Diagnosis: Chronic vestibular disorder.

Impairment Rating: 31% to 60% impairment of the whole person.

Comment: Ophthalmologic evaluation required to evaluate visual complaints.

11.3 The Face

The face, its parts, and its structural components serve multiple functions: protection of underlying structures and organs (such as the eyes), portals of entry for deglutition and respiration, and communication through expression and speech.

The skin covers the body, acts as a physical barrier to underlying structures, provides sensory perception, regulates temperature and body fluids, and resists trauma. See Chapter 8 for primary skin impairments.

The portal for deglutition is the mouth and lips. Disturbances in function can result in drooling or inability to keep food or liquid in the mouth while eating. The lips and mouth also serve in vocal articulation, adding intelligibility to speech. The nose and mouth are the portals of entry for respiration. Impairment may be a result of neurologic disorders, such as partial or complete paralysis of the lips; scar formation and contracture of the lips; or loss of tissue.

The face plays a unique role in communication. No other part of the body serves as specific a function for personal identity and for the expression of thought and emotion. Facial expressions are an integral part of normal living postures. A degree of normalcy is needed for effective verbal and nonverbal communication. Facial anatomy contributes to identity, expression, and normal functioning, and to the appearance of the forehead and cheeks; eyes, eyelids, and eyebrows; lips and mouth; nose; and chin and neck. The face is such a prominent feature that it plays a critical role in the individual's physical, psychological, and emotional makeup. Facial disfigurement can affect all of these components and can result in social and vocational handicaps and even psychiatric impairment.

11.3a Criteria for Rating Impairment Due to Facial Disorders and/or Disfigurement

To evaluate permanent impairment due to a disorder or disfigurement of the face, consider changes in anatomy and function and the effect of the impairment on the ability to perform activities of daily living. This section deals with permanent impairment as it relates mainly to the face's structural integrity. For loss of function involving other aspects of the functioning of the face, refer to the specific organ system involved and combine the structural integrity loss with the relevant loss of function. Loss of structural integrity can result from cutaneous disfigurement, such as that due to abnormal pigmentation or scars, or from loss of supporting structures, such as soft tissue, bone, or cartilage of the facial skeleton. Other information on cutaneous disfigurement appears in Chapter 8 (The Skin).

Disfigurement of the face can result from many causes, particularly burns, traumatic injury, surgery, infections, or dysplasia. Effects on individuals can vary tremendously, as can remaining function. Total disfigurement of the face after treatment should be deemed a 16% to 50% impairment of the whole person, dependent also upon the degree of functional loss. For the assessment of psychosocial impairment due to disfigurement, refer to Chapter 14 on mental and behavioral disorders.

Facial disfigurement may be considered total if it is severe and grossly deforming of the face and features. Such disfigurement must involve at least the entire area between the brow line and the upper lip on both sides. Severe disfigurement above the brow line should be deemed to be, at a maximum, 1% impairment of the whole person. If disfigurement is severe below the upper lip, it may be deemed to be 8% impairment of the whole person. Specific, prominent facial disfigurements are estimated as shown in Table 11-5.

Table 11-5 Criteria for Rating Impairment Due to Facial Disorders and/or Disfigurement

Class 1 0%-5% Impairment of the Whole Person	Class 2 6%-10% Impairment of the Whole Person	Class 3 11%-15% Impairment of the Whole Person	Class 4 16%-50% Impairment of the Whole Person
Facial abnormality limited to disorder of cutaneous structures, such as visible scars or abnormal pigmentation (refer to Chapter 8 for skin disorders) ***or*** mild, unilateral, total facial paralysis ***or*** nasal distortion that affects physical appearance	Facial abnormality involves loss of supporting structure of part of face, with or without cutaneous disorder (eg, depressed cheek, nasal, or frontal bones)	Facial abnormality involves absence of normal anatomic part or area of face, such as loss of eye or loss of part of nose, with resulting cosmetic deformity; combine with any functional loss, eg, vision (Chapter 12) ***or*** severe, unilateral, total facial paralysis ***or*** mild, bilateral, total facial paralysis	Massive or total distortion of normal facial anatomy with disfigurement so severe that it precludes social acceptance; combine with any mental and behavioral impairment (Chapter 14) ***or*** severe, bilateral, total facial paralysis ***or*** loss of a major portion of or entire nose

Class 1 0%-5% Impairment of the Whole Person
Facial abnormality limited to disorder of cutaneous structures, such as visible scars or abnormal pigmentation (refer to Chapter 8 for skin disorders) ***or*** mild, unilateral, total facial paralysis ***or*** nasal distortion that affects physical appearance

Example 11-8
0% to 5% Impairment Due to Facial Disorders and/or Disfigurement

Subject: 25-year-old woman.

History: Struck in nose with baseball bat 1 year previously; sustained 2-cm laceration across dorsum of nose with minimally displaced nasal bone fractures. Underwent closed reduction of fractures of nasal bones and repair of laceration. Returned to normal activities after normal recovery.

Current Symptoms: Small scar on top of nose.

Physical Exam: Normal nasal region except for well-healed, stable 1.5-cm scar across glabellar region. Scar falls in skinfold lines.

Clinical Studies: None.

Diagnosis: Residual scar on dorsum of nose from compound nasal bone fracture.

Impairment Rating: 1% impairment of the whole person.

Comment: No loss of nasal function or nasal bone structural integrity. Appearance of nose did not change. Scar falls in skinfold line and is barely visible.

Example 11-9
0% to 5% Impairment Due to Facial Disorders and/or Disfigurement

Subject: 36-year-old man.

History: Fell off tractor at work 18 months previously and sustained deep abrasion over right cheek and fracture of right zygomatic arch. Surgery was performed with closed reduction of zygomatic arch fracture and debridement of right cheek wound. Fracture healed well and maintained its normal anatomical position. Deep abrasion healed well with additional topical wound care. Returned to normal activities shortly after injury.

Current Symptoms: Injured skin area on right cheek is lighter than normal surrounding skin, especially after sun exposure, but does not require medical care, even with prolonged sun exposure.

Physical Exam: 3- to 4-cm area of skin on right cheek is lighter than uninjured skin. Injured skin has irregular, rough "cobblestone" appearance in some areas. Right zygomatic arch has normal appearance and projection compared to left side.

Clinical Studies: None.

Diagnosis: Stable scar on right cheek with loss of normal skin color and residual skin texture changes. Healed fracture.

Impairment Rating: 3% impairment of the whole person.

Comment: No permanent loss of structural integrity of arch. Injured skin area has lost some structural integrity, but healed without surgery. Area has abnormal pigmentation and appearance compared to surrounding skin.

Class 2 6%-10% Impairment of the Whole Person
Facial abnormality involves loss of supporting structure of part of face, with or without cutaneous disorder (eg, depressed cheek, nasal, or frontal bones)

Example 11-10
6% to 10% Impairment Due to Facial Disorders and/or Disfigurement

Subject: 35-year-old woman.

History: Struck across nasal region 19 months previously by a box that had fallen off a shelf in a store. Sustained crush injury to face with compound fracture of nasal bones and compound fracture of frontal bone that goes into frontal sinus. Fractures and wounds were surgically repaired. Wounds and bones healed well. Frontal sinus and nasal respiratory function returned to normal. No additional surgery. Returned to normal activities.

Current Symptoms: Affected area is darker than surrounding skin; hollow area over nasofrontal region.

Physical Exam: Slightly brown discoloration of skin over superior dorsal nasal and glabellar regions. 3-cm depression 3 to 4 mm deep over frontal sinus region.

Clinical Studies: None.

Diagnosis: Healed compound nasal and frontal bone fractures. Residual skin pigmentation changes. Loss of structural integrity of frontal bone.

Impairment Rating: 6% impairment of the whole person.

Comment: Although initial injury required extensive surgery, permanent loss of structural integrity of skin and frontal bone involves relatively small area, with no anticipated problems with function of nose or nasal passages.

Example 11-11
6% to 10% Impairment Due to Facial Disorders and/or Disfigurement

Subject: 35-year-old man.

History: Struck on right side of face with a heavy pipe 14 months previously. Sustained crush injury to right facial region; deep laceration along inferior orbital rim; and fractures of malar ("tripod"), orbital floor, and nasal bones. Refused additional surgery. Quickly recovered and returned to normal activities after surgical repair of injuries.

Current Symptoms: Scars on right lower eyelid and lateral orbital regions. Sunken appearance of right eye and right cheekbone. Nose is wider and flatter than it was before injury. Individual is embarrassed by his appearance but has no complaints of loss of vision or nasal function.

Physical Exam: Well-healed, stable, 1- to 2-cm scars over right inferior and lateral orbital rim regions, with palpable metal plates beneath scars. 1-cm depression of right malar eminence (compared to left side). Mild to moderate enophthalmos of right orbit. Nasal bones have smooth, flat depression in nasofrontal region.

Clinical Studies: None.

Diagnosis: Depression of right malar bone and nasal bones; enophthalmos of right orbit; scars on right lower eyelid and lateral orbital skin.

Impairment Rating: 10% impairment of the whole person.

Comment: Structural integrity of right orbital and nasal regions was lost, leaving permanent, measurable depressions and enophthalmos.

Class 3 11%-15% Impairment of the Whole Person
Facial abnormality involves absence of normal anatomic part or area of face, such as loss of eye or loss of part of nose, with resulting cosmetic deformity; combine with any functional loss, eg, vision (Chapter 12)
or
severe, unilateral, total facial paralysis
or
mild, bilateral, total facial paralysis

Example 11-12
11% to 15% Impairment Due to Facial Disorders and/or Disfigurement

Subject: 35-year-old woman.

History: Sustained gunshot wound to face 9 months previously. Bullet blew off portion of left side of nose and created open, deep wound on left cheek. Returned to most normal activities after undergoing several operations.

Current Symptoms: Scar on left cheek. Missing tip of nose on left side. She is uncomfortable with her appearance.

Physical Exam: Significant depression on left tip of nose due to loss of left lateral cartilage and nasal tissue. Alar region on left has significant shortening compared to right side and partially consists of grafted tissue, which has whiter, thicker appearance than skin on right side. Left cheek has a stable, soft scar approximately 4 cm long by 2 mm wide running from left nasolabial fold to left lateral orbital region.

Clinical Studies: None.

Diagnosis: Loss of skin and cartilage on left tip of nose and scar on left cheek.

Impairment Rating: 15% impairment of the whole person.

Comment: Reconstructive surgery was able to somewhat correct cosmetic defect. But loss of an anatomical part and a significant scar on left cheek have affected self-image.

Example 11-13
11% to 15% Impairment Due to Facial Disorders and/or Disfigurement

Subject: 55-year-old man.

History: Struck with large hook in left eye while working on fishing boat 18 months previously. Eye was destroyed due to injury and replaced with prosthetic eye. Returned to most normal activities.

Current Symptoms: Loss of function of left eye.

Physical Exam: Loss of left eye.

Clinical Studies: None.

Diagnosis: Loss of left eye.

Impairment Rating: 15% impairment of the whole person.

Comment: Combine impairment with impairment resulting from total loss of vision in left eye, as determined according to criteria in Chapter 12.

Class 4 16%-50% Impairment of the Whole Person
Massive or total distortion of normal facial anatomy with disfigurement so severe that it precludes social acceptance; combine with any mental and behavioral impairment (Chapter 14)
or
severe, bilateral, total facial paralysis
or
loss of entire nose

Example 11-14
16% to 50% Impairment Due to Facial Disorders and/or Disfigurement

Subject: 34-year-old man.

History: Thrown and kicked in face by a bull 26 months previously. Sustained crush injury to right side of face and compound fractures of mandible, nasal bones, and orbital bones. Subsequently developed severe infection in face, which required multiple surgical procedures. Operations resulted in loss of most of the normal skin and muscle on right side of nose, right cheek, and right side of upper lip. Nasal septum cartilage and tip were lost. Bones of right side of nose, right half of mandible, and right anterior maxillary region were lost. Underwent no further reconstructive procedures but has been fitted with facial prostheses. Condition is stable. Required speech therapy due to loss of articulatory function. Required help

in management of diet because of permanent dietary restriction to semisolid or soft foods.

Current Symptoms: Altered speech with loss of ability to speak well. Loss of skin and bones on right side of face. Loss of ability to eat normal food.

Physical Exam: Loss of normal skin, muscles, and bone structures on right side of nose and in right mandibular and right anterior maxillary regions. Speech is poorly articulated and has low intensity due to loss of skin and muscle on right side of mouth.

Clinical Studies: None.

Diagnosis: Massive loss of normal structural integrity of right side of face and loss of normal speech function and mastication.

Impairment Rating: 25% impairment of the whole person.

Comment: Combine with other impairments for loss of speech (Section 11.4d) and mastication (Section 11.4b).

Example 11-15
16% to 50% Impairment Due to Facial Disorders and/or Disfigurement

Subject: 45-year-old woman.

History: Sustained severe electrical injury to face 26 months previously with loss of left orbital structures, skin on left cheek, and anterior maxillary sinus bones.

Current Symptoms: Lost vision in left eye and is missing left side of face. Individual says she looks like a freak.

Physical Exam: Loss of left orbital structures with open orbital region. No bones remain on orbital floor or inferior orbital rim. Left anterior maxillary sinus regions and overlying skin and muscles are gone, leaving large, residual, open orbital and maxillary cavity.

Clinical Studies: None.

Diagnosis: Massive loss of normal facial structural integrity.

Impairment Rating: 40% impairment of the whole person.

Comment: Combine with other impairments from the vision chapter (Chapter 12) and mental and behavioral chapter (Chapter 14).

11.4 The Nose, Throat, and Related Structures

The nasal region includes the external part of the nose, the nasal cavity, and the nasopharynx. The oral region includes the mouth and lips, teeth, temporomandibular joint, tongue, hard and soft palate, region of the palatine tonsil, and oropharynx. The neck and chest region includes the hypopharynx, larynx, trachea, esophagus, and bronchi.

The functions of these structures, and the order in which they will be discussed, are as follows: (1) respiration, (2) mastication and deglutition, (3) olfaction and taste, and (4) speech. Permanent impairment may result from a deviation from normal in any of the above functions, and, because of their close relationship, more than one structure may be involved.

11.4a Respiration

Respiration may be defined as the act or function of breathing, that is, the act by which air is inspired and expired from the lungs. The respiratory mechanism includes the lungs and the air passages; the latter includes the nares, nasal cavities, mouth, pharynx, larynx, trachea, and bronchi.

In this chapter, discussion of permanent impairments related to respiration is limited to defects of the air passages. Refer to Chapter 5 on the respiratory system for a discussion of impairments of the lower airways and lung parenchyma.

The most commonly encountered defect of the air passages is obstruction, which may be partial, as with stenosis, or complete, as with occlusion. Obstructions and other air passage defects are evidenced primarily by dyspnea or so-called unusual breathlessness. Sleep apnea, which is covered in Chapter 5, may be related to functional upper-airway obstruction.

Dyspnea is a cardinal factor that contributes to an individual's diminished capacity to carry out activities of daily living and to permanent impairment. This subjective complaint or symptom, which indicates an awareness of respiratory distress, usually is noted first and is most severe during exercise. When dyspnea occurs at rest, respiratory dysfunction probably is severe. Dyspnea may or may not be accompanied by related signs or symptoms.

Individuals with air passage defects may be evaluated in accordance with the classification in Table 11-6. Permanent impairments involving obstructive sleep apnea should be evaluated with the respiratory system criteria described in Chapter 5.

Table 11-6 Criteria for Rating Impairment Due to Air Passage Defects

Class 1 **0%-10% Impairment of the Whole Person**	**Class 2** **11%-29% Impairment of the Whole Person**	**Class 3** **30%-49% Impairment of the Whole Person**	**Class 4** **50%-89% Impairment of the Whole Person**	**Class 5** **90%+ Impairment of the Whole Person**
Dyspnea *does not occur* at rest ***and*** dyspnea is not produced by walking freely, climbing stairs freely, or performance of other usual activities of daily living ***and*** dyspnea is not produced by stress, prolonged exertion, hurrying, hill-climbing, or recreational or similar activities requiring intensive effort* ***and*** examination reveals partial obstruction of the oropharynx, laryngopharynx, larynx, upper trachea (to the fourth cartilaginous ring), lower trachea, bronchi, or complete (bilateral) obstruction of the nose or nasopharynx	Dyspnea *does not occur* at rest ***and*** dyspnea is not produced by walking freely on a level surface, climbing one flight of stairs, or performance of other usual activities of daily living ***but*** dyspnea is produced by stress, prolonged exertion, hurrying, hill-climbing, or recreational or similar activities (except sedentary forms) ***and*** examination reveals partial obstruction of the oropharynx, laryngopharynx, larynx, upper trachea (to the fourth cartilaginous ring), lower trachea, bronchi, or complete (bilateral) obstruction of the nose or nasopharynx	Dyspnea *does not occur* at rest ***and*** dyspnea is produced by walking more than one or two level blocks, climbing one flight of stairs even with periods of rest, or performance of other usual activities of daily living ***and*** dyspnea is produced by stress, prolonged exertion, hurrying, hill-climbing, or recreational or similar activities ***and*** examination reveals partial obstruction of the oropharynx, laryngopharynx, larynx, upper trachea (to the fourth cartilaginous ring), lower trachea, or bronchi	Dyspnea *occurs* at rest, although individual is not necessarily bedridden ***and*** dyspnea is aggravated by the performance of any of the usual activities of daily living (beyond personal cleansing, dressing, or grooming) ***and*** examination reveals partial obstruction of the oropharynx, laryngopharynx, larynx, upper trachea (to the fourth cartilaginous ring), lower trachea, and/or bronchi	Severe dyspnea *occurs* at rest and spontaneous respiration is inadequate ***and*** respiratory ventilation is required ***and*** examination reveals partial obstruction of the oropharynx, laryngopharynx, larynx, upper trachea (to the fourth cartilaginous ring), lower trachea, and/or bronchi

*Prophylactic restriction of activity, such as strenuous competitive sport, does not exclude subject from class 1.

Note: Individuals with successful permanent tracheostomy or stoma should be rated at 25% impairment of the whole person.

Class 1 0%-10% Impairment of the Whole Person
Dyspnea *does not occur* at rest
and
dyspnea is not produced by walking freely, climbing stairs freely, or performance of other usual activities of daily living
and
dyspnea is not produced by stress, prolonged exertion, hurrying, hill-climbing, or recreational or similar activities requiring intensive effort
and
examination reveals partial obstruction of the oropharynx, laryngopharynx, larynx, upper trachea (to the fourth cartilaginous ring), lower trachea, bronchi, or complete (bilateral) obstruction of the nose or nasopharynx

Example 11-16
0% to 10% Impairment Due to Right Vocal Fold Paralysis

Subject: 26-year-old man.

History: Spinal cord tumor removed 4 years ago, with right anterior cervical fusion. Persistent hoarseness since surgery. Had to give up coaching.

Current Symptoms: Voice stable, but weak, with poor volume and projection. Coughing and clearing of throat develop after drinking cold liquids. No shortness of breath or difficulty swallowing.

Physical Exam: Ear, nose, and throat examination: within normal limits.

Clinical Studies: Fiberoptic laryngoscopy: right vocal cord in paramedian position, with a 2-3-mm gap on attempted phonation.

Diagnosis: Right vocal fold paralysis.

Impairment Rating: 5% to 10% impairment due to vocal fold paralysis; combine with appropriate rating for musculoskeletal impairment to determine whole person impairment (see Combined Values Chart, p. 604).

Comment: Partial obstruction of the laryngeal airway.

Class 2 11%-29% Impairment of the Whole Person
Dyspnea *does not occur* at rest
and
dyspnea is not produced by walking freely on a level surface, climbing one flight of stairs, or performance of other usual activities of daily living
but
dyspnea is produced by stress, prolonged exertion, hurrying, hill-climbing, or recreational or similar activities (except sedentary forms)
and
examination reveals partial obstruction of the oropharynx, laryngopharynx, larynx, upper trachea (to the fourth cartilaginous ring), lower trachea, bronchi, or complete (bilateral) obstruction of the nose or nasopharynx

Example 11-17
11% to 29% Impairment Due to Bilateral Vocal Fold Paralysis and Permanent Tracheostomy

Subject: 29-year-old man.

History: Tracheostomy performed 10 years ago after traumatic tracheal intubation. Diagnosed with Arnold-Chiari syndrome and underwent successful neurosurgical decompression. Developed meningitis of unknown etiology, hemiparesis, and other neurologic sequellae. Past history reveals hearing loss, hypertension, and diabetes. 20-year cigarette use.

Current Symptoms: Wheelchair dependent. Metal tracheotomy tube in place. With tube occluded, has good voice but poor airway.

Physical Exam: Right-side hemiparesis and right-side hearing loss.

Clinical Studies: Fiberoptic laryngoscopy: both vocal folds in midline position with very poor abduction.

Diagnosis: Bilateral vocal fold paralysis with poor airway. Permanent tracheostomy.

Impairment Rating: 29% impairment due to vocal fold paralysis; combine with appropriate ratings for musculoskeletal and hearing impairments to determine whole person impairment (see Combined Values Chart, p. 604).

Comment: Monitor for tracheostomy patency.

11.4b Mastication and Deglutition

The act of eating includes mastication and deglutition. Numerous conditions of nongastrointestinal origin, singly or in combination, may interfere with these functions.

Dysfunction of the temporomandibular joint may impede mastication, affect speech, cause lower facial deformity, and produce pain.[7,8] In this section, the effect of temporomandibular joint dysfunction on eating is considered; other effects may be considered in conjunction with parts of the *Guides* that deal with the nervous system or pain.

In accordance with the philosophy of the *Guides*, when mastication and deglutition are evaluated, the ability to eat should be stable and maximal rehabilitation should have been achieved. When mastication or deglutition is impaired, the imposition of dietary restrictions usually results. Such restrictions are the most objective criteria by which to evaluate permanent impairment of these functions.[9-14] The relationship of the restrictions to impairments of mastication and deglutition are shown in Table 11-7.

Table 11-7 Relationship of Dietary Restrictions to Permanent Impairment

Type of Restriction	% Impairment of the Whole Person
Diet is limited to semisolid or soft foods	5%-19%
Diet is limited to liquid foods	20%-39%
Ingestion of food requires tube feeding or gastrostomy	40%-60%

Example 11-18
5% to 19% Impairment Due to Inflammation and Scarring of the Left Temporomandibular Joint

Subject: 58-year-old woman.

History: Following removal of an impacted upper left third molar, individual developed a left oro-antral fistula and acute left maxillary sinusitis, confirmed by x-ray. Dental films confirmed a tooth remnant in the maxillary area. Despite use of antibiotics, she developed persistent drainage from the fistula and pain in the left maxillary area of the face. Severe pain was noted in the left temporomandibular joint (TMJ), and she experienced progressive loss of mobility of the mandible, with the ability to open the jaws limited to a 1-cm excursion. The left oro-antral fistula was explored surgically 6 weeks later, and the residual tooth fragment was removed. A left naso-antral window was placed in the inferior meatus for drainage of the maxillary sinus. Extensive scarring in and about the left TMJ was found. The scars were released, but full mobility of the mandible was not obtained until the left coronoid process was released from the surrounding tissues. She received postoperative steroid therapy; physical therapy exercises maintained mandibular mobility. A stent to keep the jaws apart was created and used for several months while individual was sleeping.

Current Symptoms: On a soft diet because of discomfort in the left TMJ.

Physical Exam: Maxillary mobility limited to about 60% of mobility noted at surgery, with a well-healed oral fistula area.

Clinical Studies: Paranasal sinus x-rays: normal.

Diagnosis: Inflammation and scarring of the left TMJ; reduced mandibular mobility.

Impairment Rating: 10% impairment of the whole person.

Comment: Individual is able to talk satisfactorily, but dietary choices are limited. Speech is not affected. No facial deformity, but she may need to continue exercises to maintain maxillary mobility. No problem in maintaining body weight.

11.4c Olfaction and Taste

Only rarely does complete loss of the closely related senses of olfaction and taste seriously affect an individual's performance of the usual activities of daily living. For this reason, a value of 1% to 5% impairment of the whole person is suggested for use in cases involving partial or complete bilateral loss of either sense due to peripheral lesions. This value is to be combined with any other impairment of the individual (see the Combined Values Chart, p. 604).

11.4d Speech

In this chapter, speech is defined as the capacity to produce vocal signals that can be heard, understood, and sustained over a useful period of time. Speech ought to allow effective communication in the activities of daily living.

This chapter does not consider the causes and characteristics of abnormal speech. Rather, it considers how an impairment relates to the individual's ability or efficiency in using speech to make himself or herself understood in activities of daily living. It is assumed that speech evaluation pertains to the production of voice and articulate speech and not to the language content or structure of the individual's communication. On the basis of these assumptions, the primary problem is estimating proficiency in the use of oral language or measuring the utility of speech as defined above. This section also considers esophageal speech.

At this time there is no single, acceptable, proven test that will measure objectively the degrees of impairment due to the many varieties of speech disorders. Therefore, it is recommended that speech impairment be evaluated by examining the audibility, intelligibility, and functional efficiency of speech.

- Audibility is based on the ability to speak at a level sufficient to be heard.
- Intelligibility is based on the ability to articulate and to link phonetic units of speech with sufficient accuracy to be understood.
- Functional efficiency is based on the ability to produce a satisfactorily rapid rate of speaking and to sustain this rate over a useful period of time.

Other definable attributes of speech–such as voice quality, pitch, and melodic variation–are evaluated only when they affect one of the three primary characteristics noted above.

The classification chart, oral reading paragraph, and examining procedure used in estimating speech impairment are described below.

Classification Chart

Judgments as to the amount of impairment should be made with reference to the classes, percentages, and examples provided in the classification chart (Table 11-8). The 15 categories in the chart suggest activities or situations with different levels of impairment. Data gathered from direct observation of the individual or from interviews should be compared with these categories, and values should be assigned on the basis of the specific impairments that are present.

Oral Reading Paragraph

The following paragraph, entitled "The Smith House," is composed of 100 words and 10 sentences. It provides a uniform means of comparing a speech sample of the person being evaluated with the speech of normal speakers. The phonetic elements of the paragraph are selected particularly for their relevance to the intelligibility of the person's speech.

The Smith House

Larry and Ruth Smith have been married nearly 14 years. They have a small place near Long Lake. Both of them think there's nothing like the country for health. Their two boys would rather live here than any other place. Larry likes to keep some saddle horses close to the house. These make it easy to keep his sons amused. If they wish, the boys can go fishing along the shore. When it rains, they usually want to watch television. Ruth has a cherry tree on each side of the kitchen door. In June they enjoy the juice and jelly.

Examining Procedure

General Orientation

The examiner should have normal hearing as defined in the earlier section in this chapter on hearing. The setting of the examination should be a reasonably quiet room that approximates the noise levels of everyday living.

The examiner should base judgments of impairment on two kinds of evidence: (1) attention to and observation of the individual's speech in the office—for example, during conversation, during the interview, and while reading and counting aloud—and (2) reports pertaining to the individual's performance in everyday living situations. The reports or the evidence should be supplied by reliable observers who know the person well. The standard of evaluation is an average speaker's performance in average situations of everyday living. It is assumed in this context that an average speaker can usually perform according to the following criteria:

- Talk in a loud voice when the occasion demands it.
- Sustain phonation for at least 10 seconds after one breath.
- Complete at least a 10-word sentence in one breath.
- Form all of the phonetic units of American speech and join them intelligibly.
- Maintain a speech rate of at least 75 to 100 words per minute and sustain a flow of speech for a reasonable length of time. A speech rate of 125 words per minute enables a speaker to read approximately one 8½ x 11-inch page of double-spaced text in 2 minutes.

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Specific Instructions

1. Place the individual approximately 8 ft from the examiner.
2. Interview the individual. This will permit observation of his or her speech in ordinary conversation while pertinent historical information is obtained.
3. Have the individual's back toward the examiner and keep a separation of 8 ft between the examiner and the examinee. Instruct the person as follows: "You are to read this passage so I can hear you plainly. Be sure to speak so I can understand you." Then ask him or her to read aloud the short paragraph, "The Smith House."
4. If additional reading procedures are required, simple prose paragraphs from a magazine may be used. A person who cannot read may be requested to give his or her name and address and name all the days of the week and months of the year. Additional evidence regarding the person's rate of speech and ability to sustain it may be obtained by noting the time required to count to 100 by ones. Completion of this task in 60 to 75 seconds is accepted as normal.
5. Record judgment of the individual's speech capacity with regard to each of the three rows of the classification chart (Table 11-8). The degree of impairment of speech is equivalent to the greatest percentage of impairment recorded in any one of the three rows of the classification chart.

For example, a person's speech capacity is judged to be the following: audibility, 10% (class 1); intelligibility, 50% (class 3); and functional efficiency, 30% (class 2). The individual's speech impairment is judged to be equivalent to the greatest impairment (50%). A speech impairment of 50% is judged to be an 18% impairment of the whole person, according to Table 11-9.

11.4e Voice

Voice, as the term is used in this section, refers to the production of audible sounds by the vibration of the true vocal folds of the larynx. Voice, or phonation, is therefore the generator of speech—the shaping of sounds into intelligible words. Alternative physiological sound generators, such as the false vocal folds or the esophagus, are not considered here.

This section does not consider the causes of voice disorders. Rather, it recognizes that voice disorders may present such definable symptoms as abnormal volume (voice fatigue, weakness, or low sound intensity), abnormal control (pitch and/or melodic variation), and/or abnormal quality (hoarseness, harshness, or breathiness). These symptoms indicate abnormal physiological functioning of the phonatory mechanism and may contribute to impairment of speech.

At this time, there is no single, acceptable, proven test that will measure objectively the degrees of impairment associated with the many varieties of voice disorders. Tests such as laryngoscopy, acoustical analysis of voice, strobovideolaryngoscopy, analysis of phonatory function, and laryngeal electromyography are recognized as appropriate and useful.[15-17] The significance of current normative data is unclear when confined to consideration of impairment.