Dental numbering systems

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

1.The Universal Numbering System has been adopted by the ADA. Tooth number 1 is the tooth farthest back on the right side of your mouth in the upper (maxillary) jaw. Numbering continues along your upper teeth toward the front and across to the tooth farthest back on the top left side number 16. The numbers continue by dropping down to the lower (mandibular) jaw. Number 17 is the tooth farthest back on the left side of your mouth on the bottom. Numbering continues again toward the front and across to the tooth farthest back on the bottom right side of your mouth number 32. In this system, the teeth that should be there are numbered. If you are missing your third molars, your first number will be 2 instead of 1, acknowledging the missing tooth. If you've had teeth removed or teeth missing, the missing teeth will be numbered as well.

2.The Palmer Notation Numbering System. The mouth is divided into four sections called quadrants. The numbers 1 through 8 and a unique symbol is used to identify the teeth in each quadrant. The numbering runs from the center of the mouth to the back. In the upper right quadrant tooth, number 1 is the incisor. The numbers continue to the right and back to tooth number 8, which is the third molar. The numbers sit inside an └ -shaped symbol used to identify the quadrant. The └ is right side up for the teeth in the upper right quadrant. The teeth in the upper left use a backwards └ . For the bottom quadrants, the └ is upside down following the same pattern from the uppers. Letters such as UR or URQ for the upper right or upper right quadrant may also identify the quadrants.

3.The Federation Dental International Numbering System (FDI). Internationally the two- digit system is used worldwide. Every branch of dentistry uses this system. Each quadrant is assigned a number. The maxillary right quadrant is assigned the number 1, the maxillary left quadrant is assigned the number 2, the mandibular left quadrant is assigned the number 3, and the mandibular right quadrant is assigned the number 4.The teeth within each quadrant are assigned a number from 1 through 8 with 1 being the central incisor and 8 being the third molar.

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Palmer Notation

Permanent Teeth															
upper right								upper left							
8⌋	7⌋	6⌋	5⌋	4⌋	3⌋	2⌋	1⌋	L1	L2	L3	L4	L5	L6	L7	L8
⌈8	⌈7	⌈6	⌈5	⌈4	⌈3	⌈2	⌈1	⌈1	⌈2	⌈3	⌈4	⌈5	⌈6	⌈7	⌈8
lower right								lower left							

Deciduous Teeth															
upper right								upper left							
			E⌋	D⌋	C⌋	B⌋	A⌋	LA	LB	LC	LD	LE			
			⌈E	⌈D	⌈C	⌈B	⌈A	⌈A	⌈B	⌈C	⌈D	⌈E			
lower right								lower left							

The FDI two digit tooth numbering system (below) is used in all examinations.

FDI / UNIVERSAL NUMBERING SYSTEM

PERMANENT DENTITION

FDI	**1.8**	**1.7**	**1.6**	**1.5**	**1.4**	**1.3**	**1.2**	**1.1**	**2.1**	**2.2**	**2.3**	**2.4**	**2.5**	**2.6**	**2.7**	**2.8**	**FDI**
Universal	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Universal
	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	
FDI	**4.8**	**4.7**	**4.6**	**4.5**	**4.4**	**4.3**	**4.2**	**4.1**	**3.1**	**3.2**	**3.3**	**3.4**	**3.5**	**3.6**	**3.7**	**3.8**	**FDI**
	RIGHT														**LEFT**		

PRIMARY DENTITION

FDI	**5.5**	**5.4**	**5.3**	**5.2**	**5.1**	**6.1**	**6.2**	**6.3**	**6.4**	**6.5**	**FDI**
Universal	A	B	C	D	E	F	G	H	I	J	Universal
	T	S	R	Q	P	O	N	M	L	K	
FDI	**8.5**	**8.4**	**8.3**	**8.2**	**8.1**	**7.1**	**7.2**	**7.3**	**7.4**	**7.5**	**FDI**
	RIGHT								**LEFT**		

Dental Indices

Index is 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 the same criteria and methods.

Ideal properties of an index:

- ❖ Clarity: The examiner should be able to carry out the index rules in his mind.
- ❖ Simplicity: The index should be easily to apply.
- ❖ Objectivity: The index criteria should have clear-cut.
- ❖ Validity: The index should be measure what it is intended to measure. So it should be correspond with clinical stages of the disease, (ex. number of missing teeth in adults is not a valid measure of caries activity ?).
- ❖ Reliability: The index should measure consistently at different times and under a variety of conditions, by the same person or different persons.
- ❖ Quantifiability: The index should have meaning to statistical analysis. So that the status of a group can be expressed by a number that corresponds to a relative position on a scale from zero to the upper limit.
- ❖ Sensitivity: The index should be able to detect reasonably small shifts, in either direction in the group condition.
- ❖ Acceptability: The use of the index should not be painful or demeaning to the subject.

Uses of dental indices:

1. To provide data for epidemiological studies by studying prevalence, incidence, and severity of disease.

2. To study and compare oral health status of individuals and population and finding out etiological and predisposing factors for the diseases.

3. For planning of oral health policy and evaluating the success and effectiveness of preventive programs.

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Classification of indices:

A- Depending on the direction in which their scores can fluctuate:

1. Irreversible index …….. DMF

Index that measures conditions will not return to the normal state. Once established cannot decrease in value on subsequent examinations.

2. Reversible index …… GI

Index that measures conditions that can be return to the normal state. Reversible index scores can decrease or increase in value on subsequent examinations.

3. Composite index …… PDI

Index that measures conditions that can be return to the normal state and conditions will not return to the normal state.

B- Depending on the extent to which areas of oral cavity are measured:

1. Full mouth index …… Dean's Fluorosis Index

These indices measure the patient's entire dentition.

2. Simplified index ……..…… CSI

These indices measure only a representative sample of teeth.

C- Depending on the entity which they measured for:

1. Disease index ……. D M F

2. Treatment index …… D M F

3. Symptom index …….. PBI

Scales

There are three types of scales:

1. Ordinal scale: It is a scale of measurement that lists conditions in some order. Use of this sort of scale merely attempts to order a condition progressively, without attempting to define any mathematical relation

Dr. Dalia Kuder

between the categories defined. For example, classifying the condition of inflammation of gingival tissues as mild , moderate, severe.

2. A nominal scale is even less rigidly defined; it simply gives names to different conditions and therefore is not strictly a scale at all. An example, classifying the condition of gingival tissues as good, poor, fair, which merely attaches names to variously defined conditions.

3. An interval or a ratio scale is one in which the numbers used in the measuring scale

Indices used for dental caries assessment

1- Indices used for coronal caries.

A- Permanent teeth. B- Primary teeth.

2- Indices used for root caries.

-Permanent teeth index:

(Decayed-Missing-Filled)Index (DMF) which was introduced by Klein, Palmer and Knutson in 1938 and modified by WHO:

1-DMF teeth index (DMFT) which measures the prevalence of dental caries/Teeth.

2- DMF surfaces index (DMFS) which measures the severity of dental caries.

The components are:

D component:

Used to describe (Decayed teeth) which includes:

1. Carious tooth.
2. Filled tooth with recurrent decay.
3. Only the root are left.
4. Defect filling with caries.
5. Temporary filling.
6. Filled tooth surface with other surface decayed.

M component:

Used to describe (Missing teeth due to caries) other cases should be **excluded** these are:

1. Tooth that extracted for reasons other than caries should be excluded, which include: (Orthodontic treatment, Impaction, Periodontal disease)
2. Unerupted teeth.
3. Congenitally missing teeth.

Dr. Dalia Kudier

4. Avulsion teeth due to trauma or accident.

F component:

Used to describe (Filled teeth due to caries). Teeth were considered filled without decay when one or more permanent restorations were present and there was no secondary (recurrent) caries or other area of the tooth with primary caries. A tooth with a crown placed because of previous decay was recorded in this category.

Teeth stored for reason other than dental caries should be **excluded,** which include:

1. Trauma (fracture).
2. Hypoplasia (cosmatic purposes).
3. Bridge abutment (retention).
4. Seal a root canal due to trauma.
5. Fissure sealant.
6. Preventive filling.

Note :

1- A tooth is considered to be erupted when just the cusp tip of the occlusal surface or incisor edge is exposed. The excluded teeth in the DMF index are:

1- Supernumerary teeth.

2- The third molar according to **Klein, Palmer and Knutson** only.

Limitations - DMF index can be invalid in older adults or in children because index can overestimate caries record by cases other than dental caries.

Principle and rules in recoding:

1-DMFT:

A- A tooth may have several restorations but it counted as one tooth, F.

B- A tooth may have restoration on one surface and caries on the other surface, it should be counted as decayed D.

C- No tooth must be counted more than once, D M F or sound.

2-DMFS

Each tooth was recorded scored as 4 surfaces for anterior teeth and 5 surfaces for posterior teeth.

- ❖ Retained root was recorded as 4 D for anterior teeth, 5 D for posterior teeth.
- ❖ Missing tooth was recorded as 4 M for anterior teeth, 5 M for posterior teeth.

Dr. Dalia Kudier

- ❖ Tooth with crown was recorded as 4 F for anterior teeth, 5 F for posterior teeth.

Calculation of DMFT \ DMFS:

1- For individual

DMF = D + M + F

2- For population

$$\text{Mean DMF} = \frac{\text{Total DMF}}{\text{Total No. of the subjects examined}}$$

Minimum score = Zero

Maximum score:

1- DMFT = 32

3- DMFS = 12 * 4 + 20 * 5 = 48 + 100 = 148 or 128

***Primary teeth index:**

1- dmft / dmfs

Maximum scores: dmft = 20 , dmfs = 88

2- deft / defs , which was introduced by Gruebbel in 1944

d- decayed tooth .

e- decayed tooth indicated for extraction .

f- filled tooth.

3- dft / dfs

In which the missing teeth are ignored, because in children it is difficult to make sure whether the missing tooth was exfoliated or extracted due to caries or due to serial extraction.

Mixed dentition:

Each child is given a separate index, one for permanent teeth and another for primary teeth.

Information from the dental caries indices can be derived to show the:

1. Number of persons affected by dental caries (%).
2. Number of surfaces and teeth with past and present dental caries (DMFT / dmft -- DMFS / dmfs).
3. Number of teeth that need treatment, missing due to caries, and have been treated (DT/dt , MT/mt , FT/f t).

Differentiation between tooth missing due to caries and due to exfoliation?

1- By age of the patient if it is near to exfoliation time or not.

2- The shape of ridge is concave in carious missing tooth and straight in exfoliated one and permanent successor may be seen.

Dr. Dalia Kudier

3- DMF/dmf index is higher in association with carious missing tooth especially adjacent and the contra lateral teeth.
4-Bad oral hygiene mainly associated with carious teeth.

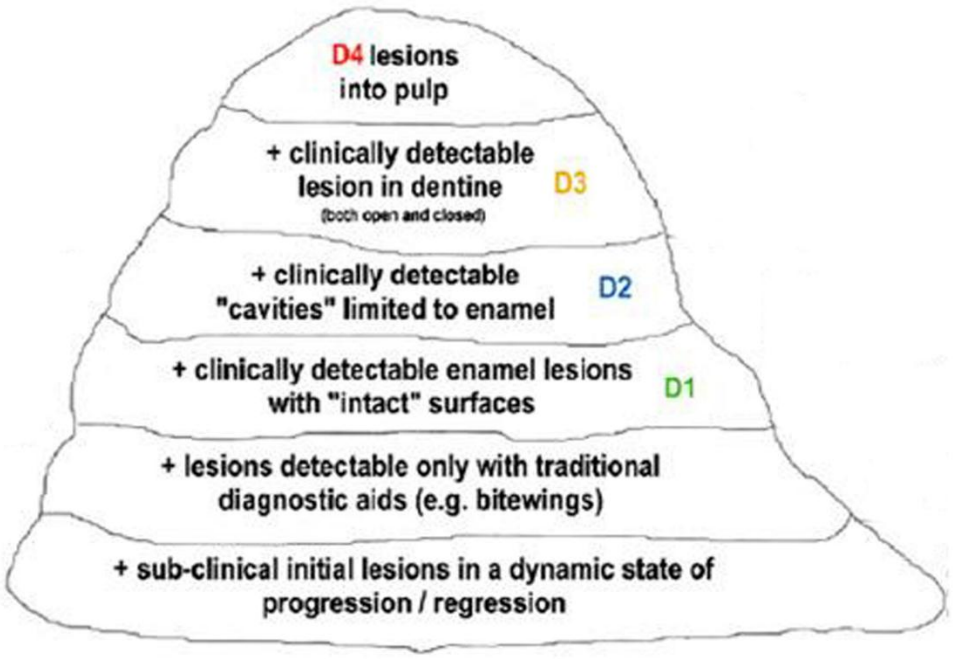
Differentiation between tooth missing due to caries and due to orthodontic treatment

1- By type of teeth, in ortho. treatment most teeth should be extracted are 4,5/c, d while in carious missing teeth any teeth may be involved.
2- Bilateral and /or opposing missing generally associated with ortho. treatment, while in carious missing teeth it is not necessary.
3- DMF/dmf index is higher in association with carious missing tooth especially adjacent and the contra lateral teeth with bad oral hygiene mainly associated with carious teeth.
4- Crowding or appliance may be seen in ortho. treatment.

DENTAL CARIES SEVERITY CLASSIFICATION SCALE

- **0-surface sound** : no evidence of treated or untreated clinical caries.
- **D1-initial caries** : no clinically detectable loss of substance For pits & fissures, there may be significant staining, discolouration, rough spots in the enamel that do not catch the explorer but loss of substance cannot be positively diagnosed.
- **D2-Enamel caries** : demonstrable loss of tooth substance in pits, fissures or on smooth surfaces, but no softened floor or wall or undermined enamel. The texture of the material within the cavity may be chalky or crumbly, but there is no evidence that cavitation has penetrated the dentin.
- **D3-caries of dentin** : detectably softened floor, undermined enamel or a softened wall, or the tooth has a temporary filling. On proximal surfaces, the explorer point must enter a lesion with certainty
- **D4-pulpal involvement** : deep cavity with probable pulpal involvement. pulp should not be probed (usually included with D3 in data analysis)

Dr. Dalia Kudier



***Root Caries Index (RCI), which was introduced by Katz in 1979:**

RCI is based on the requirement that gingival recession must occur before root surface lesions begin. Therefore, only teeth with gingival recession are examined.

1. All teeth are examined in both the lower and upper arch.
2. To obtain the RCI, each of the four surfaces the mesial, distal, buccal (labial), and lingual, of a root are examined for a single tooth.
3. When multiple types of root surfaces are exposed, the most severely affected root surface be recorded for that tooth.

The calculation of RCI:

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

(R-D) is no. of root surfaces with decay.
(R-F) is no. of root surfaces which have permanent filling.
(R-N) is the no. of sound root surfaces.