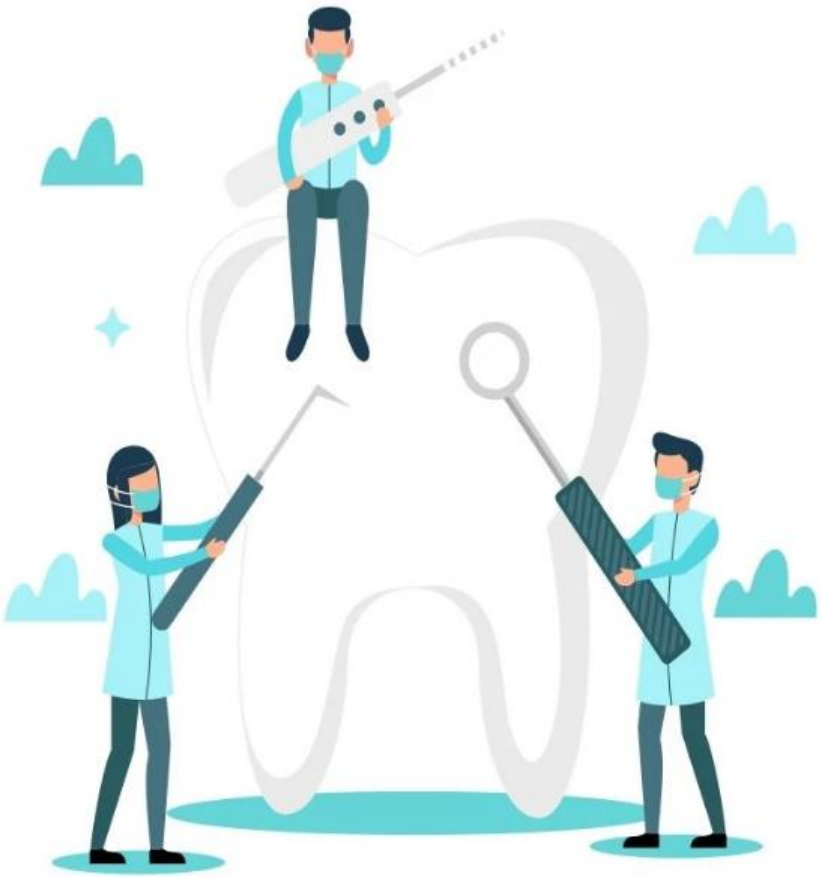

Introduction to Oral Anatomy I

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Intended learning Outcomes

- Understand the structure and function of the oral cavity and its various components in mastication, speech, and digestion
- Recognize key anatomical features
- Explore the development of dentition
- Identify clinical relevance in dental practice
- Describe the development process of primary and permanent dentition

Overview of the Oral Cavity

Definition: is the “getaway” of the digestive and respiratory systems and plays an essential role in processes such as ingestion, and breathing.

Functions: Comminution of food, digestion, speech, respiration, and sensory perception and a lot more to come!

Key landmarks: Lips, cheeks, palate, tongue, and floor of the mouth

The Oral Cavity:

1- Oral Vestibule

2- Oral Cavity Proper

Oral Vestibule

The vestibule is the space between the lips and cheeks externally and the teeth and gums internally.

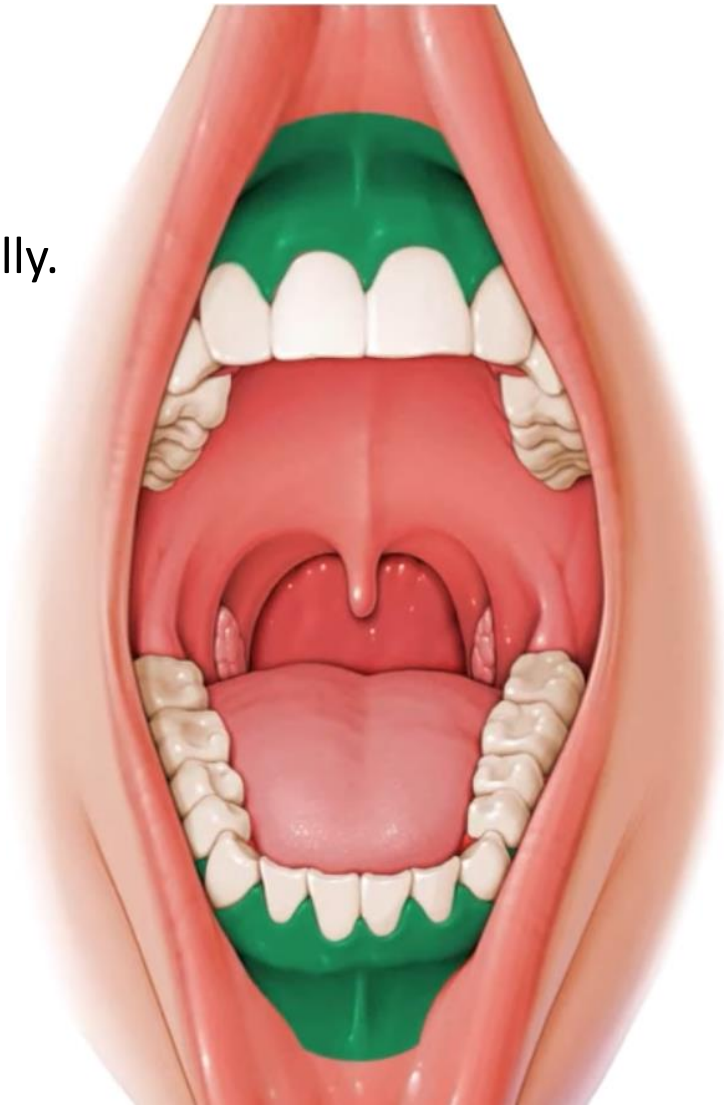
Borders

Anteriorly and laterally:

Lips and **cheeks**

Posteriorly and medially:

Teeth and **Gums**



Oral Cavity Proper

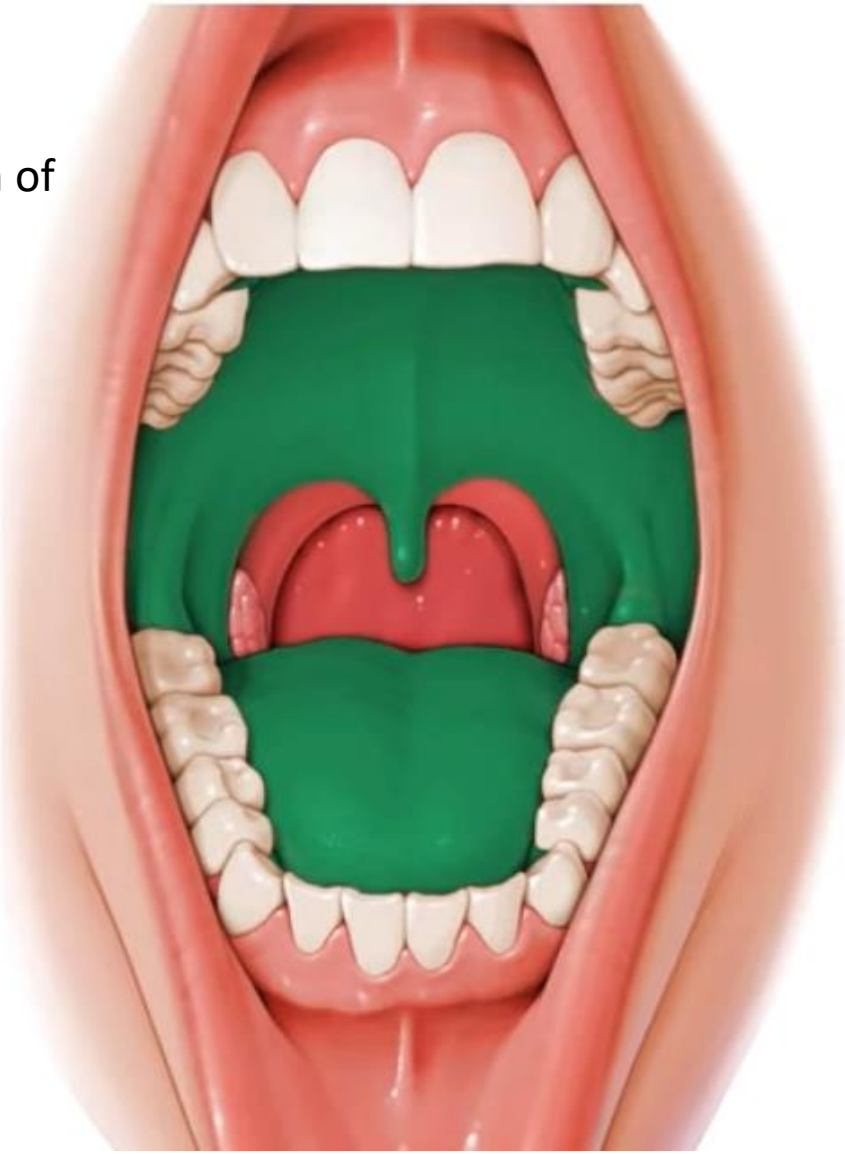
The oral cavity proper is the larger central portion of the mouth that lies within the dental arches.

Borders:

Superiorly: **Hard** and **Soft Palates.**

Inferiorly: **Floor Of The Mouth** and **Tongue**.

Posteriorly: opens into the **Oropharynx.**



Components of the Oral Cavity

Lips, Cheeks, Hard Palate And Soft Palate (Roof Of The Mouth), Tongue, Floor Of The Mouth

Teeth, Gums, Oral Mucosa (Mucus Membranes), Salivary Glands, Taste Buds

Posterior wall of Oropharynx, Uvula, Palato-pharyngea Arch and Palatine Tonsils

https://sketchfab.com/3d-models/oral-cavity-64d4e31440ba48ee9e1ecccf6fe0ac17

Structure of the Oral Cavity

- Lips: Protective barrier and aids in speech
- Cheeks: Form the lateral walls of the oral cavity
- Palate: Hard and soft palate; separates oral and nasal cavities
- Tongue: Muscle involved in taste, mastication, and speech
- Salivary glands: Parotid, submandibular, sublingual

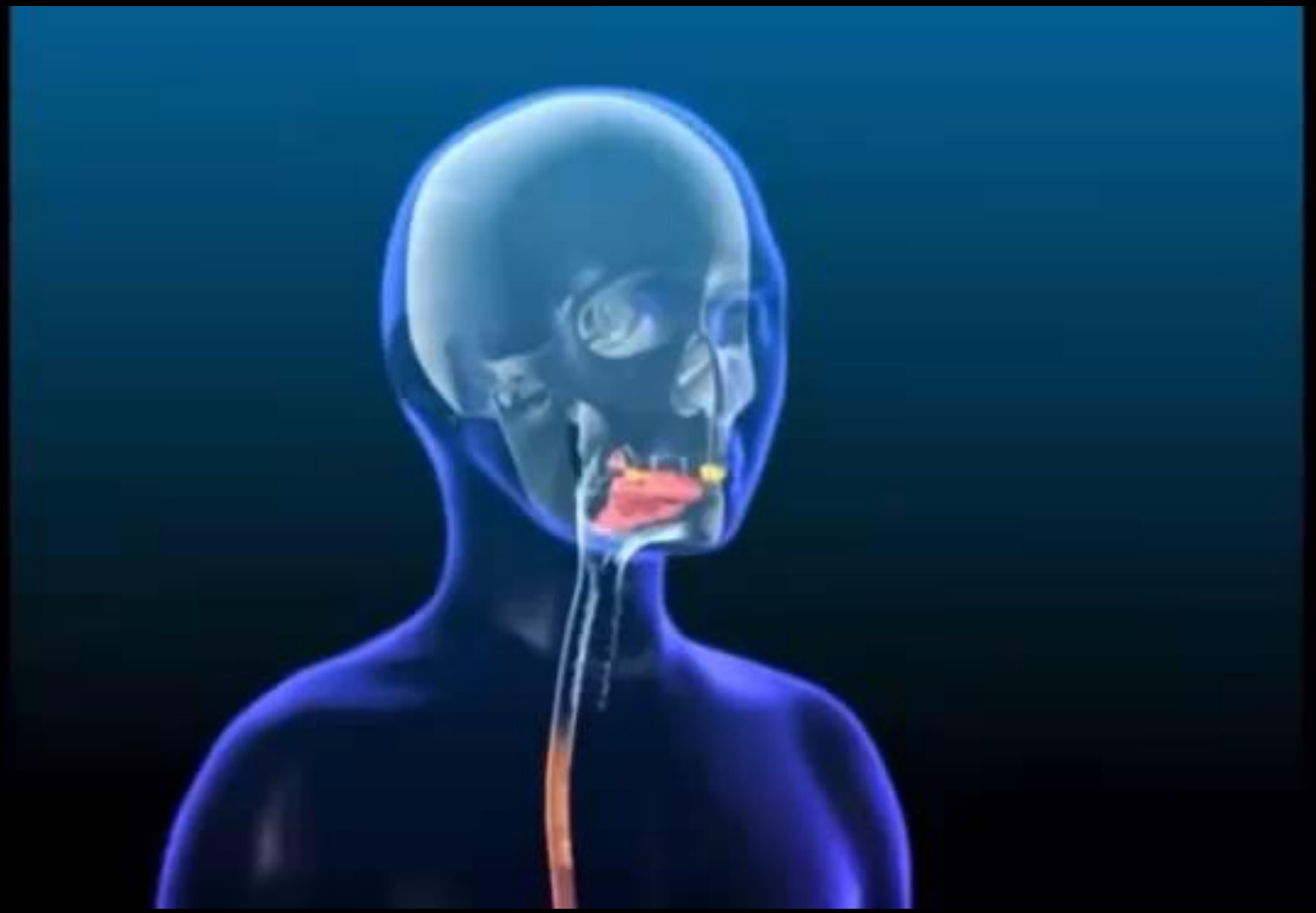
Functions of the Oral Cavity

Ingestion and Mastication

- **Ingestion** – Food is introduced into the mouth, initiating the digestive process.

- **Mastication (Chewing)** – Teeth, along with the tongue and jaw muscles, work together to break food into smaller pieces. This mechanical digestion increases the surface area of food, aiding in enzymatic breakdown.

- **Formation of Bolus** – The tongue and saliva mix the chewed food into a soft bolus, preparing it for swallowing.



Functions of the Oral Cavity

Saliva Production and Lubrication

Salivary glands within the oral cavity secrete saliva, which plays multiple roles:

- **Lubrication** – Moistens food, making it easier to chew and swallow.
- **Enzymatic Digestion** – Contains enzymes like amylase, which begins the breakdown of carbohydrates into sugars.[6]
- **Antimicrobial Action** – Contains lysozymes and immunoglobulins that help fight bacteria and protect against infections.
- **Taste Enhancement** – Dissolves food particles, allowing taste receptors to detect flavors.

Functions of the Oral Cavity

Speech and Articulation

The oral cavity is essential for speech production and articulation.

- The tongue, lips, and soft palate work together to modify airflow, producing distinct sounds and words.
- Teeth and the hard palate provide surfaces for sound modulation and articulation of consonants.
- The oral cavity acts as a resonating chamber, amplifying sounds produced by the vocal cords.


SPEECH GRAPHICS

Functions of the Oral Cavity

Facial Expression and Communication

Storage and Transport of Food

- **Voluntary Phase** – The tongue pushes the bolus to the back of the mouth.
- **Pharyngeal Phase** – The soft palate elevates to block the nasal cavity, and the epiglottis closes the airway to prevent aspiration.
- **Esophageal Phase** – The food is directed into the esophagus for further digestion.

Moistening and Cleaning

Regulation of pH

Digestion Initiation

- **Lingual Lipase** – initiates the digestion of fats by breaking down fats into fatty acids and glycerol.

Immune Defense

- **Thermoreceptors**
- **Mechanoreceptors**
- **Nociceptors**

Sensory Reception

Swallowing (Deglutition)

Taste Perception

Respiration and Air Passage

Human teeth

Human dentition is diphyodont

2 sets of dentitions

i. Primary/deciduous
   20 teeth in total
   Incisors/canines/molars
   Smaller size

ii. Secondary/permanent
   32 teeth in total
   Incisors/canines/premolars/molars
   Bigger size

Dental tissues

A. Enamel. The protective outer surface of the anatomic crown. It is 96% mineral and is the hardest tissue in the body.

B. Dentin. Located in both the crown and root, it makes up the bulk of the tooth beneath the enamel and cementum. It lines the pulp cavity.

C. Cementum. This substance covers the surface of the anatomic root.

D. Pulp. The central, innermost portion of the tooth. It has formative, sensory, nutritive, and functions during the life of the tooth.

Tooth Types

Incisor teeth (central and lateral) have incisal edges.

8 in both primary and permanent

Tooth Types

Canines

have single cusps.

4 in both primary and permanent

Tooth Types

Premolars
have two to three cusps
8 only in permanent

Tooth Types

Molars

have three to five cusps

12 in permanent 8 in primary

Crown and Root Development

Dental development can be considered to have two components:

- the formation of crowns and roots and
- the eruption of the teeth.

After the **crown** of the tooth is formed, development of the **root portion** begins.

Development of the Dentition

- Primary dentition (20 teeth) erupts from 6 months to 2.5 years

- Permanent dentition (32 teeth) erupts form 6 years to 18 years

- Stages of development: initiation, bud, cap, bell

Tooth development for all teeth starts in utero!

TABLE 2-1 Chronology of Primary Teeth*

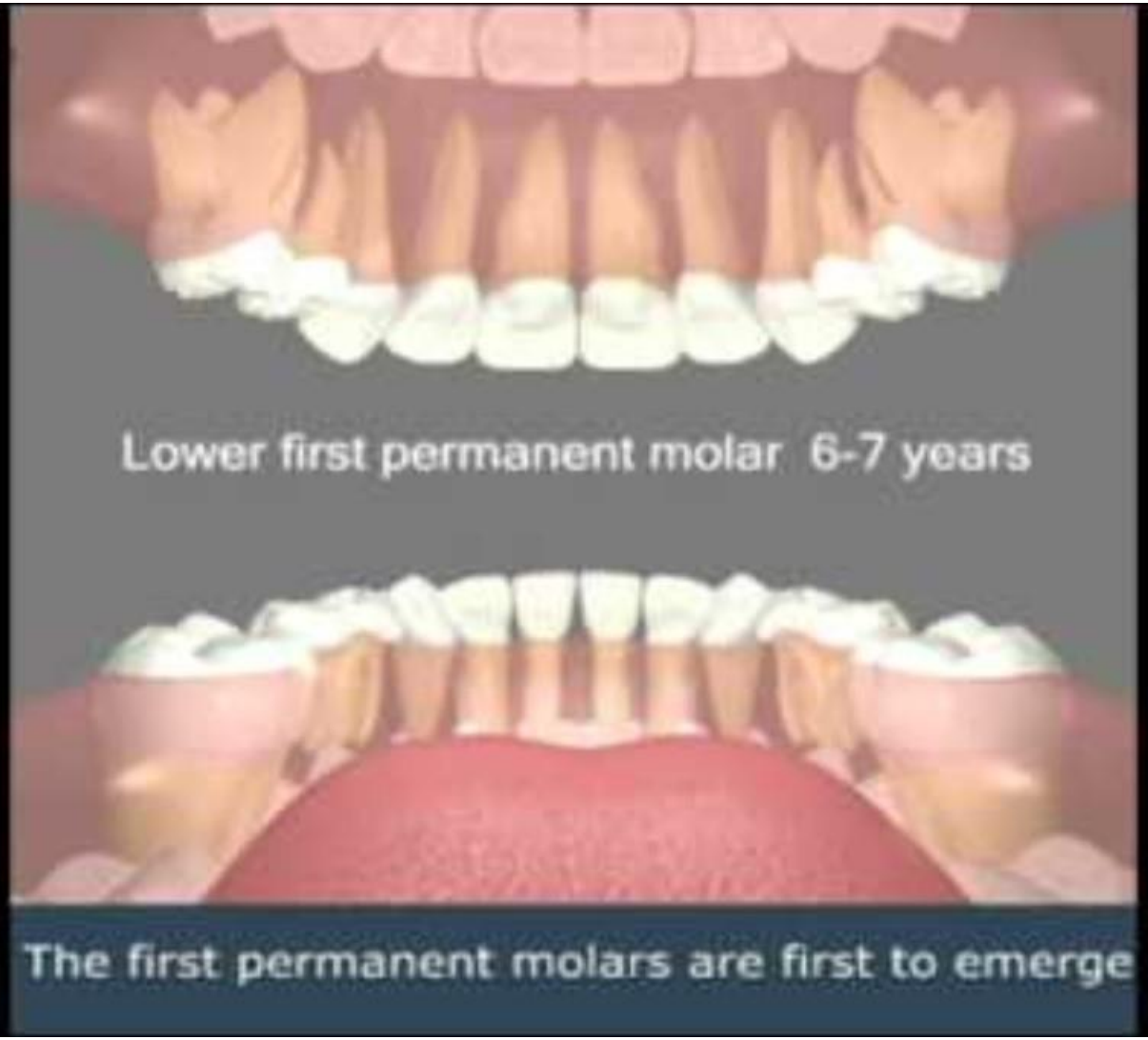
Tooth		First Evidence of Calcification (Weeks in Utero)	Crown Completed (Months)	Eruption (Mean Age) (Months)	Root Completed (Years)
Upper					
i1	E, F	14	1½	10	1½
i2	D, G	16	2½	11	2
c	C, H	17	9	19	3¼
m1	B, I	15	6	16	2½
m2	A, J	19	11	29	3
		Maxillary Teeth Right A B C D E | F G H I J Left T S R Q P | O N M L K Mandibular Teeth			
Lower					
i1	P, O	14	2½	8	1½
i2	Q, N	16	3	13	1½
c	R, M	17	9	20	3¼
m1	S, L	15½	5½	16	2¼
m2	T, K	18	10	27	3

i1, Central incisor; *i2*, lateral incisor; *c*, canine; *m1*, first molar; *m2*, second molar.
*Universal numbering system for primary/deciduous dentition; see Chapter 1. See Tables 2-3 and 2-4 for detailed presentation of the data.

Chronology of Permanent Teeth

Tooth		First Evidence of Calcification	Crown Completed (Years)	Emergence (Eruption) (Years)	Root Completed (Years)
I1	8, 9	3–4 mo	4–5	7–8	10
I2	7, 10	10–12 mo	4–5	8–9	11
C	6, 11	4–5 mo	6–7	11–12	13–15
P1	5, 12	1½–1¾ yr	5–6	10–11	12–13
P2	4, 13	2–2¼ yr	6–7	10–12	12–14
M1	3, 14	At birth	2½ –3	6–7	9–10
M2	2, 15	2½–3 yr	7–8	12–13	14–16
M3	1, 16	7–9 yr	12–16	17–21	18–25
		Maxillary Teeth Right 1 2 3 4 5 6 7 8 | 9 10 11 12 13 14 15 16 Left 32 31 30 29 28 27 26 25 | 24 23 22 21 20 19 18 17 Mandibular Teeth			
I1	24, 25	3–4 mo	4–5	6–7	9
I2	23, 26	3–4 mo	4–5	7–8	10
C	22, 27	4–5 mo	6–7	9–10	12–14
P1	21, 28	1¾–2 yr	5–6	10–12	12–13
P2	20, 29	2¼–2½ yr	6–7	11–12	13–14
M1	19, 30	At birth	2½ –3	6–7	9–10
M2	18, 31	2½–3 yr	7–8	11–13	14–15
M3	17, 32	8–10 yr	12–16	17–21	18–25

I1, Central incisor; *I2*, lateral incisor; *C*, canine; *P1*, first premolar; *P2*, second premolar; *M1*, first molar; *M2*, second molar; *M3*, third molar.
*See Tables 2-3 and 2-4 in Tooth Formation Standards for detailed presentation of the data.


Lower first permanent molar 6-7 years
The first permanent molars are first to emerge


أول الشجرة بذرة
أشد الفاقة عدم العقل
Thank you!