# 17 Mouth, Throat, Nose, and Sinuses

## Structure and Function

The mouth and throat make up the first part of the digestive system and are responsible for receiving food (ingestion), taste, preparing food for digestion, and aiding in speech. Cranial nerves V (trigeminal), VII (facial), IX (glossopharyngeal), and XII (hypoglossal) assist with some of these functions (the cranial nerves are discussed in Chapter 25). The nose and **paranasal sinuses** constitute the first part of the respiratory system and are responsible for receiving, filtering, warming, and moistening air to be transported to the lungs. Receptors of cranial nerve I (olfactory) are also located in the nose. These receptors are related to the sense of smell.

### MOUTH

The mouth or **oral cavity** is formed by the lips, cheeks, hard and soft palates, uvula, and the tongue and its muscles (Fig. 17-1). The mouth is the beginning of the digestive tract and serves as an airway for the respiratory tract. The upper and lower lips form the entrance to the mouth and serve as a protective gateway to the digestive and respiratory tracts. The roof of the oral cavity is formed by the anterior hard **palate** and the posterior soft palate. An extension of the soft palate is the **uvula,** which hangs in the posterior midline of the oropharynx. The cheeks form the lateral walls of the mouth, whereas the tongue and its muscles form the floor of the mouth. The **mandible** ( jaw bone) provides the structural support for the floor of the mouth.

Contained within the mouth are the tongue, teeth, gums, and the openings of the salivary glands (parotid, submandibular, and sublingual). The tongue is a mass of muscle and is attached to the hyoid bone and styloid process of the temporal bone and is connected to the floor of the mouth by a fold of tissue called the frenulum. The tongue assists with moving food, swallowing, and speaking. The gums (**gingiva**) are covered by mucous membrane and normally hold 32 permanent teeth in the adult (Fig. 17-2). The top, visible, white enameled part of each tooth is the crown. The portion of the tooth that is embedded in the gums is the root. The crown and root are connected by the region of the tooth referred to as the neck. Small bumps called papillae cover the dorsal surface of the tongue. Taste buds, scattered over the tongue's surface, carry sensory impulses to the brain. The three pairs of **salivary glands** secrete saliva (watery, serous fluid containing salts, mucus, and salivary amylase) into the mouth (Fig. 17-3). **Saliva** helps break down and lubricates food. **Amylase** digests carbohydrates. The parotid glands, located below and in front of the ears, empty through Stensen's ducts, which are located inside the cheek across from the second upper molar. The **submandibular glands,** located in the lower jaw, open under the tongue on either side of the frenulum through openings called Wharton's ducts. The **sublingual glands,** located under the tongue, open through several ducts located on the floor of the mouth.

### THROAT

The throat (**pharynx**), located behind the mouth and nose, serves as a muscular passage for food and air. The upper part of the throat is the nasopharynx. Below the **nasopharynx** lies the **oropharynx,** and below the oropharynx lies the **laryngopharynx.** The soft palate, anterior and posterior pillars, and uvula connect behind the tongue to form arches. Masses of lymphoid tissue referred to as the **palatine tonsils** are located on both sides of the oropharynx at the end of the soft palate between the anterior and posterior pillars. The **lingual tonsils** lie at the base of the tongue. **Pharyngeal tonsils** or adenoids are found high in the nasopharynx. Because tonsils are masses of lymphoid tissue, they help protect against infection (Fig. 17-4).

### NOSE

The nose consists of an external portion covered with skin and an internal nasal cavity. It is composed of bone and cartilage and is lined with mucous membrane. The **external nose** consists of a bridge (upper portion), tip, and two oval openings called **nares.** The **nasal cavity** is located between the roof of the mouth and the cranium. It extends from the anterior nares (nostrils) to the posterior nares, which open into the nasopharynx. The nasal septum separates the cavity into two halves. The front of the nasal **septum** contains a rich supply of blood vessels and is known as Kiesselbach's area. This is a common site for nasal bleeding.

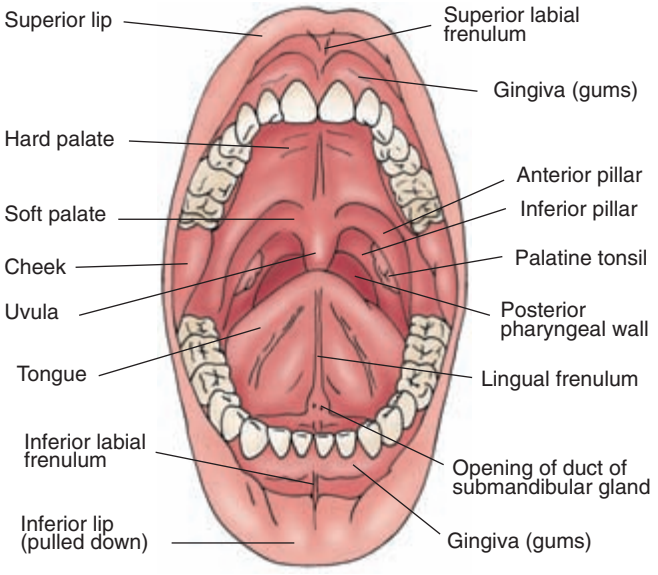



**Figure 17-1** Structures of the mouth.

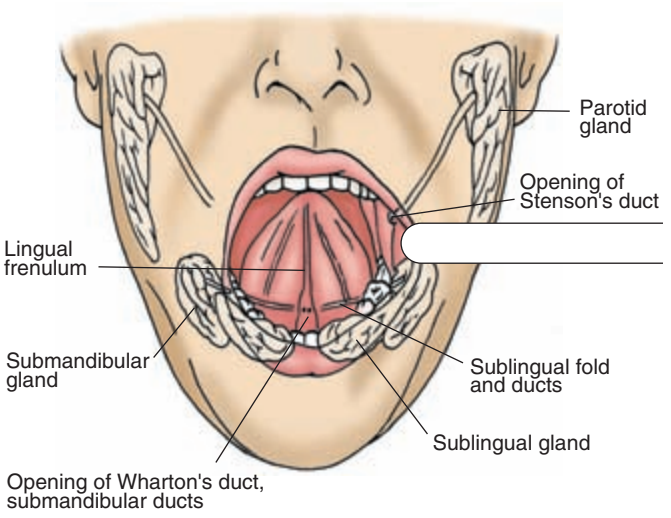



**Figure 17-3** Salivary glands.

The superior, middle, and inferior **turbinates** are bony lobes, sometimes called conchae, that project from the lateral walls of the nasal cavity. These three turbinates serve to increase the surface area that is exposed to incoming air (see Fig. 17-4). As the person inspires air, nasal hairs (vibrissae) filter large particles from the air. Ciliated mucosal cells then capture and propel debris toward the throat, where it is swallowed. The rich blood supply of the nose warms the inspired air as it is moistened by the mucous membrane. A meatus underlies each turbinate and receives drainage from the **paranasal sinuses** and the **nasolacrimal duct.** Receptors for the first cranial nerve (olfactory) are located in the upper part of the nasal cavity and septum.

## SINUSES

Four pairs of **paranasal sinuses** (frontal, maxillary, ethmoidal, and sphenoidal) are located in the skull (Fig. 17-5). These air-filled cavities decrease the weight of the skull and act as resonance chambers during speech. The paranasal sinuses are also lined with ciliated mucous membrane that traps debris and propels it toward the outside. The sinuses are often a primary site of infection because they can easily become blocked. The **frontal sinuses** (above the eyes) and the **maxillary sinuses** (in the upper jaw) are accessible to examination by the nurse. The **ethmoidal and sphenoidal sinuses** are smaller, located deeper in the skull, and are not accessible for examination.

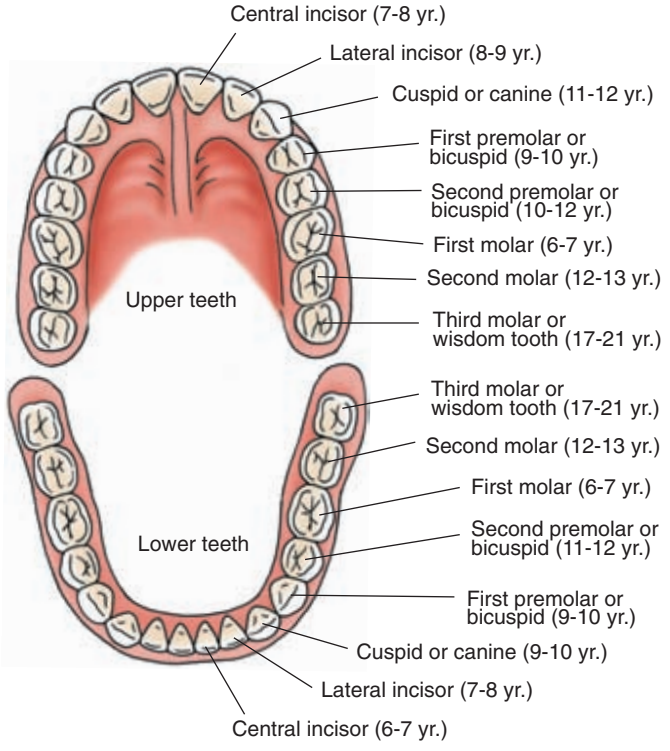



**Figure 17-2** Teeth.

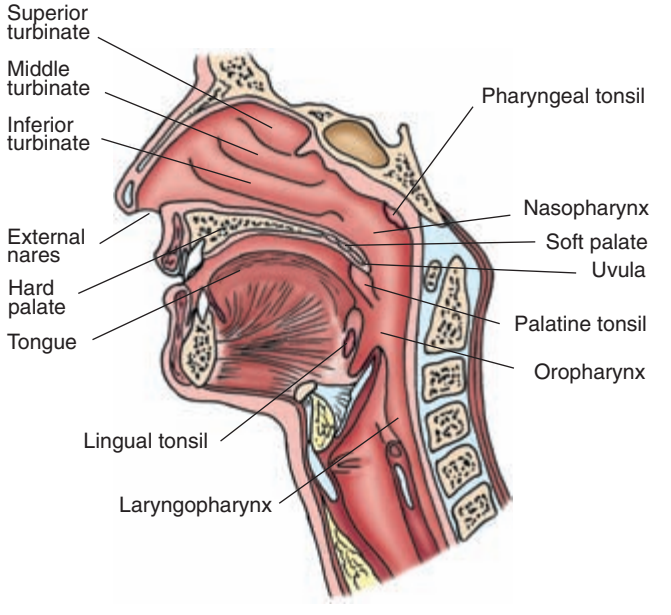



**Figure 17-4** Nasal cavity and throat structures.

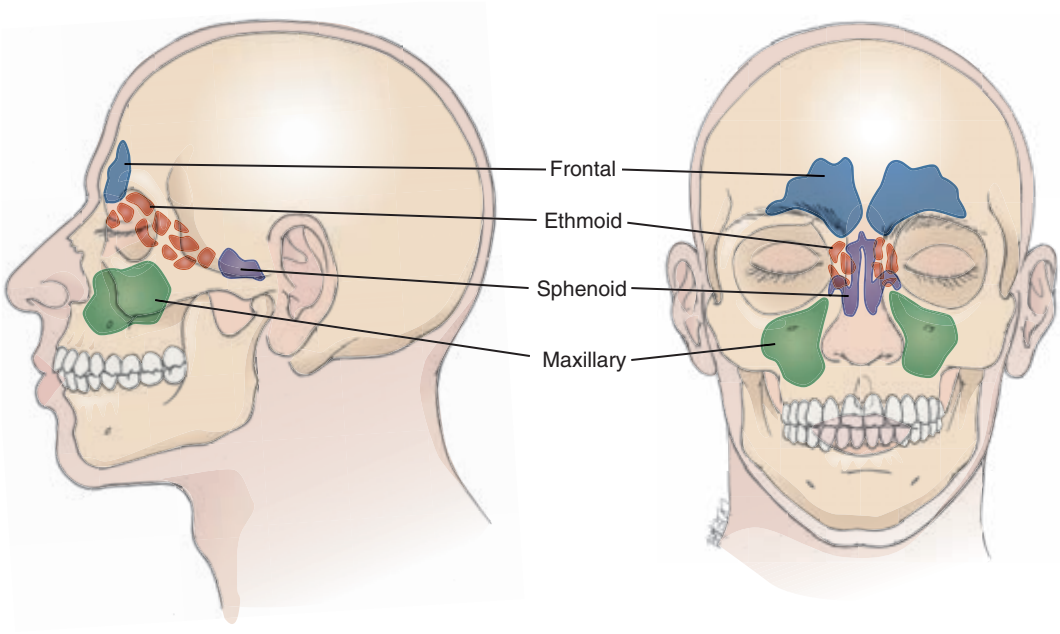



**Figure 17-5** Paranasal sinuses.

## Nursing Assessment

### COLLECTING SUBJECTIVE DATA: THE NURSING HEALTH HISTORY

Subjective data related to the mouth, throat, nose, and sinus can aid in detecting diseases and abnormalities that may affect the client's activities of daily living. Screening for cancer of the mouth, throat, nose, and sinuses is an important area of this assessment. These cancers are highly preventable (see Promote Health—Cancer of the Oral Cavity). Use of tobacco and heavy alcohol consumption increases one's risk for cancer. Data collected regarding the client's risk factors may form the basis for preventive teaching.

Other problems may cause discomfort and loss of function and can lead to serious systemic disorders. For example, malnutrition may develop in a client who cannot eat certain foods because of poorly fitting dentures. A client with frequent sinus infections and headaches may have impaired concentration, which affects job or school performance.

This examination also allows the nurse to evaluate the client's health practices. For example, improper use of nasal decongestants may explain recurrent sinus congestion, and infection and improper oral hygiene practices may cause tooth decay or gum disease. The nurse should provide teaching for a client with these health practices.

*(text continues on page 285)*

#### HISTORY OF PRESENT HEALTH CONCERN

| *Question* | *Rationale* |
|---|---|
| ***Tongue and Mouth*** | |
| Do you experience tongue or mouth sores or lesions? Are they painful? How long have you had them? Do they recur? Is it single or do you have many? | Painful, recurrent ulcers in the mouth are seen with aphthous stomatitis (canker sores) and herpes simplex (cold sores). Mouth or tongue sores that do not heal; red or white patches that persist; a lump or thickening; or rough, crusty, or eroded areas are warning signs of cancer and need to be referred for further evaluation (see Promote Health—Cancer of the Oral Cavity). |
| Do you experience redness, swelling, bleeding, or pain of the gums or mouth? How long has this been happening? Do you have any toothache? Have you lost any permanent teeth? | Red, swollen gums that bleed easily occur in early gum disease (gingivitis), whereas destruction of the gums with tooth loss occurs in more advanced gum disease (periodontitis). Pain can accompany inflammation and is a later sign of oral cancer. |

*continued on page 282*

## HISTORY OF PRESENT HEALTH CONCERN *Continued*

| Question | Rational |
|---|---|
| |  The gums recede, become ischemic, and undergo fibrotic changes as a person ages. Tooth surfaces may be worn from prolonged use. These changes make the older client more susceptible to periodontal disease and tooth loss. |
| ***Nose and Sinuses*** | |
| Do you have pain over your sinuses? | Sinusitis may cause pressure and pain over the sinuses (see Promote Health—Sinusitis). |
| Do you experience nosebleeds? How much bleeding? What color is the blood? | Nosebleeds may be seen with overuse of nasal sprays, excessively dry nasal mucosa, hypertension, leukemia, thrombocytopenia, and other blood disorders. A client who experiences frequent nosebleeds should be referred for further evaluation. |
| Do you experience frequent clear or mucous drainage from your nose? | Thin, watery, clear nasal drainage (rhinorrhea) can indicate a chronic allergy or, in a person with a past head injury, a cerebrospinal fluid leak. Mucous drainage, especially yellow, is typical of a cold, rhinitis, or a sinus infection. |
| Can you breathe through both of your nostrils? Do you have a stuffy nose at times during the day or night? | Inability to breathe through both nostrils may indicate sinus congestion, obstruction, or a deviated septum. Nasal congestion can interfere with daily activities or a restful sleep. |
| Do you have seasonal allergies, i.e., hay fever? Describe the timing of the allergies (e.g., spring, summer) and symptoms (e.g., sinus problems, runny nose, or watery eyes). | Pollens cause seasonal rhinitis, whereas dust may cause rhinitis year round. |
| Have you experienced a change in your ability to smell or taste? | A decrease in the ability to smell may occur with upper respiratory infections, smoking, cocaine use, or a neurologic lesion or tumor in the frontal lobe of the brain or in the olfactory bulb or tract. A decreased ability to taste may be reported by clients with upper respiratory infections or lesions of the facial nerve (VII). Changes in perception of smell also occur from a zinc deficiency and from menopause in some women. |
| |  The ability to smell and taste decreases with age. Medications can also decrease sense of smell and taste in older people. |
| ***Throat*** | |
| Do you have difficulty chewing or swallowing food? How long have you had this? Do you have any pain? | Dysphagia (difficulty swallowing) may be seen in esophageal disorders, anxiety, poorly fitting dentures, or a neurologic disorder. Dysphagia increases the risk for aspiration, and clients with dysphagia may require consultation with a speech therapist. Difficulty chewing, swallowing, or moving the tongue or jaws may be a late sign of oral cancer. Malocclusion may also cause difficulty chewing or swallowing. |
| Do you have a sore throat? How long have you had it? Describe. How often do you get sore throats? | Throat irritation and soreness are common with sinus drainage and may also occur with a viral or bacterial infection. A sore throat that persists without healing may signal throat cancer. |
| Do you experience hoarseness? How long? | Hoarseness is associated with upper respiratory infections, allergies, hypothyroidism, overuse of the voice, smoking or inhaling other irritants, and cancer of the larynx. If hoarseness lasts 2 weeks or longer, refer the client for further evaluation. |

*continued*

### COLDSPA Example

Use the **COLDSPA** mnemonic as a guideline to collect needed information for each symptom the client shares. In addition, the following questions help elicit important information.

| *Mnemonic* | *Question* | *Client Response Example* |
|---|---|---|
| **C**haracter | Describe the sign or symptom (feeling, appearance, sound, smell, or taste if applicable). | "My throat is sore and it hurts to swallow." |
| **O**nset | When did it begin? | "Last night." |
| **L**ocation | Where is it? Does it radiate? Does it occur anywhere else? | "Just in my throat." |
| **D**uration | How long does it last? Does it recur? | "The pain is constant, and getting worse." |
| **S**everity | How bad is it? or How much does it bother you? | "I'm miserable." |
| **P**attern | What makes it better or worse? | "Ibuprofen helps some but it never goes away completely." |
| **A**ssociated factors/How it **A**ffects the client | What other symptoms occur with it? How does it affect you? | "Headache, 101 fever, and my boyfriend says I have bad breath." |

## PAST HEALTH HISTORY

| *Question* | *Rationale* |
|---|---|
| Have you ever had any oral, nasal, or sinus surgery? | Present symptoms may be related to past problems. |
| Do you have a history of sinus infections? Describe your symptoms. Do you use nasal sprays? (What type? How much? How often?) | Some clients are more susceptible to sinus infections, which tend to recur. Overuse of nasal sprays may cause nasal irritation, nosebleeds, and rebound swelling. |

## FAMILY HISTORY

| *Question* | *Rationale* |
|---|---|
| Is there a history of mouth, throat, nose, or sinus cancer in your family? | There is a genetic risk factor for mouth, throat, nose, and sinus cancers. |

## LIFESTYLE AND HEALTH PRACTICES

| *Question* | *Rationale* |
|---|---|
| Do you smoke or use smokeless tobacco? If so, how much? Are you interested in quitting this habit? | Cigarette, pipe, or cigar smoking and use of smokeless tobacco increase a person's risk for oral cancer. Tobacco use and heavy alcohol consumption are responsible for 75% of the oral cancers (Weinberg & Estefan, 2002). Cancer of the cheek is linked to chewing tobacco. Smoking a pipe is a risk factor for lip cancer. Clients who want to quit using tobacco may benefit from a referral to a smoking cessation program (see Promote Health—Cancer of the Oral Cavity). |
| Do you drink alcohol? How much and how often? | Excessive use of alcohol increases a person's risk for oral cancer. |
| Do you grind your teeth? | Grinding the teeth (bruxism) may be a sign of stress or of slight malocclusion. The practice may also precipitate temporomandibular joint (TMJ) problems and pain. |

*continued on page 284*

## LIFESTYLE AND HEALTH PRACTICES *Continued*

| Question | Rationale |
|---|---|
| Describe how you care for your teeth or dentures. How often do you brush and use dental floss? When was your last dental examination? | Proper brushing, flossing, and oral hygiene can prevent dental caries and gum disease. Regular dental checkups and screening can help to detect the early signs of gum disease and oral cancer, which promotes early treatment. |
| If the client wears braces: How do you care for your braces? Do you avoid any specific types of foods? Describe your usual dietary intake for a day. | Clients with braces should avoid crunchy, sticky, and chewy foods when wearing braces. These foods can damage the braces and the teeth. Poor nutrition also increases one's risk for oral cancers. |
| If the client wears dentures: How do your dentures fit?<br><br>  **Elderly and some disabled clients may have difficulty caring properly for teeth or dentures because of poor vision or impaired dexterity.** | Poorly fitting dentures may lead to poor eating habits, a reluctance to speak freely, and mouth sores or leukoplakia (thick white patches of cells). Leukoplakia is a precancerous condition. |
| Do you brush your tongue? | Cleaning the tongue is a way to prevent bad breath resulting from bacteria that accumulates on the posterior tongue. |
| How often are you in the sun? Do you use lip sunscreen products? | Exposure to the sun is the primary risk factor associated with lip cancer. |

## PROMOTE HEALTH

### Cancer of the Oral Cavity

*Overview*

More than 90% of oral cavity and oropharyngeal cancers are squamous cell cancers. Cancers develop in the lining, in the salivary glands, tonsils, or base of the tongue, but only squamous cell cancers of the oral and oropharyngeal cavity are discussed here. As of the year 2007, experts estimated that 34,360 new cases would be diagnosed in the United States with 7,550 deaths resulting. The incidence of oral cancer has slowly decreased in the United States since the early 1980s. Most cases (90%) occur in people who are heavy users of tobacco (smoking and smokeless) and alcohol and whose ages range in the fifties and sixties.

However, cases of oral cavity and tongue cancers are beginning to appear more frequently in people in their thirties and forties. Incidence is higher in men but is increasing in women. People with oral and oropharyngeal cancer often have another cancer or develop one at a later time. Follow-up examinations and avoidance of risk factors are extremely important for these clients (American Cancer Society [ACS], 2007).

*Risk Factors (ACS, 2007)*

- Tobacco use, smoking and smokeless
- Alcohol consumption
- Combined tobacco and alcohol use
- Alcohol dependence accompanied with nutritional deficiencies
- Age over 40
- Male gender (twice as likely to affect males as females, but incidence is rising in females)
- Genetic predisposition, family history
- Occupation related to nickel refining, woodworking, or textile fibers
- Diet low in fruits and vegetables; Vitamin A deficiency
- Ultraviolet light exposure (especially the lips)
- Long term irritation (i.e., poorly fitted dentures)

*Possible Risk Factors*

- Human papillomavirus (HPV) infection
- Immune system suppression
- Marijuana use
- Mouthwash

*Teach Risk Reduction Tips (ACS, 2007)*

- Stop smoking
- Limit alcohol consumption
- Eat a healthy, balanced diet
- Take precautions when working in an environment where substances or particles could be inhaled
- Avoid excessive exposure to ultraviolet light
- Avoid sources of oral irritation

## PROMOTE HEALTH

### Sinusitis

*Overview*

Chronic sinusitis is one of the most common illnesses in the United States, affecting between 30 and 40 million people each year (Mayo Clinic, 2006). Swelling in the sinuses or impaired function of the cilia, which normally move mucus out of the sinuses, cause sinusitis. Sinusitis is inflammation of the sinus cavity membranes; it may be an acute or chronic condition. Causes include allergic reactions to pollen, dust mites, molds, airborne fungi, and other substances; respiratory infections, nasal or sinus obstruction (anatomical or polyps); other diseases such as cystic fibrosis, HIV, and other immunodeficiency diseases; facial trauma; changes in air pressure; overuse of decongestant sprays; smoking; swimming or diving; and presence of nasal polyps. Sinus infections (bacterial or viral) can also lead to chronic sinusitis.

*Risk Factors*

- Poor hygiene, especially inadequate hand washing
- Chronic exposure to allergens
- Repeated upper respiratory illnesses
- Facial trauma
- Recurrent sinus infections
- Nasal polyps
- Overuse of decongestants
- Smoking
- Frequent swimming or diving
- Changes in air pressure (e.g., long air travel trips)

*Teach Risk Reduction Tips*

- Maintain good hygiene, especially frequent and thorough hand washing.
- Maintain adequate fluid intake to keep nasal passages lubricated.
- Avoid cigarette smoking.
- Avoid polluted air.
- Avoid allergens when possible.
- Use a humidifier to increase moisture.
- Work with primary care provider to control allergies and cold symptoms.
- Keep immune system strong.

## COLLECTING OBJECTIVE DATA: PHYSICAL EXAMINATION

Examination of the mouth and throat can help the nurse to detect abnormalities of the lips, gums, teeth, oral mucosa, tonsils, and uvula. This examination also allows for early detection of oral cancer. Examination of the nose and sinuses assists the nurse with detection of a deviated septum, patency of the nose and nasopharynx, and detection of sinus infection. In addition, assessment of the mouth, throat, nose, and sinuses provides the nurse with clues to the client's nutritional and respiratory status.

The mouth and nose examination can be very useful to the nurse in many situations, both in the hospital and the home. Detection of impaired oral mucous membranes or a poor dental condition may require a change in the client's diet. Additional mouth care may be needed to facilitate ingestion of food or to prevent infection of the gums (gingivitis). Detection of nasal septal deviation may help the nurse to determine which nostril to use to insert a nasogastric tube or how to suction a client. In addition, assessing for nasal obstruction may explain the reason for mouth breathing.

Assessment of the mouth, throat, nose, and sinuses usually follows the examination of the head and neck. Techniques for this examination are fairly simple to perform. However, the nurse develops proficiency in interpreting findings with continued practice.

### Preparing the Client

Ask the client to assume a sitting position with the head erect. It is best if the client's head is at your eye level. Explain the specific structures you will be examining, and tell the client who wears dentures, a retainer, or rubber bands on braces that they will need to be removed for an adequate oral examination. The client wearing dentures may feel embarrassed and concerned about his or her appearance and over the possibility of breath odor on removing the dentures. A gentle, yet confident and matter-of-fact approach may help the client to feel more at ease.

### Equipment

- Gloves (wear gloves when examining any mucous membrane)
- 4 × 4-inch gauze pad
- Penlight
- Short, wide-tipped speculum attached to the head of an otoscope
- Tongue depressor
- Nasal speculum

### Physical Assessment

When preparing to examine the nose and mouth,

- Be able to identify and understand the relationship among the structures of the mouth and throat, nose, and sinuses.
- Know age-related changes of the oral cavity and nasal and sinus structures.
- Be aware of ethnocultural phenomena related to oral and nasal health.
- Refine examination techniques.

*(text continues on page 297)*

## PHYSICAL ASSESSMENT

| Assessment Procedure | Normal Findings | Abnormal Findings |
|---|---|---|
| ***Mouth*** | | |
| **Inspection and Palpation** | | |
| **Inspect the lips.** Observe lip consistency and color. | Lips are smooth and moist without lesions or swelling. Pink lips are normal in light-skinned clients as are bluish or freckled lips in some dark-skinned clients, especially those of Mediterranean descent.<br><br>Lip pits (up to 4 mm deep and looking like cheilosis) are seen in the crease between the upper and lower lip in about 20% of African Americans and less frequently in Asians and Caucasians (Overfield, 1995). | Pallor around the lips (circumoral pallor) is seen in anemia and shock. Bluish (cyanotic) lips may result from cold or hypoxia. Reddish lips are seen in clients with ketoacidosis, carbon monoxide poisoning, and COPD with polycythemia. Swelling of the lips (edema) is common in local or systemic allergic or anaphylactic reactions. Additional abnormal findings are pictured in Abnormal Findings 17-1. |
| **Inspect the teeth and gums.** Ask the client to open the mouth (Fig. 17-6). Note the number, color, condition, and alignment of the teeth.<br><br>Put on gloves and retract the client's lips (Fig. 17-7) and cheeks to check gums for color and consistency. | Thirty-two pearly whitish teeth with smooth surfaces and edges. Upper molars should rest directly on the lower molars and the front upper incisors should slightly override the lower incisors. Some clients normally have only 28 teeth if the four wisdom teeth do not erupt.<br><br>No repaired or decayed areas; no missing teeth or appliances.<br><br>Peg teeth (usually lateral incisors) occur in up to 8% of Asians and occasionally in other cultural groups, especially those without third molars. Australian Aborigines and Melanesians may have four additional molars, totaling 36 teeth (Overfield, 1995).<br><br>Gums are pink, moist, and firm with tight margins to the tooth. No lesions or masses. | Clients who smoke, drink large quantities of coffee or tea or have an excessive intake of fluoride may have yellow or brownish teeth. Tooth decay (caries) may appear as brown dots or cover more extensive areas of chewing surfaces. Missing teeth can affect chewing as well as self-image. A chalky white area in the tooth surface is a cavity that will turn darker with time. Malocclusion of teeth is seen when upper or lower incisors protrude. Poor occlusion of teeth can affect chewing, wearing down of teeth, speech, and self-image. White spots on teeth may result from antibiotic therapy.<br><br>Receding gums are abnormal in younger clients; in elderly clients, the teeth may appear longer because of age-related gingival recession, which is common.<br><br>Red, swollen gums that bleed easily are seen in gingivitis, scurvy (vitamin C deficiency), and leukemia. Receding red gums with loss of teeth are seen in periodontitis. Enlarged reddened gums (hyperplasia) that may cover some of the normally exposed teeth may be seen in pregnancy, puberty, leukemia, and use of some medications, such as phenytoin. A bluish-black or grey-white line along the gum line is seen in lead poisoning (see Abnormal Findings 17-1). |

**Figure 17-6** Inspecting the general condition of the teeth.

**Figure 17-7** Lower gingiva (gums).

*continued*

| Assessment Procedure | Normal Findings | Abnormal Findings |
|---|---|---|
| **Inspect the buccal mucosa.** Use a penlight and tongue depressor to retract the lips and cheeks to check color and consistency (Fig. 17-8). Also note Stenson's ducts (parotid ducts) located on the buccal mucosa across from the second upper molars. | It should appear pink in light-skinned clients; tissue pigmentation typically increases in dark-skinned clients. In both, tissue is smooth and moist without lesions. Stenson's ducts are visible with flow of saliva and with no redness, swelling, pain, or moistness in area. Fordyce spots or granules, yellowish-whitish raised spots, are normal ectopic sebaceous glands.<br><br>Oral mucosa is often drier and more fragile in the older client because the epithelial lining of the salivary glands degenerates. | Leukoplakia may be seen in chronic irritation and smoking.<br><br>➤ ***Clinical Tip*** • *Smokers may also have a yellow-brown coating on the tongue, which is not leukoplakia.*<br><br>Leukoplakia is a precancerous lesion, and the client should be referred for evaluation. Whitish, curdlike patches that scrape off over reddened mucosa and bleed easily indicate "thrush" (*Candida albicans*) infection. Koplik's spots (tiny whitish spots that lie over reddened mucosa) are an early sign of the measles. Canker sores may be seen as may brown patches inside the cheeks of clients with adrenocortical insufficiency. See Abnormal Findings 17-1. |
| **Inspect and palpate the tongue.** Ask client to stick out the tongue. Inspect for color, moisture, size, and texture. Observe for fasciculations (fine tremors), and check for midline protrusion. Palpate any lesions present for induration (hardness). | Tongue should be pink, moist, a moderate size with papillae (little protuberances) present. A common variation is a fissured, topographic-map–like tongue, which is not unusual in older clients (Fig. 17-9). No lesions are present. | Among possible abnormalities are deep longitudinal *fissures* seen in dehydration; a *black tongue* indicative of bismuth (PeptoBismol) toxicity: *black, hairy tongue;* a smooth, reddish, shiny tongue without papillae indicative of niacin or vitamin $B^{12}$ deficiencies, certain anemias, and antineoplastic therapy (see Abnormal Findings 17-1). An enlarged tongue suggests hypothyroidism, acromegaly, or Down's syndrome, and angioneurotic edema of anaphylaxis. A very small tongue suggests malnutrition. An atrophied tongue or fasciculations point to cranial nerve (hypoglossal, CN 12) damage. |

**Figure 17-8** Inspecting the buccal mucosa.

**Figure 17-9** Fissured tongue (courtesy of Dr. Michael Bennett).

*continued*

## PHYSICAL ASSESSMENT *Continued*

| Assessment Procedure | Normal Findings | Abnormal Findings |
|---|---|---|
| **Assess the ventral surface of the tongue.** Ask the client to touch the tongue to the roof of mouth, and use a penlight to inspect ventral surface of tongue, frenulum, and the area under the tongue. Palpate the area (Fig. 17-10) if you see lesions, if the client is over age 50, or if the client uses tobacco or alcohol. Note any induration. Check also for a short frenulum that limits tongue motion (the origin of "tongue-tied"). | The tongue's ventral surface is smooth, shiny, pink or slightly pale with visible veins and no lesions.<br><br>The older client may have varicose veins on the ventral surface of the tongue (Fig. 17-11). | Leukoplakia, persistent lesions, ulcers, or nodules may indicate cancer and should be referred. Induration increases the likelihood of cancer.<br><br>➤ ***Clinical Tip*** • *The area underneath the tongue is the most common site of oral cancer.* |
| **Inspect for Wharton's ducts—** openings from the submandibular salivary glands—located on either side of the frenulum on the floor of the mouth. | The frenulum is midline; Wharton's ducts are visible with salivary flow or moistness in the area. The client has no swelling, redness, or pain. | Abnormal findings include lesions, ulcers, nodules, or hypertrophied duct openings on either side of frenulum. |
| **Observe the sides of the tongue;** use a square gauze pad to hold the client's tongue to each side (Fig. 17-12). Palpate any lesions, ulcers, or nodules for induration. | No lesions, ulcers, or nodules are apparent. | Canker sores may be seen on the sides of the tongue in clients receiving certain kinds of chemotherapy. Leukoplakia, persistent lesions, ulcers, or nodules may indicate cancer and should be further evaluated medically. Induration increases the likelihood of cancer (see Abnormal Findings 17-1).<br><br>➤ ***Clinical Tip*** • *The side of the tongue is the most common site of tongue cancer.* |

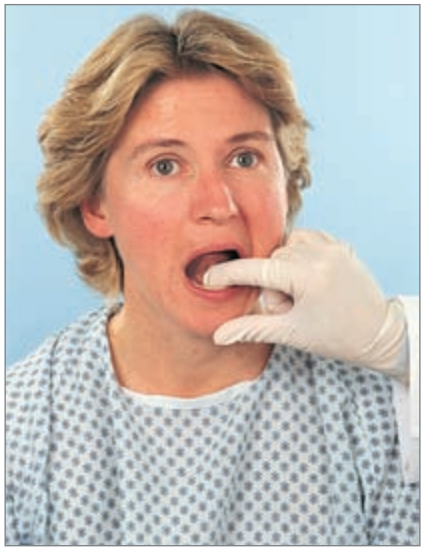


**Figure 17-10** Palpating area under tongue.

**Figure 17-11** Varicose veins on ventral surface of tongue.

**Figure 17-12** Inspecting side of tongue.

*continued*

| Assessment Procedure | Normal Findings | Abnormal Findings |
|---|---|---|
| **Check the strength of the tongue.** Place your fingers on the external surface of the client's cheek. Ask the client to press the tongue's tip against the inside of the cheek to resist pressure from your fingers. Repeat on the opposite cheek. | The tongue offers strong resistance. | Decreased tongue strength may occur with a defect of the twelfth cranial nerve—hypoglossal—or with a shortened frenulum that limits motion. |
| **Check the anterior tongue's ability to taste** by placing drops of sugar and salty water on the tip and sides of tongue with a tongue depressor. | The client can distinguish between sweet and salty. | Loss of taste discrimination occurs with zinc deficiency, a seventh cranial nerve (facial) defect, and certain medication use. |
| **Inspect the hard (anterior) and soft (posterior) palates and uvula.** Ask the client to open the mouth wide while you use a penlight to look at the roof. Observe color and integrity. | The hard palate is pale or whitish with firm, transverse rugae (wrinklelike folds).<br>A bony protuberance in the midline of the hard palate, called a torus palatinus, is a normal variation seen more often in females, Eskimos, Native Americans, and Asians (Fig. 17-13). Palatine tissues are intact; the soft palate should be pinkish, movable, spongy, and smooth. | A candidal infection may appear as thick white plaques on the hard palate. Deep purple, raised, or flat lesions may indicate a Kaposi's sarcoma (seen in clients with AIDS; see Abnormal Findings 17-1).<br>A yellow tint to the hard palate may indicate jaundice because bilirubin adheres to elastic tissue (collagen). An opening in the hard palate is known as a cleft palate. |
| **Note odor.** While the mouth is wide open, note any unusual or foul odor. | No unusual or foul odor is noted. | Fruity or acetone breath is associated with diabetic ketoacidosis. An ammonia odor is often associated with kidney disease. Foul odors may indicate an oral or respiratory infection, or tooth decay. Alcohol or tobacco use may be identified by breath odor. Fecal breath odor occurs in bowel obstruction; sulfur odor (fetor hepaticus) occurs in end-stage liver disease. |
| **Assess the uvula.** Apply a tongue depressor to the tongue (halfway between the tip and back of the tongue) and shine a penlight into the client's wide-open mouth (Fig. 17-14). Note the characteristics and positioning of the uvula. Ask the client to say "aaah" and watch for the uvula and soft palate to move.<br>➤ ***Clinical Tip*** • *Depress the tongue slightly off center to avoid eliciting the gag response.* | The uvula is a fleshy, solid structure that hangs freely in the midline. No redness of or exudate from uvula or soft palate. Midline elevation of uvula and symmetric elevation of the soft palate. | A bifid uvula looks like it is split in two or partially severed. Clients with a bifid uvula may have a submucous cleft palate. |

**Figure 17-13** Torus palatinus (courtesy of Dr. Michael Benett).

**Figure 17-14** Inspecting the uvula.

*continued*

## PHYSICAL ASSESSMENT *Continued*

| Assessment Procedure | Normal Findings | Abnormal Findings |
|---|---|---|
| | |  A bifid uvula is common in Native Americans (Bifid uvula, 2005) (see Abnormal Findings 17-1).<br><br>Asymmetric movement or loss of movement may occur after a cerebrovascular accident (stroke). Palate fails to rise and uvula deviates to normal side with cranial nerve X (vagus) paralysis. |
| **Inspect the tonsils.** Using the tongue depressor to keep the mouth open wide, inspect the tonsils for color, size, and presence of exudate or lesions. Tonsils should be graded. | Tonsils may be present or absent. They are normally pink and symmetric and may be enlarged to 1+ in healthy clients. No exudate, swelling, or lesions should be present. | Tonsils are red, enlarged (to 2+, 3+, or 4+), and covered with exudate in tonsillitis. Abnormal Findings 17-2 depicts grading of tonsils. They also may be indurated with patches of white or yellow exudate. |
| **Inspect the posterior pharyngeal wall.** Keeping the tongue depressor in place, shine the penlight on the back of the throat. Observe the color of the throat, and note any exudate or lesions. Before inspecting the nose, discard gloves and perform hand hygiene. | Throat is normally pink without exudate or lesions. | A bright red throat with white or yellow exudate indicates pharyngitis. Yellowish mucus on throat may be seen with postnasal sinus drainage. |
| ***Nose*** | | |
| **Inspection and palpation** | | |
| **Inspect and palpate the external nose.** Note nasal color, shape, consistency, and tenderness. | Color is the same as the rest of the face; the nasal structure is smooth and symmetric; the client reports no tenderness. | Nasal tenderness on palpation accompanies a local infection. |
| **Check patency of air flow through the nostrils** by occluding one nostril at a time and asking client to sniff. | Client is able to sniff through each nostril while other is occluded. | Client cannot sniff through a nostril that is not occluded, nor can he or she sniff or blow air through the nostrils. This may be a sign of swelling, rhinitis, or a foreign object obstructing the nostrils. A line across the tip of the nose just above the fleshy tip is common in clients with chronic allergies. |
| **Inspect the internal nose.** To inspect the internal nose, use an otoscope with a short wide-tip attachment (or you can also use a nasal speculum and penlight). | The nasal mucosa is dark pink, moist, and free of exudate. The nasal septum is intact and free of ulcers or perforations. Turbinates are dark pink (redder than oral mucosa), moist, and free of lesions | Nasal mucosa is swollen and pale pink or bluish gray in clients with allergies. Nasal mucosa is red and swollen with upper respiratory infection. Exudate is common with infection and may |

*continued*

| Assessment Procedure | Normal Findings | Abnormal Findings |
|---|---|---|
| Use your nondominant hand to stabilize and gently tilt the client's head back. Insert the short wide tip of the otoscope into the client's nostril without touching the sensitive nasal septum (Fig. 17-15). Slowly direct the otoscope back and up to view the nasal mucosa, nasal septum, the inferior and middle turbinates, and the nasal passage (the narrow space between the septum and the turbinates).<br>➤ ***Clinical Tip*** • *Position the otoscope's handle to the side to improve your view of the structures. If an otoscope is unavailable, use a penlight and hold the tip of the nose slightly up. A nasal speculum with a penlight also facilitates good visualization.* | (Fig. 17-16). The superior turbinate will not be visible from this point of view. A deviated septum may appear to be an overgrowth of tissue (Fig. 17-17). This is a normal finding as long as breathing is not obstructed. | range from large amounts of watery discharge to thick yellow-green purulent discharge. Purulent nasal discharge is seen with acute bacterial rhinosinusitis. Bleeding (epistaxis) or crusting may be noted on lower anterior part of nasal septum with local irritation. Ulcers of the nasal mucosa or a perforated septum may be seen with use of cocaine, trauma, chronic infection, or chronic nose picking. Small, pale, round, firm overgrowths or masses on mucosa (polyps) are seen in clients with chronic allergies (see Abnormal Findings 17-3). |

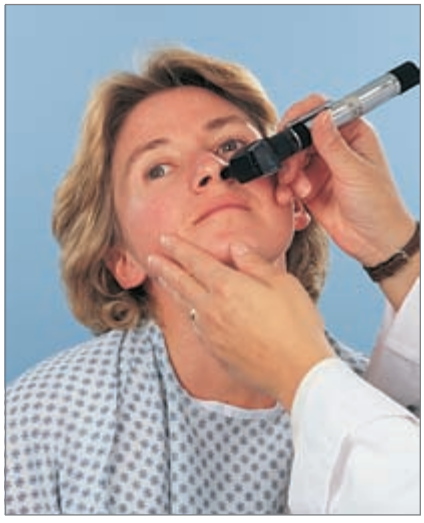


**Figure 17-15** Inspecting the internal nose using an otoscope and wide-tipped attachment.

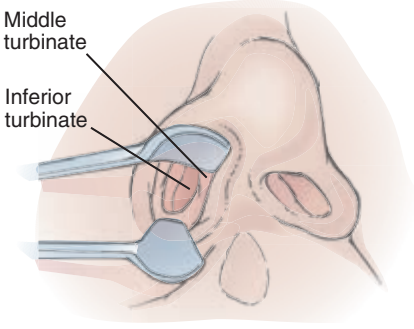



**Figure 17-16** Normal internal nose.

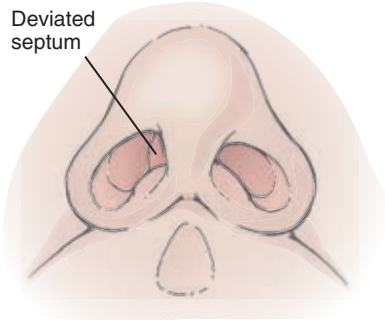



**Figure 17-17** Deviated septum.

## Sinuses

| | | |
|---|---|---|
| **Palpation**<br>**Palpate the sinuses.** When an infection is suspected, the nurse can examine the sinuses through palpation, percussion, and transillumination. Palpate the frontal sinuses by using your thumbs to press up on the brow on each side of nose (Fig. 17-18). | Frontal and maxillary sinuses are nontender to palpation, and no crepitus is evident. | Frontal or maxillary sinuses are tender to palpation in clients with allergies or acute bacterial rhinosinusitis. If the client has a large amount of exudate, you may feel crepitus upon palpation over the maxillary sinuses. |

*continued*

## PHYSICAL ASSESSMENT *Continued*

| Assessment Procedure | Normal Findings | Abnormal Findings |
|---|---|---|
| Palpate the maxillary sinuses by pressing with thumbs up on the maxillary sinuses (Fig. 17-19). | | |
| **Percussion** | | |
| **Percuss the sinuses.** Lightly tap (percuss) over the frontal sinuses and over the maxillary sinuses for tenderness. | The sinuses are not tender on percussion. | The frontal and maxillary sinuses are tender upon percussion in clients with allergies or sinus infection. |
| **Transillumination** | | |
| **Transilluminate the sinuses.** If sinus tenderness was detected during palpation and percussion, transillumination will let you see if the sinuses are filled with fluid or pus. Transilluminate the frontal sinuses by holding a strong, narrow light source snugly under the eyebrows (the room should be dark). Use your other hand to shield the light. Repeat this technique for the other frontal sinus. Figure 17-20 illustrates the technique. | A red glow transilluminates the frontal sinuses. This indicates a normal, air-filled sinus. | Absence of a red glow usually indicates a sinus filled with fluid or pus. |
| Transilluminate the maxillary sinuses by holding a strong, narrow light source over the maxillary sinus and asking the client to open his or her mouth (Fig. 17-21). Repeat this technique for the other maxillary sinus.<br>➤ ***Clinical Tip*** • *Upper dentures should be removed so the light is not blocked.* | A red glow transilluminates the maxillary sinuses (Fig. 17-22). The red glow will be seen on the hard palate. | Absence of a red glow usually indicates a sinus filled with fluid, pus, or thick mucus (from chronic sinusitis; see Promote Health—Sinusitis). |

**Figure 17-18** Palpating the frontal sinuses.

**Figure 17-19** Palpating the maxillary sinuses.

*continued*

| Assessment Procedure | Normal Findings | Abnormal Findings |
|---|---|---|

**Figure 17-20** (*Left*) Positioning for transillumination of frontal sinuses; (*right*) transillumination of frontal sinuses; note the red glow. (This photograph shows a lighted room because of a special photographic technique. In practice, the room must be dark to show the red glow. © B. Proud.)

**Figure 17-21** Positioning for transillumination of maxillary sinuses.

**Figure 17-22** Transillumination of maxillary sinuses; note the red glow. (This photograph shows a lighted room because of a special photographic technique. In practice, the room must be dark to show the red glow. © B. Proud.)

## Abnormal Findings 17-1 Abnormalities of the Mouth and Throat

This display depicts common abnormalities of the mouth and throat.

Herpes simplex type I.

Cheilosis of lips.

Carcinoma of lip.

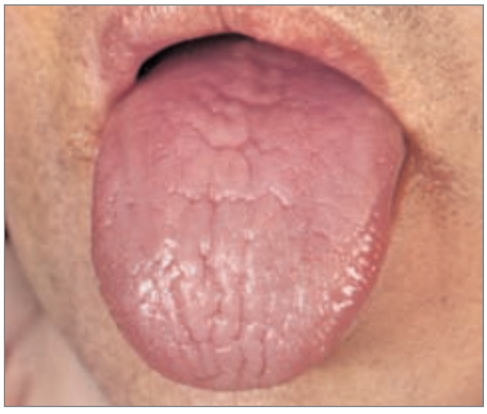
Leukoplakia (ventral surface.)

Hairy leukoplakia (lateral surface.)

Candida albicans infection (thrush).

*continued*

## Abnormal Findings 17-1 Abnormalities of the Mouth and Throat *Continued*



Smooth, reddish, shiny tongue without papillae due to vitamin B12 deficiency.

Black hairy tongue. (Dr. Michael Bennett.)

Carcinoma of tongue.

Canker sore.

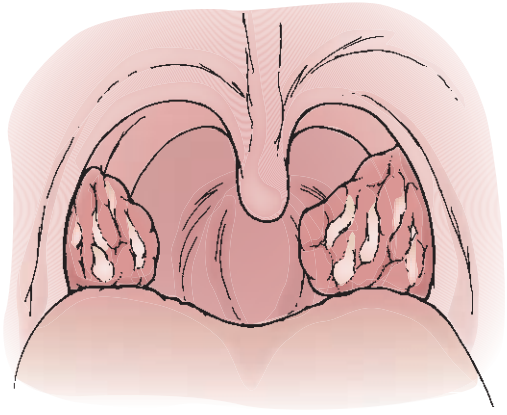
Gingivitis. (Dr. Michael Bennett.)

Receding gums (periodontitis). (Dr. Michael Bennett.)

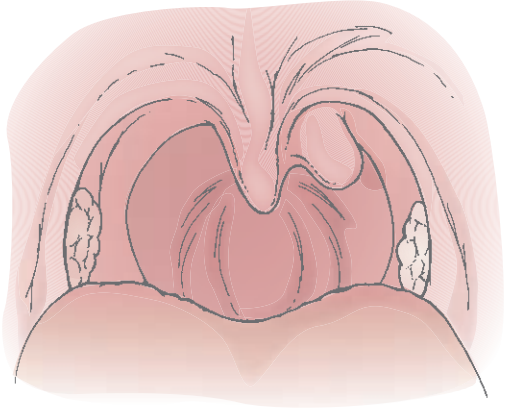
*continued on page 296*

## Abnormal Findings 17-1 Abnormalities of the Mouth and Throat *Continued*

Kaposi's sarcoma lesions.



Acute tonsillitis and pharyngitis.

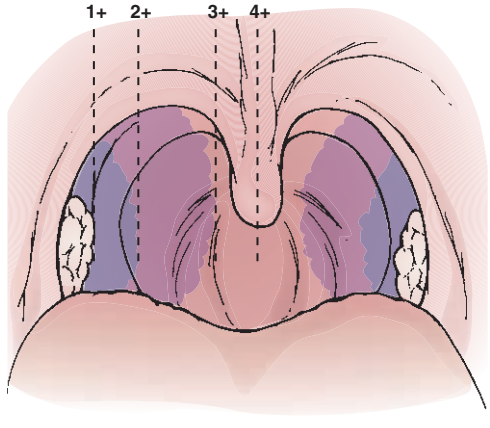


Bifid uvula.

## Abnormal Findings 17-2 Tonsillitis (Detecting and Grading)

In a client who has both tonsils and a sore throat, tonsillitis can be identified and ranked with a grading scale from 1 to 4 as follows:

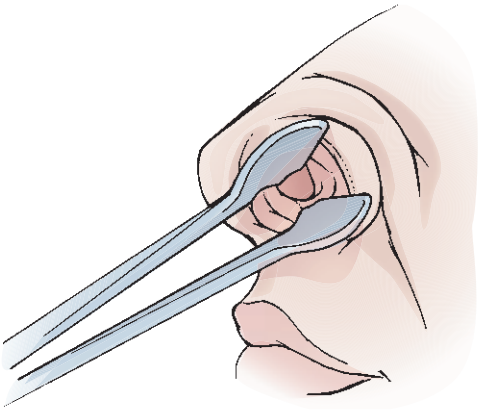
| | |
|---|---|
| 1+ | Tonsils are visible. |
| 2+ | Tonsils are midway between tonsillar pillars and uvula. |
| 3+ | Tonsils touch the uvula. |
| 4+ | Tonsils touch each other. |



**Abnormal Findings 17-3** **Abnormalities of the Nose**

The following are common abnormalities of the nose.

Nasal polyp. (© 1992 J. Barrabe.)



Perforated septum.

## VALIDATING AND DOCUMENTING FINDINGS

Validate the mouth, throat, nose, and sinus assessment data that you have collected. This is necessary to verify that the data are reliable and accurate. Document the assessment data following the health care facility or agency policy.

### Sample Documentation of Subjective Data

*Client describes the condition of mouth, throat, and nose as "adequate." No history of past oral or nasal surgery. Has 32 permanent teeth. Had four teeth filled for cavities several years ago as a child. Brushes teeth twice a day and uses dental floss each evening. Occasional mild bleeding with flossing. Never needed braces. Receives regular dental checkups twice a year. Has occasional sinus headaches (one to two per year) and minor sore throats due to sinus drainage. Relieved with over-the-counter oral decongestants and acetaminophen (Tylenol). Nasal discharge clear to purulent occasionally. No oral or nasal lesions noted by client. Does not smoke or chew tobacco. No difficulty breathing through either nostril. Able to chew and swallow without difficulty. No oral or nasal pain or tenderness.*

### Sample Documentation of Objective Data

*Lips pink, smooth, and moist without lesions. Buccal mucosa pink, moist, and without exudate. Parotid ducts visible with no redness or swelling. Moist bubbles are seen near ducts. Thirty-two white to yellowish teeth present. Gums pink without redness or swelling. Protrudes geographic tongue in midline with no tremors. Equal bilateral strength in tongue. Ventral surface of tongue smooth and shiny pink with small visible veins present. Frenulum in midline with visible submandibular ducts on each side. Torus palatinus visible on whitish hard palate. Soft palate smooth and pink. Midline and symmetric elevation of uvula and soft palate with phonation. Tonsillar pillars pink and symmetric. Tonsils absent.*

*Nose somewhat large but smooth and symmetric. Able to sniff and blow through each nostril. Nasal septum slightly deviated to left but does not obstruct air flow. Inferior and middle turbinates dark pink, moist, and free of lesions. No purulent drainage noted. Frontal and maxillary sinuses transilluminate and are nontender to palpation and percussion.*

# Analysis of Data

## DIAGNOSTIC REASONING: POSSIBLE CONCLUSIONS

After collecting subjective and objective data pertaining to the mouth, throat, nose, and sinuses, identify abnormal findings and client strengths. Then cluster the data to reveal any significant patterns or abnormalities. These data may be used to make clinical judgments about the status of the client's mouth, throat, nose, and sinuses.

## Selected Nursing Diagnoses

Following is a listing of selected nursing diagnoses (wellness, risk, or actual) that you may identify when analyzing the cue clusters.

### *Wellness Diagnoses*

- Readiness for Enhanced Effective Management of the teeth and gums
- Health-Seeking Behaviors: Requests information on how to quit smoking

### *Risk Diagnoses*

- Risk for Aspiration related to decreased or absent gag reflex
- Risk for Imbalanced Nutrition: Less Than Body Requirements related to poorly fitting dentures or gum disease
- Risk for Infection of gums related to poor oral hygiene
- Risk for Injury to teeth and gums related to participation in active sports and lack of knowledge of protective mouth gear

### *Actual Diagnoses*

- Ineffective Health Maintenance related to poor oral hygiene
- Bathing/Hygiene Self-Care Deficit: Oral mouth care related to paralysis or decreased cognitive functions
- Disturbed Sensory Perception: Olfactory related to local irritation of nasal mucosa, impairment of cranial nerve I, decrease in olfactory bulb function secondary to nasal obstruction
- Impaired Oral Mucous Membranes related to poor oral hygiene or dehydration
- Impaired Swallowing related to impaired neurologic or neuromuscular function (i.e., CVA; damage to cranial nerves V, VII, IX, or X; cerebral palsy; myasthenia gravis; muscular dystrophy; cerebral palsy)
- Pain related to chronic sinusitis or inflammation of oral mucous membranes (gingivitis, periodontitis, canker sores)
- Disturbed Sensory Perception: Gustatory related to impairment of cranial nerve VII or IX, reduction of number of taste buds secondary to the aging process
- Imbalanced Nutrition: Less Than Body Requirements related to decreased appetite secondary to decreased sense of taste and smell and social isolation

## Selected Collaborative Problems

After grouping the data, certain collaborative problems may become apparent. Remember that collaborative problems differ from nursing diagnoses in that they cannot be prevented by nursing intervention. However, these physiologic complications of medical conditions can be detected and monitored by the nurse. In addition, the nurse can use physician- and nurse-prescribed interventions to minimize the complications of these problems. The nurse may also have to refer the client in such situations for further treatment of the problem. Following is a list of collaborative problems that may be identified when obtaining a general impression. These problems are worded as Risk for Complications (or RC) followed by the problem.

- RC: Nosebleed
- RC: Sinus infection
- RC: Stomatitis
- RC: Gum infection (gingivitis, periodontitis)
- RC: Oral lesions
- RC: Laryngeal edema

## Medical Problems

After grouping the data, the client's signs and symptoms may clearly require medical diagnosis and treatment. Referral to a primary care provider is necessary.

## CASE STUDY

*The case study demonstrates how to analyze mouth, throat, nose, and sinus assessment data for a specific client. The critical thinking exercises included in the study guide/lab manual and interactive product that complement this text also offer opportunities to analyze assessment data.*

Jonathan Miller (JM), a 22-year-old college student, visits the student health service in mid-December complaining of severe throat pain ("like swallowing razor blades"), swollen lymph nodes, chills, fever, general fatigue, and anorexia. He admitted that he had been studying "day and night" for final exams and had "only one more to go." "This is the third time I've had this problem this year," he related. "I didn't even bother coming in the first or second time. I just stayed in bed between classes and treated myself."

Upon examination, you note that his face and neck are flushed, with dark circles underlying his eyes. His blood pressure is 126/72 rt. arm; pulse is 104; respirations are 24; and oral temperature reads 103.2°F/39.6°C. When inspecting his throat, you find erythema and edema of the pharynx and uvula with white, patchy exudate on the tonsillar areas. Tonsils are 3+ and injected. Cervical and retropharyngeal lymph nodes are grossly palpable and very tender.

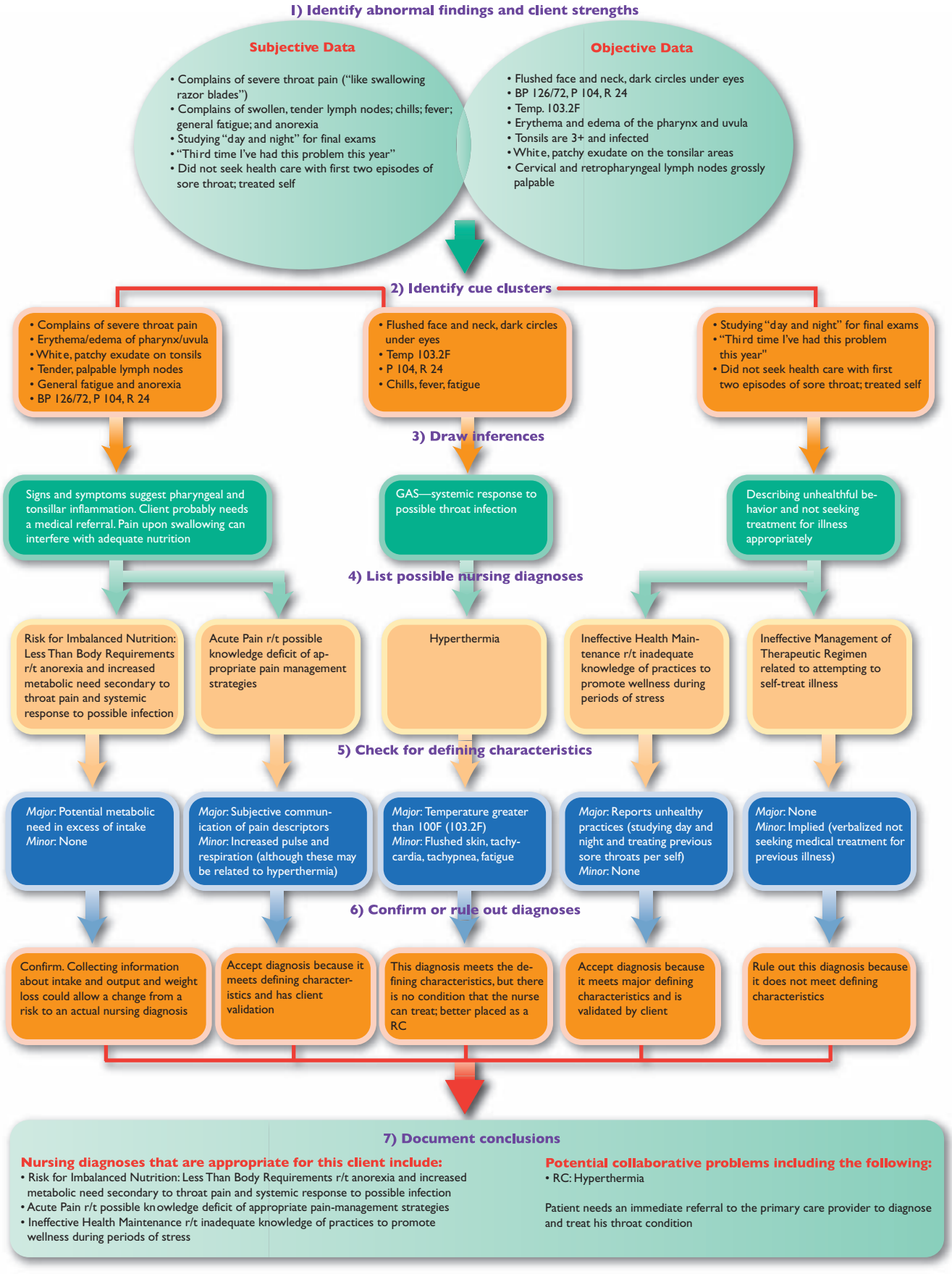
*The following concept map illustrates the diagnostic reasoning process.*

*continued*

### *Applying COLDSPA*

Applying **COLDSPA** for client symptoms: "severe throat pain."

| *Mnemonic* | *Question* | *Data Provided* | *Missing Data* |
|---|---|---|---|
| **C**haracter | Describe the sign or symptom (feeling, appearance, sound, smell, or taste if applicable). | Severe throat pain | |
| **O**nset | When did it begin? | | "When did this pain first begin?" |
| **L**ocation | Where is it? Does it radiate? Does it occur anywhere else? | | "Do you have any pain in your sinuses or neck? |
| **D**uration | How long does it last? Does it recur? | "Third time I have had this during the past year, but I have always just stayed in bed and treated it myself." | |
| **S**everity | How bad is it? or How much does it bother you? | "Feels like I am swallowing razor blades." | |
| **P**attern | What makes it better or worse? | | "Are you taking anything that makes the pain go away?" |
| **A**ssociated factors/How it **A**ffects the client | What other symptoms occur with it? How does it affect you? | "Swollen lymph nodes, chills, fever, fatigue, and loss of appetite." | |


1) Identify abnormal findings and client strengths
Subjective Data
• Complains of severe throat pain ("like swallowing razor blades")
• Complains of swollen, tender lymph nodes; chills; fever; general fatigue; and anorexia
• Studying "day and night" for final exams
• "Third time I've had this problem this year"
• Did not seek health care with first two episodes of sore throat; treated self
Objective Data
• Flushed face and neck, dark circles under eyes
• BP 126/72, P 104, R 24
• Temp. 103.2F
• Erythema and edema of the pharynx and uvula
• Tonsils are 3+ and infected
• White, patchy exudate on the tonsilar areas
• Cervical and retropharyngeal lymph nodes grossly palpable
2) Identify cue clusters
• Complains of severe throat pain
• Erythema/edema of pharynx/uvula
• White, patchy exudate on tonsils
• Tender, palpable lymph nodes
• General fatigue and anorexia
• BP 126/72, P 104, R 24
• Flushed face and neck, dark circles under eyes
• Temp 103.2F
• P 104, R 24
• Chills, fever, fatigue
• Studying "day and night" for final exams
• "Third time I've had this problem this year"
• Did not seek health care with first two episodes of sore throat; treated self
3) Draw inferences
Signs and symptoms suggest pharyngeal and tonsillar inflammation. Client probably needs a medical referral. Pain upon swallowing can interfere with adequate nutrition
GAS—systemic response to possible throat infection
Describing unhealthful behavior and not seeking treatment for illness appropriately
4) List possible nursing diagnoses
Risk for Imbalanced Nutrition: Less Than Body Requirements r/t anorexia and increased metabolic need secondary to throat pain and systemic response to possible infection
Acute Pain r/t possible knowledge deficit of appropriate pain management strategies
Hyperthermia
Ineffective Health Maintenance r/t inadequate knowledge of practices to promote wellness during periods of stress
Ineffective Management of Therapeutic Regimen related to attempting to self-treat illness
5) Check for defining characteristics
Major: Potential metabolic need in excess of intake
Minor: None
Major: Subjective communication of pain descriptors
Minor: Increased pulse and respiration (although these may be related to hyperthermia)
Major: Temperature greater than 100F (103.2F)
Minor: Flushed skin, tachycardia, tachypnea, fatigue
Major: Reports unhealthy practices (studying day and night and treating previous sore throats per self)
Minor: None
Major: None
Minor: Implied (verbalized not seeking medical treatment for previous illness)
6) Confirm or rule out diagnoses
Confirm. Collecting information about intake and output and weight loss could allow a change from a risk to an actual nursing diagnosis
Accept diagnosis because it meets defining characteristics and has client validation
This diagnosis meets the defining characteristics, but there is no condition that the nurse can treat; better placed as a RC
Accept diagnosis because it meets major defining characteristics and is validated by client
Rule out this diagnosis because it does not meet defining characteristics
7) Document conclusions
Nursing diagnoses that are appropriate for this client include:
• Risk for Imbalanced Nutrition: Less Than Body Requirements r/t anorexia and increased metabolic need secondary to throat pain and systemic response to possible infection
• Acute Pain r/t possible knowledge deficit of appropriate pain-management strategies
• Ineffective Health Maintenance r/t inadequate knowledge of practices to promote wellness during periods of stress
Potential collaborative problems including the following:
• RC: Hyperthermia
Patient needs an immediate referral to the primary care provider to diagnose and treat his throat condition

## References and Selected Readings


Arkell, S. (2003). Update on oral candidosis. *Nursing Times, 99*(48), 52–3.

Bifid uvula. (2005). Available at http://www.biology-online.org/dictionary/Bifid_uvula

Daniel, B. T., Damato, K. L., & Johnson, J. (2004). Education issues in oral care. *Seminars in Oncology Nursing, 20*(1), 48–52.

Eilers, J., & Epstein, J. B. (2004). Assessment and measurement of oral mucositis. *Seminars in Oncology Nursing, 20*(1), 22–29.

Freer, S. K. (2000). Use of an oral assessment tool to improve practice. *Professional Nurse, 15*(10), 635–637.

Gilmurry, B. (2000). Wheezing, breathlessness, and cough – Is it really asthma? A look at vocal cord dysfunction. *Canadian Journal of Respiratory Therapy, 35*(4), 28–31.

Hamdy, S. (2004). The diagnosis and management of adult neurogenic dysphagia. *Nursing Times, 100*(18), 52–54.

Keefe, D. M., Gibson, R. J., & Hauer-Jensen, M. (2004). Gastrointestinal mucositis. *Seminars in Oncology Nursing, 20*(1), 38–47.

Krejci, C. B., & Bissada, N. F. (2000). Periodontitis—The risks for its development. *General Dentistry, 48*(4), 430–436.

Landry, S. T. (2000). Alternatives: Healthy teeth from the inside out. *Health (San Francisco), 14*(2), 82, 86, 89.

Olson, K., Hanson, J., Hamilton, J., Stacey, D., Eades, M., Gue, D., et al. (2004). Assessing the reliability and validity of the revised WCCNR stomatitis staging system for cancer therapy-induced stomatis. *Canadian Oncology Nursing Journal, 14*(3), 168–174, 176–182.

Overfield, T. (1995). *Biological variation in health and illness: Race, age, and sex differences* (2nd ed.). Boca Raton, FL: CRC Press.

Reynolds, T. (2004). Ear, nose, and throat problems in accident and emergency. *Nursing Standards, 18*(26), 47–53, quiz, 54–55.

Scheid, D. C., & Hamm, R. H. (2004). Acute bacterial rhinosinusitis in adults: Part I. Evaluation. *American Family Physician, 70,* 1685–1692.

Sjogren, R., & Nordstrom, G. (2000). Oral health status of psychiatric patients. *Journal of Clinical Nursing, 9*(4), 632–638.

Weinberg, M. A., & Estefan, D. J. (2002). Assessing oral malignancies. *American Family Physician, 65*(7), 1379–1384.


### *Promote Health—Sinusitis and Cancer of the Oral Cavity*


American Cancer Society. (2007). What are the risk factors for oral cavity and oropharyngeal cancer? Available at http://www.cancer.org/docroot/CRI

Hicks, R. (2006). Sinusitis. Available at http://www.bbc.co.uk/health

Mayo Clinic. (2006). Chronic sinusitis. Available at http://www.mayoclinic.com/health/chronic-sinusitis/DS00232/DSECTION=3

Sinusitis. (2005). Available at http://www.familydoctor.org/online/famdocen/home/common/infections/cold-flu/686.html


### *Websites*


American Dental Association, 211 E Chicago Ave., Chicago, IL. 60611; 312-440-2806; http://www.ada.org

Centers for Disease Control and Prevention, 1600 Clifton Road, Atlanta, GA. 30333; 404-639-7000; http://www.cdc.gov/health

National Oral Health Information Clearinghouse, 1 NOHIC Way, Bethesda, MD. 20892-3500; 1-301-401-7364; http://www.pho.com/node/9826