

# Chapter 2

## Anatomy and Oral Structures

### Objectives

*Upon completion of this chapter, the reader should be able to identify and understand terms related to the following:*

- 1. Anatomy of the skull.** Name and identify the major bones of the face and skull.
- 2. Anatomical features of the skull.** Locate the sinus cavities, sutures, processes, and foramina of the skull.
- 3. Landmarks and features of the mandible.** Locate the major structural points of the mandible, and explain their functions or purposes.
- 4. Muscles of mastication.** Identify the names and locations of the major muscles of mastication, and explain the function of each.
- 5. Trigeminal nerve location and functions.** Describe the principal branches of the trigeminal nerve, and explain the functions of each division.
- 6. Blood supply of the cranium.** Locate and identify the major blood vessels to and from the cranium.
- 7. Locations and purposes of the salivary glands.** Describe the placement and functions of the major salivary glands.
- 8. Agents and functions of the lymphatic system.** Discuss the tissue bodies present in the cranium and their function in fighting infection and assisting with immunity.
- 9. Important structures in the oral cavity.** Locate and explain features in the oral cavity, such as the labia, frena, tongue, and palate structures and miscellaneous tissues.

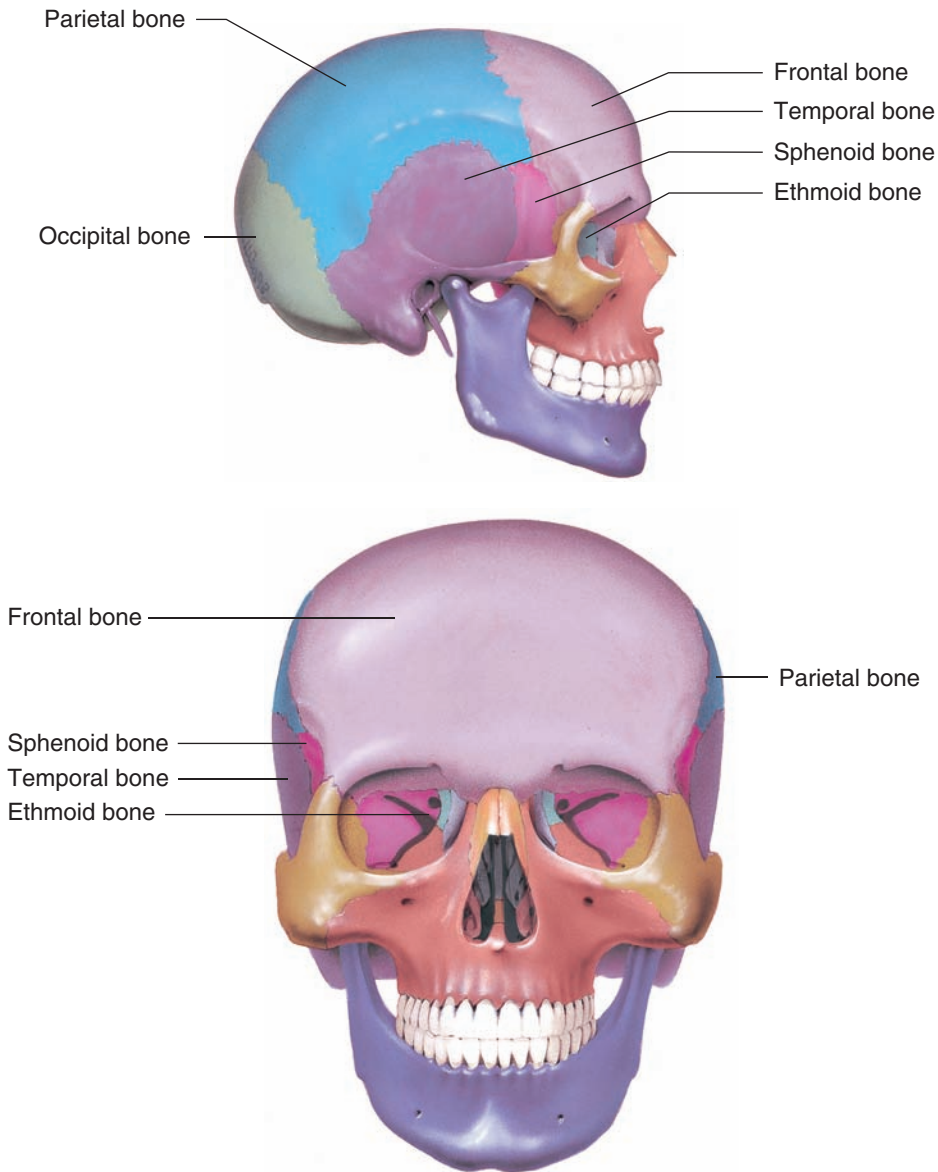
### Anatomy of the Skull

Medical terminology deals with the entire body and all its systems, whereas the language of dentistry is related mostly to the head region. The skull area is composed of two main bone divisions: the cranium and the facial section.

## Cranium

The **cranium** (KRAY-nee-um) is the portion of the skull that encloses the brain. Eight bones make up this section of the skull (Figure 2-1):

**temporal** (TEM-pore-al): two fan-shaped bones, one on each side of the skull, in the temporal area above each ear.



**Figure 2-1**

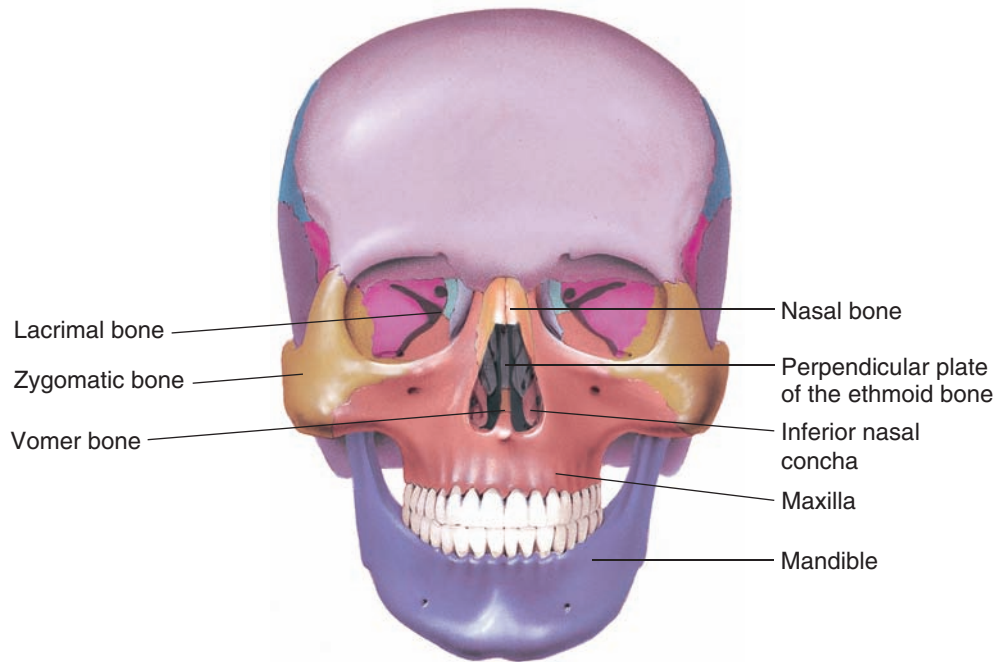
Cranial bones

- parietal** (pah-**RYE**-eh-tal): two bones, one on each side, that make up the roof and side walls covering the brain.
- frontal** (**FRON**-tal): a single bone in the frontal or anterior region that makes up the forehead.
- occipital** (ock-**SIP**-ih-tahl): one large, thick bone in the lower back of the head that forms the base of the skull and contains a large opening for the spinal cord passage to the brain.
- ethmoid** (**ETH**-moyd): a spongy bone located between the eye orbits that helps form the roof and part of the anterior nasal fossa of the skull.
- sphenoid** (**SFEE**-noyd): a large bat-shaped bone at the base of the skull between the occipital and ethmoid in front, and the parietal and temporal bones at each side.

## Facial Bones

Fourteen bones make up the facial division of the cranium (see Figure 2-2). All are paired with one on each side, except there is only one vomer in the nose and one mandible extending from right to left. The facial bones are:

- zygomatic** (zye-goh-**MAT**-ick): two facial bones, one under each eye, that form the cheekbone and give character to the face. The zygomatic bones are also called the **malar** (**MAY**-lar) bones.
- maxilla** (**MACK**-sih-lah): two large facial bones, one under each eye, that unite in the center in the *median suture* to form the upper jaw that supports the maxillary teeth in the *alveolar process*. Also present in this bone is the *maxillary sinus* (Atrium of Highmore), and the *infraorbital frenalum* under each eye that permits the passage of nerves.
- palatine** (**PAL**-ah-tine): two bones, one left and one right, that unite at the *median palatine suture* to form the hard palate of the mouth and the nasal floor. Present in this bone are multiple foramina, the largest, the *incisive foramen*, is directly behind the central incisors.
- nasal** (**NAY**-zal): two bones, one left and one right, that join side by side to form the arch or bridge of the nose.
- lacrimal** (**LACK**-rih-mal): two small bones, one each on the inner side or nose site of the orbital cavity, that make up the corner of the eye where the *tear ducts* are located.
- inferior concha** (**KONG**-kah in singular use or (conchae) **KONG**-kee in plural use): two thin scroll-like bones that form the lower part of the interior of the nasal cavity.
- mandible** (**MAN**-dih-bull): the strong, horseshoe-shaped bone that forms the lower jaw (described in further detail later in this chapter).
- vomer** (**VOH**-mer): a single bone that forms the lower posterior part of the nasal septum and separates the nose into two chambers.

**Figure 2-2**

Facial bones

## Miscellaneous Bones of the Skull

Although the **auditory ossicles** (AHS-ih-kuls), small bones in the ear, are not considered bones of the face or cranium, they are present in the head or skull. The three auditory ossicles are:

**malleus** (MAL-ee-us): the largest of three ossicles in the middle ear; commonly called the ear mallet.

**incus** (IN-kus): one of the three ossicles of the middle ear; commonly called the anvil.

**stapes** (STAY-pee-z): one of the three ossicles in the middle ear; commonly called the stirrup.

Another bone of interest and closely related to the dental field but not located in the skull is the **hyoid** (HIGH-oyd), a horseshoe-shaped bone lying at the base of the tongue. It does not articulate with any other bone.

## Anatomical Features of the Skull

Many anatomical features are present in the cranial and facial bones, including the sinuses, bone sutures, processes of the skull bones, and major foramina. Each feature has a specific location and purpose.

## Sinus

A **sinus** (SIGH-nus) is an air pocket or cavity in a bone that lightens the bone, warms the air intake, and helps form sounds. These sinus cavities receive their names from the bone in which they are situated (Figure 2-3). The **accessory paranasal sinuses** that empty into the nasal cavity are:

**frontal:** larger accessory sinus, located in the frontal bone or the forehead above each eye.

**ethmoid:** multiple, smaller sinuses located in the ethmoid bone, at the side of each eye.

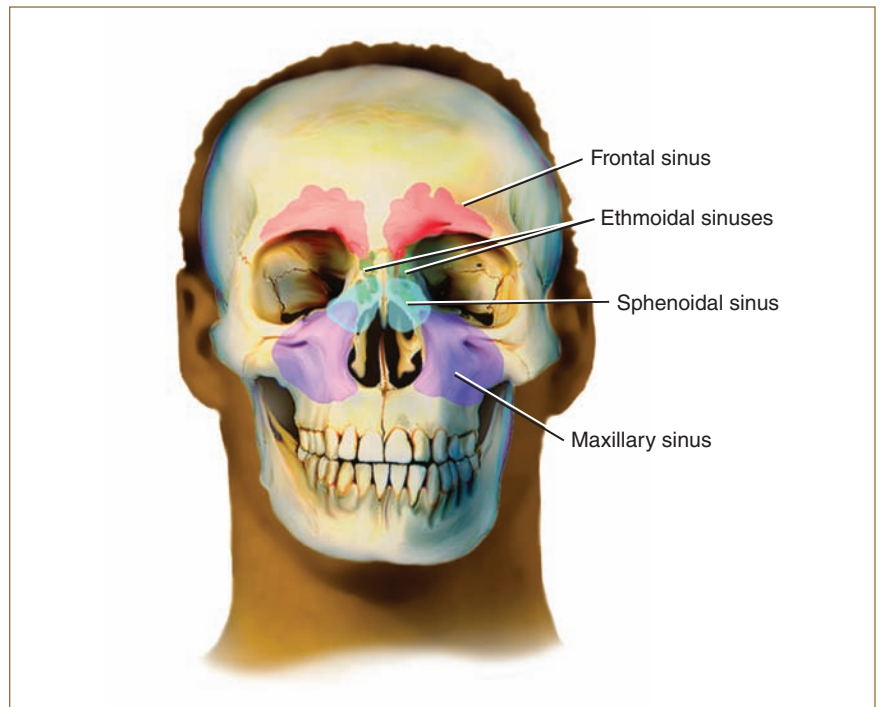
**sphenoid:** multiple, small sinuses located in the sphenoid bone situated behind the eyes.

**maxillary:** located in the maxilla; the maxillary sinus is the largest and is called the **atrium** (A-tree-um) of **Highmore**; this cavity is easily seen and is used as a landmark for identifying radiographs in the mounting of films.

## Sutures of the Skull

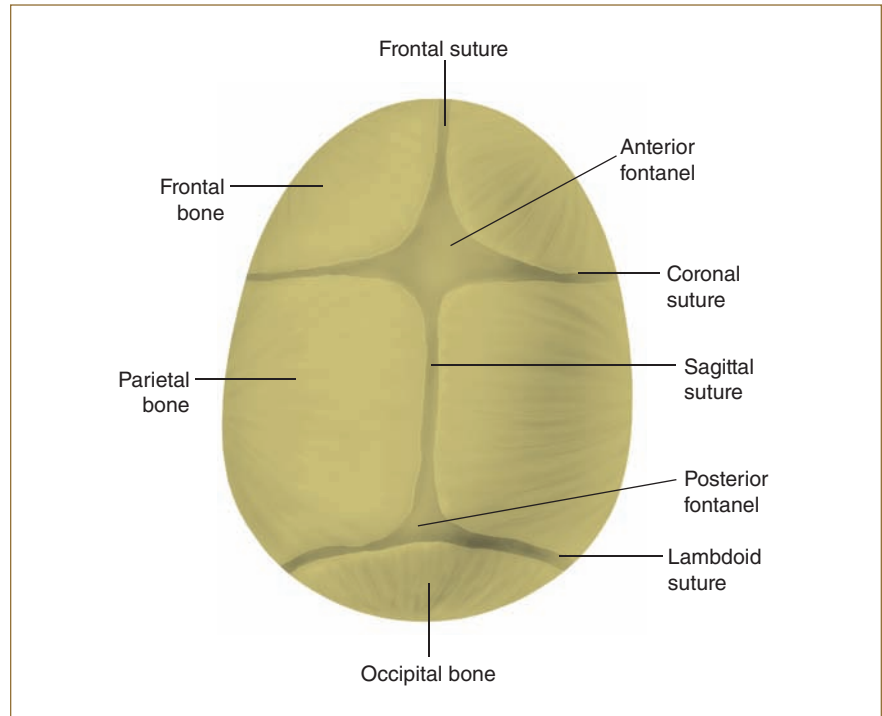
A **suture** (SOO-chur) is a line where two or more bones unite in an immovable joint. Several main sutures are located in the cranium (Figure 2-4):

**coronal** (kor-OH-nal): junction of the frontal and the parietal bones; this area is soft at birth and shortly afterward, and it has been called the baby's "soft spot" or **fontanel** (fon-tah-NELL = *little fountain*), sometimes spelled *fontanelle*.



**Figure 2-3**

Sinuses

**Figure 2-4**

Sutures of the skull

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**sagittal** (SAJ-ih-tahl): the union line between the two parietal bones on the top of the skull.

**lambdoid** (LAM-doyd): located between the parietal bone and the upper border of the occipital bone.

**temporoparietal** (tem-poe-roe-pah-RYE-eh-tal): located between the temporal and parietal bones; also known as the **squamous** (SKWAY-mus) suture (not visible in Figure 2-4).

## Bone Structures of the Hard Palate

Oral cavity sutures are unions of bones occurring in the mouth. The hard palate is composed of four main processes united by two palatine sutures, the *median* and the *transverse palatine sutures*. The left and right palatine processes and the left and right processes of the maxilla meet at the median palatine suture. All four edges of the processes combine at the transverse palatine suture completing the hard palate. Five foramina are present in this hard palate bone. The largest, the *incisive foramen*, is situated behind the incisors; a *greater* and a *lesser palatine foramina* are present on each side in the rear (Figure 2-5).

## Processes of the Cranium

A **process** (PROS-es) is a projection or outgrowth of bone or tissue. This bone excess is not to be confused with the fusion line where two bones develop into one, such as the mandible. The **symphysis** (SIM-fih-sis) is in the center of the mandible, forms the chin, and is called the **mental** or chin **protuberance**