Overview of the Dentitions
Chapter 11

Learning Objectives
Lesson 11.1: Dentition Periods, Dental Arches, and Tooth Identification
1. Pronounce, define, and spell the key terms.
2. Name the three dentition periods and explain the differences between them.
3. Name the two dental arches and explain two ways that the arches can be divided.
4. Describe the types and functions of teeth.
5. Name and identify tooth surfaces.

Introduction
- Dentition is the term used to describe the natural teeth in the jawbones.
- The dental assistant must know the names, locations, and functions of the teeth.
- The dental assistant must also understand the various systems of numbering the teeth.
Dentition Periods

- Although there are only two sets of teeth, there are three dentition periods:
  - Primary
  - Mixed
  - Permanent

Primary Dentition

- The first set of 20 primary teeth is called the primary dentition
- This dentition is commonly referred to as the "baby teeth"
- You may also hear the term deciduous dentition, an older and less frequently used dental term to describe the primary dentition

Example of the Complete Primary Dentition
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Mixed Dentition

- Mixed dentition generally occurs between the ages of 6 and 12 years
- Both primary and permanent teeth are present during this transitional period
- The mixed dentition period begins with the eruption of the first permanent tooth, which is a permanent mandibular first molar
- This period ends with shedding of the last primary tooth

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Mixed Dentition Period

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Permanent Dentition

- The final, or adult, dentition
- This period begins with shedding of the last primary tooth
- Growth of the jawbones slows and eventually stops
- There is very little growth of the jaw overall during this period because puberty has passed
Dental Arches

- The maxillary arch (upper), which is actually part of the skull, is fixed and not capable of movement.
- The teeth are set in the maxilla bone.
- The mandibular arch (lower) is capable of movement through the action of the temporomandibular joint.
- The mandible is the bone that supports the lower arch of teeth, hence the name mandibular arch.
- Occlusion is the natural contact between the maxillary and mandibular teeth in all positions.

Quadrants

- Dividing the maxillary and mandibular arches into halves yields four sections, which are called quadrants.
- Each quadrant of permanent dentition contains eight permanent teeth, and a quadrant of primary dentition contains five teeth.
Sextants

Sometimes it is necessary to divide the dentition into six parts, each called a sextant:

- Maxillary right posterior
- Maxillary anterior
- Maxillary left posterior
- Mandibular right posterior
- Mandibular anterior
- Mandibular left posterior

Permanent Dentition Separated into Sextants

Anterior and Posterior Teeth

- The anterior teeth are the incisors and canines
- They are usually visible when people smile
- These teeth are aligned to form a smooth, curving arc from the distal (back of the) canine on one side of the arch to the distal canine on the opposite side
Anterior and Posterior Teeth (Cont.)

- The posterior teeth are the premolars and molars
- The posterior teeth are aligned with little or no curvature
- These teeth appear to be in an almost straight line

Types and Functions of Teeth

- Human beings eat both meat and plants
- To accommodate this variety in diet, teeth are designed for the cutting, tearing, and grinding of different types of food
- The permanent dentition is divided into four types of teeth:
  - Incisors
  - Canines
  - Premolars
  - Molars

Types and Functions of Teeth (Cont.)

- The primary dentition has:
  - Incisors
  - Canines
  - Molars
- There are no premolars in the primary dentition
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Occlusal View of the Permanent Dentition

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Occlusal View of the Primary Dentition

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Incisors

- Single-rooted teeth with relatively sharp, thin edges
- Located at the front of the mouth, the incisors are designed to cut food without the application of heavy force
- Incisor means "that which makes an incision or cut"
- The tongue side, or lingual surface, of the incisor is shaped like a shovel to help guide food into the mouth
Canines

- Canine teeth are also known as cuspids.
- They are located at the “corners” of the arch.
- The canines are designed for cutting and tearing food.
- They are the longest teeth in the human dentition.
- Canine teeth have the longest roots of all teeth and are usually the last teeth to be lost.
- Because of its sturdy crown, long root, and location in the arch, the canine is referred to as the cornerstone of the dental arch.

Premolars

- There are four maxillary and four mandibular premolars.
- The premolars, also known as bicuspids, are a cross between canines and molars.
- The pointed buccal cusps hold the food while the lingual cusps grind it.
- The premolars are not as long as canines and also have a broader surface made for chewing food.

Molars

- Molars are much larger than premolars and usually have four or more cusps.
- The function of the 12 molars is to chew or grind food.
- The molars have more cusps than do the other teeth.
- Four or five cusps on the occlusal (biting) surface of each molar, depending on the tooth’s location.
- Maxillary and mandibular molars differ greatly from each other in shape, size, and numbers of cusps and roots.
Tooth Surfaces

- Each tooth has five surfaces:
  - Facial
  - Lingual
  - Occlusal
  - Mesial
  - Distal
Anatomical Features of Teeth

- Anatomical features of the teeth help maintain their positions in the arch and protect the tissues during mastication.
- Three anatomical features:
  - Contours
  - Contacts
  - Embrasures

Contours

- All teeth have a curved surface except when the tooth is fractured or worn.
  - Some surfaces are convex; others are concave.
  - General principle that the crown of the tooth narrows toward the cervical line is true for all types of teeth.
- Facial and lingual contours
  - The normal contour of a tooth provides the gingiva with adequate stimulation for health, while protecting it from damage that may be caused by food.
- Mesial and distal contours
  - These contours provide normal contact and embrasure form.

Tooth Contours
Contacts

- The contact area is the area of the mesial or distal surface of a tooth that touches the adjacent tooth in the same arch
- A proper contact serves the following purposes:
  - Prevents food from being trapped between the teeth
  - Stabilizes the dental arches by holding the teeth in either arch in positive contact with each other
  - Protects the interproximal gingival tissue from trauma during mastication

Height of Contour

- The "bulge," or widest point, on a specific surface of the crown
- Contact areas on the mesial and distal surfaces are usually considered the height of contour on the proximal surfaces
- Facial and lingual surfaces also have a height of contour
Embrasures

- When two teeth in the same arch touch, their curvatures next to the contact areas form spaces called embrasures.
- An embrasure is a triangular space in a gingival direction between the proximal surfaces of two adjoining teeth in contact.
- Embrasures are continuous with the interproximal spaces between the teeth.
- All tooth contours, including contact areas and embrasures, are important in the function and health of the oral tissues.

Angles and Divisions of Teeth

- Line and point angles are used only as descriptive terms to indicate specific locations.
  - Line angle: Formed by the junction of two surfaces.
  - Named from the combination of the two surfaces that join.
- Point angle: Angle formed by the junction of three surfaces at one point.
  - Named from the combination of surfaces that form them.
Line and Point Angles

Divisions into Thirds

- Each tooth surface is divided into imaginary thirds to help identify a specific area of the tooth.

- Root of tooth
  - Apical third
  - Middle third
  - Cervical third

- Crown of tooth
  - Occlusocervical division
    - Crosswise division parallel to occlusal surface
  - Mesiodistal division
  - Buccolingual division
    - Lengthwise division in a labial or buccal-lingual direction
Occlusion and Malocclusion

- Occlusion: Relationship between maxillary and mandibular teeth when upper and lower jaws are fully closed and relationship between teeth in the same arch
  - Centric occlusion: Occurs when jaws are closed in a position that produces maximal stable contact between occluding surfaces of maxillary and mandibular teeth
  - Functional occlusion (physiologic occlusion): Contact of the teeth during biting and chewing movements
- Malocclusion: Abnormal or malpositioned relationships of maxillary teeth to mandibular teeth when they are in centric occlusion

Lingual View of Teeth in Centric Occlusion


Angle's Classification

- Used to describe and classify occlusion and malocclusion
- Basis of system is that the permanent maxillary first molar is the key to occlusion
- Assumes that the patient is occluding in a centric position
Classes of Malocclusion

- Class I (neutroclusion): An ideal mesiodistal relationship exists between the jaws and the dental arches.
  - Mesiobuccal cusp of permanent maxillary first molar occludes with mesiobuccal groove of the mandibular first molar.
- Class II (distoclusion): Mesio buccal cusp of maxillary first molar occludes (by more than the width of a premolar) mesial to the mesiobuccal groove of mandibular first molar.
  - Frequently gives the appearance of protrusion of the maxillary anterior teeth over the mandibular anterior teeth.

Divisions of Class II Malocclusion

- Division 1: Lips are usually flat and parted, with the lower lip tucked behind the upper incisors.
  - Maxillary incisors are in labioversion.
- Division 2: Maxillary incisors are not in labioversion.
  - Maxillary central incisors are nearly normal anteroposteriorly, and they may be slightly in linguoversion.

Class III Malocclusion (Mesioclusion)

- The body of the mandible must be in an abnormal mesial relationship to the maxilla.
- Frequently gives the appearance of protrusion of the mandible.
Stabilization of the Arches

Closure and Curve of Spee

- Closure: Anterior teeth are not designed to fully support the occlusal forces on the entire dental arch
  - As the jaws close, the stronger posterior teeth come together first
- Curve of Spee: Occlusal surfaces of the posterior teeth do not form a flat plane
  - The curvature formed by the maxillary and mandibular arches in occlusion is known as the curve of Spee

Curve of Spee

From Fehrenbach MJ, Popowics T: Illustrated dental embryology, histology, and anatomy, ed 4, St Louis, 2016, Saunders.
Curve of Wilson

- Cross-arch curvature of the posterior occlusal plane

From Fehrenbach MJ, Popowics T: Illustrated dental embryology, histology, and anatomy, ed 4, St Louis, 2016, Saunders.

Tooth-Numbering Systems

- Numbering systems are used as a simplified means of identifying the teeth for charting and descriptive purpose
  - Universal/National System
  - International Standards Organization System
  - Palmer Notation System

Palmer Notation System
Universal/National System
- Used most often in the United States
- Permanent teeth are numbered from 1 to 32
- Numbering begins with the upper-right third molar and works around to the upper-left third molar
- Then numbering drops to the lower-left third molar and works around to lower-right third molar

International Standards Organization System
- The ISO/FDI System uses a two-digit tooth-recording system
- First digit indicates the quadrant
- Second digit indicates the tooth within the quadrant, with numbering from the midline toward the posterior

Palmer Notation System
- Each of the four quadrants is given its own tooth bracket made up of a vertical line and a horizontal line
  - A shorthand diagram of the teeth presented as if one is viewing the patient's teeth from the outside
Questions?