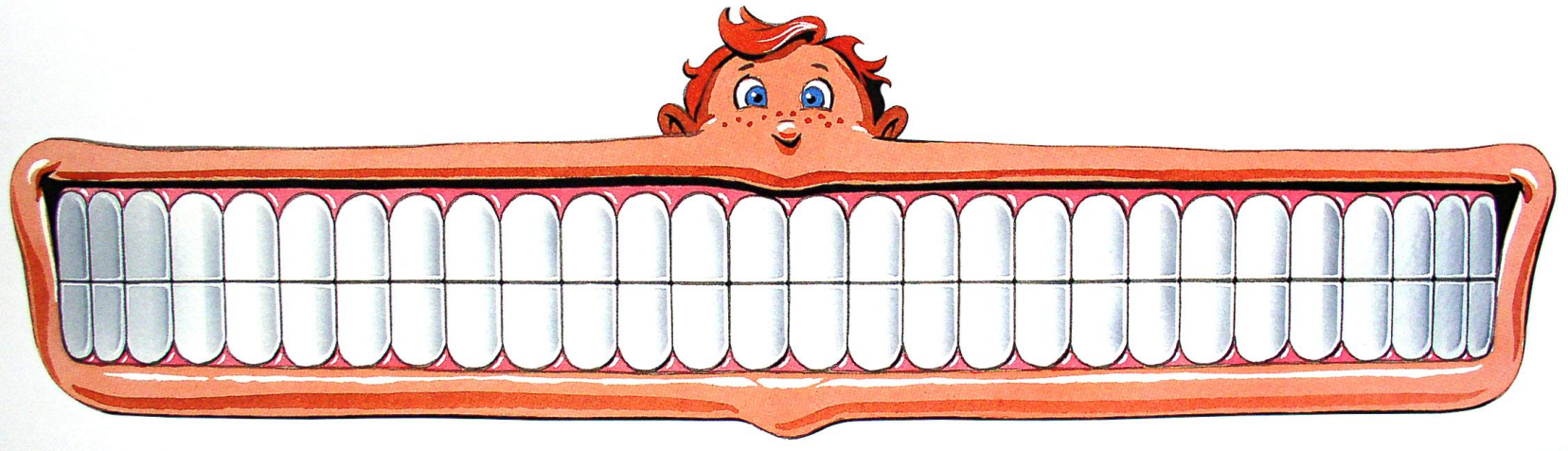
نمو و تطور الإطباق المؤقت

Primary Occlusion Growth and Development

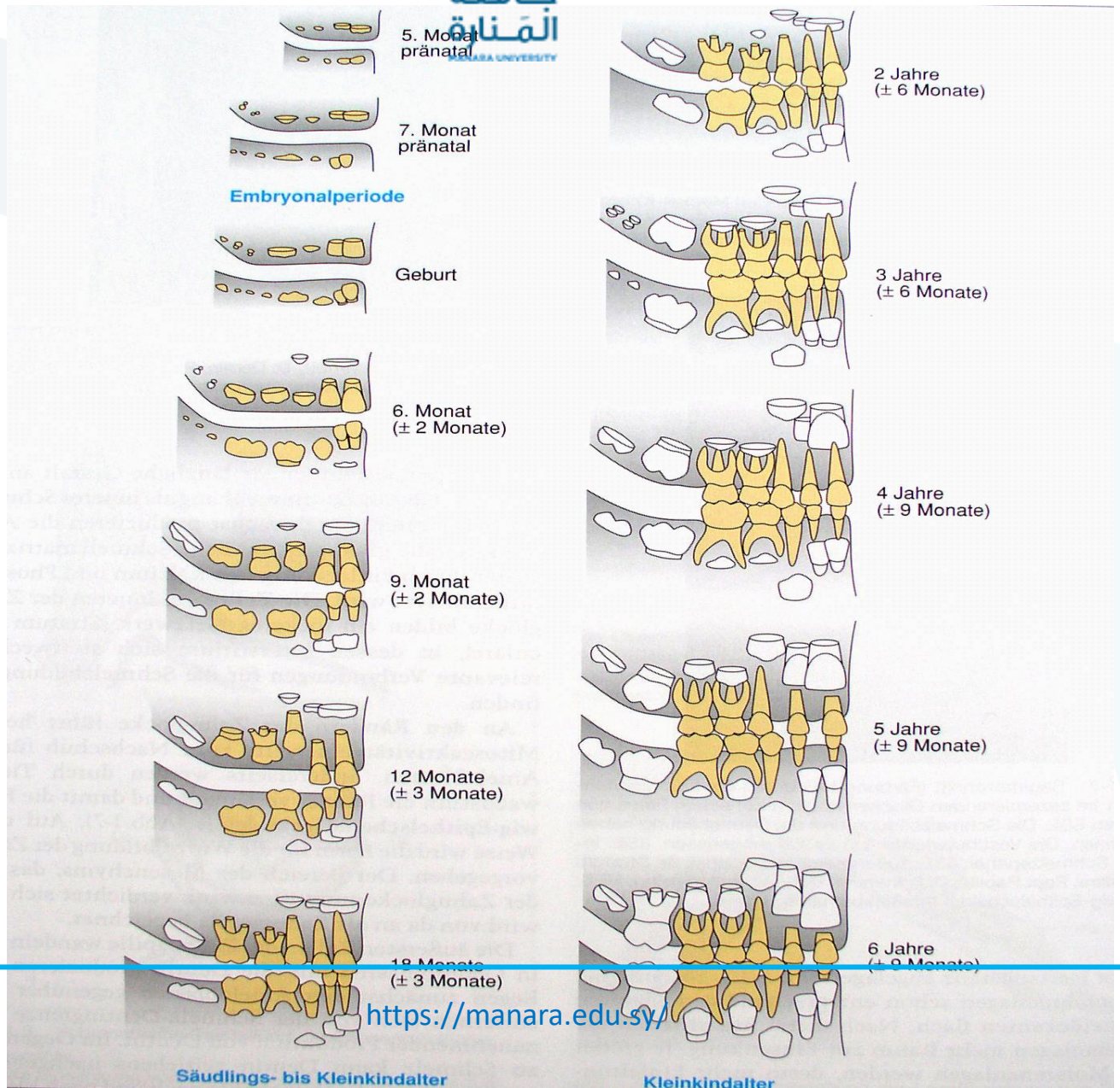


Dr. Abdul Wahab Nourallah

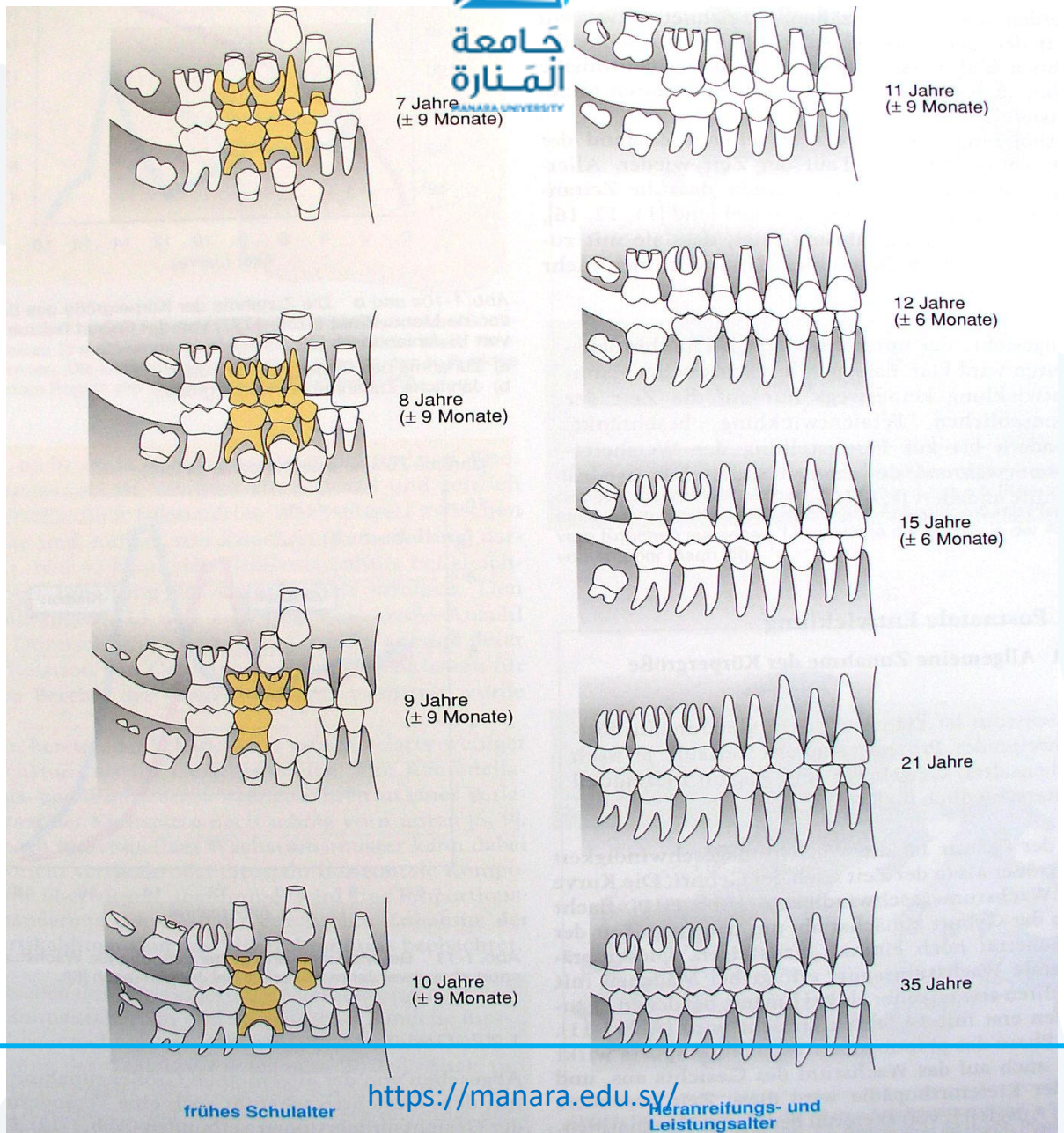
Primary Dentition Functions

- Aesthetic
- Psychological
- Pronunciation
- Physiological, Chewing foods
- Growth and development guidance

Teeth development and eruption sequence (primary dentition)



Teeth development and eruption sequence (permanent dentition)



Most common eruption sequences Permanent Dentition

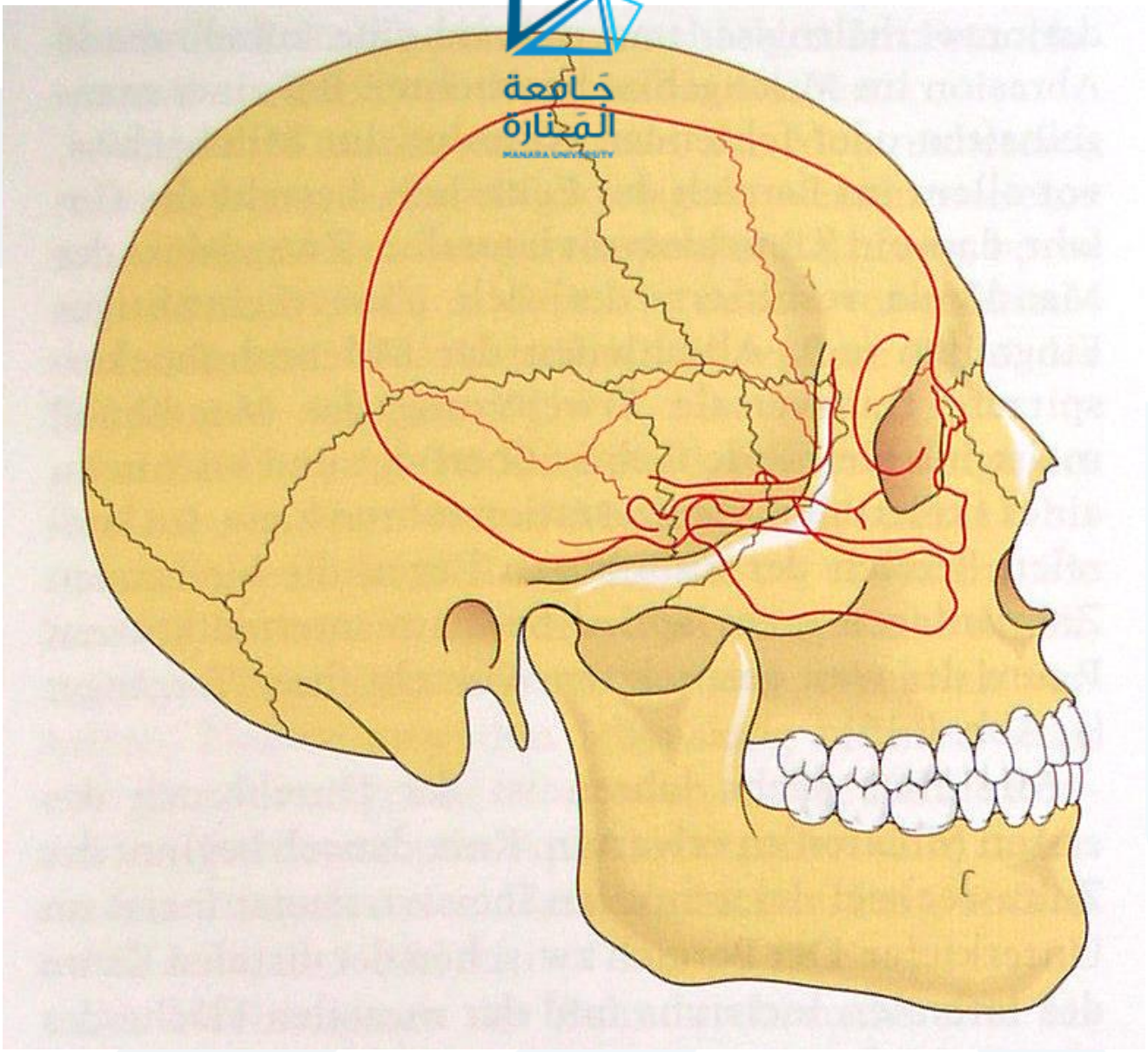
Upper arch

6,1,2,4,5,3,7	In 48,72%
6,1,2,4,3,5,7	In 16,51%
6,1,2,4,5,7,3	In 11,78%

Lower arch

6,1,2,3,4,5,7	In 45,77%
6,1,2,3,4,7,5	In 18,64%
6,1,2,4,3,5,7	In 8,74%

Face, Upper and Lower Jaw Growth and Development



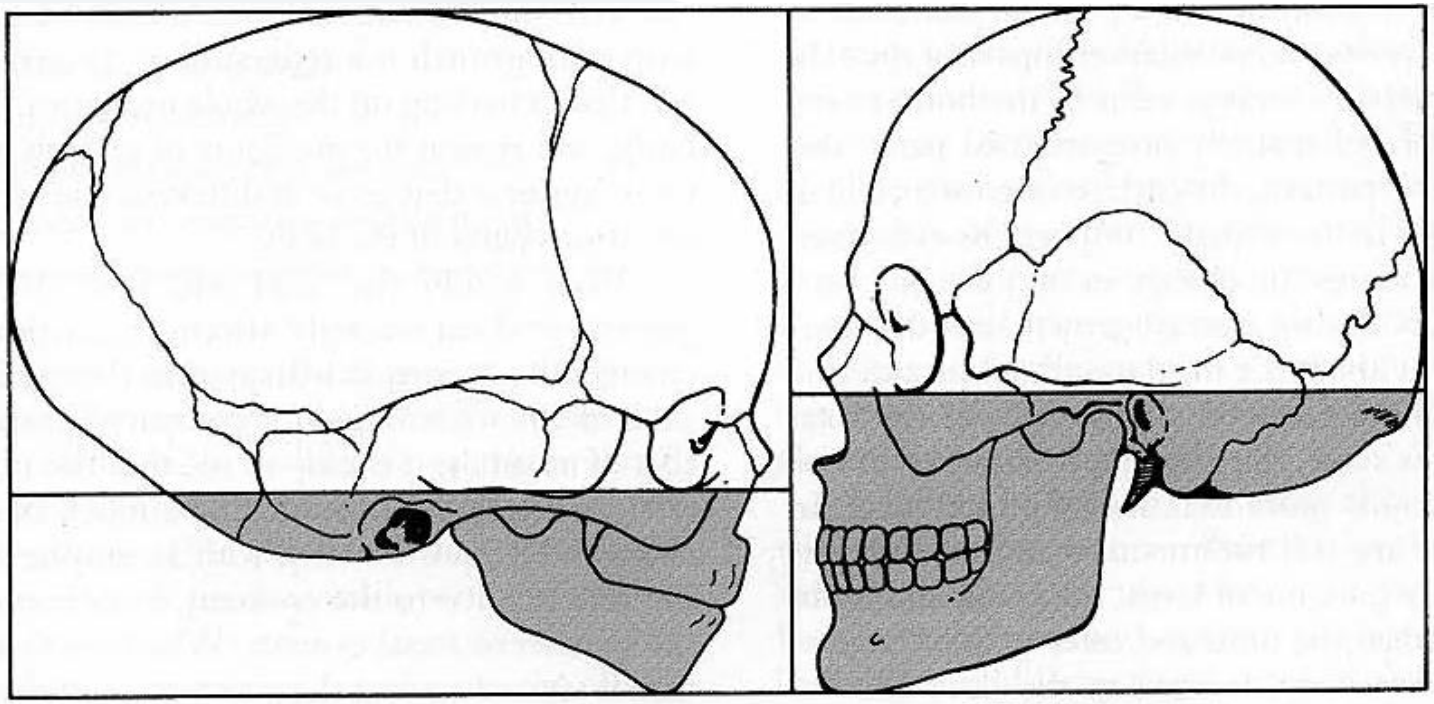


FIGURE 2-3 Changes in proportions of the head and face during growth. At birth, the face and jaws are relatively underdeveloped compared with their extent in the adult. As a result, there is much more growth of facial than cranial structures postnatally. (Redrawn from Lowery GH: *Growth and development of children*, ed 6, Chicago, 1973, Mosby.)

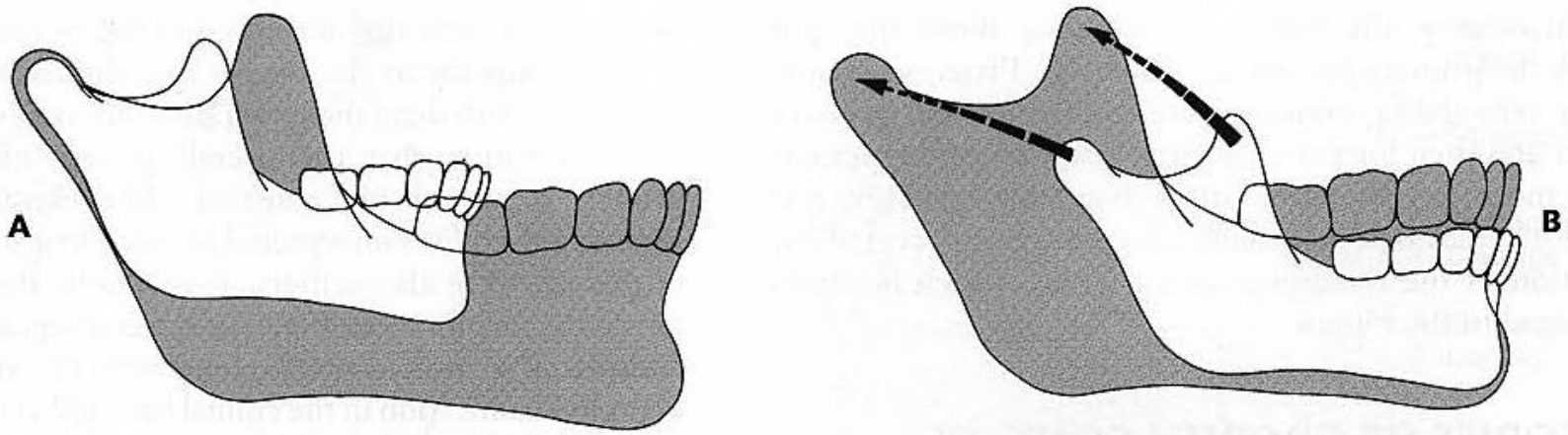
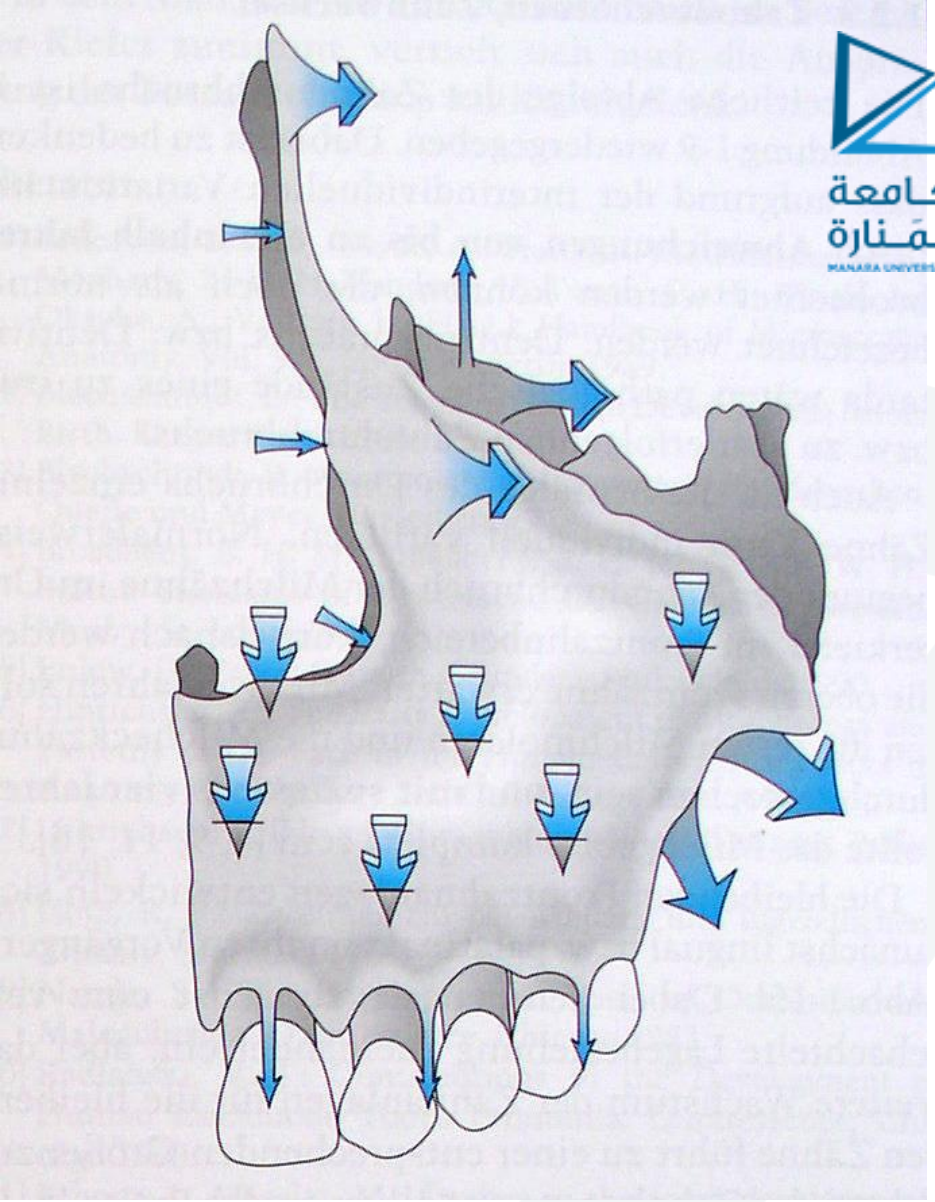
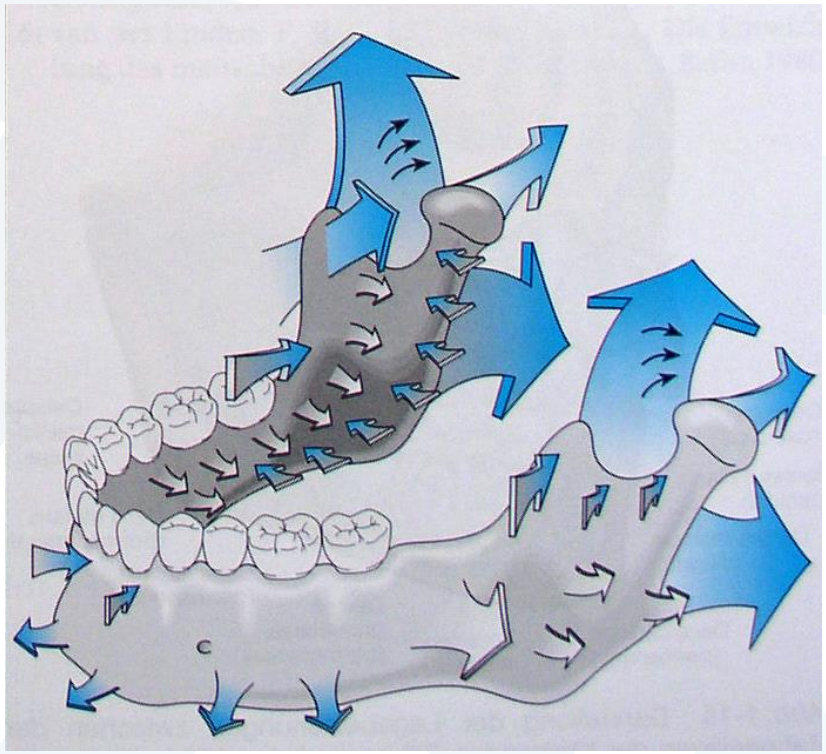
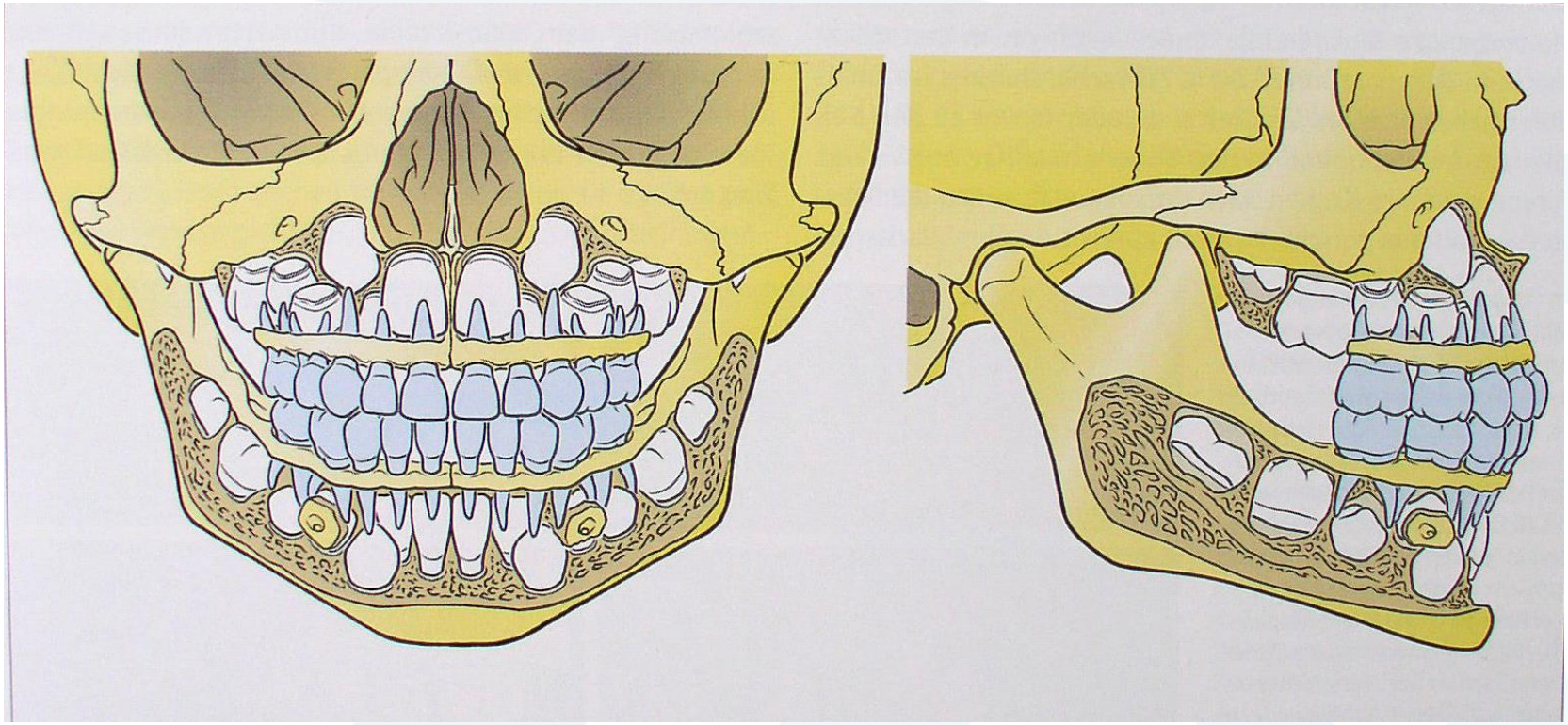


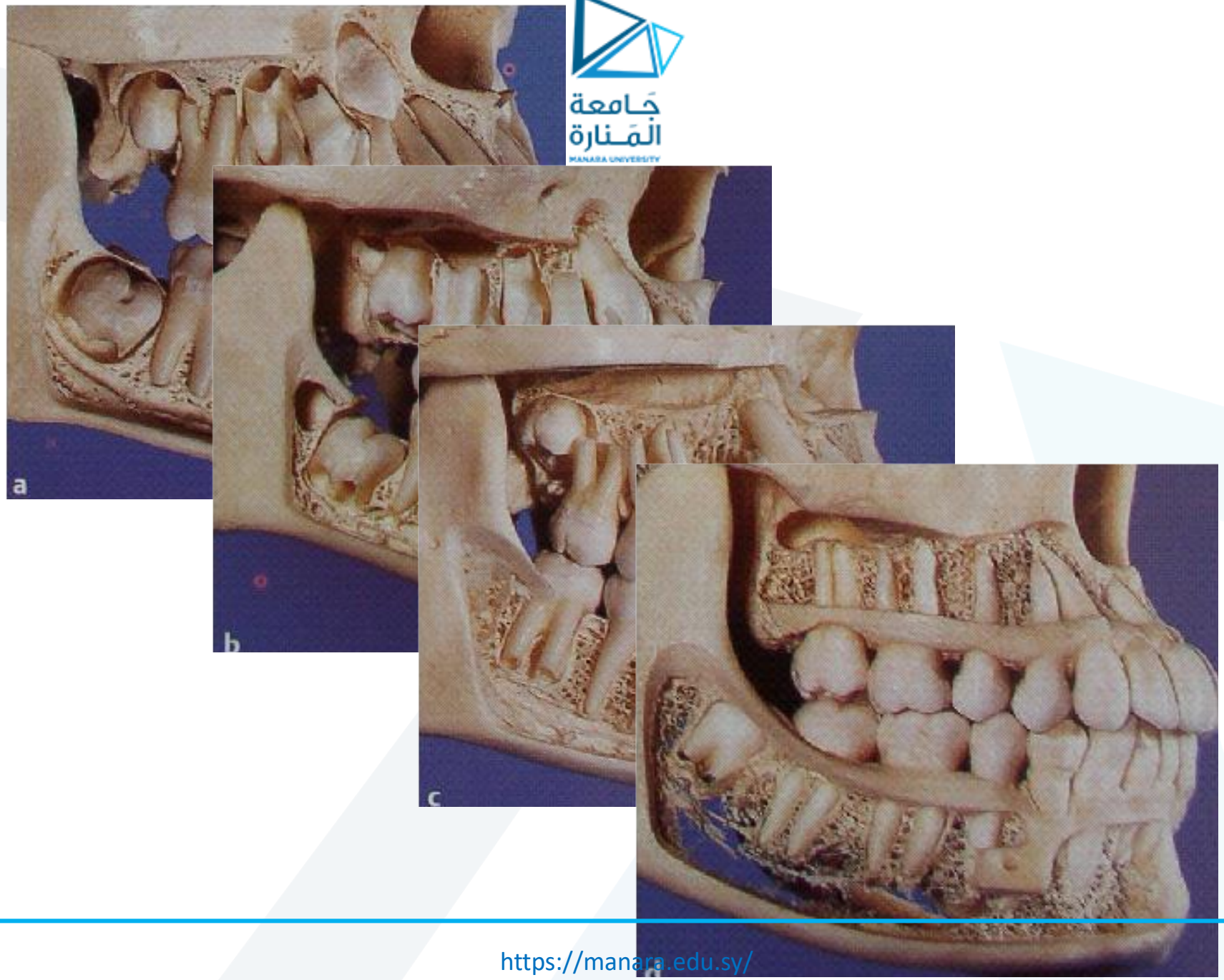
FIGURE 2-30 A, Growth of the mandible, as viewed from the perspective of a stable cranial base: the chin moves downward and forward. **B,** Mandibular growth, as viewed from the perspective of vital staining studies, which reveal minimal changes in the body and chin area, while there is exceptional growth and remodeling of the ramus, moving it posteriorly. The correct concept of mandibular growth is that the mandible is translated downward and forward and grows upward and backward in response to this translation, maintaining its contact with the skull.





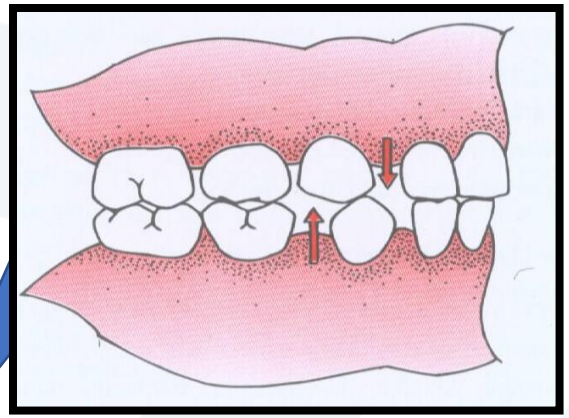
Permanent teeth buds, their position and relationship with the primary teeth




a
b
c

Primary dentition development

Normal features of Primary dentition



- Spaced anteriors
- Primate space
- Shallow overbite and overjet
- Straight terminal plane
- Cl-I molar and cuspid relationship
- Almost vertical inclination of anterior teeth
- Ovoid arch form

Primary dentition: Development of occlusion

- **In mandible**
  - **Increased intercanine width by 3.7 mm between 3-13 yrs**
  - **Increased Intermolar width of 1.5 mm between 3-6 yr**

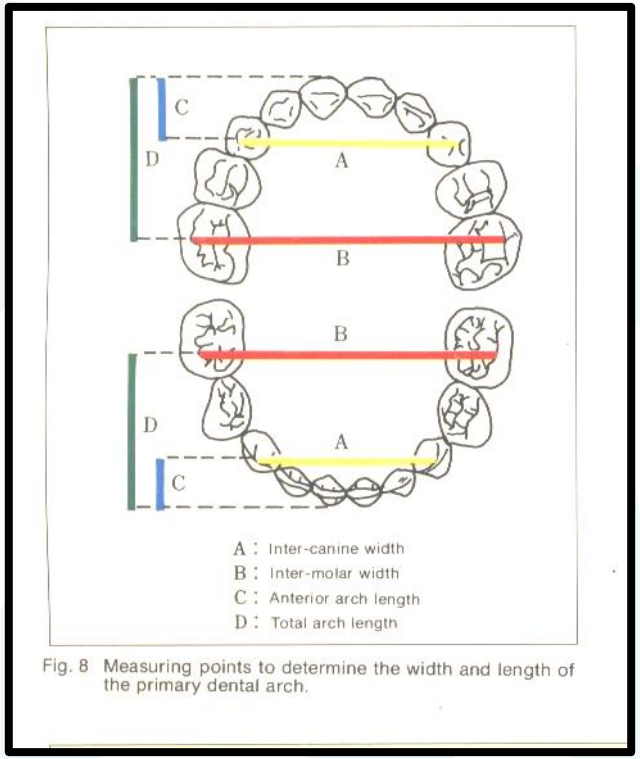
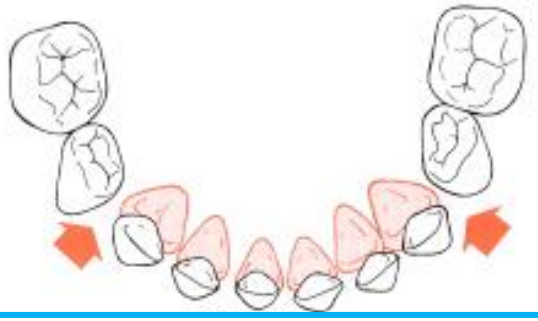


Fig. 8 Measuring points to determine the width and length of the primary dental arch.



Primary dentition: Development of occlusion

- **In maxilla**
  - **Increased inter-canine width by 6 mm between 3-13 yrs**
  - **Increased Inter-molar width of 2 mm between 3-6 yr**

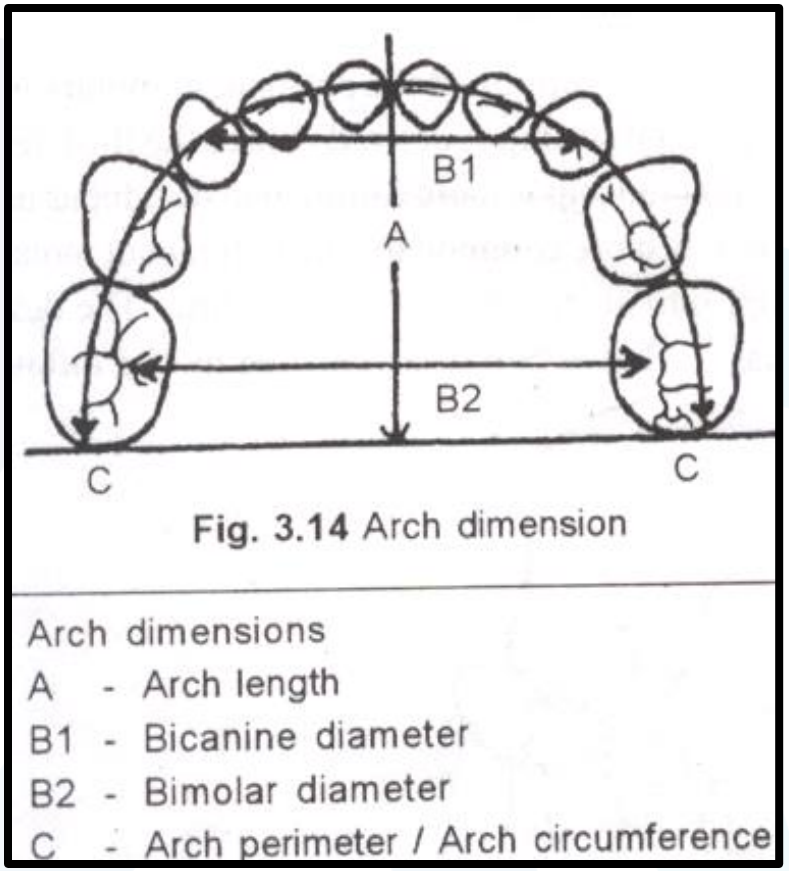
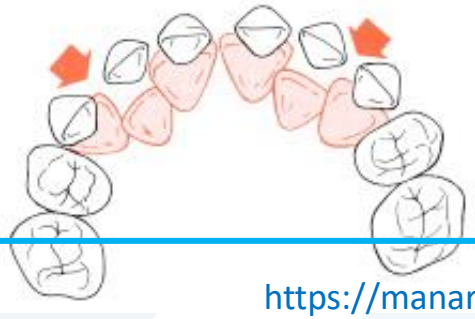


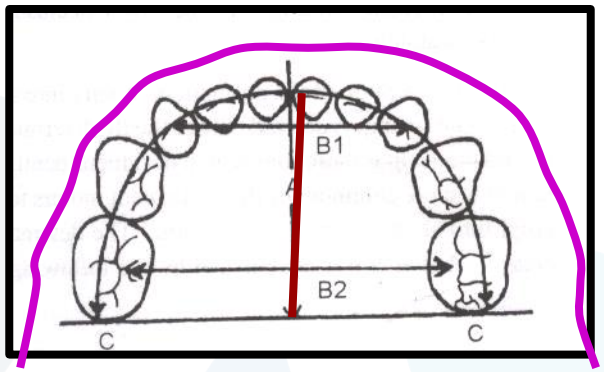
Fig. 3.14 Arch dimension

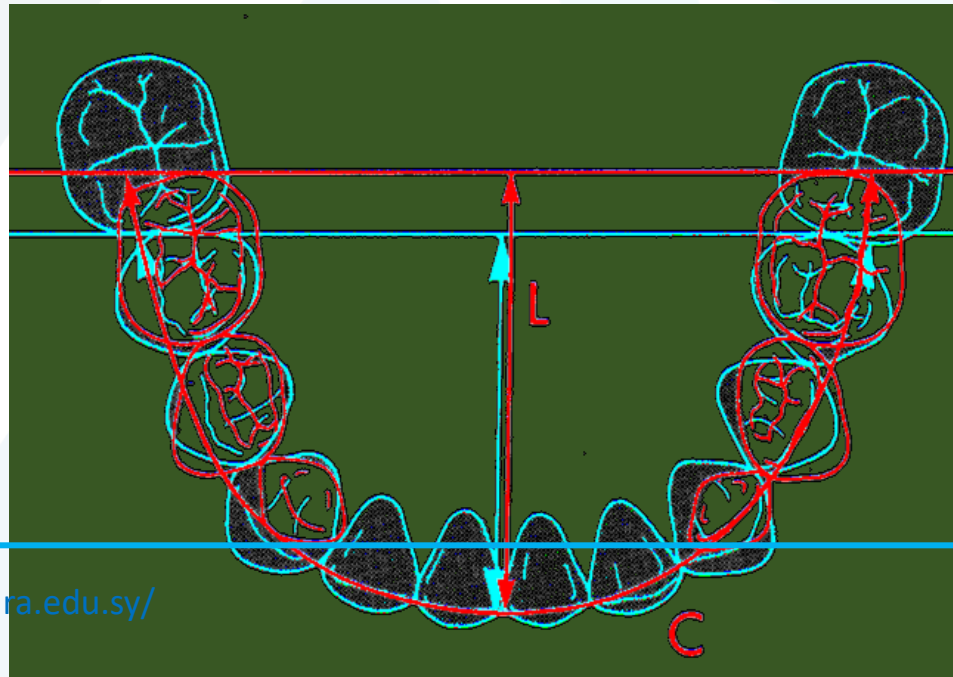
Arch dimensions
A - Arch length
B1 - Bicanine diameter
B2 - Bimolar diameter
C - Arch perimeter / Arch circumference



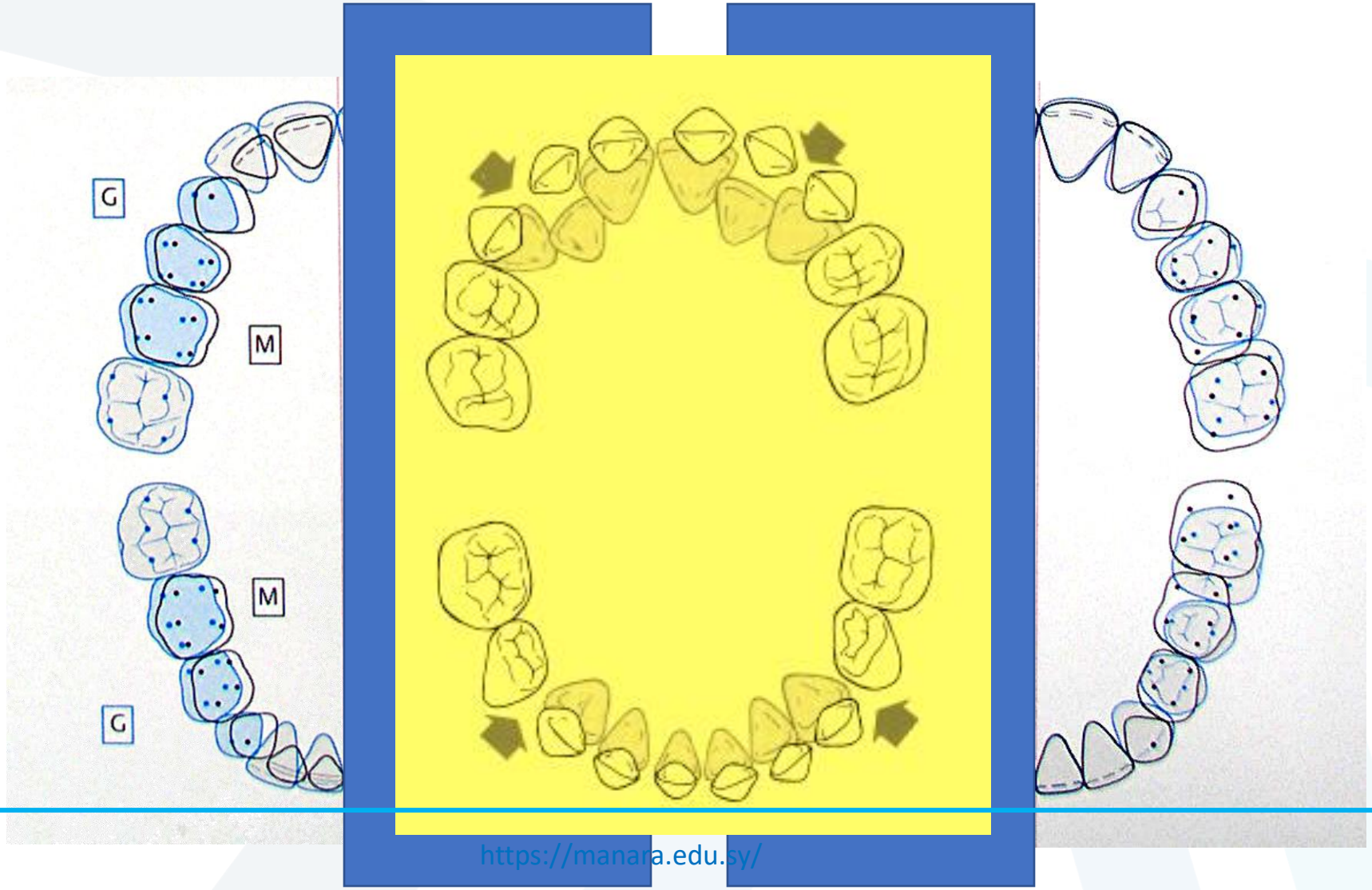
Primary dentition: Primary dental arches

- **Arch length and circumference**
  - **Small amt. of decrease during transition into permanent dentition**

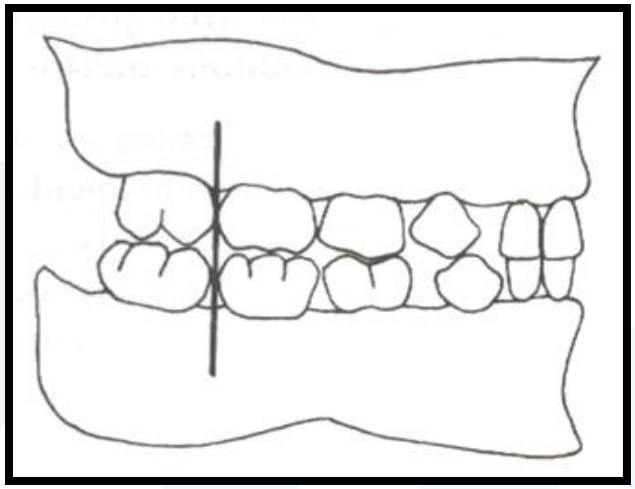




Transition phase

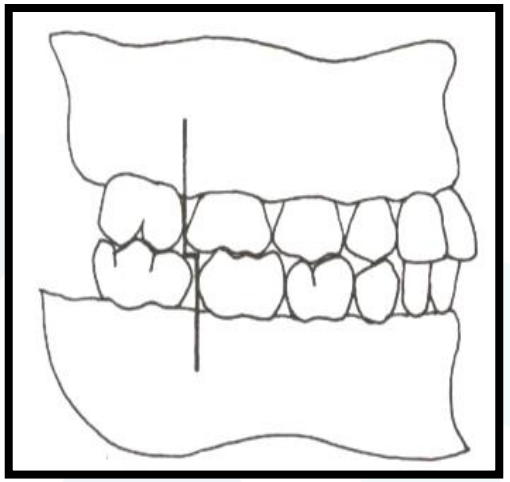


Primary dentition: Development of occlusion



- **Occlusal relation**
  - Flush terminal plane
    - Distal surface of U/L
    - Favourable to guide permanent molars

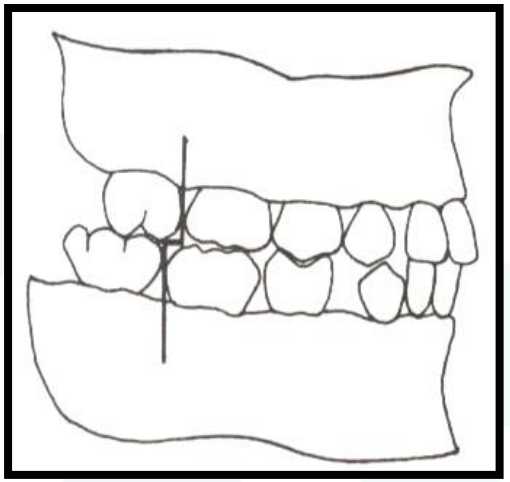
Primary dentition: Development of occlusion

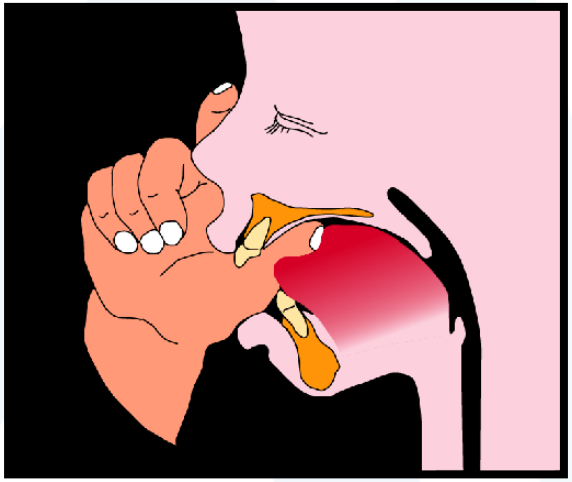


- **Mesial step**
  - Distal surface of lower more mesial to upper
  - Favourable

Primary dentition: Development of occlusion

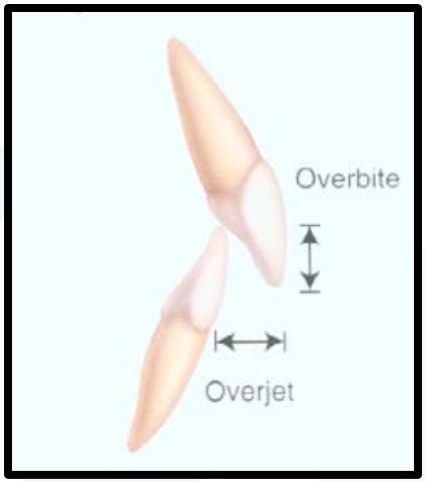
- **Distal step**
  - Distal surface of lower more distal to upper
  - Sucking habits
  - unfavorable





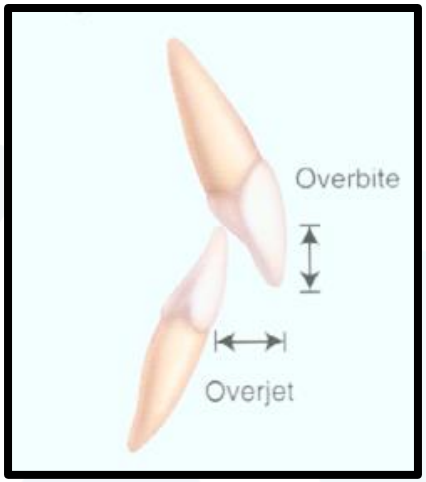
Primary dentition

- **Normal characteristics**
  - **Over bite**
    - Vertical Incisor overlap
    - Average- 1- 2mm
    - 10-40% variation

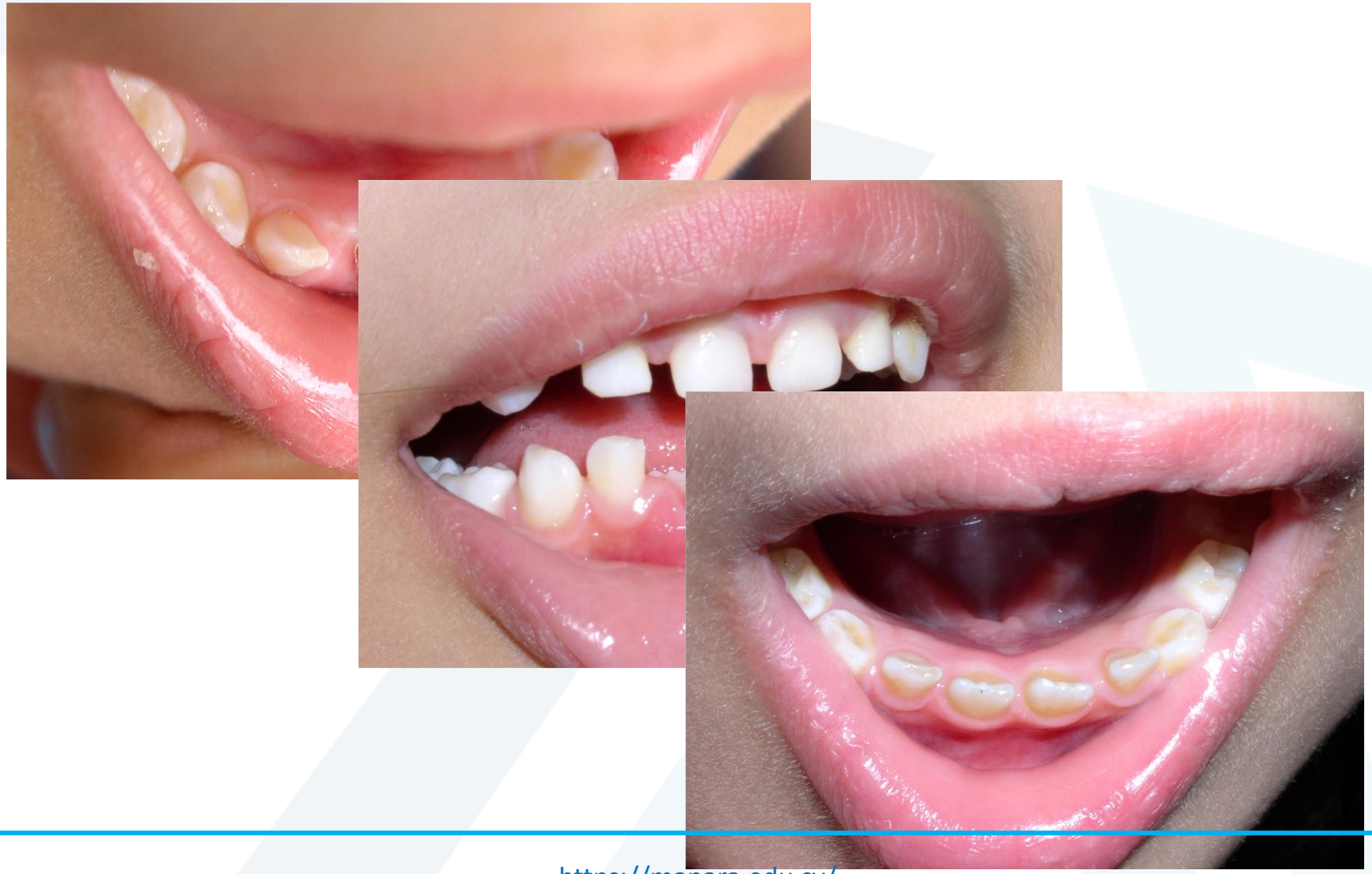


Primary dentition: Normal characteristics

- **Overjet**
  - Horizontal relationship
  - Normal 1-2mm



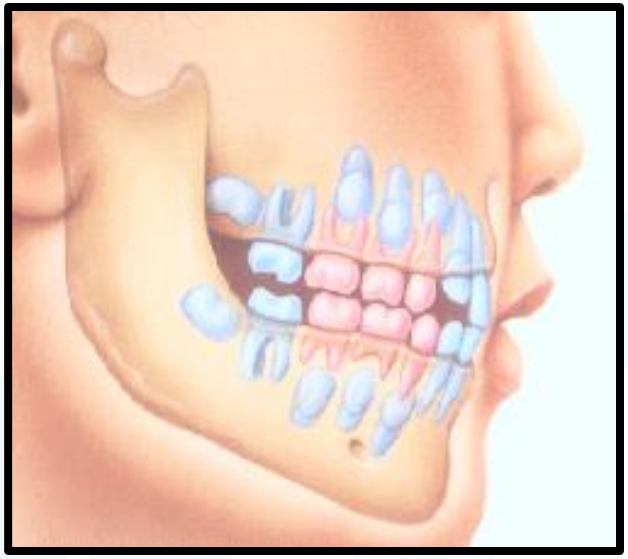
Lower incisors eruption path



Mixed dentition

Mixed dentition

- Period of both primary and permanent dentition
- Clinical importance
  - Utilization of arch perimeter
  - Adaptive changes in occlusion
  - Orthodontic intervention



Mixed dentition

- Three phases
  - First transitional period.
  - Inter transition period.
  - Second transitional period

Mixed dentition

- First transitional period :
  - Emergence of first permanent molars.
  - Exchange of Primary incisors with permanent incisors.
  - Establishment of occlusion

Mixed dentition

- Intertransitional period
  - Both sets of dentition
    - Permanent incisors, 1st molars
    - Primary canines ,1st ,2nd molars
- Second transitional period
  - Emergence of Bicuspids, cuspids, 2nd molar.
  - Establishment of occlusion

Mixed dentition

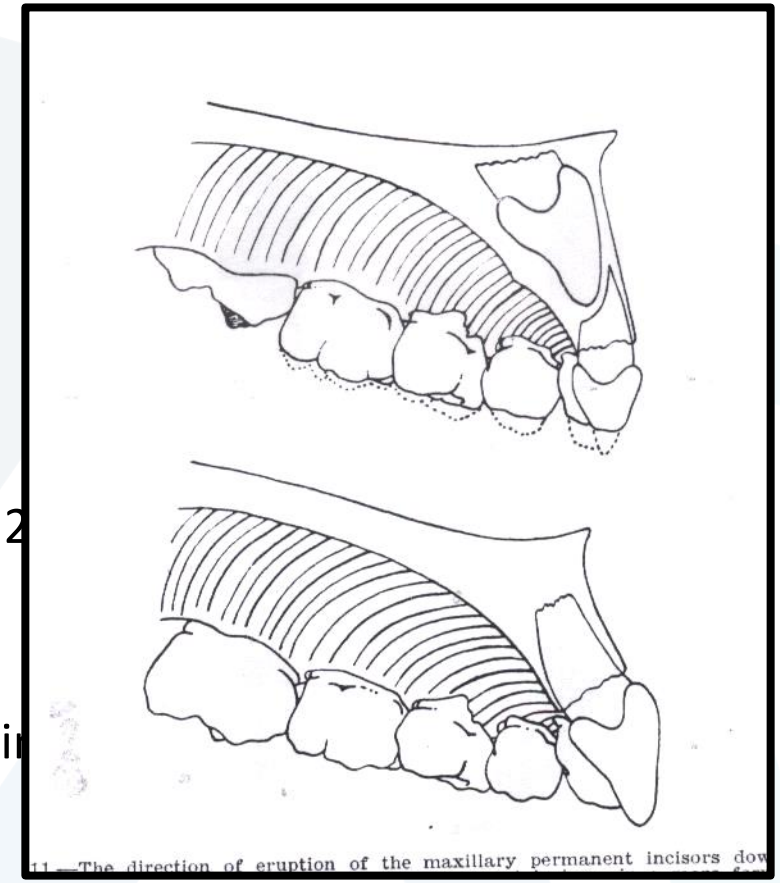
- Uses of dental arch perimeter
  - Alignment of permanent incisors- Crowding (Incisor liability)
  - Space for cuspid and bicuspid (Leeway space)
  - Adjustment of molar occlusion (Mesial shift)

Mixed dentition

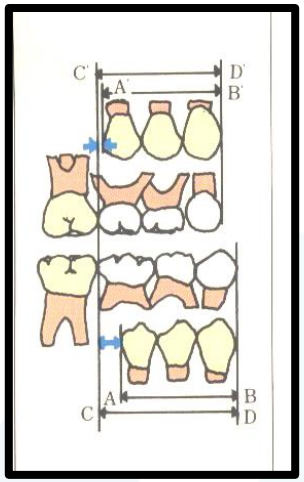
- Incisor liability (Alignment of incisors)
  - Primary – Permanent incisor difference= 6-7 mm

Mixed dentition: Incisor liability

- Mechanisms of incisor liability adjustment
  - Intercanine arch growth-3 to 4 mm
  - Interdental (Developmental spacing)- 2 mm
  - More anterior position of permanent i as they erupt-1 to 2 mm



Mixed dentition

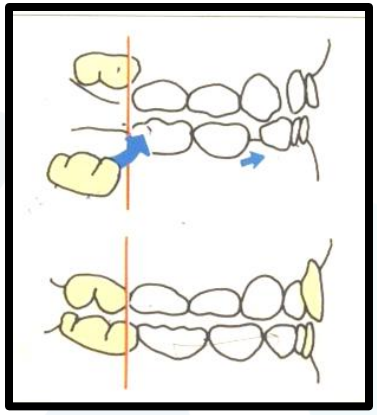


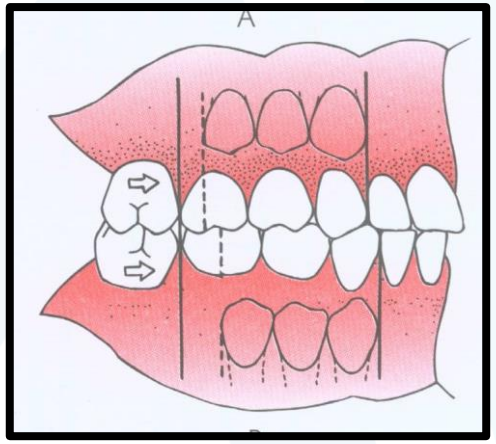
- Space for cuspid and Bicuspid
  - Leeway space
  - Mandible- Per quadrant 1.7mm
  - Maxilla- 0.9mm

Mixed dentition

◉ Molar adjustment

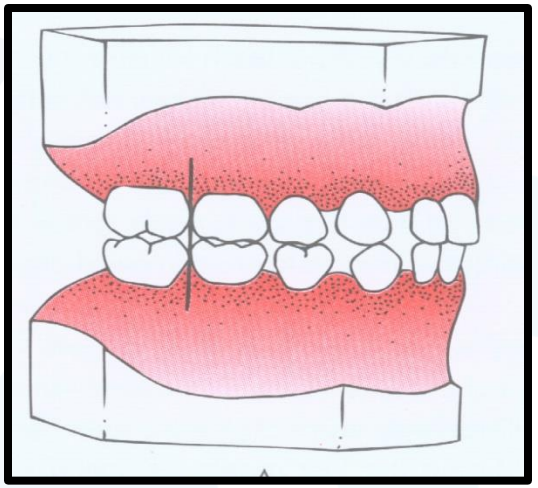
- Closure of primate space
  - Early mesial shift - Controversial
  - Eruption of incisors
- Late mesial shift-
  - Mesial migration of first permanent molar after loss of second Primary molar using leeway space.



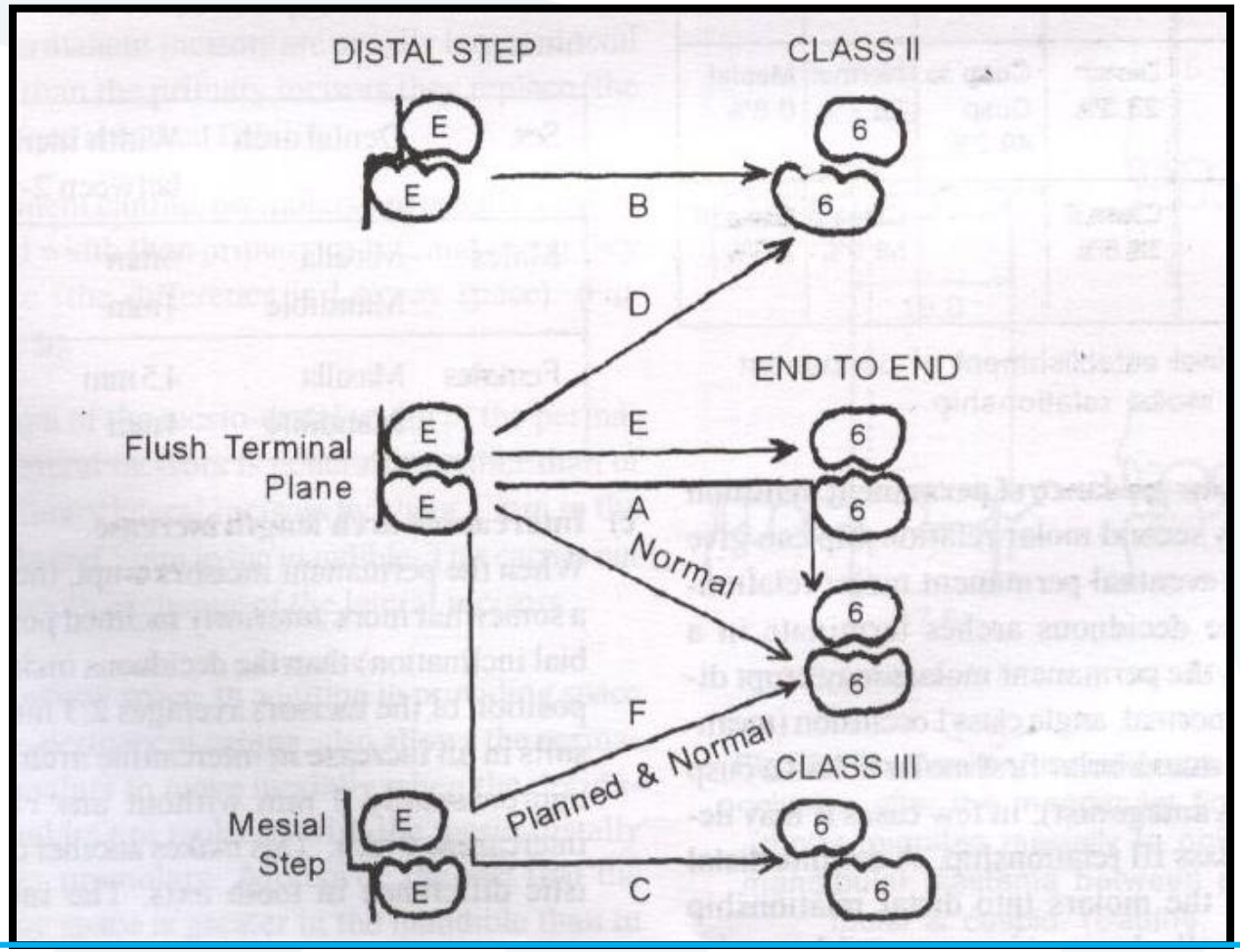


Mixed dentition

- Occlusal changes
  - Flush terminal plane of primary dentition
    - Cl I molar relations achieved by.
      - Late mesial shift
      - Greater forward growth of mandible
      - Combination of both

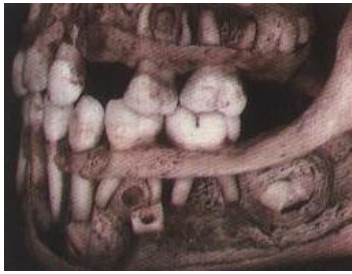


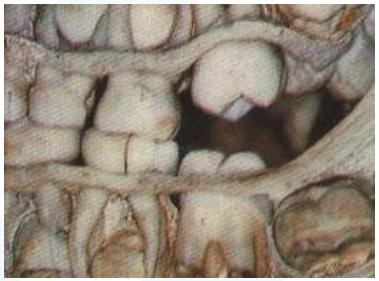
Mixed dentition

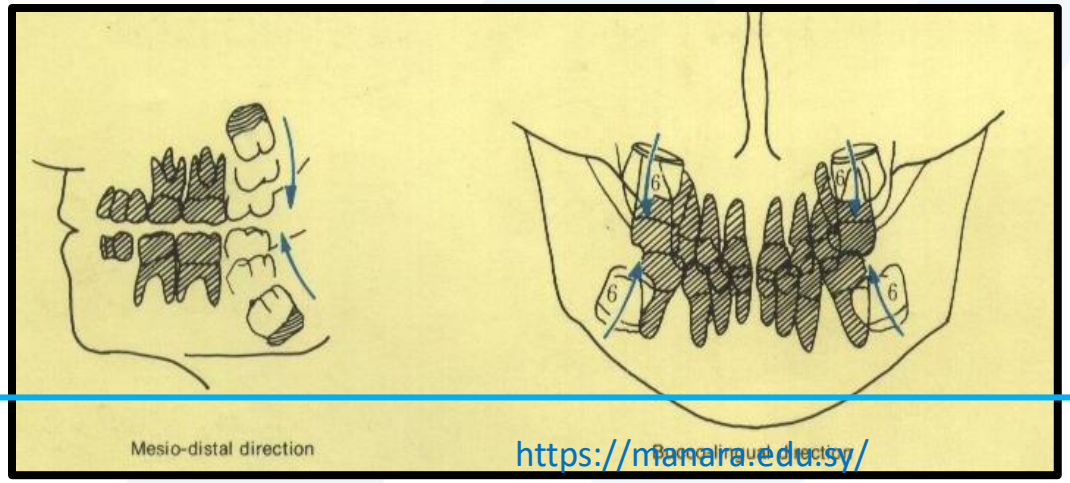


Mixed dentition-Posterior

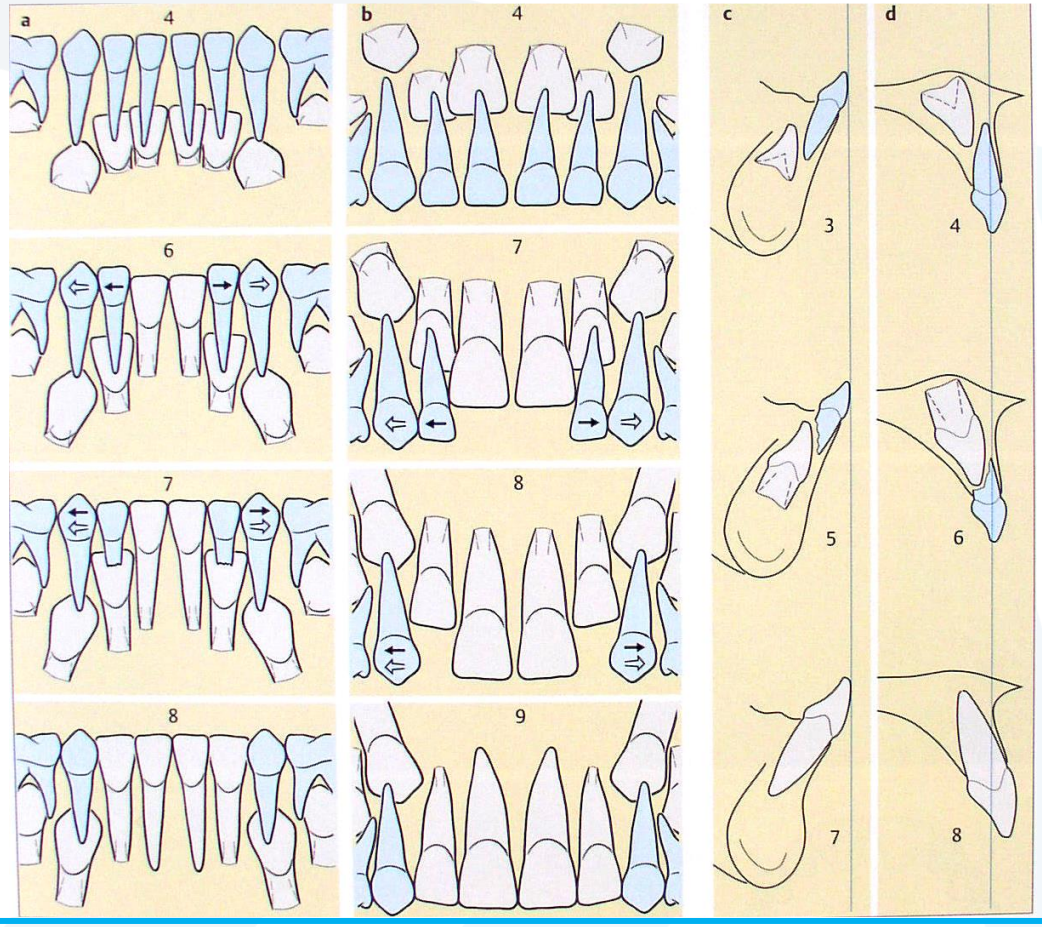
- **1st molar eruption**
  - **Mandible**
    - **Guidance by distal surface of 2nd primary molar**
    - **Mesial and lingual path of eruption**
  - **Maxilla**
    - **Forward movement of maxillary growth**
    - **Space created posteriorly**
    - **Distal and buccal path of eruption**



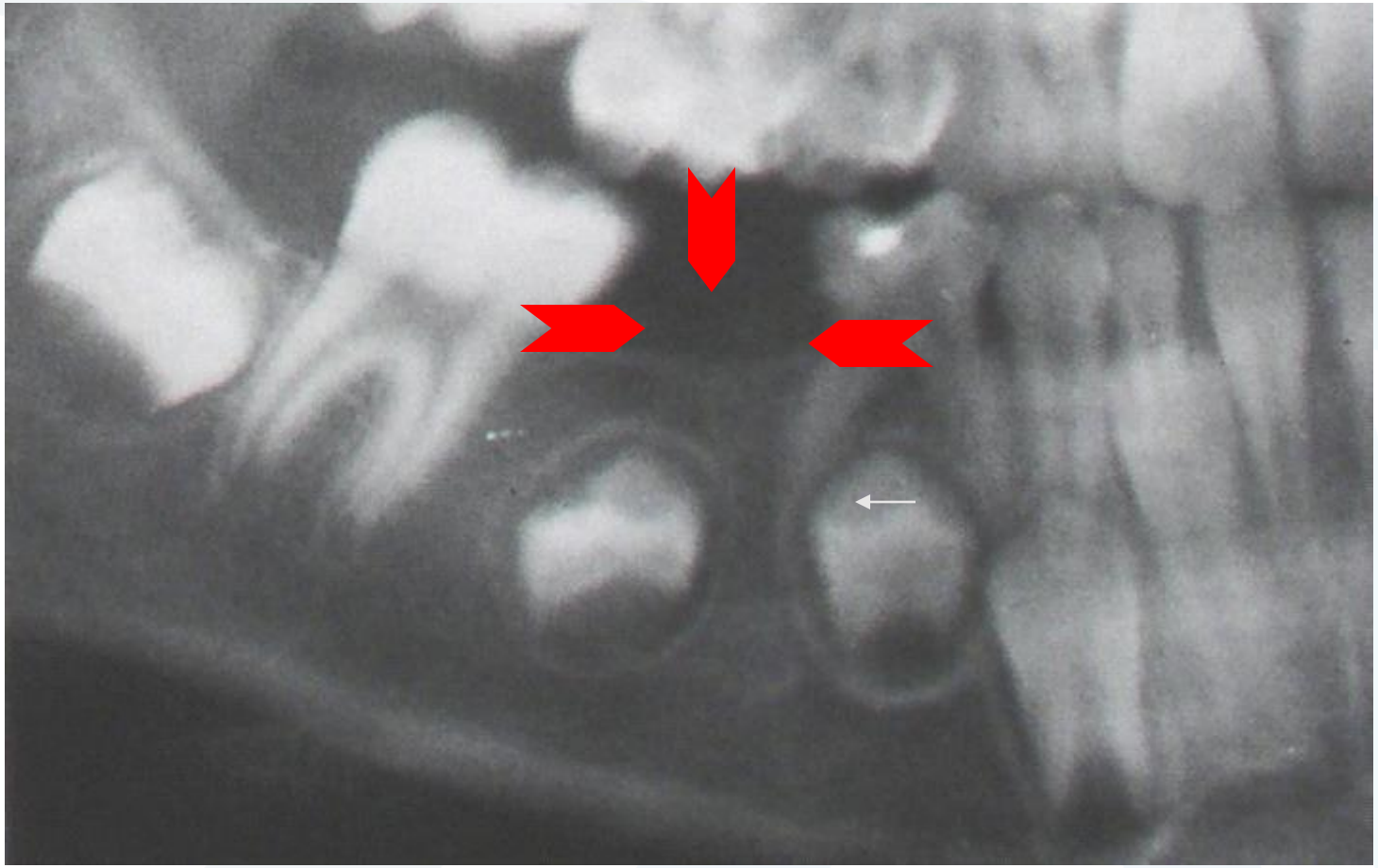




Mixed dentition-Anterior



What happen when a tooth is missed too early



Dental arch physiologic harmony