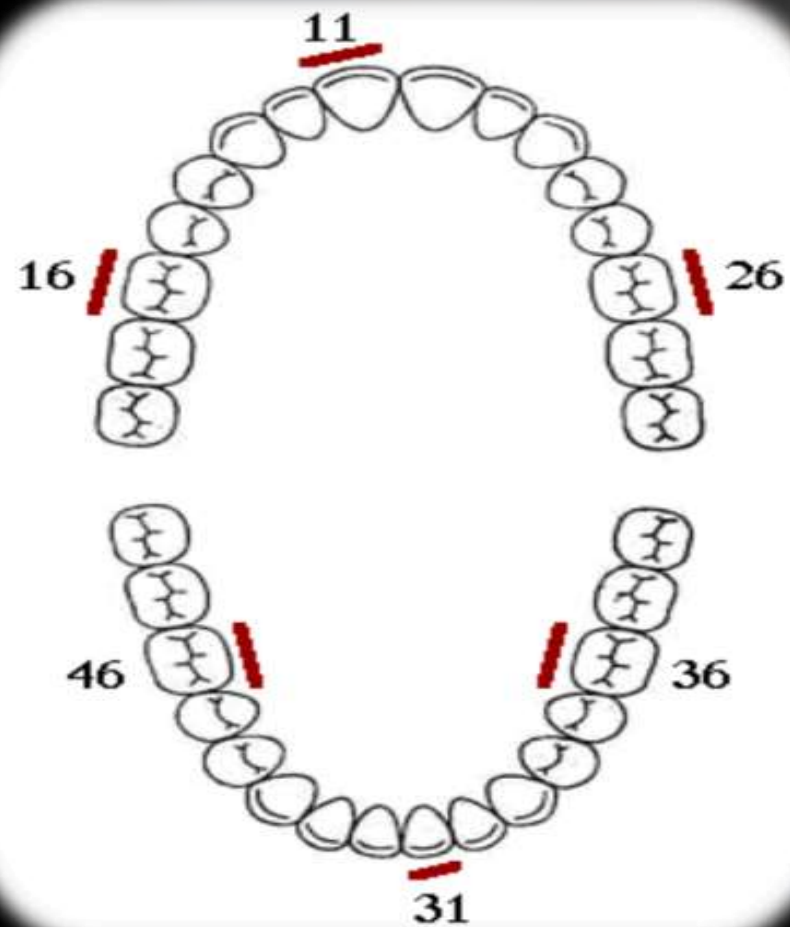
Subgingival calculus

SCORE	CRITERIA
0	No calculus present
1	Supragingival calculus covering not more than 1/3 of the exposed tooth surface
2	Supragingival calculus covering more than 1/3 but not more than 2/3 the exposed tooth surface or presence of individual flecks of subgingival calculus around the cervical portion of the tooth or both.
3	Supragingival calculus covering more than 2/3 the exposed tooth surface or a continuous heavy band of subgingival calculus around the cervical portion of tooth or both.

II. Oral Hygiene Index-Simplified (OHI-S) by Greene and Vermillion (1964) Calculus index.

Selection of teeth and scoring:

The same as DI-S. The surface examined are the buccal surface of 16, and 26, the lingual surface of 36 and 46, and the labial surface of 11 and 31.



Criteria of CI- S:

The same as CI.

0: no calculus.

1: supra gingival calculus covering not more than 1/3rd of surface .

2: supra gingival calculus covering 1/3rd – 2/3rd of surface or flecks of subgingival calculus.

3: supra gingival calculus covering 2/3rd of surface or continuous heavy blend of sub gingival calculus.

III. Calculus Surface Index (CSI) BY Sturzenberger and Radike (1961).

Selection of teeth and scoring:

Teeth selected are 31, 32, 41, 42 (FDI).

All surfaces of each tooth are examined, therefore the maximum score is 16.

2	1	1	2
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The background of the slide is a dark, atmospheric photograph of a lake at night. In the upper portion, a multi-story building with lit windows is visible, its light reflecting on the water's surface. The foreground and middle ground are dominated by the dark, rippling water of the lake. On the right side, the dark silhouette of a tree branch with a few leaves extends into the frame. The overall mood is quiet and somewhat mysterious.

Criteria:

0: no calculus present on surface.

1: any calculus present on surface.

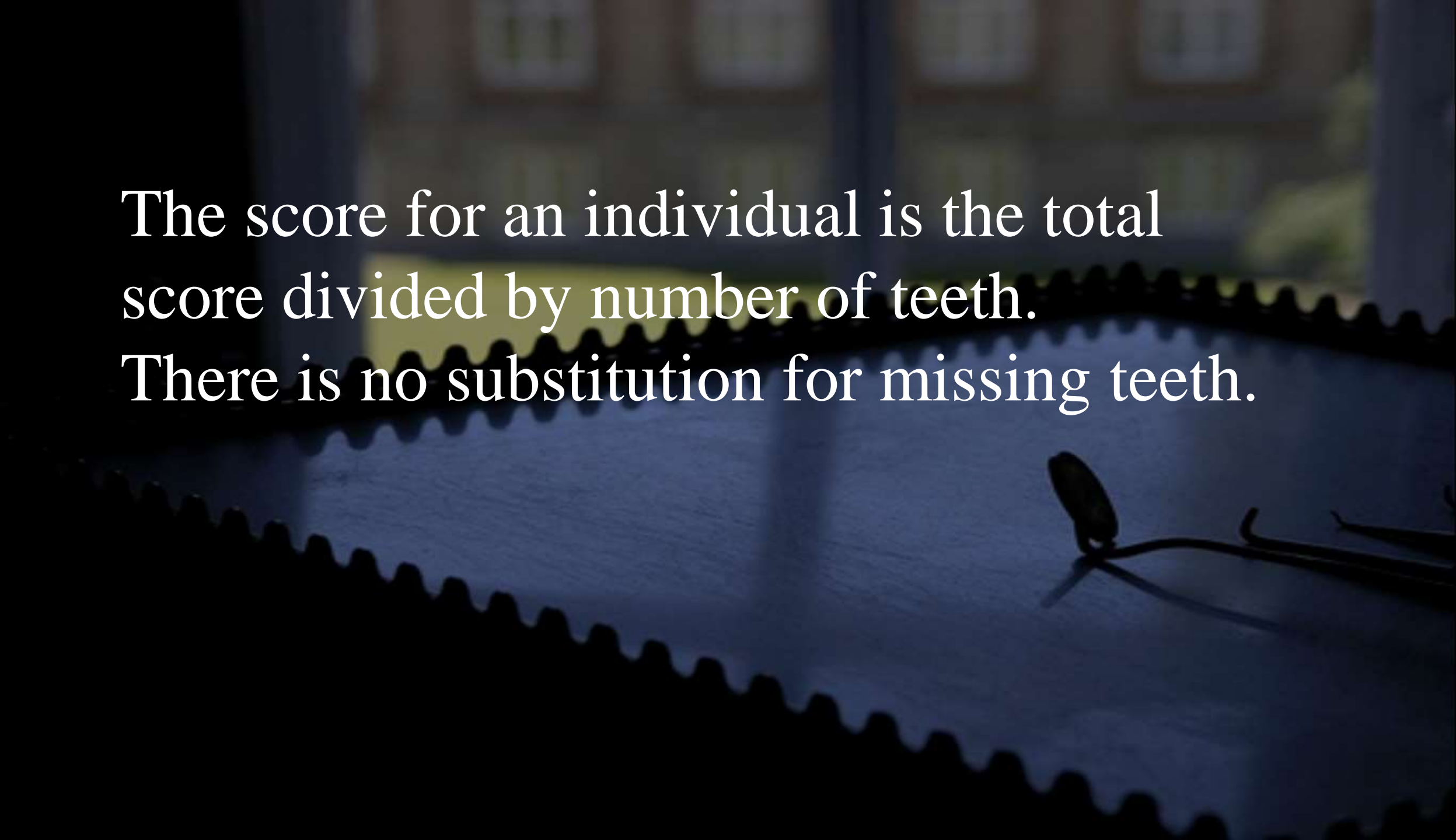
The background of the slide is a dark, atmospheric photograph of a body of water at night. In the upper portion, the blurred lights of a building are visible. The water in the foreground is dark, with a small, dark boat or structure on the right side. The overall mood is quiet and somewhat somber.

IV. Ramfjord periodontal disease index- calculus component (1959):

Selection of teeth and scoring:

Only six selected teeth are scored for assessment of the periodontal status of the mouth; 16, 21, 24, 36, 41 and 44 (FDI).

6		1	4
4	1		6



The score for an individual is the total score divided by number of teeth.
There is no substitution for missing teeth.

Criteria

C 0: no calculus

C 1: supra gingival calculus extending not more than 1 mm below gingival margin.

C 2: moderate amount of supra gingival and sub gingival calculus or sub gingival calculus alone.

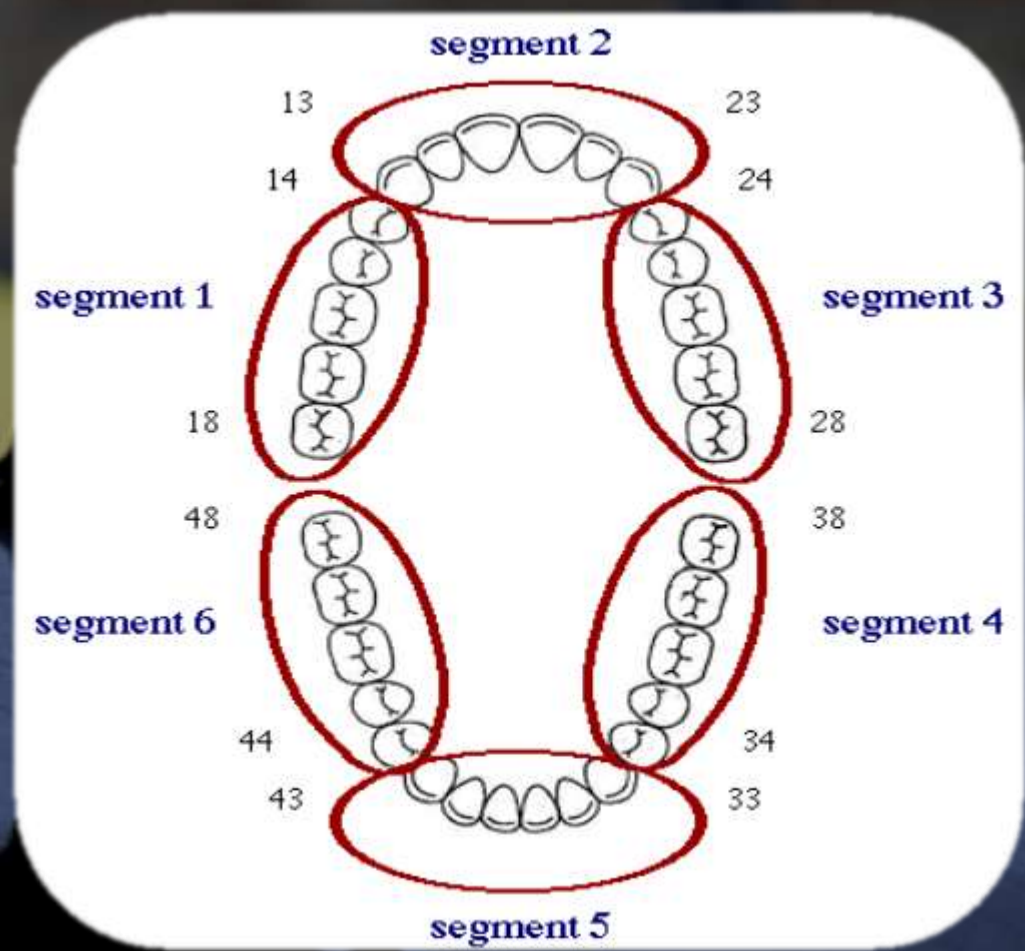
C 3: heavy accumulation of both supra and sub gingival calculus.

V. WHO System (1977):

Selection of teeth and scoring:

The mouth is divided into 6 segments posterior right and left, and anterior in each jaw.

All surfaces are examined each segment is scored as one unit. The maximum score for an individual is 6.



Criteria:

0: if the deposit is soft, or there is no suspected calculus.

1: if there is calculus clearly present on visual examination on at least one tooth in the segment.

If a deposit is suspected of being calcified, a probe may be used to confirm this.

VI. Calculus surface Severity index (CSSI) by Ennever *et al.* (1961).

Selection of teeth and scoring:

Same as Calculus Surface Index CSI.

2	1	1	2
---	---	---	---

Criteria:

0: no calculus.

1: less than 0.5 mm width thickness of calculus.

2: 0.5-1mm width thickness of calculus.

3: over 1mm thickness of calculus.

The image shows a night scene with a building in the background and water in the foreground. The text "Thank you" is written in a white, glowing cursive font, centered in the image. The text is reflected in the water below it. The background is dark, with some lights visible on the building.

Thank you

Gingival indices

- Gingival index
- WHO system for gingival health



Gingival Index

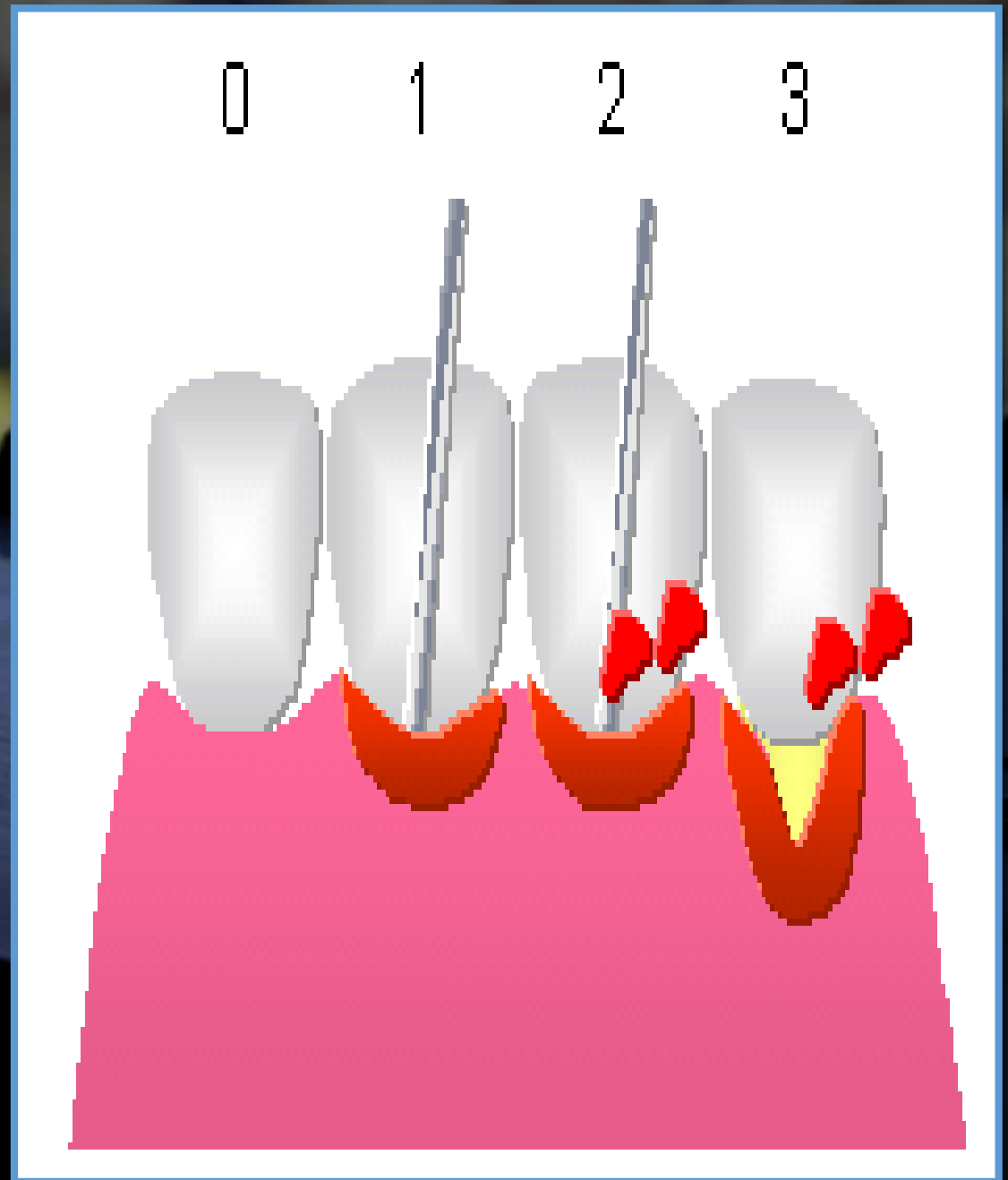
- Developed by Loe H and Silness J in 1963.
- One of the most widely accepted and used gingival indices.
- Assess the severity of gingivitis and its location in 4 possible areas.
 - Mesial
 - Lingual
 - Distal
 - Facial
- Only qualitative changes are assessed.

METHOD:

- All surfaces of all teeth or selected teeth or selected surface of all teeth or selected teeth are scored.
- The selected teeth as the index teeth are 16,12,24,36,32,44.
- The teeth and gingiva are first dried with a blast of air and/or cotton rolls.
- The tissues are divided into 4 gingival scoring units: disto facial papilla, facial margin, mesio facial papilla and entire lingual margin.
- A blunt periodontal probe is used to assess the bleeding potential of the tissues.



SCORE	CRITERIA
0	Absence of inflammation/normal gingiva
1	Mild inflammation, slight change in color, slight edema, no bleeding on probing
2	Moderate inflammation, moderate glazing, redness, edema and hypertrophy. bleeding on probing
3	Severe inflammation, marked redness and hypertrophy ulceration. Tendency to spontaneous bleeding.



Calculation and Interpretation

- If the scores around each tooth are totaled and divided by the number of surfaces per tooth examined (4), the gingival index score for the tooth is obtained.
- Totaling all of the scores per tooth and dividing by the number of teeth examined provides the gingival index score for individual.
- Interpretation:
 - 0.1 - 1.0 : Mild gingivitis
 - 1.1 – 2.0 : Moderate gingivitis
 - 2.1 – 3.0 : Severe gingivitis

WHO system for gingival health:

- It is simple prevalence index.
- The teeth are not dried or stained, and no probe is used.
- The mouth is divided into 6 segments, posterior right and left and anterior in each jaw.
- All surfaces of each segment are examined and each segment is scored as one unit.
- Maximum score for individual is 6.
- **Criteria for WHO:**
- 0: when there is no or only minor alteration in gingival colour and form, and no bleeding after digital palpation.
- 1: when there is marked change in colour, bleeding on firm digital palpation and marked general loss of stippling.

Indices for measurement of periodontal destructions (**loss of attachment**):

Bone loss is measure by:

- Loss of attachment.
- Radiographic evaluation.
- Gingival recession.
- Assessment of tooth mobility.

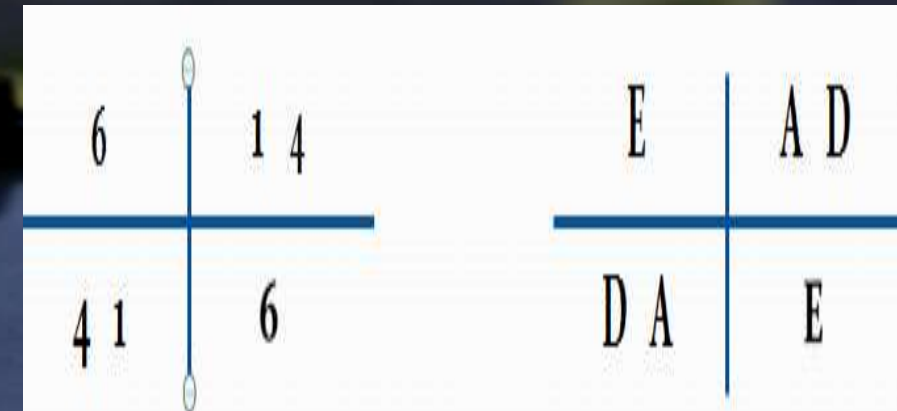
Ramfjord periodontal disease index (Gingival sulcus measurement):

Selection of teeth and scoring:

The indexed teeth are 16, 21, 24, 36, 41 and 44.
The four surfaces of each tooth are examined.

The examination done by narrow graduated periodontal probe (Michigan 0).

Use the cemento-enamel junction as baseline from which to measure the loss of attachment.



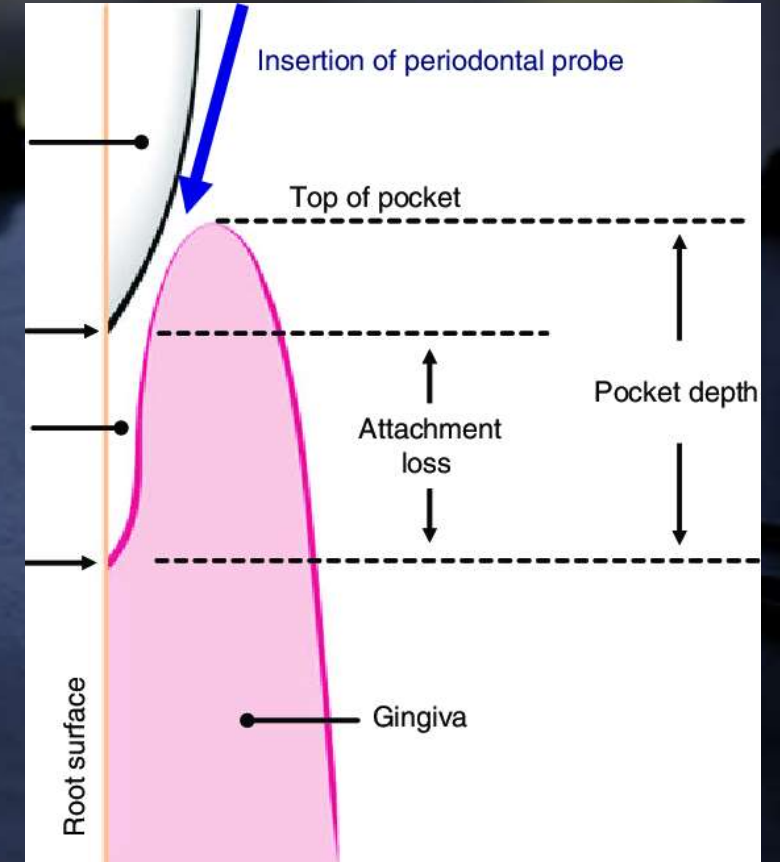
A. If gingival margin is on enamel:

1- Measure distance from gingival margin to CEJ.

2- Measure distance from gingival margin to the base of the pocket (when the pocket is apical to CEJ).

▶ Loss of attachment = 2-1

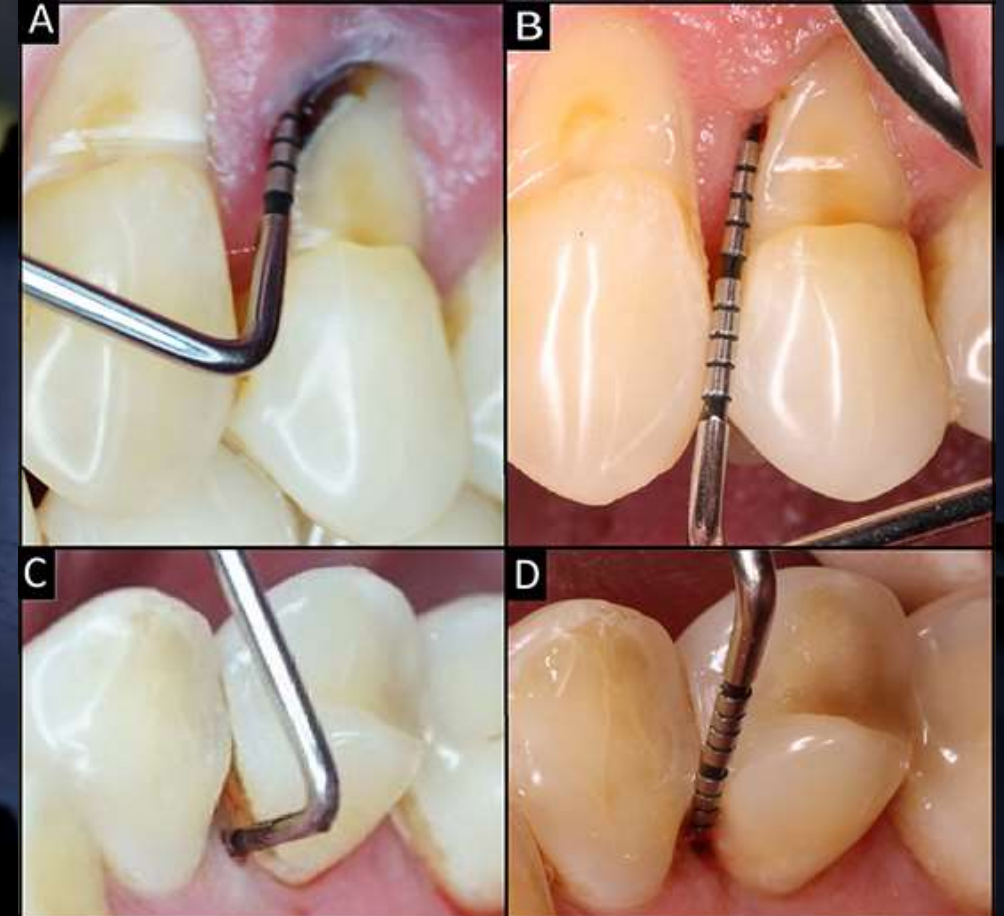
▶ Pocket depth = 2



B. If gingival margin is on cementum:

- 1- Measure distance from CEJ to gingival margin (minus score).
- 2- Measure distance from CEJ to bottom of pocket.

- ▶ Loss of attachment = 2
- ▶ Pocket depth = 1 + 2



Ramfjord periodontal disease index (pocket depth)

Selection of teeth and scoring:

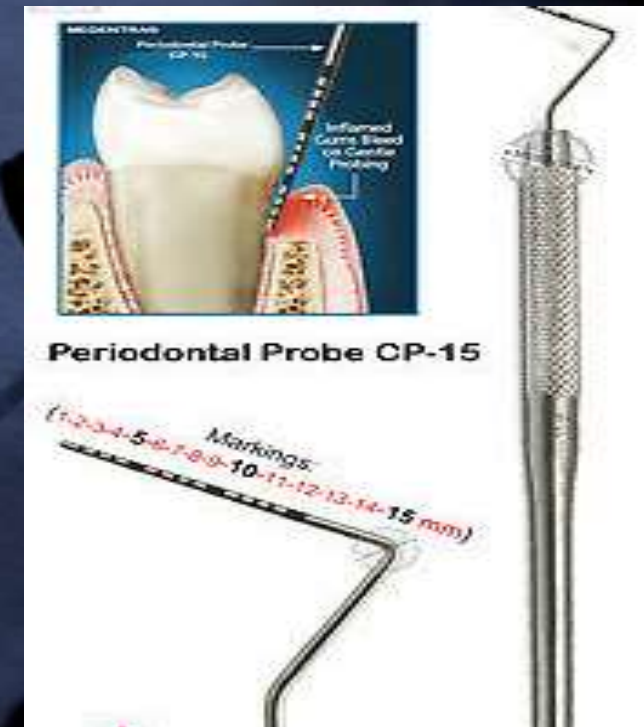
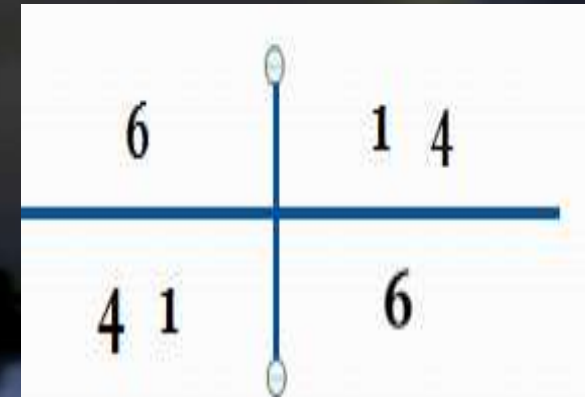
The indexed teeth are 16, 21, 24, 36, 41 and 44. The four surfaces of each tooth are examined.

The score for an individual is the total score divided by the number of teeth examined.

No replacement of missing teeth.

Criteria:

- 4: if the base of pocket is up 3mm apical to CEJ.
- 5 : if the base of pocket is 3-6 mm apical to CEJ.
- 6: if the base of pocket is more than 6 mm apical to CEJ.



Ramfjord periodontal disease index (Mobility of the teeth):

*Selection of teeth and scoring:
The same of pocket depth index*

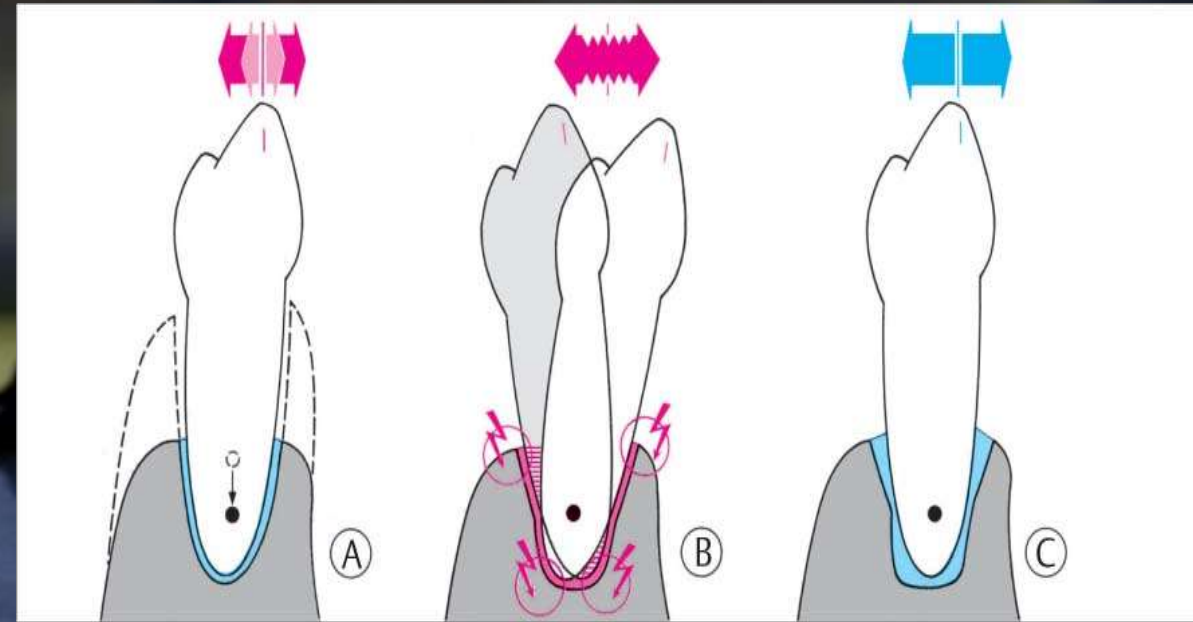
Criteria:

M 0: physiological movement only.

M 1: slightly increase mobility .

M 2: definite to considerable increase mobility . No impairment in function.

M 3: severe mobility . Normal function is impossible .



Community Periodontal Index of Treatment Needs (CPITN)

introduced by WHO / FDI in 1982

76	1	67
76	1	67

- 1-The mouth is divided into six parts. The indexed teeth are 17, 16, 11, 26, 27, 37, 36, 31, 46 and 47.
- 2- The examination done by special probe (WHO probe).
- 3- The score is identified by examination of specified index teeth or all teeth.

score criteria

- 0 No periodontal disease.
- 1 Bleeding on probing.
- 2 Calculus with plaque seen or felt by probing.
- 3 Pathological pocket 4 – 5 mm.
- 4 Pathological pocket 6 mm or more.
- x When only 1 tooth or no tooth are present.

Community Periodontal Index of Treatment Needs (CPITN)

Treatment Need

score criteria

- 0 No need for treatment.
- 1 Personal plaque control (OHI).(1- 4).
- 2 Professional plaque control (scaling and polishing). (2- 4).
- 3 Deep scaling , root planning, surgical procedure. (3- 4).

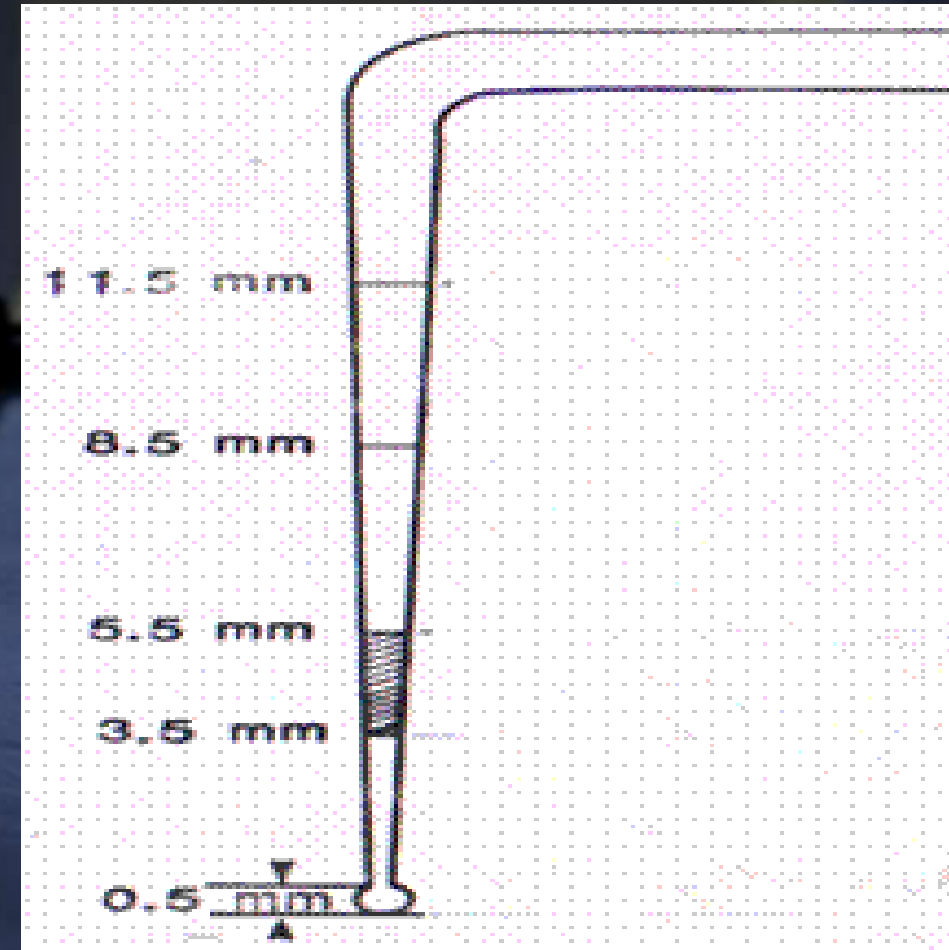
Periodontal probe

It's an instrument in dentistry commonly used in the dental armamentarium. It is usually long, thin, and blunted at the end.

The primary purpose of a periodontal probe is to measure pocket depths around a tooth in order to establish the state of health of the periodontium.

WHO probe

A special designed light weight explorer (probe) is used with a small ball tip of 0.5 mm in diameter. It is a color coded probe. The explorer is black colored for 2 mm, called black zone, starting from 3.5 mm away from the tip of the ball; i.e., it is black colored coded from 3.5 mm to 5.5 Mm from tip of the ball.

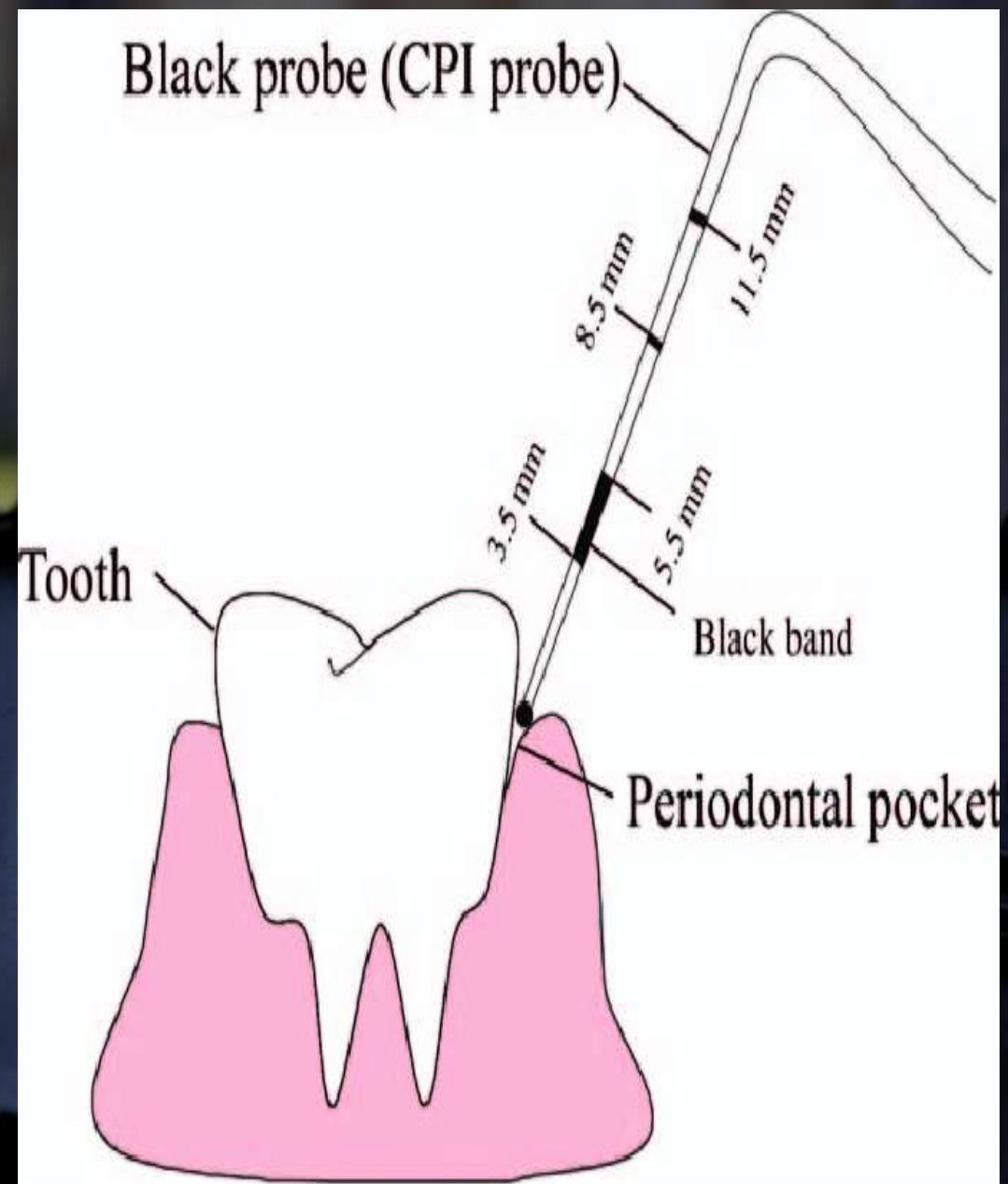


CPI probe

A more recent probe is used in this index which is called CPI probe, and it is similar to the WHO probe.

The only difference is that CPI probe contains, in addition to the black area, two graduations of 3 mm each;

i.e.; 8.5 mm and 11.5 mm from the tip of the ball.



Michigan O probe

Is a long, narrow and thin probe with blunt end to facilitate insertion in the periodontal pocket without causing damage to adjacent healthy tissue,

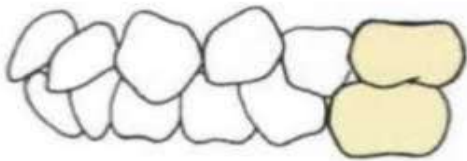
contains grades from one to ten millimeters.



Malocclusion index:

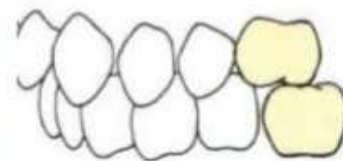
Malocclusion

Class I



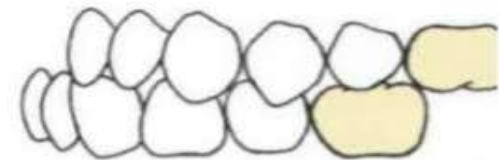
Class I malocclusion

Class II

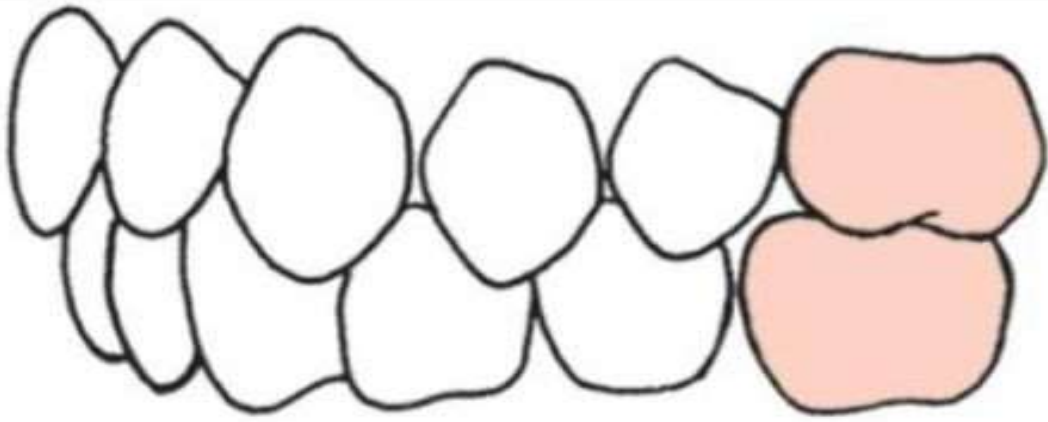


Class II malocclusion

Class III



Class III malocclusion



Normal occlusion



Class I Malocclusion



Class II Malocclusion



Class III Malocclusion

Malocclusion classes as specified by Angle.

A night scene with a building and water, featuring the text "Thank you" in a glowing white script font. The text is reflected in the water below. The background is dark with some lights from the building.

Thank you

Primary health care



- Awareness regarding the importance of oral hygiene has significantly increased in the developed countries, but contrary to that, the **modern dietary lifestyle habits are posing a greater risk for oral health.**
- Good oral health is important to your overall well-being.

Oral Hygiene

Oral hygiene includes all the processes for keeping mouth clean and healthy.

Good oral hygiene is necessary for prevention of

- 1.dental caries,
2. Periodontal diseases,
3. bad breath
- 4.and other dental problems.





A
**Healthy
Mouth**
is freedom from...

Bleeding

Crowding

Pockets

Inflammation

Broken Teeth

Infection

Bad Breath

Missing Teeth

Pain

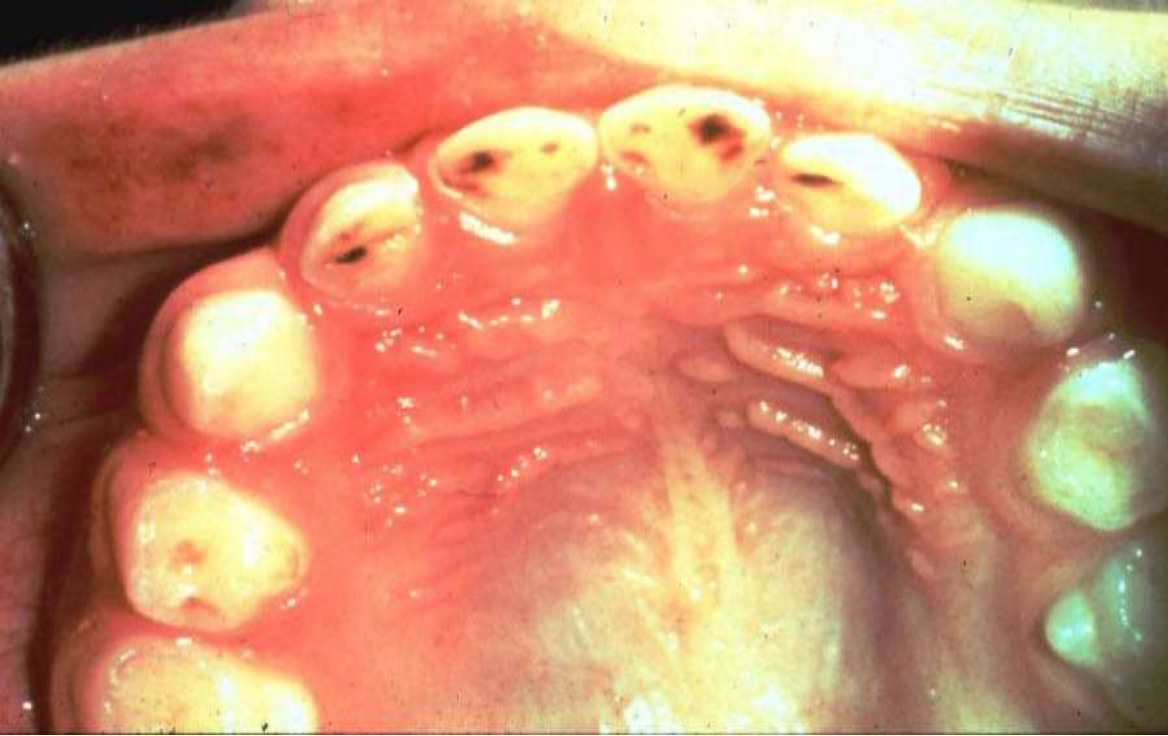
Decay

Cancer

Importance of good oral hygiene:

- Prevention is always better than cure. Good oral hygiene habits will keep away most of the dental problems saving you from toothaches and costly dental treatments.





Oral Hygiene Tips

- Brush thoroughly twice a day with a soft-bristled toothbrush
- Clean between teeth daily to remove plaque from areas your toothbrush can't reach
- Eat a balanced diet; this helps keep your teeth and gums healthy
- Don't smoke or use tobacco
- Replace your toothbrush every three months or sooner if the bristles begin to look worn out
- Visit your dentist and hygienist at least twice a year for a professional cleaning and examination



1. Brushing:

1. Always use a soft bristled toothbrush
2. Use anti-cavity Fluoride toothpaste
3. Hold toothbrush at a 45-degree angle at the gum line brushing in a circular motion. This sweeps plaque out of the gingival pocket
4. Brush teeth for a minimum of two minutes at least twice a day.
5. Brush gums and tongue along with your teeth.
6. Don't brush too hard because this can cause gingival (gum) recession.

Total manual brushing time of 3 to 5 minutes has been suggested; powered brushes may be used for 2 minutes



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k2209760 www.fotosearch.com

Proper brushing method



1. For thorough but gentle cleansing, use a soft toothbrush

2. Hold your brush at a 45° angle. Begin by brushing the outside of the front teeth. Use a gentle back-and-forth motion.

3. Next, brush the outside back teeth, starting along the gum line.

4. Inside back teeth. Use short, angled brush strokes



5. Inside front teeth. Tilt the brush vertically; use an up-and-down motion.



6. Chewing surfaces. Hold the brush flat. use a gentle scrubbing motion.

2.Flossing:

METHOD:

1. Use an arms length (18 inches) of floss. Wrap around fingers mostly to one side.
2. Floss each tooth forming a “C” shape with the floss each time.
3. A new area of floss should be introduced into each gingival pocket.
7. Don't forget to floss behind your last molar.

REASONS FOR FLOSSING:

Flossing removes plaque from behind your teeth that brushing misses.

Flossing helps prevent periodontal disease by removing plaque.

Pull out about 18" of dental floss and wrap the ends around your fingers.

Hale aproximadamente 18" (46 cm) de hilo dental y envuelva los extremos alrededor de sus dedos del corazón (medianos).

1



Gently slide the floss up and down against each side of each tooth.

2

Deslice suavemente el hilo dental hacia arriba y abajo contra el lado de cada diente.



No olvide cepillar la lengua y el paladar.

5

Don't forget to brush your tongue and the roof of your mouth.



5 Steps to Good Flossing and Brushing

Follow these instructions on flossing and brushing to keep your smile healthy!

5 Pasos para un buen cepillado y uso del hilo dental

Siga estas instrucciones de cepillado y de uso del hilo dental para mantener una sonrisa saludable.

Angle the toothbrush along the gumline and gently brush back and forth.

3

Coloque el cepillo en ángulo a lo largo de la encía y cepille suavemente con movimientos alternados.



Brush the inside and outside and the chewing surface of every tooth.

Limpie la superficie de masticación interna y externa de cada diente.

4



Use about 18" of floss, leaving an inch or two to work with.



Gently follow the curves of your teeth.



Be sure to clean beneath the gum line, but avoid snapping the floss on the gums.



3. Proper Diet:

1. Avoid foods that are high in sugar content.
2. Carbonated drinks are more acidic than non carbonated drinks; hence more dangerous.
3. Foods like potato crisps tend to stick in the grooves; stay for an extended period and cause decay.
4. Avoid excessive intake of fruit juices (can be very acidic). They can be diluted with water.

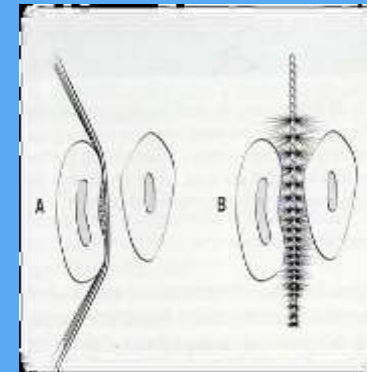


4. Other interdental cleaning:

1. Single tufted brushes :. one large bristle.
 - .for cleaning spaces between teeth.
 - .to carry medicated gel into pockets.



2. Interdental brushes:
 - .for cleaning spaces between teeth.
 - .for cleaning pontics



4. Other interdental cleaning:

3. Interdental wood sticks:

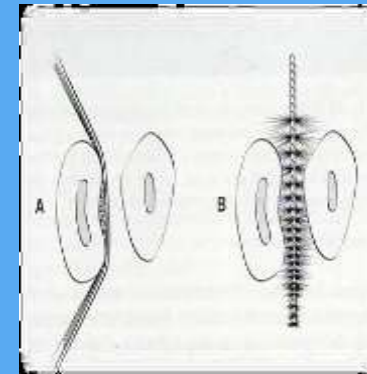
.Specially shaped 'tooth picks' made from either wood or plastic.

.used for interdental cleaning.



4. Super floss:

.Special type of floss designed to clean beneath pontics or fixed bridges.



5. TONGUE CLEANER

- The dorsum of the tongue harbors a great number of microorganisms. These bacteria may serve as a source of bacterial dissemination to other parts of the oral cavity.
- Therefore, tongue brushing has been advocated as part of daily home oral hygiene together with tooth brushing and flossing, since this might reduce a potential reservoir of microorganisms contributing to plaque formation
- The bacterial accumulations on the dorsum of the tongue may also be the source of bad breath.



6.Rinsing:

- Regular rinses with a good mouthwash helps to keep your mouth clean, fresh and germ free.
- Daily rinses must be alcohol free (they cause dryness of oral mucosa)
- Flouride rinses helps to boost the strength of newly erupted teeth.
- It is important to follow manufacturer's instructions.
- Do not rinse the mouth with water after used mouth rinse



**KEEPS TEETH
CLEANER & BRIGHTER**

**NEW Advanced
LISTERINE**

with Tartar Protection

ANTISEPTIC

- ▶ Kills Germs for 12 Hr Plaque Protection
- ▶ Fights Plaque & Gingivitis
- ▶ Enhanced Breath Protection
- ▶ Controls Tartar that can Discolor Teeth

ARCTIC MINT

1.5 LITERS (1 qt 1 pt 2.7 fl oz)

1.5 LITERS (1 qt 1 pt 2.7 fl oz)

7.Regular dental checkups:

- Good oral hygiene should be a joined effort between you and your dentist.
- Your dentist, if visited regularly, will detect and prevent any problem before it becomes hazardous for you.
- Regular dental checkups are an essential part of dental hygiene routine for young and old alike.



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Signs of good oral hygiene:

Good oral hygiene results in a mouth that looks and smells healthy. This means:

- ➔ Your teeth are clean and free of debris.
- ➔ Gums are pink and do not hurt or bleed when you brush or floss.
- ➔ Bad breath is not a constant problem.



THANK YOU



QUIZ 1

- The recommended time of powerful tooth brushing is 5 minute (T OR F) .

Definition (*3 parts*)

- Art and science of the **DIAGNOSIS**, **TREATMENT**, and **PROGNOSIS** of defects of teeth that do not require full coverage restoration for correction.

Conservative Dentistry

- Treatment should result in the restoration of proper tooth form, function, and esthetics, while maintaining the physiologic integrity of the teeth in harmonious relationship with the adjacent hard and soft tissues.

Conservative Dentistry

- All of which should enhance the general health and welfare of the patient

Conservative Dentistry also known as Restorative Dentistry or operative Dentistry

Indications for Operative Treatment

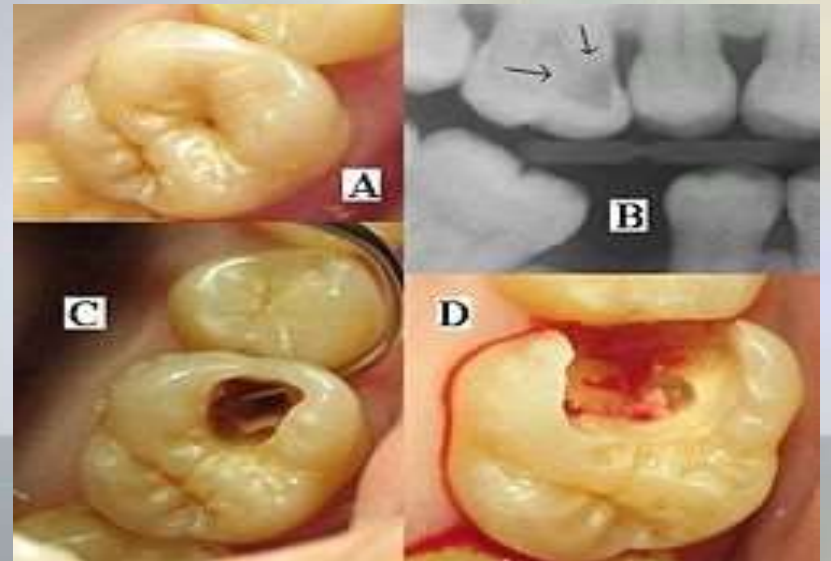
- Caries,
- Malformed, discolored, non esthetic, or fractured teeth,
- Wearing of teeth (attrition, abrasion, etc.)
- Restoration replacement or repair.



Pit and fissure caries



Rampant smooth surface caries





Crevical Abrasion



Attrition in Anterior Teeth

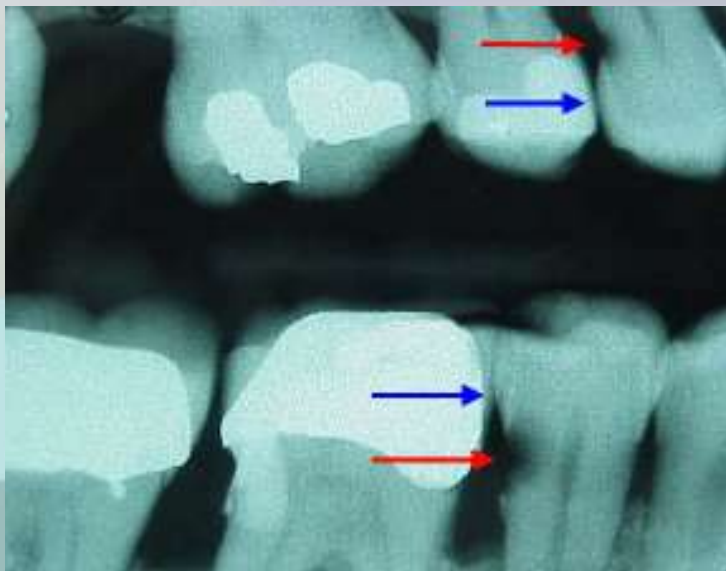


Fig. 1: Attrition

Attrition in Posterior Teeth

Procedures

Procedures commonly done are

- Direct restoration – Amalgam, Composite resin, GIC.
- Indirect restoration – Inlay, onlay, crowns (base metal, precious metal, porcelain fused to metal, or metal free ceramic)
- Veneers – Direct or indirect

- **Direct Restoration – After tooth preparation, the restoration is placed in a moldable stage in the prepared tooth to recreate normal contours.**

Adv. – easy to place, less time consumed, and cost effective.

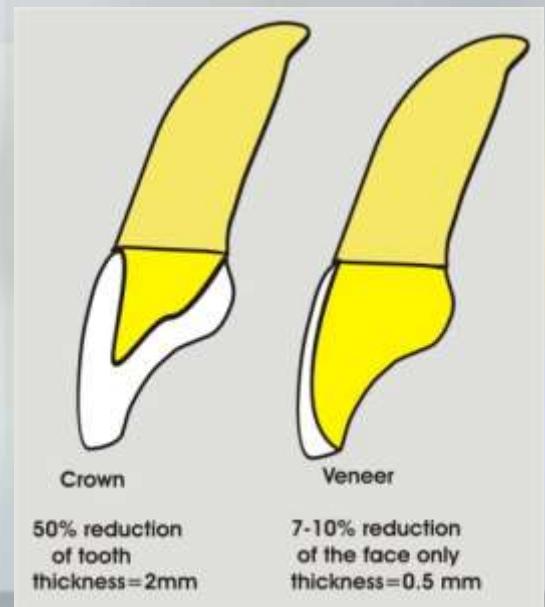
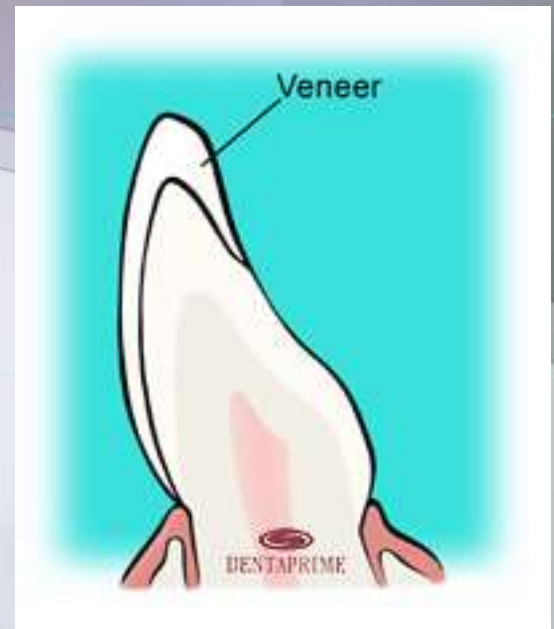
Disadv. – compromised mechanical properties



- **Indirect Restoration-** After tooth preparation, it involves making of impression, pouring of cast, die preparation, wax pattern, investing, casting, finishing, polishing and cementing (or luting) of restoration. (restoration is fabricated outside and cemented to prepared tooth)

Adv.- provide better mechanical properties
and stress distribution

Disadv.- time consuming, expensive, and
more technique sensitive



Cavity Preparation

Is the mechanical alteration of a defective, injured or diseased tooth to receive a restorative material that re-establish a healthy state for the tooth, including esthetic correction where indicated and normal form and function.

- Purpose of cavity preparation
 - To remove carious or diseased portion of tooth and to avoid further progression or recurrence of it.
 - Caries might have progressed in an irregular shape, but one must prepare the tooth in an appropriate shape to obtain best mechanical properties of restorative material

- **How is cavity preparation done**

- With diamond burs attached to hand held device called hand piece at high speed (200000 rpm) for gross cutting.
- With finishing burs attached to slow speed hand piece (30000 – 40000 rpm) or hand cutting instruments for finer adjustments

Change in concept

Tooth preparation originally adhered to the concept of 'extension for prevention', but increased knowledge of preventive methods, advanced clinical techniques, and improved materials now have provided a more conservative approach to the restoration.

Pre clinical Operative Dentistry

Is a branch of operative dentistry wherein practical training is given in cavity preparation and restoration of teeth with various materials in dummy models in simulated oral environment

PIT AND FISSURE SEALANTS

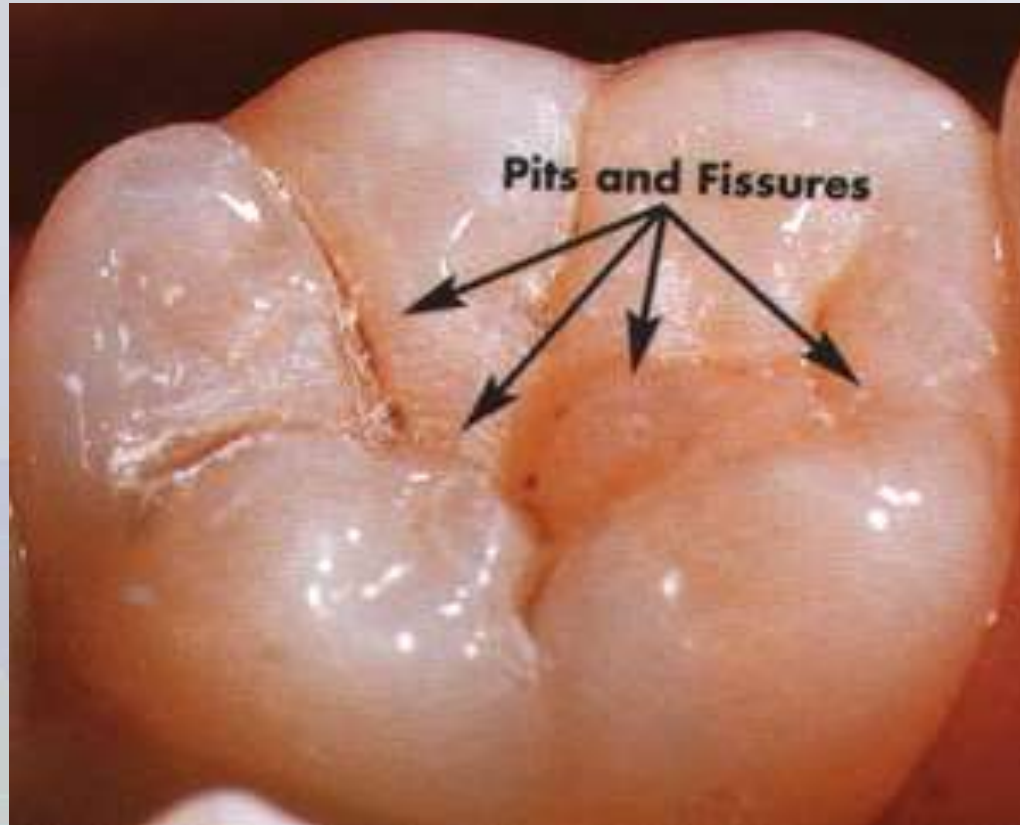
Dental Sealants

- Very effective in prevention of caries
- Fills deficient pits and fissures
- Acts as a barrier to plaque and bacteria
- Non-invasive
- Can also be used to seal margins of composite restorations.
- Need to be diagnosed and prescribed
- Can be done by:
 - Doctor
 - Hygienist
 - Expanded Function Dental Assistant

Pits and Fissures can be described as:

- Areas in the fossa's and grooves that have failed to form
- Found on occlusal surfaces of posterior teeth
- Found on the lingual of anterior teeth
- Narrow and deep grooves
- Can't be reach by brushing
- Acid producing bacteria cause demineralization

Pits and Fissures



Sealant Barrier

- Acts as barrier
- Arrests incipient decay
- Blocks carbohydrate
- Used with good habits and fluoride
- Proven to be an effective method for prevention



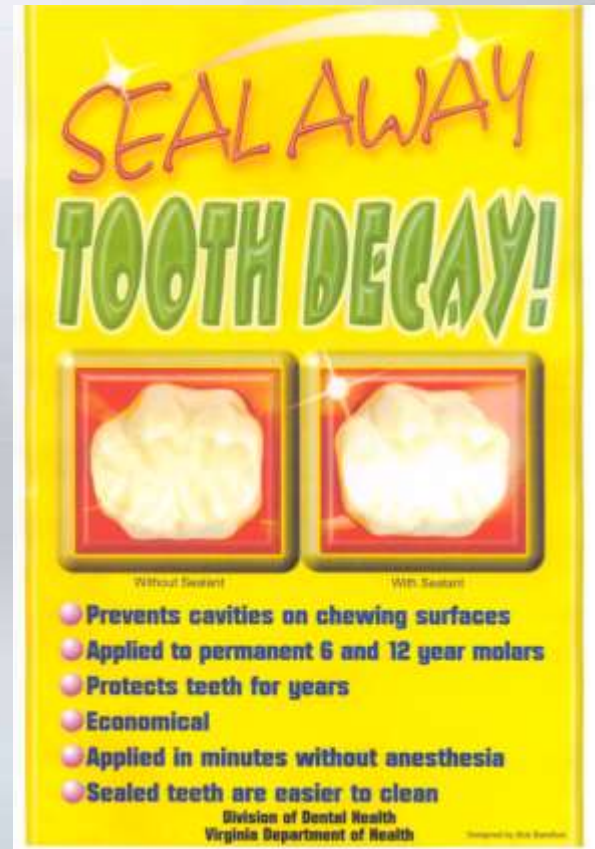
Types of Sealant Material

- Acrylic resin-based composite
- Less viscous than restorative composite
- Flowable
- Clear, Tinted or Opaque
- Can contain Fluoride
- Can be an allergen



Indications for Sealants

- Primary teeth with no decay
- Incipient decay with deep pits and fissures
- Patient with high caries rate
- Ages 6-15
- Preventive procedure



Contraindications for Sealants

- Shallow or blended pit and fissures
- Insufficiently erupted teeth
- Restorations.
- Primary tooth will be lost soon
- Caries free for more than four years
- **Poor cooperation**



Process for Placement of Sealants

- Clean tooth surface with pumice
- Rinse, dry and isolate
- Etch, rinse and dry
- Apply sealant resin
- Light cure/self cure
- Check margins for voids, irregularities, smoothness
- Floss interproximal spaces

Success vs. Failure

- Success depends on good isolation
- Failure can be due to moisture contamination
- Success depends on a good mechanical bond
- Failure can be due to incomplete etching



DENTAL FLUOROSIS



Dental fluorosis

is a defect of the teeth marked by increased porosity of the enamel (a condition known as “Hypomineralization“ or enamel mottling)



Causes

This defect of tooth enamel caused by too much fluoride intake during the first 8 years of life. the damage to the enamel is permanent .The fluorosis of primary tooth enamel is very rare.



Causes of fluorosis include:

- ❑ Excess fluoridation of drinking water.
- ❑ Inappropriate use of fluoride containing dental products such as Toothpastes and mouth rinses .
- ❑ Consumption of processed food made with fluoridated water.
- ❑ taking a higher-than-prescribed amount of a fluoride supplement during early childhood (As use overuse of Fluoride tablets).
- ❑ taking a fluoride supplement when fluoridated drinking water or fluoride fortified fruit juices and soft drink already provide the right amount



HISTORY



1888 : “**KUHNS**” described teeth of persons in areas of Mexico that were opaque, discolored and disfigured. (Kuhns1888; Moller 1982).

1901 Dr. Fredrick Mckay of Colorado USA discovered permanent stains on teeth of his patients which were referred as Colorado stains.

Mckay named then “mottled enamel”.

An Assitant surgeon of U.S marine hospital service reported similar condition in Italians emigrating from USA from Naples named it denti di chiaie. (Eager 1901).

1916 Mckay and **Black** published a series of articles in dental cosmos.

Mechanism of action of fluoride:

- ⦿ , an increase in fluoride intake results in an increase in degree and extent of porosity of the enamel ; the enamel changes described may be a result of a fluoride damage of secretory ameloblasts.
- ⦿ This can either be due to a fluoride-induced change in composition of enamel matrix, or be a result of a disturbance of the cellular processes during enamel maturation.

Optimal Level of Fluoride and Fluorosis:

1 ppm → minimal threshold of fluorosis

.When fluoride concentration is more than 1 ppm undesirable mottling began to be seen in about 10% of the population.

Variables Affecting Prevalence and Severity of Dental Fluorosis :

- ⦿ **Fluoride concentration in drinking water.**
- ⦿ **Total amount of fluoride ingested**
which include amount of fluoride in water, food, drugs, dentifrices
- ⦿ **Temperature**
water requirement increase in hot temperature which increase possibility of fluorosis
- ⦿ **Duration of exposure**
fluorosis increased with the longer time teeth are exposed to fluoride.
- ⦿ **Malnutrition**
in some studies showed that malnourished children develop more dental fluorosis than well-nourished

DEAN'S FLUOROSIS INDEX

1934; TRENDLEY H. DEAN
devised an index for
assessing the presence and
severity of mottled enamel.



Dental fluorosis index



- ◎ **Dean's Index – 1934**
- ◎ **Dean's 0 Normal:** The enamel surface is smooth, glossy and usually a pale creamy-white color.
- ◎ **Dean's 1 Questionable:** The enamel shows slight aberrations from the translucency of normal enamel, which may range from a few white flecks to occasional spots.



- ◎ **Dean's 2 Very mild:** small opaque white area scattered irregularly over the tooth, but not involving more than 25% of the tooth surface, for posterior teeth it is an area of 1 – 2 mm white opaque area at the tips of the cusps of molars and premolars.



- ① **Dean's 3 Mild** :we have white opaque area in the enamel more extensive than for code 2 but involving not more than 50% of the tooth surface.



- ① **Dean's 4 Moderate:** all enamel surface are effected, surfaces are subjected to attrition, it showed there is a marked wear brown stain.



- ① **Dean's 5 Severe:** when the all enamel surface are badly affected and the hypoplasia is so marked that the general form of the tooth may be affected, There are pitted or worn areas and brown stains are widespread; the teeth often have a corroded appearance.



⦿ **Code 6** : All 4 anterior teeth absent.



Original Criteria- 1934



Normal



Questionable



Very mild



Mild



Moderate



Moderately severe



Severe

Enamel Mottling by AL – Alousi et al . (1975)

⦿ Selection of teeth and scoring

Labial surface of permanent incisor teeth .
Calculation of the prevalence of different types of opacities in both individual and teeth :

:Diagnosis and criteria

:

- ◎ **Type A** : White area less than 2 mm in diameter.
- ◎ **Type B** : White area of , or greater than 2 mm in diameter.
- ◎ **Type C** : Colourd (brown) area less than 2 mm in diameter, irrespective of there being white area.

- ◎ **Type D** : Coloured (brown) area of, or greater than 2 mm in diameter, irrespective of there being any white area.
- ◎ **Type E** : Horizontal white lines , irrespective of there being any white non-linear lines.
- ◎ **Type F** : Coloured (brown) or White area or lines associated with pits or hypoplastic area .



Thank
You

