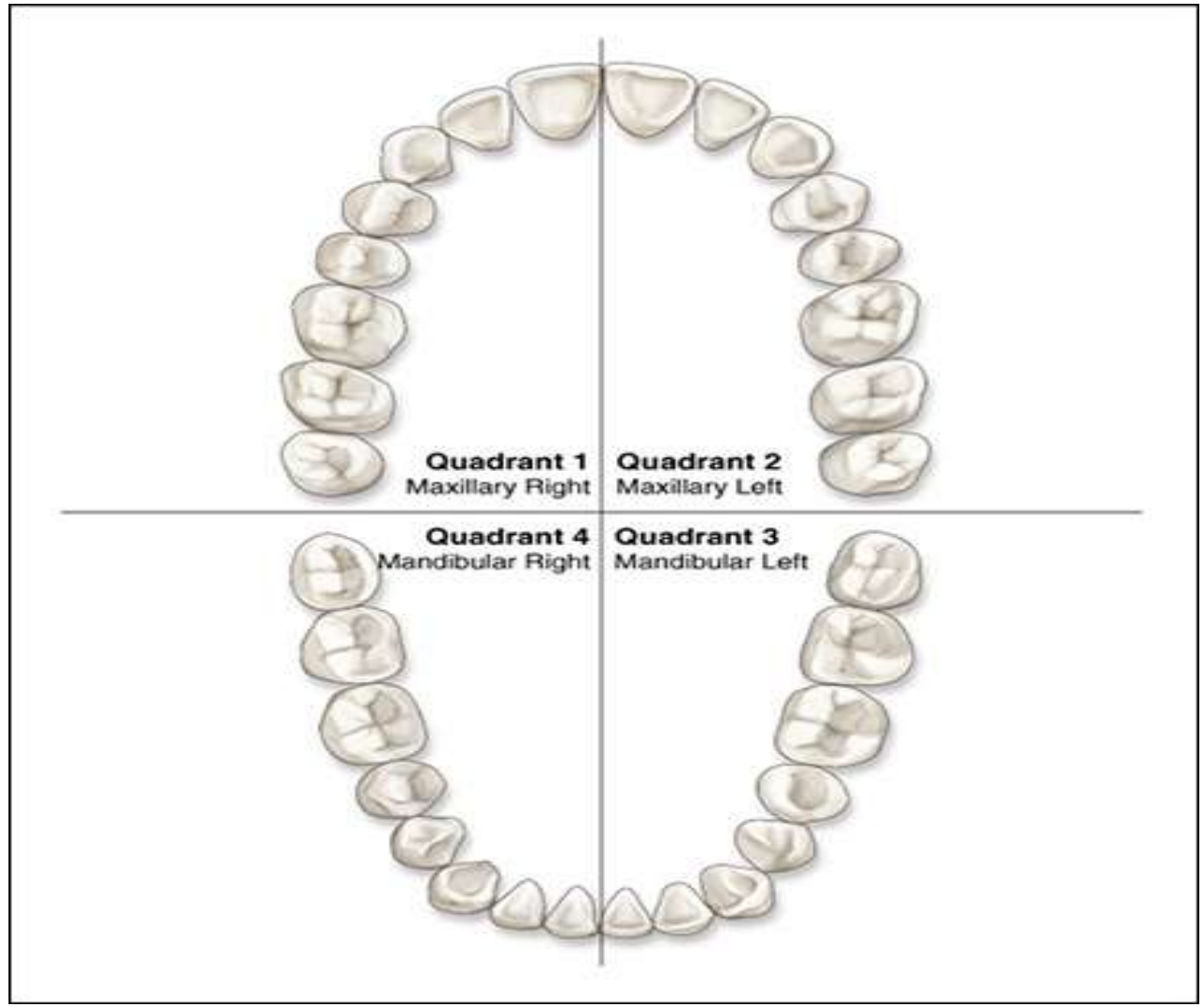
Introduction To Dental Anatomy

Introduction

- Midline: imaginary vertical line which divides each arch as well as body into approx equal halves
- Right Maxillary teeth: teeth arranged in upper arch
- Manduibular teeth: teeth arranged in lower arch

- Quadrants: two approximately equal portions of each arch divided by midline
- Four in entire mouth and termed as
- 1. maxillary (upper) right
- 2. maxillary (upper) left
- 3. mandibular (lower) right
- 4. mandibular (lower) left


Quadrant 1
Maxillary Right
Quadrant 2
Maxillary Left
Quadrant 4
Mandibular Right
Quadrant 3
Mandibular Left

- Dentition

Two types of dentition are present in humans

1. Deciduous
2. Primary

Deciduous teeth

- So named because they are shed like the leaves of tree in autumn
- 20 total deciduous teeth are present
- Erupts from 6 months to 2 years other non scientific names for deciduous teeth include "milk” teeth “temporary" teeth

Permanent Dentition

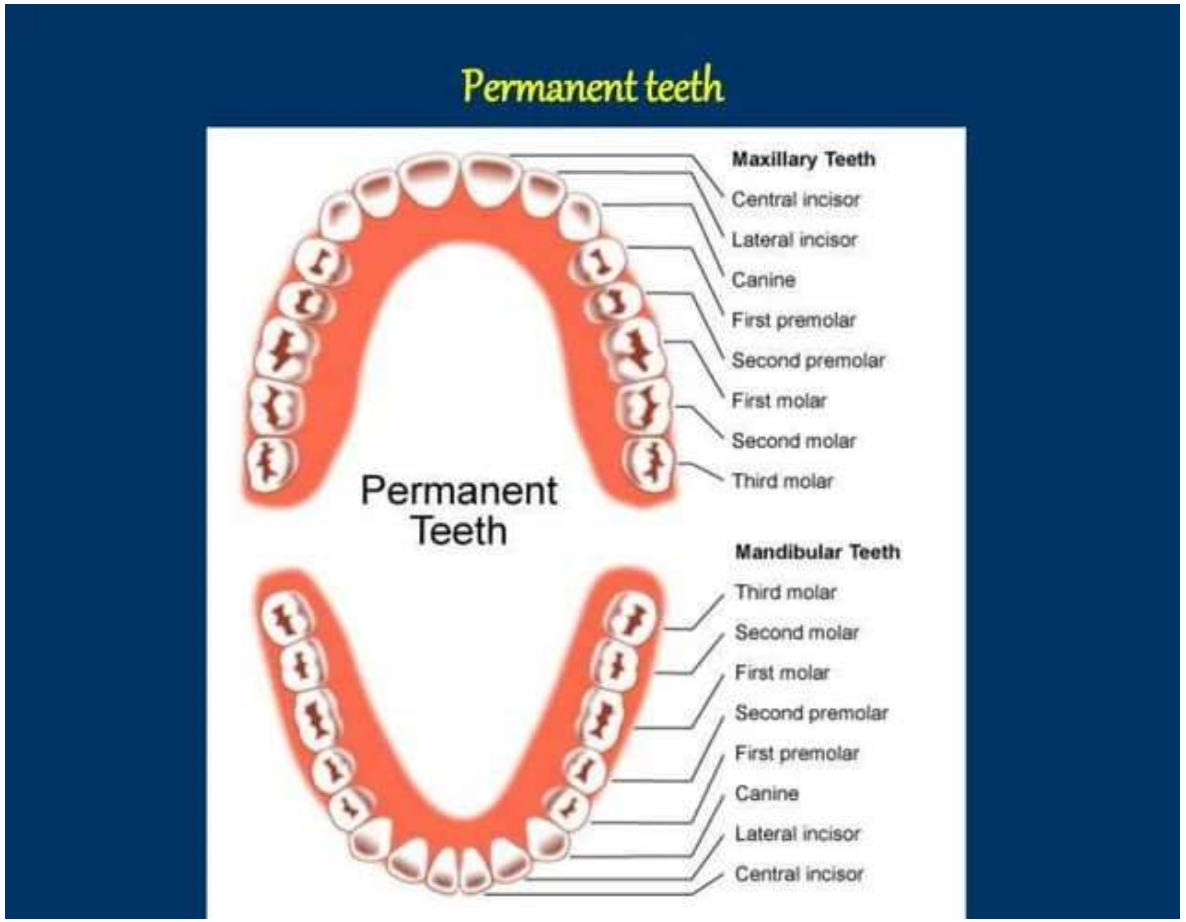
- Teeth of the secondary, or adult dentition
- There are 32 permanent teeth
- Erupt from 6-21 years of age

Classification of deciduous teeth

Classification of teeth (Primary)

Tooth	Name	Position	Function	Number
Incisors	Central & Lateral Incisors	Two teeth of each quadrant which are closest to midline	Biting, cutting, incising & shearing	08
Canine (Cuspid)	Canine	3rd tooth from midline in each quadrant	Cutting, tearing, piercing & holding	04
Molars	1st & 2nd Molars	4th tooth from midline	Grinding	08

Permanent teeth



Classification of teeth (permanent)

Tooth	Name	Position	Function	Number
Incisors	Central & Lateral Incisors	Two teeth of each quadrant which are closest to midline	Biting, cutting, incising & shearing	08
Canine (Cuspid)	Canine	3rd tooth from midline in each quadrant	Cutting, tearing, piercing & holding	04

Tooth	Name	Position	Function	Number
Premolars (Bicuspid)	1st & 2nd Premolars	4th and 5th teeth from midline	Tearing, holding & grinding	08
Molars	1st , 2nd & 3rd Molars	6th , 7th , 8th teeth from midline	Grinding	12

teeth

- It Simply means "succeeding" deciduous teeth
- Twenty deciduous teeth are replaced by twenty succedaneous teeth
- Incisors and canines – replace their deciduous counterpart
- Premolars - which replaces deciduous molars
- Molars are not considered as succedaneous teeth

Dental formula

Milk teeth

Incisors, I = 2
Canines, C = 1
Molars, M = 2

$$\frac{212}{212} \times 2 = 20$$

Permanent teeth

Incisors, I = 2
Canines, C = 1
Premolar, PM = 2
Molars, M = 3

$$\frac{2123}{2123} \times 2 = 32$$

Dental Formula shows the arrangement of teeth:

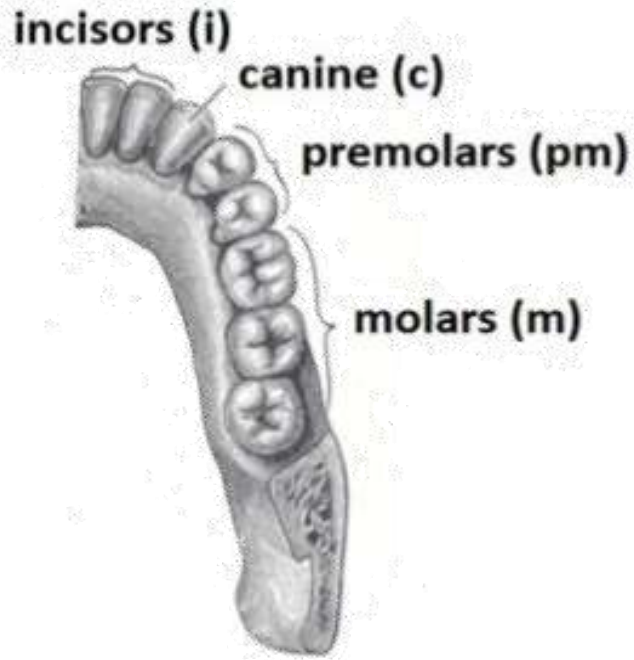
Dental Formula for human permanent dentition

$$2\left[\mathrm{i}\frac{2}{2}\,\mathrm{c}\frac{1}{1}\,\mathrm{pm}\frac{2}{2}\,\mathrm{m}\frac{3}{3}\right]$$

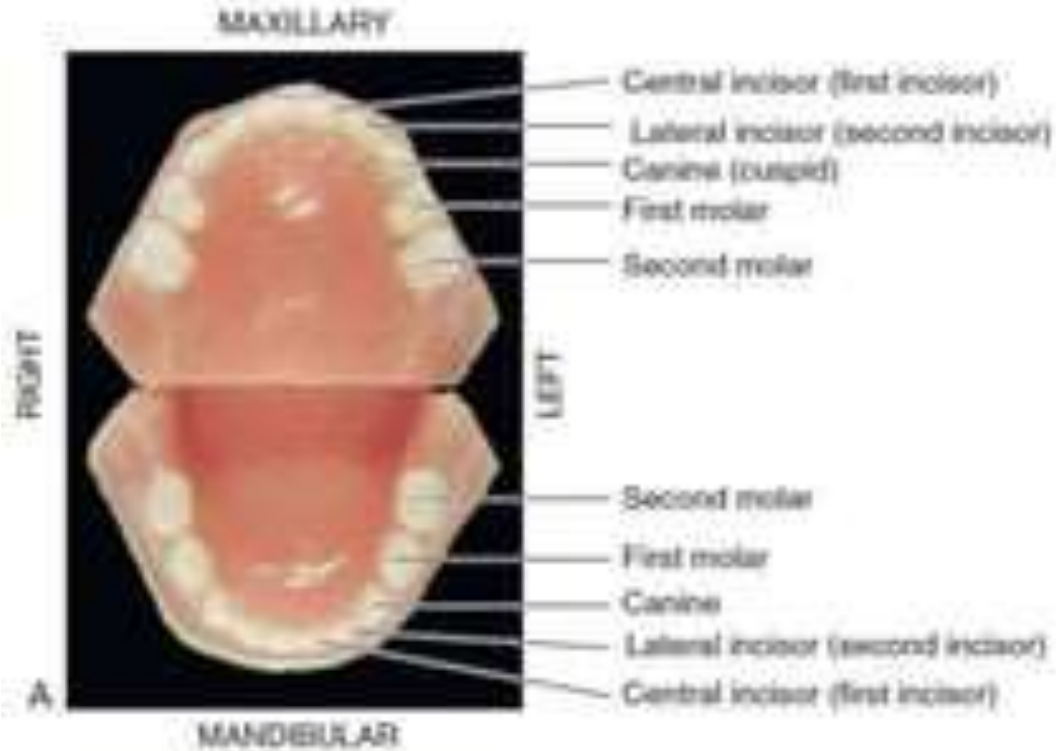
Upper jaw: 16

Lower jaw: 16

Total: 32



PRIMARY DENTITION



- **Dental formula for the deciduous teeth**

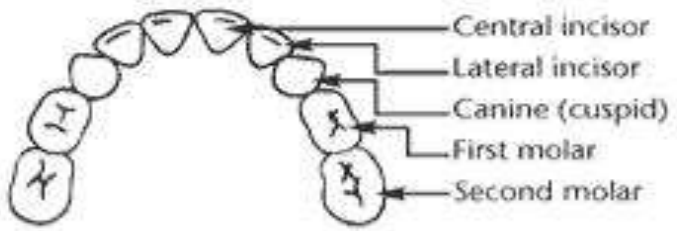
$$I\frac{2}{2}C\frac{1}{1}M\frac{2}{2}=10$$

- *Erruption Patterns*

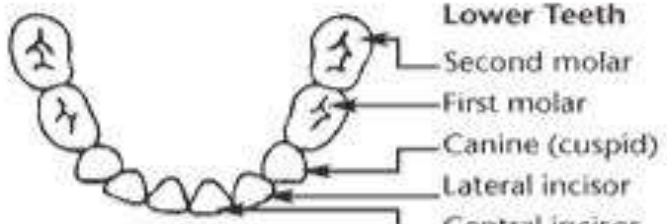
- Deciduous Dentition

Tooth Eruption Chart

PRIMARY DENTITION

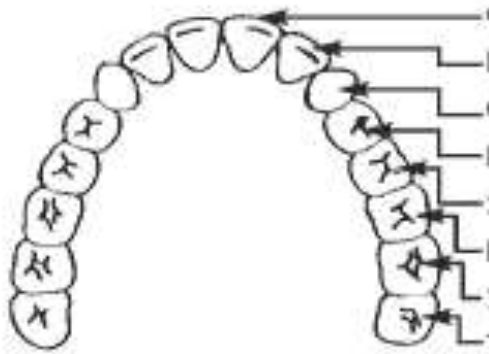


Upper Teeth	Erupt	Exfoliate
Central incisor	8-12 months	6-7 years
Lateral incisor	9-13 months	7-8 years
Canine (cuspid)	16-22 months	10-12 years
First molar	13-19 months	9-11 years
Second molar	25-33 months	10-12 years

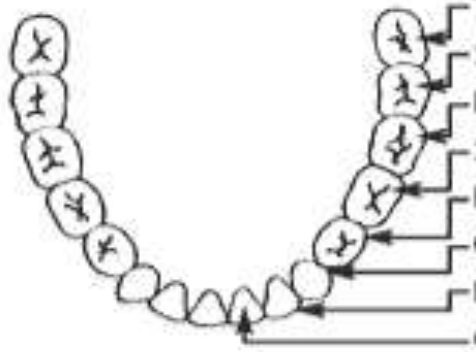


Lower Teeth	Erupt	Exfoliate
Second molar	23-31 months	10-12 years
First molar	14-18 months	9-11 years
Canine (cuspid)	17-23 months	9-12 years
Lateral incisor	10-16 months	7-8 years
Central incisor	6-10 months	6-7 years

PERMANENT DENTITION



Upper Teeth	Erupt
Central incisor	7-8 years
Lateral incisor	8-9 years
Canine (cuspid)	11-12 years
First premolar (first bicuspid)	10-11 years
Second premolar (second bicuspid)	10-12 years
First molar	6-7 years
Second molar	12-13 years
Third molar (wisdom tooth)	17-21 years



Lower Teeth	Erupt
Third molar (wisdom tooth)	17-21 years
Second molar	12-13 years
First molar	6-7 years
Second premolar (second bicuspid)	10-12 years
First premolar (first bicuspid)	10-11 years
Canine (cuspid)	11-12 years
Lateral incisor	8-9 years
Central incisor	7-8 years

Dentition period

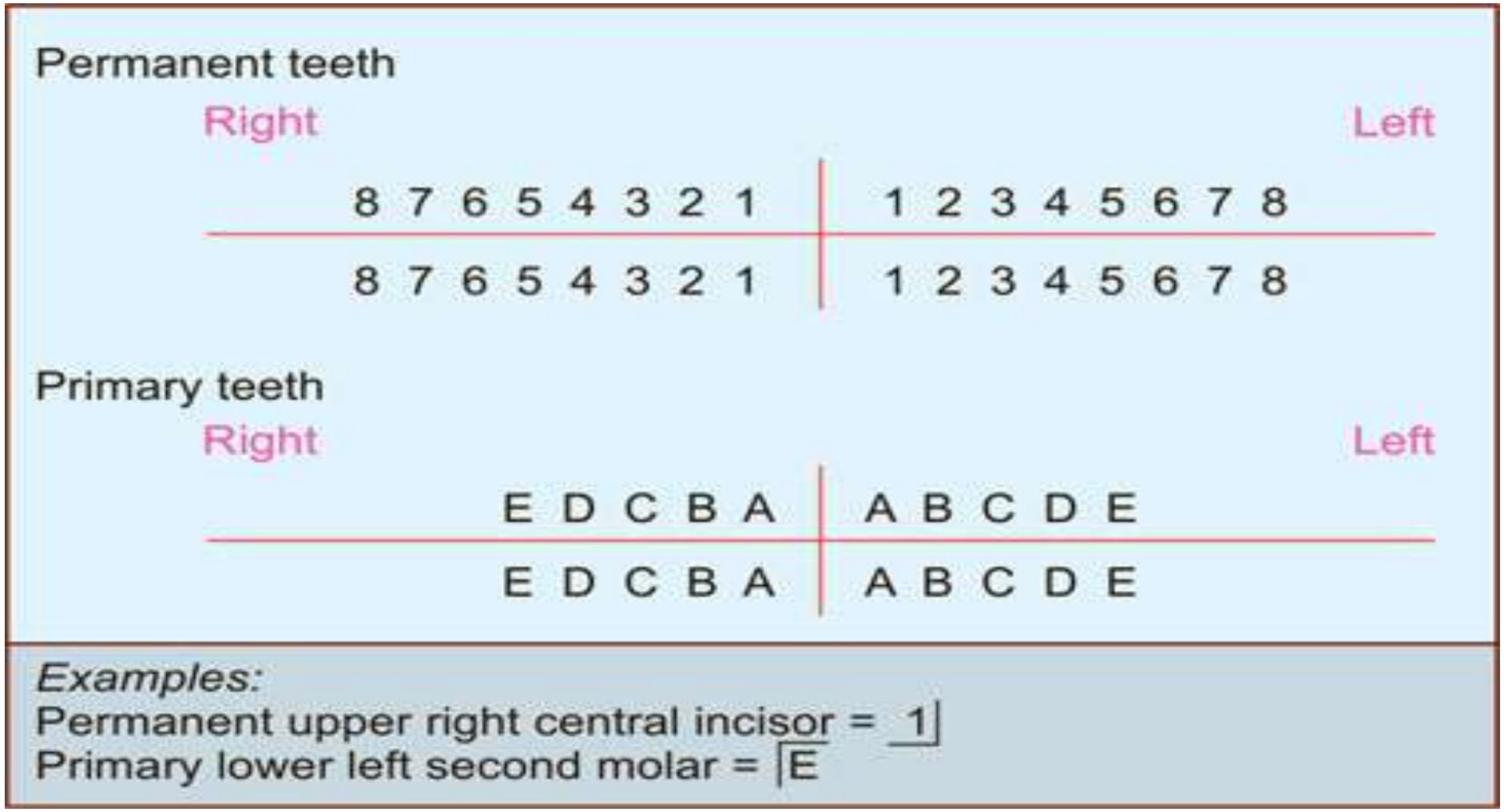
Dentition	Age	Teeth Present
Primary dentition period	6 months to 6 years of age	Only Primary teeth
Mixed dentition period	6 years to 12 years of age	Both Primary & Permanent Teeth
Permanent dentition period	12 years of age & continues rest of life	Only Permanent Teeth

- *Tooth numbering system*

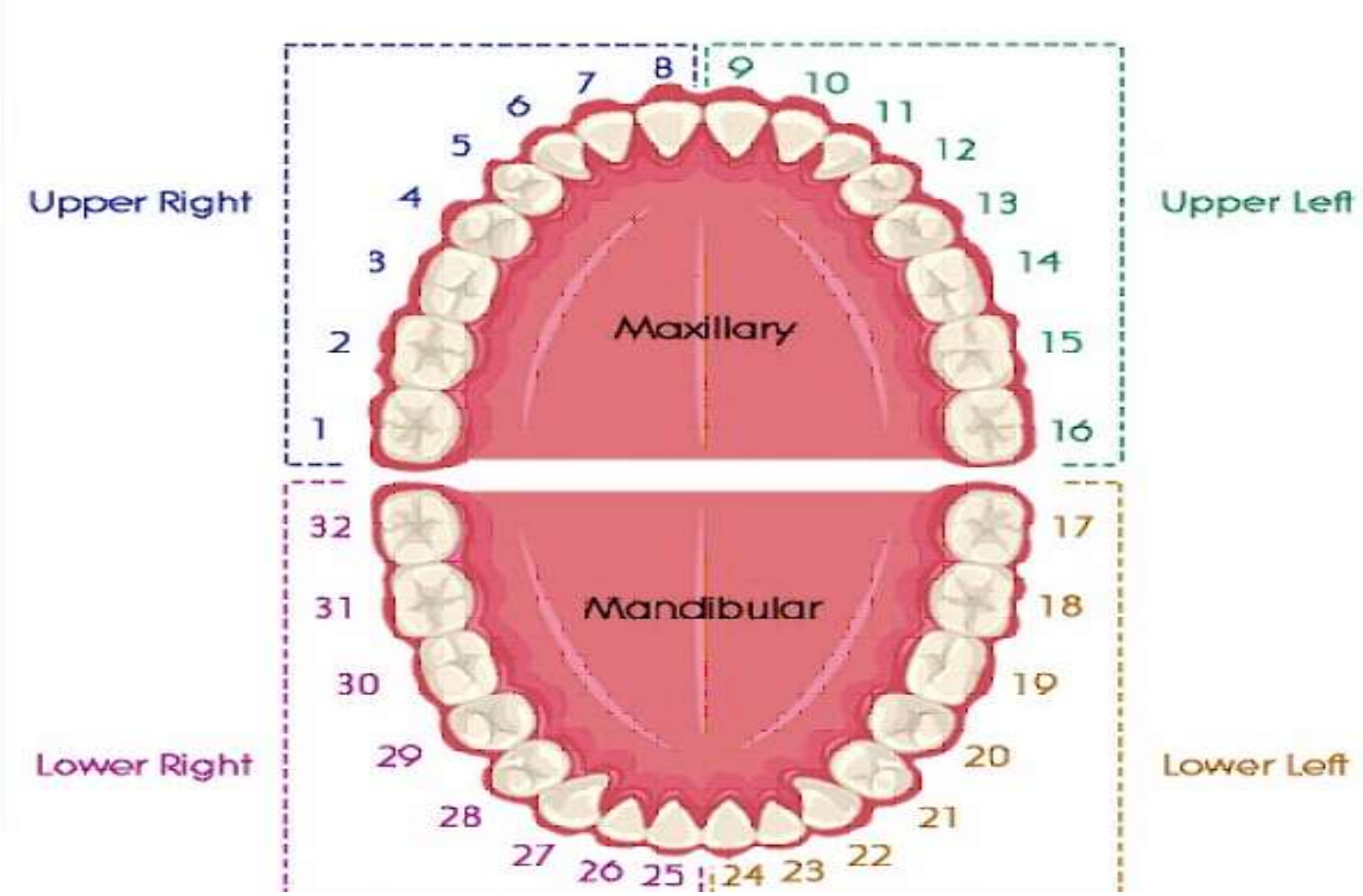
- Tooth numbering or "short hand" system of tooth notation.
- Necessary in clinical practice for
- -Recording data
- Communication

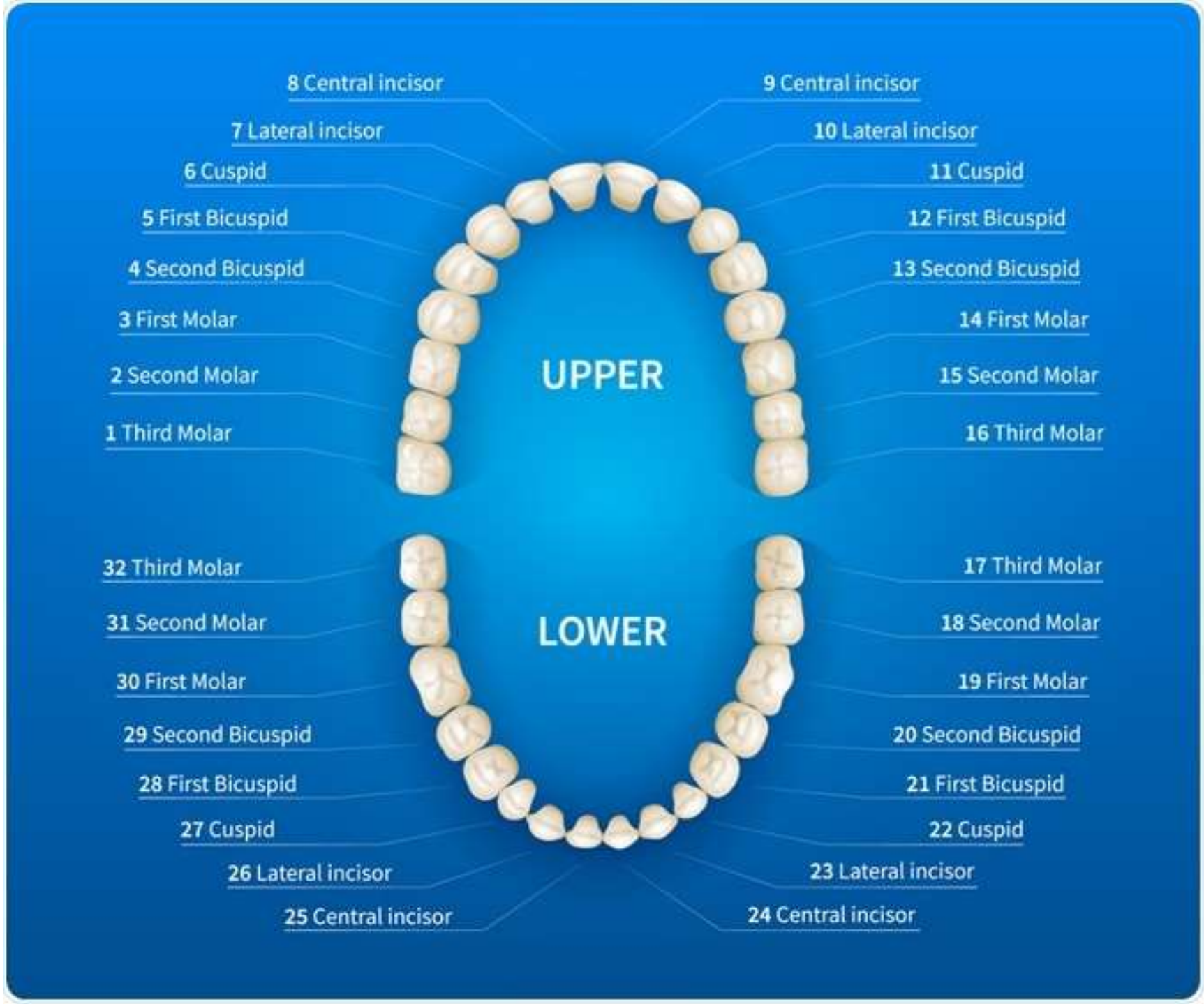
- The various tooth notation systems:
- 1. Zsigmondy palmer notation system
- 2. Universal notation system
- 3. FDI system

- *Zsigmondy palmer notation system*



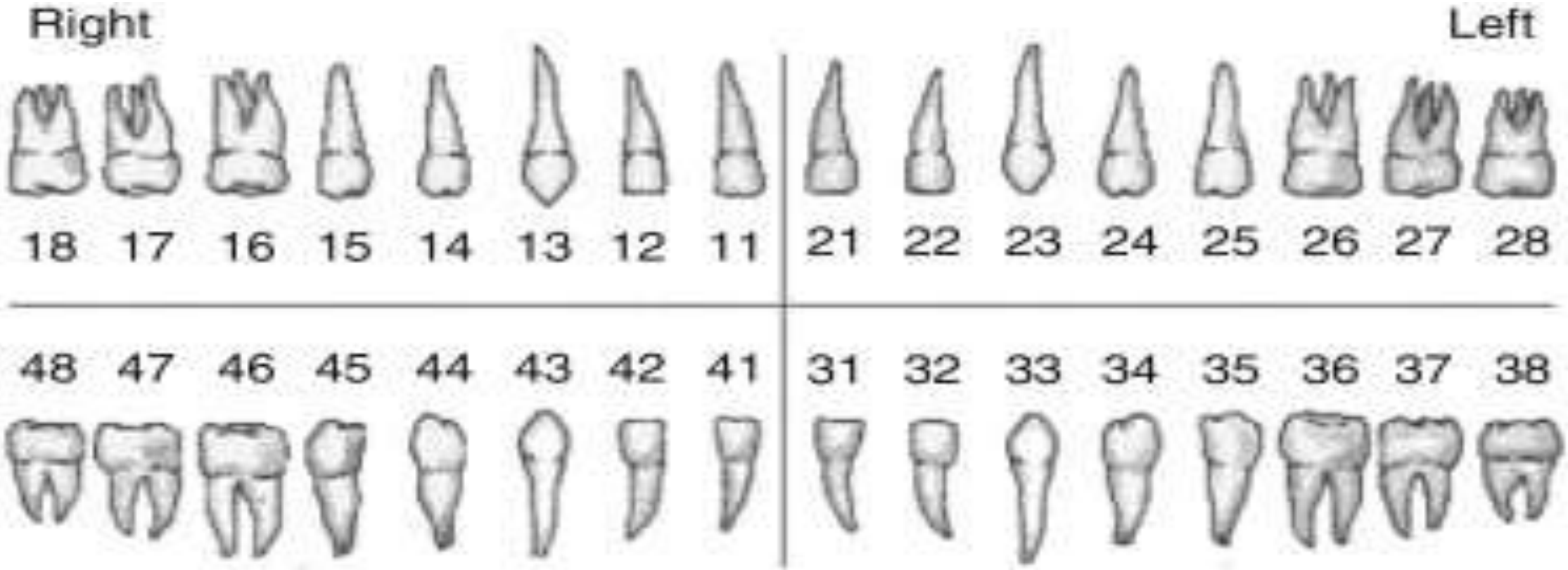
- *Universal Notation System*



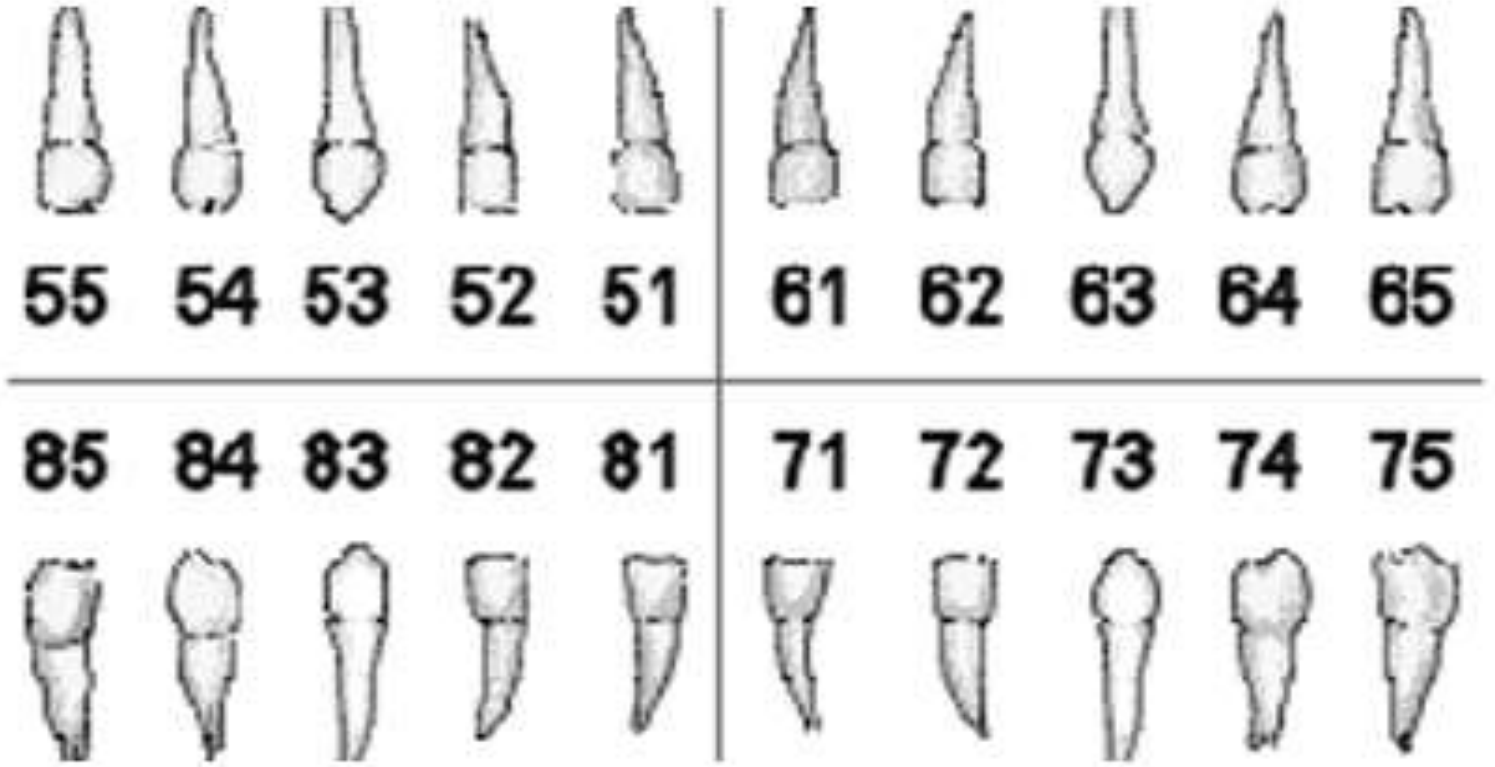

8 Central incisor
7 Lateral incisor
6 Cuspid
5 First Bicuspid
4 Second Bicuspid
3 First Molar
2 Second Molar
1 Third Molar
9 Central incisor
10 Lateral incisor
11 Cuspid
12 First Bicuspid
13 Second Bicuspid
14 First Molar
15 Second Molar
16 Third Molar
UPPER
LOWER
32 Third Molar
31 Second Molar
30 First Molar
29 Second Bicuspid
28 First Bicuspid
27 Cuspid
26 Lateral incisor
25 Central incisor
17 Third Molar
18 Second Molar
19 First Molar
20 Second Bicuspid
21 First Bicuspid
22 Cuspid
23 Lateral incisor
24 Central incisor

- ***FDI system (federation dentaire internationale)***

- Two digit system
- First digit indicates the quadrant and second digit indicates the tooth within the quadrant
- 1 to 4 and 5 to 8 as the first digit indicates permanent and primary dentition respectively
- 1 to 8 and 1 to 5 as the second digit indicates permanent teeth respectively.


Right
Left
18 17 16 15 14 13 12 11
21 22 23 24 25 26 27 28
48 47 46 45 44 43 42 41
31 32 33 34 35 36 37 38

FDI notation for primary teeth



General and oral anatomy

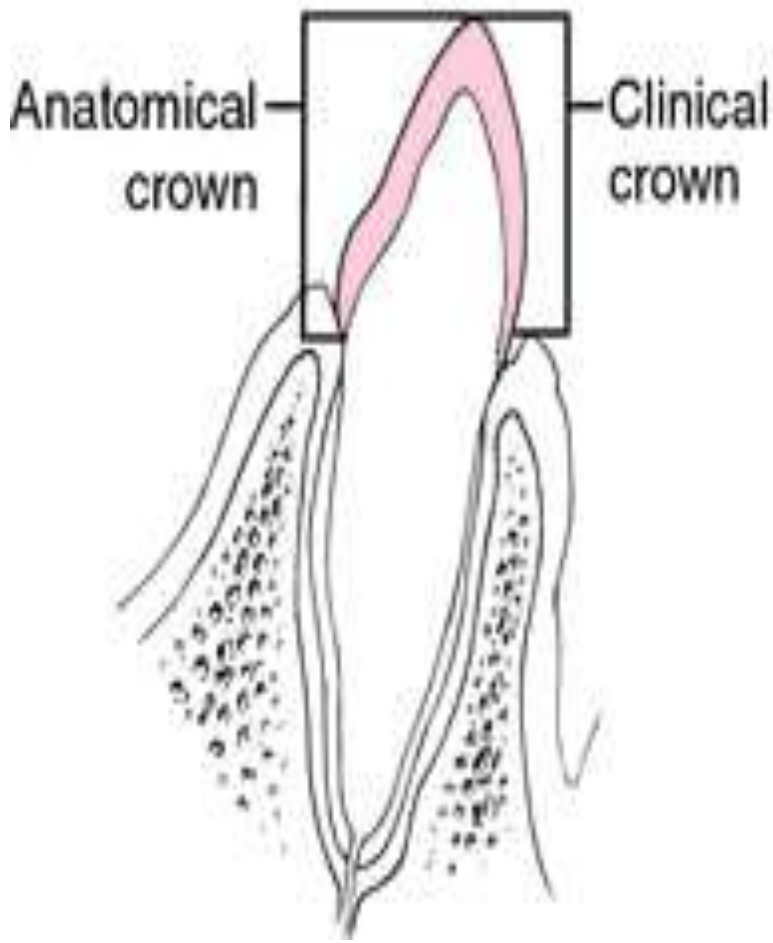
- **Anatomical crown**: portion of tooth which is covered by enamel
- **Clinical crown:**

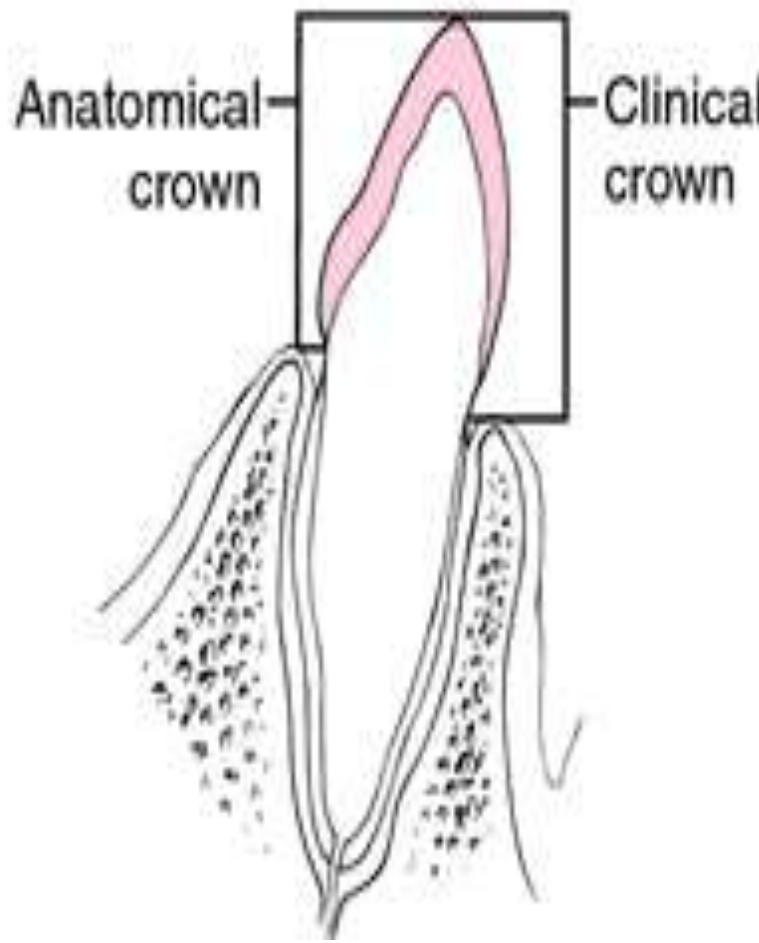
1.portion of tooth which is visible in mouth

2.Clinical crown may, or may not correspond to

anatomical crown, depending on level of soft tissue and

may also include a portion of anatomical

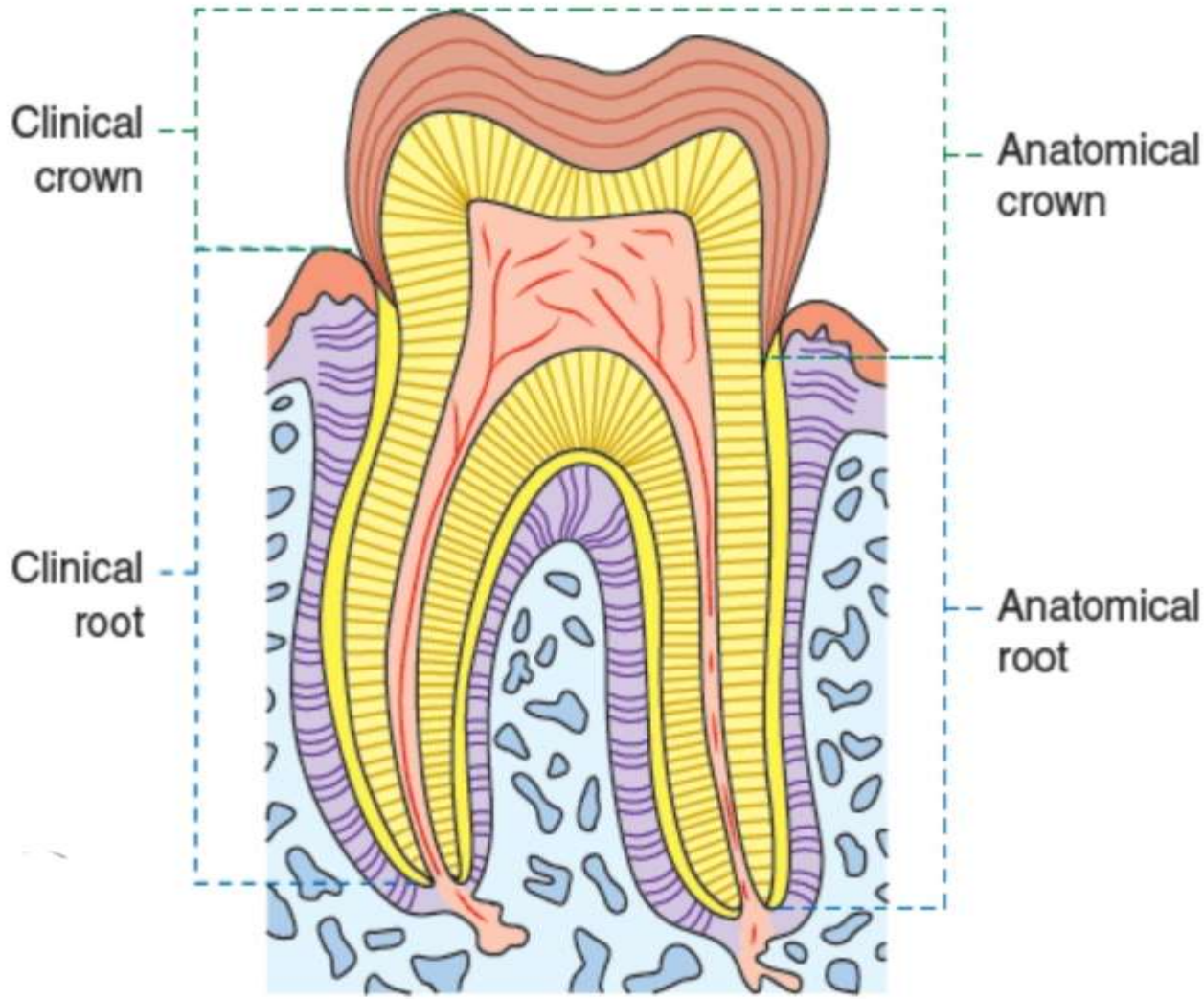

Anatomical crown
Clinical crown


Anatomical crown
Clinical crown

Anatomical root: portion of tooth which is covered with cementum

Clinical root:

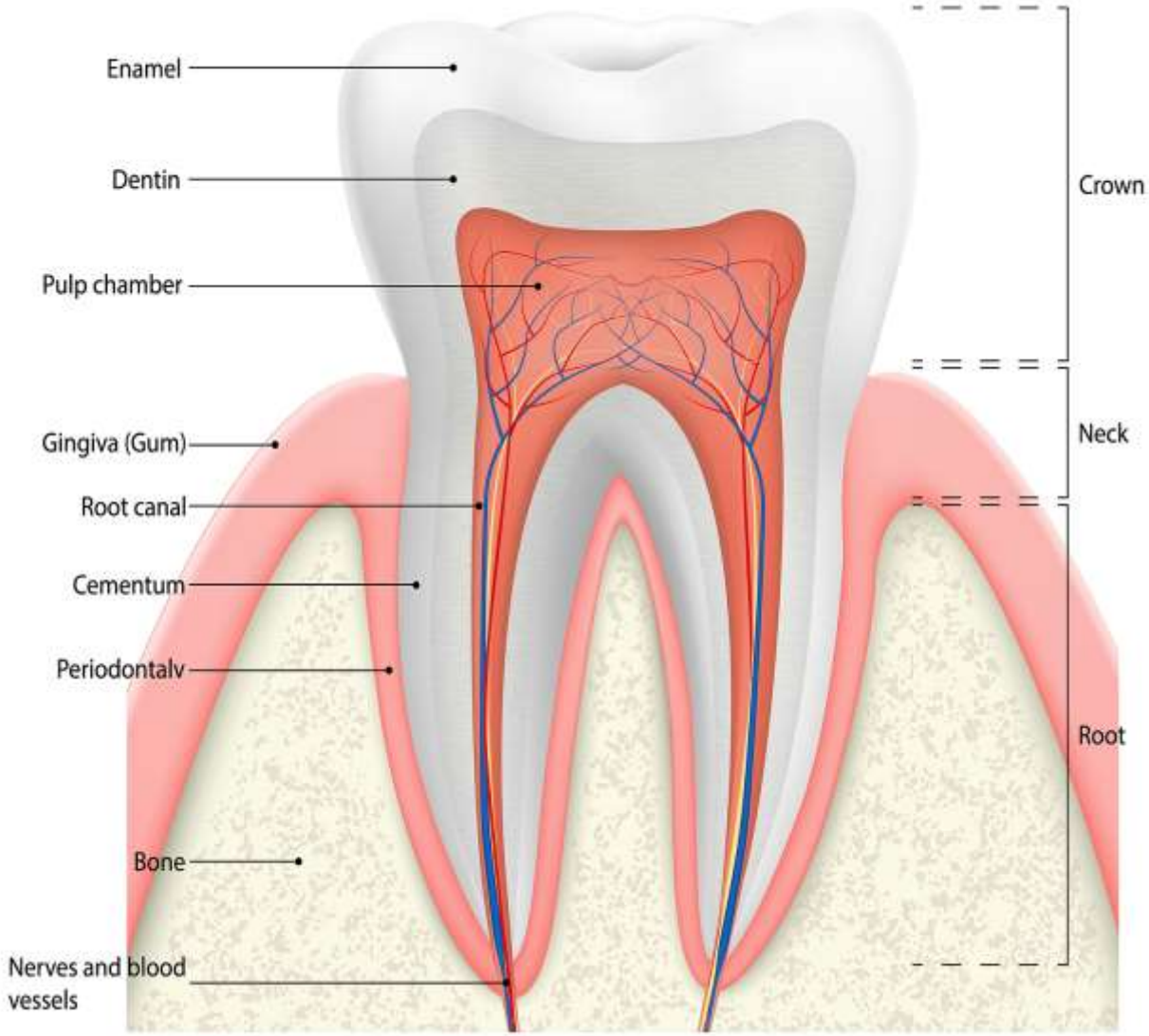
1. portion of tooth which is not visible in mouth
2. Clinical root is an ever changing entity and may, or may not correspond to anatomical root


Clinical crown
Anatomical crown
Clinical root
Anatomical root

- **Enamel**: hard, mineralized tissue which covers dentin of anatomical crown of a tooth and hardest living body tissue

- **Dentin**: hard tissue which forms main body of tooth and surrounds pulp cavity and is covered by enamel in anatomical crown and by cementum in anatomical root.

- **Cementum**: a layer of hard, bone like tissue which covers dentin of anatomical root of tooth


Enamel
Dentin
Pulp chamber
Gingiva (Gum)
Root canal
Cementum
Periodontalv
Bone
Nerves and blood vessels
Crown
Neck
Root

- **Dentino-enamel junction or DEJ:** internal line meeting of dentin and enamel in anatomical crown of a tooth

- **Pulp**: living soft tissue which occupies pulp cavity of a vital tooth and contains tooth's blood vessels and nerve supply.

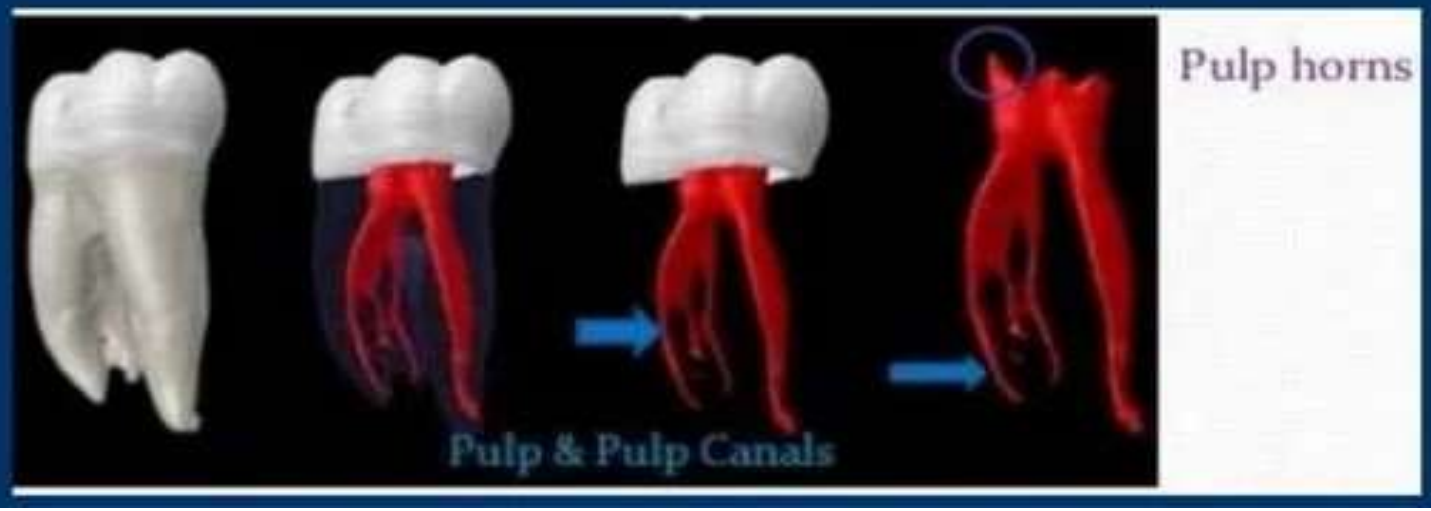
- **Pulp cavity:** entire internal cavity of tooth which contains the pulp and consists of the following entities

- **Pulp canal:** portion of pulp cavity which is located in root of the tooth (also called as root canal)

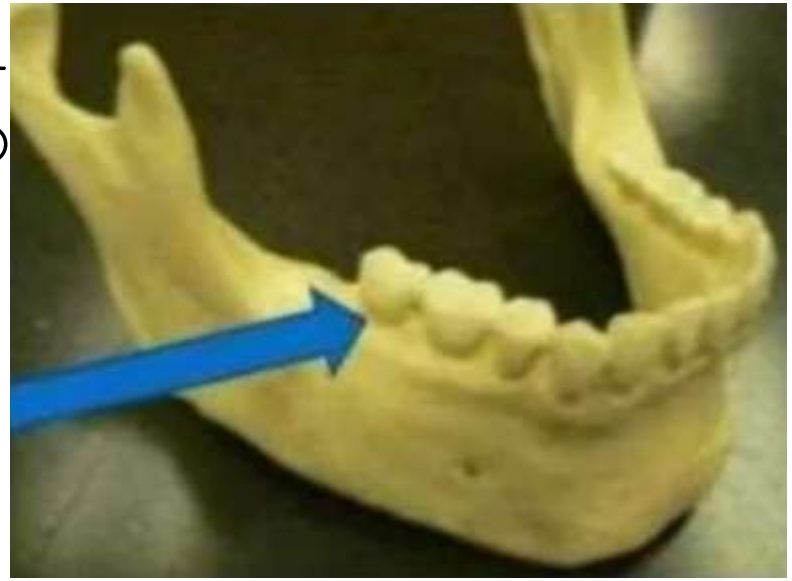
- **Pulp chamber:** enlarged portion of pulp cavity which is found mostly in anatomical crown

- **Pulp horn:** usually pointed incisal or

- **Pulp cavity:** entire internal cavity of tooth which contains the pulp and consists of the following entities
  - Pulp **canal:** portion of pulp cavity which is located in root of the tooth (also called as root canal)
  - Pulp **chamber:** enlarged portion of pulp cavity which is found mostly in anatomical crown
  - Pulp **horn:** usually pointed incisal or occlusal elongations of pulp chamber which often correspond to cusps, or lobes of teeth.



- Alveolar process: entire bony entity which surrounds and supports all teeth in each jaw member
- Alveolus: bony socket, or portion of al into al to

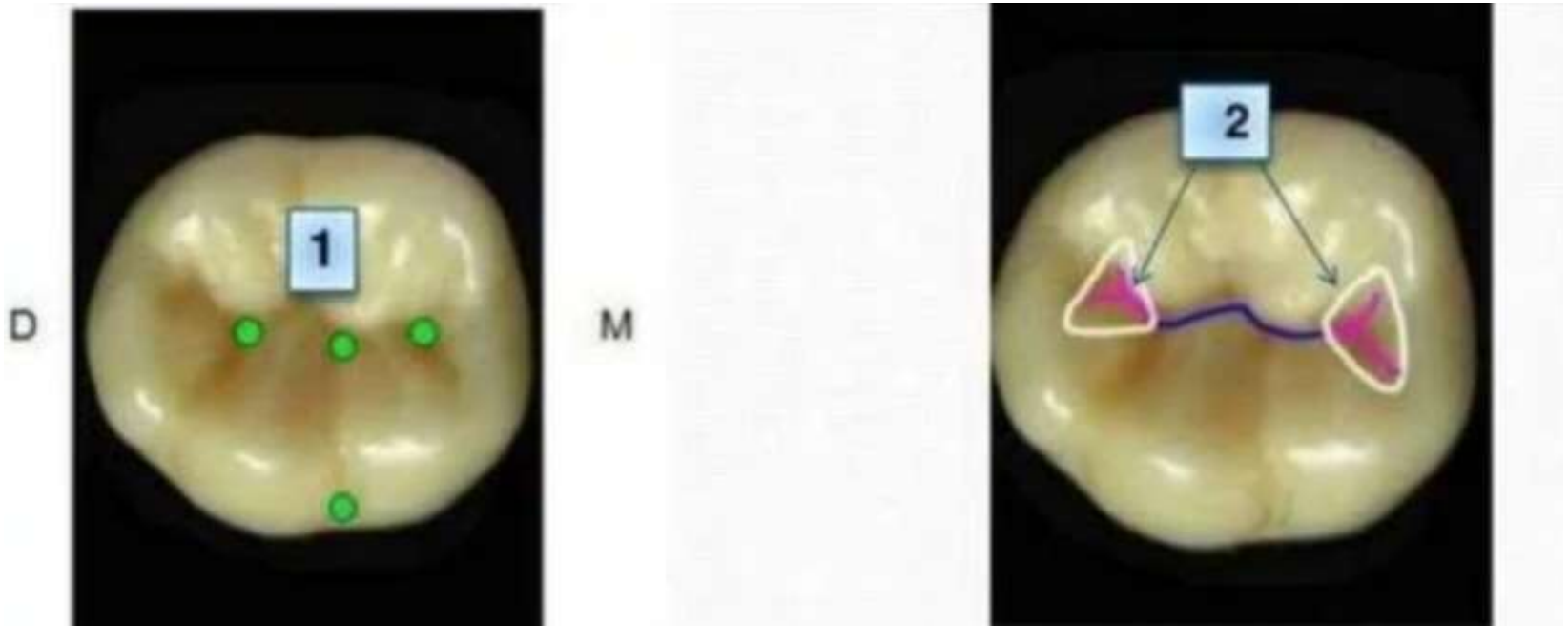


- **Periodontal ligament**: fibrous attachment of tooth cementum to the alveolar bone

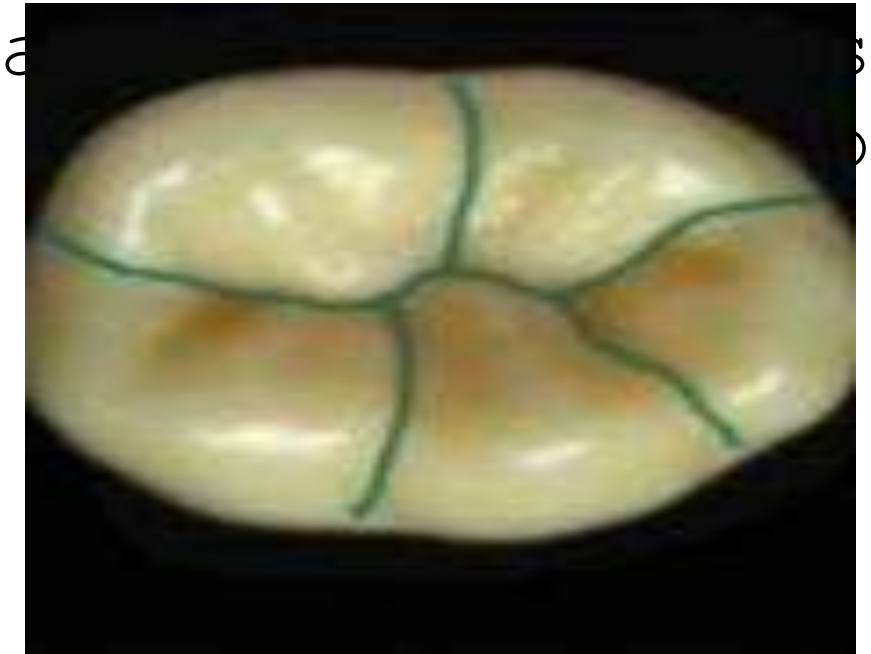
- **Gingiva**: "gum" or "gums”, or fibrous tissue enclosed by mucous membrane that covers alveolar process and surrounds neck of teeth

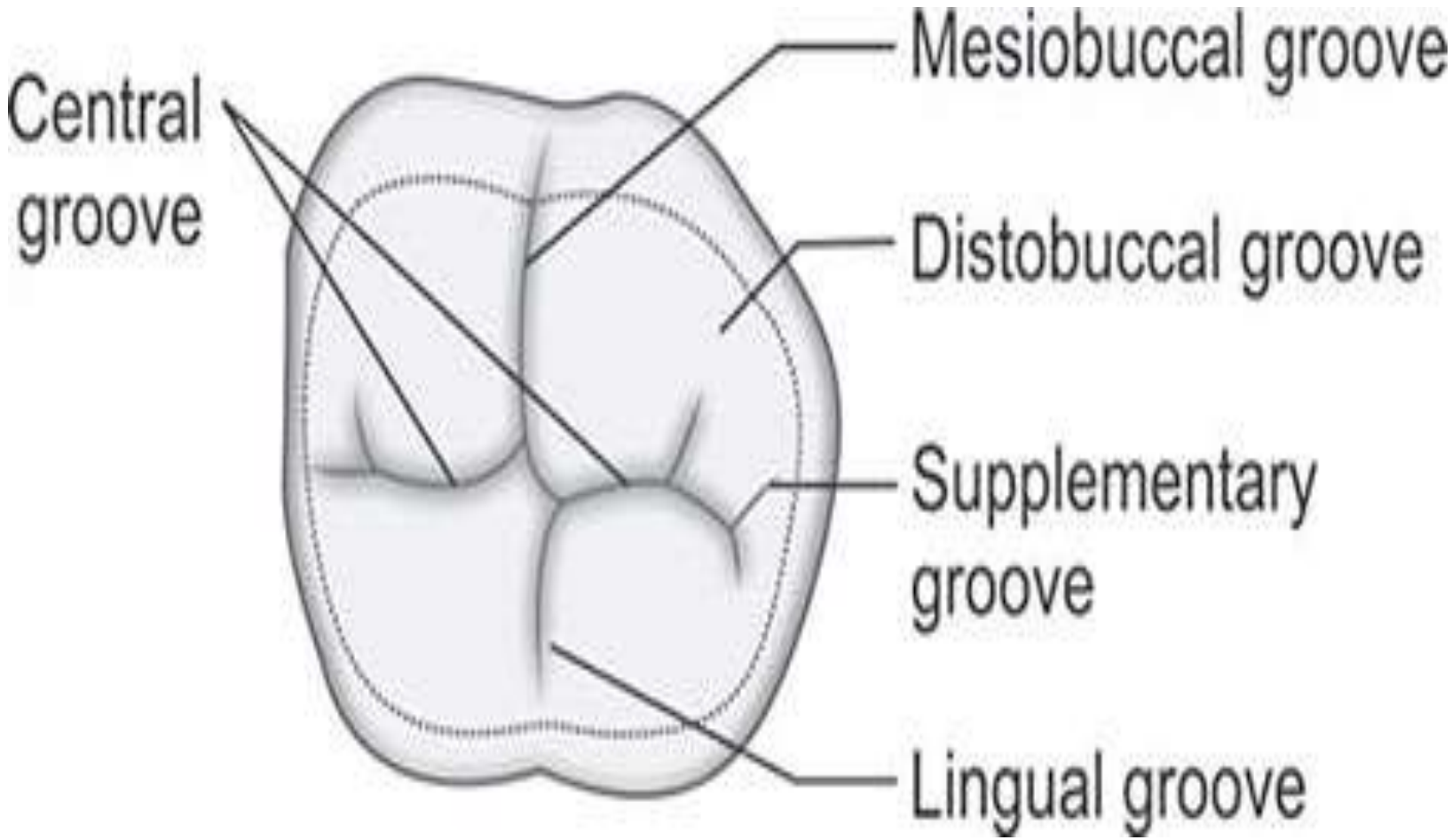
- *Depression on the tooth surface*

- 1. Pit: A small pinpoint depression on the surface of enamel
- 2. Fossa: An irregular depression or concavity on surface of tooth



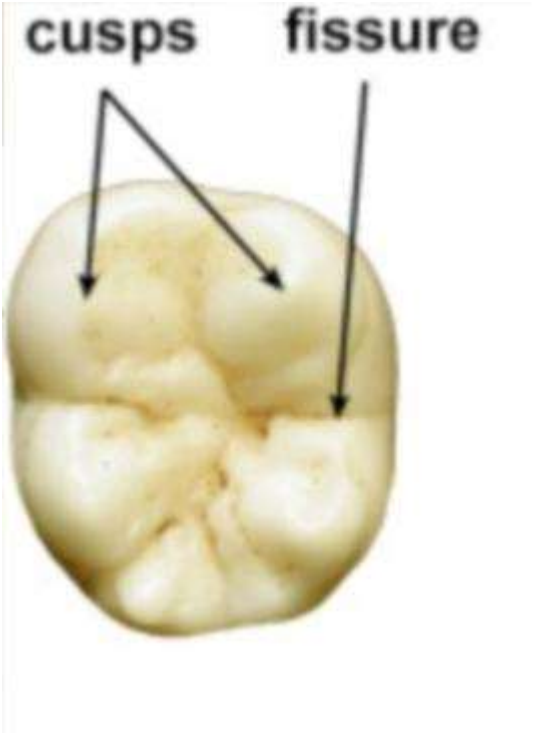
- 3. **Sulcus**: A long depression on the surface of a tooth
- 4. **Groove**: is a shallow linear depression on the surface of a tooth
- A developmental groove is a shallow groove or line between the primary parts of the crown or root
- A supplementa s distinct and does not n of primary parts

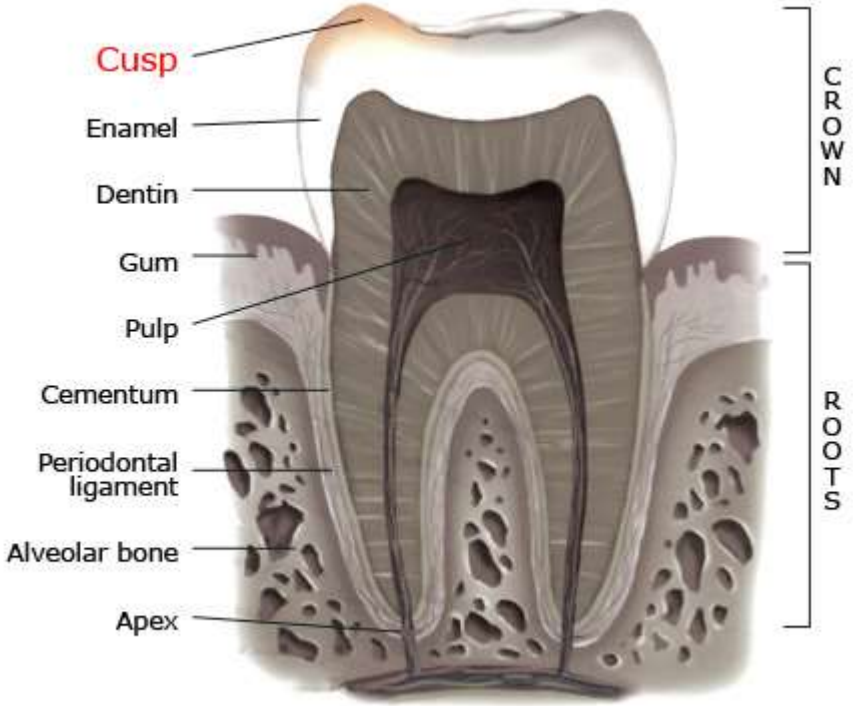



Central groove
Mesiobuccal groove
Distobuccal groove
Supplementary groove
Lingual groove

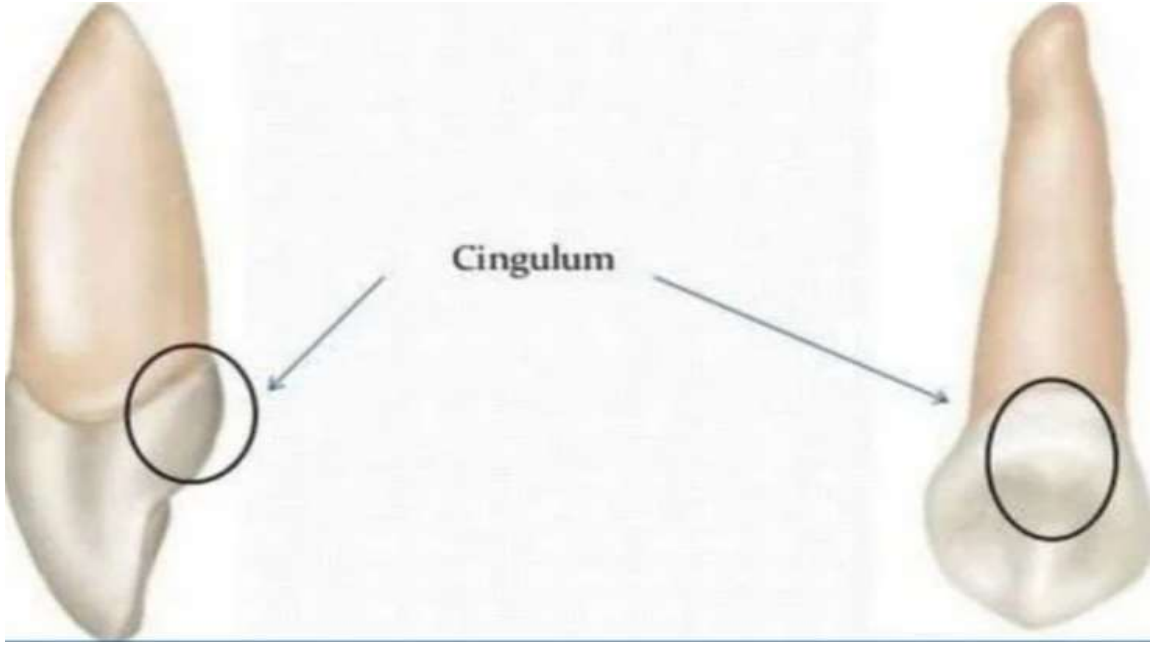
- *Elevations on tooth surface*

- 1: Cusp: an elevation or mound on the crown of a tooth



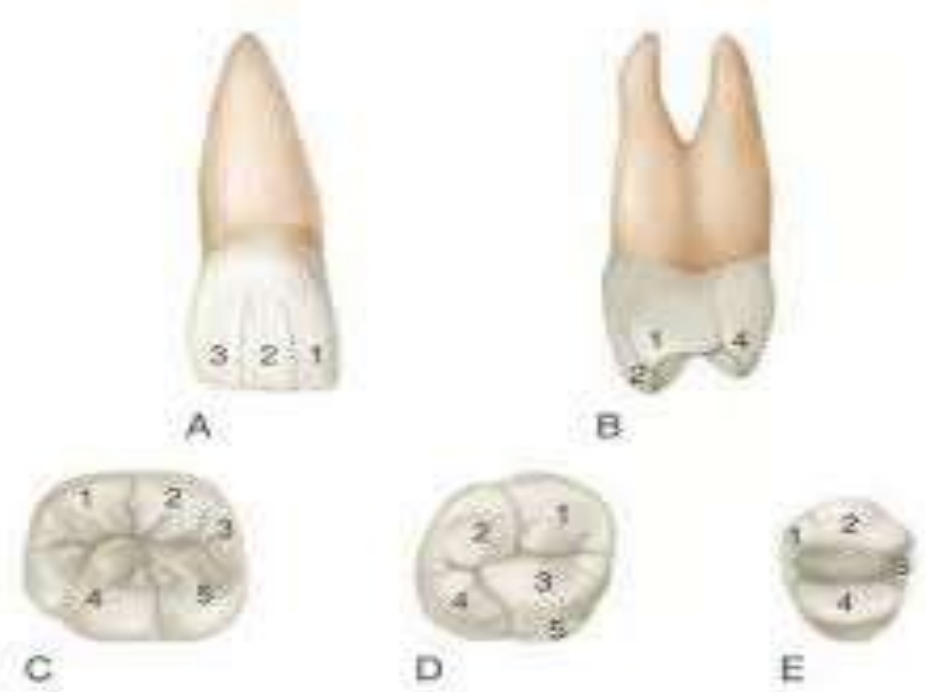


- 2: **Cingulum**: is the lingual lobe of an anterior tooth and makes up the bulk of the cervical third of the lingual surfaces



- 3. **Lobe**: is one of the primary section of forma in development of crown
- Cusps and mamelons are representative of lobes

- 4. **Mamelons**: are three rounded protuberances found on incisal ridges of newly erupted incisor teeth



- 5. **Ridge**: A linear elevation on the surface tooth
- - **Marginal ridges**: are rounded borders of enamel that form mesial and distal margins of occlusal surfaces of posterior teeth and mesial and distal margin of lingu

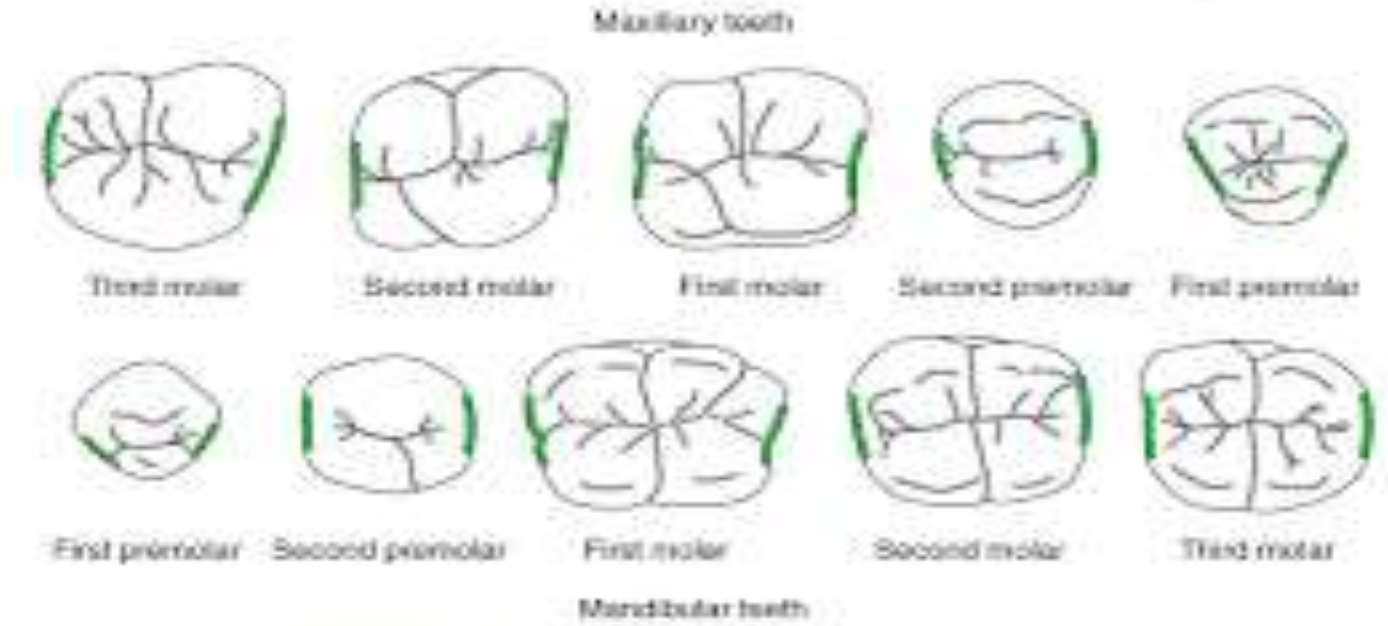
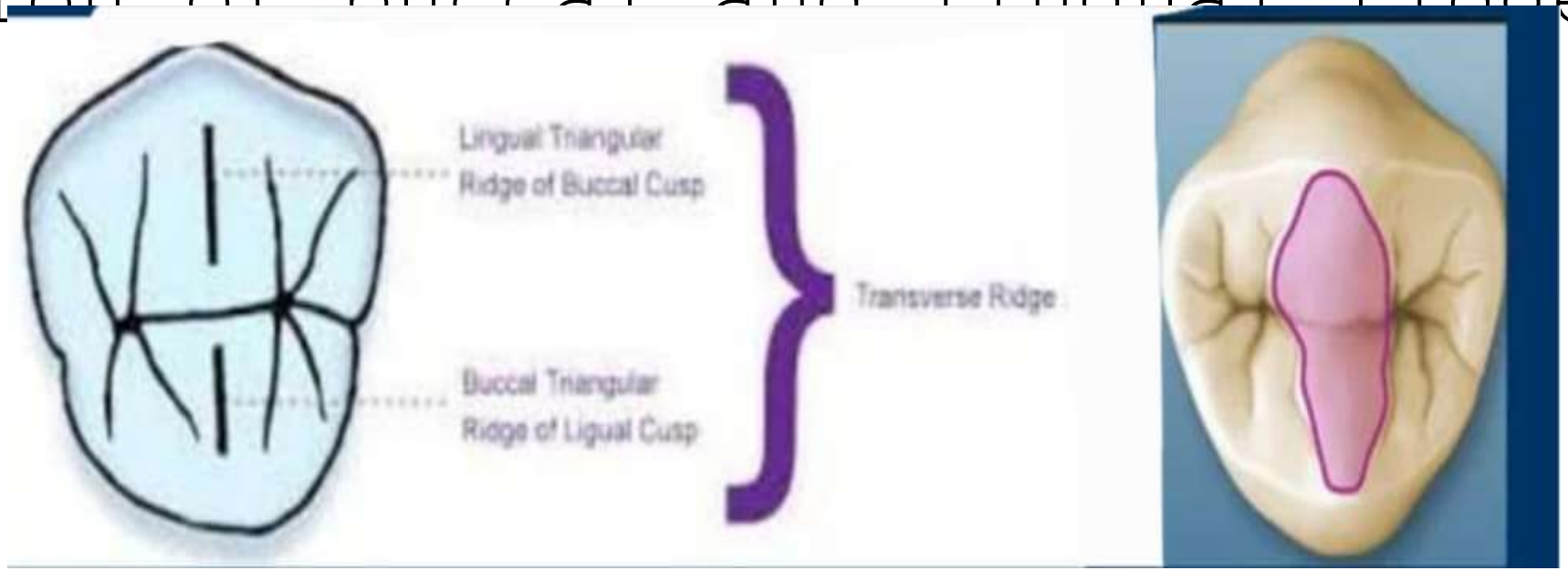


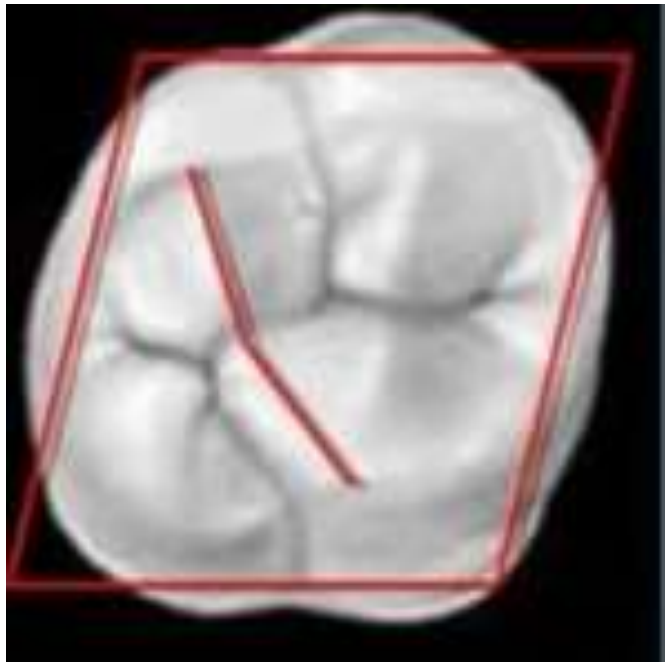
Figure 5.23 Marginal ridge in the posterior teeth

- **Triangular ridge**: is a ridge that descends from the tips of the cusps of molars and premolars towards the center part of the occlusal surfac

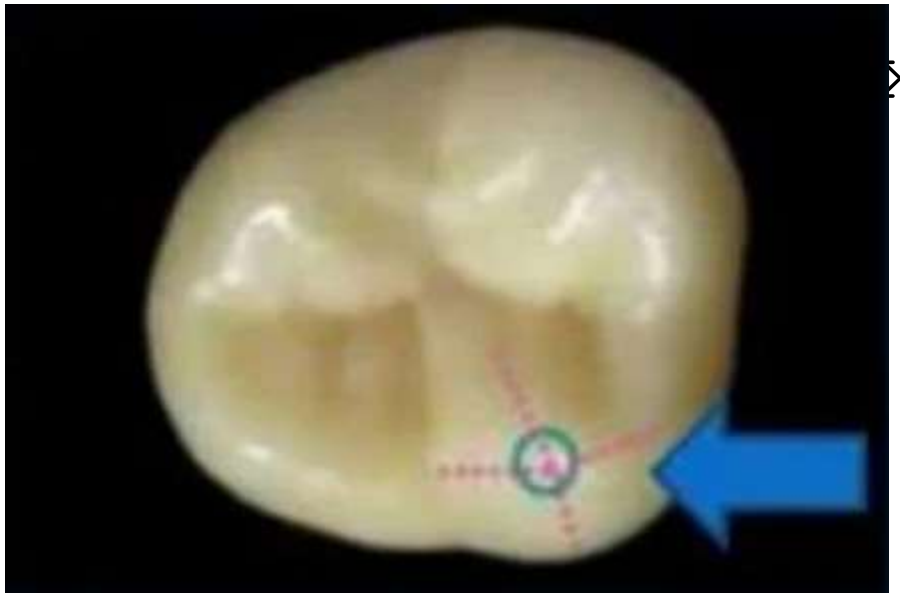
- **Transverse ridge**: is formed by the union of buccal and lingual ridges



- **Oblique ridge**: is a ridge obliquely crossing occlusal surface of maxillary molars

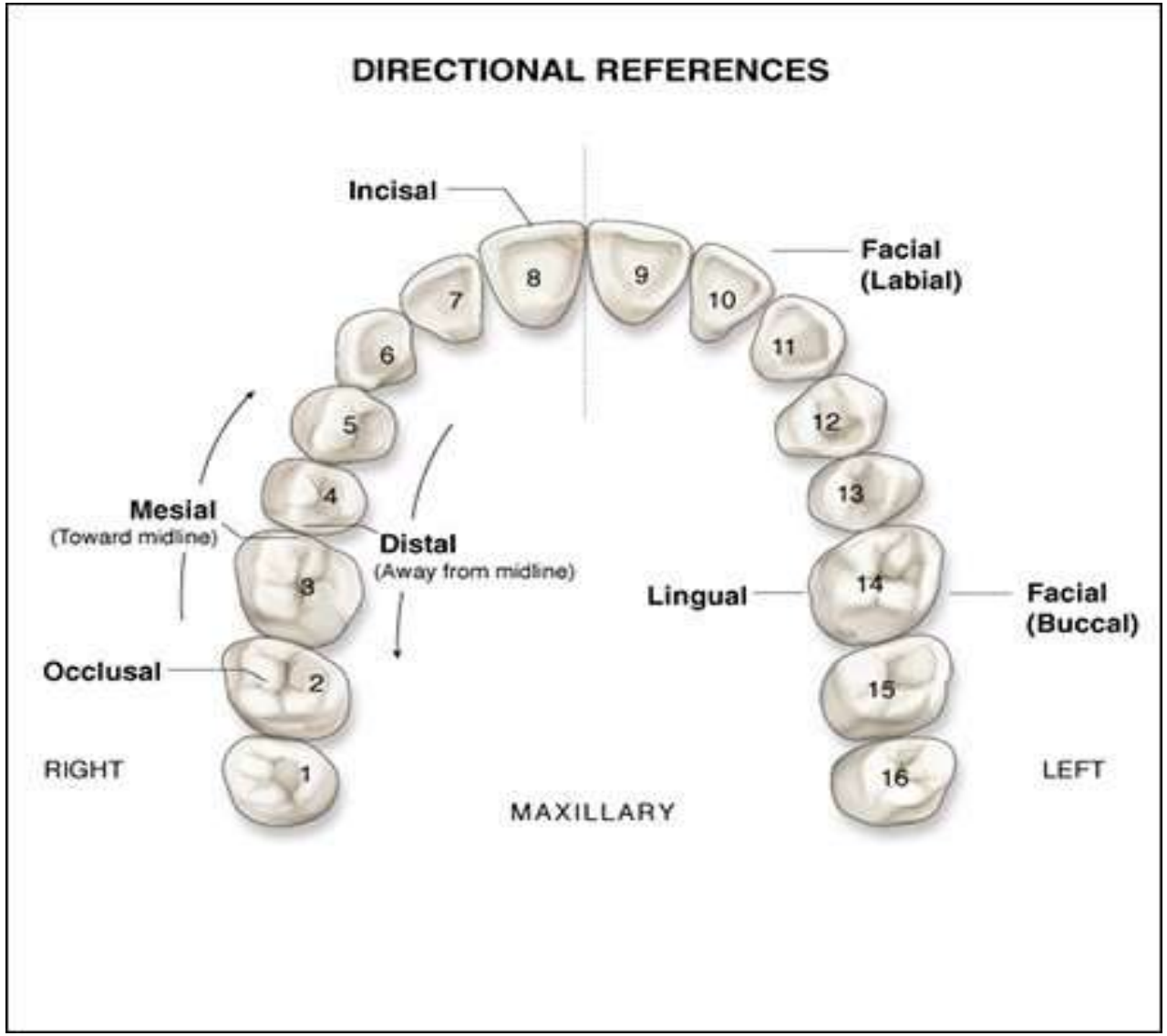


- **Cusp ridge:**
- Each cusp has four cusp ridges extending in different directions (mesial, distal, facial, lingual) from its tip
- Normally the cusp ridge which extends towards central portion of occlusal surface is also a triangular ridge
- Named by the [illegible]xtend from the cusp tip



- *Surfaces of teeth*

- Crowns of all teeth have 5 surfaces
- **Facial surface:** facial surface can be **labial** surface or **buccal** surface
- **Labial surface:** the surface of incisors and canines that are towards lip
- **Buccal surface:** the surfaces of premolars and molars that are towards the cheek


DIRECTIONAL REFERENCES
Incisal
Facial
(Labial)
Mesial
(Toward midline)
Distal
(Away from midline)
Lingual
Facial
(Buccal)
Occlusal
RIGHT
LEFT
MAXILLARY
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

- **Lingual surface (palatal surface)**

-Surface facing towards tongue

-**Proximal surfaces-**

-**Mesial**: surfaces towards midline

-**Distal**: surfaces away from midline.

- **Incisal or occlusal surface:**

- **Incisal surface:** the surface of incisors canines that come in contact with those in the opposite jaws during the act of closure are called incisal surfaces- . **Occlusial surface**
-the surface of premolars and molars that come in contact with those in opposite jaws during act of closure are called occlusal surfaces.