



**E** *emmetropia; energy; Escherichia; eye.*

**e** *electric charge; electron; L. ex, from.*

**E<sub>1</sub>** *estrone.*

**E<sub>2</sub>** *estradiol.*

**E<sub>3</sub>** *estriol.*

**ea** *each.*

**EACA** *epsilon-aminocaproic acid.*

**ead** *L. eadem, the same.*

**EAFUS** *Everything added to food in the United States.*

**EaggEC** *Enteroaggregative Escherichia coli.*

**Eales' disease** (ēlz) [Henry Eales, Brit. physician, 1852–1913] Recurrent hemorrhage into the retina and vitreous, most commonly seen in men in the second and third decades of life. The cause is unknown.

**ear** [AS. *ear*] The organ of hearing and equilibrium. The ear consists of outer, middle, and inner portions, and is innervated by the eighth cranial nerve. **SEE: illus.**

The pathway of hearing is as follows: the auricle funnels sound waves from the environment through the external auditory canal to the tympanic membrane, making this thin epithelial structure vibrate. The vibrations are transmitted to the middle ear ossicles, the malleus, incus, and stapes, then to the perilymph and endolymph in the inner ear labyrinth. The receptors are part of the organ of Corti; they generate impulses transmitted by the cochlear branch of the eighth cranial nerve to the spiral ganglion and auditory tracts of the brain. The auditory areas are in the temporal lobes.

The healthy human ear responds to a variety of sounds, with frequencies ranging from about 20 to 20,000 Hz. It is most sensitive, however, to sounds whose frequencies fall in the 1500- to 3000-Hz range, the frequency range of most human speech. **SEE: hearing.**

The receptors for equilibrium are in the utricle and saccule, and in the semicircular ducts of the inner ear; they are innervated by the vestibular branch of the eighth cranial nerve. Impulses from the utricle and saccule provide information about the position of the head, those from the semicircular ducts about the speed and direction of three-dimensional movement.

**Blainville's e.** **SEE: Blainville's ear.**

**Cagot e.** An ear without a lower lobe.

**cauliflower e.** A colloquial term for a thickening of the external ear resulting from trauma. It is commonly seen in

boxers. Plastic surgery may restore the ear to a normal shape.

**darwinian e.** **SEE: darwinian ear.**

**external e.** The portion of the ear consisting of the auricle and external auditory canal, and separated from the middle ear by the tympanic membrane or eardrum. **SYN: auris externa; outer ear.**

**foreign bodies in e.** Objects that enter the ear accidentally or are inserted deliberately. These are usually insects, pebbles, beans or peas, cotton swabs, or coins.

**SYMPTOMS:** Foreign objects cause pain, ringing, or buzzing in the ear. A live insect usually causes a noise.

**TREATMENT:** Water is not introduced if any vegetable matter is in the ear because it may push the foreign body further into the ear or cause it to swell and become firmly embedded.

To remove insects from the ear, a few drops of lidocaine should be instilled. Inorganic foreign bodies can be removed with small forceps by a health care provider.

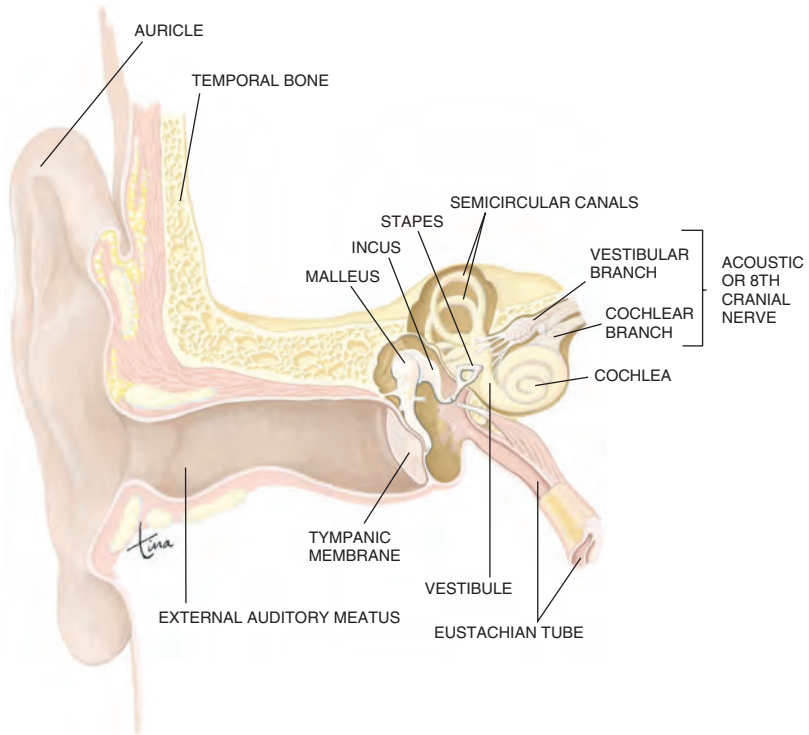
**glue e.** The chronic accumulation of a viscous exudate in the middle ear, occurring principally in children who are 5 to 8 years old. It causes deafness, which can be treated by removal of the exudate.

**inner e.** Internal e.

**internal e.** The portion of the ear consisting of the cochlea, which contains the receptors for hearing in the organ of Corti, and the vestibule and semicircular canals, which contain the receptors for static and dynamic equilibrium. The receptors are innervated by the vestibulocochlear nerve. **SYN: auris interna; inner ear.**

**middle e.** The tympanic cavity, an irregular air-filled space in the temporal bone. Anteriorly, it communicates with the eustachian tube, which forms an open channel between the middle ear and the cavity of the nasopharynx. Posteriorly, the middle ear opens into the mastoid antrum, which in turn communicates with the mastoid sinuses. Of the three potential openings into the middle ear, two—the tympanic membrane and the round window—are covered. The third one is the eustachian tube. Three ossicles (small bones) joined together, the malleus, incus, and stapes, extend from the tympanic membrane to the oval window of the inner ear. **SYN: auris media. SEE: eardrum; tympanum.**

**Mozart e.** **SEE: Mozart ear.**



### STRUCTURE OF THE EAR

**nerve supply of e.** *External:* The branches of the facial, vagus, and mandibular nerves and the nerves from the cervical plexus. *Middle:* The tympanic plexus and the branches of the mandibular, vagus, and facial nerves. *Internal:* The vestibulocochlear nerve (eighth cranial).

**outer e.** External e.

**pierced e.** An ear lobe that has been pierced with a needle so that a permanent channel will remain, permitting the wearing of an earring attached to the ear by a connector that passes through the channel.

**surfer's e.** SEE: *surfer's ear*.

**swimmer's e.** A type of external otitis seen in persons immersed in water, usually during the summer months. It is typically caused by *Staphylococcus aureus* or *Pseudomonas aeruginosa* and is treated with a suspension of neomycin, polymyxin B sulfate, and hydrocortisone.

**earache** Pain in the ear. SYN: *otalgia*; *otodynia*.

**ear candling, ear coning** An alternative medicine practice in which a cone of waxed paper is placed in the patient's external auditory canal and then set on fire. It is promoted as a treatment for cerumen impaction and for removal of unspecified toxins from the body. The

practice is dangerous; it occasionally results in burns or perforation of the eardrum. In Canada and the U.S., it is considered an unregulated medical practice—unproven, untested, and illegal to use.

**eardrops** A medication in liquid form for instillation into the external ear canal, usually to treat infections or loosen cerumen.



Eardrops should not be used if the tympanic membrane is damaged or broken.

**eardrum** (ēr'drūm) The membrane at the junction of the external auditory canal and the middle ear cavity. SYN: *tympanum*.

**earlobe, ear lobe** The soft bottom edge of the outer ear containing no cartilage.

**early supported discharge** Methods to facilitate the return of hospitalized patients to lower levels of care, including nursing care facilities, foster care, or home. Early supported discharge optimizes the management of patient length-of-stay, relieves caregiver stress, and empowers patients to return to higher levels of functioning.

**ear pinning** A colloquial term for *otoplasty*.

**ear plug** A device for preventing sound from entering the ear by occluding the external auditory canal.



Ear plugs should not be used during swimming, diving, or flying because they may interfere with pressure equalization.

**earth** The soil on the surface of the planet earth.

**alkaline e.** A general term for the oxides of calcium, strontium, magnesium, and barium (these metals are referred to as the "alkaline earth" metals).

**diatomaceous e.** Silica containing fossilized shells of microscopic algae with a siliceous or calcium-containing cell wall. It is used in insulating material and filters and as an absorbent.

**earth eating** Eating of clay or dirt, sometimes by children as a form of pica.

**ear thermometry** Determination of the temperature of the tympanic membrane by use of a device for rapidly sensing infrared radiation from the membrane. Commercially available devices do this in 3 sec. The convenience of assessing body temperature using this method is obvious, but if the probe is left in the ear canal for more than a few seconds, the reading may be abnormally low. In general, the accuracy and reproducibility of ear thermometry is poor. SEE: *temperature*.

**ear tube** Grommet.

**earwax** (ēr'wāks) Cerumen.

**eat** [AS. *etan*] 1. To devour, as food. 2. To take solid food. 3. To corrode.

**eating disorder** Any pattern of eating that results in compromises (or potential compromises) to one's health. Anorexia nervosa, bulimia, pica, and rumination disorder of infancy are included.

**eating plan** Diet (2).

**Eaton agent** (ēt'ōn) *Mycoplasma pneumoniae*, one of the causes of atypical pneumonia. SEE: *Mycoplasma*.

**Eaton-Lambert syndrome** (ēt'in-lām'bért sîn'drōm") Lambert-Eaton myasthenic syndrome.

**Eberthella** (ā'bēr-tēl'ā) [Karl Joseph Eberth, Ger. pathologist, 1835–1926] Formerly a genus of bacteria; now classified under *Salmonella*.

**Ebola virus hemorrhagic fever** (ē-bō'lā) [Ebola, Zaire, Africa] An often fatal viral disease that has appeared in sporadic outbreaks in Africa. The clinical presentation of widespread bleeding into many organs and fever is similar to that seen in Lassa, Marburg, and Congo-Crimean viral hemorrhagic fevers.

**ETIOLOGY:** The disease is caused by one of three species of Ebola virus, a Fi-

loviridae virus that is distinguished by long threadlike strands of RNA. The animal host (reservoir) has not been identified, limiting study of the disease. In each outbreak, the first human infection is believed to be caused by a bite from an infected animal. Subsequent cases are the result of contact with blood or body secretions from an infected person, or the reuse of contaminated needles and syringes.

The use of standard barrier precautions prevents transmission, with the addition of leg and shoe covers if large amounts of blood, vomit, or diarrhea are present; negative pressure isolation rooms are used if available. Ebola virus spread between humans by airborne droplets has never been documented, but face masks are recommended if the patient has respiratory symptoms. All equipment must be sterilized before reuse.

**SYMPTOMS:** The incubation period of 2–3 weeks is followed by sudden onset of high fever, myalgia, diarrhea, headache, fatigue, and abdominal pain; a rash, sore throat, and conjunctivitis may be present. Within 7 days, shock develops, usually associated with hemorrhage; more than 50% of patients die. The patient is infectious after fever appears.

**TREATMENT:** Currently no vaccines or drugs are effective against Ebola hemorrhagic fever viruses, and treatment is focused on supportive measures to maintain blood pressure, oxygenation, and fluid and electrolyte balance.

**ebonation** (ē'bō-nā'shūn) [L. *e*, out, + AS. *ban*, bone] Removal of bony fragments from a wound.

**Ebstein's anomaly** (ēb'stīnz) [Wilhelm Ebstein, Ger. physician, 1836–1912] A congenital heart condition resulting from downward displacement of the tricuspid valve from the anulus fibrosus. It causes fatigue, palpitations, and dyspnea.

**ebullism** (ēb'ū-līzm) [L. *ebullire*, to boil over] Formation of water vapor in body tissue, which occurs when the body is exposed to extreme reduction in barometric pressure. SEE: *bends*; *decompression illness*.

**eburnation** (ēb'ūr-nā'shūn) [L. *eburnus*, made of ivory] Changes in bone that cause it to become dense, hard, and smooth like ivory; often seen at sites of active arthritis.

**eburneous** (ē-būr'nē-ūs) Resembling ivory; ivory-colored.

**EBV** *Epstein-Barr virus*. SEE: *mononucleosis*, *infectious*.

**EB virus** Epstein-Barr virus.

**EC** *enteric coated*; *Enzyme Commission*; *extracellular*.

**ecarin** (ē'kā-rīn) [Gr. *echis*, viper] A prothrombin activator purified from the

venom of the Indian saw-scaled viper. It is used in laboratory assays of anticoagulation by prothrombin inhibitors such as hirudin.

**ecbolic** (ĕk-bŏl'ĭk) [Gr. *ekbolikos*, throwing out] **1.** Hastening uterine evacuation by causing contractions of the uterine muscles. **2.** Any agent producing or hastening labor or abortion. SYN: *oxytotic*.

**ECC** *emergency cardiac care; external cardiac compression; emergency cardiovascular care.*

**eccentric** (ĕk-sĕn'trĭk) [Gr. *ek*, out, + *kentron*, center] **1.** Proceeding away from a center. **2.** Peripheral. **3.** Departing from the usual, as in dress or conduct.

**eccentric muscle contraction** SEE: *muscle contraction, eccentric.*

**eccentric viewing** A method of scanning peripheral visual fields to optimize vision in patients with diseases that cause central visual loss, such as macular degeneration.

**eccentro-osteochondrodysplasia** (ĕk-sĕn'trŏ-ŏs'tĕ-ŏ-kŏn'drŏ-dĭs-plā'zhĕ-ă) [Gr. *ekkentros*, from the center, + *osteon*, bone, + *chondros*, cartilage, + *dys*, bad, + *plassein*, to form] A pathological condition of bones caused by imperfect bone formation. Ossification occurs in several different centers instead of in one common center.

**echondroma** (ĕk-ŏn-drŏ'mă) [Gr. *ek*, out, + *chondros*, cartilage, + *oma*, tumor] A chondroma or cartilaginous tumor.

**echondrotome** (ĕk-ŏn'drŏ-tŏm) [" + " + *tome*, incision] A knife for excision of cartilage.

**ecchymosis** (ĕk-ĭ-mŏ'sĭs) *pl.* **ecchymoses** [" + " + *osis*, condition] Superficial bleeding under the skin or a mucous membrane; a bruise. SEE: *illus.* **ecchymotic** (-mŏt'ĭk), *adj.*



ECCHYMOSIS OF THE LEG

**ecrine** (ĕk'rĭn) [Gr. *ekkrinein*, to secrete] Pert. to secretion, esp. of sweat. SEE: *apocrine; endocrine; exocrine.*

**ecritic** (ĕk-krĭt'ĭk) [Gr. *ekkritikos*] **1.** Promoting excretion. **2.** An agent that promotes excretion.

**ecdysis** (ĕk'dĭ-sĭs) *pl.* **ecdyses** [Gr. *ek-*

*dysis*, getting out] **1.** The shedding or sloughing off of the epidermis from the skin. SYN: *desquamation*. **2.** The shedding (molting) of the outer covering of the body as occurs in certain animals such as insects, crustaceans, and snakes.

**ECF** *extracellular fluid.*

**ECG, ecg** *electrocardiogram.*

**echidnase** (ĕ-kĭd'nās) [Gr. *echidna*, viper] An enzyme present in the venom of vipers that produces inflammation.

**echidnin** (ĕ-kĭd'nĭn) The venom of poisonous snakes.

**Echidnophaga** (ĕk'ĭd-nŏf'ă-gă) A genus of fleas belonging to the family Pulicidae.

**E. gallinacea** The sticktight flea, an important pest of poultry. It collects in clusters on the heads of poultry and in the ears of mammals. It may infest humans, esp. children.

**Echinacea angustifolia, blacksamson**

**echinacea** (ĕk-ĭ-nā'sĕ-ă ahng-gŭs'tĭ-fŏl'ĕ-ă) A native American perennial herb of the family Compositae. Its extracts have been promoted as a means of treating or preventing upper respiratory infections. Many studies of Echinacea show conflicting results based on timing of administration, dosage, and varying plant preparation. Those allergic to ragweed should not take Echinacea as there is a cross allergen sensitivity.

**Echinacea purpurea** (pŭr-pŭr'ĕă, poor') A native American perennial herb (purple coneflower) of the family Compositae. Its root and leaf extracts are promoted both for their effects on wound healing and for their impact on the treatment and prevention of respiratory infections. SEE: *illus.*



ECHINACEA PURPUREA

**echinate** (ĕk'ĭ-năt) [Gr. *echinos*, hedgehog] **1.** Spiny. **2.** In agar streak, a bacterial growth with pitted or toothed margins along the inoculation line; in stab cultures, coiled growth with pointed outgrowths. SYN: *echinulate*.

**echinocandin** (ĕ-kĭ'nŏ-kăn'dĭn) [Gr. *echinos*, hedgehog, sea urchin, + *Candida albicans*] Any of a class of antifungal drugs that block the synthesis of the fungal cell wall.

**echinococcosis** (ĕ-kī'nō-kōk-ō'sīs, ĕk'ī-nō-kōk-ō'sīs) [*"* + *kokkos*, berry, + *osis*, condition] Infestation with *Echinococcus*.

**echinococotomy** (ĕ-kī'nō-kōk-ōt'ō-mē) [*"* + *"* + *tome*, incision] An operation for evacuation of an echinococcal cyst.

**Echinococcus** (ĕ-kī'nō-kōk'ūs) *pl.* **Echinococci** A genus of very short tape-worms. Each consists of a scolex and three or four proglottids.

**E. granulosus** A species of tape-worms that infests dogs and other carnivores. Its larva, called a hydatid, develops in other mammals, including humans, and causes the formation of hydatid cysts in the liver or lungs. **SEE: illus.; hydatid.**



**ECHINOCOCCUS GRANULOSIS**

(Orig. mag. ×5)

**E. hydatidus** A variety of *Echinococcus* characterized by development of daughter cysts from the mother cyst. **SEE: hydatid.**

**echinocyte** (ĕ-kī'nō-sīt) An abnormal erythrocyte with multiple, regular, spiny projections from the surface.

**Echinostoma** (ĕk'ī-nōs'tō-mă) [*"* + *stoma*, mouth] A genus of flukes characterized by a spiny body and the presence of a collar of spines near the anterior end. They are found in the intestines of many vertebrates, esp. aquatic birds. They occasionally occur as accidental parasites in humans.

**echinulate** (ĕ-kīn'ū-lăt) Echinate.

**Echis carinatus** (ĕ'kīs kă-rī-nă'tūs) [*Gr. echis*, viper + *L. carina*, keel] The Indian saw-scaled viper. Its venom contains a prothrombin activator, a potent anticoagulant.

**echo** (ĕk'ō) [*Gr. ekho*] A reverberating sound produced when sound waves are reflected back to their source.

**amphoric e.** A sound, sometimes heard in auscultation of the chest, resembling the sound of air blown over the mouth of a bottle. **SEE: chest.**

**echocardiogram** (ĕk'ō-kăr'dē-ō-gră'm") The graphic record produced by echocardiography.

**echocardiography** (ĕk'ō-kăr'dē-ōg'ră-fē) A noninvasive diagnostic method that uses ultrasound to visualize cardiac structures. The heart's valves, walls, and chambers can be evaluated, and in-

tracardiac masses or clots can often be seen.

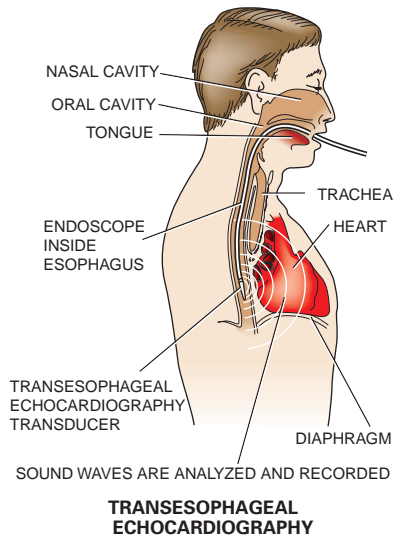
**dobutamine stress e.** ABBR: DSE. A noninvasive test for coronary artery disease in which dobutamine is given to patients to increase the workload of the heart, and then the heart is evaluated with ultrasonic imaging. Regions of the heart that do not receive adequate blood flow (ischemic regions) contract poorly during the stress of the test but normally when the patient is at rest. Heart muscle that does not contract normally either at rest or with stimulation has been injured previously by myocardial infarction.

**Doppler e.** **SEE: Doppler echocardiography.**

**multidimensional visualization e.** An experimental echocardiographic technique using computer technology for three-dimensional visualization of cardiac structures. This becomes four-dimensional when time is used to impart the cinematic perception of motion.

**stress e.** The ultrasonic identification of segments of heart muscle that do not move properly when a patient with coronary artery disease exercises or takes a vasodilating drug (e.g., adenosine or dipyridamole). Stress-induced impairments in regional heart muscle activity are used as markers of obstructions in specific coronary arteries.

**transesophageal e.** ABBR: TEE. An invasive technique for obtaining echocardiographic images in which the ultrasonographic transducer is introduced into the esophagus. TEE is useful in detecting cardiac sources of emboli, prosthetic heart valve malfunction, endocarditis, aortic dissection, cardiac tumors, and valvular and congenital heart disease. **SEE: illus.**





**transthoracic e.** ABBR: TTE. Imaging of the heart and great vessels by means of an ultrasonic transducer placed on the chest wall. Sound waves are transmitted to the underlying organs (e.g., the heart or aorta), and an image is constructed from those that rebound toward the transducer.

**echoencephalogram** (ĕk'ō-ĕn-sĕf'ă-lō-grām") Recording of the ultrasonic echoes of the brain, a technique that is rarely used since the advent of computed tomography and magnetic resonance imaging.

**echogenic** Capable of producing echoes, i.e., of intensely reflecting sound waves rather than transmitting them. SEE: *hyperechoic*.

**echogram** (ĕk'ō-grām) Sonogram

**echography** (ĕk-ōg'ră-fĕ) [" + *graph-*, to write] The use of ultrasound to image the echo produced when sound waves are reflected from tissues of different density. SEE: *ultrasonography*.

**echolalia** (ĕk-ō-lă'lĕ-ă) [" + *lalia*, talk, babble] Involuntary repetition of words spoken by others.

**echomimia** (ĕk'ō-mĭm'ĕ-ă) [" + *mimesis*, imitation] Imitation of the actions of others, as seen in schizophrenia. SYN: *echopraxia*.

**echopathy** (ĕ-kōp'ă-thĕ) [" + *pathos*, disease, suffering] Pathological repetition of another's actions and words.

**echophotony** (ĕk'ō-fōt'ō-nĕ) [" + *phos*, light, + *tonos*, tone] Mental association of certain sounds with particular colors.

**echo planar imaging** ABBR: EPI. A fast magnetic resonance imaging technique in which an image is acquired after a single radiofrequency excitation.

**echopraxia** (ĕk'ō-prăk'sĕ-ă) [" + *prax-*, to perform] Meaningless imitation of motions made by others. SYN: *echomimia*.

**echo sign** Repetition of the closing word of a sentence, a sign of epilepsy or other brain conditions.

**echotexture** (ĕk'ō-tĕks-chŭr) The characteristic pattern or structure of tissue layers as seen during ultrasonic imaging.

**echothiophate iodide** (ĕk'ō-thĭ'ō-făt) A cholinergic drug used topically in the eye for treatment of glaucoma.

**echovirus** (ĕk'ō-vĭ'rŭs) A virus belonging to the group originally known as *Enteric Cytopathogenic Human Orphan* group. They are associated with aseptic meningitis, enteritis, myocarditis, myositis, and pleurodynia.

**Eck's fistula** (ĕks) [N. V. Eck, Russian physiologist, 1847-1908] An artificial communication between the portal vein and the inferior vena cava, used in experimental surgery in animals.

**eclabion** [Gr. *ek*, out, + L. *labium*, lip]

A turning outward of the lips seen, e.g., in some skin diseases of newborns.

**eclampsia** (ĕ-klămp'sĕ-ă) [" + *lampein*, to shine] A severe hypertensive disorder of pregnancy characterized by convulsions and coma, typically occurring between 20 weeks' gestation and the end of the first postpartum week (and rarely, seen as long as 4 weeks postpartum). Eclampsia is the most serious complication of pregnancy-induced hypertension (PIH). It occurs in 0.5% to 4.0% of all deliveries; roughly 25% of seizures occur within the first 72 hr of delivery. Perinatal maternal mortality is about 1%. Neonatal mortality (about 12%) usually occurs because of fetal hypoxia, complications of premature birth, inadequate intrauterine growth, or abrupt separation of the placenta. SEE: *pregnancy-induced hypertension*.

**ETIOLOGY:** Although the cause is unknown, vasospasm is one of the underlying mechanisms. Risk factors for the disorder include nulliparity, advanced maternal age, maternal hypertension or renal disease, diabetes mellitus, collagen-vascular disorder, molar pregnancy, and multifetal pregnancies. SEE: *pre-eclampsia*.

**SYMPTOMS:** The woman experiences several seizures often without warning, but sometimes preceded by severe headache or an increase in deep tendon reflexes. Coma, which follows the convulsive episode, may be short or persist for more than an hour. Without treatment, seizures may recur within minutes. Other symptoms may include abdominal pain and edema and multiorgan dysfunction. SEE: *epilepsy*.

**TREATMENT:** Immediate and effective seizure management is vital. The mother's airway should be secured, and oxygenation and ventilation provided. The patient should be turned to her left side. In the attempt to abort subsequent seizure activity, an intravenous bolus and a continuous infusion of magnesium sulfate are administered. Intravenous drugs are used to control maternal blood pressure. Oxygen is administered at 8 to 10 L/m and the fetus electronically monitored. An indwelling catheter is inserted and hourly output measured; oliguria is an ominous sign that may indicate renal failure or magnesium toxicity. The mother should be assessed for evidence of placental abruption: vaginal bleeding, tachycardia and hypotension, abdominal or uterine tenderness or contractions, and decreased fetal heart tones. Once the mother's condition is stabilized, induction of labor or cesarean delivery is indicated in pregnancies of 24-28 weeks duration. It is better to give regional anesthesia rather than general anesthesia to assist delivery.

**PATIENT CARE:** Emergency care is provided during convulsions, and prescribed medications are administered as directed. Postseizure, a quiet, darkened environment is provided until the patient is stabilized. The patient is maintained in a left-lateral position to increase venous return, cardiac output, renal blood flow, and placental perfusion. Because of the risk of aspiration, the eclamptic mother is given nothing by mouth. Side rails should be padded and kept elevated to protect the patient from injury during any further seizures. Both fetal and maternal response to magnesium sulfate must be monitored closely because of the risk of toxicity. Signs of maternal magnesium toxicity include absence of patellar reflexes, respiratory rate less than 12 breaths/min, urinary output less than 30 ml/hr, serum magnesium level greater than 8 mg/dl, flushing and muscle flaccidity, fetal bradycardia, or severe maternal hypotension. Calcium gluconate must be immediately available at bedside to counteract the effects of magnesium therapy. Stress and nonstress tests are used to monitor for fetal hypoxemia. The health care provider also must be particularly alert to signs of impending labor and abruptio placentae. Emergency resuscitative equipment and drugs should be readily available in case of seizure or cardiac or respiratory arrest.

Emotional support and information are given to the woman and her family. Postdelivery assessments vary in frequency depending on the woman's condition, eventually decreasing to every 4 hr for 48 hr postpartum. If the patient received magnesium sulfate prior to delivery, the infusion should be continued for 24 hr postdelivery, with antihypertensive drugs administered as prescribed. Infants of eclamptic mothers may be small for gestational age and will require close monitoring for this condition. SEE: *Patient Care* under *pregnancy-induced hypertension*.

**eclamptic** Rel. to, or of the nature of, eclampsia.

**eclampsogenic** (ĕk-lămp"tō-jĕn'ĭk) [Gr. *ek*, out, + *lampein*, to shine, + *gennan*, to produce] Causing eclampsia.

**eclectic** (ĕk-lĕk'tĭk) [Gr. *eklektikos*, selecting] Selecting what elements seem best from various sources.

**eclecticism** (ĕk-lĕk'tĭ-sĭzm) ["/ + *ismos*, state of] A system of herbal medical practice popularized in the late 19th and early 20th centuries by Finley Ellingwood.

**eclipse phase** (ĭ-klĭps') [L. fm. Gr. *ekleipsis*, failure to appear] That phase of the viral life cycle during which a virus enters a cell to parasitize it. The eclipse phase of the viral life cycle includes 1.

the attachment of the virus to the cell membrane, 2. the penetration of the cell by the virus, and 3. the uncoating of the virus once it has entered the cytoplasm.

**ECM** *erythema chronicum migrans*.

**ecmnesia** (ĕk-nĕ'zĕ-ă) [Gr. *ek*, out, + *mnesis*, memory] A term formerly used to indicate impaired recall of recent events.

**ECMO** *extracorporeal membrane oxygenator*.

**EC-Naprosyn** SEE: *naproxen*.

**ecocide** (ĕk"ō-sĭd') [Gr. *oikos*, house, + L. *caedere*, to kill] Willful destruction of some portion of the environment.

**E. coli** *Escherichia coli*.

**ecological fallacy** In epidemiology, the erroneous attempt to determine an individual's specific risk of developing a disease from an analysis of the risk at large found in the study of a community or population.

**ecological terrorism** The threat to use violent acts that would harm the quality of the environment in order to blackmail a group or society.

**ecology** (ĕ-kŏl'ō-jĕ) [Gr. *oikos*, house, + *logos*, word, reason] The science of the relationship of organisms to their environment, including the interactions among organisms. SEE: *food chain*.

**e. of human performance** ABBR:

EHP. A conceptual framework for occupational therapy practice aimed at improving task performance by considering the person's skills and experiences, the context of the situation in which a task is performed, and the nature of the task. Interventions include altering the context of task performance to make it more supportive or a better match for the person's skills and remediate a person's skill deficits, among others.

**ecomap** (ĕk'ō-măp") A family interview and assessment tool that delineates the needs, patterns, and relationships among family members and the environment.

**Economó's disease** (ĕ-kŏn'ō-mŏz) Encephalitis lethargica.

**economy of movement** [Gr. *oikos*, house, + *nomos*, law] The efficient, energy-saving motion or activity of the system or body.

**écorché** (ă'kor-shă') [Fr.] A representation of an animal or human form without skin so that the muscles are clearly seen.

**ecosphere** (ĕk'ō-sfĕr") [Gr. *oikos*, house, + L. *sphera*, ball] The portions of the earth habitable by microorganisms, plants, and animals.

**ecostate** (ĕ-kŏs'tăt) [L. *e*, without, + *costa*, rib] Without ribs.

**ecosystem** (ĕk'ō-sĭs'tĕm) A defined portion of the environment (e.g. lake, tundra, desert), including all its living organisms.

**écouvillonnage** (ā-koo"vē-yō-nāzh') [Fr. *ecouvillon*, a stiff brush or swab] The cleansing and application of remedies to a cavity by means of a brush or swab.

**écrasement** (ā-krāz-mōn') [Fr.] Excision by means of an *écraseur*.

**écraseur** (ā-krā-zēr') [Fr., crusher] A wire loop used for excisions.

**ecstasy** (ĕk'stā-sē) [Gr. *ekstasis*, a standing out] **1.** An exhilarated, trance-like condition or state of exalted delight. **2.** A synthetic, psychoactive, amphetamine-like drug, 3,4-methylenedioxyamphetamine (MDMA). Known colloquially as "lemon drops." In the U.S., 15% of teenagers have used the drug illicitly. It is most often used as a euphoric agent (e.g., at dance parties called "raves"). The powder is snorted, or dissolved in water or alcohol for ingestion or injection; the crystals usually are smoked. It was prescribed in the 1970s in some forms of psychotherapy. Use of the drug has been associated with hyperthermia, disseminated intravascular coagulation, liver damage, hallucinations, convulsions, coma, and death.

**TREATMENT:** The priorities of emergency care are to control agitation, prevent or treat convulsions, measure the core temperature, and reverse hyperthermia by rapid rehydration and active cooling measures.

**PATIENT CARE:** The patient who has overdosed on ecstasy may be brought to the ER by a friend, usually with symptoms such as nausea and vomiting, dry mouth, bruxism, muscle ache or stiffness, ataxia, sweating, dilated pupils, hypertension, or tachycardia. Nystagmus, hypotension, paranoia, hallucinations, and seizures may also be present. Fever is a serious finding: severely hyperthermic patients (i.e., with a body temperature above 103°F) should be cooled with cooling blankets, rehydration, iced saline gastric lavage, convection evaporation, or other means. Neuromuscular blocking agents and muscle relaxants are often used to minimize muscle contraction, esp. shivering, which causes additional heat production. Agitation and seizures should be treated with prescribed benzodiazepines (e.g., diazepam), haloperidol, and long-acting anticonvulsants. Hypertension may be treated with drugs such as labetalol, which may be titrated intravenously until blood pressure (BP) is controlled. Urine and blood toxicology screening should be performed as quickly as possible. Blood cultures, electrolyte levels, blood urea nitrogen (BUN), creatinine, liver profile, troponin-I, and creatinine kinase levels can help assess the patient for complications of drug overdose (e.g., rhabdomyolysis or acute coronary syndromes) and

assist in the differential diagnosis. The overdosed patient should be treated as gently as possible and be kept in quiet surroundings. While the patient may initially appear lethargic, he or she may suddenly become combative and require sedation. Seizure pads may be used to protect the patient from injury; mechanical restraints are used only if absolutely necessary because they may exacerbate combativeness. The patient should also be frequently reoriented to allay his fears, and necessary procedures should be explained to him. Severely ill overdose patients must be admitted to intensive care units for monitoring and support. Before the patient is discharged, he or she should be taught the risks of abusing stimulants and hallucinogens and be encouraged to seek appropriate substance-abuse counseling. Testing for hepatitis and HIV should be carried out if IV drug use places the patient at risk for these diseases.

**ECT** *electroconvulsive therapy*.

**ectasia, ectasis** (ĕk-tā'sē-ā, ĕk'tā-sīs) [Gr. *ek*, out, + *teinein*, to stretch] Dilatation of any tubular vessel.

**dural e.** A dilatation of the membranes that line the lumbosacral spine, typically seen in patients with Marfan's syndrome.

**hypostatic e.** Dilatation of a blood vessel from the pooling of blood in dependent parts, esp. the legs.

**e. iridis** Small size of the pupil of the eye caused by displacement of the iris.

**-ectasis** Suffix meaning *dilatation* or *expansion*.

**ectatic** (ĕk-tāt'ĭk) Distensible or capable of being stretched.

**ectental** (ĕk-tĕn'tāl) [Gr. *ektos*, without, + *entos*, within] Pert. to the endoderm and ectoderm.

**ecthyma** (ĕk-thī'mā) [Gr. *ek*, out, + *thyein*, to rush] A crusting skin infection caused by pyogenic streptococci. It is similar to impetigo but extends more fully into the epidermis. Typically lesions are found on the shins or the dorsum of the feet.

**TREATMENT:** Topical skin cleansing, mupirocin ointment, and/or oral antibiotics (such as clindamycin) are needed to eradicate the infection.

**ectiris** (ĕk-t'ĭrīs) [Gr. *ektos*, outside, + *iris*, iris] The external portion of the iris.

**ecto-** [Gr. *ektos*, outside] Combining form meaning *outside*.

**ectoantigen** (ĕk'tō-ān'ti-gĕn) [" + *anti*, against, + *gennan*, to produce] A surface antigen of bacteria that may be separated from them by agitation.

**ectoblast** (ĕk'tō-blāst) [" + *blastos*, germ] **1.** The outer layer of cells (the "epithelium") of an embryo. **2.** The ectoderm.



**ectocardia** (ĕk'tō-kār'dē-ă) [*l'* + *kar-dia*, heart] Displacement of the heart.

**ectocervix** (ĕk'tō-sēr'vīks) The portion of the canal of the uterine cervix that is lined with squamous epithelium. **ectocervical** (-sēr'vī-kāl), *adj.*

**ectochoroidea** (ĕk'tō-kō-roy'dē-ă) [*l'* + *chorioeides*, choroid] The outer layer of the choroid coat of the eye.

**ectochondyle** (ĕk'tō-kōn'dīl) [*l'* + *condylos*, knuckle] The outer condyle of a bone.

**ectocornea** (ĕk-tō-kor'nē-ă) [*l'* + *L. corneus*, horny] The external layer of the cornea.

**ectocuneiform** (ĕk-tō-kū'nē-ī-form) [*l'* + *L. cuneus*, wedge, + *forma*, form] The most lateral of the three cuneiform bones.

**ectodactylism** (ĕk'tō-dāk'tīl-īzm) [*Gr. ektrosis*, miscarriage, + *daktylos*, finger, + *ismos*, state of] Lack of a digit or digits.

**ectoderm** (ĕk'tō-dĕrm) [*Gr. ektos*, outside, + *derma*, skin] The outer layer of cells in an embryo. SYN: *epiblast*. SEE: *endoderm*; *mesoderm*. **ectodermal**, **ectodermic** (-ăl, -īk), *adj.*

**ectoentad** (ĕk'tō-ĕn'tād) [*l'* + *entos*, within] From the outside inward.

**ectogenous** (ĕk-tōj'ĕ-nūs) [*l'* + *gennan*, to produce] 1. Originating outside a body or structure, as infection. 2. Able to grow outside the body, as a parasite.

**ectogony** (ĕk-tōg'ō-nē) [*l'* + *gone*, seed] Influence of the embryo on the mother.

**ectolecithal** (ĕk'tō-lĕs'ī-thāl) [*l'* + *leki-thos*, yolk] Pert. to an ovum having food yolk placed near the surface.

**ectomere** (ĕk'tō-mĕr) [*l'* + *meros*, part] One of the blastomeres forming the ectoderm.

**ectomorph** (ĕk'tō-morf) [*l'* + *morphe*, form] A person with a body build marked by predominance of tissues derived from the ectoderm. The body is linear with sparse muscular development. SEE: *endomorph*; *mesomorph*; *somatotype*.

**-ectomy** (ĕk'tō-mĕ) [*Gr. ektome*] Combining form meaning *surgical excision* of any anatomical structure.

**ectopagus** (ĕk-tōp'ă-gūs) [*l'* + *pagos*, something fixed] An abnormal fetus consisting of twins fused at the thorax.

**ectoparasite** (ĕk'tō-pār'ă-sīt') [*l'* + *Gr. parasitos*, parasite] Any parasite that thrives in or on the skin; such as fleas, lice, maggots, mites, ticks.

**ectoperitonitis** (ĕk'tō-pĕr'ī-tō-nī'tīs) [*l'* + *peritonaion*, peritoneum, + *itis*, inflammation] Inflammation of the parietal layer of the peritoneum (the layer lining the abdominal wall).

**ectophyte** (ĕk'tō-fit) [*l'* + *phyton*, plant] A plant parasite that grows on the surface of a host.

**ectopia** (ĕk-tō'pĕ-ă) [*Gr. ektopos*, dis-

placed] Malposition or displacement, esp. congenital, of an organ or structure.

**cervical e.** The presence of glandular cells (which are normally found within the cervical canal) on the surface of the cervix.

**e. cordis** A malposition of the heart in which it lies outside the thoracic cavity.

**e. lentis** Displacement of the crystalline lens of the eye.

**e. pupillae congenita** Congenital displacement of the pupil.

**e. renis** Displacement of the kidney.

**e. testis** Displacement of the testis.

**e. vesicae** Displacement, esp. exstrophy, of the bladder.

**visceral e.** Umbilical hernia.

**ectopic** (ĕk-tōp'īk) In an abnormal position. Opposite of entopic.

**ectopic beat, complex** Any electrical activation of the heart that originates outside the sinoatrial node.

**ectopic hormone production** The secretion of hormones by nonendocrine tissue. Ectopically produced hormones may arise from both benign and malignant tissues.

**ectopic secretion** (ĕk-tōp'īk) Ectopic hormone production.

**ectoplasm** (ĕk'tō-plāzm) [*Gr. ektos*, outside, + *LL. plasma*, form, mold] The outermost layer of cell protoplasm. **ectoplasmic**, **ectoplasmic** (ĕk'tō-plāz'mīk, ĕk'tō-plās'tīk), *adj.*

**ectopotomy** (ĕk-tō-pōt'ō-mĕ) [*Gr. ektopos*, displaced, + *tome*, incision] Removal of the fetus in ectopic pregnancy.

**ectopy** (ĕk'tō-pĕ) [*Gr. ektopos*, displaced] Displacement of an organ or structure. SYN: *ectopia*.

**ectoretina** (ĕk'tō-rĕt'ī-nă) [*Gr. ektos*, outside, + *L. rete*, net] The outer layer of the retina.

**ectostosis** (ĕk-tōs-tō'sīs) [*l'* + *osteon*, bone, + *osis*, condition] Formation of bone beneath the periosteum.

**ectotherm** (ĕk'tō-thĕrm") An organism whose body temperature varies according to the temperature of the environment; the opposite of *endotherm*. SYN: *poikilotherm*.

**ectothrix** (ĕk'tō-thrīks) [*l'* + *thrix*, hair] Any fungus that produces arthrospores on the hair shafts.

**Ectotrichophyton** (ĕk'tō-trī-kōf'ī-tōn) [*l'* + *thrix*, hair, + *phyton*, plant] A former name for *Trichophyton megalosporon ectothrix*.

**ectozoon** (ĕk-tō-zō'ōn) [*l'* + *zoon*, animal] A parasitic animal that lives on the outside of another animal.

**ectro-** [*Gr. ektrosis*, miscarriage] Combining form meaning *congenital absence*.

**ectrodactylism** (ĕk'trō-dāk'tīl-īzm) [*l'* + *daktylos*, finger, + *-ismos*, state of] Congenital absence of all or part of a digit.

**ectromelia** (ĕk"trō-mē'lē-ă) [*l'* + *melos*, limb] Hypoplasia of the long bones of the limbs.

**ectromelus** (ĕk-trōm'ĕ-lūs) [*l'* + *melos*, limb] An individual with ectromelia.

**ectropic** (ĕk-trō'pĭk) [Gr. *ek*, out, + *trope*, turning] Pert. to complete or partial eversion of a part, generally the eyelid.

**ectropion** (ĕk-trō'pē-ōn) Eversion of an edge or margin, as the edge of an eyelid.

**ETIOLOGY:** Causes include aging or loss of tone of the skin, scarring, infection, and palsy of the facial nerve.

**ectrosyndactyly** (ĕk"trō-sin-dăk'ti-lē) [*l'* + *syn*, together, + *dactylos*, finger] Congenital absence of one or more fingers; the remaining fingers are fused together.

**eczema** (ĕk'zē-mă) [Gr. *ekzein*, to boil out] A general term for an itchy red rash that initially weeps or oozes serum and may become crusted, thickened, or scaly. Eczematous rash may result from various causes, including allergies, irritating chemicals, drugs, scratching or rubbing the skin, or sun exposure. It may be acute or chronic. The rash may become secondarily infected. SEE: *dermatitis*.

**TREATMENT:** Avoiding the cause of the rash (e.g., a sun-sensitizing drug; the leaves of the poison oak plant; an irritating soap or perfume) prevents recurrences and allows the skin to heal. Locally applied astringent solutions (such as Burow's solution), antihistamines, or corticosteroid ointments, tablets, or injections may relieve the inflammation.

**PATIENT CARE:** Patients are helped to identify and avoid allergens in their diet or environment. Clothing should be soft textured, preferably cotton, and washed in a mild detergent and rinsed thoroughly. Fingernails should be kept short to decrease damage from scratching. Antihistamines may help to reduce itching at night. Maintaining a room temperature below 72°F, using humidifiers during the winter, and bathing in tepid water help keep the skin hydrated and decrease itching. SEE: *Nursing Diagnoses Appendix; Standard Precautions Appendix*.

**asteatotic e.** SYN: *winter itch*.

**dyshidrotic e.** Pompholyx.

**erythematous e.** Dry, pinkish, ill-defined patches with itching and burning; slight swelling with tendency to spread and coalesce; branny scaling; roughness and dryness of skin. This type may become generalized.

**e. herpeticum** Massive crops of vesicles that become pustular, occurring when herpes simplex virus infection occurs in a person, usually an infant, with pre-existing eczema. SYN: *Kaposi's varicelliform eruption*.

**lichenoid e.** Eczema with thickening of the skin.

**nummular e.** Eczema with coin-shaped or oval lesions. It is often associated with dry skin and worsens in dry weather. SEE: *illus*.



NUMMULAR ECZEMA

**pustular e.** Follicular, impetiginous, or consecutive eczema including eczema rubrum (red, glazed surface with little oozing), eczema madidans (raw, red, and covered with moisture), eczema fissum (thick, dry, inelastic skin with cracks and fissures), and squamous eczema (chronic on soles, legs, scalp; multiple circumscribed, infiltrated patches with thin, dry scales).

**seborrhic e.** Eczema marked by excessive secretion from the sebaceous glands. SYN: *seborrhea*.

**vaccinatum e.** The spreading of vaccinia virus to localized areas of skin, or to the entire body, in patients recently vaccinated against smallpox. This reaction is a rare complication of smallpox vaccination, occurring in about 40 per million of newly vaccinated individuals. It usually occurs in people with pre-existing eczema and is occasionally fatal.

**eczematous** (ĕk-zēm'ă-tūs) Marked by or resembling eczema.

**ED** *effective dose; erythema dose*.

**ED<sub>50</sub>** The median effective dose, producing the desired effect in 50% of subjects tested.

**E.D.** *Emergency Department*.

**EDC** *expected date of confinement*.

**EDD** *expected date of delivery*.

**edema, oedema** (ē-dē'mă) *pl.* **edemas** or **edemata** [Gr. *oidema*, swelling] A local or generalized condition in which body tissues contain an excessive amount of tissue fluid in the interstitial spaces. *Ascites* and *hydrothorax* and *pericardial effusion* are words for third spacing of excess fluid in the peritoneal and pleural cavities and the pericardium, respectively. Generalized edema was previously termed *dropsy*; it is now known as *anasarca*. SEE: *illus. edematous* (-ăt-ūs), *adj.*

**ETIOLOGY:** Edema may result from increased permeability of the capillary walls; increased capillary pressure due to venous obstruction or heart failure;



### EDEMA

Edematous arm caused by subclavian vein stenosis

lymphatic obstruction; disturbances in renal function; reduction of plasma proteins; inflammatory conditions; fluid and electrolyte disturbances, particularly those causing sodium retention; malnutrition; starvation; or chemical substances such as bacterial toxins, venoms, caustics, and histamine. Diagnostic studies (e.g., a thorough history, physical examination, urinalysis, serum chemistries and liver functions, thyroid function, and chest x-ray) help to determine the cause and guide treatment.

**TREATMENT:** Bed rest helps relieve lower extremity edema. Sitting with the feet and legs elevated also may reduce edema in the lower extremities. Dietary salt should be restricted to less than 2 g/day. Fluid intake may be restricted to about 1500 ml in 24 hr. This prescription may be relaxed when free diuresis has been attained. Diuretics relieve swelling when renal function is good and when any underlying abnormality of cardiac function, capillary pressure, or salt retention is being corrected simultaneously. One of various effective diuretics may be used. Diuretics are contraindicated in pre-eclampsia and when serum potassium levels are very low (e.g., less than 3.0 mEq/dl). They may be ineffective in edema associated with advanced renal insufficiency. The diet in edema should be adequate in protein, high in calories, and rich in vitamins. Patients with significant edema should weigh themselves daily to gauge fluid loss or retention.

**PATIENT CARE:** Edema is documented according to type (pitting, non-pitting, or brawny), extent, location, symmetry, and degree of pitting. Areas over bony prominences are palpated for edema by pressing with the fingertip for 5 sec, then releasing. Normally, the tissue should immediately rebound to its original contour, so the depth of indentation is measured and recorded. The patient is questioned about increased tightness of rings, shoes, waistlines of

garments, and belts. Periorbital edema is assessed; abdominal girth and ankle circumference are measured; and the patient's weight and fluid intake and output are monitored. Fragile edematous tissues are protected from damage by careful handling and positioning and by providing and teaching about special skin care. Edematous extremities are mobilized and elevated to promote venous return, and lung sounds auscultated for evidence of increasing pulmonary congestion. Prescribed therapies, including sodium restriction, diuretics, ACE inhibitors, protein replacement, and elastic stockings or other elastic support garments, are provided, and the patient is instructed in their use.

**angioneurotic e.** Angioedema.

**brain e.** Swelling of the brain. It may be caused by a variety of conditions, including increased permeability of brain capillary endothelial cells, focal strokes or other lesions, swelling of brain cells associated with hypoxia or water intoxication, trauma to the skull, and interstitial edema resulting from obstructive hydrocephalus. SYN: *brain swelling; cerebral edema.*

**e. bullosum vesicae** A form of edema affecting the bladder.

**cardiac e.** Accumulation of fluid due to congestive heart failure. It is most apparent in the dependent portion of the body and/or the lungs.

**cerebral e.** Brain e.

**dependent e.** Edema or swelling of the lower extremities or, if the patient is lying down, of the sacrum.

**high-altitude pulmonary e.** ABBR: HAPE. Pulmonary edema that may occur in aviators, mountain climbers, or anyone exposed to decreased atmospheric pressure. SEE: *hypoxia.*

**inflammatory e.** Edema associated with inflammation. The cause is assumed to be damage to the capillary endothelium. It is usually nonpitting and localized, red, tender, and warm.

**laryngeal e.** Swelling of the larynx, usually resulting from allergic reaction and causing airway obstruction unless treated. Therapy consists of intravenous or intratracheal epinephrine, emergency tracheostomy, or both.

**malignant e.** Rapid destruction of tissue by cutaneous or subcutaneous infections, such as anthrax or clostridial species.

**e. neonatorum** Edema in newborn, esp. premature, infants. This condition is usually transitory, involving the hands, face, feet, and genitalia, and rarely becomes generalized.

**pitting e.** Evidence of fluid in soft tissues, esp. those of dependent body parts like the lower extremities. When pressed firmly with a finger, tissues that are swollen with extravascular fluid re-

tain the shape of the depression produced by the finger. **SEE: illus.**



### PITTING EDEMA

Demonstration of pitting edema of the foot



**pulmonary e.** A potentially life-threatening accumulation of fluid in the interstitium and alveoli of the lungs. The collected fluid may block the exchange of oxygen and carbon dioxide and produce respiratory failure. **SEE: *Nursing Diagnoses Appendix.***

**ETIOLOGY:** Fluid may seep out of the alveolar capillaries if these blood vessels are damaged and become excessively permeable to liquids (noncardiogenic pulmonary edema) or if hydrostatic pressures within blood vessels exceed the strength of the normal alveolar capillary wall (cardiogenic pulmonary edema). Cardiogenic pulmonary edema can result from any condition that compromises left ventricular function, causing elevations in pulmonary venous and capillary hydrostatic pressures (congestive heart failure), including myocardial infarction, ischemia, or myocardial stunning; severe valvular heart disease; arrhythmias; excessive intravenous fluid administration; and diastolic dysfunction, among others.

Noncardiogenic pulmonary edema usually results from blood vessel injury, as occurs in the adult respiratory distress syndrome (sepsis, shock, aspiration pneumonia, airway obstruction). Occasionally protein-rich fluid floods the lungs as a result of drug exposure (e.g., heroin overdose), hypoalbuminemia, high-altitude exposure (mountain sickness), fresh water aspiration in near drowning, hemorrhage in or around the brain, or other conditions. Pulmonary edema can occur as a chronic or acute condition.

**SYMPTOMS:** Chronic symptoms include dyspnea or exertion, nocturnal dyspnea, orthopnea, and cough. When pulmonary edema develops rapidly, patients experience a rapid onset of shortness of breath and suffocation and often demonstrate labored, noisy breathing; cough productive of frothy, bloody sputum; air hunger; anxiety; palpitations; and altered mental status caused by inadequate oxygenation. Signs of the con-

dition include a rapid respiratory rate, heaving of the chest and abdomen, intercostal muscle retractions, diffuse crackles on lung exam, and often, cold, clammy skin with diaphoresis and cyanosis. Tachycardia, jugular vein distension, and a diastolic (S3) gallop occur. As cardiac output decreases, the pulse becomes thready and blood pressure falls. Pulmonary artery catheterization helps identify left-sided failure (elevated pulmonary wedge pressures), and arterial blood gases show hypoxia. Profound respiratory alkalosis occurs when patients hyperventilate when trying to increase their oxygenation; acidosis may occur with respiratory fatigue and failure. To improve the movement of air into and out of the chest, the patient will often sit upright to breathe and resist lying down.

**TREATMENT:** Oxygen (in high concentrations by cannula, face mask, or nonrebreather mask) should be administered immediately. Assisted ventilation (continuous positive airway pressure (CPAP) or intubation with mechanical ventilation) may be needed to reach acceptable levels of PaO<sub>2</sub> and improve acid-base balance. Morphine sulfate, nitrate vasodilators (IV nitroglycerin or nitroprusside and loop diuretics are typically given to patients with cardiogenic pulmonary edema to improve dyspnea, alter preload and afterload on the heart, and promote diuresis. Angiotensin-converting enzyme inhibitors, inotropic drugs (digoxin), antiarrhythmic agents, beta-adrenergic blockers, human B-type natriuretic peptide, and phosphodiesterase inhibitors may be used in selected circumstances. Bronchodilators also may be administered. Depending on the underlying cause, invasive interventions may occasionally include coronary angiography, intra-aortic balloon pump therapy, or surgical interventions such as coronary artery revascularization or valve repair, or ventricular assist device therapy.

**PROGNOSIS:** The outlook is good if the condition is stabilized or reversed with treatment.

**PATIENT CARE:** The patient's head is elevated; respirations and ventilatory effort are assessed. Oxygen is administered as prescribed, with care taken to limit the flow rate in patients whose respiratory drive is compromised. The lungs are auscultated for adventitious breath sounds, such as crackles, gurgles, and wheezes, and the heart is assessed for apical rate and gallops. The patient is monitored for a cough productive of pink, frothy sputum. His or her skin is checked for diaphoresis and pallor or cyanosis. A medication history is collected, especially for cardiac or re-



spiratory drugs and use of recreational drugs. The patient's cardiac rate and rhythm, blood pressure, and oxygen saturation levels are monitored continuously. An intravenous (IV) line administering normal saline solution (NSS) is inserted at a keep-vein-open rate to provide access for medication administration. Prescribed first-line drug therapy is administered, and the patient's response to the drugs is evaluated. IV morphine slows respirations, improves hemodynamics, and reduces anxiety. It should be administered prior to initiating continuous positive air pressure (CPAP). CPAP, in turn, improves oxygenation and decreases cardiac workload, thus decreasing the need for intubation and ventilation with positive end-expiratory pressure (PEEP). An indwelling urinary catheter is inserted to accurately monitor the patient's fluid status; diuresis should begin within 30 minutes of administration of an IV loop diuretic. Pulmonary edema is a life-threatening respiratory emergency. All individuals involved with the patient through this crisis must remain as calm and quiet as possible, provide ongoing reassurance, and validate everything occurring through basic and simply understood explanations. After the crisis resolves, health care providers should discuss with the patient his or her feelings about the episode and give in-depth explanations of what occurred. The at-risk patient is taught early warning signs to act on immediately (such as weight gain or increasing peripheral edema), in an effort to recognize and prevent future episodes. Medications and dietary and lifestyle restrictions are explained (low-sodium diet, losing weight, smoking cessation), and written information provided for home review. The patient should be encouraged to enroll in a cardiac rehabilitation program (as applicable) for regular exercise tailored to his condition.

**purulent e.** Swelling caused by a local collection of pus.

**salt-induced e.** A form of edema worsened by excess sodium in the diet.

**edematogenic** (ĕ-dĕm'ă-tō-jĕn'ĭk) Causing edema.

**edentulous** (ĕ-dĕnt'ū-lūs) Without teeth.

**edetate calcium disodium** (ĕd'ĕ-tăt) The disodium salt of ethylenediaminetetra-acetic acid. A chelating agent, it is used in diagnosing and treating lead poisoning. Trade names are Calcium Disodium Versenate and Versene CA.

**edetate disodium** (ĕd'ĕ-tăt dī-sō' dē-ŭm) A chelating agent, disodium dihydrogen ethylenediaminetetra-acetate dihydrate. It is used to treat hypercalcemia.

**edge** A margin or border.

**bevel e.** A tooth edge produced by beveling.

**cutting e.** An angled or sharpened edge for cutting, as an incisor tooth or the blade of a knife.

**denture e.** The margin or border of a denture.

**incisal e.** The sharpened edge of a tooth produced by occlusal wear; the labiolingual margin.

**edible** (ĕd'ĭ-bl) [L. *edere*, to eat] Suitable for food; fit to eat; nonpoisonous.

**editosome** (ĕ-dĭt'ō-sōm") [Fr. *editer*, to edit + Gr. *soma*, body] An intracellular protein complex that processes RNA, altering it from its original form into its final, mature form.

**edrophonium chloride** (ĕd'rō-fō'nĕ-ŭm) A cholinergic drug. SEE: *edrophonium test*.

**edrophonium test** The use of edrophonium chloride to test for the presence of myasthenia gravis. The appropriate dose is injected intravenously; if there is no effect, a larger dose is given within 45 sec. A positive test demonstrates brief improvement in strength unaccompanied by lingual fasciculation. The test may also be used to determine an overdose of a cholinergic drug. An excessive dose of cholinergic drug produces weakness that closely resembles myasthenia. A very small dose of edrophonium chloride given intravenously worsens the weakness if it is due to cholinergic drug overdose and improves it if it is due to myasthenia gravis.



The test should not be performed unless facilities and staff for respiratory resuscitation are immediately available.

**EDTA** *Ethylene diamine tetracetic acid.*

**education** (ĕj'oo-kă'shŭn) [L. *educatio*] Imparting, receiving, or acquiring knowledge.

**distance e.** The dissemination of knowledge between teachers and students who are separated in space, time, or both.

**e-nursing e.** Nursing education aided or wholly provided via online resources, texts, clips, and discussion groups, among other Web-based technologies.

**innovation in nursing e.** Organized efforts to promote the education of new nursing students, including those that improve the recruiting of new students, improve the quality of nursing scholarship and didactics, and train nurse leaders for the future.

**educational audiologist** An audiologist who works in a school and who screens pupils for evidence of hearing loss that may affect their ability to learn.

**educator** (ĕj'oo-kă'tĕr) A person who



demonstrates, instructs, leads, or teaches clients, families, patients, or students.

**eduction** (ē-dŭk'shŭn) [L. *e*, out, + *ducere*, to lead] Emergence from a particular state or condition (e.g., coming out of the effects of general anesthesia). SEE: *induction* (4).

**Edwards' syndrome** (ēd'wārdz) [James H. Edwards, U.S. geneticist, b. 1928] Trisomy 18.

**EE** *coefficient of elastic expansion.*

**EEE** *eastern equine encephalitis.*

**EEG** *electroencephalogram.*

**EENT** *eyes, ears, nose, and throat.*

**EEOC** *Equal Employment Opportunity Commission.*

**EFA** *essential fatty acid.*

**efacement** (ē-fās'mēnt) In obstetrics, the thinning of the cervix as the internal os is slowly pulled up into the lower uterine segment.

**effect** (ē-fēkt') [L. *effectus*, to accomplish] The result of an action or force. Particular effects are listed under the first word. SEE: *cumulative effect*; *Doppler effect*; *side effect*.

**effectiveness** (ē-fēk'tiv-nēs) The ability to cause the expected or intended effect or result.

**effective radiating area** ABBR: ERA. The area of a therapeutic ultrasound head that produces useful ultrasonic energy, measured in square centimeters (cm<sup>2</sup>). The effective radiating area is calculated by identifying all points where the ultrasonic energy is at least 5% of the maximum measured intensity at the transducer's surface.

**effector** (ē-fēk'tor) A cell, tissue, or organ that produces the final result of a stimulus. SYN: *effector organ*.

**effector cell** An active cell of the immune system responsible for destroying or controlling foreign antigens. SEE: *leukocyte*.

**effector organ** Effector.

**effeminate** (ē-fēm'-i-nā) 1. Pert. to a male who has the appearance or mannerisms traditionally considered feminine. 2. Excessively soft, delicate, or self-indulgent.

**effemination** (ē-fēm'ī-nā'shŭn) [L. *effeminare*, to make feminine] The production of female physical characteristics in a male. SYN: *feminization*.

**effluent** (ēf'ēr-ēnt) [L. *efflrens*, to bring out] Carrying away from a central organ or section, as efferent nerves, which conduct impulses from the brain or spinal cord to the periphery; efferent lymph vessels, which convey lymph from lymph nodes; and efferent arterioles, which carry blood from glomeruli of the kidney. Opposite of afferent.

**effervesce** (ēf'ēr-vēs') [L. *effervesce*, to boil up] To boil or form bubbles on the surface of a liquid.

**effervescence** (ēf-ēr-vēs'ēns) Formation

of gas bubbles that rise to the surface of a fluid.

**effervescent** Bubbling; rising in little bubbles of gas.

**Effexor XR** (ē-fēk'sōr) SEE: *venlafaxine*.

**efficacy** The ability to produce a desired effect.

**efficiency** (i-fish'in-sē) [L. *efficiencia*] The optimal use of resources, e.g., chemical reagents in a laboratory, human resources in an institution, or health care dollars in a governmentally administered public health program.

**effleurage** (ēf'lē-rāzh) A massage technique that employs gentle hand movements along the long axis of limbs or muscles.

**abdominal e.** Light stroking with the fingertips in a circular pattern from the symphysis pubis to the iliac crests, a Lamaze technique for coping with uterine contractions during the first stage of labor.

**efflorescence** (ēf-flor-ēs'ēns) [L. *efflorescere*, to bloom] 1. A rash; a redness of the skin. SYN: *exanthem*. 2. The formation of a powder on the surface of a compound as it gives up water and becomes anhydrous.

**efflorescent** (ēf'floo-rēs'ēnt) Becoming powdery or dry from loss of water in crystallization.

**effluent** (ēf'loo-ēnt) [L. *effluere*, to flow out] 1. A flowing out. 2. Fluid material discharged from a sewage treatment or industrial plant.

**effluvium** (ēf-loo'vē-ŭm) *pl.* **effluvia** A malodorous outflow of vapor or gas, particularly one that is toxic.

**efflux** (ēf'lŭks) [" + "] Outward flow, i.e., the movement of chemicals or other fluids from within a structure, such as a cell, to the outside.

**effort** Expenditure of physical or mental energy.

**effort-independent test** A test whose accuracy or success does not depend on patient compliance.

**effort syndrome** Unusual or unexpected fatigue with exertion. The fatigue is increased by mild exertion and may be more pronounced in the morning. SEE: *chronic fatigue syndrome*.

**effuse** (ē-fūs') [L. *effusio*, pour out] Thin, widely spreading; applied to a bacterial growth that forms a very delicate film over a surface.

**effusion** (ē-fŭ'zhŭn) Escape of fluid into a part, as the pleural cavity, such as pyothorax (pus), hydrothorax (serum), hemothorax (blood), chylothorax (lymph), pneumothorax (air), hydro-pneumothorax (serum and air), and pyopneumothorax (pus and air).

**joint e.** Increased fluid within a joint cavity. There may be increased production of synovial fluid following trauma, with some arthritic disease processes, or blood accumulating in the joint fol-

lowing trauma or surgery or due to hemophilia. Excessive amounts of synovial fluid, pus, or blood accumulate in many arthritic diseases (such as gout or rheumatoid arthritis), after trauma, in joint infections, following joint surgery, or in hemophilia.

**pericardial e.** Fluid in the pericardial cavity, between the visceral and the parietal pericardium. This condition may produce symptoms of cardiac tamponade, such as difficulty breathing. **SEE: illus.**

**pleural e.** Fluid in the thoracic cavity between the visceral and parietal pleura. It may be seen on a chest radiograph if it exceeds 300 ml.

**EGCg, EGCG** *Epigallocatechin gallate.*

**egesta** (ē-jēs'tā) [L. *egere*, to cast forth] Waste matter eliminated from the body, esp. excrement.

**egg** [AS. *aeg*] **1.** The female sex cell or ovum, applied esp. to a fertilized ovum that is passed from the body and develops outside, as in fowls. **2.** The mammalian ovum.

**raw e.** An egg in its fresh, uncooked state, esp. one intended for food. Human consumption of raw or inadequately cooked eggs has caused *Salmonella* infections. To kill *Salmonella* organisms, if present, eggs should be boiled for 7 min, fried for 3 min per side, or poached for 5 min. It is unsafe to use sauces or dressings made with raw eggs. Fresh eggs should be refrigerated; cracked eggs should be discarded. **SEE: salmonellosis.**

**eglandulous** (ē-glānd'ū-lūs) [L. *e*, out,

+ *glandula*, glandule] Without glands.

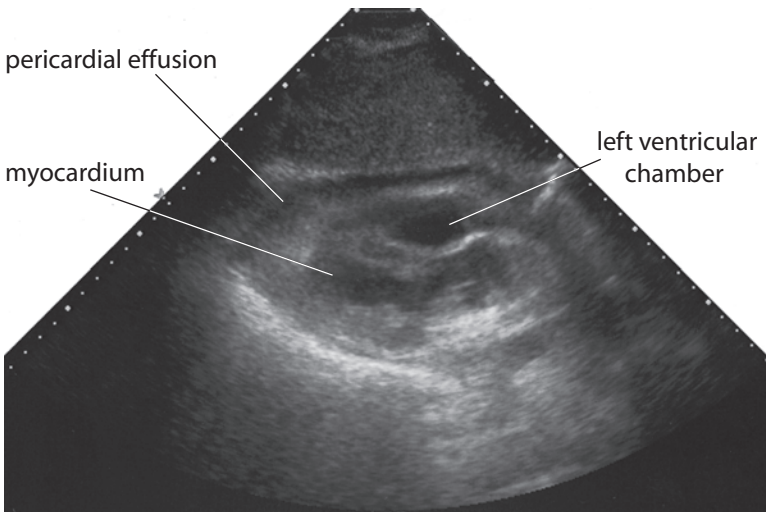
**ego** (ē'gō, ěg'ō) [L. *ego*, I] In psychoanalytic theory, one of the three major divisions in the model of the psychic apparatus. The others are the id and superego. The ego is involved with consciousness and memory and mediates among primitive instinctual or animal drives (the id), internal social prohibitions (the superego), and reality. The psychoanalytic use of the term should not be confused with its common usage in the sense of self-love or selfishness. **SEE: id; superego.**

**egocentric** (ē'gō-sēn'trĭk) [L. *ego*, I, + Gr. *kentron*, center] Pert. to a withdrawal from the external world with concentration on the self.

**egocentricity** (ē'gōsēn-trĭs'ĭ-tē) The stage of cognitive development in which perception is almost exclusively from the child's own viewpoint and in the child's own way. This stage is characteristic of toddlers and early preschool children.

**ego-dystonic** (ē'gō-dĭs-tōn'ĭk) [ʹ + Gr. *dys*, bad, + *tonos*, tension] Pert. to something repulsive to the individual's self-image.

**ego-integrity** (ē'gō-ĭn-tēg'ĭ-tē) The eighth stage in Erik Erikson's developmental theory; the opposite of despair. It is the major psychic task of the mature elderly and is marked by a healthy unifying philosophy and the wisdom learned from experience. The individual feels vital, balanced, and whole in relation to the self and the world.



**PERICARDIAL EFFUSION**

Pericardial effusion as seen by echocardiography

**egoism** (ē'gō-izm) An inflated estimate of one's value or effectiveness.

**egomania** (ē'gō-mā'nē-ä) [n + Gr. *mania*, madness] Abnormal self-esteem and self-interest.

**egophony** (ē-gōf'ō-nē) [Gr. *aix*, goat, + *phone*, voice] An abnormal change in tone, somewhat like the bleat of a goat, heard in auscultation of the chest when the subject speaks normally. It is associated with bronchophony and may be heard over the lungs of persons with pleural effusion, or occasionally pneumonia.

**ego-syntonic** (ē'gō-sin-tōn'ik) [n + Gr. *syn*, together, + *tonos*, tension] Pert. to something that is consistent with the individual's self-image.

**egotism** (ē'gō-tizm) 1. The tendency to regard oneself more highly than is warranted by the facts, and to boast of one's abilities or achievements. 2. An inflated sense of self-importance; conceit. SEE: *egoism*.

**egotropic** (ē'gō-trōp'ik) [L. *ego*, I, + Gr. *tropos*, a turning] Interested chiefly in one's self; self-centered.

**EH** The symbolic representation of the oxidation-reduction potential, that is, the electric potential energy needed to transfer a mole of electrons from an oxidant to a reductant. The use of catalysts to remove contaminants from water supplies during water treatment relies on measurements of the redox potential.

**e-health** The application of electronic information technology to health care by using websites providing a common set of standards across operating systems.

**EHEC** Enterohemorrhagic *Escherichia coli*.

**Ehlers-Danlos syndrome** (ā'lērz-dān'lōs) [Edvard Ehlers, Danish dermatologist, 1863–1937; H. A. Danlos, Fr. dermatologist, 1844–1912] Any of six inherited disorders of connective tissue (collagen and collagen-related proteins). Characteristic findings in most Ehler-Danlos patients include: joint hypermobility with dislocations (e.g., during childbirth) and velvety, loose and easily bruised skin. The syndrome is relatively rare. It affects about 1 child per 5000 births.

**Ehrlichia** A genus of gram-negative bacteria that use the adenosine triphosphate (ATP) of other cells in order to survive. They are the pathogenic agents responsible for a variety of influenza-like illnesses in humans and canines, among other mammals.

***Ehrlichia chaffeensis*** An obligate intracellular gram-negative bacterium that causes human monocytic ehrlichiosis in humans.

***Ehrlichia phagocytophila*** The former name of the bacterium now known as *Anaplasma phagocytophilum*.

***Ehrlichia ewingii*** An ehrlichial species that causes human granulocytic ehrlichiosis in Tennessee and neighboring states in the U.S.

***Ehrlichia sennetsu*** An ehrlichial species that causes a mononucleosis-like syndrome in Japan known as Sennetsu fever.

**ehrlichiosis** (ār'lik-ē-ō'sis) [Paul Ehrlich, Ger. physician, 1854–1915. Awarded Nobel Prize in medicine in 1908] One of several forms of an infectious disease of monocytes and granulocytes transmitted by exposure to species of *Ehrlichia* (small, gram-negative, obligate intracellular cocci of the Rickettsiaceae family). It was first reported in humans in the U.S. in 1987 and is considered an emerging disease.

**ETIOLOGY:** There are three causes of ehrlichiosis:

1. *E. chaffeensis*, carried by the Lone Star tick, causes human monocytic ehrlichiosis (HME);

2. *Anaplasma phagocytophila* (formerly named *E. phagocytophila*), carried by *Ixodes* (e.g., the Western black-legged tick [*I. Pacificus*]), causes human granulocytic ehrlichiosis (HGE);

3. *E. ewingii* causes a related syndrome.

Thirty states have reported cases, but HME is found mostly in the southern U.S., and HGE in the northern U.S. In Japan, *E. sennetsu* causes a mononucleosis-like illness (Sennetsu fever).

**SYMPTOMS:** Both HME and HGE are marked by nonspecific influenza-like symptoms. A high fever with rigors, headache, malaise, myalgia, leukopenia, and thrombocytopenia are most common; a rash may be present in HME. The symptoms last for approx. 3 weeks; it is unclear if a latent infection remains. Complications of renal failure, cardiomegaly, coagulopathies, or coma occur in 16% of patients, mostly in the older adults. Most patients are men over 40.

**TREATMENT:** Doxycycline (or other tetracyclines) is the recommended treatment.

**DIAGNOSIS:** Serological tests are used; a polymerase chain reaction (PCR) applied to whole blood samples can confirm the diagnosis in 24 to 48 hr.

**PREVENTION:** Ticks should be avoided by avoiding grassy areas where they reside, by wearing long pants and light-colored clothing, and by applying tick repellents to clothing before entering grasslands or woodlands. After leaving these areas, exposed clothing should be immediately laundered, and the skin bathed and inspected for the presence of adult ticks and tiny nymphs. Any attached ticks should be promptly removed with tweezers, making certain to remove the entire insect.

**EIA** *enzyme immunoassay*.

**ejcosa-** Combining form used in chemistry to indicate *twenty*.

**icosanoid** (ī-kō'sā-noyd") Any of several autocrine or paracrine cytokines formed from the metabolism of arachidonic acid. They include prostaglandins, thromboxanes, and leukotrienes.

**EID** 1. *electroimmunodiffusion*; *electronic infusion device*. 2. *esophageal intubation detector device*.

**eidetic** (ī-dēt'ik) [Gr. *eidōs*, form, shape] Rel. to or having the ability of total visual recall of anything previously seen.

**EIEC** Enteroinvasive *Escherichia coli*.

**Eikenella corrodens** (ī'kēn-ēl'ā) A Gram-negative bacillus that is part of normal oral flora. It can cause serious human infections, including abscesses, empyema, and endocarditis, among others.

**eikonometer** (ī'kō-nōm'ē-tēr) [Gr. *eikon*, image, + *metron*, measure] An optical instrument used in detecting anisokonia.

**eikonometry** (ī-kō-nōm'ē-trē) Determination of the distance of an object by measuring the image produced by a lens of known focus.

**Eimeria** (ī-mē'rē-ā) A genus of sporozoan parasites belonging to the class Telosporidia, subclass Coccidia. They are intracellular parasites living in the epithelial cells of vertebrates and invertebrates. They rarely are parasitic to humans.

**E. hominis** A species that has been found in empyema in humans.

**einsteinium** (īn-stīn'ē-ūm) [Albert Einstein, German-born U.S. physicist, 1879–1955] A radioactive element with atomic number 99 and an atomic weight of 254.0881. Its symbol is Es.

**EIP** *end-inspiratory pause*.

**Eisenmenger's complex** (ī'sēn-mēng'ēr) [Victor Eisenmenger, Ger. physician, 1864–1932] A congenital cyanotic heart defect consisting of ventricular septal defect, dextroposition of the aorta, pulmonary hypertension with pulmonary artery enlargement, and hypertrophy of the right ventricle.

**Eisenmenger's syndrome** Pulmonary hypertension that results from any congenital heart defect.

**E & IT** *electronic and information technology*.

**ejaculate** (ē-jāk'ū-lāt") The semen released during ejaculation.

**ejaculatio** (ē-jāk'ū-lā'shē-ō) [L.] Sudden expelling; ejaculation.

**e. praecox** Premature ejaculation.

**ejaculation** (ē-jāk'ū-lā'shūn) [L. *ejaculare*, to throw out] Ejection of the seminal fluid from the male urethra.

**PHYSIOLOGY:** Ejaculation consists of two phases: (1) the passage of semen and the secretions of the accessory organs (bulbourethral and prostate glands and seminal vesicles) into the

urethra and (2) the expulsion of the seminal fluid from the urethra. The former is brought about by contraction of the smooth muscle of the ductus deferens and the increased secretory activity of the glands, the latter by the rhythmic contractions of the bulbocavernosus and ischiocavernosus muscles and the levator ani. The prostate discharges its secretions before those of the seminal vesicle. The sensations associated with ejaculation constitute the male orgasm. Ejaculation occurs without ejection of the seminal fluid from the male urethra in patients who have had a prostatectomy. In that case, the ejaculate is in the bladder.

Ejaculation is a reflex phenomenon. Afferent impulses arising principally from stimulation of the glans penis pass to the spinal cord by way of the internal pudendal nerves. Efferent impulses arising from a reflex center located in the upper lumbar region of the cord pass through sympathetic fibers in the hypogastric nerves and plexus to the ductus deferens and seminal vesicles. Other impulses arising from the third and fourth sacral segments pass through the internal pudendal nerves to the ischiocavernosus and bulbocavernosus muscles. Erection of the penis usually precedes ejaculation. Ejaculation occurs normally during copulation or masturbation or as a nocturnal emission. The seminal fluid normally contains 60 million to 150 million sperm/ml. The volume of the ejaculation is from 2 to 5 ml. SEE: *orgasm*; *semen*.

**premature e.** An imprecise term that usually indicates ejaculation occurring very shortly after the onset of sexual excitement, or ejaculation occurring before copulation or before the partner's orgasm. This disorder is usually accompanied by feelings of guilt or relationship difficulties.

**retrograde e.** Ejaculation in which the seminal fluid is discharged into the bladder rather than through the urethra. Retrograde ejaculation can occur as a consequence of some psychotropic drugs or radical prostatectomy.

**ejaculatory** (ē-jāk'ū-lā-tōr'ē) Pert. to ejaculation.

**ejecta** (ē-jēk'tā) [L. *ejectus*, thrown out, ejected] Material, especially waste material, excreted by the body. SYN: *dejecta*; *egesta*.

**ejection** (ē-jēk'shūn) Removal, esp. sudden, of something.

**ventricular e.** Forceful expulsion of blood from the ventricles of the heart.

**ejection fraction** In cardiac physiology, the percentage of the blood emptied from the ventricle during systole; the left ventricular ejection fraction averages 60% to 70% in healthy hearts but can be markedly reduced if part of the

heart muscle dies (e.g., after myocardial infarction) or in cardiomyopathy or valvular heart disease.

**Ekbohm's syndrome** (èk'boomz) [Karl A. Ekbohm, Swedish neurologist, 1907–1977] The delusion that one is infested with parasites, esp. those that burrow under the skin.

**EKG** Abbreviation for the German *elektrokardiogramm*. SEE: *electrocardiogram*.

**ekphorize** (èk'fò-rìz) [Gr. *ek*, out, + *phorein*, to bear] In psychiatry, to bring to mind a psychological experience so as to repeat the experience in memory. SEE: *engram*.

**elaboration** (è-láb'ò-rá'shün) In body metabolism, the formation of complex compounds from simpler substances (e.g., formation of proteins from amino acids).

**elastase** (è-lás'tās) A pancreatic enzyme that cleaves amino acids from proteins in the presence of trypsin.

**elastic** (è-lás'tik) [Gr. *elastikos*, driven on, set in motion] Capable of being stretched and then returning to its original state.

**intermaxillary e.** An elastic band used between the maxillary and mandibular teeth in orthodontic therapy; also called a maxillomandibular elastic.

**intramaxillary e.** An elastic band used in a horizontal space closure by attachments within the same arch.

**vertical e.** An elastic band applied to arch brackets perpendicularly to the occlusal plane for approximating teeth.

**elasticity** (è'lás-tis'ì-tè) The quality of returning to original size and shape after compression or stretching.

**elastic shoelaces** A type of assistive device that makes shoes with laces easier to wear by eliminating the movements needed to tie and untie them.

**elastic stocking** A stocking worn to apply pressure to the extremity, aiding the return of blood from the extremity to the heart through the deep veins. SEE: *thrombosis*, *deep venous*.

**elastin** (è-lás'tin) An extracellular connective tissue protein that is the principal component of elastic fibers in the middle layer of arteries and around the alveoli of the lungs.

**elastinase** (è-lás'tin-ās) An enzyme that dissolves elastin.

**elastofibroma** (è-lás'tò-fì-brò'mā) [ + *L. fibra*, fiber, + *Gr. oma*, tumor] A benign soft tissue tumor that contains elastic and fibrous elements.

**elastoid** (è-lás'toyd) [ + *eidōs*, form, shape] Pert. to a substance formed by hyaline degeneration.

**elastoma** (è'lás-tò'mā) [ + *oma*, tumor] A yellow nodular or papular lesion of the skin composed of elastic fibers. Elastomas are seen in the genetic disease pseudoxanthoma elasticum.

**elastometer** (è'lás-tòm'è-tèr) [ + *Gr. metron*, measure] A device for measuring elasticity.

**elastometry** (è'lás-tòm'è-trè) The measurement of tissue elasticity.

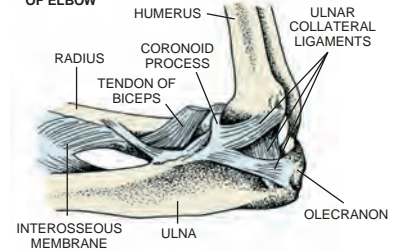
**elastorrhesis** (è-lás'tò-rèk'sis) [ + *rhexis*, rupture] Rupture of elastic tissue.

**elastose** (è-lás'tōs) A peptone resulting from gastric digestion of elastin.

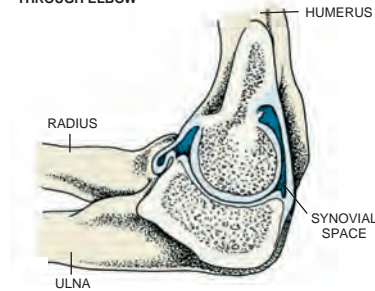
**elation** (è-lá'shün) [*L. elatus*, exalted] Joyful emotion. It is pathological when out of accord with the patient's actual circumstances.

**elbow** (èl'bō) [AS. *eln*, forearm, + *boga*, bend] The joint between the arm and forearm. SEE: *illus.*

MEDIAL VIEW OF ELBOW



CROSS-SECTION THROUGH ELBOW



ELBOW JOINT

**Boston e.** Boston arm.

**golfer's e.** Tendonitis occurring at the medial epicondyle. This injury is commonly seen as a result of overuse of the elbow. SYN: *medial humeral epicondylitis*. SEE: *tennis elbow*.

**little league e.** A form of overuse syndrome marked by inflammation of the medial condyle or fractures of the lateral humeral condyle of the elbow. It is seen in adolescent baseball players, esp. in pitchers. In order to help prevent this condition, Little League Baseball regulations limit the number of pitches a player can throw per week.

**nursemaid's e.** Subluxation of the head of the radius with entrapment of the annular ligament in the radiohumeral joint, esp. in a young child after



being lifted by the hand or wrist. The condition is acutely painful, and the child will not willingly use the affected arm.

**TREATMENT:** The subluxation can be readily reduced with closed manipulation.

**tennis e.** SEE: *tennis elbow*.

**elbow conformer** A splint applied to prevent flexion contractures following burns to the upper extremity. The device is fabricated to conform to the anterior arm. Pressure is applied to the olecranon process by a soft, cupped pad.

**elbow unit** A component of the upper-extremity prosthesis that permits the arm to bend at the elbow.

**elder** (él'dér) A person over 65 years old.

**eldercare** Providing health care and assistance with activities of daily living for older adults, either at home or in care facilities. Family members usually provide most of the needed assistance, although friends, professional agencies, or volunteers often participate.

**PATIENT CARE:** Although all patients benefit from respectful, dignified, and professional care, and generalizations about older patients' needs may not apply to every patient, some special needs of some older patients are addressed here. Sensory problems (self-reported) are fairly prevalent in older adults. For example hearing impairments are present in about a third of 65 to 74 year olds and half those 75 and older, and vision problems are present in a seventh of those age 65 to 74, and in a fifth age 75 and older. Tooth loss, which influences both chewing and clarity of speech, occurs in more than a fifth of individuals over the age of 65. Age-related changes in heart and kidney function make older adults more vulnerable to shifts in water balance that can result in dehydration, e.g., in hot weather, when left alone, or while waiting for medical or surgical procedures. In older adults, adequate fluid intake is associated with fewer falls, less constipation, lower rates of laxative use, and better rehabilitation outcomes in orthopedic patients. In older adults dehydration can precipitate emergency hospitalization and increase mortality. The decline in renal function that occurs with aging means that the kidneys are less able to concentrate urine, so more water is lost in an older person than would be in a younger individual. Institutionalized adults should be ensured of access to something to drink at all times, with fluid offered regularly since thirst may not prompt older individuals to drink. Fasting should be minimized. Ambulatory adults should be reminded to increase their fluid intake during exercise, hot weather, and illness, and healthy older adults should be taught to

monitor urine color as one indicator of dehydration — darker urine often represents incipient dehydration, while clear, watery urine is seen in well-hydrated adults. Individuals with urinary incontinence should be advised not to limit their intake in an effort to prevent incontinence episodes; 1500 to 2000 ml (1½ to 2 quarts) of fluid daily is required to maintain hydration for most individuals.

When communicating with the elderly, caregivers in all settings should remember to encourage the patient's use of hearing aids and/or eyeglasses; use the patient's name, make eye contact, and use touch as appropriate; enunciate clearly; allow time for the patient to respond; ask only one question at a time, develop a signaling system for "yes" and "no" answers, and post it clearly for all caregivers and visitors to see and use; use gestures that relate to the information being conveyed verbally; and write questions/options so that the patient can see them as they are read aloud for the patient to hear. Other critical elements of the care of the elderly include providing physical therapy to improve balance and prevent falls; limiting the use of medications that may contribute to cognitive dysfunction, confusion or delirium; ensuring adequate nutrition; screening for cancers, dementia, depression, and other diseases that become more common with advancing age; remaining aware of "atypical" presentations of illnesses and infections; protecting the skin from ulceration; and maintaining healthful participation in the community.

**elder neglect** Elder abuse.

**e-learning** Facilitates and enhances learning through both computer and communications technology. It can include only the text portion of a computer or it can include Internet-based distance learning using a multimedia-capable computer.

**elective therapy** A treatment or surgical procedure not requiring immediate attention and therefore planned for the patient's or provider's convenience.

**Electra complex** (ē-lék'trā) [Gr. Elektra, Agamemnon's daughter, who helped assassinate her mother because of love for her father, whom the former had slain] In psychoanalysis, a group of symptoms due to suppressed sexual love of a daughter for her father. SEE: *Jocasta complex*; *Oedipus complex*.

**electric, electrical** [Gr. *elektron*, amber] Pert. to, caused by, or resembling electricity.

**electrical alternans** Beat-to-beat changes in one or more portions of the electrocardiogram.

**electrical dental analgesia** ABBR: EDA.

The treatment of oral pain or the administration of oral anesthesia by means of electrode pads applied to the cheeks or the oral mucosa.

**electrical leakage** (ĭ-lĕk'trĭ-kĭl lĕk'ĭj) [ʹ + ME. *leken*, to moisten] The presence of unwanted current from an electrical device, such as a patient monitoring or treatment device.

**electrical patch** An electrical device for delivering medications transdermally. The slight electric current used in electrical patches allows larger molecules to be transported through the skin. This technique differs from electrophoresis by the electrical current used, which increases the permeability of the skin. SYN: *electroporation*. SEE: *iontophoresis*.

**electrical source imaging** ABBR: ESI. A means of mapping the electrical activity of organs such as the brain or heart in order to diagnose or treat diseases such as seizures or dysrhythmias. ESI relies on the collection via external sensors of the electrical activity generated by multiple tissue sites within an organ, and the mathematical manipulation of that data to localize areas where patterns of electrical conduction are blocked or excessively active.

**electrical stimulation, electrostimulation** (ĕ-lĕk'trō-s'tĭm'ū-lā'shŭn) ABBR: ES. Use of electric current to affect a tissue, such as nerve, muscle, or bone. In the latter case, the stimulation is used to facilitate and hasten healing of fractures. SYN: *electrotherapy*. SEE: *bipolar* (2); *monopolar*; *transcutaneous electrical nerve stimulation*.

**electric field, gradient-induced** A electric field that may surround an object placed in a rapidly changing magnetic environment, such as one generated by a magnetic resonance imaging device.

**electricity** A form of energy that is generated by the interactions of positive and negative charges and that exhibits magnetic, chemical, mechanical, and thermal effects.

**frictional e.** Static electricity generated by rubbing two objects together.

**galvanic e.** Electricity generated by chemical action.

**induced e.** Electricity generated in a body from another body nearby without contact between them.

**magnetic e.** Electricity induced by a magnetic device.

**negative e.** An electric charge caused by an excess of negatively charged electrons.

**positive e.** An electric charge caused by loss of negatively charged electrons.

**static e.** Electricity generated by friction of certain materials.

**electric shock treatment** Electroconvulsive therapy.

**electro-, electr-** [Gr. *elektron*, amber]

Prefixes indicating a *relationship to electricity*.

**electroacupuncture** (ĕ-lĕk'trō-āk'ū-pŭnk'chĕr) Stimulation of acupuncture points using transcutaneous electrical nerve stimulators (TENS) or other therapeutic electrical stimulation currents applied via needle or surface electrodes.

**electroanalgesia** (ĕ-lĕk'trō-ān'āl-jĕ'zĕ-ā) [ʹ + *analgesia*, want of feeling] Relief from pain by application of low-intensity electric currents locally or through implanted electrodes.

**electroanesthesia** (ĕ-lĕk'trō-ān'ĕs-thĕ'zĕ-ā) [ʹ + *an-*, not, + *aisthesis*, sensation] General anesthesia produced by a device that passes electricity of a certain frequency, amplitude, and wave form through the brain.

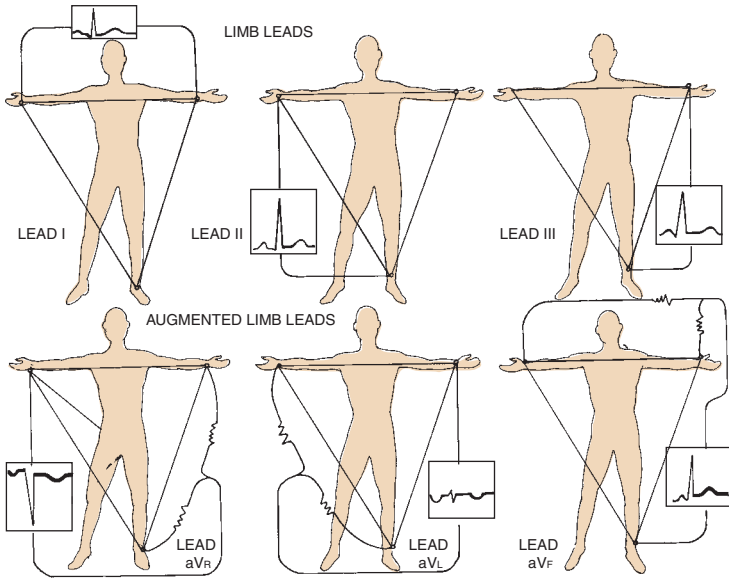
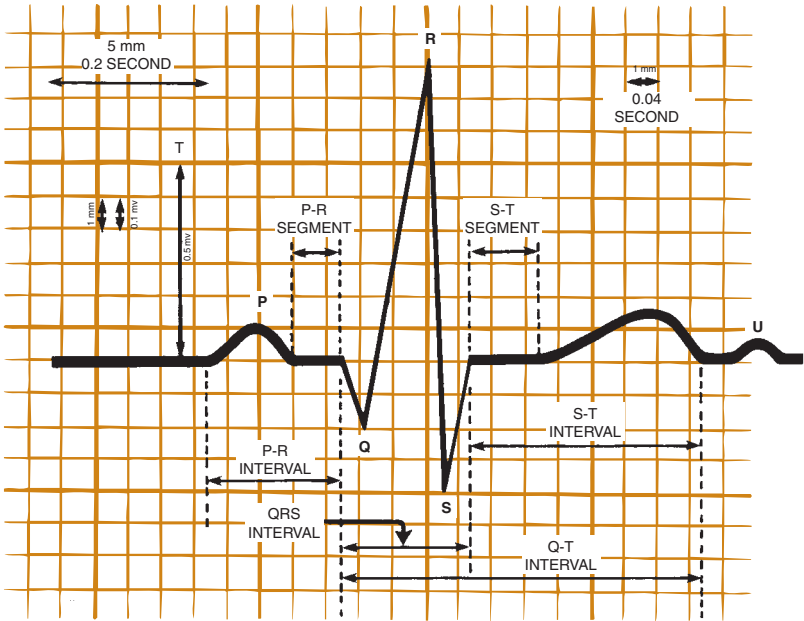
**electrobiology** (ĕ-lĕk'trō-bĭ-ōl'ō-jĕ) [ʹ + *bios*, life, + *logos*, word, reason] The science of electrical phenomena in the living body.

**electrocardiogram** (ĕ-lĕk'trō-kār'dĕ-ō-grām) [ʹ + *kardia*, heart, + *gramma*, something written] ABBR: ECG. A record of the electrical activity of the heart, consisting of waves called P, Q, R, S, T, and sometimes U. The first, or P, wave is caused by the depolarization of the atria, whose electrical changes in turn cause atrial contraction. The Q, R, and S waves (QRS complex) correspond to depolarization of ventricular muscle. The T wave corresponds to ventricular repolarization. The electrocardiogram gives important information concerning the spread of electricity to the different parts of the heart and is used to diagnose rhythm and conduction disturbances, myocardial infarction or ischemia, chamber enlargement, and metabolic disorders, among others. SEE: *illus.*

**exercise e.** A record of the electrical activity of the heart taken during graded increases in the rate of exercise. SEE: *stress test*.

**signal-averaged e.** ABBR: SAECG. An electrocardiographic study, usually performed on patients with unexplained loss of consciousness or suspected dysrhythmias, in which hundreds of QRS complexes are collected, filtered, and analyzed to discover the presence or absence of certain abnormalities in the conducting system of the ventricle. These abnormalities, called late potentials, point to an increased risk of ventricular tachycardia or ventricular fibrillation. The signal-averaging technique allows late potentials to be examined free from random electrical discharges ("noise"), which often are present when only a small number of QRS complexes are evaluated.

**electrocardiograph** (ĕ-lĕk'trō-kār'dĕ-ō-grāf) [ʹ + " + *graphein*, to write] A



QRST COMPLEX OF ELECTROCARDIOGRAM/ECG LEADS

device for recording changes in the electrical energy produced by the action of heart muscles.

**electrocardiographical technician** A technician who operates and maintains electrocardiographic machines, records

the heart's electrical activity, and provides data for diagnosis and treatment of heart ailments.

**electrocardiography** (ē-lĕk"trō-kār"dē-ōg'rā-fē) The creation and study of graphic records (electrocardiograms)

produced by electric currents originating in the heart.

**electrocardiophonograph** (ē-lĕk'trō-kār'dē-ō-fō'nō-grāf) [Gr. *elektron*, amber, + *kardia*, heart, + *phone*, sound, + *graphein*, to write] A device for recording heart sounds.

**electrocautery** (ē-lĕk'trō-kaw'tēr-ē) [" + *kauterion*, branding iron] Cauterization using a variety of electrical modalities to create thermal energy, including a directly heated metallic applicator, or bipolar or monopolar electrodes.

**electrocerebral silence** (ē-lĕk'trō-sā-rē'brīl, sēr'ī) In electroencephalography (EEG), the absence of detectable electrical activity in the cortex of the brain. The EEG tracing shows no deflections from its baseline. This finding is diagnostic of brain death.

**electrochemiluminescence, electrochemoluminescence** (ē-lĕk'trō-kēm'ī-loo'mī-nēs'ēns) The production of visible light by an electrochemical reaction in which molecules, after becoming electronically excited, release visible electromagnetic energy when they return to their relaxed state. Electrochemiluminescence is used in laboratory science as a means of measuring the concentration of specific chemicals in solution. Light-emitting molecules that commonly bind to the chemical of interest are introduced into the solution, and the amount of light given off by the "labeled" or "tagged" chemical is measured.

**electrochemistry** (ē-lĕk'trō-kēm'ī-strē) [" + *chemeia*, chemistry] The science of chemical changes produced by or resulting in electricity.

**electrocision** (ē-lĕk'trō-sī'zhŭn) [" + L. *caedere*, to cut] Excision by electric current.

**electrocoagulation** (ē-lĕk'trō-kō-āg'ū-lā'shŭn) [" + L. *coagulare*, to thicken] Coagulation of tissue by means of a high-frequency electric current. SEE: *electrocautery*.

**electrocochleography** (ē-lĕk'trō-kōk-lē-ōg'rā-fē) Measurement of electrical activity produced when the cochlea is stimulated. A needle electrode is passed through the eardrum and placed on the cochlea. The electrical activity is then recorded.

**electrocontractility** (ē-lĕk'trō-kōn-trāk'tīl'ī-tē) [" + L. *contrahere*, to contract] Contraction of muscular tissue by electrical stimulation.

**electroconvulsive therapy** (ē-lĕk'trō-kōn-vŭl'sīv) ABBR: ECT. The use of an electric shock to produce convulsions and thereby treat drug-resistant or esp. severe psychiatric disorders (e.g., major depression, bipolar disorder, suicidal ideation, and schizophrenia).

**PATIENT CARE:** Before ECT, the patient should sign an informed consent

form for the procedure, which may be withdrawn orally at any time. ECT may only be administered involuntarily if the patient has been judged mentally incompetent and a court order has been obtained. In preparation for the procedure, the patient must have nothing by mouth (NPO) from midnight before the procedure and remove all jewelry and dentures and have an empty bladder. Resuscitation equipment and staff should be on hand during the procedure. The patient receives anesthetic and a neuromuscular blocker to relax skeletal muscles and is mechanically ventilated with 100% oxygen while unable to breathe unassisted. As soon as the patient is unconscious and paralyzed, the psychiatrist applies unilateral or bilateral electrodes to the head and delivers an electrical stimulus of 70 to 150 volts to the brain for 0.1 to 1 second. This produces a generalized seizure lasting 30 to 60 sec. Neuromuscular blockades minimize muscular contractions and the risk of vertebral fractures or other complications. Application of electrical current only to the nondominant hemisphere may cause fewer cognitive adverse reactions, but some psychiatrists believe that bilateral ECT is more effective. The patient typically becomes responsive about 15 min after the treatment and fully recovered 1 to 2 hr later. Staff monitors vital signs, assesses the patient's orientation and alertness, notes any signs of confusion, constantly reorients and reassures the patient, and frequently checks blood pressure and pulse until the patient's vital signs are stable. Postural hypotension is a common response to ECT. Confusion and short-term memory loss are the most common adverse reactions to ECT; the confusion usually resolves within an hour. Short-term memory further deteriorates during a treatment course, but it, too, usually resolves within a few weeks after the final treatment. Other complications include delayed short-term memory loss, heart arrhythmias, and seizures. An ECT treatment course usually involves 6 to 12 treatments: 3 treatments each week for 2 to 6 weeks. Many patients show improvement after only a few treatments. ECT usually begins during inpatient care to treat severe depression, where the patient's response can be closely evaluated and adverse effects noted. Treatment may continue on an outpatient basis as the patient improves. After a full course of therapy, the patient may require intermittent ECT as maintenance therapy. Antidepressant drug therapy usually is instituted even if previously unsuccessful, and individual or group psychotherapy and psychoeducation are instituted, as a combination of therapies generally

provides the most successful treatment. SYN: *electric shock treatment; electroshock therapy; shock therapy; shock treatment.*

**electrocortigraphy** (ē-lĕk'trō-kor'tī-kōg'rā-fē) Recording of the electrical impulses from the brain by electrodes placed directly on the cerebral cortex.

**electrocution** (ē-lĕk'trō-kū'shūn) [l' + *L. acutus*, sharpened] Destruction of life by electric current. In the U.S. about 1000 people die of electrical shocks each year; about a fourth of these die of lightning strikes. SEE: *electric shock; lightning safety rules.*

**electrode** (ē-lĕk'trōd) [l' + *hodos*, a way] **1.** An electrical terminal or lead. **2.** A conductive medium. **3.** In electrotherapy, an instrument with a point or surface from which to discharge current to a patient's body. **4.** An electrical terminal or lead that is adapted to sense current or voltage in response to specific analytes, for purposes of quantifying the particular analyte.

**active e.** An electrode that is smaller than a dispersive electrode and produces stimulation in a concentrated area.

**calomel e.** An electrode that develops a standard electric potential and is used to provide a reference voltage in the circuit for sensing electrodes. It is composed of an amalgam of mercury and mercury chloride. It is used as a standard in determining the pH of fluids.

**carbon dioxide e.** A blood gas electrode used to measure the carbon dioxide tension (symbolized as  $PCO_2$ ) in blood. Its operation is based on the diffusion of carbon dioxide from the blood sample through a semipermeable membrane into a buffer solution with a subsequent change in the pH of the buffer. SYN: *Severinghaus electrode.*

**Clark e.** Oxygen electrode.

**coated wire e.** ABBR: CWE. A chemical sensor in some clinical laboratory analyzers that functions similarly to a pH electrode. SEE: *hydrogen e.; saturated calomel e.*

**depolarizing e.** An electrode with greater resistance than the part of the body in the circuit.

**dispersive e.** An electrode larger than an active electrode. It produces electrical stimulation over a large area. SYN: *indifferent electrode.*

**gas-sensing e.** An electrode in which a gas-permeable membrane separates the test solution from an aqueous electrode solution in contact with an ion-selective electrode. Gas permeation of the membrane changes the chemical equilibrium within the electrolyte, and the ion-sensitive electrode detects this change.

**glass e.** In chemistry, a chemical

sensor that uses a glass membrane, as opposed to one that uses an organic or solid-state membrane as the sensing surface.

**hydrogen e.** An electrode that absorbs and measures hydrogen gas; used as the reference for pH measurement in research laboratories.

**immobilized enzyme e.** A chemical sensor that is highly selective due to a specific enzyme incorporated into its structure.

**indifferent e.** Dispersive e.

**internal reference e.** The metal electrode inside all chemical-sensing potentiometric electrodes. The two most commonly used internal reference electrodes are the calomel and the silver/silver chloride.

**ion-selective e.** A chemical transducer that yields a response to variations in the concentration of a given ion in solution.

**liquid membrane e.** An electrode in which the sensing membrane is made up of a hydrophobic ion-exchange neutral carrier (ionophore) dissolved in a viscous, water-insoluble solvent. The liquid membrane is physically supported by an inert porous matrix such as cellulose acetate.

**multiple point e.** Several sets of terminals providing for the use of several electrodes. SEE: *multiterminal.*

**negative e.** A cathode; the pole by which electric current leaves the generating source.

**oxygen e.** An electrode invented by Dr. Leland Clark, used to measure the partial pressure of oxygen ( $PO_2$ ), usually in arterial blood (blood gas). SYN: *Clark electrode;  $PO_2$  electrode; polarographic electrode.*

**$PO_2$  e.** Oxygen e.

**point e.** An electrode with an insulating handle at one end and a small metallic terminal at the other for use in applying static sparks.

**polarographic e.** Oxygen e.

**polymer membrane e.** An electrode in which the sensing membrane is an organic polymer containing a hydrophobic ion-exchange neutral carrier (ionophore).

**positive e.** An anode; the pole opposite a cathode.

**reference e.** A chemical electrode whose cell potential remains fixed and against which an indicator electrode is compared. The most common reference electrode is the silver/silver chloride ( $Ag/AgCl$ ) electrode.

**saturated calomel e.** ABBR: SCE. One of two practical reference electrodes, used with a mercurous chloride (calomel) paste in pH and other potentiometric instruments. The other is the silver/silver chloride electrode. The calomel electrode has been the standard



secondary reference electrode used in the laboratory since the introduction of the pH electrode.

**Severinghaus e.** Carbon dioxide electrode.

**solid-state membrane e.** An electrode in which the sensing membrane is made of a single crystal or pressed pellet containing the salt of the ion to be sensed.

**standard hydrogen e.** ABBR: SHE. The standard reference electrode against which all others are measured. Its assigned electrode potential is 0.000 V.

**subcutaneous e.** An electrode placed beneath the skin.

**surface e.** An electrode placed on the surface of the skin or exposed organ.

**therapeutic e.** An electrode used for introduction of medicines through the skin by ionization. SEE: *iontophoresis*.

**electrodermal testing** (ē-lĕk'trō-dĕr-mĭl tĕst'ing) A technique used in complementary and alternative medicine to measure electromagnetic energy in the skin and to apply that information to diagnostic and/or therapeutic purposes.

**electrodesiccation** (ē-lĕk'trō-dĕs'ī-kā'shŭn) [Gr. *elektron*, amber, + L. *desiccare*, to dry up] The destructive drying of cells by application of electrical energy similar to, but to a lesser intensity than electrocoagulation. Electrodesiccation is used for hemostasis of very small capillaries or veins that have been severed during surgery.

**electrodiagnosis** (ē-lĕk'trō-dī'āg-nō-sīs) The use of electrical and electronic devices for diagnostic purposes. This technique is helpful in almost all branches of medicine, but particularly in investigating the function of the heart, nerves, and muscles.

**electrodiagnostic technologist** (ē-lĕk'trō-dī'āg-nōs'tĭk) ["/ + "] A specialist in the use of neurological diagnostic devices, including electroencephalography, electromyography, polysomnography, and evoked potentials.

**electrodialysis** (ē-lĕk'trō-dī-āl'ī-sīs) *pl.*

**electrodialyses** ["/ + *dia-*, apart, + *lysis*, dissolution] A method of separating electrolytes from colloids by passing a current through a solution containing both. A semipermeable membrane is usually used to aid in the separation, with one electrode on each side.

**electrodynamometer** (ē-lĕk'trō-dī'nā-mōm'ĕ-tĕr) ["/ + *dynamis*, power, + *metron*, measure] An instrument that measures the strength of an electric current.

**electroejaculation** (ī-lĕk'trō-ĕ-jāk'ū-lā'shŭn) ["/ + L. *ejaculare*, to throw out] The retrieval of semen by electrical stimulation of the prostate. Electroejaculation is used to obtain sperm from men who are unable to ejaculate, e.g., because of spinal cord in-

jury. It has also been used in veterinary medicine.

**electroencephalogram** (ē-lĕk'trō-ĕn-sĕf'ā-lō-grām) ["/ + *enkephalos*, brain, + *gramma*, something written] ABBR: EEG. A tracing on an electroencephalograph. SEE: *illus.*; *electroencephalography*.

**electroencephalograph** (ē-lĕk'trō-ĕn-sĕf'ā-lō-grāf) ["/ + " + *graphein*, to write] An instrument for recording the electrical activity of the brain. SEE: *electroencephalography*.

**electroencephalographic technologist** (ē-lĕk'trō-ĕn-sĕf'ā-lō-grāf'ĭk) A technologist who operates and maintains electroencephalographic machines.

**electroencephalography** (ē-lĕk'trō-ĕn-sĕf'ā-lōg'rā-fĕ) Amplification, recording, and analysis of the electrical activity of the brain. The record obtained is called an electroencephalogram (EEG).

Electrodes are placed on the scalp in various locations. The difference between the electric potential of two sites is recorded. The difference between one pair or among many pairs at a time can be obtained. The most frequently seen pattern in the normal adult under resting conditions is the alpha rhythm of 8½ to 12 waves per sec. A characteristic change in the wave occurs during sleep, on opening the eyes, and during periods of concentration. Some persons who have intracranial disease will have a normal EEG and others with no otherwise demonstrable disease will have an abnormal EEG. Nevertheless, the use of this diagnostic technique has proved to be very helpful in studying epilepsy and convulsive disorders and in localizing lesions in the cerebrum. SEE: *rhythm, alpha; rhythm, beta; wave, theta*.

**electrogoniometer** (ē-lĕk'trō-gō'nĕ-ōm'ĕ-tĕr) An electrical device for measuring angles of joints and their range of motion.

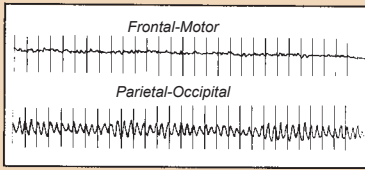
**electrohydraulic** (ē-lĕk'trō-hī-drōl'ĭk) Pert. to the electrical generation of shock waves in a fluid; said of a device or system.

**electroimmunodiffusion** (ē-lĕk'trō-īm'ū-nō-dī-fū'zhŭn) A laboratory method of identifying antigens in the blood by creating an artificial antigen-antibody reaction.

**electrolarynx** (ē-lĕk'trō-lār'ĭnks) A voice-restoring device used by some patients after surgical removal of the larynx. The device works by amplifying breath sounds.

**electrolysis** (ē'lĕk-trōl'ī-sīs) ["/ + *lysis*, dissolution] The decomposition of a substance by passage of an electric current through it. Hair follicles may be destroyed by this method. SEE: *depilatory technique*.

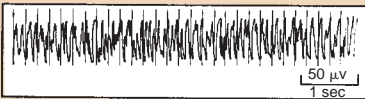
**electrolyte** (ē-lĕk'trō-līt) ["/ + *lytos*, soluble] 1. A solution that conducts elec-



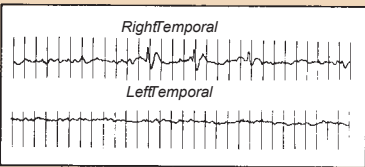
NORMAL ADULT  
10/sec activity in occipital area



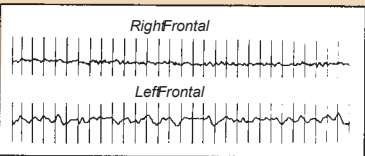
PETIT MAL SEIZURE  
Synchronous 3/sec spikes and waves



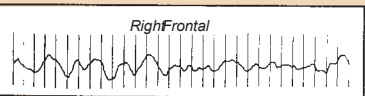
GRAND MAL SEIZURE  
High-voltage spikes generalized



TEMPORAL LOBE EPILEPSY  
Right temporal spike focus



BRAIN TUMOR  
Left frontal low wave focus



ENCEPHALITIS  
Diffuse slowing

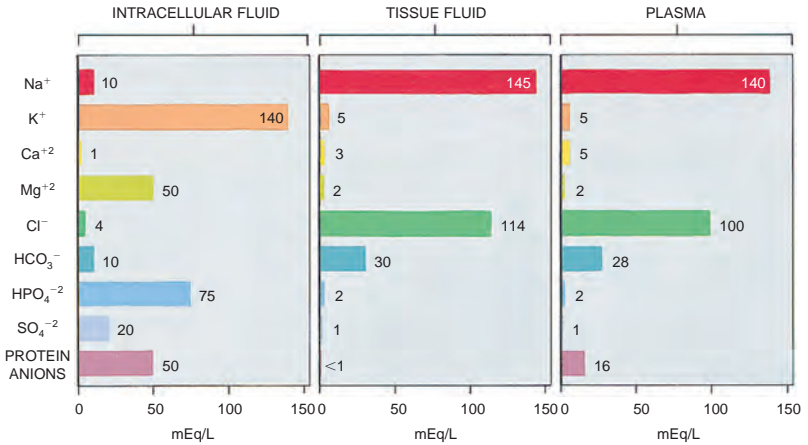
### NORMAL AND ABNORMAL ELECTROENCEPHALOGRAPH WAVE PATTERNS

SOURCE: Reprinted with permission from *The Merck Manual*, 13th ed., Merck & Co., Inc., 1977, pp. 1408-1409.

tricity. **2.** A substance that, in solution, conducts an electric current and is decomposed by its passage. Acids, bases, and salts are common electrolytes. **3.** An ionized salt in blood, tissue fluids, and

cells. These salts include sodium, potassium, and chlorine. **SEE: illus.**

**amphoteric e.** A solution that produces both hydrogen ( $H^+$ ) and hydroxyl ( $OH^-$ ) ions.



ELECTROLYTE CONCENTRATIONS IN BODY FLUIDS

**fecal e's** Osmotically and electrically active ions present in stool. They are measured in the evaluation of chronic diarrhea, to determine whether the diarrhea is secretory or osmotic. SEE: *osmotic diarrhea*; *secretory diarrhea*.

#### electrolytes, direct measurement of

Measurement of serum-plasma ions, such as sodium, chloride, and potassium, without prior dilution of the sample. Direct measurement of electrolytes is considered more physiologically accurate than indirect measurement.

#### electrolytes, indirect measurement of

Measurement of serum ions, such as sodium, chloride, and potassium, using a sample diluted before analysis. The method is prone to physiological error in patients with hyperlipidemia, myeloma, and other disturbances of plasma water concentration.

**electrolytic** (ē-lĕk'trō-lit'ik) Caused by or rel. to electrolysis.

**electrolytic conduction** The passage of a direct current between metallic electrodes immersed in an ionized solution. In metals, the electric charges are carried by the electrons of inappreciable mass. In solutions, the electric charges are carried by electrolytic ions, each having a mass several thousand times as great as the electron. The positive ions move to the cathode and the negative ions to the anode.

**electromagnet** (ē-lĕk'trō-măg'nĕt) [ " + *magnes*, magnet] A magnet consisting of a length of insulated wire wound around a soft iron core. When an electrical current flows through the wire, a magnet is produced. **electromagnetic, adj.**

**electromagnetic field** (ĭ-lĕk'trō-măg-nĕt'ik fĕld) ABBR: EMF. All forms of energy emanating from an electrical

source. Included are the fields produced by light, radio, x-rays, and gamma rays. The higher the frequency of the fields produced, the more energy is contained. Thus, the radiated energy from the 60-cycle frequency of an ordinary household electric line is quite small. The long-range effects of prolonged exposure to EMF are poorly understood.

**electromagnetic induction** Generation of an electromotive force, in an insulated conductor moving in an electromagnetic field, or in a fixed conductor in a moving magnetic field.

**electromagnetic spectrum** The complete range of wavelengths of electromagnetic radiation. SEE: table.

**electromagnetism** (ē-lĕk'trō-măg'nĕ-tizm) Magnetism produced by an electric current.

**electromassage** (ē-lĕk'trō-mă-săzh') [ " + Fr. *masser*, to massage] Massage combined with electrical treatment.

**electromotive** (ē-lĕk'trō-mō'tiv) [ " + L. *motor*, mover] Pert. to the passage of electricity in a current or motion produced by it.

**electromyogram** (ē-lĕk'trō-mī'ō-grām) [ " + *mys*, muscle, + *gramma*, something written] The graphic record of resting and voluntary muscle activity as a result of electrical stimulation.

**electromyographical technician** A technician who assists the neurologist in recording and analyzing bioelectric potentials that originate in muscle tissue. This includes the operation of various electronic devices, maintenance of electronic equipment, assisting with patient care during testing, and record keeping.

**electromyography** (ē-lĕk'trō-mi-ōg'rā-fĕ) [ " + " + *graphein*, to write] ABBR: EMG. The preparation, study, and interpretation of electromyograms that record the electrical activity of selected

## Electromagnetic Spectrum

Frequency (Hz)	Type of Radiation	Wave-length (cm)
$10^{22}$	Gamma rays	$10^{-12}$
$10^{19}$		$10^{-9}$
$10^{16}$	X-rays	$10^{-6}$
$10^{15}$		$10^{-5}$
$10^{14}$	Ultraviolet radiation	$10^{-4}$
$10^{13}$	Visible light	$10^{-2}$
$10^{12}$	Infrared radiation	$10^{-1}$
$10^9$	Submillimeter waves	10
$10^4$	Microwaves	$10^6$
	Television and radio waves	

skeletal muscle groups while at rest and during voluntary contraction.

**PATIENT CARE:** The test determines whether a person's perceived muscle weakness is caused by a disease within the muscle or by a problem in a nerve supplying the muscle. It aids in differentiating between primary muscle disorders (e.g. muscular dystrophies) and secondary muscle disorders, helps assess diseases characterized by central neuronal degeneration (e.g. amyotrophic lateral sclerosis or ALS), and aids in diagnosis of neuromuscular disorders (e.g. myasthenia gravis) and radiculopathies. It is an invasive test: it is performed by inserting needles percutaneously into muscles and measuring their responsiveness to electrical stimulation. The conduction velocity of nerves is often measured simultaneously. Risks include pain during needle insertion, bleeding, or infection. Bleeding or infection occurs infrequently. The patient will feel electrical shocks in the muscles tested during the EMG. If the patient understands the test and wants to proceed, he or she should complete a consent form. The patient's history should be checked for medications that may interfere with test results (e.g. cholinergics, anticholinergics, and skeletal muscle relaxants). EMG is contraindicated in patients with bleeding disorders. Prohibited medications are withheld before testing, as necessary. In some cases, cigarettes, coffee, tea, and cola drinks may be restricted for 2 to 3 hours

before the test, but usually no food or fluid restrictions are imposed.

A typical EMG lasts between 15 and 90 min. The patient is positioned on an examination table or in a chair, wearing a hospital gown or comfortable clothing that permits access to the muscles being tested, with the muscles to be tested at rest. Next, an antiseptic is used to cleanse the skin at the planned needle insertion points, and a metal plate to serve as a reference electrode is positioned under the muscle(s) being tested. Several needle electrodes are then quickly inserted through the skin and into the muscle. The muscle's electrical activity will be measured at rest and with voluntary contraction. The electrical activity (motor unit potential) will be amplified 1 million times to be audible over an audio amplifier. It is also visible on an oscilloscope or computer monitor and recorded on graph paper. At rest the normal muscle shows minimal electrical activity, which increases markedly during voluntary contraction. After the test the patient may take a mild analgesic and/or apply warm compresses to the muscles for soreness. Needle insertion sites should be observed and the patient's primary health care provider notified if bleeding, a hematoma, or signs of infection are noted. The patient may resume any prescribed medications withheld for the test.

**electron** (ē-lĕk'trŏn) [ʹ] An extremely minute particle with a negative electrical charge that revolves about the central core or nucleus of an atom. Its mass is about  $\frac{1}{1840}$  that of a hydrogen atom, or  $9.11 \times 10^{-28}$  g. The negative electrical charge is  $1.602 \times 10^{-19}$  coulombs. When emitted from radioactive substances, electrons are known as negative beta particles, or rays.

**electron boost** An adjunct to external beam radiation therapy in which small focused fields of radiation are applied to a tumor in an attempt to destroy it. Electron boost radiation is used to treat some breast cancers.

**electron cryomicroscopy** ABBR: cryo-EM. Electron microscopic imaging of rapidly frozen molecules and crystals in solution.

**electron-dense** In electron microscopy, having a density that prevents penetration by electrons.

**electronegative** (ē-lĕk'trŏ-nĕg'ă-tĭv) [ʹ + L. *negare*, to deny] 1. The relative attraction of a nucleus for electrons. Using the periodic table, the most electronegative atom is fluorine (upper right), with decreasing electronegativity as one traverses the table down or to the left. 2. Charged with negative electricity, which results in the attraction of positively charged bodies and the repulsion of negatively charged bodies.

**electroneurodiagnostic technologist** (ē-lĕk"trō-nū"rō-dī"āg-nōs'tĭk) A health care professional with special training in the use of diagnostic studies that monitor brain function, including electroencephalograms, evoked potentials, and polysomnograms.

**electroneurolysis** (ē-lĕk"trō-nū-rōl'ī-sīs) Electrical destruction of a nerve.

**electronic** Pert. to electrons.

**electronic fetal monitoring** ABBR: EFM. The use of an electronic device to monitor vital signs of the fetus.

**electronic health record** Electronic medical record.

**electronic portfolio** E-portfolio.

**electronics** The science of all systems involving the use of electrical devices used for communication, information processing, and control.

**electron transport chain** The stage of cellular respiration in which the most adenosine triphosphate is generated. In this crucial biochemical reaction, electrons are passed along a cell or mitochondrial membrane and ultimately accepted by oxygen, producing water. Hydrogen ions (protons) are transported across the membrane. The source of the protons and electrons is primarily nicotinamide adenine dinucleotide, which is recycled during the reaction. SYN: *cytochrome transport system*.

**electron volt** SYMB: eV. The energy acquired by an electron as it passes through a potential of 1 V.

**electroretinography** (ē-lĕk"trō-nīs"tāg-mōg'rā-fē) [" + *nystagmos*, drowsiness, + *graphein*, to write] A method of recording the electrical activity of the extraocular muscles. SEE: *nystagmus*.

**electro-oculogram** (ē-lĕk"trō-ōk'ū-lō-grām") Recording of the electric currents produced by eye movements. SEE: *electroretinogram*.

**electropathology** (ē-lĕk"trō-pā-thōl'ō-jē) [" + *pathos*, disease, suffering, + *logos*, word, reason] Determination of the electrical reaction of muscles and nerves as a means of diagnosis.

**electrophobia** (ē-lĕk"trō-fō'bē-ā) Irrational fear of electricity.

**electrophoresis** (ē-lĕk"trō-for-ē'sīs) [" + *phoresis*, bearing] The movement of charged colloidal particles through the medium in which they are dispersed as a result of changes in electrical potential. Electrophoretic methods are useful in the analysis of protein mixtures because protein particles move with different velocities depending principally on the number of charges carried by the particle. SEE: *diathermy*; *iontophoresis*; *phoresis*.

**gel e.** The separation of whole or fragmented molecules, such as nucleic acids, through an electrically charged gel.

The smaller the molecule, the faster its migration through the gel.

**electrophrenic** (ē-lĕk"trō-frĕn'ĭk) Pert. to stimulation of the phrenic nerve by electricity.

**electrophysiology** (ē-lĕk"trō-fĭz"ē-ōl'ō-jē) [" + *physis*, nature, + *logos*, word, reason] **1.** A field of study that deals with the relationships of body functions to electrical phenomena (e.g., the effects of electrical stimulation on tissues, the production of electric currents by organs and tissues, and the therapeutic use of electric currents). **2.** The study and treatment of cardiac arrhythmias.

**electrophysiology study** ABBR: EPS. A procedure used to determine the cause of life-threatening cardiac arrhythmias and the effect of treatments to prevent them. EPS is used typically after an episode of sudden death caused by ventricular tachycardia or ventricular fibrillation, or in patients at high risk of death from these arrhythmias. Electrodes are placed within the heart and used to stimulate rhythm disturbances; the response of the heart can be studied after administration of antiarrhythmic drug therapy or under other controlled conditions.

**electroporation** (ē-lĕk"trō-po-rā'shūn) **1.** Electrical patch. **2.** The opening of pores in cellular or nuclear membranes with electrical current. It has been used as a treatment for some solid tumors.

**electropositive** (ē-lĕk"trō-pōz'ĭ-tĭv) [" + *L. positivus*, to put, place] Charged with positive electricity, which results in the repulsion of bodies electrified positively and the attraction of bodies electrified negatively.

**electroresection** (ē-lĕk"trō-rē-sĕk'shūn) Removal of tissue by use of an electric device such as an electrocautery.

**electroretinogram** (ē-lĕk"trō-rĕt'ĭ-nō-grām) ABBR: ERG. A record of the electrical responses of the retina to stimulation by light.

**electroscission** (ē-lĕk"trō-sĭ'zhūn) [" + *L. scindere*, to cut] Division of tissues by electrocautery.

**electroscope** (ē-lĕk"trō-skōp) [" + *sko-pein*, to examine] An instrument that detects radiation intensity.

**electroshock** (ē-lĕk"trō-shōk") Shock produced by an electric current, used in psychiatry to treat depression.

**electroshock therapy** Electroconvulsive therapy.

**electrosleep** (ē-lĕk"trō-slĕp") Sleep produced by the passage of mild electrical impulses through parts of the brain.


**electrostatic** (ē-lĕk"trō-stāt'ĭk) [" + *statikos*, causing to stand] Pert. to static electricity.

**electrostatic unit** ABBR: ESU or ESE (from the German *elektrostatische*



*Einheit*). Any electrical unit of measure based on the attraction or repulsion of a static charge, as distinguished from an electromagnetic unit, which is defined in terms of the attraction or repulsion of magnetic poles.

**electrosurgery** (ĭ-lĕk"trō-sūr'jī-rĕ) An operative procedure that is undertaken with an instrument that converts electricity to heat used for cutting, cauterizing, coagulation, or coaptation of tissues. **electrosurgical**, *adj.*

 Potential (but rare) complications of electrosurgery include unanticipated burns, interference with implanted electronic devices (e.g., pacemakers, defibrillators), operating room fires, and exposure to noxious fumes.

**electrotaxis** (ĕ-lĕk"trō-tāks'is) The movement of cells, tissues, or organisms under the influence of an electromagnetic stimulus.

**electrotherapy** (ĕ-lĕk"trō-thĕr'ā-pĕ) The use of electricity in treating musculoskeletal dysfunction, pain, or disease. Also called *electrotherapeutics*.

**electrothermal** (ĭ-lĕk"trō-thĕr'mil) Pert. to the heat generated by electricity and its uses (e.g., in surgery).

**electrotonus** (ĕ-lĕk-trōt'ō-nūs) The change in the irritability of a nerve or muscle during the passage of an electric current.

**electrovalence** (ĕ-lĕk"trō-vā'lĕns) The ionic linkage between atoms in which each accepts or donates electrons so that each atom ends up with a completed electron shell.

**electrovaporization** (ĭ-lĕk"trō-vā'pĕr-ĭ-zā'shŭn) Cutting of tissues with an instrument that uses electricity to convert solid tissues into gas.

**electuary** (ĕ-lĕk'tŭ-ā-rĕ) [Gr. *ekleikhein*, to lick up] A medicinal substance mixed with honey or sugar to form a paste suitable for oral consumption.

**eleidin** (ĕ-lĕ'ī-dīn) [Gr. *elaion*, oil] A translucent protein present in the stratum lucidum of the epidermis of the palms and soles.

**element** [L. *elementum*, a rudiment] In chemistry, a substance that cannot be separated into substances different from itself by ordinary chemical processes. Elements exist in free and combined states. There are 110 named elements, plus others yet to be fully characterized and named.

Oxygen, carbon, hydrogen, nitrogen, phosphorus, and sulfur are found in all living organisms. These six elements and calcium make up 99% of the human body mass. Sodium, potassium, magnesium, chlorine, iodine, and iron form 0.9% of the body mass.

**trace e.** SEE: under *trace element*. SEE: *ultra-trace elements*.

**elemental** (ĕl'ĕ-mĕn'til) Pert. to diets that are easy to digest or predigested; rudimentary or simple.

**eleosaccharum** (ĕl'ĕ-ō-sāk'ā-rŭm) [l' + *sakcharon*, sugar] A mixture of powdered sugar with a volatile oil. It is used in compounding a variety of herbal remedies and other pills.

**elephantiasis** (ĕl'ĕ-fān-tī'ā-sīs) [Gr. *elephas*, elephant, + *-iasis*, condition] Massive swelling, esp. of the genitalia and lower extremities, resulting from obstruction of lymphatic vessels, for example by filarial parasites, malignancies, neurofibromatosis, or a familial congenital disease (Milroy's disease). Prolonged swelling can cause an increase in interstitial fibrous tissue and skin puckering or breakdown. In patients with parasitic elephantiasis (i.e., the filarial diseases, which are common in the tropics), single-dose therapy with ivermectin or ivermectin plus albendazole destroys immature but not adult worms. SEE: *lymphedema*.

**scrotal e.** Swelling of the scrotum, usually as a result of infection of the pelvic lymphatics by filaria. SYN: *chyloderma*.

**elephant man disease** Colloquial name for Recklinghausen's disease.

**Eleutherococcus senticosus** (ĕl-ŭ'thĕr-ō-kōk'ōs sĕn-tī-kō'sōs) [NL. fm Gk., thorny free-seed] The scientific name for Russian ginseng, also known as Siberian ginseng.

**elevation** (ĕl'ĕ-vā'shŭn) **1.** A raised area that protrudes above the surrounding area. **2.** The measured distance above a fixed object, e.g., the distance above sea level, or above a fixed anatomic structure. **3.** The rise of a physiological variable above normal, e.g., in ophthalmology, the rise in intraocular pressure above what is healthy or normal; in serology, an increase in the level of an electrolyte or other blood test result.

**S-T segment e.** The height of the ST segment of an electrocardiogram relative to a level line that can be drawn between the preceding P-R interval and the subsequent T-P interval. S-T segment elevation in two or more contiguous leads of the electrocardiogram is one of the diagnostic criteria for acute myocardial infarction.

**tactile e.** A small raised area of the palm and sole that contains a cluster of nerve endings.

**elevator** [L. *elevare*, to lift up] **1.** A curved retractor for holding the lid away from the globe of the eye. **2.** A retractor for raising depressed bones by levers or screws. **3.** Instrument used for soft tissue; e.g., periosteal elevator. **4.** An instrument of varying design for extract-

- ing teeth or removing root or bone fragments.
- periosteal e.** A surgical instrument for separating the periosteum from the bone.
- eleventh cranial nerve** The motor nerve, made up of a cranial and a spinal part, that supplies the trapezius and sternomastoid muscles and the pharynx. The accessory portion joins the vagus to supply motor fibers to the pharynx, larynx, and heart.
- elfin** Having the facial appearance of an elf. The term is used to describe the facial structure of children with Williams syndrome.
- eligible** (ĕl'ĭ-jĭ-bĭl) [LL. *eligibilis*] Qualified to be considered a candidate for some role, e.g., membership in a professional society or enrollment in an insurance program or a research study.
- eligible for organ donation** Any person who is expected to die in the near future, is under 70 years old, and is free of excluded medical conditions for organ donation such as Creutzfeldt-Jakob disease, human immunodeficiency virus infection, or leukemia.
- eliminant** (ĕ-lĭm'ĭ-nănt) [L. *e*, out, + *limen*, threshold] 1. Effecting evacuation. 2. An agent aiding in elimination.
- eliminate** (ĕ-lĭm'ĭ-năt) To expel; to rid the body of waste material.
- elimination** 1. Excretion of waste products by the skin, kidneys, lungs, and intestines. 2. Leaving out, omitting, removing.
- ELISA** *Enzyme-linked immunosorbent assay*, the former name for EIA (enzyme immunoassay).
- elixir** (ĕ-lik'sĕr) [L. from Arabic *al-iksir*] A sweetened, aromatic, hydroalcoholic liquid used in the compounding of oral medicines. Elixirs constitute one of the most common types of medicinal preparation taken orally in liquid form.
- ellagic acid** An antioxidant and anticancer polyphenol found in strawberries, raspberries, and pecans, among other foods.
- ellipsis** (ĕ-lĭp'sĭs) [L. *ellipsis* fr. Gr., a falling short, defective] In psychoanalysis, omission by the patient of important words or ideas during treatment.
- ellipsoid** (ĕ-lĭp'soyd) Spindle-shaped.
- elliptocyte** (ĕ-lĭp'tō-sīt) An oval-shaped red blood cell. About 11% to 15% of red blood cells are normally oval, but in anemia and hereditary elliptocytosis, the percentage is increased to 25% to 100%. In birds, reptiles, and some other animals, the red cells are normally elliptocytes.
- elliptocytosis** (ĕ-lĭp'tō-sĭ-tō'sĭs) A condition in which the number of elliptocytes is increased. It occurs in some forms of anemia.
- hereditary e.** An inherited condition in which the red blood cells are oval or elliptical. This anomaly occurs in about 1 in every 2000 births.
- Ellis-van Creveld syndrome** (ĕl'ĭs-vănk-rĕ'vĕld) [Richard W. B. Ellis, Scot. physician, 1902–1966; Simon Creveld, Dutch physician, 1894–1977] A congenital syndrome consisting of polydactyly, chondrodysplasia with acromelic dwarfism, hydrotic ectodermal dysplasia, and congenital heart defects. It is thought to be transmitted as an autosomal trait. SYN: *chondroectodermal dysplasia*.
- Elocon** SEE: *mometasone*.
- elongation** (ĕ'lŏng-gă'shŭn) The condition of being extended or lengthened, or the process of extending.
- elope** 1. To run away secretly with a lover, esp. to marry. 2. To leave a hospital, esp. a psychiatric hospital, without permission.
- eloquent brain** Those parts of the brain that control speech, movement, and sensation, i.e., whose functions are readily felt, heard, and observed.
- eluante** (ĕl'ū-ăt) The material washed out by elution.
- eluent** (ĕ-lŭ'ĕnt) The solvent or dissolving substance used in elution.
- elution** (ĕ-lŭ'shŭn) [L. *e*, out, + *luere*, to wash] In chemistry, separation of one material from another by washing. If a material contains water-soluble and water-insoluble materials, the passage of water (the eluent) through the mixture will remove the portion that is water soluble (the eluate) and leave the water-insoluble residue.
- elutriation** (ĕ-lŭ-trĕ-ă'shŭn) [L. *elutriare*, to cleanse] The separation of insoluble particles from finer ones by decanting of the fluid.
- EM** *erythema migrans*.
- emaciate** (ĕ-mă'sĕ-ăt) [L. *emaciare*, to make thin] To cause to become excessively lean.
- emaciated** (ĕ-mă'shĕ-ă-tĕd) Excessively thin; wasted.
- emaciation** (ĕ-mă'shĕ-ă'shŭn) The state of being extremely lean. SYN: *wasting*. SEE: *cachexia*.
- emailloid** (ă-mĭ'loyd) [Fr. *email*, enamel, + Gr. *eidos*, form, shape] A tumor having its origin in tooth enamel.
- emanation** (ĕm-ă-nă'shŭn) [L. *e*, out, + *manare*, to flow] 1. Something given off; radiation; emission. 2. A gaseous product of radioactive disintegration.
- actinium e.** The radioactive gas given off by actinium; a radioactive isotope of actinium. SYN: *actinon*.
- radium e.** The radioactive gas given off by radium. SYN: *radon*.
- thorium e.** The radioactive gas given off by thorium. SYN: *thoron*.
- emancipatory teaching** (ĕ-măn'sĭ-pĭ-tŏr'ĕ) [L. *emancipare*, to declare free and independent] 1. A model of teaching in which coaching, dialogue, and en-

couragement are more important than the dissemination of information from teacher to student. **2.** Online teaching.

**emasculat** (ĕ-mās'kū-lā'shŭn) [L. *emasculare*, to castrate] **1.** Castration. **2.** Excision of the entire male genitalia. **3.** Figuratively, the act of making another person powerless or ineffective.

**embalming** (ĕm-bām'ing) [L. *im-*, on, + *balsamum*, balsam] Preparing a body or part of a body for burial by injecting it with a preservative such as a 4% formaldehyde solution. This is usually done within 48 hr of death. SEE: *Standard Precautions Appendix*.

**embarrass** (ĕm-bār'ās) To interfere with or compromise function.

**EMBASE** (ĕm'bās') [Fm. *Excerpta Medica* + *base*] An electronic database of biomedical and pharmacological information administered by Excerpta Medica. It contains citations and abstracts of journal articles culled from about 4600 scientific journals published since 1974 in 70 countries.

**Embden-Meyerhof pathway** (ĕm'dĕn-mī'ĕr-hof) [Gustav G. Embden, Ger. biochemist, 1874–1933; Otto Fritz Meyerhof, Ger. biochemist, 1884–1951] A series of metabolic and enzymatic changes that occur in many plants and animals when glucose, glycogen, or starch is metabolized anaerobically to produce acetic acid. The process produces energy in the form of adenosine triphosphate (ATP).

**embedding** (ĕm-bĕd'ing) [ʹ + AS. *bedd*, to bed] In histology, the process by which a piece of tissue is placed in a firm medium such as paraffin to support it and keep it intact during the subsequent cutting into thin sections for microscopic examination.

**embolalia, embololalia** (ĕm'bō-lā'lĕ-ā, ĕm'bō-lō-lā'lĕ-ā) [Gr. *embolos*, thrown in, + *lalia*, babble] Insertion of stammered sounds or fillers such as "ah," "hmm," or "uh" in connected speech. SYN: *embolophrasia*.

**embole** (ĕm'bō-lĕ) [Gr. *emballein*, to throw in] **1.** Reduction of a dislocation. **2.** Formation of the gastrula by invagination.

**embolectomy** (ĕm'bō-lĕk'tō-mĕ) [ʹ + *ektome*, excision] Removal of an embolus from a vessel. It may be done surgically or by the use of enzymes that dissolve the clot. The latter method is used in treating acute myocardial infarction and in other areas where blood flow is obstructed by a blood clot. SEE: *tissue plasminogen activator*.

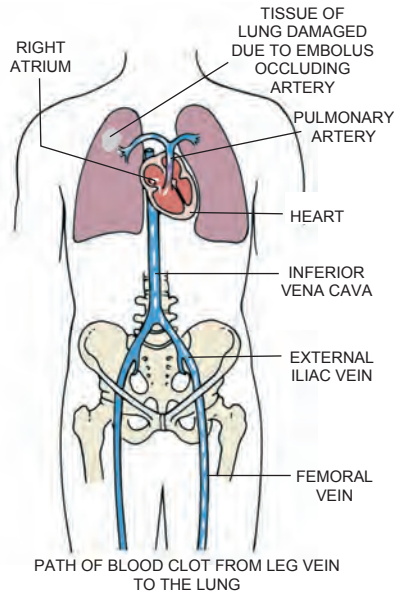
**embolic** (ĕm-bōl'ik) Pert. to or caused by embolism.

**embolic protection filter** In interventional vascular procedures, a net or umbrella placed distal to the site of an angioplasty to capture debris that has

been released by the procedure and that might occlude downstream vessels.

**emboliform** (ĕm-bōl'ĭ-fōrm") [ʹ + L. *forma*, form] **1.** Resembling an embolus. **2.** Wedge-shaped, as the nucleus emboliformis.

**embolism** (ĕm'bō-lizm) [ʹ + *-ismos*, condition] Sudden obstruction of a blood vessel by debris. Blood clots, cholesterol-containing plaques, masses of bacteria, cancer cells, amniotic fluid, fat from the marrow of broken bones, and injected substances (e.g., air bubbles or particulate matter) all may lodge in blood vessels and obstruct the circulation. SEE: *illus.*



**EMBOLISM**

**air e.** Obstruction of a blood vessel caused by an air bubble.

**ETIOLOGY:** Air may enter a vessel postoperatively, during change of an intravenous set on a central line or by injection into a central line port or rupture of a central line balloon, during an intravenous injection if the syringe is not properly filled, or from intravenous tubing if fluid is permitted to flow through tubing from which air has not been evacuated. **NOTE:** A very small amount of air in the tubing or syringe will not cause symptoms.

**SYMPTOMS:** Symptoms include sudden onset of dyspnea, unequal breath sounds, hypotension, weak pulse, elevated central venous pressure, cyanosis, sharp chest pains, hemoptysis, a churning murmur over the precordium, and decreasing level of consciousness.

**PATIENT CARE:** When an air or gas embolism is suspected in the systemic venous circulation (the blood supply that returns from the body to the heart), echocardiography should be used to confirm its presence. The suspected site of gas entry should be secured and flooded with normal saline to prevent further entry of gas into the circulation. One hundred percent oxygen should be administered to the patient by nonre-breather mask. The patient should be immediately repositioned so that the right atrium is above the gas entry site, so that air will be trapped there and not move in to the pulmonary circulation or the right heart. A central venous catheter should be placed into the central venous circulation into any gas bubbles, and air aspirated from the catheter. Intravenous fluids and inotropic medications may be needed to support blood pressure and pulse.

**Prevention:** All air should be purged from the tubing of all IV administration sets before hookup and when solution bags or bottles are changed; air elimination filters should be used close to the patient; infusion devices with air detection capability should be used, as well as locking tubing, locking connection devices, or taped connections. For central lines, to increase peripheral resistance and prevent air from entering the superior vena cava, the patient should be instructed to perform a Valsalva maneuver as the stylet is removed from the catheter, during attachment of the IV tubing, and when adapters or caps are changed on ports.

**amniotic fluid e.** The entry of amniotic fluid through a tear in the placental membranes into the maternal circulation. This rare event may occur at any gestational age, but most commonly during labor, delivery or in the immediate postpartum period. The contents of the fluid (e.g., shed fetal cells, meconium, lanugo, vernix) may produce pulmonary or cerebral emboli. Cardiac arrest and disseminated intravascular coagulation (DIC) commonly occur. Maternal death is a frequent complication.

**SYMPTOMS:** Chest pain, dyspnea, cyanosis, tachycardia, hemorrhage, hypotension, or shock are potential symptoms. Amniotic fluid embolism is frequently fatal.

**drug e.** Obstruction of the circulation by injected drugs, debris, or talc, often resulting in pulmonary infarction.

**fat e.** ABBR: FE. An embolism caused by globules of fat obstructing small blood vessels in the brain, lungs, and skin. It frequently occurs after fracture of long and pelvic bones or after orthopedic surgery and has been linked to episodes of acute pancreatitis, sickle-cell crisis, diabetes mellitus, osteomye-

litis, and liposuction. Effects may be mild and undetected but can be severe, leading to acute respiratory distress syndrome, multiple organ dysfunction syndrome, or disseminated intravascular coagulation. Individuals most at risk for FE are males age 20 to 40 injured in serious motor-vehicle accidents and elderly adults after hip fracture.

**SYMPTOMS:** Findings often include agitation, restlessness, delirium, convulsions, coma, tachycardia, tachypnea, dyspnea, wheezing, blood-tinged sputum, and fever, esp. during the first 12 to 72 hr after injury or insult, when fat emboli are most likely to occur. Petechiae may appear on the buccal membranes, conjunctival sacs, and the chest and axillae (in a vestlike distribution). Retinal hemorrhages may be seen on fundoscopic examination. If fat globules lodge in the kidneys, renal failure may occur. Laboratory values are nonspecific, but may show hypoxemia, suddenly decreased hemoglobin and hematocrit levels, leukocytosis, thrombocytopenia, increased serum lipase, and fat globules in urine and/or sputum.

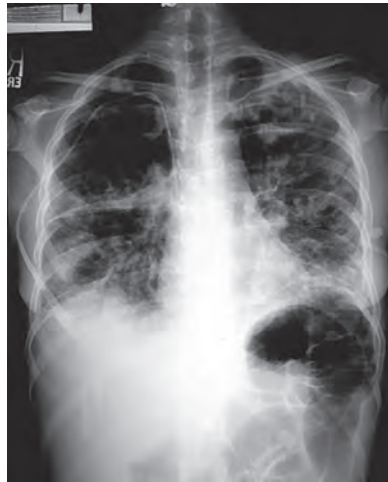
**PATIENT CARE:** There is evidence that FE can be prevented when long bone fractures are immobilized immediately. Limited movement and gentle handling of any fractures prior to fixation may help to prevent fat globule release. Patients at risk (i.e., those with fractures of long bones, severe soft tissue bruising, fatty liver injury, or multiple injuries) are assessed for symptoms of fat embolism. Chest radiograph reports are reviewed for evidence of mottled lung fields and right ventricular dilation, and the patient's electrocardiogram is checked for large S waves in lead I, large Q waves in lead III, and right axis deviation.

Monitor the patient's respiratory and neurological status frequently for signs of hypoxemia. The treatment for the syndrome is nonspecific—good general supportive care of fluid balance, vital signs, oxygenation, electrolytes, and hemodynamics. The patient is placed in the high Fowler's, orthopedic, or other comfortable position to improve ventilation; high-concentration oxygen is administered, and endotracheal intubation and mechanical ventilation are initiated if the patient cannot maintain a PaO<sub>2</sub> of 60 mm Hg on 40% oxygen by face mask. Positive and end-expiratory pressure may be used to keep functional alveoli inflated, improving functional reserve capacity. IV fluid administration helps to prevent shock. Deep breathing exercises and use of incentive spirometry to open and stabilize atelectatic lung areas may improve lung capacity and ventilation. Prescribed phar-

macological agents are administered; these may include steroids, heparin, and anxiolytic agents such as diazepam.

**paradoxical e.** An embolism arising from the venous circulation that enters the arterial circulation by crossing from the right side of the heart to the left side through a patent foramen ovale or septal defect. It may occasionally cause stroke in a patient with a deep venous thrombosis.

**pulmonary e.** ABBR: PE. An obstruction of the pulmonary artery or one of its branches, usually caused by an embolus from a blood clot in a lower extremity. Roughly 10% to 15% of patients with the disease will die. Risks for it include genetic predisposition, recent limb or pelvic fracture, other trauma, burns, surgery (especially joint replacement [knee, hip]), long-term immobility, enforced immobilization (long car or plane trips or hospitalization), pregnancy, use of estrogen-containing hormonal contraceptives, postmenopausal hormones, atrial fibrillation, vascular injury, IV drug abuse, polycythemia vera, heart failure, autoimmune hemolytic anemia, sickle cell anemia, thrombocytosis, dehydration,, advanced age, cancer, and obesity. Diagnosis is challenging because symptoms are nonspecific and often misinterpreted and may mimic many other diseases of the limbs, abdomen, or chest. It is often assumed that a sudden, unexpected death occurring after a hospitalization was caused by an unsuspected PE. PE is currently the third most common cause of death in the U.S. When a pulmonary embolism is suspected, evaluation includes oximetry, chest x-ray, blood tests for D-dimer, and depending on local hospital practices, duplex venous ultrasonography of the legs, ventilation/perfusion scanning, or multidetector CT angiography of the chest. Pulmonary angiography was formerly the gold standard test but is invasive, poses some risk to the patient, and requires angiographic skill and excellent radiographic equipment. It is now rarely performed. Treatment includes the administration of anticoagulants (low molecular weight heparins or unfractionated heparins, followed by oral warfarin). Oxygen is administered as prescribed by nasal cannula or mask. In critically ill patients, intubation and mechanical ventilation may be required. Thrombolytic drugs may be needed for massive emboli, i.e., those that cause shock or that impair the filling of the right atrium and ventricle with blood. Thrombolectomy may be attempted in critically ill patients, when a competent surgical team is available. SEE: *illus.; thrombosis, deep venous.*



#### PULMONARY EMBOLISM

Septic pulmonary emboli seen in plain chest x-ray

**PATIENT CARE:** In the hospitalized patient, early mobilization, administration of prophylactic anticoagulants, and compression stockings (elastic or pneumatic) may prevent deep venous thrombosis (DVT). Vital signs, oxygen saturation, respiratory effort, breath sounds, cardiac rhythm, and urinary output are monitored closely in affected patients. Signs of deterioration are promptly reported. The nurse assists with diagnostic studies and medical treatment, and provides explanations of procedures and treatments, analgesics for pain, prescribed medications, supplemental oxygen, patient education, and emotional support. Once the pain is stable, the patient is encouraged to resume normal activities. Following a pulmonary embolism, most patients will remain on anticoagulant therapy for at least 6 months. The patient is taught about taking the medication dosage precisely as prescribed, bleeding signs to be reported, avoidance of over-the-counter and prescription drugs that may influence anticoagulation, regulation of foods high in vitamins, and the need for frequent blood tests to ensure appropriate levels of anticoagulation. SEE: *International Normalized Ratio.*

In patients who cannot use anticoagulants, a filtering device may be inserted transvenously into the vena cava to try to prevent blood clots from embolizing from the legs to the heart and lungs. SEE: *Nursing Diagnoses Appendix.*

**pyemic e.** Septic e.

**septic e.** An embolism made up of purulent matter that arises from the site of an infection caused by a pyogenic



(pus-forming) organism. It can result in the spread of infection to a distant site. SYN: *pyemic embolism*.

**embolization** (ēm-bō-lī-zā'shūn) Obstruction of a blood vessel by intentionally injected material or by physiologic migration of loosened intravascular plaque or thrombi.

**arterial e.** Embolotherapy; pathophysiologic migration of an embolus into an artery.

**therapeutic e.** Embolotherapy.

**uterine artery e.** The injection of particles into the uterine artery to block its blood supply. Uterine artery embolization is used as an alternative to hysterectomy in the management of uterine fibroids and, occasionally, postpartum bleeding. Complications from the procedure include pelvic pain, cramping, fever, nausea, vomiting, or occasionally uterine injury that necessitates surgical removal of the uterus. SEE: *embolotherapy*.

**embolophrasia** (ēm'bō-lō-frā'zē-ā) [" + *phrasis*, utterance] Embolalia.

**embolotherapy** (ēm'bō-lō-thēr'ā-pē) The use of any type of embolic material (autologous thrombus, muscle fragment, or foreign body) for therapeutic occlusion of a blood vessel. This technique is used to control bleeding, close fistulae or arteriovenous malformations, devascularize organs, and reduce tumors or varicoceles. Generally a catheter is threaded through the vascular system to the origin of the vessel to be occluded, and an agent is injected under radiographic control.

**embolus** (ēm'bō-lūs) *pl. emboli* [Gr. *embolos*, stopper] A mass of undissolved matter present in a blood or lymphatic vessel and brought there by the blood or lymph. Emboli may be solid, liquid, or gaseous. Occlusion of vessels from emboli usually results in the development of infarcts. SEE: *thrombosis*; *thrombus*.

**air e.** Air embolism.

**coronary e.** An embolus in one of the coronary arteries. It may be a complication of arteriosclerosis and may cause angina pectoris.

**pulmonary e.** An embolus in the pulmonary artery or one of its branches. SEE: *pulmonary embolism*.

**embolysis** (ēm-bōl'ī-sīs) The dissolution of an embolus, esp. one due to a blood clot.

**embrasure** (ēm-brā'zhūr) [Fr., window opening from within] The space formed by the contour and position of adjacent teeth.

**buccal e.** The embrasure spreading toward the cheek between the molar and premolar teeth.

**labial e.** The embrasure opening toward the lips between the canine and incisor teeth.

**lingual e.** The embrasure opening to the lingual sides of the teeth.

**occlusal e.** The embrasure marked by the marginal ridge on the distal side of one tooth and that on the mesial side of the adjacent tooth, and the contact points.

**embryectomy** (ēm'brē-ēk'tō-mē) [Gr. *embryon*, something that swells in the body, + *ektome*, excision] Removal of an extrauterine embryo.

**embryo** (ēm'brē-ō) [Gr. *embryon*, something that swells in the body] **1.** The young of any organism in an early stage of development. **2.** In mammals, the stage of prenatal development between fertilized ovum and fetus. In humans, this stage begins on day 4 after fertilization and continues through gestational week 8. SEE: *illus*.

**DEVELOPMENT:** First week after fertilization: The zygote begins a series of mitotic divisions called cleavage and forms a morula, a solid sphere of cells. The morula develops into a blastocyst, which has an outer trophoblast and an inner cell mass. The trophoblast gives rise to the chorion, and after implantation in the uterus, becomes the fetal placenta. Second week: The amniotic cavity and yolk sac form within the inner cell mass; they are separated by the embryonic disk, which at this time consists of ectoderm and endoderm. Third week: Mesoderm develops between ectoderm and endoderm; all three germ layers are established.

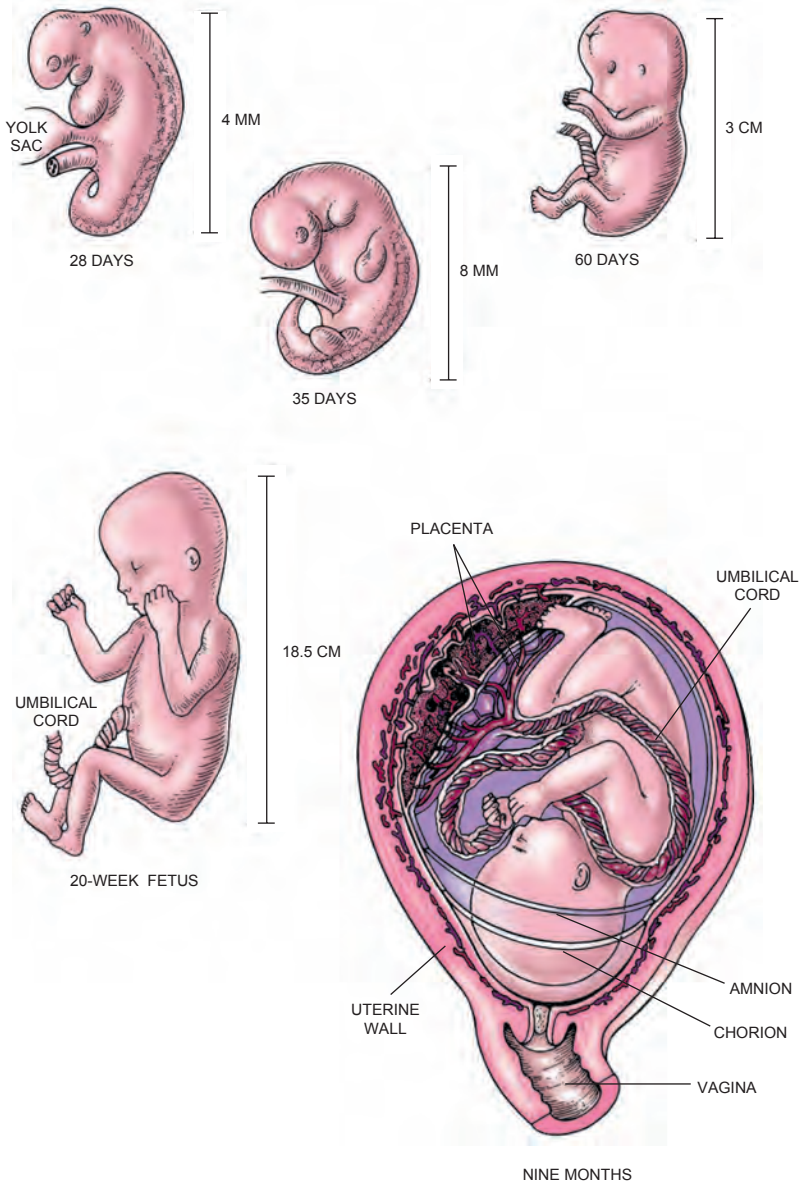
The epithelium of the alimentary canal, liver, pancreas, and lungs develops from endoderm. Muscle, all connective tissues, blood, lymphatic tissue, and the epithelium of blood vessels, body cavities, kidneys, gonads, and suprarenal cortex develop from mesoderm. The epidermis, nervous tissue, hypophysis, and the epithelium of the nasal cavity, mouth, salivary glands, bladder, and urethra develop from ectoderm.

*Embryo* (Third through eighth weeks): The embryo increases in length from about 1.5 mm to 23 mm. The organ systems develop and the embryo begins to show human form. During this period of organogenesis, the embryo is particularly sensitive to the effects of viral infections of the mother (e.g., rubella) and toxic chemicals, including alcohol and tobacco smoke, and is sensitive to hypoxemia.

**embryocardia** (ēm'brē-ō-kār'dē-ā) [" + *kardia*, heart] Heart action in which the first and second sounds are equal and resemble the fetal heart sounds; a sign of cardiac distress.

**embryocidal** (ēm'brē-ō-sī'dāl) [Gr. *embryon*, something that swells in the body, + *L. cida*, killer] Pert. to anything that kills an embryo.

**embryoctony** (ēm'brē-ōk'tō-nē) [" +



### STAGES OF DEVELOPMENT OF HUMAN EMBRYO INCLUDING MATURE FETUS

*ktein*, to kill] Destruction of the fetus in utero, as when delivery is impossible or during abortion. SEE: *craniotomy*.

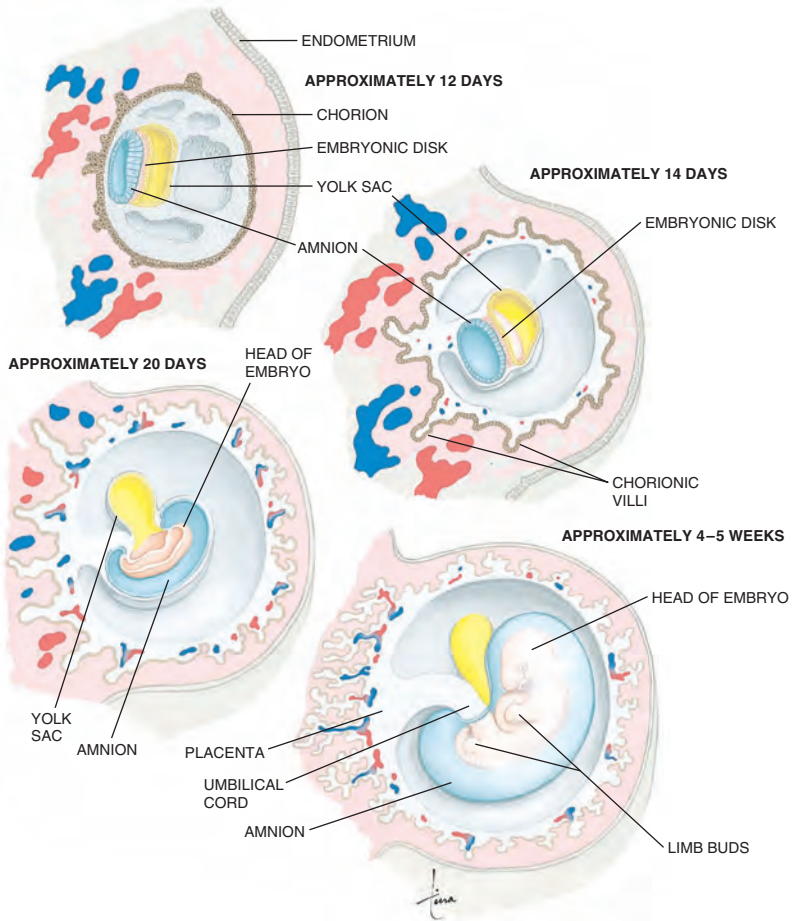
**embryogenetic, embryogenic** (ēm'brē-ō-jē-nēt'ik, ēm'brē-ō-jēn'ik) [ + *genan*, to produce] Giving rise to an embryo.

**embryogeny** (ēm'brē-ō-j'ē-nē) The growth and development of an embryo.

**embryography** (ēm'brē-ōg'rā-fē) [ + *graphein*, to write] A treatise on the embryo.

**embryology** (ēm'brē-ōl'ō-jē) [ + *logos*, word, reason] The science that deals with the origin and development of an organism in the womb.

**embryoma** (ēm'brē-ō'mă) [ + *oma*, tumor] A tumor, such as Wilms' tumor of the kidney, neuroblastoma, or tera-



### EMBRYONIC DEVELOPMENT

tomas, consisting of derivatives of the embryonic germ layers but lacking in organization.

**embryonal** (ēm'brē'ō-nāl) Pert. to or resembling an embryo.

**embryonic** (ēm'brē-ōn'ik) [Gr. *embryon*, something that swells in the body] Pertaining to or in the condition of an embryo.

**embryonic period** In human gestation, the stage of prenatal development between the fourth day after fertilization and the end of the eighth week.

**embryopathy** (ēm'brē-ōp'ä-thē) [ʹ + *pathos*, disease, suffering] Any acquired or genetic disease of a developing embryo.

**embryoplastic** (ēm'brē-ō-pläs'tik) [ʹ + *plassein*, to form] Having a part in the formation of an embryo; said of cells.

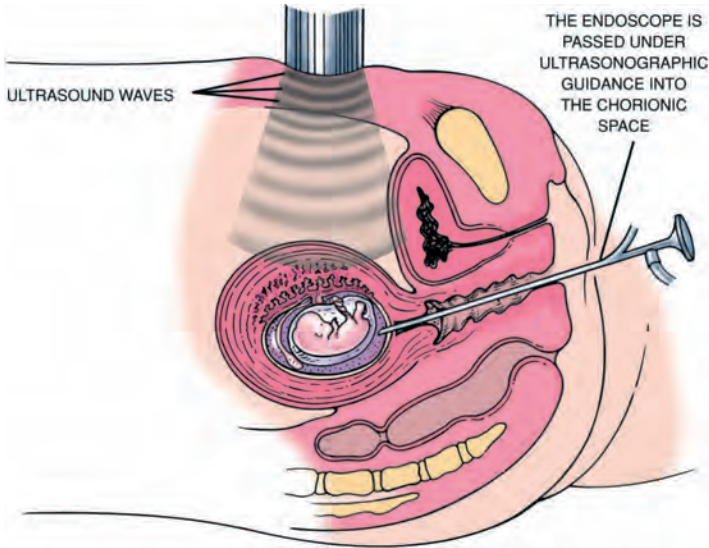
**embryoscopy** (ēm'brē-ōs'kō-pē) Direct visualization of the fetus or embryo in

the uterus by insertion of the light source and image-detecting portion of a fetoscope into the amniotic cavity through a small incision in the abdominal wall. This technique permits visualization and photography, surgical correction of certain types of congenital defects, and collection of amniotic fluid specimens for analysis of chemical and cellular materials. **SEE: illus.**

**embryotomy** (ēm'brē-ōt'ō-mē) Dissection of a fetus to aid delivery.

**embryotoxon** (ēm'brē-ō-tōks'ōn) [ʹ + *toxos*, bow] Congenital marginal opacity of the cornea. **SYN: arcus juvenilis.**

**embryo transfer** Placement of embryos into the uterus through the cervix after in vitro fertilization (IVF) or, in the case of gamete intrafallopian transfer (GIFT), into the fallopian tubes. Fertilization is usually done by placing the sperm and ovum in a special culture



### EMBRYOSCOPY

tube. SEE: *gamete intrafallopian transfer in vitro fertilization; GIFT; surrogate mother.*

**embryotroph** (ēm'brē-ō-trōf) [ʼ + *trophe*, nourishment] A fluid resulting from the enzyme action of the trophoblast on the neighboring maternal tissue. This fluid nourishes the embryo from the time of implantation into the uterus.

**emedullate** (ē-mēd'ū-lāt) [L. *e*, out, + *medulla*, marrow] To remove the marrow from a bone.

**emergence** (ī-mēr'jīns) [L. *emergere*, to raise up] Awakening from the effects of an anesthetic drug (i.e., from sedation or hypnosis).

**emergency** [L. *emergere*, to raise up]  
 1. Any urgent condition perceived by the patient as requiring immediate medical or surgical evaluation or treatment. 2. An unexpected serious occurrence that may cause a great number of injuries, which usually require immediate attention. SEE: *disaster planning.*

**emergency fire** A situation in which fire may cause death or severe injury. A person whose clothing catches fire should be rolled in a rug or blanket to smother the flames. If an individual is outdoors, rolling in the dirt will smother flames. SEE: *burn; gas; smoke inhalation injury; transportation of the injured.*

If the victim is trapped in a burning building, the occupied room should have the doors and windows closed to prevent cross-breezes from increasing the fire. The window should be opened only if the victim is to be rescued through it. Doors should be opened only a few inches to

ascertain the possibility of escape. A burst of flame or hot air can push the door in and asphyxiate anyone in the room. Wet cloths or towels should be held over the mouth and nostrils to keep out smoke and gases.



In attempting to escape from an area filled with smoke or fire, it is important to crawl rather than walk or run upright. The heat several feet above floor level may be lethal due to superheated gases, but at floor level, it may be cool enough to tolerate. Even when crawling, it is important to proceed as quickly as possible. Carbon monoxide is present in higher concentration at floor level because it is heavier than air.

**emergency cardiac care** ABBR: ECC.

The basic and advanced life support assessment and treatment necessary to manage sudden and often life-threatening events affecting cardiovascular and pulmonary systems. ECC includes identifying the nature of the problem, monitoring the patient closely, providing basic and advanced life support as quickly as possible, preventing complications, reassuring the patient, and transporting the patient to the most appropriate facility for definitive cardiac care. SEE: *advanced cardiac life support; basic life support; cardiopulmonary resuscitation.*

**Emergency Department** ABBR: E.D.

The unit of a hospital in which acute, severe, or urgent illnesses and/or injuries are treated.



**emergency kit** A box or bag containing the equipment, supplies, and medications needed to provide an initial assessment and to manage life-threatening conditions. The kit typically includes tools for managing the airway and breathing, supporting circulation, providing basic or advanced life support, inserting intravenous access, and measuring vital signs.

**emergency medical dispatch** A communications system that uses the telephone to interview witnesses to an emergency, make triage decisions, and provide protocol-based advice so that first-aid treatment may be initiated before emergency services providers arrive at the scene.

**emergency medical identification** SEE: *Medic Alert*<sup>®</sup>.

**emergency medical services medical director** The physician responsible for the patient care and clinical components of an EMS system.

**Emergency Medical Service System** ABBR: EMSS. A comprehensive approach to providing emergency medical services, including the following components: manpower, training, communications, transportation facilities, critical care units, public safety agencies, consumer participation, access to care, patient transfer, coordinated patient record keeping, public information and education, review and evaluation, and disaster planning. SEE: *disaster planning*.

**emergency medical technician** ABBR: EMT. An individual trained to administer emergency care in a variety of conditions, but esp. to patients who have suffered illnesses such as cardiac arrest, chest pain, stroke, or trauma. EMTs function in an EMS system, are certified by the state after completing instruction, and work under the authority of a supervising medical control physician, using treatment protocols approved by a medical advisory committee. SEE: *Emergency Medical Service System*; *EMS medical control*; *EMS treatment protocol*; *paramedic*.

**e.m.t.-basic** ABBR: EMT-B. An individual who has become state certified or nationally registered after completion of the U.S. Department of Transportation EMT-B standard curriculum.

**e.m.t.-defibrillation** ABBR: EMT-D. During the transition from the 1985 to the 1994 U.S. Department of Transportation standard curriculum, the title given in many states to individuals who became certified EMTs in the skill of defibrillation.

**e.m.t.-intermediate** ABBR: EMT-I. An individual who has become state certified or nationally registered after completion of the U.S. Department of Transportation EMT-I standard curriculum.

This curriculum emphasizes basic life support skills as well as advanced life support procedures such as assessment, intravenous fluid administration, advanced airway procedures (i.e., endotracheal intubation), defibrillation, trauma management, and a limited number of medications given in medical emergencies.

**e.m.t.-paramedic** ABBR: EMT-P. An EMS provider who has completed the U.S. DOT EMT-Paramedic curriculum and is licensed or certified to provide assessment and management of patients in the field. Paramedics work under treatment protocols that are developed by the medical control physicians and require either standing orders or direct online medical control. SEE: *medic*; *paramedic*.

**Emergency Medical Treatment and Active Labor Act** ABBR: EMTALA. An American federal statute that prohibits a hospital from failing to treat or stabilize indigent medical patients simply because of their low-income status. The statute mandates that the hospital where a patient comes for care 1. perform a screening medical examination and 2. stabilize any emergent condition the patient has. The hospital must not transfer the patient to another facility without receiving explicit permission to do so from an attending physician at the receiving facility.

**Emergency Nurses Association** A professional organization representing and certifying nurses who are proficient in emergency care.

**emergency readiness** Planning in advance for an unexpected crisis, esp. a natural disaster such as a flood or hurricane. The home should be inspected for potential hazards, and those discovered should be corrected. Flammable materials such as paints, oils, and fuels should be isolated. Utility shut-off valves should be located and pointed out to all members of the household. It is important to know the location of the nearest public shelter and the time required to go there on foot and by car. Family members should be trained in basic life support techniques. Emergency telephone numbers, including names and telephone numbers of neighbors, should be posted and easily accessible. A first-aid kit should be available and restocked when supplies have been used. Fire extinguishers and flashlights should be in working condition. Supplies of food and water for least 3 days and protective clothing and blankets should be available. It is important to provide for the special needs of infants, the elderly, and the ill. Emergency drills should be practiced, including evacuation from the home by various routes in case the usual exits are blocked or sur-



rounded by flames. SEE: *emergency, fire*.

**emergency responder** The preferred term for those individuals previously known as "first responders" who are trained to assist victims of injury or ill health at the scene of the emergency.

**Emergency Room** ABBR: E.R. The term that was previously used for the room in the hospital where patients with emergencies were taken. Today most hospitals that receive emergency patients have an emergency department or E.D.

**emergent** [L. *emergere*, to raise up]  
1. Growing from a cavity or other part.  
2. Sudden, unforeseen.

**emergent literacy** 1. The attitudes and learning that lead to the ability to manipulate graphic symbols (e.g., the letters of the alphabet), form sounds, and develop vocabulary. 2. Attainment of mastery in reading and writing.

**emerging adulthood** A period of personal development in which young adults (between about 18 and 25 years old) become less dependent on their parents but have not yet completed their education, established a durable relationship with another person, formed a family, or entered the work force. It is sometimes referred to as a period of "prolonged adolescence."

**emerging infectious disease** Any previously unknown communicable illness or any previously controlled contagion whose incidence and prevalence are suddenly rising. In recent years, some emerging (and re-emerging) infections have been bovine spongiform encephalopathy (mad cow disease), Ebola hemorrhagic fever, cholera, plague, hemolytic uremic syndrome caused by *Escherichia coli* 0157:H7, drug-resistant strains of enterococcus, the human immunodeficiency virus, SARS, and antibiotic-resistant organisms, among many others.

**emery** (ēm'ě-rē) A granular mineral substance used as an abrasive.

**Emery-Dreifuss muscular dystrophy** (ēm'ě-rē-dri'fūs) [A. E. H. Emery, British geneticist, b. 1928; F. E. Dreifuss, German-born Brit. neurologist, 1926–1997] ABBR: EDMD. One of several rare forms of muscular dystrophy, characterized by muscular degeneration principally in the shoulders, arms, and calves. Cardiac conduction abnormalities resulting in heart block and joint contractures are common complications.

**emesis** (ēm'ě-sis) [Gr. *emein*, to vomit] Vomiting. It may be of gastric, systemic, or neurological origin. SEE: *antiemetic; aspiration; emetic; vomit*.

**PATIENT CARE:** The relationship of emesis to meals, administered drugs, or other environmental stimuli should be noted. The presence of any aggravating

factors, e.g., pain, anxiety, nauseating medications, pregnancy, neurological conditions (e.g., head trauma, hemorrhage, or tumors); the type of foods eaten; and noxious environmental stimuli; as well as the type of vomiting, amount, color, and characteristics of the emesis are documented. Assistance is provided with oral hygiene, and antiemetics are administered, if prescribed, to control vomiting. If vomiting leaves the patient weak, dysphagic, or with an impaired sensorium, or if the patient is comatose or has an impaired cough mechanism and is receiving enteral feedings, safety measures are instituted to prevent aspiration of vomitus into the lungs; these include placing the patient in a side-lying position with the head lowered or in a high-Fowler's position after feeding and having suction and emergency tracheostomy equipment readily available.

**chemotherapy-induced e.** Vomiting associated with or caused by drug treatments for cancer. Even though this side effect is usually self-limiting and seldom life-threatening, the prospect of it may produce anxiety and depression in many patients. Treatments may include drugs such as dronabinol, granisetron, lorazepam, prochlorperazine, and steroids, among others.

**gastric e.** Vomiting present in gastric ulcer, gastric carcinoma, acute gastritis, chronic gastritis, hyperacidity and hypersecretion, and pressure on the stomach.

**e. gravidarum** Vomiting of pregnancy. SEE: *hyperemesis gravidarum*.

**emetic** (ě-mět'ik) [Gr. *emein*, to vomit] An agent that promotes vomiting. An emetic may induce vomiting by irritating the gastrointestinal tract or by stimulating the chemoreceptor trigger zone of the central nervous system. Some drugs, such as narcotic pain relievers and chemotherapeutic agents used to treat cancer, have emetic properties as unwanted side effects of their administration. SEE: *vomiting; vomitus*.

**TREATMENT OF DRUG OVERDOSES:** Drugs that promote vomiting (such as syrup of ipecac and apomorphine hydrochloride) are given occasionally to treat toxic ingestions. Gastric lavage or the oral administration of activated charcoal usually is preferred for the management of patients who have overdosed on medications, because these methods are generally safer, better tolerated, and more effective than are emetics. Emetics are particularly hazardous in patients with altered mental status or patients who have ingested petroleum distillates, because of the risk of aspiration, and in patients who have ingested corrosive agents, because the emetic drug may worsen the injury to

the esophagus and oropharynx. Emetics are also contraindicated in patients with known cardiac or epileptic disorders because they occasionally trigger seizures or arrhythmias. SEE: *Poisons and Poisoning Appendix*. SYN: *emetogenic*.

**direct e.** An emetic that acts by its presence in the stomach (e.g., mustard).

**indirect e.** An emetic that acts on the vomiting center of the brain (e.g., apomorphine).

**emetine** (ēm'ĕ-tēn) [Gr. *emein*, to vomit] A powdered white alkaloid emetic obtained from ipecac.

**bismuth iodide e.** A combination of emetine and bismuth containing about 20% emetine and 20% bismuth.

**e. hydrochloride** The hydrated hydrochloride of an alkaloid obtained from ipecac. It is used for the treatment of both intestinal and extraintestinal amebiasis. It should be used cautiously in elderly or debilitated patients. Children, pregnant women, and patients with serious organic disease should not receive emetine.

**emetism** (ēm'ĕ-tīzm) [ʹ + *-ismos*, condition of] Poisoning from an overdose of ipecac.

**SYMPTOMS:** Symptoms are acute inflammation of the pylorus, hyperemesis, diarrhea, and sometimes aspiration and suffocation.

**emetocathartic** (ēm'ĕ-tō-kā-thār'tik) [ʹ + *katharsis*, a purging] Producing both emesis and catharsis.

**emetogenic** (ĕ-mĕt'ō-jĕn'ik) Emetic.

**emetology** (ēm'ĕ-tōl'ō-jĕ) [ʹ + *logos*, word, reason] The study of the anatomy and physiology of vomiting.

**E.M.F.** *electromotive force; erythrocyte maturation factor.*

**EMG** *electromyogram.*

**-emia** Suffix meaning *blood condition*. SEE: *hemat-*.

**EMIC** *emergency maternal and infant care.*

**emic** (ĕ'mĭk) In anthropology and transcultural nursing, rel. to a type of disease analysis that focuses on the culture of the patient. The emic perspective emphasizes the subjective experience and cultural beliefs pertinent to the illness experience. For example, in psychiatric settings in the southeastern U.S., many patients believe that their illness is caused by a spell or curse from evil spirits. In these cases, a health care worker using an emic perspective would ask an indigenous health care provider to consult with the patient in addition to providing care within the traditional health care system. SEE: *etic*.

**emigration** [L. *e*, out, + *migrare*, to move] The passage of white blood cells through the walls of capillaries and into surrounding tissue during inflammation. SEE: *inflammation*.

**eminence** [ʹ + *minere*, to hang on] A prominence, bump, bulge, or projection, esp. of a bone.

**arcuate e.** A rounded eminence on the upper surface of the petrous portion of the temporal bone. SEE: *jugum petrosum*.

**articular e. of the mandibular fossa** A rounded eminence forming the anterior boundary of the glenoid fossa.

**canine e.** A vertical ridge on the external surface of the maxilla.

**frontal e.** A gently rounded prominence on either side of the median line and a little below the center of the frontal bone.

**germinal e.** The mass of follicle cells that surrounds the ovum. SYN: *cumulus oophorus*.

**hypothenar e.** Hypothenar.

**intercondyloid e.** A process on the head of the tibia lying between the two condyles.

**nasal e.** A prominence on the vertical portion of the frontal bone above the nasal notch and between the two superciliary ridges.

**occipital e.** A protuberance on the occipital bone.

**olivary e.** An oval projection at the upper part of the medulla oblongata above the extremity of the lateral column. SYN: *oliva; olivary body*.

**parietal e.** A marked convexity on the outer surface of the parietal bone.

**portal e.** One of the small median lobes on the lower surface of the liver.

**pyramidal e.** An elevation on the mastoid wall of the tympanic cavity. It contains a cavity through which the stapedius muscle passes. SYN: *pyramid of the tympanum*.

**thenar e.** An prominence formed by muscles on the palm below the thumb.

**eminentia** (ēm'in-ĕn'shĕ-ă) *pl. eminentiae* [L.] Eminence.

**emiocytosis** (ĕ'mĕ-ō-sĭ-tō'sis) [L. *emitto*, to send forth, + Gr. *kytos*, cell, + *osis*, condition] The process of movement of intracellular material to the outside. Granules join the cell membrane, which ruptures to allow the substance to be free in the intercellular fluid. SYN: *exocytosis*. SEE: *endocytosis; pinocytosis*.

**emissary** (ēm'i-să-rĕ) [L. *e*, out, + *mittere*, to send] 1. Providing an outlet. 2. An outlet.

**emissary vein** A small vein that pierces the skull and carries blood from the sinuses within the skull to the veins outside it.

**emission** (ĕ-mĭsh'ūn) [L. *e*, out, + *mittere*, to send] An issuance or discharge; the sending forth or discharge of, for example, an atomic particle, an exhalation, or a light or heat wave.

**nocturnal e.** The involuntary dis-

charge of semen during sleep, usually occurring in conjunction with an erotic dream. SYN: *wet dream*.

**thermionic e.** The process by which electrons are released from an x-ray filament after a current has been passed through it.

**emissivity** (ēm'ī-sīv'ī-tē) The ability of a substance or surface to emit radiant energy.

**EMIT** *enzyme-multiplied immunoassay technique*.

**emit** To produce or release something (e.g., light, heat, or sound waves).

**EMLA** *eutectic mixture of local anesthetics*.

**EMLA Cream** A topical anesthetic composed of lidocaine and prilocaine. The cream is applied to the skin, covered with an occlusive bandage, and left in place for 1 to 2 hr. This anesthetizes the skin to a depth of about 5 mm so that superficial skin lesions can be removed. Patients will not be aware of a needle piercing the skin; however, they will feel any tissue irritation caused by the fluid injected.

**emmenagogue** (ēm-ēn'ā-gōg) [Gr. *em-mena*, menses, + *agogos*, leading] A substance that promotes or assists the flow of menstrual fluid. SEE: *ecbolic*.

**direct e.** An agent, such as a hormone, that induces menstruation by a direct effect on the reproductive tract.

**indirect e.** An agent that alters menstrual function as a side effect of the treatment of another illness.

**emmeniotherapy** (ē-mē'nē-ōp'ā-thē) [*r* + *pathos*, disease, suffering] Any disorder of menstruation.

**Emmet's operation** (ēm'ēts) [Thomas A. Emmet, U.S. gynecologist, 1828–1919] 1. Uterine trachelorrhaphy (i.e., suturing of a torn uterine cervix). 2. Suturing of a lacerated perineum. 3. Conversion of a sessile submucous tumor of the uterus into a pedunculated one.

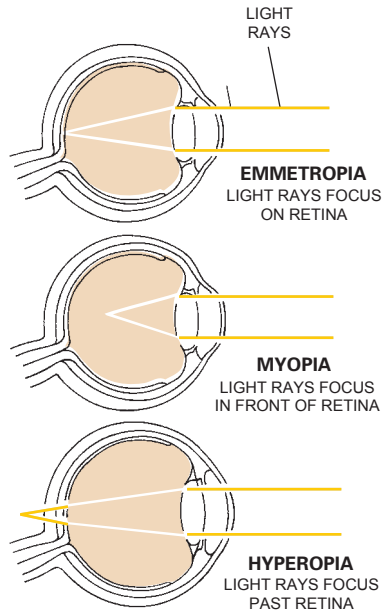
Additional procedures attributed to Emmet, such as repair of prolapsed uterus and creation of a vesicovaginal fistula, have been superseded by more modern procedures.

**emmetrope** (ēm'ē-trōp) [Gr. *emmetros*, in measure, + *opsis*, sight] One endowed with normal vision. **emmetropic** (-trōp'ik), *adj.*

**emmetropia** (ēm'ē-trōp'ē-ā) The normal condition of the eye in refraction in which, when the eye is at rest, parallel rays focus exactly on the retina. SEE: *illus.*; *astigmatism*; *myopia*.

**emollient** (ē-mōl'yēnt) [*L.* *e*, out, + *mollire*, to soften] An agent that softens and soothes the surface to which it is applied, usually the skin. SEE: *demulcent*.

**emotion** (ē-mō'shūn) [*L.* *emovere*, to stir up] A mental state or feeling such as fear, hate, love, anger, grief, or joy arising



EMMETROPIA, MYOPIA, HYPEROPIA

ing as a subjective experience rather than as a conscious thought. Physiological changes invariably accompany emotions, but such change may not be apparent to either the person experiencing the emotion or an observer. **emotional** (-āl), *adj.*

**DISORDERS:** See names of specific mood disorders for more information, e.g., depression, bipolar mood disorders.

**emotivity** (ē'mō-tīv'ī-tē) One's capability for emotional response.

**empacho** (ēm-pā'chō) [*Sp.*, surfeit, impacted stomach] A culture-based syndrome of gastrointestinal distress in infants and children ascribed to intestinal blockage, whose symptoms may include bloating, diarrhea, vomiting, and lethargy. In some Latin American cultures, empacho is treated by a folk practitioner, who may use external massage or internal treatments, including herbal teas, commercial laxatives, or olive or castor oil. Some traditional treatments use mercury compounds or lead salts, which may poison affected infants. SEE: *curanderismo*.

**empathy** (ēm'pā-thē) Awareness of and insight into the feelings, emotions, and behavior of another person and their meaning and significance. It is not the same as sympathy, which is usually nonobjective and noncritical. **empathic** (-pā'thik), *adj.*

**emperipoleosis** (ēm-pēr'ī-pē-lē'sīs) [Gr. *en*, in + *peri*, around + *poleisthai*, to wander] The presence of cells of one

type within the cytoplasm of cells of another lineage. One example of emperipolesis is erythrophagocytosis.

**emperor of pruritus** The intense itching that accompanies poison ivy dermatitis involving the anal area.

**emphysema** (ēm'fī-sē'mā) [Gr. *emphosan*, to inflate] **1.** Pathological distention of interstitial tissues by gas or air. **2.** A chronic obstructive pulmonary disease marked by an abnormal increase in the size of air spaces distal to the terminal bronchiole, with destruction of the alveolar walls. These changes result in a loss of the normal elastic properties of the lungs and difficulty exhaling air. Alveolar septa are destroyed, and portions of the capillary bed are eliminated. Residual volume increases. **emphysematous** (-ă-tūs), *adj.*

**ETIOLOGY:** Tobacco smoking is the most common cause of the tissue destruction found in emphysema. Exposure to environmental dust, smoke, or particulate pollution may also contribute to the disease. A small number of people with emphysema may have developed it as a result of alpha-1-antitrypsin deficiencies, a group of genetic illnesses in which there is inadequate protection against destructive enzyme activity in the lung. Complications include cor pulmonale, recurrent respiratory infections, and respiratory failure.

**SYMPTOMS:** Symptoms include difficulty breathing, esp. during exertion. Weight loss, chronic cough, and wheezing are also characteristic. Physical findings include prolongation of expiration, diminished breath sounds, a decrease in the measured distance between the thyroid cartilage and the chin, and heart tones that are audible only in the subxiphoid region of the chest.

**TREATMENT:** Smoking cessation helps preserve remaining alveoli. Inhaled bronchodilators and anticholinergics, such as ipratropium, tiotropium, albuterol, or salmeterol may improve respiratory function. Aerosolized corticosteroids reduce inflammation, and mucolytics thin inspissated secretions and aid mucus expectoration. Antibiotics are only used when bacterial infections are identified. Oxygen therapy prevents right heart failure. The respiratory therapist administers oxygen at low-flow settings to maintain adequate oxygenation (PaO<sub>2</sub> 60–80 mm/Hg). Lung volume reduction surgery can eliminate hyperinflated (nonfunctional) portions of the lungs, allowing the healthier lung tissue that is left behind to expand and contract with improved efficiency. The patient is protected from environmental bronchial irritants, such as smoke, automobile exhaust, aerosol sprays, and

industrial pollutants. SEE: *chronic obstructive pulmonary disease* for further treatment recommendations.

**PATIENT CARE:** The patient is protected from environmental bronchial irritants, such as smoke, automobile exhaust, aerosol sprays, and industrial pollutants. The patient's oxygenation, weight, and the results of electrolyte and complete blood count measurements are monitored. The patient is evaluated for infection and other complications, and the effects of the disease on functional capabilities. Prescribed medications are administered by parenteral or oral route or by inhalation.

The patient is encouraged to intersperse normal activities with rest periods. Respiratory infections may be devastating to the emphysema patient; some of them can be prevented by avoiding crowds and contact with infectious persons; by using correct pulmonary hygiene procedures, including thorough hand hygiene; and by obtaining influenza and pneumococcal immunizations. Patients are taught breathing techniques to control dyspnea. Frequent small meals of easy-to-chew, easy-to-digest, high-calorie, high-protein foods and food supplements are encouraged. Small meals conserve patient energy, prevent fatigue, and also reduce intra-abdominal pressure on the diaphragm and reduce dyspnea.

When patients with emphysema are hospitalized, the respiratory therapist and physician monitor the results of arterial blood gases, pulmonary function studies, and breath sounds. Once stabilized, the patient often benefits from participation in a pulmonary rehabilitation program to promote improved lung function and more efficient breathing techniques. SEE: *Nursing Diagnoses Appendix*.

**congenital lobar e.** A rare cystic lesion of a lobe of the lung that may cause infantile respiratory distress. The affected lobe is distended and appears excessively lucent on plain radiographs of the chest.

**TREATMENT:** Surgical excision of the lobe is used to treat infants with severe symptoms.

**interlobular e.** The presence of air between the lobes of the lung.

**pulmonary interstitial e.** ABBR: PIE. The presence of air in the connective tissues of the lung; seen, e.g., in neonates treated with high-pressure mechanical ventilation. This condition can cause insufficient oxygenation and cystic lung damage.

**subcutaneous e.** The presence of air in subcutaneous tissue.

**empiric** (ēm-pīr'ik) [Gr. *empeirikos*, skilled, experienced] **1.** Empirical. **2.** A practitioner whose skill or art is based

on what has been learned through experience.

**empirical** (ĕm-pĭr'ĭk-ăl) Based on experience rather than on scientific principles.

**empirical therapy** Use of antibiotics to treat an infection before the specific causative organism has been identified with laboratory tests.

**empiricism** (ĕm-pĭr'is-izm) [Gr. *empeirikos*, skilled, experienced, + *-ismos*, condition of] Experience, not theory, as the basis of medical science.

**empiric treatment** Empirical therapy.

**Employee Retirement Income Security Act of 1974** ABBR: ERISA. A federal law that protects individuals covered by voluntarily administered health insurance and pension plans. Important amendments to ERISA are the Consolidated Omnibus Budget Reconciliation Act of 1985 (COBRA), the Health Insurance Portability and Accountability Act (HIPAA), Newborns' and Mothers' Health Protection Act, Mental Health Parity Act, and the Women's Health and Cancer Rights Act.

**employment, supported** A program of paid work in regular workplace settings by persons with physical and mental disabilities. Ongoing training is provided by an interdisciplinary team of rehabilitation professionals, employers, and family members.

**empowerment** 1. Investing power in another person or group by sharing leadership roles, or helping others to engage fully in a process. 2. Participating actively and autonomously in policies or events that affect one's health or well-being.

**emprostotonos** (ĕm'prŏs-thŏt'ŏ-nŏs) [Gr. *emprosthēn*, forward, + *tonos*, tension] A form of spasm in which the body is flexed forward, sometimes seen in tetanus and strychnine poisoning. Opposite of opisthotonos.

**empty can test** An orthopedic test of the shoulder, used to determine the integrity of the supraspinatus muscle. With the patient sitting or standing, the shoulder is fully internally rotated, abducted to 90 degrees, and placed in 30 degrees of forward flexion, as if emptying a beverage can. The patient then attempts to maintain this position against resistance. Inability to hold this position, or pain while holding it, suggests pathology of the supraspinatus muscle.

**empty follicle syndrome** In *in vitro* fertilization investigations, the absence of oocytes in the stimulated follicle of the ovary. This may be a cause of infertility in some individuals.

**empty-sella syndrome** A condition, shown by radiography of the skull, in which the sella turcica, which normally contains the pituitary gland, is found to be empty. Clinically, patients may show

no endocrine abnormality or may have signs of decreased pituitary function. Hormonal replacement is given to patients with hypopituitarism. In autopsy studies, empty-sella syndrome has been found in about 5% of presumably normal persons. SEE: *pituitary gland*.

**empyema** (ĕm'pĭ-ĕ'mă) [Gr.] A collection of pus in a body cavity, esp. the pleural space. SEE: *thoracentesis*.

**ETIOLOGY:** It is usually caused by the local spread of infection from a pneumonia or lung abscess but may be caused by organisms brought to the pleural space via the blood or lymphatic system or an abscess extending upward from below the diaphragm. *Streptococcus pneumoniae*, *Staphylococcus aureus*, and *Klebsiella pneumoniae* are the most common pathogens, but anaerobic organisms also can cause empyema.

**SYMPTOMS:** Patients are usually quite ill, with high fevers and sweats, malaise, anorexia, and fatigue. They frequently present with tachycardia, pleurisy, cough, and dyspnea. Depending on the amount of pus and fluid present, physical examination may reveal unequal chest expansion, dullness to percussion, and decreased or absent breath sounds over the involved area. Fibrinous adhesions may fill the pleural space and inhibit lung expansion.

**DIAGNOSIS:** Empyema may be diagnosed indirectly by chest x-rays, computerized tomography, magnetic resonance imaging, or definitively by thoracentesis (insertion of a large-bore needle into the pleural space). Withdrawal of fluid from the pleural space provides material for a culture and sensitivity test of the organism and helps the infection resolve.

**TREATMENT:** The purulent exudate and fluid are drained via thoracentesis and insertion of one or more chest tubes to underwater-seal chest drainage with suction. Surgical removal of the thick coating over the lung (decortication) or rib resection may be required to allow open drainage and lung expansion. Standard dressing precautions are used if the patient has open drainage. Medications such as urokinase may be injected into the pleural space to minimize fibrous adhesions and to help keep the chest tube patent; surgical drainage may be necessary. Intravenous antibiotic therapy is administered based on pathogen sensitivity. Oxygen is administered to treat associated hypoxia.

**PATIENT CARE:** The patient should be prepared for the procedure and its associated sensations, and urged to breathe normally and avoid coughing, sighing, or sudden movement. Vital signs are assessed before, during, and after the procedure, and the patient observed for syncope, respiratory distress,



or pneumothorax. Sterile preparation of the chest before insertion of a needle, or any incision, is mandatory. After the fluid is definitively located (e.g., by ultrasonography), the skin on the chest wall is anesthetized, e.g., with an injection of lidocaine through a small gauge (29 or 30 g) needle. A larger needle is inserted deeper into the soft tissues and guided just above a rib (not below it, where the rib's neurovascular bundle is found). The patient will experience a sudden, intense pain when the needle penetrates the parietal pleura. Another needle with a very wide bore (12 or 14 gauge) is then used to withdraw fluid from the pleural space. Samples should be labeled immediately with unique patient identifiers and sent to the lab for analysis (pH, cell count, cultures, chemistries, fungal, and AFB stains). After the procedure is completed, the patient's vital signs, oxygen saturation, and symptoms are monitored for evidence of pneumothorax. Patency of any indwelling drainage system is maintained; drainage volume, color, and characteristics are documented; and the patient is protected from accidental dislodgement of the drainage tube. Increased fluid and protein are provided, and adequate pain relief is ensured. Breathing exercises and the use of incentive spirometry are encouraged. The patient may be discharged to home or rehabilitative care with a drainage tube still in place. Home health care is arranged as necessary.

**interlobular e.** A form of empyema with pus between the lobes of the lung.

**empyema** (ém"pī-ĕ'sis) [Gr., suppuration] **1.** Any skin eruption marked by pustules. **2.** Any accumulation of pus. **3.** Hypopyon, or accumulation of pus in the anterior chamber of the eye.

**EMR** *electronic medical record.* Similarly, EHR stands for *electronic health record.*

**EMS** *emergency medical service.*

**EMS communication** A communication system that coordinates emergency medical care among ambulances, 911 (telephone) dispatch centers, and hospital emergency departments. Contact includes citizen to EMS, dispatcher to EMS crew, paramedic to doctor, and EMS crew to emergency department, as well as EMS to other public safety organizations (i.e., police, fire, and rescue). SEE: *disaster planning; EMS medical control.*

**EMS medical advisory committee** Representatives of medical groups that provide medical direction to the EMS system.

**EMS medical control** Physician direction of life support procedures performed by emergency medical technicians (EMT) and paramedics in prehospital care, including online and off-line supervision.

*Online:* The physician provides instruction via radio or telephone to an EMS crew. *Off-line:* The EMS crews receive direction and supervision via treatment protocols, case review, in-service training, and standing orders for treatment.

Medical control is also divided into prospective, immediate, and retrospective forms. *Prospective form:* Treatment protocols for EMTs are developed under a license from the medical director or medical advisory committee. *Immediate form:* Direct medical orders or consultation is given by radio or telephone (defined above as online control). *Retrospective form:* Call reports are reviewed to determine whether protocols have been followed.

**EMS medical director** The physician responsible for ensuring and evaluating the appropriate level of quality of care throughout an EMS system.

**EMS standing orders** Instructions preapproved by the medical advisory committee directing EMS crews to perform specific advanced life support measures *before* contacting a medical control physician. These orders are implemented in cases in which a delay in treatment could harm the patient (e.g., cardiac arrest).

**EMS treatment protocol** Written procedures for assessment, treatment, patient transportation, or patient transfer between hospitals. These procedures are part of the official policy of the EMS system and are approved by representatives of the medical advisory committee. The EMS treatment protocols may either be implemented as standing orders or require prior approval of a medical control physician.

**EMT** *emergency medical technician.*

**EMTALA** *emergency medical treatment and active labor act.*

**EMT-B** *emergency medical technician-basic.*

**EMT-D** *emergency medical technician-defibrillation.*

**EMT-I** *emergency medical technician-intermediate.*

**EMT-P** *emergency medical technician-paramedic.*

**emulsification** (ĕ-mŭl'sī-fī-kā'shŭn) [L. *emulsio*, emulsion, + *facere*, to make]

**1.** The process of making an emulsion, allowing fat and water to mix. **2.** The breaking down of large fat globules in the intestine into smaller, uniformly distributed particles, largely accomplished through the action of bile acids, which lower surface tension.

**emulsifier** (ĕ-mŭl'sī-fī-ĕr) Anything used to make an emulsion.

**emulsify** (ĕ-mŭl'sī-fi) To form into an emulsion.

**emulsion** [L. *emulsio*] **1.** A mixture of two liquids not mutually soluble. If they are thoroughly shaken, one divides into

globules in what is called the discontinuous or dispersed phase; the other is then the continuous phase. Milk is an emulsion in which butterfat is the discontinuous phase. **2.** In radiology, the part of the radiographic film sensitive to radiation and containing the image after development.

**fat e.** A combination of liquid, lipid, and an emulsifying system suitable for intravenous use because the lipid has been broken into small droplets that can be suspended in water. Such a solution should not be mixed with other fluids prior to intravenous administration.

**ENA** *Emergency Nurses Association; extractable nuclear antigen.*

**enablement** (ĕn-ă'bĭl-mĕnt) Creation of the opportunity to participate in life tasks and occupations despite physical or mental limitations and environmental barriers.

**enalapril** (ĕn-ăl'-ă-prĭl) An angiotensin-converting enzyme inhibitor used to treat hypertension and congestive heart failure.

**enamel** (ĕn-ăm'ĕl) [O.Fr. *esmail*, enamel] The hard, white, dense, inorganic substance covering the crown of the teeth. Enamel is composed of hydroxyapatite crystal, a calcium-containing salt. The crystals are arranged to form a rod. The enamel rods are organized to form the enamel. Enamel is the hardest substance in the body. Demineralization may result in a carious lesion, or "cavity."

**aprismatic e.** A thin surface layer of the tooth, thought to be solid without individual enamel rods or prisms.

**cervical e.** Enamel at the neck of the tooth characterized by shorter enamel rods with more prominent incremental lines and perikymata.

**gnarled e.** Enamel under the cusp of a tooth characterized by twisting, intertwining groups of enamel rods, thought to resist shearing forces.

**e. hypoplasia** Incomplete formation of tooth enamel, caused by local trauma to the tooth, infections such as syphilis, exposure to fluoride during dental development, and genetic and metabolic diseases.

**mottled e.** Discoloration and defective calcification of teeth caused by malfunctioning of ameloblasts. The defects range from minor surface irregularities to areas where no enamel forms. It may be caused by exposure to drugs (esp. fluoride) during tooth formation. SEE: *fluorosis*.

**enanthem, enanthema** (ĕn-ăn'thĕm, -ănthĕ'mă) [Gr. *en*, in, + *anthema*, blossoming] An eruption on a mucous membrane. SEE: *exanthem; Koplik's spots; rash*. **enanthematous** (-thĕm'ă-tŭs), *adj.*

**enantio-** Combining form meaning *opposite*.

**enantibiosis** (ĕn-ăn'tĕ-ĕ-bĭ-ĕ'sĭs) [Gr. *enantios*, opposite, + *bios*, life] The condition in which associated organisms are antagonistic to each other. SEE: *symbiosis*.

**enantiomer** (ĕn-ăn'tĕ-ĕ-mĕr) [ʹ + Gr. *meros*, part] Enantiomorph.

**enantiomorph** (ĕn-ăn'tĕ-ĕ-mŏr'f) One of a pair of isomers, each of which is a mirror image of the other. They may be identical in chemical characteristics, but in solution one rotates a beam of polarized light in one direction and the other in the opposite direction. Isomers are called dextro if they rotate light to the right, and levo if they rotate light to the left. SYN: *enantiomer*.

**enarthrosis** (ĕn'ăr-thrŏ'sĭs) *pl.* **enarthroses** [Gr. *en*, in, + *arthron*, joint, + *osis*, condition] Ball-and-socket joint.

**en bloc** (ĕn blŏk) [Fr., as a whole] As a whole or as en masse; used to refer to surgical excision.

**encanthis** (ĕn-kăn'thĭs) [Gr. *en*, in, + *kanthos*, angle of the eye] An excrescence or new growth at the inner angle of the eye.

**encapsulated** Confined; surrounded by an envelope, capsule, or membrane. Said of certain tumors, abscesses, and medications.

**encapsulated delusion** An isolated mistaken but unshakable belief in something for which there is neither evidence nor common acceptance, occurring in the absence of other signs or symptoms of psychiatric illness.

**encapsulation** (ĕn-kăp'sŭ-lă'shŭn) [ʹ + *capsula*, a little box] **1.** Enclosure in a sheath not normal to the part. **2.** Formation of a capsule or a sheath about a structure.

**encatarrhaphy** (ĕn'kăt-ăr'ă-fĕ) [Gr. *enkatarrhaphēin*, to sew in] Insertion of an organ or tissue into a part where it is not normally found.

**encephalalgia** (ĕn-sĕf'ă-l'jĕ-ă) [Gr. *enkephalos*, brain, + *algos*, pain] Deep-seated head pain. SYN: *cephalalgia*.

**encephalatrophy** (ĕn-sĕf'ă-lăt'rŏ-fĕ) [ʹ + *a-*, not, + *trophe*, nourishment] Cerebral atrophy.

**encephalic** (ĕn'sĕf-ăl'ĭk) [Gr. *enkephalos*, brain] Pert. to the brain or its cavity.

**encephalitis** (ĕn-sĕf'ă-lĭ'tĭs) [ʹ + *itis*, inflammation] Inflammation of the white and gray matter of the brain. It is almost always associated with inflammation of the meninges (meningoencephalitis) and may involve the spinal cord (encephalomyelitis). In the U.S. 20,000 cases are reported annually. SEE: *arbovirus; herpesviruses; rabies*.

**ETIOLOGY:** Most cases are caused by viruses: there are about 100 different viral agents that may infect the brain.

The disease occurs more often in the very young, the very old, and patients with immune-suppressing illnesses. Mosquito-borne equine arboviruses (or in some cases a tick-borne virus) are the most common cause of encephalitis in the U.S. Mosquitoes are infected by feeding on infected birds; subsequently they transmit the virus to humans and animals. Viruses also may be transmitted by inhalation (thus passed person to person) or by ingestion of infected goat milk. The West Nile virus (WNV) can cause encephalitis and is related to St. Louis encephalitis (SLE). Encephalitis also occurs as a component of rabies, acquired immune deficiency syndrome (AIDS), and an aftereffect of systemic viral diseases (e.g., herpesvirus, influenza, measles, German measles, and chickenpox). Central nervous system (CNS) involvement occurs in 15% to 20% of patients with AIDS who develop cytomegalovirus infections. Other organisms causing encephalitis in immunosuppressed patients include fungi (e.g., *Candida*, *Aspergillus*, and *Cryptococcus*) and protozoa (e.g., *Toxoplasma gondii*).

**SYMPTOMS:** Patients present with a wide variety of neurological signs and symptoms, depending on the infected region of the brain and the type and amount of damage the organism has caused. Sudden onset of fever with headache and vomiting may be the first symptoms. These progress to stiff neck and back (meningeal irritation) and to signs of neuronal damage: drowsiness, seizures, tremors, ataxia, cranial nerve paralysis, abnormal reflexes, and muscle weakness and paralysis are common. Personality changes and confusion usually appear before the patient becomes stuporous or comatose. Coma may persist for weeks following the acute phase of illness.

**DIAGNOSIS:** The diagnosis is based on clinical presentation, culture and examination of blood and cerebrospinal fluid, and computerized tomography (CT) scan or magnetic resonance imaging (MRI) results.

**TREATMENT:** Acyclovir is given for herpes simplex virus infection, the only common viral pathogen for which there is effective treatment. Survival and residual neurological deficits appear to be tied to mental status changes before acyclovir therapy begins. Rabies is treated with rabies immune globulin and vaccine. If the infection is bacterial, antibiotics are used. For other viruses, treatment focuses on supportive care and control of increased intracranial pressure (ICP) using osmotic diuretics (e.g., mannitol), corticosteroids, and drainage.

**PATIENT CARE:** The acutely ill pa-

tient's mental status, level of consciousness, orientation, and motor function are assessed for indications of increasing ICP and documented to monitor changes. The head of the bed is raised slightly to promote venous return; neck flexion is contraindicated. Sedatives help to control restlessness; aspirin or acetaminophen reduces fever and relieves headache. Measures to prevent stimuli that increase ICP are implemented (e.g., preoxygenating with 100% oxygen before suctioning, preventing isometric muscle contraction, using diet and stool softeners to minimize straining at stool, and using turning sheets and head support when turning the patient). Fluid intake should be adequate to prevent dehydration, but overload must be avoided to prevent further cerebral edema. Fluid balance and weight are monitored daily. Adequate nutrition should be maintained with small, frequent meals or enteral or parenteral feeding as necessary. Frequent oral care should be provided. Passive and/or active range-of-motion exercises and resistive exercises to prevent contractures and maintain joint mobility and muscle tone are used as long as they do not increase ICP.

Normal supportive care is provided in a quiet environment, with lights dimmed to ease photophobia, without creating shadows, which increase the potential for hallucinations. Emotional support and reassurance should be provided and the patient reoriented if delirium or confusion is present. Behavioral changes that occur with encephalitis usually fade as the acute phase passes, but rehabilitation programs are necessary for the treatment of residual neurological deficits. Public health preventive measures include controlling standing water that provides mosquito breeding sites and insecticide spraying to kill larvae and adult mosquitoes. Public education should focus on reducing outdoor time during early morning and early evening hours, wearing appropriate covering clothing when exposure is unavoidable, and use of insect repellents containing DEET. SEE: *Nursing Diagnoses Appendix*.

**acute disseminated e.** Postinfectious e.

**Australian e.** Murray Valley encephalitis.

**California (La Crosse) virus e.** A viral encephalitis that is the most common mosquito-borne illness in the U.S. It typically affects children in summer or early fall, largely in the Middle Atlantic or midwestern states, causing fever, headache, seizures, and localized muscle paralysis. The primary vector is

*Aedes triseriatus*. A full recovery usually follows the illness.

**cortical e.** Encephalitis of the brain cortex only.

**eastern equine e.** Encephalitis caused by the eastern equine arbovirus, which is transmitted from horses to humans by mosquitoes; the incubation period is 1 to 2 weeks. Although this is the least common of the arboviruses, mortality is approx. 25%, and those who survive often have neurological problems. In the U.S. it occurs on the East Coast, Gulf Coast, and in the Great Lakes region during the mosquito season from midsummer to early fall.

**epidemic e.** Any form of encephalitis that occurs as an epidemic.

**equine e.** Encephalitis caused by either the western or the eastern equine arbovirus, which is carried by mosquitoes from horses. The disease ranges from mild to fatal.

**hemorrhagic e.** Herpes encephalitis in which there is hemorrhage along with brain inflammation.

**herpetic e.** Encephalitis caused by infection of the brain with herpes simplex virus-1 (or, less often, herpes simplex virus-2). This relatively common form of encephalitis typically involves the inferior surfaces of the temporal lobes and may cause hemorrhagic necrosis of brain tissue. It is fatal in at least one third of all cases. Acyclovir (or one of its analogs) is used to treat the infection.

**infantile e.** Encephalitis that occurs in infants. The most common agents are arboviruses and herpes simplex virus.

**Japanese (B type) e.** Encephalitis caused by the Japanese B type arbovirus, an infection carried by swine. It occurs sporadically in Japan, Taiwan, China, and Korea and is controlled by vaccine.

**lead e.** Encephalitis due to lead poisoning.

**e. lethargica** A form of encephalitis that occurred frequently after the influenza pandemic of 1917–1918, but rarely since. Its hallmarks include paralysis of oculomotor function and marked sleepiness or coma. Survivors developed a parkinsonism-like illness. SYN: *Econom's disease*.

**Murray Valley e.** An epidemic viral encephalitis originating in Murray Valley, Australia. SYN: *Australian encephalitis*.

**neonatal e.** A form of encephalitis occurring within the first several weeks of life.

**paraneoplastic limbic e.** ABBR: PNLE. A brain disorder occurring in some patients with cancer, characterized by the rapid onset of memory loss, often in association with temporal lobe disease, seizures, delirium, or distur-

bances of mood. Patients with PNLE often have antibodies against tumor antigens that also react with nerve cell antigens. In some patients the neurological disorder improves after treatment of the responsible tumor.

**e. periaxialis** Inflammation of the white matter of the cerebrum, occurring mainly in the young.

**postinfectious e.** Encephalitis that follows a systemic viral infection (e.g., mumps or measles) or a reactivation to varicella-zoster in adults. SYN: *acute disseminated encephalitis*.

**postvaccinal e.** Acute encephalitis following vaccination.

**purulent e.** Encephalitis characterized by abscesses in the brain.

**raccoon roundworm e.** Encephalitis characterized by inflammation of the meninges, eosinophilia, prolonged encephalopathy, retinitis, and delayed recovery with profound neurological deficits. It is transmitted to children (or others) who eat soil contaminated by raccoon feces.

**Rasmussen e.** ABBR: RE. A rare inflammatory disorder, typically involving a single hemisphere of the brain and often resulting in hemiplegia and partial seizures that are difficult to control. The condition is more common in children than in adults.

**Russian spring-summer e.** Encephalitis due to a tick-borne virus. Humans may also contract it by drinking goat milk.

**St. Louis e.** Encephalitis caused by the St. Louis arbovirus and carried by mosquitoes. It emerged during an epidemic in the summer of 1933 in and around St. Louis, Missouri. Now endemic in the U.S. (esp. Florida), Trinidad, Jamaica, Panama, and Brazil, it occurs more frequently during summer and early fall.

**tick-borne e.** A flaviviral infection of the brain transmitted by *Ixodes* ticks.

**toxic e.** Encephalitis resulting from metal poisonings (e.g., lead poisoning).

**western equine e.** A mild type of viral encephalitis that has occurred in the western U.S. and Canada.

**Encephalitozoon** (ĕn-sĕf'ă-lĭt'-ō-zō'ōn) A genus of the order Microsporidia. SEE: *microsporidiosis*.

**encephalocoele** (ĕn-sĕf'ă-lō-sĕl) [Gr. *enkephalos*, brain, + *kele*, hernia] A protrusion of the brain through a cranial fissure. SYN: *hydrencephalocoele*.

**encephalocystocoele** (ĕn-sĕf'ă-lō-sĭs'tō-sĕl) [C + *kystis*, sac, + *kele*, tumor, swelling] A hernia through a defect in the skull that contains brain and cerebrospinal fluid.

**encephalogram** (ĕn-sĕf'ă-lō-grām) [C + *gramma*, something written] A radiograph of the brain, usually performed with air in the ventricles as a contrast

medium. This procedure has been replaced by computed tomography and magnetic resonance imaging.

**encephalography** (ĕn-sĕf'ă-lŏg'ră-fĕ) [*"* + *graphein*, to write] Radiography of the head, esp. examination following the introduction of air into the ventricles through a lumbar or cisternal puncture. This procedure is no longer performed. SEE: *encephalogram*.

**encephaloid** (ĕn-sĕf'ă-loyd) [*"* + *eidōs*, form, shape] 1. Resembling the cerebral substance. 2. A malignant neoplasm of brainlike texture.

**encephalolith** (ĕn-sĕf'ă-lŏ-lĭth) [*"* + *lithos*, stone] A calculus of the brain.

**encephaloma** (ĕn-sĕf'ă-lŏ-mă) [*"* + *oma*, tumor] A tumor of the brain.

**encephalomalacia** (ĕn-sĕf'ă-lŏ-mă-lă'sĕ-ă) [*"* + *malakia*, softening] Cerebral softening.

**multicystic e.** A rare disorder of childhood in which multiple fluid-filled cavities replace brain tissue that has been deprived of oxygen or blood.

**encephalomeningitis** (ĕn-sĕf'ă-lŏ-mĕn'ĭn-jĭ'tis) [*"* + *meninx*, membrane, + *itis*, inflammation] Inflammation of the brain and meninges. SYN: *meningoencephalitis*.

**encephalomeningocele** (ĕn-sĕf'ă-lŏ-mĕ-nĭng'gŏ-sĕl) [*"* + *"* + *kele*, tumor, swelling] A protrusion of membranes and brain substance through the cranium.

**encephalomere** (ĕn-sĕf'ă-lŏ-mĕr') [*"* + *meros*, part] A primitive segment of the embryonic brain. SYN: *neuromere*.

**encephalometer** (ĕn-sĕf'ă-lŏm'ĕ-tĕr) [*"* + *metron*, measure] An instrument for measuring the cranium and locating brain regions.

**encephalomyelitis** (ĕn-sĕf'ă-lŏ-mĭ-ĕl-ĭ'tis) [*"* + *myelos*, marrow, + *itis*, inflammation] Encephalitis that is accompanied by infection and inflammation of the spinal cord. It may follow a viral infection or, in rare instances, a vaccination with a live, weakened virus.

**acute disseminated e.** An uncommon demyelinating, inflammatory brain disease that may occur after some viral infections or some vaccinations. SYN: *postinfectious encephalomyelitis*.

**benign myalgic e.** An epidemic disease of unknown etiology marked by influenza-like symptoms, severe pain, and muscular weakness. SYN: *Iceland disease*.

**equine e.** A viral disease of horses that may be communicated to humans. It includes eastern and western equine encephalitis.

**paraneoplastic encephalomyelitis** ABBR: PEM. An inflammatory disorder of the central nervous system that occurs in the setting of a cancer found in another part of the body and probably

results from the remote effects of some antigen or hormone released by the tumor.

**postinfectious e.** Acute disseminated e.

**postvaccinal e.** Encephalomyelitis following smallpox vaccination.

**encephalomyeloneuropathy** (ĕn-sĕf'ă-lŏ-mĭ'ĕ-lŏ-nŭ-rŏp'ă-thĕ) Any disease involving the brain, spinal cord, and nerves.

**encephalomyelopathy** (ĕn-sĕf'ă-lŏ-mĭ'ĕl-ŏp'ă-thĕ) [*"* + *"* + *pathos*, disease, suffering] Any disease of the brain and spinal cord.

**subacute necrotizing e.** Leigh disease.

**encephalomyeloradiculitis** (ĕn-sĕf'ă-lŏ-mĭ'ĕ-lŏ-ră-dĭk'ŭ-l'ĭ'tis) Inflammation of the brain, spinal cord, and nerve roots.

**encephalomyocarditis** (ĕn-sĕf'ă-lŏ-mĭ'ŏ-kăr-dĭ'tis) Any disease involving the brain and cardiac muscle.

**encephalon** (ĕn-sĕf'ă-lŏn) [Gr. *enkephalos*, brain] The brain, including the cerebrum, cerebellum, medulla oblongata, pons, diencephalon, and midbrain.

**encephalopathy** (ĕn-sĕf'ă-lŏp'ă-thĕ) [*"* + *pathos*, disease, suffering] Generalized brain dysfunction marked by varying degrees of impairment of speech, cognition, orientation, and arousal. In mild instances, brain dysfunction may be evident only during specialized neuropsychiatric testing; in severe instances (e.g., the last stages of hepatic encephalopathy), the patient may be unresponsive even to unpleasant stimuli.

**bovine spongiform e.** ABBR: BSE. A progressive neurological disease of cattle, marked by spongiform changes in the brain and spinal cord and associated with rapid and fatal deterioration. SYN: *mad cow disease*. SEE: *Creutzfeldt-Jakob disease*; *transmissible spongiform e.*

**ETIOLOGY:** BSE is found in cattle that have been fed offal. An infectious protein (prion) is thought to be the cause.

**PREVENTION:** Because of the possible link between BSE and rapidly fatal neurological diseases in humans, many countries have banned the use of ruminant proteins in the preparation of cattle feed.

**hepatic e.** Portal-systemic e.

**HIV e.** AIDS-dementia complex.

**hypertensive e.** The abrupt onset of headache and altered mental status that may occur with sudden and extreme elevations in blood pressure (usually diastolic pressures greater than 125 mm Hg). The altered mental states include irritability, confusion, convulsions, and/or coma. Nausea, vomiting, and visual disturbances are common. The symptoms resolve as the blood pressure is brought under control. Hyper-



tensive encephalopathy is an emergency that requires immediate treatment, usually with intravenous medications. SYN: *posthypoxia syndrome*.

**hypoxic e.** The neurological damage that results from depriving the brain of oxygen or blood, or both, for several minutes. The damage may range from a transient loss of short-term memory to persistent vegetative coma. Many conditions can result in an oxygen deficiency in the brain, which is acutely dependent on oxygen, blood, and glucose to work normally. These conditions include carbon monoxide inhalation, cardiac arrest, hypotensive episodes of any kind (e.g., any form of shock), near-drowning, and suffocation. If patients are not rapidly revived and oxygenation restored, the hippocampus, and later the other cerebral structures, may be permanently injured and the patient may suffer irreversible brain damage.

**metabolic e.** Any alteration of brain function or consciousness that results from the failure of other internal organs. In the hospital, metabolic encephalopathy is among the most common causes of altered mental status. Renal failure, liver injury, electrolyte or acid-base abnormalities, hypoxia, hypercarbia, and inadequate brain perfusion caused by a failing heart are but some of the medical conditions that may produce treatable encephalopathies.

**SYMPTOMS:** Confusion, irritability, seizures, and coma are common findings.

**portal-systemic e.** ABBR: PSE. Brain dysfunction present in patients with chronic liver disease and portal hypertension, in which chemicals that the liver normally detoxifies are shunted past it and left to circulate in the blood. Some patients are asymptomatic; others have mild impairments in memory, calculation, speech, affect, or judgment. Severely affected patients may lapse into coma. SYN: *hepatic encephalopathy*. SEE: *asterixis*.

**transmissible spongiform e.** Neurological illnesses marked by rapidly developing dementia, or the sudden onset of psychiatric illnesses, often with myoclonus, ataxia, and aphasia. Death may occur within months of onset. These illnesses are believed to be caused by infectious proteins called prions. Examples include kuru, mad cow disease (bovine spongiform encephalopathy), and Creutzfeldt-Jakob disease.

**encephalopathy** (ĕn-sĕf'ă-lō-pī-ō'sīs) [" + *pyosis*, suppuration] An abscess of the brain.

**encephalospinal** (ĕn-sĕf'ă-lō-spī-nāl) [" + *L. spina*, thorn, spine] Pert. to the brain and spinal cord.

**encephalotomy** (ĕn-sĕf'ă-lōt'ō-mĕ)

1. Brain dissection. 2. Surgical destruction of the brain of a fetus to facilitate delivery.

**enchondroma** (ĕn'kōn-drō'mă) [Gr. *en*, in, + *chondros*, cartilage, + *oma*, tumor] A benign cartilaginous tumor occurring generally where cartilage is absent, or within a bone, where it expands the diaphysis. SYN: *enchondrosis*.

**enchondrosarcoma** (ĕn-kōn-drō-săr-kō'mă) [" + " + *sarx*, flesh, + *oma*, tumor] A sarcoma made up of cartilaginous tissue or growing within an enchondroma.

**enchondrosis** (ĕn-kōn-drō'sīs) [" + " + *osis*, condition] A benign cartilaginous outgrowth from bone or cartilaginous tissue. SYN: *enchondroma*.

**enclave** (ĕn'klāv) [Fr. *enclaver*, to enclose] A mass of tissue that becomes enclosed by tissue of another kind.

**enclitic** (ĕn-klīt'ik) [Gr. *enklinein*, to lean on] Having the planes of the fetal head inclined to those of the maternal pelvis.

**encode** 1. To express or represent in genetic code, i.e., in a string of nucleotide bases that can be translated into the amino acids that make up a protein. 2. To program or represent computer instructions in software.

**encopresis** (ĕn-kō-prĕ'sīs) [" + *kopros*, excrement] A condition associated with constipation and fecal retention in which watery colonic contents bypass the hard fecal masses and pass through the rectum. This condition is often confused with diarrhea.

**encrustation** (ĕn-krūs-tă'shŭn) Obstruction of a body part or of a stent placed in the body with granulation tissue or calcified debris. The term is used in particular to refer to blockage of urethral stents.

**encrypt** (ĕn-krĭpt') [" + Gr. *kryptos*, hidden] To disguise; to shield from view by representing one symbolic character with another.

**enculturation** (ĕn-kŭl'tŭ-ră'shŭn) The adjustment of a person to the norms and values of his community.

**encysted** (ĕn-sĭst'ĕd) [" + *kystis*, bladder, pouch] Surrounded by membrane; encapsulated. SYN: *saccate*.

**end** [AS. *ende*] A termination; an extremity.

**end-** SEE: *endo-*.

**endadelphos** (ĕnd'ă-dĕl'fōs) [Gr. *endon*, within, + *adelphos*, brother] A congenitally deformed fetus whose twin is enclosed in the body or in a cyst on the fetus.

**Endamoeba** (ĕn'dă-mĕ'bă) Entamoeba. **endangiitis, endangeitis** (ĕnd'ăn-jĕ-ĭ'tis) [Gr. *endon*, within, + *angeion*, vessel, + *itis*, inflammation] Inflammation of the endothelium, the innermost layer of

a blood vessel. SYN: *endoangiitis*; *endarteritis*; *endophlebitis*.

**endangium** (ĕn-dăn'jĕ-ŭm) [" + *an-geion*, vessel] The innermost layer, or intima, of a blood vessel.

**endoarthritis** (ĕnd'ā-or-tī'tis) [" + *aorte*, aorta, + *itis*, inflammation] Inflammation of the inner layer of the aorta.

**endarterectomy** (ĕnd'ār-tĕr-ĕk'tō-mĕ) Surgical removal of the lining of an artery. It can be performed on almost any major artery that is diseased or blocked, such as the carotid, femoral, or popliteal artery.

**carotid e.** A surgical technique for removing intra-arterial obstructions (plaque) from an artery, especially the internal carotid artery. When performed on a significantly narrowed carotid artery, this operation can reduce the risk of stroke, but only in those institutions in which the operative risk of stroke or death is less than 6%. An alternative to the procedure for patients who have a higher operative risk is carotid artery stenting, which is usually performed in an angiography suite under local anesthesia. SEE: *transient ischemic attack*.

**PATIENT CARE:** *Preoperative:* To reduce anxiety, the procedure and expected sensations are explained to the patient and family, and their questions answered. Expected postoperative pain and discomfort are explained, and the patient is instructed in pain assessment and administration of pain relief medications and other noninvasive pain relief measures. The procedure requires informed consent. Not proceeding with surgery markedly increases the patient's risk of stroke or death, even with optimal medical treatment; however, the risk of heart attack, stroke, wound infection, or death with the procedure is not insignificant.

*Postoperative:* Vital signs are monitored every 15 min for several hours, then hourly for 24 to 48 hr (or according to protocol) until the patient is stable. (Alterations in blood pressure and heart rate and respirations could indicate cerebral ischemia, intracerebral hemorrhage, or other complications). Neurological assessments are performed for the first 24 to 48 hr (or according to protocol) evaluating cranial nerve function, extremity strength, speech, level of consciousness, pupillary dilation, and orientation. Intake and output are monitored hourly for the first 24 hr (or according to protocol) and IV fluids administered at a controlled rate and volume to help prevent ICP increases. Continuous cardiac and hemodynamic monitoring is performed for the first 24 hr (or according to protocol). Prescribed analgesic medication is administered,

and other noninvasive pain relief measures are offered.

The surgical wound is assessed for hematoma development, dehiscence, or infection. Wound care is provided and taught to the patient and family, and the signs and symptoms of infection to be reported to the surgeon (redness, swelling, or drainage from the incision, fever, or sore throat) are reviewed. Patients who smoke cigarettes are encouraged to stop. Smoking almost doubles the risk for ischemic stroke. Smokers should be referred to a smoking cessation program. Modification of other risk factors (such as high lipid levels, hypertension, diabetes mellitus, obesity) is critical to disease prevention. Prescribed medications are administered, and the patient is instructed in their use and adverse reactions to report to the physician.

The patient who has had a cerebrovascular accident and needs follow-up care is referred to a rehabilitation or home health care agency. Instruction is given in the management of postsurgical neurological, sensory, or motor deficits, and the importance of regular checkups explained. The surgeon or neurologist should be contacted immediately if any new neurological symptoms occur. The patient should wear or carry a medical identification tag to alert others to the condition and treatments in case of an emergency.

**endarterial** (ĕnd'ār-tĕ'rĕ-āl) [" + *arteria*, artery] 1. Pert. to the inner portion of an artery. 2. Within an artery.

**endarteritis, endoarteritis** (ĕnd'ār-tĕr-ĭ'tis) [" + " + *itis*, inflammation] Infection or inflammation of the lining of a blood vessel.

**e. deformans** A condition in which the intima is thickened or replaced with atheromatous or calcium-containing deposits.

**e. obliterans** Chronic progressive thickening of the intima leading to stenosis or obstruction of a lumen.

**syphilitic e.** Endarteritis caused by syphilis.

**endbrain** (ĕnd'brān") Telencephalon.

**end-bulb** The enlarged tip of the end of an axon.

**endemic** (ĕn-dĕm'ĭk) [Gr. *en*, in, + *demos*, people] Found in a specific population or particular region of the world. The term is usually used to refer to a disease that occurs continuously or with a stable baseline incidence within a locale or a group of people.

**endemic pemphigus foliaceus** Fogo selvagem.

**endemoepidemic** (ĕn-dĕm'ō-ĕp-ĭ-dĕm'ĭk) [" + " + *epi*, on, among, + *demos*, people] Endemic, but becoming epidemic periodically.

**endergonic** (ĕnd'ĕr-gŏn'ĭk) [Gr. *endon*,

within, + *ergon*, work] Pert. to chemical reactions that require energy in order to occur.

**end feel** In physical therapy and rehabilitation, the feeling experienced by an evaluator when overpressure is applied to tissue at the end of the available range of motion. It is interpreted as abnormal when the quality of the feel is different from normal response at that joint. The feeling may be soft as when two muscle groups are compressed or soft tissues are stretched, firm as when a normal joint or ligament is stretched, or hard as when two bones block motion. Abnormal end feels may include a springy sensation when cartilage is torn within a joint, muscle guarding when a muscle involuntarily responds to acute pain, or muscle spasticity when there is increased tone due to an upper motor neuron lesion or when the feeling is different from that normally experienced for the joint being tested.

**end-foot** A terminal button; the enlarged end of a nerve fiber that terminates adjacent to the dendrite of another nerve cell.

**ending** The terminal or final portion of a tissue or cell.

**end-inspiratory pause** The brief, normal period of breath-holding between inhalation and exhalation.

**endo-, end-** Prefixes meaning *within*.

**endoaneurysmorrhaphy** (ĕn"dō-ān"ū-rīs-mor'āf-ē) [Gr. *endon*, within, + *aneurysma*, aneurysm, + *rhaphe*, seam, ridge] Surgical opening of an aneurysmal sac and suturing of its orifice.

**endoangiitis** (ĕn"dō-ān-jē-ī'tis) [" + *angion*, vessel, + *itis*, inflammation] Endangiitis.

**endoauscultation** (ĕn"dō-āws"kūl-tā'shūn) [" + L. *auscultare*, to listen to] Auscultation by an esophageal tube passed into the stomach or by a tube passed into the heart.

**endobiotic** (ĕn"dō-bī-ōt'ik) [" + *bios*, life] Pert. to an organism living parasitically in the host.

**endoblast** (ĕn"dō-blāst) [" + *blastos*, germ] The endoderm.

**endobronchial** (ĕn"dō-brōng'kē-āl) Within a bronchus.

**endobronchial tube** A double-lumen tube used in anesthesia. One tube may be used to aerate a portion of the lung, while the other is occluded to deflate the other lung or a portion of it.

**endocannabinoid** (ĕn"dō-kū-nāb'in-oid, -kān'ū-bin) Any chemical produced by the body that stimulates receptors for *Cannabis sativa* in the central nervous system.

**endocardiac, endocardial** (ĕn"dō-kār'dē-āk, ĕn"dō-kār'dē-āl) [" + *kardia*, heart] Within the heart or arising from the endocardium.

**endocarditis** (ĕn"dō-kār-dī'tis) [" + "

+ *itis*, inflammation] Infection or inflammation of the heart valves or of the lining of the heart. In day-to-day clinical speech, this word is often used to mean "infective endocarditis." SEE: *infective e.*

**acute bacterial e.** ABBR: ABE. Infective endocarditis with a rapid onset, usually a few days to 2 weeks. The infection is typically caused by virulent organisms such as *Staphylococcus aureus*, which may rapidly invade and destroy heart valvular tissue and also metastasize to other organs or tissues. SEE: *ulcerative e.*

**atypical verrucous e.** An infrequently used term for nonbacterial thrombotic endocarditis.

**culture-negative e.** Infective endocarditis produced by organisms that do not quickly or readily grow in blood cultures, usually because their growth is masked by the previous use of antibiotics or because the causative organisms require special culture media or grow slowly in the laboratory. *Mycoplasma*, *Rickettsia*, HACEK (an acronym for *Haemophilus*, *Actinobacillus*, *Cardiobacterium*, *Eikenella*, *Kingella*) organisms, and some fungi produce culture-negative endocarditis. SEE: *infective e.*

**infective e.** ABBR: IE. Endocarditis caused by any microorganism, esp. any species of streptococci or staphylococci, and less often by *Haemophilus* spp. or other HACEK bacteria (e.g., *Actinobacillus actinomycetem comitans*, *Cardiobacterium hominis*, *Eikenella corrodens*, or *Kingella kingae*), enteric bacteria, rickettsiae, chlamydiae, or fungi. Traditionally, IE can be categorized as *acute* if the illness has a fulminant onset; *catheter-related* if the causative microorganism gains access to the heart from an indwelling line; *culture-negative* if echocardiograms reveal vegetations and other criteria for the disease are present, but the causative microbes have not been isolated in the laboratory; *left-sided* if it develops on the mitral or aortic valves; *nosocomial* if it occurs after 48 hr of hospitalization or an invasive surgical procedure; *pacemaker-related* if the disease occurs on an implanted pacemaker or cardioverter-defibrillator; *prosthetic* if it occurs on a surgically implanted heart valve; *right-sided* if it develops on the tricuspid or pulmonary valves; and *subacute* if it develops after several weeks or months of anorexia, low-grade fevers, and malaise. The incidence in the U.S. is about 2 to 4 cases per 100,000. Patients who are elderly or have a history of injection drug abuse, diabetes mellitus, immunosuppressing illnesses, aortic stenosis, mitral valve prolapse, or rheumatic

heart disease are more likely than others to become infected.

**SYMPTOMS:** Patients with *subacute* IE may have vague symptoms, including low-grade fevers, loss of appetite, malaise, and muscle aches. *Acutely* infected patients often present with high fevers, prostration, chills and sweats, stiff joints or back pain, symptoms of heart failure (esp. if the infection has completely disrupted a heart valve or its tethers), heart block (if the infection erodes into the conducting system of the heart), symptoms caused by the spreading of the infection to lungs or meninges (e.g., cough, headache, stiff neck, or confusion), stroke symptoms, symptoms of renal failure, rashes (including petechiae), or other findings. Signs of the illness typically include documented fevers, cardiac murmurs, or (more rarely) nodular eruptions on the hands and feet (Osler's nodes or Janeway lesions). Cottonwool spots may be seen on the retinas of some affected persons. **SEE: illus.**



**OSLER'S NODES**

**DIAGNOSIS:** Blood cultures, esp. if persistently positive, form the basis for the diagnosis of endocarditis. Contemporary criteria for diagnosis also include visual confirmation of endocardial infection (vegetations) by echocardiography, the presence of several other suggestive anomalies (e.g., persistent fevers in a patient who is known to inject drugs or a patient with an artificial heart valve), infective emboli in the lungs or other organs; and characteristic skin findings. Occasionally, a patient who dies of a febrile illness may be found to have infective vegetations on the heart valves at autopsy.

**PROGNOSIS:** Endocarditis is deadly in about 10% to 25% of patients. Death is most likely to occur in patients who suffer strokes resulting from infected fragments embolizing to the brain and in patients who suffer congestive heart failure. Patients with right-sided endo-

carditis have a better prognosis than patients with other forms of the disease.

**TREATMENT:** Many patients recover after treatment with prolonged courses of parenteral antibiotics. Some (e.g., those with heart failure or severely injured hearts) may not respond without surgery to replace damaged valves or debride abscesses within the myocardium.

**PATIENT CARE:** During the acute phase of treatment, patients are monitored for signs and symptoms of heart failure (e.g., dyspnea, orthopnea, crackles, dependent edema, changes in the heart murmur, and a postsystolic gallop), cerebral emboli (e.g., paralysis, aphasias, changes in mental status), and embolization to the kidney (e.g., decreased urine output, hematuria); lung involvement (e.g., dyspnea, cough, egophony, hemoptysis, pleuritic pain, or friction rub) or spleen involvement (e.g., left upper quadrant abdominal pain radiating to the left shoulder, abdominal rigidity); and peripheral vascular occlusion (e.g., numbness or tingling, changes in pulses, pallor, and coolness in an extremity). Blood cultures may be taken periodically to monitor the effectiveness of antibiotic therapy. Before the administration of antibiotics, a history of allergies is obtained. Treatment peak and trough drug levels are checked (e.g. when aminoglycoside or vancomycin is given) to maintain therapeutic levels and prevent toxicity. Supportive treatment includes bedrest, sufficient fluid intake to preserve hydration, and aspirin or acetaminophen for fever and aches.

Passive and active limb exercises are used to maintain muscle tone and quiet, diversional activities to prevent excessive physical exertion until a slow, progressive activity program that limits cardiac workload can be established.

**PROPHYLAXIS:** The American Heart Association recommends that patients at high risk for endocarditis should receive prophylactic antibiotics prior to many procedures, including dental and periodontal cleanings and extractions, intraligamentary local anesthetic injections, tonsillectomy, adenoidectomy, bronchoscopy with rigid instrument, sclerotherapy for esophageal varices, esophageal stricture dilation, biliary tract procedures, barium enema or colonoscopy, surgery involving the respiratory or intestinal mucosa, prostate surgery, cystoscopy, and urethral dilation.

**Libman-Sacks e.** **SEE:** *Libman-Sacks endocarditis*.

**Löffler's endocarditis** **SEE:** *Löffler's endocarditis*.

**malignant e.** **1.** An old term for endocarditis that is rapidly fatal. **2.** Val-

ular vegetations composed of tumor cells.

**mural e.** Endocarditis of the lining of the heart but not the heart valves.

**native valve e.** Infective endocarditis occurring on a patient's own heart valve(s), rather than on a prosthetic (surgically implanted) valve(s).

**nonbacterial thrombotic e.** ABBR: NBTE. The presence on the heart valves of vegetations that are produced not by bacteria but by sterile collections of platelets in fibrin. NBTE is characteristically found in severe cases of systemic lupus erythematosus, tuberculosis, or malignancy. The vegetations of NBTE readily embolize, causing infarctions in other organs. SYN: *verrucous endocarditis*.

**prosthetic valve e.** Bacterial infection of a surgically implanted artificial heart valve.

**rheumatic e.** Valvular inflammation and dysfunction (esp. mitral insufficiency) occurring during acute rheumatic fever.

**right-sided e.** Endocarditis affecting the tricuspid or pulmonary valve. It is usually the result of a percutaneous infection and is most often seen in injection drug users.

**subacute bacterial e.** ABBR: SBE. A heart valve infection that becomes clinically evident after weeks or months. It usually results from infection with streptococcal species that have relatively low virulence (e.g., viridans group streptococci). The infection often develops on a previously abnormal heart valve. SYN: *endocarditis viridans*.

**syphilitic e.** Endocarditis due to syphilis having extended from the aorta to the aortic valves.

**tuberculous e.** Endocarditis caused by *Mycobacterium tuberculosis*.

**ulcerative e.** A rapidly destructive form of acute bacterial endocarditis characterized by necrosis or ulceration of the valves.

**valvular e.** Endocarditis affecting the heart valves and not the inner lining of the heart.

**vegetative e.** Endocarditis associated with fibrinous clots on ulcerated valvular surfaces.

**verrucous e.** Nonbacterial thrombotic e.

**e. viridans** Subacute bacterial e.

**endocardium** (èn'dō-kār'dē-üm) [Gr. *endon*, within, + *kardia*, heart] The endothelial membrane that lines the chambers of the heart and is continuous with the lining (intima) of the arteries and veins. It is a single layer of cells under which lie nerves, Purkinje cells, and veins.

**endocervical** (èn'dō-sēr'vī-kāl) [" + L. *cervix*, neck] Pert. to the endocervix.

**endocervicitis** (èn'dō-sēr'vī-sī'tis) [" +

" + Gr. *itis*, inflammation] Inflammation of the mucous membranes that line the uterine cervix. It is usually caused by chlamydia, gonorrhea, or malignancy.

**endocervix** (èn'dō-sēr'vīks) [" + L. *cervix*, neck] The mucous membrane that lines the opening into the uterine cervix.

**endochondral** (èn'dō-kōn'drāl) [" + *chondros*, cartilage] Within a cartilage.

**endochondral bone formation** One of the two types of bone formation in skeletal development. Each long bone is formed as a cartilage model before bone is laid down, replacing the cartilage.

**endocoagulation** (èn'dō-kō-äg'ū-lā'shŭn) Thermocoagulation.

**Endocodone** (èn'dō-kō'dōn") Oxycodone.

**endocolitis** (èn'dō-kō-lī'tis) [" + *kolon*, colon, + *itis*, inflammation] Inflammation of the mucosa of the colon. SEE: *colitis*.

**endocorpuscular** (èn'dō-kor-pŭs'kŭ-lār) [" + L. *corpusculum*, small body (corpuscle)] Within a cell.

**endocranial** (èn'dō-krā'nē-āl) [" + *kranion*, cranium] 1. Intracranial or within the cranium. 2. Pert. to the endocranium.

**endocranium** (èn'dō-krā'nē-ŭm) The dura mater of the brain, which forms the lining membrane of the cranium.

**endocrine** (èn'dō-krīn, -krīn, -krēn) [" + *krinein*, to secrete] 1. An internal secretion. 2. Pert. to a gland that secretes directly into the bloodstream.

**endocrine disruptor** (dīs-rŭp'tēr) A chemical that may imitate or block the function of natural hormones if it is absorbed by the body. Many pesticides and plasticizing compounds, e.g., phthalates, are thought to disrupt endocrine pathways, esp. if they are absorbed by pregnant women during embryonic and fetal development.

**endocrine-inactive tumor** A pituitary adenoma that does not secrete a clinically important concentration of hormones. Endocrine-inactive tumors were formerly known as chromophobe adenomas. They are the most commonly detected neoplasms of the pituitary gland.

**endocrine neoplasm, multiple** SEE: *multiple endocrine neoplasia*.

**endocrine system** The ductless glands or the glands of internal secretion, which include the pineal gland, hypothalamus, pituitary, thyroid, parathyroid, adrenal glands, ovaries, testes, and pancreas. SEE: *endocrine gland*.

**endocrino-** [Gr. *endon*, within, + *krinein*, to secrete] Combining form meaning *endocrine*.

**endocrinologist** (èn'dō-krī-nōl'ō-jīst) A specialist who diagnoses, prevents, or treats hormonal disease.

**endocrinology** (èn'dō-krīn-ōl'ō-jē) [" +



" + *logos*, word, reason] The scientific study of hormones and of the glands that secrete them.

**endocrinopathy** (ĕn"ďō-křin-ŏp"ă-thĕ) [" + " + *pathos*, disease, suffering] Any disease resulting from a disorder of an endocrine gland or glands. **endocrinopathic** (-křin"-ŏ-pă'thik), *adj.*

**endocrinotherapy** (ĕn"ďō-křin"ŏ-thĕr'ă-pĕ) [" + " + *therapeia*, treatment] Hormonotherapy.

**endocyst** (ĕn"ďō-sĭst) [" + *kystis*, bladder, pouch] The innermost layer of any hydatid cyst.

**endocystitis** (ĕn"ďō-sĭs-tĭ'tis) [" + " + *itis*, inflammation] Inflammation of the mucous membrane of the bladder. SEE: *cystitis*.

**endocytosis** (ĕn"ďō-sĭ-tŏ'sĭs) A method of ingestion of a foreign substance by a cell. The cell membrane invaginates to form a space for the material and then the opening closes to trap the material inside the cell. SEE: *emiocytosis*; *exocytosis*; *phagocytosis*; *pinocytosis*.

**endoderm** (ĕn"ďō-dĕrm) [" + *derma*, skin] The innermost of the three primary germ layers of a developing embryo. It gives rise to the epithelium of the digestive tract and its associated glands, the respiratory organs, bladder, vagina, and urethra. SYN: *hypoblast*.

**endodermal** (-dĕrm'ăl), *adj.*

**endodontia** (ĕn"ďō-dŏn'shĕ-ă) [" + *odous*, tooth] Endodontics.

**endodontics** (ĕn"ďō-dŏn'tĭks) The branch of dentistry concerned with diagnosis, treatment, and prevention of diseases of the dental pulp and its surrounding tissues.

**endodontist** (ĕn"ďō-dŏn'tĭst) A specialist in endodontics.

**endodontitis** (ĕn"ďō-dŏn-tĭ'tis) [" + *odous*, tooth, + *itis*, inflammation] Inflammation of the dental pulp. SYN: *pulpitis*.

**endoctothrix** (ĕn"ďō-ĕk'tŏ-thřiks) [" + *ektos*, outside, + *thřix*, hair] Any fungus growth on and in the hair.

**End-of-Life Nursing Education Consortium** ABBR: ELNEC. An educational initiative for U.S. nurses to improve core clinical competencies in the care of dying patients.

**endogamy** (ĕn-dŏg'ă-mĕ) [" + *gamos*, marriage] 1. The custom or tribal restriction of marriage within a tribe or group. 2. In biology, reproduction by joining together gametes descended from the same ancestral cell.

**endogastritis** (ĕn"ďō-gă-s-trĭ'tis) Gastritis.

**endogenic** (ĕn"ďō-jĕn'ĭk) [" + *gennan*, to produce] Endogenous.

**endogenous** (ĕn-dŏj'ĕ-nŭs) 1. Produced or originating from within a cell or organism. 2. Concerning spore formation within the bacterial cell. SYN: *endogenic*.

**endogenous opiate-like substance** SEE: *endorphin*; *enkephalin*; *opiate receptor*.

**endoglobar, endoglobular** (ĕn"ďō-glŏb'ăr, ĕn"ďō-glŏb'ŭ-lăr) [Gr. *endon*, within, + L. *globulus*, a globule] Within blood cells.

**endo intoxication** (ĕn"ďō-ĭn-tŏk'sĭ-kă'shŭn) [" + L. *in*, into, + Gr. *toxikon*, poison] Poisoning due to an endogenous toxin (e.g., by hepatotoxins in liver failure, or urea compounds in renal failure).

**endolabyrinthitis** (ĕn"ďō-lăb'ĭ-rĭn-thĭ'tis) [" + *labyrinthos*, labyrinth, + *itis*, inflammation] Inflammation of the membranous labyrinth.

**endoleak** (ĕn"ďō-lĕk") [" + *leak*] Seepage of blood from a graft placed in a diseased blood vessel. The blood leaks out of the graft into the aneurysm that the graft was used to repair.

**Endolimax nana** (ĕn"ďō-lĭ'măks nă'nă) [" + *leimax*, meadow] A species of ameba inhabiting the intestines of humans, monkeys, and other mammals. Although it is often found in stool specimens, it is usually thought to be a commensal or nonpathogenic inhabitant of the gut.

**endolymph** (ĕn"ďō-lĭmf) [" + L. *lymph*, clear fluid] A pale transparent fluid within the vestibular labyrinth of the inner ear. Endolymph differs in composition from the perilymph that is outside the vestibular labyrinth: endolymph is similar to intracellular fluid; perilymph, to extracellular cerebrospinal fluid. **endolymphatic** (-lĭmfăt'ĭk), *adj.*

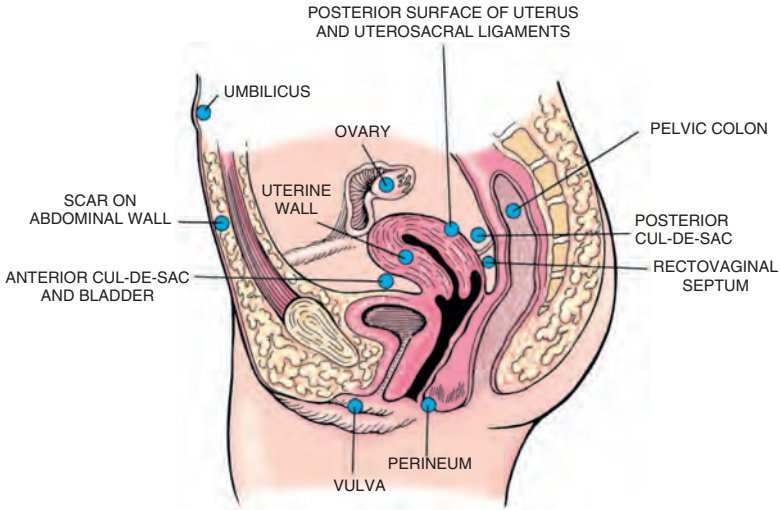
**endolysin** (ĕn-dŏl'ĭ-sĭn) [" + *lysis*, dissolution] A bacteriocidal substance within a leukocyte that destroys bacteria.

**endomastoiditis** (ĕn"ďō-măs'tŏy-dĭ'tis) [" + *mastos*, breast, + *eidōs*, form, shape, + *itis*, inflammation] Inflammation of the mucosa lining the mastoid cavity and cells.

**endometrial** (ĕn"ďō-mĕ'trĕ-ăl) [" + *metra*, uterus] Pert. to the lining of the uterus (the endometrium).

**endometrial dating** Microscopic examination of a suitable, stained specimen from the endometrium to establish the number of days to the next menstrual period. The dating is based on an ideal 28-day cycle. Thus, day 8 indicates menstruation is 20 days away, and day 23 that it is 5 days away. This system was devised by the late Dr. John Rock, a physician at Harvard Medical School, to enable gynecologists to visualize endometria being discussed without having to provide detailed descriptions of the material studied.

**endometrial jet washing** Collection of fluid that has been used to irrigate the uterine cavity. Cells present in the fluid are examined for evidence of malignancy.



POSSIBLE SITES OF OCCURRENCE OF ENDOMETRIOSIS

nancy. This method is used as a screening test for endometrial carcinoma.

**endometrioma** (ĕn"ďō-mĕ"trĕ-ō-mă) [Gr. *endon*, within, + *metra*, uterus, + *oma*, tumor] A benign tumor comprised of ectopic endometrial cells. It is found most frequently in the ovary, the cul-de-sac, the rectovaginal septum, and the peritoneal surface of the posterior portion of the uterus.

**endometriosis, endomyometritis** (ĕn"ďō-mĕ"trĕ-ō'sis) [ " + " + *osis*, condition] The presence of functioning ectopic endometrial glands and stroma outside the uterine cavity. Characteristically, the endometrial tissue invades other tissues and spreads by local extension, intraperitoneal seeding, and lymphatic and vascular routes. The endometrial implants may be present in almost any area of the body, though generally they are confined to the pelvic area. In the U.S. this condition is estimated to occur in 10% to 15% of actively menstruating women between the ages of 25 and 44. Estimates are that 25% to 35% of infertile women are affected. Women whose mothers or sisters have endometriosis are 6 times more likely to develop the condition than those with no family history. Postmenopausal women on estrogen replacement therapy also can develop endometriosis. The disease is exceptionally rare in men with prostate cancer receiving large doses of estrogens. The fallopian tubes are common sites of ectopic implantation. Ectopic endometrial cells respond to the same hormonal stimuli as does the uterine endometrium. The cyclic bleeding and local inflammation surrounding the implants may cause fibro-

sis, adhesions, and tubal occlusion. Infertility may result. **SEE: illu.**

**ETIOLOGY:** Although the cause is unknown, hypotheses are that either endometrial cell migration occurs during fetal development, or the cells shed during menstruation are expelled through the fallopian tubes to the peritoneal cavity.

**SYMPTOMS:** No single symptom is diagnostic. Patients often complain of dysmenorrhea with pelvic pain, premenstrual dyspareunia, sacral backache during menses, and infertility. Dysuria may indicate involvement of the urinary bladder. Cyclic pelvic pain, usually in the lower abdomen, vagina, posterior pelvis, and back, begins 5 to 7 days before menses, reaches a peak, and lasts 2 to 3 days. Premenstrual tenesmus and diarrhea may indicate lower bowel involvement. Dyspareunia may indicate involvement of the cul-de-sac or ovaries. No correlation exists between the degree of pain and the extent of involvement; many patients are asymptomatic.

**DIAGNOSIS:** Although history and findings of physical examination may suggest endometriosis, and imaging studies (transvaginal ultrasound) may be helpful, definitive diagnosis of endometriosis and staging requires laparoscopy, a procedure that allows direct visualization of ectopic lesions and biopsy.

**TREATMENT:** Medical and surgical approaches may be used to preserve fertility and to increase the woman's potential for achieving pregnancy. Pharmacological management includes the use of hormonal agents to induce endo-

metrial atrophy by maintaining a chronic state of anovulation.

Surgical management includes laparotomy, lysis of adhesions, laparoscopy with laser vaporization of implants, laparotomy with excision of ovarian masses, or total hysterectomy with bilateral salpingo-oophorectomy and removal of aberrant endometrial cysts and implants to encourage fertility. The definitive treatment for endometriosis ends a woman's potential for pregnancy by removal of the uterus, tubes, and ovaries.

**PATIENT CARE:** Providing emotional support and meeting informational needs are major concerns. The patient is encouraged to verbalize feelings and concerns.

The woman is prepared physically and emotionally for any surgical procedure.

Adolescent girls with a narrow vagina or small vaginal meatus are advised to use sanitary napkins rather than tampons to help prevent retrograde flow. Because infertility is a possible complication of endometriosis, a patient who wants children is advised not to postpone childbearing. An annual pelvic examination and Papanicolaou test are recommended. SEE: *Nursing Diagnoses Appendix*.

**peritoneal e.** Endometrial tissue found throughout the pelvis.

**transplantation e.** Endometriosis occurring within an abdominal incision scar following pelvic surgery.

**endometritis** (ĕn"ďō-mĕ-trĭ"tĭs) [" + " + *itis*, inflammation] Inflammation of the lining of the uterus. Organisms may migrate through the cervical canal along mucosal surfaces, piggyback on sperm, or be carried on tampons or intrauterine devices. The inflammation may be acute, subacute, or chronic. The disorder is most common among females of childbearing age. The woman is at highest risk for endometritis during the immediate postpartum period. Endometritis that is not associated with pregnancy may result from pelvic inflammatory disease or invasive gynecologic procedures. SEE: *puerperal e.*

**ETIOLOGY:** Endometritis usually results from an ascending bacterial invasion of the uterine cavity. Common offenders include *Staphylococcus aureus*, a normal commensal resident of human skin; *Escherichia coli*, a common inhabitant of the human bowel; *Chlamydia trachomatis*; and *Neisseria*. SEE: *pelvic inflammatory disease; toxic shock syndrome*.

**SYMPTOMS:** The woman usually presents with low, cramping abdominal pain, low back pain, dysmenorrhea, dyspareunia, and fever. Depending on the causative organism, a purulent, muco-

purulent, or serosanguinous cervical discharge is seen on vaginal examination. In postpartum endometritis, lochia is foul-smelling. Bimanual palpation finds a tender, boggy uterus. SEE: *cervix uteri; endometrium; uterus*.

**DIAGNOSIS:** Culturing the causative organisms from lochia, cesarean or episiotomy incisional exudate, cervical swab or aspirated materials establishes the diagnosis.

**TREATMENT:** Antibiotic regimens that treat a broad spectrum of organisms (anaerobes, aerobes, sexually transmitted microorganisms) are used empirically.

**PATIENT CARE:** The patient should be made aware that the infectious process may spread beyond the endometrium, into the fallopian tubes, ovaries, pelvic perineum, pelvic veins, or pelvic connective tissue. SEE: *pelvic inflammatory disease*.

Standard precautions are used when caring for the patient. The patient is assessed for changes in the amount, color, odor, and consistency of vaginal discharge. Pain also is assessed and treated as prescribed. The patient is taught about the drugs used for treatment, their desired effects, and any adverse effects. In acute cases, the patient may be febrile; fever is treated with antipyretic drugs if it exceeds 101°F and with PO or intravenous (IV) fluids for hydration as required. The patient may be placed on bedrest in a semi-Fowler's position to facilitate dependent drainage. Vital signs should be monitored every 4 hours, and fluid intake and output recorded. Heat may be applied to the abdomen to improve circulation.

The varied consequences of endometritis are explained. They can include the need for surgery to relieve chronic pain or to manage acute infections that are unresponsive to antibiotic therapy, adhesions, tubal scarring, and infertility. The potential or actual loss of reproductive capabilities can devastate the woman's self-concept. All professional care providers must assist the patient to adjust her self-concept to fit reality and to accept any alterations in a way that promotes future health. The patient should abstain from sexual contact until treatment is complete, the sexual partner has also received treatment as appropriate, and follow-up testing has been done. Sterile technique should be maintained throughout all vaginal examinations. Some states require that chlamydial infections be reported to local public health authorities. All female patients should be taught correct perineal and hand hygiene to help prevent endometritis.

**cervical e.** Inflammation of the inner portion of the cervix uteri.

**decidual e.** Inflammation of the mucous membrane of a gravid uterus.

**e. dissecans** Endometritis accompanied by development of ulcers and shedding of the mucous membrane.

**puerperal e.** Acute endometritis following childbirth. Risk factors for development of this condition include premature or prolonged rupture of membranes, dystocia with multiple vaginal examinations, poor aseptic technique, trauma related to intrauterine manipulation, and careless perineal care. Constitutional factors that predispose the parturient woman to endometritis include anemia, malnutrition, and hemorrhage. Portals of bacterial entry include the site of previous placental attachment, episiotomy, lacerations, and abrasions.

**ETIOLOGY:** Aerobic organisms include streptococci, *Gardnerella vaginalis*, *Escherichia coli*, *Staphylococcus aureus*, and group A  $\beta$ -hemolytic streptococci. Endometritis that occurs late in the postpartal period is most commonly caused by *Chlamydia trachomatis*.

**SYMPTOMS:** Abdominal tenderness is common. Severe endometritis may cause fever, chills, tachycardia, extreme uterine tenderness, and subinvolution. Although a moderate-to-profuse foul-smelling vaginal discharge usually is seen, the lochia of women infected by  $\beta$ -hemolytic streptococci is scant, odorless, and serosanguineous to serous.

**TREATMENT:** Antibiotics that treat aerobic and anaerobic bacteria are administered, usually for a 4- or 5-day course. Supportive therapy includes bedrest, analgesics, and oral and IV fluids.

**endometrium** (ĕn'dō-mĕ'trĕ-ŭm) [Gr. *endon*, within, + *metra*, uterus] The mucous membrane that lines the uterus. It consists of two highly vascular layers of areolar connective tissue; the basilar layer is adjacent to the myometrium, and the functional layer is adjacent to the uterine cavity. Simple columnar epithelium forms the surface of the functional layer and the simple tubular uterine glands. Straight arteries supply blood to the basilar layer; spiral arteries supply the functional layer. Both estrogen and progesterone stimulate the growth of endometrial blood vessels.

Beginning with menarche and ending at menopause, the uterine endometrium passes through cyclical changes that constitute the menstrual cycle. These changes are related to the development and maturation of the graafian follicle in the ovary, the discharge of the ovum, and the subsequent development of the corpus luteum in the ovary.

If the ovum is not fertilized or the zygote not implanted, the functional layer of the endometrium is shed in menstruation.

The cycle then begins again, with the

functional layer regenerated by the basilar layer.

Following implantation of the zygote, the endometrium becomes the maternal portion of the placenta; it fuses with the chorion of the embryo. After birth, the uterine lining is shed. SEE: *fertilization* for illus.

**proliferative e.** Endometrial hypertrophy due to estrogen stimulation during the preovulatory phase of the menstrual cycle. This condition is detected through endometrial biopsy.

**secretory e.** Histological changes in the endometrium due to the effects of postovulatory progesterone secretion by the corpus luteum. SEE: *luteal phase defect*; *menstrual cycle*.

**endomorph** (ĕn'dō-morf') [ " + *morphe*, form] A person with a body build marked by predominance of tissues derived from the endoderm. SEE: *ectomorph*; *mesomorph*; *somatotype*.

**endomyocarditis** (ĕn'dō-mĭ-ō-kār-dĭ'tis) [ " + *mys*, muscle, + *kardia*, heart, + *itis*, inflammation] Inflammation of the endocardium and myocardium.

**endomysium** (ĕn'dō-mĭs'ĕ-ŭm) [ " + *mys*, muscle] A thin sheath of connective tissue, consisting principally of reticular fibers, that invests each striated muscle fiber and binds the fibers together within a fasciculus.

**endonasal** (ĕn'dō-nāz'əl) Inside the nose.

**endoneuritis** (ĕn'dō-nū-rĭ'tis) [ " + *neuron*, nerve, + *itis*, inflammation] Inflammation of the endoneurium.

**endoneurium** (ĕn'dō-nū'rĕ-ŭm) A delicate connective tissue sheath that surrounds nerve fibers within a fasciculus.

**endonuclease** (ĕn'dō-nū'klĕ-ās) An enzyme that cleaves the ends of polynucleotides.

**restriction e.** One of many bacterial enzymes that inactivates foreign DNA but does not interfere with the cell's DNA. This type of enzyme is used to cleave strands of DNA at specific sites.

**endoparasite** (ĕn'dō-pār'ā-sĭt) [ " + *para*, beside, + *sitos*, food] Internal parasite.

**endopelvic** (ĕn'dō-pĕl'vĭk) [ " + L. *pelvis*, basin] Within the pelvis.

**endopelvic fascia** The downward continuation of the parietal peritoneum of the abdomen to form the pelvic fasciae, which contribute to the support of the pelvic viscera.

**endopeptidase** (ĕn'dō-pĕp'tĭ-dās) A proteolytic enzyme that cleaves peptides in their centers rather than from their ends.

**endopericarditis** (ĕn'dō-pĕr'ĭ-kār-dĭ'tis) [ " + *peri*, around, + *kardia*, heart, + *itis*, inflammation] Endocarditis complicated by pericarditis.

**endoperimyocarditis** (ĕn'dō-pĕr'ĭ-mĭ'ō-kār-dĭ'tis) [ " + " + *mys*, muscle, +

- kardia*, heart, + *itis*, inflammation] Inflammation of the pericardium, myocardium, and endocardium.
- endoperitonitis** (ĕn"ďō-pĕr"ĭ-tō-nĭ'tis) [ " + *peritonaion*, peritoneum, + *itis*, inflammation] Inflammation of the peritoneum.
- endophasia** (ĕn"ďō-fā'zĕ-ă) [ " + *phasis*, utterance] Formation of words by the lips without producing sound.
- endophasy** (ĕn"ďō-fā'zĕ) The silent process of thought and production of unuttered words. This function, called inner speech, is essential to thinking that is done with words. SEE: *exophasy*.
- endophlebitis** (ĕn"ďō-flĕ-bĭ'tis) [ " + *phleps*, vein, + *itis*, inflammation] Inflammation of the inner layer or membrane of a vein. SYN: *endangiitis*.
- e. obliterans** Endophlebitis causing obliteration of a vein.
- e. portalis** Inflammation of the portal vein.
- endophthalmitis** (ĕn"ďōf-thāl-mĭ'tis) [ " + *ophthalmos*, eye, + *itis*, inflammation] Inflammation of the inside of the eye that may or may not be limited to a particular chamber (i.e., anterior or posterior).
- endoplasm** (ĕn"ďō-plāzm) [ " + LL. *plasma*, form, mold] The central, more fluid portion of the cytoplasm of a cell. Opposed to ectoplasm.
- endopyelotomy** (ĕn"ďō-pĭ'ĕ-lōt'ō-mĕ) [Gr. *endo-*, within, + *pyelo-*, pelvis, + *-otomy*, cutting] An endoscopic incision of the renal pelvis or the ureteropelvic junction.
- endorphin** (ĕn-dor'fĭn, ĕn'dor-fĭn) A polypeptide produced in the brain that acts as an opiate and produces analgesia by binding to opiate receptor sites involved in pain perception. The threshold for pain is therefore increased by this action. The most active of these compounds is beta-endorphin. SEE: *enkephalin*; *opiate receptor*; *substance P*.
- endosalpingitis** (ĕn"ďō-sāl'pĭn-jĭ'tis) [ " + *salpinx*, tube, + *itis*, inflammation] Inflammation of the lining of the fallopian tubes.
- endosalpingoma** (ĕn"ďō-sāl'pĭn-gō'mă) An adenomyoma of the uterine tube.
- endosalpinx** (ĕn"ďō-sāl'pĭnks) [ " + *salpinx*, tube] The mucous membrane lining the uterine tube.
- endoscope** (ĕn"ďō-skōpĕ) [ " + *skopein*, to examine] A device consisting of a tube and optical system for observing the inside of a hollow organ, cavity, or tissue plane. This observation may be done through a natural body opening or a small incision. SYN: *enteroscope*.
- endoscopic laser cholecystectomy** SEE: under *laparoscopic laser cholecystectomy*.
- endoscopic mucosectomy** Surgical removal of a part of the mucosa of an organ, esp. when cancer is present only in the lining of that organ. Endoscopic mucosectomy sometimes is used to treat superficial cancers of the esophagus.
- endoscopic retrograde cholangiopancreatography** ABBR: ERCP. Radiography following injection of a radiopaque material into the papilla of Vater. This is done through a fiberoptic endoscope guided by use of fluoroscopy. The procedure is helpful in determining the cause of obstructive jaundice. SEE: *jaundice*; *percutaneous transhepatic cholangiography*.
- endoscopy** (ĕn-dōs'kō-pĕ) Inspection of body organs or cavities by use of an endoscope. Although endoscopy is well tolerated by nearly all patients, major complications, e.g., perforation of the organ being examined, bleeding, difficulty breathing, chest pain, or adverse anesthetic reactions, occur rarely.
- endoskeleton** (ĕn"ďō-skĕl'ĕt-ōn) [ " + *skeleton*, skeleton] The internal bony framework of the body. Opposite of exoskeleton.
- endosome** (ĕn"ďō-sōm) [ " + L. *soma*, body] The vacuole formed when material is absorbed in the cell by endocytosis. The vacuole fuses with lysosomes. SYN: *receptosome*.
- endosonography** [ " + L. *sonus*, sound, + Gr. *gramma*, something written] Endoscopic ultrasonography, i.e., the imaging of an internal body part by attaching an ultrasonographic transducer to an endoscope or laparoscope.
- endospore** (ĕn"ďō-spor) [ " + *sporos*, a seed] A thick-walled spore produced by a bacterium to enable it to survive unfavorable environmental conditions.
- endosseous** (ĕn-dōs'ĕ-ūs) [ " + " ] Within bone.
- endostatin** (ĕn"ďō-stăt'ĭn) A protein fragment of collagen that contributes to the regulation of blood vessel growth. It is being investigated for its potential to shrink malignant tumors by decreasing their blood supply.
- endosteitis** (ĕn"ďōs-tĕ-ĭ'tis) [ " + *osteon*, bone, + *itis*, inflammation] Inflammation of the endosteum or the medullary cavity of a bone. SYN: *endostitis*.
- endosteoma** (ĕn-dōs'tĕ-ō'mă) [ " + " + *oma*, tumor] A tumor in the medullary cavity of a bone.
- endosteum** (ĕn-dōs'tĕ-ūm) [ " + *osteon*, bone] The membrane lining the marrow cavity of a bone.
- endostitis** (ĕn"ďōs-tĭ'tis) [ " + " + *itis*, inflammation] Endosteitis.
- endostoma** (ĕn-dōs-tō'mă) [ " + " + *oma*, tumor] An osseous tumor within a bone.
- endostosis** (ĕn"ďōs-tō'sĭs) [ " + " + *osis*, condition] The development of an endostoma.
- endotendineum** (ĕn"ďō-tĕn-dĭn'ĕ-ūm) [ " + L. *tendo*, tendon] The connective tissue in tendons between the bundles of fibers.



**endothelial** (ĕn'dō-thē'lē-ăl) [Gr. *endon*, within, + *thele*, nipple] Pert. to or consisting of endothelium.

**endothelin** (ĕn'dō-thē'lin) A peptide released from the lining of blood vessels that causes blood vessels to constrict and blood pressure to increase. Endothelins are one of several agents involved in raising blood pressure and contributing to congestive heart failure.

**endotheliocyte** (ĕn'dō-thē'lē-ō-sīt') [l' + " + *kytos*, cell] An endothelial cell.

**endotheliocytosis** (ĕn'dō-thē'lē-ō-sīt-ō'sis) [l' + " + " + *osis*, condition] An abnormal increase in endothelial cells.

**endotheliolysin** (ĕn'dō-thē-lē-ō'lī-sīn) [l' + *thele*, nipple, + *lysis*, dissolution] An antibody found in snake venom that dissolves endothelial cells.

**endotheliolytic** (ĕn'dō-thē-lē-ō-līt'ik) Capable of destroying endothelial tissue.

**endothelioma** (ĕn'dō-thē-lē-ō'mă) [l' + *thele*, nipple, + *oma*, tumor] A malignant growth of lining cells of the blood vessels.

**endotheliomyoma** (ĕn'dō-thē'lē-ō-mī-ō'mă) [l' + " + *mys*, muscle, + *oma*, tumor] A muscular tumor with elements of endothelium.

**endotheliomyxoma** (ĕn'dō-thē'lē-ō-mīks-ō'mă) [l' + " + *myxa*, mucus, + *oma*, tumor] A myxoma with elements of endothelium.

**endotheliosis** (ĕn'dō-thē'lē-ō'sis) Increased growth of endothelium.

**endotheliotoxin** (ĕn'dō-thē-lē-ō-tōks'in) [l' + " + *toxikon*, poison] A toxin that acts on endothelial capillary cells and causes bleeding.

**endothelium** (ĕn'dō-thē'lē-üm) [l' + *thele*, nipple] A form of squamous epithelium consisting of flat cells that line the blood and lymphatic vessels, the heart, and various other body cavities. It is derived from mesoderm. Endothelial cells are metabolically active and produce a number of compounds that affect the vascular lumen and platelets. Included are endothelium-derived relaxing factor (EDRF), prostacyclin, endothelium-derived contracting factors 1 and 2 (EDCF1, EDCF2), endothelium-derived hyperpolarizing factor (EDHF), and thrombomodulin. SEE: *intima*.

**endothelium-derived hyperpolarizing factor** ABBR: EDHF. A vasodilating substance released by the vascular endothelium. SEE: *endothelium*.

**endothelium-derived relaxing factor** ABBR: EDRF. An active vasodilator released by the vascular endothelium. It facilitates relaxation of vascular smooth muscle and inhibition of adhesion and aggregation of platelets. When the normal function of the endothelium is disrupted by mechanical trauma, hypertension, hypercholesterolemia, or

atherosclerosis, less EDRF is released and the inhibition of platelet aggregation is decreased. In addition, the damaged vessels constrict. This favors the formation of thrombi. SEE: *endothelium*.

**endotherm** (ĕn'dō-thĕrm") [l' + *therme*, heat] An organism that maintains a constant body temperature despite fluctuating environmental temperatures; the opposite of *ectotherm*. SEE: *homeotherm*; *homotherm*.

**endothermal, endothermic** (ĕn'dō-thĕr'măl, ĕn'dō-thĕr'mik) [Gr. *endon*, within, + *therme*, heat] **1.** Storing up potential energy or heat. **2.** Absorbing heat. **3.** Pert. to absorption of heat during chemical reactions.

**endothermy** (ĕn'dō-thĕr'mĕ) An elevation of the temperature of local body tissue in response to high-frequency current.

**endothrix** (ĕn'dō-thrĭks) [l' + *thrix*, hair] Any fungus growing inside the hair shaft.

**endotoscope** (ĕn-dō'tō-skōp) [l' + *ous*, ear, + *skopein*, to examine] An ear speculum. SYN: *otoscope*.

**endotoxemia** (ĕn'dō-tōks-ĕ'mĕ-ă) Toxemia due to the presence of endotoxins in the blood.

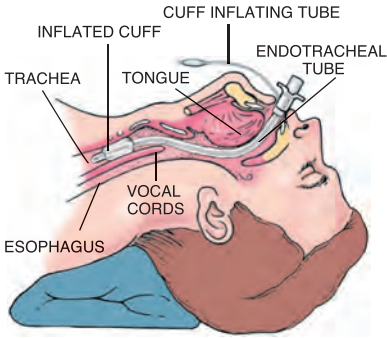
**endotoxicosis** (ĕn'dō-tōk'sī-kō'sis) [Gr. *endon*, within, + *toxikon*, poison, + *osis*, condition] Poisoning due to an endotoxin.

**endotoxin** (ĕn'dō-tōks'in) A lipopolysaccharide that is part of the cell wall of gram-negative bacteria. It binds with CD14 receptors on leukocytes. The linkage stimulates the release of interleukin-1, tumor necrosis factor, and other cytokines, affecting inflammation, the specific immune response, vascular tone, hematopoiesis, and wound healing. When large amounts of lipopolysaccharides are present, the clinical state of sepsis or systemic inflammatory response syndrome occurs. Endotoxins are still active even after bacteria are destroyed; thus, in treating some infections, the positive effects of antibiotics may be delayed or absent. SEE: *bacterium*; *inflammation*; *sepsis*; *systemic inflammatory response syndrome*.

**endotracheal tube** (ĕn'dō-tră'kĕ-ăl) [l' + " ] ABBR: ET. A catheter inserted into the trachea to provide or protect an airway. SEE: *illus*. SYN: *tracheal tube*; *intubation tube*.



Although an ET is often thought to be the most secure and definitive airway, its use in emergencies may be complicated by misplacement (e.g., in the esophagus instead of in the trachea), displacement (e.g., during patient transport), or injury to the airway.



**CUFFED ENDOTRACHEAL TUBE**

**endotracheitis** (ĕn" dō-trā-kē-ī'tīs) [" + *tracheia*, trachea, + *itis*, inflammation] Inflammation of the tracheal mucosa.

**endotracheitis** (ĕn" dō-trā-kē-ī'tīs) [" + *trachelos*, neck, + *itis*, inflammation] Endocervicitis.

**endoreterotomy** (ĕn" dō-ūr-ē"tēr-ōt'ā-mē) [" + "] Endoscopic surgery to open a stricture in a ureter.

**endovaginal** (ĕn" dō-vāj'ī-nāl) [" + "] Within the vagina.

**endovascularitis** (ĕn" dō-vās" kŭ-lī'tīs) [" + *L. vasculum*, vessel, + *Gr. itis*, inflammation] Endangiitis.

**endpoint** The final objective, result, or resolution of an illness, treatment, or research protocol.

**end product** The final material or substance left at the completion of a series of reactions, either chemical or physical.

**end-stage** The final phase of a disease process.

**end-stage renal disease** ABBR: ESRD.

The stage of chronic renal failure in which the clearance of creatinine has decreased so much that the patient will not long survive without renal replacement therapies (e.g., dialysis or kidney transplantation). This stage of renal failure occurs when the creatinine clearance is about 10% of normal, or the glomerular filtration rate is 5 – 10 ml/min. Renal replacement therapies are required to prevent fatal fluid overload, hyperkalemia, and other uremic complications. In the U.S., approximately 400,000 people are actively treated for ESRD with dialysis or kidney transplantation.

**ETIOLOGY:** End-stage renal disease may occur as a consequence of many other illnesses, including diabetes mellitus, hypertension, glomerulonephritis, recurrent or chronic renal infections, congenital kidney anomalies, vasculitis, multiple myeloma, analgesic overuse, or any of the causes of acute renal failure (e.g., shock, dehydration, post obstructive nephropathy, or exposure to neph-

rotoxins such as aminoglycosides, lead, or radiocontrast media).

**SYMPTOMS:** All body systems experience major changes as a result of chronic and end-stage renal failure. Patients may complain of fatigue (e.g., as a result of anemia), difficulty concentrating, irritability, personality changes, increased sleepiness, muscle cramping and twitching, nausea, vomiting, anorexia, edema, breathlessness (if fluid retention results in pulmonary edema), or decreased urination. Some patients who become frankly uremic may develop uremic frost or become stuporous or comatose; others may develop uremic pericarditis.

**TREATMENT:** Hemodialysis, peritoneal dialysis, or kidney transplantation are used to restore renal function to patients with end-stage renal disease. Other therapies include the administration of water-soluble vitamins, phosphate-binding medications, erythropoietin, iron and folic acid (to treat anemia), and bicarbonate buffers (to prevent acidemia). The diet of patients with ESRD is restricted to limited quantities of fluids, and small concentrations of sodium, potassium, and protein, to prevent complications like fluid retention and hyperkalemia. Tight control of blood pressure and blood sugars in patients with hypertension or diabetes, respectively, will prolong kidney function and prevent deterioration.

**PATIENT CARE:** Patients with ESRD should avoid medications that may damage the kidneys (e.g., nonsteroidal anti-inflammatory drugs) or drugs that may accumulate in toxic concentrations as a result of renal failure (i.e., drugs that are normally excreted by the kidneys, such as aspirin, magnesium, or metformin). Serum potassium levels must be closely monitored.

Because donor organs are in relatively short supply, most patients should be prepared for dialysis with educational materials and ample opportunities to discuss the procedure and learn from professional staff. For most patients a fistula should be surgically constructed using a natural artery and vein in one of the upper extremities. Once this fistula has matured, it can be used for hemodialysis, typically in a dialysis center. SEE: *hemodialysis*.

Peritoneal dialysis (PD) is an alternative in which an access is surgically constructed through the patient's abdomen, and dialysis fluid is used to fill and drain the peritoneal cavity several times a day to remove accumulated toxins. PD requires greater effort on the part of the patient or caregivers to manage since it is administered at home but may have a greater degree of patient acceptance by competent patients

than hemodialysis. However, some evidence suggests that it is associated with increased mortality. Whichever method of renal replacement is chosen, the patient will require close monitoring by a nephrologist (and other medical professionals) to optimize renal function and to maintain general health. Patients with ESRD and the professionals who care for them should familiarize themselves with information provided by the National Institute of Diabetes, Digestive and Kidney Diseases, the American Kidney Fund, and the National Kidney Foundation.

Good oral hygiene, skin care, and respiratory hygiene are encouraged. When the patient is hospitalized, all patient care concerns apply. Patients and their families will benefit from referral to agencies that provide counseling to assist them in coping. If the patient in ESRD decides that dialysis and ongoing therapies limit the quality of life, his decision should be supported and family assisted to understand. The patient is referred for hospice care.

**endurance** The ability to withstand extraordinary mental or physical stress for a prolonged period.

**endurance training** Physical training for athletic events requiring prolonged effort, such as running a marathon, swimming a long distance, or climbing mountains.

**enema** (ĕn'ĕ-mă) [Gr.] **1.** The introduction of a solution into the rectum and colon to stimulate bowel activity and cause emptying of the lower intestine, for feeding or therapeutic purposes, to give anesthesia, or to aid in radiographic studies. **2.** A solution introduced into the rectum.

**air contrast e.** An enema in which two contrast agents, thick barium sulfate and air, are introduced simultaneously under fluoroscopic control, followed by multiple radiographs of the colon. This technique produces better visualization of mucosal lining lesions, such as polyps or diverticula, than barium enemas performed without air.

**barium e.** The use of barium sulfate solution as a contrast agent to facilitate x-ray and fluoroscopic examination of the colon. The examination may be used to screen patients for colon cancer or to identify other colonic lesions, such as diverticula or changes associated with inflammatory bowel disease. Because of the redundancy of the sigmoid colon, barium enema often is used in conjunction with another exam, such as flexible sigmoidoscopy, to improve its sensitivity. Careful preparation of the bowel with laxatives and enemas is critical to eliminate retained feces and improves visualization of the intestinal lumen. **SEE: illus.**



#### BARIUM ENEMA

Tumor ("apple core" lesion) obstructs flow of barium in ascending colon. (Courtesy of Harvey Hatch, MD, Curry General Hospital)

**emollient e.** Lubricating e.

**high e.** An enema designed to reach most of the colon. A rubber tube is inserted into the rectum to carry water as far as possible.

**lubricating e.** An enema given to soften and ease the passage of feces through the anal canal. **SYN:** *emollient enema*.

**medicinal e.** Retention e.

**nutrient e.** An enema containing pre-digested foods for the purpose of giving sustenance to a patient unable to be fed otherwise. **SYN:** *nutritive enema*.

**nutritive e.** Nutrient e.

**physiological salt solution e.** An enema consisting of normal saline solution. It may be used, on rare occasions, to treat dehydration. **SYN:** *saline enema*.

**purgative e.** A strong, high-colonic purgative that is used when other enemas fail.

**retention e.** An enema that may be used to provide nourishment, medication, or anesthetic. It should be made from fluids that will not stimulate peristalsis. A small amount of solution (e.g., 100 to 250 ml) typically is used in adults.

**PATIENT CARE:** The procedure and expected sensations are explained to the patient. Necessary equipment is assembled, and the patient is draped for warmth and privacy and assisted into a left side-lying position with the right knee flexed (Sim's position). The tubing is cleared of air, and the small lubricated tube is inserted 3-4 in into the rectum and is not removed (unless absolutely necessary) until the procedure is completed. The fluid is allowed to flow very slowly, with stops made at intervals to aid retention. If the patient ex-

periences an urge to defecate, the fluid flow is stopped until the urge passes. When the entire volume has been instilled, the tube is quickly withdrawn, the patient's buttocks are compressed together for a few minutes to prevent evacuation, and the patient is encouraged to retain the enema for at least 30 min. The type and amount of fluid instilled, the patient's ability to retain it, and the amount, type, and consistency of the returned fluid and stool are documented. SYN: *medicinal enema*.

**saline e.** Physiological salt solution e.

**soapsuds e.** An enema consisting of prepared soapsuds or, if liquid soap is used, 30 to 1000 ml of water. Strong soapsuds should not be used because of the danger of injuring intestinal mucosa. Mild white soaps, such as castile, are best.

**energetic** (ĕn-ĕr-gĕt'ĭk) **1.** Rel. to energy. **2.** Full of energy or vigor.

**energetics** (ĕn'ĕr-jĕt'ĭks) The study of energy, esp. in relation to human use of energy in the form of food and the expenditure of energy in work or athletic exercise.

**energy** (ĕn'ĕr-jĕ) [Gr. *energeia*] In physics, the capacity to do work, that is, to effect change. Energy is manifested in motion (kinetic energy) or position or chemical bonding (potential energy).

Changes in energy may be physical, chemical, or both. Movement of a part of the body shortens and thickens the muscles involved and changes the position and size of cells temporarily, but intake of oxygen in the blood combined with glucose and fat creates a chemical change and produces heat (energy) and waste products within the cells; fatigue is produced in turn. SEE: *calorie; energy expenditure, basal*.

**conservation of e.** The principle according to which energy cannot be created or destroyed, but is transformed into other forms.

**kinetic e.** The energy of motion. It consists of the mass of an object and its velocity.

**latent e.** Potential energy.

**potential e.** Energy that is stored, but not actively used. It includes, for example, the energy stored in chemical bonds, or in objects based on their position in space. SYN: *latent energy*.

**radiant e.** A form of energy transmitted through space. Radio waves, infrared waves, visible rays, ultraviolet waves, x-rays, gamma rays, and cosmic rays are examples of energy in this form. SEE: *electromagnetic spectrum* for table.

**energy conservation** In rehabilitation, a process for managing fatigue by prioritizing goals and time use, simplifying tasks, and organizing the environment to make necessary work more efficient.

**energy expenditure, basal** ABBR: BEE.

The energy used by an individual who is at rest but not asleep. The BEE (expressed as calories) may be calculated by using the Harris-Benedict equations. These account for sex, age, height, and weight. If the individual is sedentary, moderately active, or engaged in strenuous activity, 30%, 40%, or 50%, respectively, are added to the BEE. SEE: *diet; dietetics; food*.

The Harris-Benedict equation involves W (weight in kg), H (height in cm), and A (age in years). The formulae are:

For women:  $BEE = 6.55 + (9.6 \times W) + (1.8 \times H) - (4.7 \times A)$

For men:  $BEE = 6.6 + (13.7 \times W) + (5 \times H) - (6.8 \times A)$

Hospitalized patients who are non-stressed require 20% more calories than for basal needs.

Energy expended is increased by about 13% over basal needs for each degree centigrade of fever; burn and trauma patients require 40% to 100% more calories than for basal requirements.

**energy field disturbance** A hypothetical disruption of the flow of energy surrounding a person's being that results in a disharmony of the body, mind, and/or spirit. SEE: *Nursing Diagnoses Appendix*.

**enervate** (ĕn'ĕr-vāt) To make weak or to lessen the vitality of.

**enervation** (ĕn'ĕr-vā'shŭn) [L. *enervatio*] **1.** Deficiency in nervous strength; weakness. **2.** Resection or removal of a nerve.

**ENG** *electronystagmography*.

**engagement** **1.** In obstetrics, the entry of the largest diameter of the fetal presenting part into the pelvic inlet. SYN: *lightening*. SEE: *labor*. **2.** In the behavioral sciences, a term often used to denote active involvement in everyday activities that have personal meaning.

**Engelmann's disk** (ĕng'gĕl-mānz) [Theodor W. Engelmann, Ger. physiologist, 1843–1909] H band.

**Engerix-B** (ĕn'jĕr-ĭks-bĕ') Hepatitis B (recombinant) vaccine.

**engine** A device for converting energy into mechanical motion.

**dental e.** A machine that rotates dental instruments.

**high-speed e.** A machine that rotates a dental instrument in excess of 12,000 rpm.

**ultraspeed e.** A machine that rotates a dental instrument at speeds from 100,000 to 300,000 rpm.

**engineering** In medical science, the practical application of principles of science and technology to problems posed by health or disease. Branches of this science include human, dental, genetic, and biomechanical.

**English as a Second Language** ABBR: ESL. A curriculum designed to teach English diction, fluency, grammar, idioms, pronunciation, and vocabulary to people who want to attain English language mastery after a primary education in another language.

**PATIENT CARE:** Poor English language skills may be barriers to the achievement of good health or the use of health services in nations where English is spoken as the primary language (e.g., Australia, Britain, Canada, New Zealand, and the U.S.). Illiteracy may result in the misuse of medications, nonadherence to medical regimens, or obstacles to achieving access to health care. Translators skilled in the patient's native language should be employed to enhance understanding whenever the patient's English language skills are in question.

**engorged** (ĕn-gorjĕd') [O. Fr. *engorgier*, to obstruct, to devour] Distended, as with blood or fluids.

**engorgement** (ĕn-gorj'mĕnt) **1.** Vascular congestion; distention. **2.** Filling of a breast with milk.

**engram** (ĕn'grām) [Gr. *engramm*] The physiological basis of a memory in the central nervous system.

**engrossment** (ĕn-grōs'mĕnt) An attitude of total focus on something or someone. In obstetrics, the term denotes attachment behavior exhibited by new parents during initial contacts with their newborns.

**enhancement** (ĕn-hāns'mĕnt) An increase in the effect of ionizing radiation on tissues, produced by the use of oxygen or other chemicals.

**enhancer** (ĕn-hān'sĕr) **1.** A nucleic acid sequence that increases the transcription or utilization of a gene. **2.** In neurophysiology any chemical that increases the propagation of impulses between neurons.

**enissophobia** (ĕn-ĭs'ō-fō'bĕ-ā) [Gr. *enissein*, to reproach, + *phobos*, fear] Fear of criticism, esp. for having committed a sin.

**enkephalin** (ĕn-kĕf'ā-lĭn) A pentapeptide produced in the brain. It acts as an opiate and produces analgesia by binding to opiate receptor sites involved in pain perception. The threshold for pain is therefore increased by this action. Enkephalins may have a role in explaining the withdrawal signs of narcotic addiction. SYN: *endogenous opiate-like substance*. SEE: *endorphin*; *opiate receptor*.

**enlargement** (ĕn-lārj'mĕnt) An increase in size of anything, esp. of an organ or tissue.

**enol** (ĕ'nōl) A form that a ketone may take by tautomerism. A substance changes from an enol to a ketone by the oscillation of a hydrogen atom from the enol form to the ketone form.

**enolase** (ĕ'nō-lās) An enzyme present in muscle tissue that converts phosphoglyceric acid to phosphopyruvic acid.

**enology** (ĕ-nōl'ō-jĕ) [Gr. *oinos*, wine, + *logos*, word, reason] The science of producing and evaluating wine. Also spelled *oenology*.

**enophthalmos** (ĕn'ōf-thāl'mūs) [Gr. *en*, in, + *ophthalmos*, eye] Recession of the eyeball into the orbit. Opposite of exophthalmos.

**enosimania** (ĕn'ōs-ĭ-mā'nĕ-ā) [Gr. *enosis*, a quaking, + *mania*, madness] A mental state marked by excessive and irrational terror.

**enostosis** (ĕn'ōs-tō'sĭs) [Gr. *en*, in, + *osteon*, bone, + *osis*, condition] An osseous tumor within the cavity of a bone.

**enriched** Having something extra added. For example, vitamins or minerals may be added to a food in order to *enrich* it.

**enroll** (ĕn-rōl') [ME.] In health care to enlist in or seek coverage from a health insurance plan.

**ensiform** (ĕn'sĭ-form) [L. *ensis*, sword, + *forma*, form] Xiphoid.

**entrophe** (ĕn'strō-fĕ) [Gr. *en*, in, + *strephein*, to turn] Entropion.

**ENT** ear, nose, and throat.

**ent-** SEE: *ento-*.

**entactogen** (ĕn-āk'tō-jĕn) [Gr. *en*, within, + L. *tactus*, touch, + Gr. *gennan*, to produce] Any psychoactive drug similar in chemical structure to MDMA, the recreational drug also known as *ecstasy*. Members of this drug class are derived from 1-(1,3-benzodioxol-5-yl)-2-butanamine.

**ental** (ĕn'tāl) [Gr. *entos*, within] Pert. to the interior; inside; central.

**entamebiasis** (ĕn'tā-mĕ-bĭ'ā-sĭs) [ʹ + *amoibe*, change] Infestation with *Entamoeba*.

**Entamoeba** (ĕn'tā-mĕ'bā) A genus of ameba, some of which are found in the human intestine or oral cavity.

**E. buccalis** E. gingivalis.

**E. coli** A species of ameba normally found in the human intestinal tract. This species is nonpathogenic to humans.

**E. gingivalis** A nonpathogenic species of ameba that inhabits the mouth. SYN: *Entamoeba buccalis*.

**E. histolytica** A pathogenic species of ameba, the cause of amebic dysentery and tropical liver abscess. SEE: *illius*; *amebiasis*.

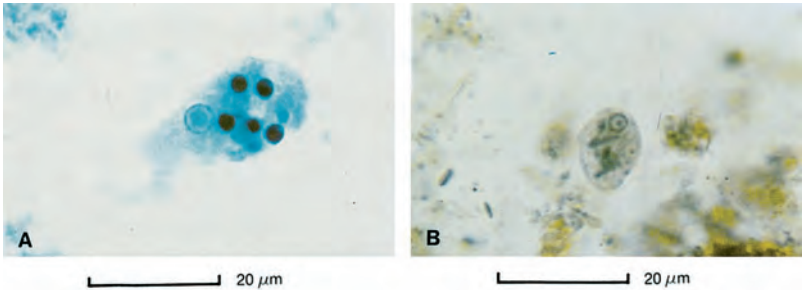
**enter-** SEE: *entero-*.

**enteral** (ĕn'tĕr-āl) [Gr. *enteron*, intestine] Within or by way of the intestine.

**enteralgia** (ĕn'tĕr-āl'jĕ-ā) [ʹ + *algos*, pain] Pain in the intestines; intestinal cramps or colic. SYN: *enterodynia*.

**enteral tube feeding** A means of providing nutrition for a patient unable to consume food normally. The patient may have difficulty with chewing or swallowing or an oral, pharyngeal, or esopha-





#### ENTAMOEBIA HISTOLYTICA

(A) trophozoite with five ingested red blood cells (orig. mag.  $\times 1000$ ), (B) cyst in fecal debris (orig. mag.  $\times 1000$ )

geal deformity. The patient is fed an appropriate nutritional formula through a tube passed into the stomach or duodenum from the nasal passage (nasogastric or nasoduodenal tube) or by a gastrostomy tube, gastrostomy button, or gastrojejunostomy tube. SYN: *total enteral nutrition*.

**PATIENT CARE:** Short-term feeding (less than 4 weeks' duration) can usually be managed with a nasogastric tube. Longer-term feeding requires a surgically implanted feeding tube. The choice of tube is determined by a number of factors, including the expected duration of feeding, the condition necessitating the feeding, concomitant conditions, and clinician preference. The percutaneous endoscopic gastrostomy tube (PEG) is the most common method for tube insertion. The tube is placed using direct endoscopic visualization through an abdominal incision, and anchored in place with an outer flange and an inner bump or balloon. It enters through the abdominal wall into the stomach. The gastrojejunostomy tube is a smaller-bore tube advanced through the stomach into the jejunum tube. It delivers contents into the jejunum and is used for patients with recurrent aspiration, upper gastrointestinal obstruction or fistula, gastroparesis, and gastroesophageal reflux. It cannot be used in patients with small bowel disease because it can cause enterocutaneous fistulae. The smaller bore increases the probability of clogging, which requires more frequent tube flushing and replacement. The gastrostomy button prevents some of the chronic complications of gastrostomy tubes (clogging, leaking, and skin irritation). The button is skin level and out of sight when the patient is clothed. It usually replaces a gastrostomy tube 4 weeks after the initial PEG to ensure development of a mature tract. Tube placement is confirmed by X-ray. Health care professionals need to assess the pa-

tient (and teach the patient and other care providers how to assess) for leakage (recognizing that high abdominal pressure, as occurs with sneezing or coughing, often causes some normal leakage), skin irritation, infection, and formation of granulation tissue. Nutrition and hydration status and signs and symptoms of aspiration, pneumonia, or GI complications (e.g., bleeding or peritonitis) also need to be assessed. The professional care provider should use the time with the patient while flushing and assessing tube concerns to teach the patient and family caregivers how to care for the tube and to offer support as the patient and significant others adjust to body image changes and the loss of eating pleasures. Flushing enteral tubes to keep them free from build-up is essential, because unclogging a tube wastes time, effort, and resources. The best method of tube flushing is a matter of active research; local protocols apply. Tubes that cannot be unclogged must be replaced.

There are four types of nutrient formulas: *intact nutrient*, *hydrolyzed nutrient*, *elemental (defined)*, and *modular*. *Intact nutrient* formulas are called "standard" because the nutrients are whole and therefore are appropriate for use whenever normal digestion takes place. They usually provide 1 kcal/ml and can be used orally. In *hydrolyzed nutrient* formulas the nutrients are pre-digested and are suitable for use whenever malabsorption is present or when the jejunum is the feeding site. These formulas are not appropriate for oral use because of their taste. They are more expensive than intact nutrient formulas. In *elemental (defined)* formulas the nutrients are in the simplest, most basic, form and are rapidly absorbed from the gut. These formulas are not appropriate for oral use. This type of formula is the most expensive. Formulas designed for specific diseases are available. In *modular* formulas, commer-

cially produced nutritional products may be used as supplements to standard formulas. For example, the addition of a protein module would convert a standard formula to a high-protein formula.

There are four kinds of delivery: *bolus*, *intermittent infusion*, *cyclic infusion*, and *continuous drip*. In *bolus administration* the formula is delivered in four to six daily feedings by a large syringe attached to the feeding tube in the stomach. This type of delivery is the least well tolerated. In *intermittent infusion* the formula is delivered four to six times daily over 30 to 60 minutes using a pump or gravity flow. In *cyclic infusion* an infusion pump delivers the nutrient solution for specified hours of the day and is turned off during other hours. In *continuous drip* an infusion pump delivers nutrition all day long.

**enterectomy** (ĕn'tĕr-ĕk'tō-mĕ) [ + *ektome*, excision] Excision of a portion of the intestines.

**enteric** (ĕn-tĕr'ĭk) [Gr. *enteron*, intestine] Pert. to the small intestine.

**enteric bacilli** A broad term for bacilli present in the intestinal tract. Included are gram-negative non-spore-forming facultatively anaerobic bacilli such as *Escherichia*, *Shigella*, *Salmonella*, *Klebsiella*, and *Yersinia*. They may be present in the intestines of vertebrates as normal flora or pathogens.

**enteric-coated** ABBR: EC. A drug formulation in which tablets or capsules are coated with a compound that does not dissolve until the pill is exposed to the fluids in the small intestine.

**enteric fever** Typhoid fever.

**enteric nervous system** A division of the autonomic nervous system (ANS) arising from its own line of neural crest cells and composed of the tens of millions of neurons and their supporting cells inside the walls of the gastrointestinal tract, pancreas, and gallbladder. Although the enteric nervous system is innervated (and modulated) by sympathetic and parasympathetic axons from the other divisions of the ANS, the enteric nervous system also acts independently. Reflex activities (e.g., maintaining gut wall tension and producing peristalsis) are initiated and coordinated via networks entirely inside the gut walls and organized via complex intrinsic ganglionated neural networks of two kinds: Auerbach's plexus and the submucous (Meissner's and Henle's) plexus lying between the circular and muscularis mucosae muscle layers.

**enteritis** (ĕn'tĕr-ĭ'tĭs) [ + *itis*, inflammation] Inflammation of the intestines, particularly of the mucosa and submucosa of the small intestine. SEE: *Nursing Diagnoses Appendix*.

**regional e.** SEE: *ileitis*, *regional*.

**entero-, enter-** [Gr. *enteron*, intestine] Combining forms meaning *intestines*.

**enteroanastomosis** (ĕn'tĕr-ō-ān-ās'tō-mō'sĭs) [ + *anastomosis*, opening] An intestinal anastomosis.

**enteroantigen** (ĕn'tĕr-ō-ān'tĭ-jĕn) [ + *anti*, against, + *gennan*, to produce] An antigen derived from the intestines.

**Enterobacter** (ĕn'tĕr-ō-bāk'tĕr) A genus of gram-negative bacilli of the family Enterobacteriaceae that occurs in water, soil, and in the intestines of humans and animals. Species of enterobacter are an important cause of opportunistic infections and hospital-acquired infections, many of which may be resistant to multiple antibiotics.

**E. aerogenes** A species that occurs normally in the intestines of humans and other animals and is found in decayed matter, on grains, and in plants. It causes opportunistic infections of the urinary tract and of the intestine when antibiotic therapy diminishes other microorganisms.

**E. agglomerans** A species that has been associated with serious systemic infections, particularly septicemia from contaminated intravenous fluids.

**E. cloacae** A species that, along with *E. agglomerans*, accounts for most nosocomial infections caused by this genus, esp. those due to intravenous line contamination.

**Enterobacteriaceae** (ĕn'tĕr-ō-bāk-tĕrĕ-ā'sĕ-ĕ) A family of gram-negative, non-spore-forming, facultatively anaerobic bacilli. Some are intestinal pathogens, others are usually normal colonizers of the human intestinal tract. Included in the family are *Shigella*, *Salmonella*, *Escherichia*, *Klebsiella*, *Proteus*, *Enterobacter*, and *Yersinia*.

**enterobiasis** (ĕn'tĕr-ō-bĭ-ā-sĭs) [Gr. *enteron*, intestine, + *bios*, life] Infestation with pinworms (*Enterobius vermicularis*). SYN: *oxyuriasis*.

**enterobiliary** (ĕn'tĕr-ō-bĭl'ĕ-ār-ĕ) [ + *L. bilis*, bile] Pert. to the intestines and the bile passages.

**Enterobius** (ĕn'tĕr-ō'bĕ-ūs) [ + *bios*, life] A genus of parasitic nematode worms, formerly *Oxyuris*.

**E. vermicularis** The species commonly known as "pinworms" that causes enterobiasis, a parasitic infestation of the large intestine. The small, white adult worms live in the cecum and adjacent portions of the colon; at night the females migrate to the anus and lay their eggs on the perianal skin. The eggs hatch by morning. Infestations cause irritation of the anal region and allergic reaction of the neighboring skin, accompanied by intense itching, which may result in loss of sleep, excessive irritability, and a secondary infection of the area around the anus as a result of the scratching. Distribution is worldwide.

The infection is most prevalent among preschool and school-age children. It is estimated that in temperate climates 20% of children have this condition. According to the Center for Disease Control and Prevention (CDC), pinworms infect 40 million children and adults in the U.S. Female worms average 8 to 13 mm in length and males 2 to 5 mm. SYN: *pinworm*. SEE: *illius*.

**DIAGNOSIS:** The presence of adult worms in feces or on the anus confirms the diagnosis. Transparent, pressure-sensitive tape or an adhesive pinworm paddle may be applied to the perianal area and then examined microscopically for eggs. This latter test is more likely to be positive in the morning before bathing, urinating, or defecating.

**TREATMENT:** Pyrantel pamoate, albendazole, or mebendazole is effective.

**PATIENT CARE:** Family members and other close contacts of infected persons should be assessed and treated as necessary. During treatment tight-fitting sleepwear should be used to prevent the eggs from contaminating bedding. The house, bedding, and night clothes must be thoroughly cleaned for several days during treatment. Infected individuals should trim their nails short and bathe every morning on arising, using a clean washcloth and towel each time. An infected child can return to school or daycare once he/she has received one dose of medication, been bathed, and had fingernails trimmed. To eradicate pinworms and prevent reinfection, children, parents, teachers, and other close contacts should be taught how to perform hand hygiene correctly, and to perform this throughout the day, esp. before food preparation or eating and after toileting or diaper changes, handling underwear or bed linens, or touching any potentially contaminated objects.

**enterocele** (èn'tēr-ò-sēl) [ " + *keke*, hernia] **1.** A hernia of the intestine through the vagina. **2.** A posterior vaginal hernia.

**enterocentesis** (èn'tēr-ò-sèn-tē'sis) [ " + *kentesis*, puncture] Puncture of the intestine to withdraw gas or fluids.

**enterocholecystostomy** (èn'tēr-ò-kō'lē-sīs-tōs'tō-mē) [ " + *chole*, bile, + *kystis*, bladder, + *stoma*, mouth] A surgically created opening between the gallbladder and small intestine. SYN: *cholecystenterostomy*.

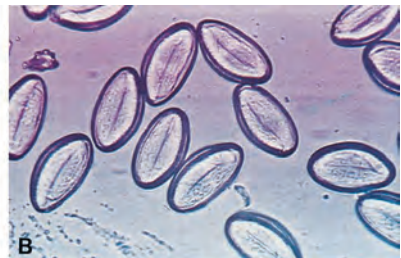
**enterocholecystotomy** (èn'tēr-ò-kō'lē-sīs-tōt'ò-mē) [ " + " + " + *tome*, incision] Incision of both the gallbladder and the intestine.

**enteroclysis** (èn'tēr-òk'li-sis) [ " + *klysis*, a washing out] **1.** Injection of a nutrient or medicinal liquid into the bowel. **2.** Irrigation of the colon with a large amount of fluid intended to fill the colon completely and flush it. SEE: *enema*. **3.** Radiography of the small bowel. A tube is advanced into the duodenum under fluoroscopic guidance and barium is given, followed by insufflation of the bowel with air.

**Enterococcus** (èn'tēr-ò-kōk'ūs) A genus of gram-positive cocci of the family Streptococcaceae, formerly classified as part of the genus *Streptococcus*, but now classified as a separate genus. Of the 12 or more species, *E. faecalis* and *E. faecium* are found normally in the human gastrointestinal tract. They may cause urinary tract infections or other serious infections that are resistant to many antibiotics.

**vancomycin-resistant e.** ABBR: VRE. A strain of *Enterococcus faecium* resistant to antibiotics, including penicillins, aminoglycosides, and vancomycin. Infection with VRE presents a major threat to infected patients; although it can be treated with linezolid, its antibiotic resistance can be transferred to other gram-positive organisms, such as *Staphylococcus aureus*, making these bacteria also more difficult to eradicate.

To prevent the spread of VRE, the organism is identified by culture and sensitivity testing as soon as the infection is recognized. Contact precautions and cohorting of infected patients are used



50 μm

#### ENTEROBIUS VERMICULARIS

(A) female (orig. mag. ×10), (B) eggs (orig. mag. ×400)

to control nosocomial spread. All persons entering the patient's room don gloves; hands are washed carefully both before they are donned and after they are removed. Gloves are removed just before leaving the room. Charts and flow sheets should not be taken into the room. Hospitals should heed the guidelines that have been developed for the use of vancomycin, to minimize the spread of vancomycin resistance to other organisms. SEE: *antibiotic resistance*; *multidrug resistance*; *Standard Precautions Appendix*.

**enteroclectomy** (ĕn'tĕr-ō-kō-lĕk'tō-mĕ) [" + *kolon*, colon, + *ektome*, excision] Surgical removal of a portion of the small intestine and colon.

**enterocolitis** (ĕn'tĕr-ō-kō-lī'tīs) [" + " + *itis*, inflammation] Inflammation of the small or large bowel, usually as a result of an infectious disease. The most common causative organisms include rotaviruses and other enteric viruses, *Salmonella*, *Escherichia coli*, *Shigella*, *Campylobacter*, and *Yersinia* species. A potentially severe presentation, pseudomembranous enterocolitis, may be induced by prolonged use of antibiotics allowing the overgrowth of *Clostridium difficile*. SEE: *diarrhea*; *gastroenteritis*. **necrotizing e.** ABBR: NEC. Severe damage to the intestinal mucosa of the preterm infant due to ischemia resulting from asphyxia or prolonged hypoxemia.

**enterocolostomy** (ĕn'tĕr-ō-kō-lōs'tō-mĕ) [" + " + *stoma*, mouth] A surgical joining of the small intestine to the colon.

**enterocutaneous** (ĕn'tĕr-ō-kū-tā-nĕ-ūs) Pert. to communication between the skin and intestine.

**enterocyst** (ĕn'tĕr-ō-sīst) [Gr. *enteron*, intestine, + *kystis*, bladder] A benign cyst of the intestinal wall.

**enterocystocele** (ĕn'tĕr-ō-sīs'tō-sĕl) [" + *kele*, tumor, swelling] A hernia of the bladder wall and intestine.

**enterocystoma** (ĕn'tĕr-ō-sīs-tō-mā) [" + " + *oma*, tumor] A cystic tumor of the intestinal wall.

**enterocystoplasty** (ĕn'tĕr-ō-sīs'tō-plās'tē) [" + " + *plastos*, formed] A plastic surgical procedure involving the use of a portion of intestine to enlarge the bladder.

**enterocyte** (ĕn'tĕr-ō-sīt') [" + "] A nutrient-absorbing cell located on the surface of the small intestinal villus. Its free surface cell membrane is folded into microvilli that increase the surface area available for absorption.

**Enterocytozoon** (ĕn'tĕr-ō-sī'tō-zō'on) A genus of protozoa of the order Microsporidia. *E. bienersiis* is a cause of chronic diarrhea in AIDS patients. SEE: *microsporidiosis*.

**enterodynia** (ĕn'tĕr-ō-dīn'ĕ-ă) [" + *odyne*, pain] Enteralgia.

**enteroenterostomy** (ĕn'tĕr-ō-ĕn'tĕr-ōs'tō-mĕ) [" + *enteron*, intestine, + *stoma*, mouth] Surgical creation of a communication between two intestinal segments.

**enteroepiplocele** (ĕn'tĕr-ō-ĕ-pīp'lō-sĕl) [" + *epiploon*, omentum, + *kele*, tumor, swelling] A hernia of the small intestine and omentum.

**enterogastritis** (ĕn'tĕr-ō-gās-trī'tīs) [" + *gaster*, belly, + *itis*, inflammation] Inflammation of the stomach (gastritis) and the intestines (enteritis).

**enterogastrone** (ĕn'tĕr-ō-gās'trōn) A hormone such as secretin that is released by the intestinal mucosa and controls the release of food from the stomach into the duodenum by depressing gastric motility and secretion. A fatty meal causes greater secretion of this hormone than a normal meal does.

**enterogenous** (ĕn'tĕr-ōj'ĕ-nūs) [" + *gennan*, to produce] Originating in the small intestine.

**enterohepatic** (ĕn'tĕr-ō-hĕ-pāt'ik) [" + *hepar*, liver] Pert. to the intestines and liver.

**enterohepatitis** (ĕn'tĕr-ō-hĕp-ā-tī'tīs) [" + " + *itis*, inflammation] Inflammation of the intestine and liver.

**enterohydrocele** (ĕn'tĕr-ō-hī'drō-sĕl) [" + *hydor*, water, + *kele*, tumor, swelling] A hydrocele with a loop of intestine in the sac.

**enterokinase** (ĕn'tĕr-ō-kī'nās) [" + *kinesis*, movement] Previous term for enteropeptidase.

**enterology** (ĕn'tĕr-ōl'ō-jĕ) [" + *logos*, word, reason] The study of the intestinal tract.

**enterolysis** (ĕn'tĕr-ōl'ī-sīs) [" + *lysis*, dissolution] Surgical division of intestinal adhesions.

**enteromegalia, enteromegaly** (ĕn'tĕr-ō-mĕ-gā'lĕ-ă, ĕn'tĕr-ō-mĕg'ă-lĕ) [" + *megas*, large] Abnormal enlargement of the intestines. SYN: *megacolon*.

**Enteromonas hominis** (ĕn'tĕr-ōm'ō-nās hōm'in-is) A flagellated protozoan that lives in the intestine of humans. It is rare and considered nonpathogenic.

**enteromycosis** (ĕn'tĕr-ō-mī-kō'sīs) [" + *mykes*, fungus, + *osis*, diseased condition] A disease of the intestine resulting from bacteria or fungi.

**enteromyiasis** (ĕn'tĕr-ō-mī-ī-ă-sīs) [" + *myia*, fly] A disease caused by the presence of maggots (the larvae of flies) in the intestines.

**enteron** (ĕn'tĕr-ōn) [Gr.] Alimentary canal.

**enteroneuritis** (ĕn'tĕr-ō-nū-rī'tīs) [" + *neuron*, nerve, + *itis*, inflammation] Inflammation of the intestinal nerves.

**entero-oxynin** (ĕn'tĕr-ō-ōk-sīn'tīn) A hormone found in animals but not humans believed to be released by the

small intestine in response to the presence of chyme. It is thought to cause the parietal cells of the gastric mucosa to release hydrochloric acid. SEE: *gastrin*.

**enteroparesis** (ĕn'tĕr-ŏ-pă'r'ĕ-sĭs) [ʹ + *paresis*, relaxation] Reduced peristalsis of the intestines; an old term for ileus.

**enteropathogen** (ĕn'tĕr-ŏ-păth'ŏ-jĕn) [ʹ + *pathos*, disease, suffering, + *gennan*, to produce] Any microorganism that causes intestinal disease.

**enteropathy** (ĕn'tĕr-ŏp'ă-thĕ) [ʹ + *pathos*, disease, suffering] Any intestinal disease.

**gluten-induced e.** Celiac sprue.

**radiation e.** Damage to the intestines due to radiation.

**enteropeptidase** (ĕn'tĕr-ŏ-pĕp'tĭ-dās) An enzyme of the duodenal mucosa that converts pancreatic trypsinogen to active trypsin. Formerly called *enterokinase*.

**enteropexy** (ĕn'tĕr-ŏ-pĕks'ĕ) [ʹ + *pexis*, fixation] Fixation of the intestine to the abdominal wall or to another portion of the intestine.

**enteroplegia** (ĕn'tĕr-ŏ-plĕ'jĕ-ă) [ʹ + *plege*, stroke] Paralysis of the intestines. SEE: *paralytic ileus*.

**enteroplexy** (ĕn'tĕr-ŏ-plĕk'sĕ) Surgical union of divided parts of the intestine. SYN: *enteroanastomosis*.

**enteroptosis** (ĕn'tĕr-ŏp-tŏ'sĭs) [ʹ + *ptosis*, a falling or dropping] Prolapse of the intestine or abdominal organs.

**enterorrhaphy** (ĕn'tĕr-or'ă-fĕ) [ʹ + *rhaphe*, seam, ridge] Stitching of an intestinal wound, or of the intestine to some other structure.

**enterorrhexis** (ĕn'tĕr-ŏ-rĕks'ĭs) [ʹ + *rhexis*, rupture] Rupture of the intestine.

**enteroscope** (ĕn'tĕr-ŏ-skŏp'') [ʹ + *skopein*, to examine] Endoscope.

**enterosepsis** (ĕn'tĕr-ŏ-sĕp'sĭs) [ʹ + *sepsis*, decay] A condition in which bacteria in the intestines produce intestinal sepsis. SEE: *enterotoxemia*.

**enterospasm** (ĕn'tĕr-ŏ-spăzm) [Gr. *enteron*, intestine, + *spasmos*, spasm] Intermittent painful contractions of the intestines.

**enterostasis** (ĕn'tĕr-ŏ-stă'sĭs) [ʹ + *stasis*, a standing] Cessation of or delay in the passage of food through the intestine; an old term for ileus.

**enterostenosis** (ĕn'tĕr-ŏ-stĕ-nŏ'sĭs) [ʹ + *stenosis*, a narrowing] Narrowing or stricture of the intestine.

**enterostomal therapist** (ĕn'tĕr-ŏs'tă-măl) ABBR: ET. An individual trained to teach patients proper methods of caring for an ostomy. The certification title is *certified enterostomal therapy nurse* (CETN).

**enterostomy** (ĕn'tĕr-ŏs'tŏ-mĕ) [ʹ + *stoma*, mouth] A surgically created

opening into a portion of the gastrointestinal tract.

**enterotoxemia** (ĕn'tĕr-ŏ-tŏk-sĕ'mĕ-ă) A condition in which bacterial toxins are absorbed from the intestine and circulate in the blood.

**enterotoxigenic** (ĕn'tĕr-ŏ-tŏk'sĭ-jĕn'ĭk) Producing enterotoxins, as in some strains of bacteria.

**enterotoxin** (ĕn'tĕr-ŏ-tŏk'sĭn) [ʹ + *toxikon*, poison] **1.** A toxin produced in or originating in the intestinal contents. **2.** An exotoxin specific for the cells of the intestinal mucosa. **3.** An exotoxin produced by certain species of bacteria that causes various diseases, including food poisoning and toxic shock syndrome.

**Enterovirus** (ĕn'tĕr-ŏ-vĭ'rŭs) A group of viruses that originally included poliovirus, coxsackievirus, and ECHO virus, which infected the human gastrointestinal tract. Enteroviruses are now classed as a genus of picornaviruses. SEE: *picornavirus*.

**enterozoic** (ĕn'tĕr-ŏ-zŏ'ĭk) [ʹ + *zoon*, animal] Pert. to parasites inhabiting the intestine.

**enterprise computing** A computer network system that seamlessly connects all the computers in a single organization or institution, even if those computers are housed in different locations.

**enthalpy** (ĕn'thăl-pĭ, ĕn'thăl') [Gr. *enthalpein*, to heat in] ABBR: H. The heat content of a system, that is, the internal energy of the system plus the product of its pressure and volume. It may be represented symbolically by the equation  $H = U + PV$ , where U is the internal energy, P is the pressure, and V is the volume.

**entheogenic** (ĕn'thĕ-ŏ-jĕn'ĭk) [Gr. *en*, in + Gr. *theos*, god + *gennan*, to engender, "engendering the deity within"] Hallucinogenic, psychedelic, or mind-altering, esp. of drugs or plants employed in mystical, religious, or spiritual ceremonies.

**enthesis** An attachment to a bone of a tendon or ligament.

**enthesitis** (ĕn-thĕ-sĭ'tis) Inflammation at the site of attachment of bone to a tendon, ligament, or joint capsule. It is usually caused by trauma to the area.

**enthesopathy** (ĕn'thĕ-sŏ'pă-thĕ) [Gr. *en*, in, into, + *thesis*, placing, + *pathos*, illness, suffering] Any disease that affects the attachment of tendons or ligaments to bone. Enthesopathies can result from inflammation associated with conditions including Reiter's syndrome, psoriatic arthritis, ankylosing spondylitis, and rheumatoid arthritis.

**enthlasia** (ĕn'thlă-sĭs) [Gr., dent caused by pressure] A depressed fracture of the skull.

**entire** (ĕn-tĭr') In bacteriology, the



smooth, regular border of a bacterial colony.

**entitlement** 1. A right or benefit. 2. A form of compensation granted to an individual because of a special status under the law (e.g., an entitlement to health insurance under the Medicare program).

**entity** (ĕn'tī-tē) [L. *ens*, being] 1. A thing existing independently, containing in itself all the conditions necessary to individuality. 2. Something that forms a complete whole, denoting a distinct condition or disease.

**ento-, ent-** [Gr. *entos*, within] Combining forms meaning *within, inside*.

**entocoele** (ĕn'tō-sēl) [ʹ + *kele*, tumor, swelling] Internal hernia.

**entochondrosis** (ĕn'tō-kōn'drōs-tō'sis) [ʹ + *chondros*, cartilage, + *osis*, condition] The development of bone within cartilage.

**entochoroidea** (ĕn'tō-kō-roy'dē-ā) [ʹ + *chorioeides*, choroid] The inner layer of the choroid of the eye. SYN: *lamina choriocapillaris*.

**entocone** (ĕn'tō-kōn) [ʹ + *konos*, cone] The inner posterior cusp of an upper molar tooth.

**entocornea** (ĕn'tō-kor'nē-ā) [ʹ + L. *corneus*, horny] The posterior limiting membrane of the cornea. SYN: *Desemet's membrane*.

**entome** (ĕn'tōm) [Gr. *en*, in, + *tome*, incision] A knife for division of urethral strictures.

**entomology** (ĕn'tō-mōl'ō-jē) [Gr. *entomon*, insect, + *logos*, word, reason] The study of insects.

**forensic e.** The use of evidence provided by insect infestations to determine the condition of cadavers, esp. the time of death of a body left outdoors.

**medical e.** The branch of entomology that deals with insects and their relationship to disease, esp. of humans.

**entomophthoramycolosis** (ĕn-tō-mōf'thō-rā-mī-kō'sis) A disease caused by fungi of the class Zygomycetes, which includes two genera (*Conidiobolus* and *Basidiobolus*) responsible for human disease. *Conidiobolus* causes infections of the heart and face; *Basidiobolus* produces infections in other parts of the body.

**SYMPTOMS:** Clinically, there is swelling of the nose, perinasal tissues, and mouth. Nodular subcutaneous masses are palpable in the skin.

**TREATMENT:** Antifungal drugs such as amphotericin B, terbinafine, or ketoconazole are used, often as part of a regimen that includes surgery to remove infected tissues.

**entopic** (ĕn-tōp'ik) [Gr. *en*, in, + *topos*, place] Normally situated; in a normal place. Opposite of ectopic.

**entoptic** (ĕn-tōp'tik) [Gr. *entos*, within,

+ *optikos*, seeing] Pert. to the interior of the eye.

**entoptic phenomenon** A visual phenomenon arising from within the eye, marked by the perception of floating bodies, circles of light, black spots, and transient flashes of light. It may be due to the individual's own blood cells moving through the retinal vessels, or to floaters, which are small specks of tissue floating in the vitreous fluid. SEE: *Moore's lightning streaks; muscae volitantes; photopsia*.

Individuals may see imperfections of their own cornea, lens, and vitreous by looking at a white background through a pinhole held about 17 mm (4.3 in) from the eye. The person sees a patch of light the size of which varies with the diameter of the pupil. The abnormalities are seen as shadows or bright areas. This method can be used also to see early discrete lens opacities.

**entoretina** (ĕn'tō-rēt'i-nā) [ʹ + L. *rete*, a net] The internal layer of the retina.

**entotic** (ĕn-tō'tik, ĕn-tō't'ik) [ʹ + *ous*, ear] Pert. to the interior of the ear or to the perception of sound as affected by the condition of the auditory apparatus.

**entozoon** (ĕn'tō-zō'ōn) *pl.* **entozoa** [ʹ + *zoon*, animal] Any animal parasite living within the body of another animal.

**entrails** (ĕn'trālz) The intestines of an animal.

**entrain** (ĕn-trān') To alter the biological rhythm of an organism so that it assumes a cycle different from a 24-hour one.

**entrainment** (ĕn-trān'mēnt) 1. Gaining control of a heart rhythm (esp. a tachycardic rhythm) with an external stimulus such as a cardiac pacemaker. 2. The drawing of a second fluid into a stream of gas or fluid by the Bernoulli effect.

**entrance skin exposure** ABBR: ESE. The dose of radiation to which the surface of the body is exposed during a radiographic procedure.

**entropion** (ĕn-trōp'ē-ōn) [Gr. *en*, in, + *trepein*, to turn] An inversion or turning inward of an edge, esp. the margin of the lower eyelid. SYN: *entrophe*.

**cicatricial e.** An inversion resulting from scar tissue on the inner surface of the lid.

**spastic e.** An inversion resulting from a spasm of the orbicularis oculi muscles.

**entropionize** (ĕn-trōp'ē-ō-nīz) To invert or correct by turning in.

**entropy** (ĕn'trō-pē) [Gr. *en*, in, + *trope*, a turning] 1. The portion of energy within a system that cannot be used for mechanical work but is available for internal use. 2. The quantity or degree of randomness, disorder, or chaos in a system.

**entry** 1. The passage of extracellular chemicals or organisms into cells. 2. The

inputting of data into a computer, e.g., for recording or ordering drugs or treatments.

**nucleate** (ē-nū'klē-āt) [L. *nucleare*, to remove the kernel of] **1.** To remove a part or a mass in its entirety. **2.** To destroy or take out the nucleus of a cell. **3.** To remove the eyeball surgically. **4.** To remove a cataract surgically.

**nucleation** (ē-nū'klē-ā'shūn) Removal of the entire eyeball after cutting the extraocular muscles and optic nerve. SYN: *ophthalmectomy*.

**nucleator** (ē-nū'klē-ā-tor) An instrument for evacuating tissue intact, such as the ocular globe.

**enuresis** (ēn'ū-rē'sis) [Gr. *enourein*, to void urine] Involuntary discharge of urine after the age at which bladder control should have been established. In children, voluntary control of urination is usually present by 5 years of age. Nevertheless, nocturnal enuresis is present in about 10% of otherwise healthy 5-year-old children and 1% of normal 15-year-old children. Enuresis is slightly more common in boys than in girls and occurs more frequently in first-born children. This condition has a distinct family tendency. SEE: *nocturnal e.*; *bladder drill*.

**ETIOLOGY:** In most instances there is no organic basis for persistent enuresis. These cases are probably due to inadequate or misguided attempts at toilet training. Also, emotional stress, such as the birth of a sibling, a death in the family, or separation from the family, may be associated with the onset of enuresis in a previously continent child. Conditions that may cause enuresis include urinary tract infection, increased fluid intake due to diabetes mellitus, any disease that interferes with the formation of concentrated urine, trauma to or disease of the spinal cord, and epilepsy.

**TREATMENT:** When no organic disease is present, the use of imipramine as a temporary adjunct may be helpful. This is usually given in a dose of 10 to 50 mg orally at bedtime, but the effectiveness may decrease with continued administration. The bladder may be trained to hold larger amounts of urine. This procedure has decreased the occurrence rate of enuresis. No matter what the cause, the child should not be made to feel guilty or ashamed, and the family and the child should regard enuresis as they would any other condition that lends itself to appropriate therapy. If the child tries too hard to control the condition, it may worsen. Conditioning devices that sound an alarm when bedwetting occurs should not be used unless prescribed by a health care professional familiar with the treatment of enuresis.



Imipramine is not recommended for children under 6 years of age. Blood counts should be taken at least monthly during therapy to detect the possible onset of agranulocytosis.

**diurnal e.** Urinary incontinence during the day. Its cause is usually pathological. It may be caused by muscular contractions brought about by laughing, coughing, or crying. SEE: *stress urinary incontinence*.

It often persists for long periods, esp. after protracted illness. It occurs more commonly in women and girls.

**nocturnal e.** Urinary incontinence during the night, more commonly known as bedwetting. It is irregular and unaccompanied by urgency or frequency. It is more common in boys than in girls.

**PATIENT CARE:** Fluid should be restricted late in the day and diurnal voidings should be spaced at more than ordinary intervals. The child may be awakened once or twice in the night and, when fully awake, robed and walked to the bathroom. As improvement is noticed, the number of awakenings may be lessened. The foot of the bed may also be elevated. Electronic devices that awaken the child the moment the bed is wet may be helpful. The use of desmopressin acetate nasal spray at bedtime or tricyclic antidepressants, such as imipramine, has been successful in preventing bedwetting. Adults who experience nocturnal enuresis should be evaluated for signs of neurological disorders. SEE: *enuresis*.

**primary e.** Enuresis in which a child has never been dependably continent.

**secondary e.** Enuresis in a child with no history of incontinence for a year or more.

**envelope** (ēn've-lōp) A covering or container.

**nuclear e.** Two parallel membranes containing a narrow perinuclear space and enveloping the nucleus of a cell. SEE: *nuclear membrane*.

**envenomation** (ēn-vēn'ō-mā'shūn) The introduction of venoms into the body by means of a bite or sting.

**environment** [O. Fr. *en-*, in, + *viron*, circle] The surroundings, conditions, or influences that affect an organism or the cells within it.

**hostile work e.** Place of employment in which a reasonable person would find conditions that are abusive or intolerable. Prohibited conduct may take place repeatedly and may include physical intimidation; sexual harassment; or political, racial, religious, or sex-based discrimination.

**neutrothermal e.** Thermoneutral e.  
**thermoneutral e.** An environment

with an ambient temperature that minimizes the risk of heat loss via conduction, convection, radiation, and evaporation; often used to protect newborns. SYN: *neutrothermal environment*.

**virtual learning e.** A form of computer-assisted education in which students participate in their studies by accessing recorded lectures, case-based tutorials, weblinks, audio and video clips, and e-mail, instead of gathering in a single geographically limited location for group lectures and laboratory study.

**environmental control 1.** In occupational health and safety, a design feature, e.g., in a hospital or workplace, that limits the risk of on-the-job injury. **2.** In the practice of allergy and immunology, a process or design that limits the exposure of the patient to particular antigens.

**environmental control unit** ABBR: ECU. An electronic device that remotely controls home climate (e.g., heating, air conditioning), security (e.g., lighting, door locks, drapes), and communication devices (telephone, television). ECUs are often, but not exclusively, used by persons with functional limitations.

**environmental health** The theory and practice of assessing, correcting, controlling, and preventing environmental factors that can adversely affect the health of present and future generations.

**environmental health technician** A technician who assists in the survey of environmental hazards and performs technical duties under professional supervision in areas such as pollution control, radiation protection, and sanitation.

**environmental interpretation syndrome, impaired** Consistent lack of orientation to person, place, time, or circumstances over more than 3 to 6 months, necessitating a protective environment. SEE: *Nursing Diagnoses Appendix*.

**environmental sleep disorder** Sleep disturbances resulting from excessive noise, light, heat, cold, movements of one's bed partner, or unfamiliar surroundings (e.g., sleeping in hospitals, hotels, planes, trains).

**envy** Unhappiness about or the wish to possess qualities, physical attributes, or belongings of someone else.

**enzootic** (ĕn'zō-ōt'ik) [Gr. *en*, in, + *zoon*, animal] An endemic disease limited to a small number of animals.

**enzygotic** (ĕn'zī-gōt'ik) [Gr. *en*, in, + *zygon*, yoke] Developed from the same ovum.

**enzyme** (ĕn'zīm) [ʹ + *zyme*, leaven] An organic catalyst produced by living cells but capable of acting outside cells or even in vitro. Most enzymes are proteins (some RNAs are enzymes) that change the rate of chemical reactions

without needing an external energy source or being changed themselves; an enzyme may catalyze a reaction many times. Enzymes are reaction specific in that they act only on certain substances (called substrates). The enzyme and its substrate or substrates form a temporary configuration, called an enzyme-substrate complex, that involves both physical shape and chemical bonding. The enzyme promotes the formation of bonds between separate substrates, or induces the breaking of bonds in a single substrate to form the product or products of the reaction. The human body contains thousands of enzymes, each catalyzing one of the many reactions that take place as part of metabolism.

Each enzyme has an optimum temperature and pH at which it functions most efficiently. For most human enzymes, these would be body temperature and the pH of cells, tissue fluid, or blood. Enzyme activity can be impaired by extremes of temperature or pH, the presence of heavy metals (lead or mercury), dehydration, or ultraviolet radiation. Some enzymes require coenzymes (nonprotein molecules such as vitamins) to function properly; still others require certain minerals (iron, copper, zinc). Certain enzymes are produced in an inactive form (a proenzyme) and must be activated (e.g., inactive pepsinogen is converted to active pepsin by the hydrochloric acid in gastric juice).

**ACTION:** Of the many human enzymes, the digestive enzymes are probably the most familiar. These are hydrolytic enzymes that catalyze the addition of water molecules to large food molecules to split them into simpler chemicals. Often the name of the enzyme indicates the substrate with the addition of the suffix *-ase*. A lipase splits fats to fatty acids and glycerol; a peptidase splits peptides to amino acids. Some enzymes such as pepsin and trypsin do not end in *-ase*; they were named before this method of nomenclature was instituted.

Enzymes are also needed for synthesis reactions. The synthesis of proteins, nucleic acids, phospholipids for cell membranes, hormones, and glycogen all require one if not many enzymes. DNA polymerase, for example, is needed for DNA replication, which precedes mitosis. Energy production also requires many enzymes. Each step in cell respiration (glycolysis, Krebs cycle, cytochrome transport system) requires a specific enzyme. Deaminases remove the amino groups from excess amino acids so that they may be used for energy. Long-chain fatty acids are split by enzymes into smaller compounds to be used in cell respiration. Blood clotting, the formation of angiotensin II to raise blood pressure, and the transport of car-

bon dioxide in the blood all require specific enzymes.

**activating e.** An enzyme that catalyzes the attaching of an amino acid to the appropriate transfer ribonucleic acid.

**allosteric e.** An enzyme whose activity can change when certain types of effectors, called allosteric effectors, bind to a nonactive site on the enzyme.

**amylolytic e.** An enzyme that catalyzes the conversion of starch to sugar.

**angiotensin-converting e.** ABBR: ACE. An enzyme normally found in the capillary endothelium throughout the vascular system. It converts angiotensin I (a part of the renin-angiotensin-aldosterone mechanism of the kidney) to angiotensin II, the final step in the renin-angiotensin mechanism. The latter stimulates aldosterone secretion and therefore sodium retention.

**autolytic e.** An enzyme that produces autolysis, or cell digestion.

**bacterial e.** An enzyme produced by bacteria; many have specific, toxic effects on humans.

**branching e.** An enzyme, called a glycosyltransferase, that transfers a carbohydrate unit from one molecule to another.

**brush border e.** An enzyme produced by the cells of the villi and microvilli (brush border) lining the small intestine.

**coagulating e.** An enzyme that catalyzes the conversion of soluble proteins into insoluble ones. SYN: *coagulase*.

**deamidizing e.** An enzyme that splits amine off amino acid compounds.

**debranching e.** An enzyme, dextrin-1-6-glucosidase, that removes a carbohydrate unit from molecules that contain short carbohydrate units attached as side chains.

**decarboxylating e.** An enzyme, such as carboxylase, that separates carbon dioxide from organic acids.

**digestive e.** Any enzyme involved in digestive processes in the alimentary canal.

**extracellular e.** An enzyme that acts outside the cell that produces it.

**fermenting e.** An enzyme produced by bacteria or yeasts that brings about fermentation, esp. of carbohydrates.

**glycolytic e.** An enzyme that catalyzes the oxidation of glucose.

**hydrolytic e.** An enzyme that catalyzes hydrolysis.

**inhibitory e.** An enzyme that blocks a chemical reaction.

**intracellular e.** An enzyme that acts within the cell that produces it.

**inverting e.** An enzyme that catalyzes the hydrolysis of sucrose.

**lipolytic e.** An enzyme that catalyzes the hydrolysis of fats. SYN: *lipase*.

**mucolytic e.** An enzyme that depo-

lymerizes mucus by splitting mucoproteins. Examples are lysozyme and hyaluronidase. SYN: *mucinase*.

**oxidizing e.** An enzyme that catalyzes oxidative reactions. SYN: *oxidase*.

**proteolytic e.** An enzyme that catalyzes the conversion of proteins into peptides.

**redox e.** An enzyme that catalyzes oxidation-reduction reactions.

**reducing e.** An enzyme that removes oxygen. SYN: *reductase*.

**respiratory e.** An enzyme, such as a cytochrome or a flavoprotein, that acts within tissue cells to catalyze oxidative reactions by releasing energy.

**splitting e.** An enzyme that facilitates removal of part of a molecule.

**transferring e.** An enzyme that facilitates the moving of one molecule to another compound. SYN: *transferase*.

**uricolytic e.** An enzyme that catalyzes the conversion of uric acid into urea.

**yellow e.** One of a group of flavoproteins involved in cellular oxidation.

**Enzyme Commission** ABBR: EC. An organization created in 1956 by the International Union of Biochemistry to standardize enzyme nomenclature.

**enzyme immunoassay** ABBR: EIA. A rapid enzyme immunochemical method for determining the presence of an antigen, antibody, or hapten in the blood. In EIA an antigen or antibody is bound to an enzyme (e.g., horseradish peroxidase or alkaline phosphatase). The resulting molecule can bind specific immunological targets in body fluid samples and highlight their presence enzymatically. EIA, formerly known as enzyme-linked immunosorbent assay (ELISA), is used as one of the primary diagnostic tests for many infectious diseases, including *treponema pallidum* (the spirochete that causes syphilis) and the human immunodeficiency virus (HIV).

**enzyme induction** The adaptive increase in the number of molecules of a specific enzyme secondary to either an increase in its synthesis rate or a decrease in its degradation rate.

**enzyme-linked immunosorbent assay** ABBR: ELISA. The former name for enzyme immunoassay (EIA).

**enzyme modulator** A chemical that modifies the allosteric binding site of an enzyme, changing its catalytic kinetics.

**enzymology** (ĕn"zī-mŏl'ō-jĕ) The study of enzymes and their actions.

**enzymolysis** (ĕn-zī-mŏl'ī-sīs) [Gr. *en*, in, + *zyme*, leaven, + *lysis*, dissolution] Chemical change or disintegration due to an enzyme.

**enzymopathy** (ĕn"zī-mŏp'ă-thĕ) Any disease involving an enzyme abnormality (can be due to sufficient quantities

but defective structure, for example, 2° to mutation).

**enzymopenia** (ĕn-zī'mō-pē'nē-ă) Deficiency of an enzyme.

**enzymuria** (ĕn'zī-mū'rē-ă) [" + " + *ouron*, urine] The presence of enzymes in the urine.

**EOM** *extraocular muscles*.

**eosin** (ē'ō-sin) [Gr. *eos*, dawn (rose-colored)] Any of several red dyes used in histology, often in conjunction with hematoxylin. It has an affinity for cytoplasm, which stains pink.

**eosinoblast** (ē'ō-sin'ō-blăst) [" + *blastos*, germ] A bone marrow cell that develops into a myelocyte. SYN: *myeloblast*.

**eosinopenia** (ē'ō-sin-ō-pē'nē-ă) [" + *penia*, poverty] An abnormally small number of eosinophilic cells in the peripheral blood.

**eosinophil** (ē'ō-sin'ō-fil) [" + *philein*, to love] A white blood cell with a lobed nucleus and cytoplasmic granules that stain red with Wright's stain. Eosinophils make up 1% to 3% of the white cell count. They contribute to the destruction of parasites and to allergic reactions by releasing chemical mediators such as histamine. SYN: *acidophilic leukocyte*; *eosinophilic leukocyte*. SEE: *blood for illius*; *leukocyte*.

**eosinophilia** (ē'ō-sin-ō-fil'ē-ă) [Gr. *eos*, dawn, + *philein*, to love] 1. An unusually large number of eosinophils in the blood. 2. The characteristic of staining readily with eosin.

**urinary e.** An abnormal amount of eosinophils in the urine, a finding that sometimes indicates an allergic interstitial nephritis.

**eosinophilia-myalgia syndrome, tryptophan-induced** Eosinophilia and severe muscle pain and joint stiffness seen in patients with a history of taking oral preparations of the amino acid L-tryptophan.

**SYMPTOMS:** There is abrupt onset, within a week or so, of pain, edema, and induration of the extremities, esp. the legs. Skin involvement includes alopecia, transient rash, and subjective weakness. The disease is disabling and chronic. To establish the diagnosis, it is necessary to exclude other diseases (e.g., infections or neoplasia) that could cause these findings.

**TREATMENT:** Treatment is supportive; tryptophan should be discontinued.

**eosinophilic** (ē'ō-sin-ō-fil'ik) Readily stainable with eosin.

**eosinophilic pustular folliculitis** ABBR: EPF. An itchy papular, plaquelike, or pustular rash of uncertain cause, often occurring on the face. It is found in patients of Asian descent, in those with HIV/AIDS, after exposure to some drugs, and after parasitic infestations. SYN: *Ofuji's disease*.

**eosinophilous** (ē'ō-sin-ōf'i-lūs) [" + *philein*, to love] 1. Easily stainable with eosin. 2. Having eosinophilia.

**eosinotactic** (ē'ō-sin-ō-tăk'tik) [" + *taktikos*, arranged] Attracting or repulsing eosinophilic cells.

**eotaxin** (ē-ō-tōks'in) [Gr. *eos*, dawn (rose-colored) + (chemo)taxin] A chemokine that specifically attracts eosinophils to particular tissues (e.g., to bronchial tissues in asthma or to the skin in contact dermatitis). Tumor necrosis factor alpha stimulates its release. SEE: *chemotaxis*; *cytokine*.

**ep-** SEE: *epi-*.

**EPAP** *expiratory positive airway pressure*.

**epaxial** (ĕp-ăk'sē-ăl) [" + L. *axis*, axis] Situated above or behind an axis.

**EPEC** Enteropathogenic *Escherichia coli*.

**ependyma** (ĕp-ĕn'dī-mă) [Gr. *ependyma*, an upper garment, wrap] The epithelial lining of the cerebral ventricles and the central canal of the spinal cord. The lining is composed of a single cell layer. Most of the cells have microvilli and motile cilia on their outer surface. **ependymal, adj.**

**ependymitis** (ĕp'ĕn-dī-mī'tis) [" + *itis*, inflammation] Inflammation of the ependyma.

**ependymoblast** (ĕp-ĕn'dī-mō-blăst) [" + *blastos*, germ] An embryonic ependymal cell, or ependymocyte.

**ependymocyte** (ĕp-ĕn'dī-mō-sīt) [" + *kytos*, cell] Ependymal cell.

**ependymoma** (ĕp-ĕn'dī-mō'mă) [" + *oma*, tumor] A tumor arising from fetal inclusion of ependymal elements.

**ephebiatrics** (ĕ-fē-bē-ăt'riks) [Gr. *epi*, at, + *hebe*, youth, + *iatrikos*, healing] A branch of medicine dealing with adolescents.

**ephedra** (ĕf-ĕd'ră) An herbal remedy (*Ephedra sinica*) promoted as a dietary aid, energy booster, and asthma treatment. SYN: *ma huang*.



Its use has been associated in some patients with heart attack, stroke, arrhythmias, and emergency room visits for chest pain. The sale and use of ephedra has been banned in the U.S.

**ephedrine** (ĕ-fĕd'rĭn, ĕf'ĕ-drĕn) A synthetic sympathomimetic alkaloid originally obtained from species of *Ephedra*; first isolated in 1887. In ancient Chinese medicine it was used as a diaphoretic and antipyretic. Its action is similar to that of epinephrine. Its effects, although less powerful, are more prolonged, and it exerts action when given orally, whereas epinephrine is effective only by injection. Ephedrine dilates the bronchial muscles, contracts the nasal mucosa, and raises the blood pressure. It is used chiefly for its bronchodilating



effect in asthma, and for its constricting effect on the nasal mucosa in hay fever.

**INCOMPATIBILITY:** Calcium chloride, iodine, and tannic acid are incompatible with ephedrine.



Ephedrine and ephedra may produce hypertensive crises, myocardial ischemia, and cardiac rhythm disturbances.

**ephehis** (ĕf-ĕ-lis) *pl.* **ephehides** [Gr. *ephehis*, freckle] A freckle.

**ephemeral** (ĕ-fĕm'ĕr-ăl) [Gr. *epi*, on, + *hemera*, day] Of brief duration.

**e-PHI** (ĕ'fi') Confidential patient care data that are transmitted or stored electronically.

**epi-, ep-** [Gr.] Prefixes meaning *upon, over, at, in addition to, after*.

**epiandrosterone** (ĕp'ĕ-ăn-drôs'tĕr-ŏn) An androgenic hormone normally present in the urine.

**epiblast** (ĕp'i-blăst) [Gr. *epi*, upon, + *blastos*, germ] The outer layer of cells of the blastoderm. **SYN:** *ectoderm*. **epiblastic** (-blăst'ik), *adj.*

**epiblepharon** (ĕp'i-blĕf'ă-rŏn) [" + Gr. *blepharon*, eyelid] A fold of skin that passes across the margin of either the upper or lower eyelid so that the eyelashes are pressed against the eye.

**epibulbar** (ĕp'i-bŭl'băr) Lying on the bulb of any structure; more specifically, located on the eyeball.

**epibulbar dermoid** A benign whitish/pink tumor of the eye. It is a hallmark of Goldenhar sequence, a variant of hemifacial microsomia.

**epicanthus** (ĕp'ik-ăn'thŭs) [Gr. *epi*, upon, + *kanthos*, canthus] A vertical fold of skin extending from the root of the nose to the median end of the eyebrow, covering the inner canthus and caruncle. It is a characteristic of certain races and may occur as a congenital anomaly in others.

**epicardia** (ĕp'i-kărd'ĕ-ă) [" + *kardia*, heart] The abdominal portion of the esophagus extending from the diaphragm to the stomach, about 2 cm in length.

**epicardium** (ĕp'i-kărd'ĕ-ŭm) The serous membrane on the surface of the myocardium; the visceral layer of the pair of serous pericardial membranes. The fat that normally surrounds the heart is just under the epicardium.

**epichordal** (ĕp'ik-kord'ăl) [" + *khorde*, cord] Located dorsad to the notochord.

**epichorion** (ĕp'i-kŏrĕ-ŏn) [" + *chorion*] The portion of the endometrium that covers the implanted early embryo.

**epicomus** (ĕ-pik'ŏ-mŭs) [" + *kome*, hair] A congenital malformation in which the head of a parasitic twin is attached to the summit or vertex of the skull of the larger twin.

**epicondylalgia** (ĕp'i-kŏn-dĭ-lăl'jĕ-ă) [" + *kondylos*, condyle, + *algos*, pain] Pain in the elbow joint in the region of the epicondyles.

**epicondyle** (ĕp-i-kŏn'dĭl) [" + *kondylos*, condyle] The eminence at the articular end of a bone above a condyle.

**epicondylitis** (ĕp'i-kŏn'dĭ-lĭ'tis) [" + " + *itis*, inflammation] Inflammation of the epicondyle of the humerus and surrounding tissues.

**lateral humeral e.** Tennis elbow.

**medial humeral e.** Golfer's elbow.

**epicranium** (ĕp'i-kră'nĕ-ŭm) [" + *kranion*, cranium] The soft tissue covering the cranium.

**epicranium** (ĕp'i-kră'nĕ-ŭs) The occipitofrontal muscle and scalp.

**epicrisis** (ĕp'i-krĭ'sis) [" + *krisis*, crisis] A secondary turning point following the initial critical stage of a disease.

**epicritic** (ĕp-i-krĭt'ik) [Gr. *epikritikos*, judging] **1.** Pert. to acute sensibility, such as that of the skin when it discriminates among degrees of sensation caused by touch or temperature. **2.** Pert. to an epicrisis. **3.** Something such as pain or itching that is well localized.

**epicytostomy** (ĕp'i-sis-tŏt'ŏ-mĕ) [" + " + *tome*, incision] A surgically created opening above the symphysis pubis into the bladder.

**epicyte** (ĕp'i-sĭt) [" + *kytos*, cell] A membrane surrounding a temporary colony of some ameoboid protozoa.

**epidemic** (ĕp'i-dĕm'ik) [" + *demos*, people] **1.** An outbreak of a disease, i.e., a disease that suddenly affects a large group of persons in a geographic region or defined population group. **2.** Excessively communicable, contagious, disseminated, prevalent, or widespread. **SEE:** *endemic; epizootic; pandemic*.

**Epidemic Intelligence Service** **ABBR:** EIS. An epidemiology field training program for postdoctoral fellows at the Centers for Disease Control and Prevention. It provides epidemiological assistance in the investigation and prevention of public health problems and a source of trained field epidemiologists for federal, state, and local health departments around the U.S.

**epidemic viral gastroenteropathy** Viral gastroenteritis.

**epidemiologist** (ĕp'i-dĕ-mĕ-ŏl'ŏ-jĭst) A specialist in the field of epidemiology.

**epidemiology** (ĕp'i-dĕ-mĕ-ŏl'ŏ-jĕ) [" + *demos*, people, + *logos*, study] The study of the distribution and determinants of health-related states and events in populations, and the application of this study to the control of health problems. Epidemiology is concerned with the traditional study of epidemic diseases caused by infectious agents and with health-related phenomena including accidents, suicide, climate, toxic agents such as lead, air pollution, and

catastrophes due to ionizing radiation. SEE: *pharmacoepidemiology*. **epidemiological** (-əl-ō'jī-kāl), *adj.*

**epidermal growth factor** ABBR: EGF. A polypeptide that stimulates growth of several different cells, including keratinocytes. It has been used experimentally to promote wound healing.

**epidermal nevus syndrome** The association of multiple cutaneous abnormalities, including multiple nevi, hemangiomas, and/or skin cancers, with scattered skeletal, neurological, urological, ophthalmic, and vascular malformations. The syndrome is sometimes transmitted to offspring by autosomal dominant inheritance.

**epidermatoplasty** (ĕp'ī-dĕr-măt'ō-plăstĕ) [" + " + *plassein*, to mold] A surgical procedure grafting pieces of epidermis with the underlying layer of the corium.

**epidermis** (ĕp'ī-dĕr'mīs) [" + *derma*, skin] The outermost layer of the skin. SEE: *skin*. **epidermal**, **epidermic**, *adj.*

**epidermitis** (ĕp'ī-dĕr-mī'tīs) [" + " + *itis*, inflammation] Inflammation of the superficial layers of the skin.

**epidermization** (ĕp'ī-dĕr'mī-zā'shŭn)  
1. Skin grafting. 2. Conversion of the deeper germinative layer of cells into the outer layer of the epidermis.

**epidermodysplasia verruciformis** (ĕp'ī-dĕr'mō-dīs-plā'vē-ă) Generalized warts of the skin.

**epidermoid** (ĕp'ī-dĕr'moyd) [Gr. *epi*, upon, + *derma*, skin, + *eidos*, form, shape] 1. Resembling or pert. to the epidermis. 2. A tumor arising from aberrant epidermal cells. SYN: *cholesteatoma*.

**epidermolysis** (ĕp'ī-dĕr-mōl'īsīs) [" + " + *lysis*, dissolution] Loosening of the epidermis.

**e. bullosa** A genetically transmitted form of epidermolysis marked by the formation of deep-seated bullae appearing after irritation or rubbing.

**epidermomycosis** (ĕp'ī-dĕr'mō-mī-kō'sīs) [" + " + *mykes*, fungus, + *osis*, condition] A skin disease caused by a fungus.

**Epidermophyton** (ĕp'ī-dĕr-mōf'ī-tŏn) [" + " + *phyton*, plant] A genus of fungi, similar to *Trichophyton* but affecting the skin and nails instead of the hair.

**E. floccosum** The causative agent of certain types of tinea, esp. tinea pedis (athlete's foot), tinea cruris, tinea unguium, and tinea corporis.

**epidermophytosis** (ĕp'ī-dĕr-mō-fī-tō'sīs) [" + " + " + *osis*, condition] Infection by a species of *Epidermophyton*.

**epididymectomy** (ĕp'ī-dīd'ī-mĕk'tō-mĕ) [" + *didymos*, testis, + *ektome*, excision] Removal of the epididymis.

**epididymis** (ĕp'ī-dīd'ī-mīs) *pl.* **epididymides** A small oblong organ resting on

and beside the posterior surface of a testis, consisting of a convoluted tube 13 to 20 ft (3.97 to 6.1 m) long, enveloped in the tunica vaginalis, ending in the ductus deferens. It consists of the head (caput or globus major), which contains 12 to 14 efferent ducts of the testis, the body, and the tail (cauda or globus minor). It is the first part of the secretory duct of each testis. The epididymis is supplied by the internal spermatic, deferential, and external spermatic arteries; it is drained by corresponding veins. SEE: *illus*.

**epididymitis** (ĕp'ī-dīd'ī-mī'tīs) [" + *didymos*, testis, + *itis*, inflammation] Inflammation of the epididymis, usually as a result of infection, and rarely as a result of trauma or urinary reflux from the urethra. SEE: *Nursing Diagnoses Appendix*.

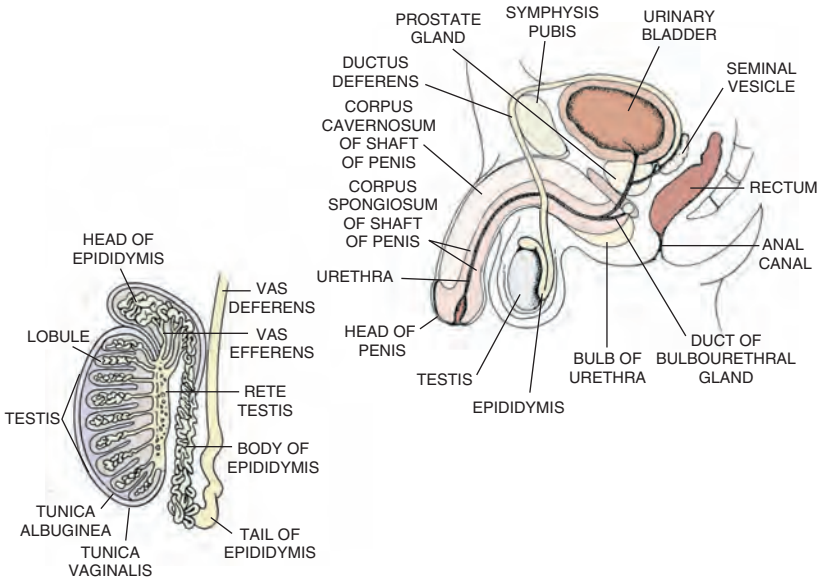
**ETIOLOGY:** The causes of epididymitis are age- and activity-dependent. Children may have epididymal infection as a result of congenital malformations of the genitourinary tract. In sexually active young men, chlamydia and gonorrhea are the most common causes. Middle-aged and older men typically have infections caused by gram-negative urinary pathogens, such as *Escherichia coli* or other enteric bacteria. Syphilis, tuberculosis, mumps, and other microorganisms are also occasionally responsible for epididymal infection.

**SYMPTOMS:** The primary symptom in adults is pain and mild to moderate tenderness, redness, and swelling in the scrotum that is usually localized to the superior pole of one of the testicles. Urethral discharge, fever, and chills are also common. In an attempt to protect the groin and scrotum while walking, the patient may walk with a waddling gait.

**DIAGNOSIS:** Urinalysis, urine culture and sensitivity, gram staining of urethral discharge, and white blood cell count above 10,000 aid diagnosis. Scrotal ultrasonography helps to differentiate this condition from testicular torsion, which is a urological surgical emergency.

**TREATMENT:** Treatment is aimed at combating the infection and reducing pain and swelling. Antibiotic therapy (such as a tetracycline for sexually active men) and nonsteroidal anti-inflammatory drugs (for pain and fever) are effective. Drug therapy usually begins to relieve symptoms in 2 or 3 days and eradicates infection in about a week.

**PATIENT CARE:** The patient is encouraged to rest in bed with his legs slightly apart and with the testes elevated on a towel roll or adhesive strapping to promote venous return, reduce edema, and relieve pain. Local intermit-



## EPIDIDYMIS

tent application of an ice bag also helps to relieve pain and swelling. Heat is contraindicated, as it may cause damage to germinal cells. The patient should wear nonconstrictive, lightweight clothing until the swelling subsides. Straining at stool is minimized through the use of stool softeners. The patient should wear a scrotal support when he sits, stands, or walks. Lifting more than 20 pounds is discouraged. The patient is observed for signs of abscess formation (a localized hot, red, tender area) or extension of the infection into the testes. The importance of adhering to the prescribed antibiotic regimen for the full course of therapy is emphasized.

If epididymitis is secondary to a sexually transmitted disease, the patient is educated regarding preventing transmission, encouraged to use a condom during sexual intercourse, and to notify sexual partners so that they can be treated for the infection. The patient should abstain from sexual activity until he and his partner have completed treatment regimens and follow-up cultures are negative.

**epididymodeferentectomy** (ĕp'ī-dīd'ī-mō-dĕf'ĕr-ĕn-tĕk'tō-mĕ) [" + " + L. *deferens*, carrying away, + Gr. *ektome*, excision] Excision of the epididymis and ductus deferens.

**epididymodeferential** (ĕp'ī-dīd'ī-mō-dĕf'ĕr-ĕn'shāl) Concerning both the epididymis and ductus deferens.

**epididymography** (ĕp'ī-dīd'ī-mōg'rā-fĕ) [" + " + *graphein*, to write] Radi-

ography of the epididymis after the introduction of a contrast medium.

**epididymo-orchitis** (ĕp'ī-dīd'īm-ō-orkī'tis) [" + *didymos*, testis, + *orchis*, testis, + *itis*, inflammation] Epididymitis with orchitis.

**epididymotomy** (ĕp'ī-dīd'ī-mōt'ō-mĕ) [" + " + *tome*, incision] An incision into the epididymis.

**epididymovasostomy** (ĕp-ī-dīd'ī-mō-vās-ōs'tō-mĕ) [" + " + L. *vas*, vessel, + Gr. *stoma*, mouth] A surgical anastomosis between the epididymis and the vas.

**epididymovesiculography** (ĕp'ī-dīd'ī-mō-vĕ-sīk'ū-lōg'rā-fĕ) Radiography of the epididymis and seminal vesicle after introduction of a contrast medium.

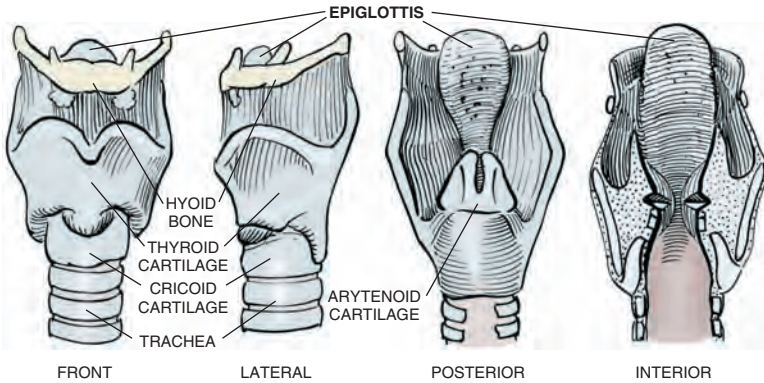
**epidural** (ĕp'ī-dūr'āl) [Gr. *epi*, upon, + L. *durus*, hard] Located over or on the dura.

**epidurogram** (ĕp'ī-dūr'ō-grām) A spinal x-ray examination that uses injected contrast to provide an outline of compressed nerve roots. This study is sometimes used in the evaluation of back pain.

**epiduroscopy** (ĕp'ī-dūr-ōs'kō-pĕ) The insertion of a fiberoptic scope into the epidural space that surrounds the spinal cord to diagnose and treat chronic back pain.

**epifolliculitis** (ĕp'ī-fōl-īk'ū-lī'tis) [" + L. *folliculus*, follicle, + Gr. *itis*, inflammation] Inflammation of the hair follicles of the scalp.

**epigallocatechin gallate** (ĕp'ī-gāl'ō-kāt-ĕ-chīn gāl'lāt) ABBR: EGCg, EGCG. A



## EPIGLOTTIS

polyphenol compound present in green tea that inhibits the growth of cancer cells in the laboratory. Its effect on patients with cancer is unknown.

**epigastralgia** (ĕp'ĭ-gās-trāl'jē-ă) [ " + " + *algos*, pain] Pain in the epigastrium.

**epigastric reflex** (ĕp'ĭ-gās'trĭk) [ " + " ] Contraction of the upper portion of the rectus abdominis muscle when the skin of the epigastric region is scratched.

**epigastrium** (ĕp'ĭ-gās'trē-ŭm) [ " + *gaster*, belly] The superior central portion of the abdomen. SEE: *abdominal regions*; *Auenbrugger's sign*; *precordium*. **epigastric** (-gās'trĭk), *adj.*

**epigastrocele** (ĕp'ĭ-gās'trō-sēl) [ " + " + *kele*, hernia] A hernia in the epigastrium.

**epigastrorrhaphy** (ĕp'ĭ-gās'tror'ă-fē) [ " + " + *rhaphe*, seam, ridge] Suture of an abdominal wound in the epigastric area.

**epigenesis** (ĕp'ĭ-jĕn'ĕ-sĭs) [ " + *genesis*, generation, birth] In embryology, the development of specific cells and tissues from undifferentiated cells of the early embryo.

**epigenetics** (ĕp'ĭ-jĕ-nĕt'ĭks) Changes in the way genes are expressed that occur without changes in the sequence of nucleic acids. In mammals the most common form of epigenetic change results from methylation (the addition of methyl [-CH<sub>3</sub>] moieties) to the promoter regions of genes. Although epigenetic changes do not alter the sequence of nucleotides, they are inheritable.

**epiglottidectomy** (ĕp'ĭ-glōt'ĭd-ĕk'tō-mē) [ " + " + *ektome*, excision] Excision of the epiglottis.

**epiglottiditis** (ĕp'glōt-ĭd-ĭt'is) Epiglottitis.

**epiglottis** (ĕp'ĭ-glōt'is) *pl.* **epiglottides** [Gr.] The uppermost cartilage of the larynx, located immediately posterior to the root of the tongue. It covers the entrance of the larynx when the individual

swallows, thus preventing food or liquids from entering the airway. **epiglottidean** (-glō-tĭd'ē-ăn), *adj.* SEE: *illus.*

**epiglottitis** (ĕp'ĭ-glōt-ĭ'tis) [ " + *itis*, inflammation] Inflammation of the epiglottis as the result of infection. The severe swelling above the epiglottis may obstruct air flow and can cause death. Epiglottitis is an emergency and must be treated immediately. SYN: *epiglottiditis*; *supraglottitis*. SEE: *croup*; *laryngo-tracheobronchitis*.

**ETIOLOGY:** It usually occurs in children, esp. from ages 2 to 5, as a result of infection with bacteria such as *Haemophilus influenzae*, Type B (Hib), streptococci, and staphylococci. Since most children born in the U.S. are immunized against Hib (which previously was the primary causative agent) the incidence of epiglottitis is declining. Epiglottitis also can affect adults, usually resulting from group A streptococcal infection.

**SYMPTOMS:** Children abruptly develop a sore throat, dysphagia, and high fever, usually at night. They are agitated and frightened and want to sit in a tripod position (upright, leaning forward, mouth open). Drooling, muffled voice, dyspnea with substernal and suprasternal retractions, and stridor are common. Severe respiratory distress and cyanosis may develop suddenly. Unlike children with croup, those with epiglottitis have no cough or hoarseness.

**TREATMENT:** Epiglottitis is treated with intravenous second- or third-generation cephalosporins, or ampicillin with sulbactam. A specialist in otorhinolaryngology or critical care medicine may need to provide an artificial airway, mechanical ventilation, and care in a pediatric critical care facility. Intubation is continued until epiglottal swelling has decreased. Blood and throat cultures are obtained to support the

antibiotic treatment choice, and IV fluid and sedation are provided while the child is intubated. Close observation is essential even after antibiotic therapy begins. Corticosteroids may be given prior to extubation to decrease laryngeal swelling. If a child with epiglottitis is observed but not intubated, a tracheostomy set should be kept nearby for 24 to 48 hr, in the event of complete airway occlusion. If siblings have not been immunized, they should be given antibiotic prophylaxis and immunized as soon as possible.

**epilate** (ĕp'ĭ-lāt) [L. *e*, out, + *pilus*, hair] To extract the hair by the roots.

**epilating** (ĕp'ĭ-lāt'ĭng) Depilating; extracting a hair.

**epilation** (ĕp'ĭ-lā'shŭn) 1. Extraction of hair. SYN: *depilation*; *electrolysis*. 2. Loss of hair due to exposure to ionizing radiation.

**epilemma** (ĕp'ĭ-lĕm'ă) [Gr. *epi*, upon, + *lemma*, husk] The neurilemma of small branches of nerve filaments.

**epilepsy** (ĕp'ĭ-lĕp'sĕ) [Gr. *epilepsia*, to seize] A disease marked by recurrent seizures; i.e., by repetitive abnormal electrical discharges within the brain. Epilepsy is prevalent; it is found in about 2% or 3% of the population. Its incidence is highest in children (i.e., under age 10) and in older people (i.e., over age 70); adolescents and adults are affected less frequently.

The International League Against Epilepsy categorizes epilepsy as either partial, generalized, or unclassified. Generalized seizures result from electrical discharges that affect both hemispheres of the brain. Tonic-clonic seizures (in which there is loss of consciousness with violent movements of the extremities) and absence seizures (in which there are brief interruptions of awareness and activity) are two examples of generalized seizure disorders. Partial seizure disorders typically begin with focal or local discharges in one part of the brain (and body); they may generalize in some instances. When a patient remains awake during a seizure episode, the seizure is said to be simple and partial. If loss of consciousness occurs after a focal seizure, the syndrome is said to be partial and complex.

Patients who suffer recurrent episodes of alcohol withdrawal or frequent severe hypoglycemia, hypercalcemia, or similar metabolic illnesses may have repetitive seizures but are not considered to have epilepsy if the seizures stop after their underlying illnesses are treated.

**ETIOLOGY:** Epilepsy may result from congenital or acquired brain disease. Infants born with lipid storage diseases, tuberous sclerosis, or cortical dysplasia, e.g., may have recurrent seizures, as

may children born with intracranial hemorrhage or anoxic brain injury. Adults may develop epilepsy as a result of strokes, tumors, abscesses, brain trauma, encephalitis or meningitis, uremia, and many other illnesses. In many instances, the underlying cause is not determined.

**SYMPTOMS:** Symptoms may vary from the almost imperceptible alteration in consciousness, as in absence seizures, to dramatic loss of consciousness, tonic-clonic convulsions of all extremities, urinary and fecal incontinence, and amnesia for the event. Some attacks are preceded by an aura; others provide no warning. Other forms are limited to muscular contractions of a localized area or only one side of the body. SEE: *postictal confusion*.

**DIAGNOSIS:** The diagnosis of epilepsy is made by a careful assessment of the patient's history, augmented by diagnostic studies. Typically, these include blood tests to assess for metabolic disarray, brain imaging using magnetic resonance imaging or computed tomography, and electroencephalography. The differential diagnosis of epilepsy includes many other illnesses marked by episodes of loss of consciousness, including pseudoseizures, syncope, transient ischemic attacks, orthostatic hypotension, and narcolepsy, to name a few.

**TREATMENT:** Medical therapy is available for the prevention and control of recurrent seizures. Antiepileptic agents often include phenytoin or carbamazepine for partial seizures, valproic acid for absence seizures, and any of these agents or phenobarbital, with or without newer drugs, such as gabapentin or lamotrigine, for generalized seizures. All these agents may have significant side effects, and many of them have a range of drug-drug interactions.

Surgical therapy to remove an epileptic focus within the brain is used occasionally to manage seizures that have been difficult to control medically. In specialized neurosurgical centers, this may cure or reduce the impact of epilepsy in about 75% of patients.

**auditory e.** Epilepsy triggered by certain sounds.

**catamenial e.** Menstrual epilepsy.

**intractible e.** Epilepsy that cannot be controlled by two or more anticonvulsant drugs.

**Lennox-Gastaut syndrome e.** Epilepsy with onset in early childhood. This type of epilepsy is characterized by a variety of seizure patterns and an abnormal electroencephalogram, and is frequently associated with developmental and mental retardation. Seizures are not controlled by the usual antiepileptic drugs; however, adjunctive therapy with felbamate may be beneficial.



## Common Causes of Seizures

Cause	Examples
Degenerative brain diseases	Alzheimer's dementia, amyloidosis, and amyloid angiopathy
Developmental brain defects	Cortical dysgenesis and vascular malformations of the brain
Drug overdose	Antihistamines, cholinesterase inhibitors, cocaine, methylxanthines, muscarinic agonists, and tricyclic antidepressants
Drug withdrawal	Alcohol; benzodiazepines
Electrolyte disorders	Profound hyponatremia, hypernatremia, hypoglycemia, and hypomagnesemia
Head trauma	Accidental or athletic injuries; complications of childbirth
Hyperthermia	Heatstroke; febrile seizures in childhood
Inborn errors of metabolism	Phenylketonuria
Infections	Brain abscesses; encephalitis; meningitis (bacterial or viral); parasitic infestations (neurocysticercosis)
Pregnancy complications	Eclampsia
Stroke	Embolitic, hemorrhagic, or ischemic cerebrovascular accidents
Tumors	Metastatic cancers or primary brain tumors (astrocytoma and glioblastoma)

**menstrual e.** SEE: *menstrual epilepsy*.

**photogenic e.** Convulsive attacks that occur as a result of intermittent light stimulus.

**reflex e.** Recurrent epileptic seizures that occur in reaction to a specific stimulus, such as photic stimulation while looking at flashing lights or television, auditory stimulation while listening to specific musical compositions, tactile stimulation, or reading.

**refractory epilepsy** A seizure disorder that cannot be controlled with two anticonvulsant drugs. Refractory epilepsy is found in about a third of all patients who have seizures.

**sleep e.** A term formerly, and improperly, used to signify narcolepsy.

**temporal lobe e.** A seizure disorder originating in a temporal lobe of the brain.

**SYMPTOMS:** Temporal lobe seizures produce one of two typical findings:

1. Complex partial seizures (loss of consciousness with abnormal gesturing or automatic movements);

2. Simple partial seizures (preserved consciousness with the sense of unusual smell, taste, thought, or altered body function).

**TREATMENT:** Surgery to remove the irritable focus in the brain appears more effective than treatment with anticonvulsant drugs.

**traumatic e.** Epilepsy caused by trauma to the brain.

**epileptic** (ĕp'ĭ-lĕp'tĭk) [Gr. *epileptikos*]

1. Concerning epilepsy. 2. An individual suffering from attacks of epilepsy.

**epileptiform** (ĕp'ĭ-lĕp'tĭ-form) [Gr. *epi-*

*lepsia*, to seize, + L. *forma*, form] Having the form or appearance of epilepsy.

**epileptogenic, epileptogenous** (ĕp'ĭ-lĕp-tō-jĕn'ĭk, -tōj'ĕ-nūs) [ʹ + *gennan*, to produce] Predisposed to or giving rise to seizures. SEE: table.

**epileptoid** (ĕp'ĭ-lĕp'toĭd) [ʹ + *eidōs*, form, shape] Resembling epilepsy. SEE: *epileptiform*.

**epileptologist** (ĕp'ĭ-lĕp-tōl'ō-jĭst) [Gr. *epilepsia*, seizure, + *logos*, word, reason] A specialist in the diagnosis and treatment of seizures.

**epileptology** (ĕp'ĭ-lĕp-tōl'ō-jĕ) [ʹ + *logos*, word, reason] The study of epilepsy.

**epiloia** (ĕp'ĭ-lōy'ā) Tuberosus sclerosis.

**epimandibular** (ĕp'ĭ-mān-dĭb'ū-lār) [Gr. *epi*, upon, above, + L. *mandibulum*, jaw] Located on the lower jaw.

**epimer** (ĕp'ĭ-mĕr) One of a pair of isomers that differ only in the position of the hydrogen atom and the hydroxyl group attached to one asymmetrical carbon atom.

**epimerite** (ĕp'ĭ-mĕr'ĭt) [ʹ + *meros*, part] An organelle of certain protozoa by which they attach themselves to epithelial cells.

**epimorphosis** (ĕp'ĭ-mor'fō-sĭs) [ʹ + *morphoun*, to give shape, + *osis*, condition] Regeneration of a part of an organism by growth at the cut surface.

**epimysium** (ĕp'ĭ-mĭz'ĕ-ŭm) [ʹ + *mys*, muscle] The outermost sheath of connective tissue that surrounds a skeletal muscle. It consists of irregularly distributed collagenous, reticular, and elastic fibers; connective tissue cells; and fat cells.

**epinephrine** (ĕp"ī-nĕf"rĭn) [" + *nephros*, kidney]  $C_9H_{13}NO_3$ ; a catecholamine produced by the adrenal gland, secreted when the sympathetic nervous system is stimulated. In the physiological response to stress, it is responsible for maintaining blood pressure and cardiac output, keeping airways open wide, and raising blood sugar levels. All these functions are useful to frightened, traumatized, injured, or sick humans and animals. The therapeutic uses of epinephrine are diverse. As one of the key agents used in advanced cardiac life support, it is helpful in treating asystole, ventricular arrhythmias, and other forms of cardiac arrest. It counteracts the effects of systemic allergic reactions and is an effective bronchodilator. It helps control local hemorrhage by constricting blood vessels; because of this action, it prolongs the effects of local anesthesia. SEE: *catecholamine*.

**INCOMPATIBILITY:** Epinephrine is incompatible with light, heat, air, iron salts, and alkalies. SYN: *adrenaline*.

**racemic e.** A mixture of dextro and levo-isomers of epinephrine that, when nebulized, can be used in the treatment of croup and bronchiolitis. The drug is usually given with parenteral dexamethasone.



Some infants and children who initially respond to this treatment will relapse. Patients treated with racemic epinephrine should be observed for several hours to determine if they should be admitted to the hospital or are stable enough for discharge to home.

**epinephritis** (ĕp"ī-nĕf-rĭ'tĭs) [" + *nephros*, kidney, + *itis*, inflammation] Inflammation of an adrenal gland.

**epinephroma** (ĕp-ĭ-nĕ-frō'mă) [" + " + *oma*, tumor] A lipomatoid tumor of the kidney. SYN: *hypernephroma*.

**epineural** (ĕp"ī-nū'rāl) [" + *neuron*, nerve] Located on a neural arch of a vertebra.

**epineurium** (ĕp"ī-nū'rĕ-ūm) The connective tissue sheath of a nerve. SEE: *nerve*.

**epiotic** (ĕp"ĕ-ōt'ĭk) [" + *ous*, ear] Located above the ear.

**epipastic** (ĕp"ī-pās'tĭk) [" + *passlein*, to sprinkle] Resembling a dusting powder.

**epipharynx** (ĕp"ī-fār'ĭnks) [" + *pharynx*, throat] Nasopharynx.

**epiphenomenon** (ĕp"ī-fĕ-nōm'ĕ-nōn) [" + *phainomenon*, phenomenon] An exceptional symptom or occurrence in a disease that is not related to the usual course of the disease.

**epiphora** (ĕ-pĭf'ō-ră) [Gr., downpour] An abnormal overflow of tears down the

cheek due to excess secretion of tears or obstruction of the lacrimal duct.

**epiphyseolysis** (ĕp"ī-fĭz'ĕ-ōl'ĭ-sĭs) [" + " + *lysis*, dissolution] Separation of an epiphysis. Also spelled *epiphysiolysis*.

**epiphyseopathy** (ĕp"ī-fĭz-ĕ-ōp'ă-thĕ) [" + " + *pathos*, disease, suffering] 1. Any disease of the pineal gland. 2. Any disease of the epiphysis of a bone. Also spelled *epiphysiopathy*.

**epiphysodesis** (ĕ-pĕ-fĭz'ĕ-ō-dĕ'sĭs) [" + Gr. *dein*, to bind] The scraping and surgical obliteration of the growth plate of a bone.

**epiphysis** (ĕ-pĭf'ĭ-sĭs) *pl.* **epiphyses** [Gr., a growing upon] 1. In the developing infant and child, a secondary bone-forming (ossification) center separated from a parent bone in early life by cartilage. As growth proceeds (at a different time for each epiphysis), it becomes a part of the larger, or parent, bone. It is possible to judge the biological age of a child from the development of these ossification centers as shown radiographically. 2. A center for ossification at each extremity of long bones. SEE: *diaphysis*. 3. The end of a long bone. **epiphyseal, epiphysial** (ĕp"ī-fĭz'ĕ-ăl), *adj.*

**epiphysitis** (ĕ-pĭf'ĭ-sĭ'tĭs) [" + *itis*, inflammation] Inflammation of an epiphysis, esp. that at the hip, knee, or shoulder in an infant.

**epipial** (ĕp"ī-pĭ'ăl) [" + L. *pia*, tender] Situated on or above the pia mater.

**epiplocele** (ĕ-pĭp'lō-sĕl) [Gr. *epiploon*, omentum, + *kele*, tumor, swelling] A hernia containing omentum.

**epiploenterocele** (ĕ-pĭp'lō-ĕn'tĕr-ō-sĕl) [" + *enteron*, intestine, + *kele*, tumor, swelling] A hernia consisting of omentum and intestine.

**epiploic** (ĕp"ī-plō'ĭk) [Gr. *epiploon*, omentum] Pert. to the omentum.

**epiploitis** (ĕ-pĭp'lō-ĭ'tĭs) [" + *itis*, inflammation] Inflammation of the omentum.

**epiploerocele** (ĕ-pĭp'lō-mĕ'rō-sĕl) [" + *meros*, thigh, + *kele*, tumor, swelling] A femoral hernia containing omentum.

**epiplomphalocèle** (ĕ-pĭp'lōm-făl'ō-sĕl) [" + *omphalos*, navel, + *kele*, hernia] An umbilical hernia with omentum protruding.

**epiploon** (ĕ-pĭp'lō-ōn) [Gr., omentum] The omentum, esp. the greater omentum. SYN: *omentum*.

**epiplopexy** (ĕ-pĭp'lō-pĕks'ĕ) [" + *pexis*, fixation] Suturing of omentum to the anterior abdominal wall.

**epiplosarcomphalocèle** (ĕ-pĭp'lō-săr'kōm-făl'ō-sĕl) [" + *sarx*, flesh, + *omphalos*, navel, + *kele*, tumor, swelling] An umbilical hernia with omentum protruding. SYN: *epiplomphalocèle*.

**epiploschocele** (ĕ-pĭp'lōs-kĕ'ō-sĕl) ["

+ *oscheon*, scrotum, + *kele*, tumor, swelling] An ommental hernia into the scrotum.

**epipygus** (ĕp'ī-pī'gūs) [Gr. *epi*, upon, + *pyge*, buttocks] A developmental anomaly in which an accessory limb is attached to the buttocks. SEE: *pygomelus*.

**epiretinal** (ĕ'pī-rĕt'īn-īl) [Gr. *on*, over, + *L. rete*, net] On the surface of the retina.

**episclera** (ĕp'ī-sklĕ'rā) [ " + *skleros*, hard] The outermost superficial layer of the sclera of the eye.

**episcleral** (ĕp'ī-sklĕ'rāl) **1.** Pert. to the episclera. **2.** Overlying the sclera of the eye.

**episcleritis** (ĕp'ī-sklĕ-rī'tis) [ " + *skleros*, hard, + *itis*, inflammation] Inflammation of the subconjunctival layers of the sclera.

**episioperineoplasty** (ĕ-pīs'ĕ-ō-pĕr'ī-nĕ-ō-plās'tē) [ " + *perinaion*, perineum, + Gr. *plassein*, to form] Plastic surgery of the perineum and vulva.

**episioperineorrhaphy** (ĕ-pīs'ĕ-ō-pĕr'ī-nĕ-or'ā-fĕ) [ " + " + *rhaphe*, seam, ridge] Repair of a lacerated perineum and vulva or repair of a surgical incision of the vulva and perineum.

**PATIENT CARE:** The perineum is inspected at intervals to assess healing and to observe for indications of hematoma formation or infection. Throughout hospitalization, general patient care concerns apply. Perineal care is provided as needed, and the patient is taught correct perineal hygiene (i.e., wiping from front to back). To relieve pain, anesthetic sprays or creams are applied as prescribed. Other pain relief measures include local heat using a heat lamp, warm soaks, or sitz baths as prescribed. The patient is taught to apply these therapies.

**episioplasty** (ĕ-pīs'ĕ-ō-plās'tē) [ " + *plassein*, to form] Plastic surgery of the vulva.

**episiostenosis** (ĕ-pīs'ĕ-ō-stĕ-nō'sis) [ " + *stenosis*, narrowing] Narrowing of the vulvar opening.

**episiotomy** (ĕ-pīs'ĕ-ō-t'ō-mĕ) [ " + *tome*, incision] Incision of the perineum at the end of the second stage of labor to avoid spontaneous laceration of the perineum and to facilitate delivery. In the U.S. episiotomy is done in about 40% of all vaginal deliveries, making the procedure one of the most common forms of surgery performed on women. Perineal massage in the weeks before delivery can reduce the use of episiotomy.

**episode** An occurrence that is one in a sequence of events.

**episome** (ĕp'ī-sōm) Plasmid.

**epispadias** (ĕp'ī-spā'dĕ-ās) [Gr. *epi*, upon, + *spadon*, a rent] A congenital opening of the urethra on the dorsum of the penis.

**episplenitis** (ĕp'ī-splĕ-nī'tis) [ " + *splen*, spleen, + *itis*, inflammation] Inflammation of the splenic capsule.

**epistasis** (ĕ-pīs'tā-sis) [Gr., stoppage]

**1.** A film that forms on urine that has been allowed to stand. **2.** The suppression of any discharge. SEE: *hypostasis*.

**epistaxis** (ĕp'ī-stāk'sis) [Gr.] Hemorrhage from the nose; nosebleed. SEE: *Kiesselbach's area*.

**ETIOLOGY:** Epistaxis may occur spontaneously or secondary to local infections (vestibulitis, rhinitis, sinusitis), systemic infections (scarlet fever, typhoid), drying of nasal mucous membranes, trauma (including picking the nose), chemical inhalation (especially tobacco smoke), tumors of the paranasal sinus or nasopharynx, septal perforation, arteriosclerosis, hypertension, and bleeding tendencies associated with anticoagulant drug use, anemia, antiplatelet agents (aspirin, nonsteroidal anti-inflammatory drugs), leukemia, hemophilia, thrombocytopenia, or liver disease.

**TREATMENT:** Epistaxis from the anterior nasal septum is usually mild and easily controlled with firm continuous pressure on the nose and nasal septum for five to ten minutes; bleeding from the posterior nasal cavity cannot usually be controlled with first aid measures at home, often drips into the throat or larynx, and requires professional management. Any bleeding that lasts more than 10 min despite firmly applied pressure to the bleeding source should receive professional care.

In the emergency room, the patient should lean forward slightly and expectorate to avoid swallowing blood and becoming nauseated, and breathe through the mouth while the pressure is maintained for an additional 5 min. Vital signs, a complete blood count, bleeding time, coagulation studies, and type and crossmatch are obtained. Patients who are bleeding vigorously, or those who are hypotensive require intravenous access and fluids. The anterior nasal cavity is examined with a nasal speculum to identify anterior bleeding. Anesthetic/vasoconstricting drugs such as topical cocaine or epinephrine are applied to shrink blood vessels. Cauterization using a silver nitrate stick, electrocautery or petroleum gauze nasal packing may be used for anterior bleeding if a bleeding site is clearly identified. The patient should then lie quietly, propped up at a 45° angle in bed and limit talking. Oral hygiene is provided to remove the taste of blood. The patient and family should be reassured that epistaxis usually looks much worse than it actually is. SEE: *nosebleed* for illus.

If the bleeding is in the posterior nasal cavity or bleeding from the anterior

nasal cavity cannot be controlled, nasal packing, nasal sponges, or inflatable balloons are inserted to tamponade the responsible blood vessels.

**PATIENT CARE:** Airway clearance and level of discomfort and anxiety are determined. The patient is assured that he or she may breathe through the mouth, with oxygen administered by mask if oximetry demonstrates a need. Antibiotics are typically prescribed if packing is to remain more than 24 hr. Vitamin K or frozen plasma may be used in cases of over-anticoagulation or bleeding disorders. If an artery is bleeding, surgical ligation or embolization and blood transfusion may be required.

After emergent care, the patient should avoid blowing or picking at the nose, removing nasal packing, or bending or lifting weights of more than 5 lb. until the site has healed. All procedures and expected sensations and outcomes are explained to the patient and caregivers. The need for follow-up, usually with an otorhinolaryngologist, to remove packing and inspect the nasal cavity is stressed. Future bleeding episodes may sometimes be prevented by controlling hypertension, carefully monitoring anticoagulation, humidifying ambient air, or avoiding digital trauma to the nose. The patient is shown how to apply anterior pressure to the nostrils to control anterior hemorrhage.

**apple packer's e.** Nosebleed due to handling packing trays containing certain dyes.

**episternum** (ĕp'ī-stĕr'nŭm) Upper portion of the sternum. SYN: *manubrium sterni*. **episternal**, *adj.*

**epitendineum** (ĕp'ī-tĕn-dĭn'ĕ-ŭm) [" + *L. tendere*, to stretch] The fibrous sheath enveloping a tendon.

**epitenon** (ĕp'ī-tĕn'ŏn) SEE: *epitendineum*.

**epithalamus** (ĕp'ī-thāl'ă-mŭs) [" + *thalamos*, chamber] The uppermost portion of the diencephalon of the brain. It includes the pineal body, trigonum habenulae, habenula, and habenular commissure.

**epithelia** (ĕp'ī-thĕ'lĕ-ă) Pl. of *epithelium*.

**epithelial cancer** (ĕp'ĕ-thĕ'lĕ-ă-ĭl kăn'sĕr) Basal cell carcinoma.

**epithelial cancer of the ovary** Ovarian cancer.

**epithelial diaphragm** The epithelial extension of Hertwig's root sheath that determines the number and size of tooth roots. It induces dentin formation locally as the root elongates. SEE: *Hertwig's root sheath*.

**epithelialization** (ĕp'ī-thĕ'lĕ-ă-ĭ-ză'shŭn) The growth of skin over a wound.

**epithelial tissue** Epithelium.

**epitheliitis** (ĕp'ī-thĕ'lĕ-ă-tĭs) Overgrowth and inflammation of the mucosal epi-

thelium following injury such as is caused by ionizing radiation.

**epithelioblastoma** (ĕp'ī-thĕ'lĕ-ŏ-blăst-ŏ-mă) [" + *thele*, nipple, + *blastos*, germ, + *oma*, tumor] An epithelial cell tumor.

**epithelioglandular** (ĕp'ī-thĕ'lĕ-ŏ-glăn'dŭ-lăr) Concerning the epithelial cells of a gland.

**epithelioid** (ĕp'ī-thĕ'lĕ-ŏ-yd) [" + " + *eidōs*, form, shape] Resembling epithelium.

**epitheliolysin** (ĕp'ī-thĕ-lĕ-ŏ-l'ĭ-sĭn) [" + " + *lysis*, dissolution] A specific lysin formed in blood serum of an animal into which epithelial cells of an animal of a different species were injected. The epitheliolysin destroys the cells of an animal of the same species as that from which the epithelial cells were derived.

**epitheliolysis** (ĕp'ī-thĕ-lĕ-ŏ-l'ĭ-sĭs) Death of epithelial tissue. Destruction or dissolving of epithelial cells by an epitheliolysin.

**epithelioma** (ĕp'ī-thĕ-lĕ-ŏ-mă) [" + *thele*, nipple, + *oma*, tumor] A malignant tumor consisting principally of epithelial cells; a carcinoma. A tumor originating in the epidermis of the skin or in a mucous membrane. **epitheliomatous** (-mă-tŭs), *adj.*

**e. adamantinum** An epithelioma of the jaw arising from the enamel organ. It may be solid or partly cystic. SYN: *adamantinoma*.

**e. adenoides cysticum** A basal cell carcinoma occurring on the surface of the body, esp. the face, and characterized by formation of cysts. SYN: *acanthoma adenoides cysticum*; *trichoepithelioma*.

**basal cell e.** Basal cell carcinoma.

**deep-seated e.** An epithelioma that invades and destroys tissue, forming irregular rounded ulcers. SYN: *rodent ulcer*.

**epitheliosis** (ĕp'ī-thĕ'lĕ-ŏ-sĭs) [" + *thele*, nipple, + *osis*, condition] Trachomatous proliferation of the conjunctival epithelium.

**epithelium** (ĕp'ī-thĕ'lĕ-ŭm) *pl.* **epithelia** [" + *thele*, nipple] The layer of cells forming the epidermis of the skin and the surface layer of mucous and serous membranes. The cells rest on a basement membrane and lie in close approximation with little intercellular material between them. They are devoid of blood vessels. The epithelium may be simple, consisting of a single layer, or stratified, consisting of several layers. Cells making up the epithelium may be flat (squamous), cube-shaped (cuboidal), or cylindrical (columnar). Modified forms of epithelium include ciliated, pseudostratified, glandular, and neuroepithelium. The epithelium may include goblet cells, which secrete mucus. Strat-

ified squamous epithelium may be keratinized for a protective function or abnormally keratinized in pathological response. Squamous epithelium is classified as endothelium, which lines the blood vessels and the heart, and mesothelium, which lines the serous cavities. Epithelium serves the general functions of protection, absorption, and secretion, and specialized functions such as movement of substances through ducts, production of germ cells, and reception of stimuli. Its ability to regenerate is excellent; it may replace itself as frequently as every 24 hr. **SEE: illus.; skin. epithelial** (-äl), *adj.*

**ciliated e.** Epithelium with hairlike processes on the surface that wave actively only in one direction. This type is present in the respiratory tract and fallopian tubes.

**columnar e.** Epithelium composed of cylindrical cells.

**cuboidal e.** Epithelium consisting of cube-shaped or prismatic cells with height about equal to their width.

**germinal e.** 1. Epithelium that covers the surface of the genital ridge of the urogenital folds of an embryo. It gives rise to the seminiferous tubules of the testes and the surface layer of the ovary. It was once thought to produce the germ cells (spermatozoa and ova). 2. The epithelium that covers the surface of a mature mammalian ovary.

**glandular e.** Epithelium consisting of secretory cells.

**junctional e.** A band of nonkeratinized stratified squamous epithelium that attaches both to the gingiva (on one side) and the crown of the tooth (on the other). SYN: *epithelial attachment; gingival cuff.*

**laminated e.** Stratified e.

**mesenchymal e.** Squamous epithelium that lines the subarachnoid and subdural cavities, the chambers of the eye, and the perilymphatic spaces of the ear.

**pavement e.** Epithelium consisting of flat, platelike cells in a single layer.

**pigmented e.** Epithelium containing pigment granules.

**pseudostratified e.** Epithelium in which the bases of cells rest on the basement membrane but the distal ends of some do not reach the surface. Their nuclei lie at different levels, giving the appearance of stratification.

**reduced enamel e.** Combined epithelial layers of the enamel organ, which form a protective layer over the enamel crown as it erupts and then become the primary epithelial attachment surrounding the tooth.

**squamous e.** The flat form of epithelial cells.

**stratified e.** Epithelium with the cells in layers; mitosis takes place in the

lowest layer. SYN: *laminated epithelium.*

**sulcular e.** The nonkeratinized epithelium that lines the gingival sulcus.

**transitional e.** A form of stratified epithelium in which the cuboidal cells adjust to mechanical changes such as stretching and recoiling. This type of tissue is found only in the urinary system (renal pelvis, ureter, bladder, and a part of the urethra).

**epitope** (ëp'î-töp) Any component of an antigen that functions as an antigenic determinant by permitting the attachment of certain antibodies. SYN: *antigenic determinant.* SEE: *paratope.*

**immunodominant e.** Immunodominant peptide.

**epitrichium** (ëp'î-trîk'ë-üm) [Gr. *epi*, upon, + *trichion*, hair] The superficial layers of the epidermis of the fetus. SYN: *epitrichial layer; periderm.*

**epitrochlea** (ëp'î-trök'lë-ä) [" + *trochalia*, pulley] The inner condyle of the humerus. **epitrochlear, adj.**

**epizoon** (ëp'î-zō'ön) *pl.* **epizoa** [" + *zoon*, animal] An animal organism living as a parasite on the exterior of the host animal. **epizoic** (-zō'îk), *adj.*

**epizootic** (ëp'î-zō-öt'îk) 1. Any disease of animals that becomes epidemic. 2. Widely disseminated in a group of animals; said of diseases and conditions.

**Epley maneuver** (ëp'lë) Canalith repositioning maneuver.

**epoch** (ëp'ök) A measurable amount of time; e.g., the length of time used in standardized sleep studies (usually 30 sec to 1 min), or the duration of a particular geological or biological event, as indicated in earth sciences.

**epoetin alfa** (ë'pō-ët'in) Synthetic human erythropoietin. SEE: *erythropoietin.*

**eponychium** (ëp'ō-nîk'ë-üm) [" + *onyx*, nail] 1. The horny embryonic structure from which the nail develops. 2. The perionychium.

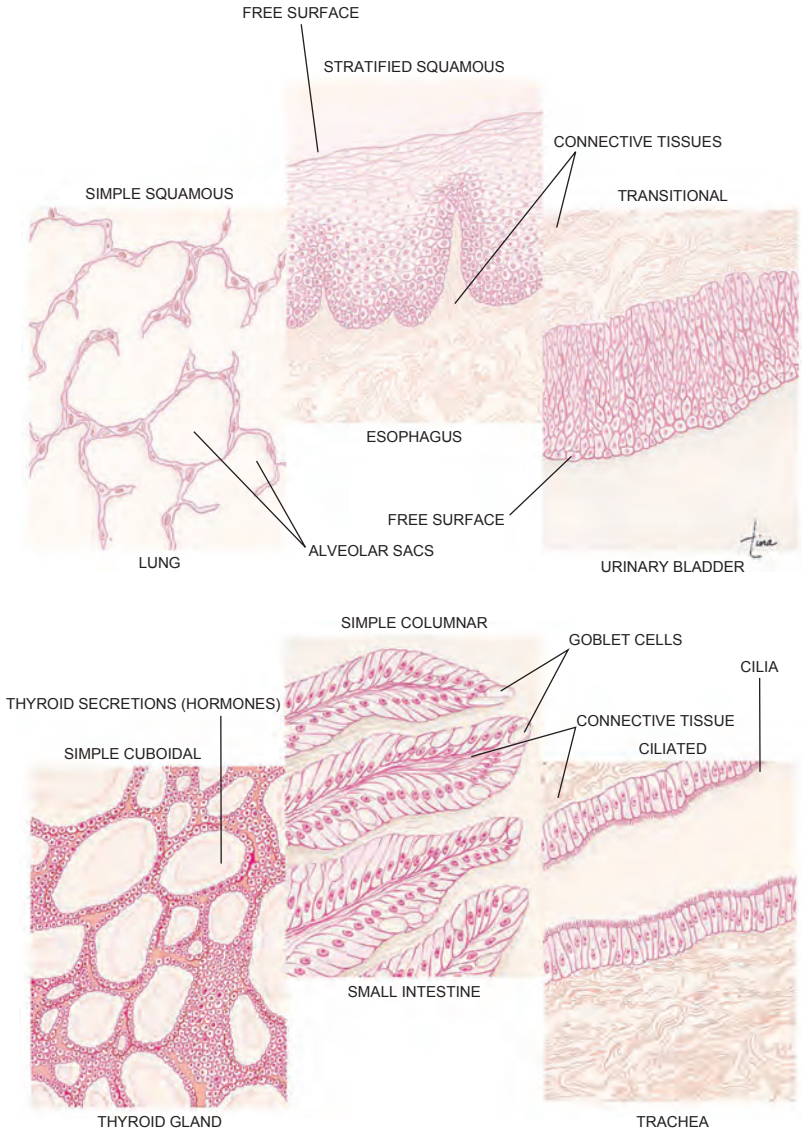
**eponym** (ëp'ō-nîm) [Gr. *eponymos*, named after] A name for anything (disease, organ, function, place) adapted from the name of a particular person or sometimes a geographical location (e.g., Haverhill fever, Lyme disease).

**epoophorectomy** (ëp'ō-ō-fō-rëk'tō-më) [Gr. *epi*, upon, + *oophoron*, ovary, + *ektome*, excision] Removal of the parovarium.

**epoophoron** (ëp'ō-ō-fō-rōn) A rudimentary structure located in the mesosalpinx. Consisting of a longitudinal duct (duct of Gartner) and 10 to 15 transverse ducts, it is the remains of the upper portion of the mesonephros and is the homologue of the head of the epididymis in males. SYN: *parovarium; Rosenmüller's body.*

**e-portfolio** (ë'pört-fō'lë-ō) An electronic resume on a personalized website with





### EPITHELIAL TISSUES

(Orig. mag.  $\times 430$ )

links to one's personal data, philosophical perspectives, and academic, avocational, creative, and professional accomplishments. SYN: *digital portfolio*; *electronic portfolio*.

**epoxide** (ě-pők'sid) Any chemical compound that contains two carbon atoms joined to a single oxygen atom.

**epoxy** (ě-pők'sē) A general term for a polymer that contains molecules in which oxygen is attached to two differ-

ent carbon atoms. These compounds are widely used as adhesives.

**e-prescribing** The use of the Internet and e-mail for prescribing and acquiring medical orders for patients.

**EPS** *electrophysiology study*.

**EPSP** *excitatory postsynaptic potential*.

**Epstein-Barr virus** (ěp'stēn-bār) [M. A. Epstein, Brit. physician, b. 1921; Y. M. Barr, Canadian physician, b. 1932] ABBR: EBV. A member of the herpes-

virus family, discovered in 1964. It is one of the causes of infectious mononucleosis. In South African children, it is associated with Burkitt's lymphoma; in Asian populations, with nasopharyngeal carcinoma.

**Epstein's pearls** (ěp'stīnz) [Alois Epstein, Czech, pediatrician, 1849–1918] In infants, benign retention cysts resembling small pearls, which are sometimes present in the palate. They disappear in 1 to 2 months.

**epulis** (ěp-ū'lis) *pl.* **epulides** [Gr. *epoulis*, a gumboil] **1.** A fibrous sarcomatous tumor having its origin in the periosteum of the lower jaw. **2.** A nonpathological softening and swelling of the gums due to hyperemia that begins during midtrimester pregnancy and subsides after delivery. In susceptible women, this condition tends to recur during subsequent pregnancies. **epuloid**, *adj.*

**epulosis** (ěp'ū-lō'sis) [Gr. *epoulosis*] Cicatrization. **epulotic**, *adj.*

**epulotic** (ěp'ū-lōt'ik) [Gr. *epoulotikos*] Promoting cicatrization.

**EQA** *External quality assessment.*

**Equal Employment Opportunity Commission** ABBR: EEOC. A federal agency that enacts and enforces regulations that protect against discrimination in the workplace, esp. on the basis of age, gender, race, religious preference, or functional impairment.

**equation** [L. *aequare*, to make equal] **1.** The state of being equal. **2.** In chemistry, a symbolic representation of a chemical reaction. **3.** A description of a mathematical relation between two or more constants or variables.

**e. of motion** A statement of the variables of pressure, volume, compliance, resistance, and flow for respiratory system mechanics.

**equator** [L. *aequator*] A line encircling a round body and equidistant from both poles. **equatorial**, *adj.*

**e. of cell** The boundary of a plane through which the division of a cell occurs.

**e. of crystalline lens** The line that marks the junction of the anterior and posterior surfaces of the crystalline lens. The fibers of the suspensory ligament are attached to it.

**e. oculi** An imaginary line encircling the eyeball midway between the anterior and posterior poles.

**equi-** [L. *aequus*, equal] Prefix meaning *equal*.

**equilibrating** (ě-kwīl'ī-brāt-īng) [L. *aequilibrium*, in perfect balance] Maintaining equilibrium.

**equilibration** (ě-kwīl'ī-brā'shūn) The modification of masticatory forces or occlusal surfaces of teeth to produce simultaneous occlusal contacts between upper and lower teeth, and to equalize the stress of occlusal forces of the sup-

porting tissues of the teeth. SYN: *occlusal equilibration*.

**occlusal e.** Equilibration.

**equilibrium** (ě'kwī-lib'rē-ūm) [L. *aequus*, equal, + *libra*, balance] A state of balance; a condition in which tending forces are equal.

**dynamic e. 1.** The sense of balance while the body or head is in motion. This is maintained by coordinating data from postural (stretch) receptors in the limbs with data from the inner ear and cerebellum. **2.** Homeostasis.

**nitrogenous e.** A situation where a balance between nitrogen excretion and nitrogen intake are equal.

**physiological e.** In nutritional theory, a state in which the body's intake and excretion of nutrients are perfectly matched.

**static e.** SEE: *static equilibrium*.

**thermal e.** A condition in which two substances exist at the same temperature and in which heat transfer is therefore in a steady state.

**equilin** (ě'kwīl-in) [L. *equus*, horse] Crystalline estrogenic hormone derived from the urine of pregnant mares.

**equimolar** (ě'kwī-mō'-lār) In the quantitative comparison of chemical substances, having the same molar concentration.

**equine** (ě'kwīn) [L. *equus*, horse] Concerning or originating from a horse.

**equinovarus** (ě-kwī'nō-vā'rūs) [L. *equinus*, equine, + *varus*, bent inward] A form of clubfoot with a combination of pes equinus and pes varus (i.e., walking without touching the heel to the ground and with the sole turned inward).

**equipoise** (ě'kwī-poyz', ěk'wī-) In the design of clinical trials, a state in which the risks and benefits of alternative treatments offered during the trial are balanced, so that no pre-existing advantage is known to exist for one treatment arm over the other. This is a required ethical consideration in clinical research.

**equipotential** (ě'kwī-pō-těn'shāl) [L. *aequus*, equal, + *potentia*, ability] Having the same electric charge or physical strength.

**equivalence** (ě-kwīv'ā-lēns) ["/ + *valere*, to be worth] The quality of being equal in power, potency, force, value, or clinical effectiveness.

**equivalent** (ě-kwīv'ā-lēnt) **1.** Equal in power, force, or value. **2.** The amount of weight of any element needed to replace a fixed weight of another body. **3.** Bioequivalent (1).

**dose e.** In radiology, the product of the absorbed dose and the quality factor. Expressed in rems or sieverts, it measures the effects of absorbing different types of radiation. SEE: *factor, quality*.

**human skin e.** SEE: *human skin equivalent*.

**metabolic e.** ABBR: MET. A unit used to estimate the metabolic cost of physical activity. One MET equals the uptake of 3.5 ml of oxygen per kilogram of body weight per minute.

**toxicity e.** ABBR: TEQ. **1.** The toxicity of a component of a toxic mixture to the toxicity of all the materials in the mixture. **2.** The toxicity of a substance relative to a pure sample of a known toxin, such as dioxin.

**equivalent dose** ABBR: HT. The biologically active dose of radiation. The damage that a particular absorbed radiation dose will have on living cells and tissues.

**ER** *Emergency Room; external resistance; external rotation.*

**Er** Symbol for the element erbium.

**eradication** (ē-rād'ī-kā'shūn) **1.** Complete elimination of a disease, esp. one that is epidemic or endemic. **2.** Complete elimination of a pathogen or a tumor from the body.

**erb-B2** (ērb-bē too) Member of the *erb-B* family of oncogenes. This oncogene is overexpressed in some human cancers, including breast. Its protein product contains part of the epidermal growth factor (EGF) receptor. Overexpression of this oncogene is associated with progression of human breast cancer. SEE: *oncogene; epidermal growth factor; breast cancer.*

**Erben's reflex** (ērb'ēnz) [Siegfried Erben, Austrian physician, b. 1863] The slowing of the pulse when the head and trunk are forcibly bent forward.

**erbium** (ēr'bē-ūm) A rare metallic element with atomic number 68, an atomic weight of 167.26, and a specific gravity of 9.051. Its symbol is Er.

**Erb's paralysis** (ērbz) [Wilhelm Heinrich Erb, Ger. neurologist, 1840–1921] Duchenne-Erb paralysis.

**Erb's point** The point on the side of the neck 2 to 3 cm above the clavicle and in front of the transverse process of the sixth cervical vertebra. Electrical stimulation over this area causes various arm muscles to contract.

**ERCP** *endoscopic retrograde cholangiopancreatography.*

**erectile** (ē-rēk'tīl) [L. *erigere*, to erect] Able to assume an upright position.

**erectile dysfunction** ABBR: ED. SEE: *under dysfunction.*

**erection** (ē-rēk'shūn) The state of swelling, hardness, and stiffness observed in the penis and to a lesser extent in the clitoris, generally due to sexual excitement. It is caused by engorgement with blood of the corpora cavernosa and the corpus spongiosum of the penis in men and the corpus cavernosa clitoridis in women.

Erection is necessary in men for the

natural intromission of the penis into the vagina but not for the emission of semen. The blood withdraws from the penis after ejaculation and the erection is reduced. Erection of the penis may occur as the result of sexual excitement, during sleep, or due to physical stimulation of the penis. Abnormal persistent erection of the penis due not to sexual excitement but to certain disease states is called priapism. SEE: *nocturnal emission; penile prosthesis; priapism.*

**erector** (ē-rēk'tor) [L. *erigere*, to erect] A muscle that raises a body part.

**erector spinae reflex** Irritation of the skin over the erector spinae muscles causing contraction of the muscles of the back. SYN: *dorsal reflex; lumbar reflex.*

**eremophobia** (ēr'ēm-ō-fō'bē-ā) [Gr. *eremos*, solitary, + *phobos*, fear] Dread of being alone.

**erethism, erethism mercurialis** (ēr'ē-thīzm) [Gr. *erethismos*, irritation] A group of psychological signs and symptoms associated with acute mercury poisoning. Included are restlessness, irritability, insomnia, difficulty in concentrating, and impaired memory. In severe cases, delirium and toxic psychosis may develop. SEE: *mercury poisoning.*

**erethismic** (ēr'ē-thīz'mīk) Pert. to or causing erethism.

**erethisophrenia** (ēr'ē-thī-zō-frē'nē-ā) [ + *phren*, mind] Unusual mental excitability.

**ereuthrophobia** (ēr'ū-thrō-fō'bē-ā) [Gr. *erythros*, red, + *phobos*, fear] Pathological fear of blushing. SYN: *erythrophobia.*

**ERG** *electroretinogram.*

**erg** (ērg) [Gr. *ergon*, work] In physics, the amount of work done when a force of 1 dyne acts through a distance of 1 cm. One erg is roughly  $\frac{1}{980}$  gram-centimeter. That is, raising a load of 1 g against gravity the distance of 1 cm requires that a force of 980 dynes operate through a distance of 1 cm, and hence that 980 ergs of work be done.

**-erg, -ergo** Combining forms indicating work.

**ergasiomania** (ēr-gā'sē-ō-mā'nē-ā) [Gr. *ergasia*, work, + *mania*, madness] An abnormal desire to be busy at work.

**ergasiophobia** (ēr-gā'sē-ō-fō'bē-ā) [ + *phobos*, fear] Abnormal dislike for work of any kind or for assuming responsibility.

**ergastic** (ēr-gās'tīk) [Gr. *ergastikos*] Possessing potential energy.

**ergo-** Prefix meaning work.

**ergocalciferol** (ēr-gō-kāl-sīf'ēr-ōl) Vitamin D<sub>2</sub>, an activated product of ergosterol. It is used primarily in prophylaxis and treatment of vitamin D deficiency.

**ergogenic** (ēr'gō-jēn'īk) [Gr. *ergon*, work, + *gennan*, to produce] Having

the ability to increase work, esp. to increase the potential for work output.

**ergogenic aid** In sports medicine, the questionable and often harmful use of various substances in an attempt to enhance performance. Some of these materials—such as blood transfusions, anabolic steroids, amphetamines, amino acids, and human growth hormone—are standard medicines approved for uses other than those intended by the athlete. Others are not only not indicated for any illness but may be harmful, esp. when the amount of the active ingredient in the product is unknown. Included in this latter group are cyproheptadine, taken to increase appetite, strength, and, allegedly, testosterone production; ginseng; pangamic acid; octacosanol, a 28-carbon straight-chain alcohol obtained from wheat germ oil, the biological effects of which are unknown; guarana, prepared from the seeds of the *Paullinia cupana* tree, used for its alleged ability to increase energy; gamma-oryzanol, an isomer of oryzanol extracted from rice bran oil, allegedly useful in decreasing recovery time after exercise; proteolytic enzymes (e.g., chymotrypsin, trypsin-chymotrypsin, and papain), the safety and efficacy of which have not been established, esp. when used with oral anticoagulants or by pregnant or lactating women; and bee pollen, which has shown no evidence of improving athletic performance. SEE: *anabolic agent*; *blood doping*.

**ergometer** (ēr-gōm'è-tēr) [*"* + *metron*, measure] An apparatus for measuring the amount of work done by a human or animal subject.

**arm e.** A hand-driven crank used instead of a bicycle or treadmill to measure cardiopulmonary conditioning or health.

**bicycle e.** A stationary bicycle used in determining the amount of work performed by the rider.

**ergonomic aid** Any device used to enhance human comfort, health, and performance in the workplace.

**ergonomics** (ēr'gō-nōm'iks) [*"* + *nomikos*, law] The science concerned with fitting a job to a person's anatomical, physiological, and psychological characteristics in a way that enhances human efficiency and well-being.

**ergophobia** (ēr'gō-fō'bē-ā) [*"* + *phobos*, fear] Morbid dread of working.

**ergosterol** (ēr-gōs'tēr-ōl) The primary steroid found in the cell membrane of some fungi; it stabilizes the membrane, as does cholesterol in human cells. Many antifungal drugs act on ergosterol to increase permeability of the cell membrane of the fungus, promoting its destruction.

**ergot** (ēr'gōt) A drug obtained from

*Claviceps purpurea*, a fungus that grows parasitically on rye. Several valuable alkaloids, such as ergotamine, are obtained from ergot.

**ergotherapy** (ēr'gō-thēr'ā-pē) [*"* + *therapeia*, treatment] The use of an appropriate amount of physical exertion as a treatment for disease (e.g., in the treatment of type 2 diabetes mellitus or hyperlipidemia).

**ergothioneine** (ēr-gō-thī'ō-nēn) C<sub>9</sub>H<sub>15</sub>N<sub>3</sub>O<sub>2</sub>S·2H<sub>2</sub>O; thiohistidine-betaine. A compound containing crystalline sulfur, it is found in ergot and red blood cells.

**ergotism** (ēr'gō-tīzm) Ergot poisoning.

**ergotope, ergotype** (ūr'gō-tōp') [Gr. *ergon*, work + *"*] An activation marker on a T cell.

**ergot poisoning** SEE: *under poisoning*.

**Erickson, Helen Cook** (ēr'ik-sōn) A U.S. nursing theorist. With Evelyn Tomlin and Mary Ann Swain, she developed and published the grand nursing theory of Modeling and Role-Modeling in 1983. SEE: *Nursing Theory Appendix*.

**Erikson, Erik H.** (ēr'ik-sōn) [Ger.-born U.S. psychoanalyst, 1902–1993] A psychological theorist who proposed eight developmental stages from birth to late adulthood. In each stage, there is conflict between a specific psychosocial task and an opposing ego threat that must be resolved:

Birth to 1 year: Trust/mistrust

2 to 3 year: Autonomy/shame and doubt

4 to 5 year: Initiative/guilt

6 to 12 year: Industry/inferiority

13 to 18 year: Identity/role confusion

Young adult: Intimacy/isolation

Middle-aged adult: Generativity/self-absorption

Old adult: Ego integrity/despair

**ERISA** Employee Retirement Income Security Act.

**Eristalis** (ērīs'tā-līs) A genus of flies belonging to the family Syrphidae. The larva, called rat-tailed maggot (*E. tenax*), may cause intestinal myiasis in humans.

**erm gene** (ürm) [Acronym fm. *erythromycin ribosomal methylase*] A gene that promotes methylation of ribosomal RNA and other intracellular molecules. It is responsible for bacterial resistance to antibiotics such as the macrolides, lincosamides, and streptogramins.

**erode** (ē-rōd') [L. *erodere*] **1.** To wear away. **2.** To eat away by ulceration.

**erogenous** (ēr-ōj'ē-nūs) [Gr. *eros*, love, + *gennan*, to produce] Causing sexual excitement. SYN: *erotogenic*.

**eros** (ēr'ōs) **1.** In psychoanalysis, the collective instincts for self-preservation. **2.** The Greek god of love.

**E rosette test** A laboratory test performed to identify human T lympho-



cytes. When T lymphocytes combine with sheep red blood cells in a culture, a cluster of cells called a rosette forms. This test is often replaced by the use of monoclonal antibodies that identify the CD4 receptor specific for T cells.

**erosion** (ĕ-rō'shŭn) [L. *erodere*, to gnaw away] **1.** An eating away of tissue. **2.** External or internal destruction of a surface layer by physical or inflammatory processes.

**e. of cervix uteri** The alteration of the epithelium on a portion of the cervix as a result of irritation or infection.

**SYMPTOMS:** In the early stages, the epithelium shows necrosis; in healing, there is a downgrowth of epithelium from the endocervical canal. If the growth is a single layer of tissue with a grossly granular appearance, it is called a simple granular erosion. If the growth is excessive and shows papillary tufts, it is called a papillary erosion. Histologically, the papillary erosion shows many branching racemose glands; their epithelium is the mucus-bearing cell with the nucleus at the base. In the healing process, squamous epithelium grows over the eroded area with one of the following results: the squamous cells replace the tissue beneath them completely, giving complete healing; the glands fill with squamous plugs and remain in that state; or the mouths of the glands are occluded by the squamous cells and nabothian cysts form. In the congenital type of erosion, the portio is covered by high columnar epithelium. SEE: *carcinoma in situ*; *Papanicolaou test*.

**TREATMENT:** Treatment consists of proper care of the cervix following delivery. Electrocauterization of the early erosion is usually curative. Cryotherapy may be used.

**dental e.** The wearing away of the surface layer (enamel) of a tooth. SEE: *abrasion*; *attrition*; *bruxism*.

**erosive** (ĕ-rō'siv) **1.** Able to produce erosion. **2.** An agent that erodes tissues or structures.

**erotic** (ĕ-rōt'ik) [Gr. *erotikos*] **1.** Stimulating sexual desire. **2.** Pert. to sexual love. **3.** Pert. to sexuality. **4.** Marked by or subject to sexual desire.

**eroticism** (ĕ-rōt'ī-sīzm) [l' + *-ismos*, condition] Sexual desire.

**anal e.** **1.** Sensations of pleasure experienced through defecation during a stage in the development of children. **2.** In psychiatry, fixation of the libido at the anal-erotic developmental stage. Personality traits associated with anal eroticism include cleanliness, frugality, and neatness, and an unusual interest in regularity of bowel movements. SYN: *anal erotism*. SEE: *anal stage*.

**oral e.** **1.** Sexual pleasure derived from use of the mouth. **2.** In psychiatry,

fixation of the libido to the oral phase of development.

**erotogenic** (ĕ-rō'tō-jĕn'ik) [Gr. *eros*, love, + *gennan*, to produce] Producing sexual excitement. SEE: *erogenous zone*.

**erotology** (ĕ-rō'tōl'ō-jĕ) [l' + *logos*, word, reason] The study of love and its manifestations.

**erotomania** (ĕ-rō'tō-, ĕ-rōt'ō-mā'nĕ-ā) [l' + *mania*, madness] The delusion that one is loved by another person, esp. a person of high economic, social, or political status. The delusion is more one of romantic or spiritual love, rather than physical. The object is usually someone of higher status or fame, but may be a complete stranger. SYN: *erotomonomania*; *erotomanic type paranoia*.

**erotomonomania** (ĕ-rōt'ō-mōn'ō-mā'nĕ-ā) Erotomania.

**erotophobia** (ĕ-rō'tō-, ĕ-rōt'ō-fō'bĕ-ā) [l' + *phobos*, fear] An aversion to sexual love or its manifestations.

**erratic** (ī-răt'ik) [L. *errare*, to wander] Having an unpredictable or fluctuating course or pattern; wandering.

**error** A mistake or miscalculation.

**active e.** A mistake that immediately injures a patient. SEE: *latent e.*

**inborn e. of metabolism** Any inherited metabolic disease caused by the absence or deficiency of specific enzymes necessary to the metabolism of basic substances such as amino acids, carbohydrates, vitamins, or essential trace elements. SEE: *metabolism*.

**latent e.** A flaw in the design or organization of health care delivery systems that may allow, on occasion, injuries to occur to patients.

**measurement e.** The difference between the true value of something being measured and the value obtained by measurement. Measurement error can be the result of one or more of several different factors, including operational blunders, random error, and systematic error. SEE: *bias*; *proportional e.*; *random e.*

**proportional e.** Systematic error that varies directly with the concentration or activity of the analyte.

**random e.** The patternless differences observed between successive analytical results or statistical trials. Even though the individual results are patternless and unpredictable, the range of random error can be predicted with a given probability once sufficient experience has been gained. The random error is then quantified by the standard deviation, the coefficient of variation, and other statistics. SEE: *measurement e.*; *systematic e.*

**systematic e.** The residual error after random error has been subtracted from total error. SEE: *bias*; *proportional e.*



**type I e.** In statistics, experimental medicine, and epidemiology, erroneous rejection of a hypothesis.

**type II e.** In statistics, experimental medicine and epidemiology, erroneous acceptance of a hypothesis.

**error chain** Linked events that ultimately result in an adverse patient outcome.

**error disclosure** Reporting to a patient that a mistake was made in the provision of his or her health care. It is a practice that is widely advocated by bioethicists but generally eschewed by practitioners because of fears of litigation or investigation. When surveyed, patients report wanting full disclosure of any errors made during their treatment. They prefer to hear how the error occurred, and how similar errors can be prevented. Finally, most patients want their practitioners to apologize or express regret about their errors.

Laws to encourage health care providers to disclose errors are known colloquially as "apology laws." These laws encourage expressions of regret by exempting statements made in apology from legal action or liability.

**ERT** *estrogen replacement therapy.*

**eructation** (ĕ-rŭk-tā'shŭn) [L. *eructare*] Producing gas from the stomach, usually with a characteristic sound; belching.

**eruption** (ĕ-rŭp'shŭn) [L. *eruptio*, a breaking out] **1.** A visible breaking out, esp. of a skin lesion or rash accompanying a disease such as measles or scarlet fever. **2.** The appearance of a lesion such as redness or spotting on the skin or mucous membrane. **3.** The breaking of a tooth through the gum; the cutting of a tooth. **eruptive** (-tĭv), *adj.*

**active e.** Movement of the tooth toward the occlusal plane.

**creeping e.** A skin lesion marked by a tortuous elevated red line that progresses at one end while fading out at the other. It is caused by the migration into the skin of the larvae of certain nematodes, esp. *Ancylostoma braziliense* and *A. caninum*, which are present in ground exposed to dog or cat feces. SYN: *cutaneous larva migrans.*

**delayed e.** The most common variation in the tooth eruption pattern. It may be due to crowding or to various genetic, endocrine, or physiological factors.

**drug e.** Dermatitis produced in some patients by application or ingestion of drugs. Drug rashes usually appear on the trunk (chest and back). SEE: **illius.**

**fixed drug e.** A localized red rash with a sharp border, which follows exposure to a drug. The rash usually burns, occurs on the face or the genitals, and, if the offending agent is given



**DRUG ERUPTION**

again, recurs in the same location (i.e., it is "fixed" in place).

**passive e.** Increased size of the clinical crown of a tooth by apical migration of the attachment epithelium and periodontium.

**seabather's e.** Itching red papules that may appear on the skin within a few hours of swimming in saltwater. The rash is caused by the sting of the larval forms of the thimble jellyfish or the sea anemone. The rash is usually more prominent under swimsuits than on exposed skin because the pressure of clothing on the skin releases the stinging barbs of the larvae. The swimsuit should be washed before it is worn again. Treatment is symptomatic, with oral antihistamines or topical corticosteroids.

**serum e.** An eruption that occurs following the injection of serous fluid. It may be accompanied by chills, fever, and arthritic symptoms.

**eRx** *Electronic prescribing.*

**erysipelas** (ĕr'ĭ-sĭp'ĕ-lās) [Gr. *erythros*, red, + *pella*, skin] An infection of the skin (usually caused by group A streptococci) that is marked by a bright red, swollen, sharply defined rash (that stings or itches) on the face, scalp, arms, legs, or trunk. Systemic symptoms such as fevers, chills, sweats, or vomiting may occur; local tissue swelling and tenderness and blistering of the rash are common. A toxin released into the skin by *Streptococcus pyogenes* creates many of the signs and symptoms of the infection. Erysipelas occurs primarily in children, adults over age 60, people with immunocompromising illnesses, and individuals with prior lymphatic or venous obstruction or surgery. SEE: **illius; cellulitis.**

**TREATMENT:** Oral or IV penicillins or erythromycin, or first-generation cephalosporins, vancomycin, or clinda-



ERYSIPELAS

mycin may effectively eradicate the responsible bacteria. Analgesic and antipyretic drugs, such as acetaminophen or ibuprofen, cold packs and topical anesthetics, and elevation of the affected area provide comfort. Standard and barrier precautions are employed.

**PROGNOSIS:** The prognosis is excellent with treatment. Without treatment, the infection may spread, or cause nephritis, abscesses, septicemia and death.

**PATIENT CARE:** Patients and family members are taught to use thorough handwashing before and after touching the affected area to prevent the spread of infection and how to safely clean or dispose of drainage-contaminated articles. The application of cool compresses and elevating the affected parts may reduce discomfort. SEE: *Standard Precautions Appendix*.

**erysipelatous** (ēr'ī-sī-pēl'ă-tūs) Of the nature of or pert. to erysipelas.

**erysipeloid** (ēr-ī-sīp'ē-loyd) [" + " + *eidos*, form, shape] Inflammation of the skin, primarily the hands and fingers, caused by the bacteria *Erysipelothrix rhusiopathiae*. It occurs in butchers, fishermen, and others who handle raw fish and poultry. The infected areas are warm, swollen, and reddish-purple. The infection rarely moves to the bloodstream and is treated with penicillin G or ampicillin, which resolves the infection in approx. 3 weeks. Erysipeloid-like rashes of the hands are sometimes caused by other infectious agents, such as *Leishmania* or fungi.

**Erysipelothrix rhusiopathiae** (ēr'ī-sī-pēl'ō-thrīks) [" + " + *thrix*, hair] A species of gram-positive, filamentous bacilli that causes erysipeloid.

**erysipelotoxin** (ēr'ī-sīp'ē-lō-tōk'sīn) The poisonous substance produced by *Streptococcus pyogenes*, the causative agent of erysipelas.

**erysiphake** (ēr-īs'ī-fāk) A small spoon-shaped device used in cataract surgery to remove the lens by suction.

**erythema** (ēr'ī-thē'mă) [Gr., redness] Reddening of the skin. Erythema is a common but nonspecific sign of skin irritation, injury, or inflammation. **ery-**

**thematic, erythematous** (-thē-măt'ik, -thēm'ă-tūs), *adj.*

**ETIOLOGY:** It is caused by dilation of superficial blood vessels in the skin.

**e. ab igne** Localized erythema due to exposure to heat.

**e. annulare** A red, ring-shaped rash.

**e. chronicum migrans** ABBR: ECM. Erythema migrans.

**e. induratum** Chronic vasculitis of the skin occurring in young women. Hard cutaneous nodules break down to form necrotic ulcers and leave atrophic scars. SYN: *Bazin's disease*.

**e. infectiosum** A mild, moderately contagious disease seen most commonly in school-age children. SYN: *Fifth disease*.

**ETIOLOGY:** The causative agent is human parvovirus B-19. Transmission is thought to be via respiratory secretions from infected patients; however, maternal-fetal transmission can occur and hemolytic disease of the newborn may result.

**SYMPTOMS:** Patients experience a mild, brief illness; complaints include fever, malaise, headache, and pruritus. The characteristic erythema appears about 10 days later. Facial redness is similar to that which occurs when a child is slapped; however, circumoral redness is absent. Several days following initial erythema, a less distinct rash may appear on the extremities and trunk. The rash usually resolves within 1 week but may occur for several weeks when the patient is exposed to heat, cold, exercise, or stress. Adults may also experience arthralgia and arthritis although these symptoms are less common in children. In addition, mild transient anemia, thrombocytopenia, and leukopenia may develop.

**TREATMENT:** Most patients require no specific therapy. Patients with chronic hemolytic anemia may experience transient aplastic crisis (TAC). These patients should be warned of the danger of exposure to parvovirus B-19 infection, informed of the early signs and symptoms, and instructed to seek medical consultation promptly if exposure is suspected. Patients with TAC may develop a life-threatening anemia that requires immediate blood transfusion or partial exchange transfusion.

**e. intertrigo** Chafing.

**e. marginatum** A form of erythema multiforme in which the center of the area fades, leaving elevated edges.

**e. migrans** ABBR: EM. The hallmark of acute infection with Lyme disease. EM is an expanding red rash with a sharply defined border and (typically) central clearing. The rash usually appears within 3–32 days after a tick bite. The center of the rash is the site of inoculation. The causative agent is *Bor-*

*relia burgdorferi*, a spirochete that may later invade the joints, the central nervous system, or the conducting system of the heart. SYN: *erythema chronicum migrans*. SEE: *Lyme disease* for illus.

**e. multiforme** ABBR: EM. A rash usually caused by an immune response to drugs or to an infection, esp. herpes simplex virus. It may express itself on the skin in multiform ways, including macules, papules, blisters, hives, and, characteristically, iris or target lesions. It may involve the palms and soles, the mucous membranes, the face, and the extremities. The disease is usually self-limited. The most severe (and occasionally fatal) variant of the illness, in which the eyes, mouth, and internal organs are involved, is called Stevens-Johnson syndrome, or toxic epidermal necrolysis. SEE: *illus*.



ERYTHEMA MULTIFORME

**necrolytic migratory e.** The raised red scaly rash characteristic of glucagonoma.

**e. nodosum** A tender, red, nodular rash on the shins that typically arises in conjunction with another illness (e.g., a streptococcal, fungal, or tubercular infection; inflammatory bowel disease; occult cancer; or sarcoidosis). Biopsies of the rash reveal inflammation of subcutaneous fat (panniculitis). Because the disease is often associated with other serious illnesses, a diagnostic search for an underlying cause usually is undertaken. In some patients, no cause is identified.

**TREATMENT:** Therapy is directed at the cause, when it is known. Nonsteroidal anti-inflammatory drugs provide symptomatic relief for many patients.

**e. nodosum leprosum** ABBR: ENL. A red, nodular vasculitic rash, which may be a complication of the treatment for leprosy. SEE: *lepra*.

**TREATMENT:** Treatment consists of withdrawing therapy against leprosy (i.e., clofazimine, steroids, or thalidomide).

**punctate e.** Erythema occurring in

minute points, such as scarlet fever rash.

**toxic e.** Redness of the skin or a rash resulting from toxic agents such as drugs.

**e. toxicum neonatorum** A benign, self-limited rash marked by firm, yellow-white papules or pustules from 1 to 2 mm in size present in about 50% of full-term infants. The cause is unknown, and the lesions disappear without need for treatment.

**e. venenatum** A form of erythema caused by contact with a toxic substance.

**erythema elevatum diutinum** A form of vasculitis that affects the skin on the extensor surfaces of the forearms or legs; it is often seen in HIV-infected individuals.

**erythemato-** [Gr. *erythros*] SEE: *erythro-*.

**erythemo-** [Gr. *erythros*] SEE: *erythro-*.  
**erythemogenic** (ĕr'ĭ-thĕ'mō-jĕn'ĭk) [" + *gennan*, to produce] Producing erythema.

**erythr-** SEE: *erythro-*.

**erythralgia** (ĕr'ĭ-thrāl'jĕ-ă) [" + *algos*, pain] Erythromelalgia.

**erythrasma** (ĕr'ĭ-thrăz'mă) A red-brown eruption in patches in the axillae and groin caused by *Corynebacterium minutissimum*.

**erythremia** (ĕr'ĭ-thrĕ'mĕ-ă) [" + *haima*, blood] Polycythemia vera.

**erythrim** (ĕr'ĭ-thrĭzm) [" + *-ismos*, condition of] Red hair and beard with a ruddy complexion. **erythritic** (-thrĭs'tĭk), *adj.*

**erythro-, erythr-, erythemo-, erythemato-** [Gr. *erythros*] Combining forms meaning *red*.

**erythroblast** (ĕ-rĭth'rō-blăst) [" + *blastos*, germ] Normoblast. **erythroblastic** (-blăst'tĭk), *adj.*

**erythroblastemia** (ĕ-rĭth'rō-blăst-tĕ'mĕ-ă) [" + " + *haima*, blood] An excessive number of erythroblasts in the blood.

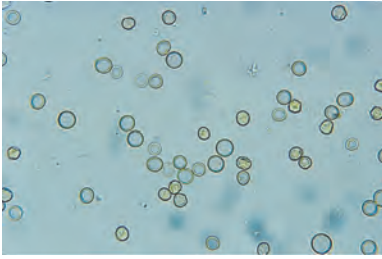
**erythroblastoma** (ĕ-rĭth'rō-blăst-tō'mă) [" + *blastos*, germ, + *oma*, tumor] A tumor (myeloma) with cells resembling megakaryoblasts.

**erythroblastosis** (ĕ-rĭth'rō-blăst-tō'sĭs) [" + " + *osis*, condition] A condition marked by erythroblasts in the blood.

**e. fetalis** A hemolytic disease of the newborn marked by anemia, jaundice, enlargement of the liver and spleen, and generalized edema (hydrops fetalis). SYN: *hemolytic disease of the newborn*.

**erythrochloropia** (ĕ-rĭth'rō-klor-ō'pĕ-ă) [Gr. *erythros*, red, + *chloros*, green, + *ops*, eye] Partial color blindness with ability to see red and green, but not blue and yellow.

**erythrochromia** (ĕ-rĭth'rō-krō'mĕ-ă) [" + *chroma*, color] Hemorrhagic red pigmentation of the spinal fluid.



**NORMAL ERYTHROCYTES, UNSTAINED**

(Orig. mag.  $\times 400$ )

**erythroclasis** (ĕr"ĕ-thrĕk'lă-sĭs) The splitting up of red blood cells.

**erythroclastic** (ĕ-rĭth-rĕ-klăs'tĭk) [*"* + *klasis*, a breaking] Destructive to red blood cells.

**erythrocyanosis** (ĕ-rĭth-rĕ-sĭ"ă-nĕ'sĭs) [*"* + *kyanos*, blue, + *osis*, condition] Red or bluish discoloration on the skin with swelling, itching, and burning.

**erythrocyte** (ĕ-rĭth'rĕ-sĭt) [*"* + *kytos*, cell] A mature red blood cell (RBC). Each is a nonnucleated, biconcave disk averaging  $7.7 \mu\text{m}$  in diameter. An RBC has a typical cell membrane and an internal stroma, or framework, made of lipids and proteins to which more than 200 million molecules of hemoglobin are attached. Hemoglobin is a conjugated protein consisting of a colored iron-containing portion (hematin) and a simple protein (globin). It combines readily with oxygen to form an unstable compound (oxyhemoglobin). The total surface area of the RBCs of an average adult is  $3820 \text{ sq m}$ , or about 2000 times more than the external total body surface area. **SEE: *illus. (Normal Erythrocytes, Unstained)*; *blood*** for *illus.*

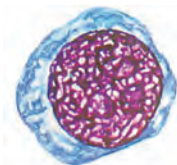
**NUMBER:** In a normal person, the number of RBCs averages about

5,000,000 per microliter (5,500,000 for men and 4,500,000 for women). The total number in an average-sized person is about 35 trillion. The number per microliter varies with age (higher in infants), time of day (lower during sleep), activity and environmental temperature (increasing with both), and altitude. Persons living at altitudes of 10,000 ft (3048 m) or more may have an RBC count of 8,000,000 per microliter or more.

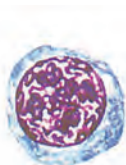
If an individual has a normal blood volume of 5 L (70 ml per kilogram of body weight) and 5,000,000 RBCs per microliter of blood, and the RBCs live 120 days, the red bone marrow must produce 2,400,000 RBCs per second to maintain this RBC count.

**PHYSIOLOGY:** The primary function of RBCs is to carry oxygen. The hemoglobin also contributes to the acid-base balance of the blood by acting as a buffer for the transport of carbon dioxide in the plasma as bicarbonate ions.

**DEVELOPMENT:** RBC formation (erythropoiesis) in adults takes place in the bone marrow, principally in the vertebrae, ribs, sternum, hip bone, diploë of cranial bones, and proximal ends of the humerus and femur. RBCs arise from large nucleated stem cells (promegakoblasts), which give rise to pronormoblasts, in which hemoglobin appears. These become normoblasts, which extrude their nuclei. RBCs at this stage possess a fine reticular network and are known as reticulocytes. This reticular structure is usually lost before the cells enter circulation as mature RBCs. The proper formation of RBCs depends primarily on nutrition, with protein, iron, and copper essential for the formation of hemoglobin, and vitamin  $B_{12}$  and folic acid necessary for DNA synthesis in stem cells of the red bone marrow. **SEE: *illus. (Erythrocyte Development)*.**



PRONORMOBLAST



BASOPHILIC  
NORMOBLAST



POLYCHROMATIC  
NORMOBLAST



ORTHOCHROMATIC  
NORMOBLAST



RETICULOCYTE



ERYTHROCYTE

**ERYTHROCYTE DEVELOPMENT**



The average life span of an RBC is about 120 days. As RBCs age and become fragile, they are removed from circulation by macrophages in the liver, spleen, and red bone marrow. The protein and iron of hemoglobin are reused; iron may be stored in the liver until needed for the production of new RBCs in the bone marrow. The heme portion of the hemoglobin is converted to bilirubin, which is excreted in bile as one of the bile pigments.

**VARIETIES:** On microscopic examination, RBCs may reveal variations in the following respects: size (anisocytosis), shape (poikilocytosis), staining reaction (achromia, hypochromia, hyperchromia, polychromatophilia), structure (possession of bodies such as Cabot's rings, Howell-Jolly bodies, Heinz bodies; parasites such as malaria; a reticular network; or nuclei), and number (anemia, polycythemia).

**achromatic e.** An RBC from which the hemoglobin has been dissolved; a colorless cell.

**basophilic e.** An RBC in which cytoplasm stains blue. The staining may be diffuse (material uniformly distributed) or punctate (material appearing as pinpoint dots).

**crenated e.** An RBC with a serrated or indented edge, usually the result of withdrawal of water from the cell, as occurs when cells are placed in hypertonic solutions.

**immature e.** Any incompletely developed RBC.

**orthochromatic e.** An RBC that stains with acid stains only, the cytoplasm appearing pink.

**polychromatic e.** An RBC that does not stain uniformly.

**erythrocyte reinfusion 1.** Infusion of blood into the person who donated it. This is usually done by obtaining one or two units of blood, separating the red blood cells and infusing them at a later date. **2.** Infusion with his or her own blood by a healthy person in an attempt to enhance athletic performance. SYN: *blood doping*.

**erythrothemia** (ĕ-rĭth"rō-sĭ-thĕ'mĕ-ă) [Gr. *erythros*, red, + *kytos*, cell, + *haima*, blood] An obsolete term for polycythemia vera.

**erythrocytolysin** (ĕ-rĭth"rō-sĭ-tōl'ĭ-sĭn) Anything that hemolyzes red blood cells.

**erythrocytolysis** (ĕ-rĭth"rō-sĭ-tōl'ĭ-sĭs) [" + " + *lysis*, dissolution] Dissolution of red blood cells with the escape of hemoglobin.

**erythrocytometer** (ĕ-rĭth"rō-sĭ-tōm'ĕ-tĕr) [" + " + *metron*, measure] An instrument for counting red blood cells.

**erythrocyto-opsonin** (ĕ-rĭth"rō-sĭ-tō-ōp-sō'nĭn) [" + " + *opsonein*, to buy

food] A substance opsonic for red blood cells.

**erythrocytopenia** (ĕ-rĭth"rō-sĭ-tō-pĕ'nĕ-ă) [" + " + *penia*, poverty] A deficiency in the number of red blood cells in the body. SYN: *erythropenia*.

**erythrocytopeniosis** (ĕ-rĭth"rō-sĭ-tō-poy-ĕ'sĭs) Erythropeniosis.

**erythrocytorrhexis** (ĕ-rĭth"rō-sĭ-tō-rĕk'sĭs) [" + " + *rhexis*, rupture] The breaking up of red blood cells with particles or fragments of the cells escaping into the plasma.

**erythrocytosis** (ĕ-rĭth"rō-sĭ-tō'sĭs) [" + " + *osis*, increasing condition] An abnormal increase in the number of red blood cells in circulation, found, for example, in hypoxemic patients or patients with polycythemia vera.

**spurious e.** Gaisböck's syndrome.

**stress e.** Gaisböck's syndrome.

**erythroderma, erythrodermia** (ĕ-rĭth"rō-dĕr'mă) [" + *derma*, skin] Abnormally widespread redness and scaling of the skin, sometimes involving the entire body. This condition may be seen in patients with extensive psoriasis, cutaneous T-cell lymphoma, drug reactions, seborrheic or atopic dermatitis, or other conditions. SYN: *erythrodermia; exfoliative dermatitis*.

**e. desquamativum** A disease of breast-fed infants. Resembling seborrhea, it is characterized by redness of the skin and development of scales.

**e. ichthyosiforme congenitum** The Latin name for congenital ichthyosiform erythroderma.

**erythrodermia** (ĕ-rĭth"rō-dĕr'mĕ-ă) Erythroderma.

**erythrodonia** (ĕ-rĭth"rō-dōn'shĕ-ă) [" + *odous*, tooth] Reddish-brown or yellow discoloration of the dentin of the teeth. This may be present in patients with congenital erythropoietic porphyria.

**erythrogenesis** (ĕ-rĭth"rō-jĕn'ĕ-sĭs) [" + *genesis*, generation, birth] The development of red blood cells.

**erythroid** (ĕr'i-throyd) [" + *eidōs*, form, shape] **1.** Reddish. **2.** Concerning the red blood cells.

**erythrokeratoderma** (ĕ-rĭth"rō-kĕr'ă-tō-dĕr'mĕ-ă) [" + *keras*, horn, + *derma*, skin] Reddening and hardening of the skin.

**erythrokinetics** (ĕ-rĭth"rō-kĭ-nĕt'ĭks) [" + *kinesis*, movement] The quantitative description of the production rate of red blood cells and their life span.

**erythroleukemia** (ĕ-rĭth"rō-loo-kĕ'mĕ-ă) [Gr. *erythros*, red, + *leukos*, white, + *haima*, blood] ABBR: AEL. A variant of acute myelogenous leukemia with anemia, bizarre red blood cell morphology, erythroid hyperplasia in the bone marrow, and occasionally hepatosplenomegaly. The leukocyte count may be extremely high or quite low.

**erythromelalgia** (ĕ-rĭth"rō-mĕl-ăl'jĕ-ă) ["



+ *melos*, limb, + *algos*, pain] Episodic burning, throbbing, and redness of the extremities caused by local dilation of blood vessels. The affected areas (typically the feet or lower legs) become flushed and warm. This condition is a symptom of myeloproliferative diseases, such as polycythemia vera, and of neuritis, multiple sclerosis, and systemic lupus erythematosus. It may also occur as a drug reaction. SYN: *acromelalgia*; *erythralgia*.

**erythromelia** (ĕ-rĭth"rō-mē'lē-ă) [ʹ + *melos*, limb] Painless erythema of the extensor surfaces of the extremities.

**erythromycin** (ĕ-rĭth"rō-mī'sĭn) [ʹ + *mykes*, fungus] An antibiotic derived from *Streptomyces erythraeus*, used primarily to treat gram-positive and atypical microorganisms, such as streptococci, mycoplasmas, and legionella. Its primary side effects are nausea, vomiting, abdominal pain, bloating, and diarrhea.

**erythron** (ĕr'ĭ-thrŏn) [Gr. *erythros*, red] The blood as a body system including the circulating red cells and the tissue from which they originate.

**erythronocytosis** (ĕ-rĭth"rō-nĕ"ō-sĭ-tō'sĭs) [ʹ + *neos*, new, + *kytos*, cell, + *osis*, condition] The presence of immature red blood cells in the peripheral blood.

**erythroparasite** (ĕ-rĭth"rō-pār'ă-sĭt) [ʹ + *parasitos*, parasite] A red blood cell parasite.

**erythropenia** (ĕ-rĭth"rō-pĕ'nĕ-ă) [ʹ + *penia*, poverty] Erythrocytopenia.

**erythrophage** (ĕ-rĭth"rō-fāj) [ʹ + *phagein*, to eat] A phagocyte that destroys red blood cells.

**erythrophagia** (ĕ-rĭth"rō-fāj'jĕ-ă) Destruction of red blood cells by phagocytes.

**erythrophile** (ĕ-rĭth'rō-fĭ) [ʹ + *philein* to love] An agent that readily stains red. **erythrophilous** (ĕr'ĭ-thrŏf'ĭ-lūs), *adj.*

**erythrophobia** (ĕ-rĭth"rō-fŏ'bĕ-ă) [ʹ + *phobos*, fear] 1. Abnormal dread of blushing or fear of being diffident or embarrassed. 2. Morbid fear of, or aversion to, anything red.

**erythrophone** (ĕ-rĭth'rŏ-fŏz) [ʹ + *phos*, light] Any red subjective perception of a bright spot. SEE: *phose*.

**erythropia, erythroptia** (ĕr'ĭ-thrŏ'pĕ-ă, -thrŏp'sĕ-ă) [ʹ + *opsis*, vision] A condition in which objects appear to be red.

**erythroplasia** (ĕ-rĭth"rō-plă'zĕ-ă) [ʹ + *plasis*, molding, forming] A condition characterized by erythematous lesions of the mucous membranes.

**e. of Queyrat** [Louis A. Queyrat, Fr. physician, 1856–1953] A precancerous lesion or invasive squamous cell carcinoma of the glans penis. It usually appears moist or velvety, and typically

arises in uncircumcised middle-aged men.

**erythropoiesis** (ĕ-rĭth"rō-poy-ĕ'sĭs) [ʹ + *poiesis*, making] The formation of red blood cells. **erythropoietic** (-ĕt'ĭk), *adj.*

**erythropoietin** (ĕ-rĭth"rō-poy'ĕ-tĭn) A cytokine made by the kidneys that stimulates the proliferation of red blood cells. Synthetic erythropoietin (epoetin alfa) is used to treat anemia, esp. in patients with renal or bone marrow failure. Hypertension is a common side effect of the drug. SEE: *blood doping*; *cytokine*; *epoetin alfa*.



Athletes have used erythropoietin in an attempt to enhance performance. When the hormone is used without medical supervision and in large doses, it can cause an abnormal increase in red blood cell mass and may lead to death.

**erythropoietin independence** A characteristic of red blood cell colonies in polycythemia rubra vera. Normal red blood cell progenitors do not multiply without stimulation by erythropoietin; cells from patients with polycythemia vera can replicate independently of this cytokine because of the intracellular derangement of other growth-promoting proteins.

**erythroprotopalgia** (e-rĭth"rō-prŏ-sŏ-păl'jĕ-ă) [ʹ + *prosopon*, face, + *algos*, pain] Neuropathy marked by redness and pain in the face.

**erythroptia** (ĕr'ĭ-thrŏp'sĕ-ă) [ʹ + *opsis*, vision] A disorder of color vision in which all objects look red.

**erythroptin** (ĕ-rĭth-rŏp'sĭn) [ʹ + *opsis*, vision] A term formerly used to indicate rhodopsin, or visual purple. SYN: *rhodopsin*.

**erythrosine sodium** (ĕ-rĭth'ră-sĭn, sĭn') A dye used as a dental disclosing agent. It is applied to the teeth in a 2% solution or in soluble tablets, which are chewed. SEE: *disclosing agent*.

**erythrosis** (ĕr'ĭ-thrŏ'sĭs) [ʹ + *osis*, condition] A reddish-purple discoloration of the skin and mucous membranes in polycythemia.

**erythrostasis** (ĕ-rĭth"rō-stă'sĭs) [ʹ + *stasis*, standing still] Accumulation of red blood cells in vessels due to cessation of the blood flow. SEE: *sludged blood*.

**erythrotxin** (ĕ-rĭth"rō-tŏk'sĭn) [ʹ + *toxikon*, poison] An exotoxin that lyses red blood cells.

**erythrovirus B19** (ĕ-rĭth"rō-vĭ'rŭs) A type of parvovirus that causes erythema infectiosum (fifth disease), a usually benign, nonfebrile disease. However, intrauterine infection may produce fetal anemia with hydrops fetalis and death. Infection of immunocompromised patients or patients with

sickle cell anemia may cause aplastic anemia, and complications may lead to death. It was formerly known as *parvovirus B19*.

**erythruia** (ēr-ī-thrū-rē-ă) [*r* + *ouron*, urine] Red color of the urine.

**Es** Symbol for the element einsteinium.

**escalate** (ēs'kă-lăt) [L. *scala*, staircase]

**1.** To increase, esp. the dosage of a medication. **2.** To become more angry, dangerous, or intense, as in an interpersonal crisis.

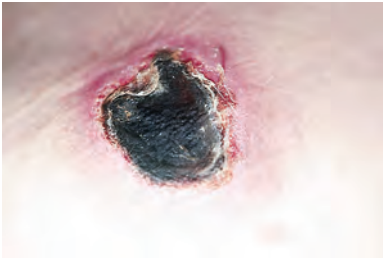
**escape** [O. Fr. *escaper*] **1.** To break out of confinement; to leak or seep out. **2.** The act of attaining freedom.

**vagal e.** An ectopic heartbeat that occurs when the normal rhythm of the heart has been stopped or inhibited by stimulation of the vagus nerve.

**ventricular e.** Single or repeated ventricular beats that arise from pacemakers in the ventricular muscle when beats from pacemakers in the sinoatrial or atrioventricular nodes fail to appear.

**escape phenomenon** The development of resistance to the effects of a continuously present stimulus.

**eschar** (ēs'kăr) [Gr. *eschara*, scab] Dead matter that is cast off from the surface of the skin, esp. after a burn. The material is often crusty or scabbed. **SEE:** *illus.*; *escharotic*.



**ESCHAR**

**escharotic** (ēs-kăr-ôt'ik) [Gr. *escharotikos*] A caustic agent, such as a strong acid or base, that is used to destroy tissue and cause sloughing. Escharotics may be acids, alkalies, metallic salts, phenol or carbolic acid, carbon dioxide, or electric cautery.

**escharotomy** (ēs-kăr-ôt'ō-mē) [Gr. *eschara*, scab, + *tome*, incision] **1.** Removal of the eschar formed on the skin and underlying tissue of severely burned areas. This procedure can be life-saving when used to allow expansion of the chest and is also used to restore circulation to the extremities of patients in which the eschar forms a tight swollen band around the circumference of the limb. **2.** Excision of dense necrotic skin about a decubitus or ischemic ulcer.

**Escherichia** (ësh-ēr-ik'ē-ă) A genus of gram-negative, motile, facultatively an-

aerobic, non-spore-forming bacilli of the family Enterobacteriaceae. These bacteria are part of the normal flora of the intestines of humans and animals.

**Escherichia coli** ABBR: *E. coli*. A gram-negative bacillus in the human colon. These small, plump, bacilli are normally nonpathogenic in the intestinal tract, but some serotypes may cause diarrheal illnesses, urinary tract infections, sepsis, or hemolytic uremic syndrome. Certain enterotoxigenic strains are a principal cause of travelers' diarrhea.

**TREATMENT:** *E. coli* are sensitive to many antibiotics, including sulfa drugs and quinolones. Diarrhea caused by *E. coli* should also be treated with aggressive fluid and electrolyte replacement to prevent dehydration.

**E.c. 0157:H7** A strain of *E. coli* that may cause bloody diarrhea (and other more serious illnesses) as a result of its production of a potent toxin. Outbreaks of diarrheal illnesses caused by 0157:H7 have occurred in day care centers, families, farms, fast-food restaurants, nursing homes, petting zoos, and schools. The organism may contaminate undercooked meat, esp. hamburger; unpreserved apple cider; vegetables grown in manure; or contaminated water supplies. The infection caused by this bacillus may spread from animal-to-person, person-to-person, or through contamination of food or water.

**SYMPTOMS:** Asymptomatic infection is common. In other cases, after the 3- to 8-day incubation period, an afebrile and self-limiting diarrhea occurs; however, the infection may progress to hemorrhagic colitis with bloody diarrhea, severe abdominal pain, and low-grade fever. Resolution usually occurs in 1 week. In about 15% of cases, patients develop hemolytic uremic syndrome (HUS); the mortality among patients who develop HUS ranges from 3 to 5%. The highest incidence of HUS is found among children and older adults.

**DIAGNOSIS:** Without a high index of suspicion, diagnosis in either a lone case or an outbreak may be delayed. To prevent unnecessary diagnostic or therapeutic intervention, such as colonoscopy or colectomy, diagnosis should be made as quickly as possible.

**PREVENTION:** Ground meat should be cooked until it reaches a temperature of 160°F (71.1°C) and the meat should not be pink in the center. Leftovers should be reheated to 165°F (73.3°C). Individuals who change a baby's diapers should thoroughly wash their hands immediately afterward. Food handlers must wash their hands after using the toilet.

**enteroaggregative E.c.** ABBR: EAggEC. A type of *E. coli* that causes

persistent diarrhea, esp. in the immunosuppressed.

**enterohemorrhagic E.c.** ABBR: EHEC. The strain of *E. coli* that causes colitis with copious bloody diarrhea.

**enteroinvasive E.c.** ABBR: EIEC. A type of *E. coli* that invades and multiplies in the epithelial cells of the distal ileum and colon causing dysentery, principally in infants and children.

**enteropathogenic E.c.** ABBR: EPEC. A type of *E. coli* that produces infantile diarrhea, esp. in developing countries.

**enterotoxigenic E.c.** ABBR: ETEC. A type of *E. coli* that can cause diarrhea in infants and travelers to developing nations. Fluid loss and abdominal cramping may be severe. The diarrhea results from the ingestion of tainted food or water and is produced by a heat stable toxin (ST) or a heat labile toxin (LT).

**Escherich's reflex** (ěsh'ěr-iks) [Theodor Escherich, Ger. physician, 1857–1911] A pursing or muscular contraction of the lips resulting from irritation of the mucosa of the lips.

**eschrolalia** (ěs-krō-lā'lě-ā) [Gr. *aischros*, indecent, + *lalia*, babble] Coprolalia.

**escorcin** (ěs-kor'sin) A stain derived from escalin. It is used to stain and identify defects or injury of the cornea.

**esculent** (ěs'kū-lěnt) Suitable for use as food.

**escutcheon** (ěs-kūch'ān) [L. *scutum*, a shield] The pattern of pubic hair growth. It is different in males and females.

**eserine** (ěs'ěr-in) [*esere*, African name for the Calabar bean] Physostigmine salicylate.

**ESF** *erythropoietic stimulating factor*. SEE: *erythropoietin*.

**-esis** Suffix meaning *condition* or *state*. SEE: *-sis*; *-asis*; *-osis*.

**ESL** *English as a Second Language*.

**Esmarch's bandage** (ěs'mārks) [Johannes F. A. von Esmarch, Ger. surgeon, 1823–1908] 1. A triangular bandage. 2. A rubber bandage used to minimize bleeding. Before surgery is begun, the bandage is applied tightly to the limb, commencing at the distal end and reaching above the site of operation, where a pneumatic tourniquet is firmly applied. The bandage is then removed, having rendered the surgical area virtually bloodless. SEE: *bandage*.

**eso-** Prefix meaning *inward*.

**esothmoiditis** (ěs'ō-ěth'moy-dī'tis) [Gr. *eso*, inward, + *ethmos*, sieve, + *eidōs*, form, shape, + *itis*, inflammation] Inflammation of the membrane of ethmoid cells.

**esogastritis** (ěs'ō-gās-trī'tis) [*gaster*, belly, + *itis*, inflammation] Inflammation of the gastric mucous membrane.

**esoph-** SEE: *esophago-*.

**esophag-** SEE: *esophago-*.

**esophagalgia** (ě-sōf-ă-gāl'jě-ă) [Gr. *oisophagos*, esophagus, + *algos*, pain] Pain in the esophagus.

**esophageal apoplexy** An intramural hematoma of the esophagus.

**esophageal cancer** An adenocarcinoma or squamous cell carcinoma of the esophagus. The disease is responsible for more than 10,000 deaths each year in the U.S. It occurs most often in men over the age of 60.

Esophageal tumors usually are fungating and infiltrating, and in most cases, the tumor partially constricts the esophageal lumen. Regional metastasis occurs early by way of submucosal lymphatics, often fatally invading adjacent vital intrathoracic organs. The liver and lungs are the usual sites of distant metastases.

**PREDISPOSING FACTORS:** The cause of esophageal cancer is unknown; however, several predisposing factors have been identified. These include chronic smoking or excessive use of alcohol; stasis-induced inflammation, as in achalasia or stricture; previous head and neck tumors; gastroesophageal reflux and Barrett's esophagus, and nutritional deficiency, as in untreated sprue and Plummer-Vinson syndrome. The disease is more commonly found in Asia, the Middle East than in other geographical locations.

**COMPLICATIONS:** Direct invasion of adjoining structures may lead to severe complications, such as mediastinitis, tracheoesophageal or bronchoesophageal fistula (causing an overwhelming cough when swallowing liquids), and aortic perforation with sudden exsanguination. Obstruction of the esophagus by the tumor often results in an inability to control secretions, malnutrition, and loss of lower esophageal sphincter control, which can result in aspiration pneumonia.

**SIGNS AND SYMPTOMS:** Early in the disease, the patient may report a feeling of fullness, pressure, indigestion, or substernal burning and may report using antacids to relieve gastrointestinal upset. Later, the patient may complain of dysphagia (food sticking in the upper gastrointestinal tract, painful swallowing) and weight loss. The degree of dysphagia varies, depending on the extent of the disease, ranging from mild dysphagia occurring only after eating solid foods (esp. meat) to difficulty in swallowing soft foods and even liquids. The patient may complain of hoarseness (from laryngeal nerve involvement), a chronic cough (possibly from aspiration), anorexia, vomiting, and regurgitation of food.

**DIAGNOSTIC TESTS:** Radiography of

the esophagus, with barium swallow and motility studies; chest radiography or esophagography; esophagoscopy; punch and brush biopsies; and exfoliative cytological tests; bronchoscopy; endoscopic ultrasonography of the esophagus; computed tomography scan; magnetic resonance imaging; liver function studies; a liver scan; and mediastinal tomography may be performed to delineate the tumor, confirm its type, reveal growth into adjacent structures, and reveal distant metastatic lesions. These studies determine disease staging (how limited or widespread the tumor is) and treatment possibilities.

**TREATMENT:** Because esophageal cancer usually is advanced when diagnosed, treatment is often palliative rather than curative. Treatment to keep the esophagus patent includes esophageal dilation, laser therapy, external beam radiation therapy, bipolar electrocoagulation, and insertion of stents or prosthetic tubes to bridge the tumor. Radical surgery can excise the tumor and resect either the esophagus alone or the stomach and esophagus with jejunal or colonic bypass grafts. Chemotherapy (5-fluorouracil or cisplatin) and radiation therapy can slow the growth of the tumor. Gastrostomy or jejunostomy can help provide adequate nutrition. A prosthesis can be used to seal fistulae. Analgesics provide pain control.

**PROGNOSIS:** Regardless of cell type, the prognosis for esophageal cancer is grim: 5-year survival rates are about 10%, and most patients die within 6 months of diagnosis.

**PATIENT CARE:** During hospitalization, food and fluid intake and body weight are monitored. All procedures and expected sensations are explained; the patient is prepared physically and emotionally for surgery and postsurgical care as indicated.

A high-calorie, high-protein diet is provided. Pureed or liquefied foods and commercially available nutritional supplements are offered as necessary. Supplemental parenteral nutrition is administered as prescribed. The patient is placed in Fowler's position for meals and plenty of time is allowed to eat to prevent aspiration. Any regurgitation is documented, and oral hygiene is provided. Prescribed analgesics and non-invasive pain relief measures are provided and the patient's response noted.

When a gastrostomy tube is used, feedings are administered slowly by gravity in prescribed amounts (usually 200 to 500 ml), and the patient may be given something to chew before and during each feeding to stimulate gastric secretions and promote some semblance of normal eating. The patient and family are taught about nutritional concerns

(e.g., care of any feeding tubes, including checking patency; administering the feeding; providing skin care at the insertion site; and keeping the patient upright during and immediately after feedings).

After surgery, vital signs and fluid and electrolyte balance (including intake and output) are monitored. The patient is observed for complications, such as infection, fistula formation, pneumonia, empyema, and malnutrition. If surgical resection with an esophageal anastomosis was performed, the patient is observed for signs of an anastomotic leak and kept supine to prevent suture-line tension. If a prosthetic tube was inserted, the patient is monitored for signs of blockage or dislodgement, which can perforate the mediastinum or precipitate tumor erosion.

If chemotherapy is prescribed, the patient is monitored for complications such as bone marrow suppression and gastrointestinal reactions. Adverse oral reactions are minimized by use of a soft toothbrush (brushing twice a day), flossing once a day and saline/bicarbonate mouthwashes (1 tsp salt and 1 tsp baking soda dissolved in 1 pint water, swished for 20 seconds 4 times a day). Extra periods of rest are encouraged, and prescribed medications (antiemetics, analgesics, bone marrow stimulants, antidepressants) are administered and the patient evaluated for desired and adverse effects. If radiation therapy is used, the patient is monitored for complications such as esophageal perforation, pneumonitis, pulmonary fibrosis, and spinal cord inflammation (myelitis).

Expected outcomes of the prescribed therapies are explained to the patient and family. Additional rest is encouraged. Assurance is provided that pain will be managed, and the nurse or other health care providers stay with the patient during periods of anxiety or distress. The patient is encouraged to participate in care decisions.

The patient should resume as normal a routine as possible during recovery to maintain a sense of control and to reduce complications associated with immobility. Referral to a home health care agency provides ongoing physical care, assessment for complications, and psychological support. Both patient and family are referred to appropriate organizations for information and support. Because of the generally poor prognosis, patient and family should be encouraged to discuss end-of-life concerns, and referral made to local hospice for home or in-patient palliative care as desired and needed.

**esophageal tube** A tube inserted in the esophagus.

**esophagectasia, esophagectasis** (ē-sōf'ā-jĕk-tā'sē-ā, -jĕk'tā-sīs) [" + *ektasis*, distention] Dilatation of the esophagus.

**esophagectomy** (ē-sōf'ā-jĕk'tō-mē) [" + *ektome*, excision] Surgical removal of all or a portion of the esophagus.

**esophagismus** (ē-sōf'ā-jīs'mūs) [" + *-ismus*, condition] Spasm of the esophagus.

**esophagitis** (ē-sōf'ā-jī'tīs) [" + *itis*, inflammation] Inflammation of the esophagus. SEE: *acid reflux test*.

**reflux e.** SEE: *gastroesophageal reflux; reflux disease*.

**esophago-, esoph-, esophag-** [Gr. *oisophagos*, esophagus] Combining forms meaning *esophagus*.

**esophagocele** (ē-sōf'ā-gō-sēl) [" + *kele*, tumor, swelling] A hernia of the esophagus.

**esophagodynia** (ē-sōf'ā-gō-dīn'ē-ā) [Gr. *oisophagos*, esophagus, + *odyne*, pain] Pain in the esophagus.

**esophagoenterostomy** (ē-sōf'ā-gō-ēn-tēr-ōs'tō-mē) [" + *enteron*, intestine, + *stoma*, mouth] A surgical opening between the esophagus and intestine following excision of the stomach.

**esophagogastrctomy** (ē-sōf'ā-gō-gās-trĕk'tō-mē) [" + *gaster*, belly, + *ektome*, excision] Surgical removal of all or part of the stomach and esophagus.

**esophagogastranoastomosis** (ē-sōf'ā-gō-gās'trō-ā-nās'tō-mō'sīs) [" + " + *anastomosis*, opening] A joining of the esophagus to the stomach.

**esophagogastrroduodenoscopy** (ē-sōf'ā-gō-gās'trō-doo"ō-dĕn-ōs'kō-pē, ī-sōf', dū", ōd'ēn) [" + " + "] ABBR: EGD. Examination of the upper gastrointestinal tract with a flexible fiberoptic endoscope. EGD is often performed to identify the cause of or to treat bleeding, pain, or swallowing disturbances.

**esophagogastroplasty** (ē-sōf'ā-gō-gās'trō-plās'tē) [" + " + *plassein*, to form] Plastic repair of the esophagus and stomach.

**esophagogastrscopy** (ē-sōf'ā-gō-gās'trōs'kā-pē) [" + " + "] Inspection of the esophagus and stomach with an endoscope.

**esophagogastrstomy** (ē-sōf'ā-gō-gās'trōs'tō-mē) [" + " + *stoma*, mouth] Formation of an opening or anastomosis between the esophagus and stomach.

**esophagojejunosotomy** (ē-sōf'ā-gō-jĕ-jū-nōs'tō-mē) [" + L. *jejenum*, empty, + Gr. *stoma*, mouth] The surgical anastomosis of a free end of the divided jejunum to the esophagus. It provides a bypass for food in cases of esophageal stricture.

**esophagomalacia** (ē-sōf'ā-gō-mā-lā'shā) [Gr. *oisophagos*, esophagus, + *malakia*, softness] Softening of the esophageal walls.

**esophagomycosis** (ē-sōf'ā-gō-mī-kō'sīs)

[" + *mykes*, fungus, + *osis*, condition] A fungal disease of the esophagus, typically esophageal candidiasis.

**esophagomyotomy** (ē-sōf'ā-gō-mī-ōt'ā-mē) [" + " + "] Cutting of the muscular coat of the esophagus, used to treat stenosis of the lower esophagus. SEE: *achalasia*.

**esophagoplasty** (ē-sōf'ā-gō-plās'tē) [" + *plassein*, to form] Repair of the esophagus by plastic surgery.

**esophagoplication** (ē-sōf'ā-gō-plī-kā'shūn) [" + L. *abplicare*, to fold] Division of the longitudinal and circular muscles of the distal esophagus.

**esophagoptosis, esophagoptosis** (ē-sōf'ā-gōp-tō'sē-ā, -sīs) [" + *ptosis*, a dropping] Relaxation and prolapse of the esophagus.

**esophagoscope** (ē-sōf'ā-gō-skōp) [" + *skopein*, to examine] An endoscope for examination of the esophagus.

**esophagospasm** (ē-sōf'ā-gō-spāzm) [" + "] A painful muscular contraction of the esophagus.

**esophagostenosis** (ē-sōf'ā-gō-stĕn-ō'sīs) [" + *stenosis*, act of narrowing] Stricture or narrowing of the esophagus.

**esophagostomiasis** Variant spelling of *oesophagostomiasis*.

**esophagostomy** (ē-sōf'ā-gōs'tō-mē) [" + *stoma*, mouth] Surgical formation of an opening into the esophagus.

**esophagotome** (ē-sōf'ā-gō-tōm) [" + *tome*, incision] An instrument for forming an esophageal fistula.

**esophagotomy** (ē-sōf'ā-gōt'ō-mē) A surgical incision into the esophagus. SEE: *achalasia; cardiospasm; dysphagia*.

**esophagotracheal** (ē-sōf'ā-gō-trā'kĕ-āl) Concerning the esophagus and the trachea, or a communication between them.

**esophagus** (ē-sōf'ā-gūs) *pl.* **esophagi** [Gr. *oisophagos*] The muscular tube, about 10 to 12 in (25 to 30 cm) long, that carries swallowed foods and liquids from the pharynx to the stomach. In the upper third of the esophagus, the muscle is striated; in the middle third, striated and smooth; and in the lower third, entirely smooth. Peristalsis is regulated by the autonomic nervous system. At the junction with the stomach is the lower esophageal sphincter, which relaxes to permit passage of food, then contracts to prevent backup of stomach contents. **esophageal** (ē-sōf'ā-jĕ'āl), *adj.* SEE: *illius*.

**Barrett's e.** SEE: *Barrett's esophagus*.

**foreign bodies in the e.** Items trapped in the esophagus (typically fishbones, coins, or large unchewed pieces of food). Parenteral glucagon may help the material pass through the esophageal sphincter to the stomach, but endoscopic retrieval of the material is usually necessary. SEE: *illius*.





ESOPHAGUS

(as seen through an endoscope)



FOREIGN BODY IN ESOPHAGUS

Meat impaction in the lower esophageal sphincter

**esophoria** (ēs-ō-fō-rē-ā) [Gr. *eso*, inward, + *phorein*, to bear] **1.** The tendency of visual lines to converge. **2.** An inward turning, or the amount of inward turning, of the eye. Opposite of exophoria. SEE: *heterotropia*.

**esosphenoiditis** (ēs"ō-sfē-noyd-i'tis) [" + *sphen*, wedge, + *eidos*, form, shape, + *itis*, inflammation] Osteomyelitis of the sphenoid bone.

**esotropia** (ēs-ō-trō'pē-ā) [" + *tropos*, turning] Marked turning inward of the eye; crossed eyes.

**ESP** *extrasensory perception*.

**ESR** *electron spin resonance*; *erythrocyte sedimentation rate*. SEE: *under rate*.

**ESRD** *end-stage renal disease*.

**essence** [L. *essentia*, being or quality] **1.** The spirit or principle of anything. **2.** An alcoholic solution of volatile oil.

**essential** [L. *essentialis*] **1.** Pert. to an essence. **2.** Indispensable. **3.** Independent of a local abnormal condition; having no obvious external cause. SEE: *idiopathic*.

**essential medicine** A medicine used to meet the fundamental health care needs of a population.

**Essiac** A tea containing anti-inflammatory, antioxidant, and immunostimulatory chemicals; it has been promoted as a treatment for cancer but has not been

scientifically studied. Essiac was first used in the 1920s. Trials of its usefulness have not shown any evidence of efficacy; it is not approved for use in the U.S. by the Food and Drug Administration.

**EST** *electroshock therapy*. SEE: *electroconvulsive therapy*.

**ester** (ēs'tēr) [L. *aether*, ether] In organic chemistry, a fragrant compound formed by the combination of an organic acid with an alcohol. This reaction removes water from the compound.

**esterase** (ēs'tēr-ās) Generic term for an enzyme that catalyzes the hydrolysis of esters.

**esterification** (ēs-tēr'i-fi-kā'shūn) The combination of an organic acid with an alcohol to form an ester.

**esthematology** (ēs'thēm-ā-tōl'ō-jē) [Gr. *aisthema*, sensation, + *logos*, word, reason] The science of the sense organs and their function.

**esthesi-** Combining form meaning *sensation, feeling*.

**esthesia** (ēs-thē'zē-ā) [Gr. *aisthesis*, sensation] **1.** Perception; feeling; sensation. **2.** Any disease that affects sensation or perception.

**esthesiology** (ēs-thē'zē-ōl'ō-jē) [" + *logos*, word, reason] The science of sensory phenomena.

**esthesiometer, aesthesiometer** (ēs-thē-zē-ōm'ē-tēr) [" + *metron*, measure] A device for measuring tactile sensibility.

**esthesioneuroblastoma** (ēs-thēz'ē-ō-nūr'ō-blās-tōm'ā) A malignant glioma of the nasal passages. The tumor is occasionally partially responsive to surgical removal, chemotherapy, or radiotherapy.

**esthesioneurosis** (ēs-thē'zē-ō-nūr-ō'sis) [" + *neuron*, nerve, + *osis*, condition] Any sensory impairment.

**esthesioscopy** (ēs-thē'zē-ōs'kō-pē) [" + *skopein*, to examine] The testing of tactile and other forms of sensibility.

**estheticokinetic** (ēs-thēt'i-kō-kīn-ēt'ik) [" + *kinesis*, movement] Being both sensory and motor.

**esthetics** (ēs-thēt'iks) Aesthetics.

**estival** (ēs'ti-vāl) [L. *aestivus*] Pert. to or occurring in summer.

**estivoautumnal** (ēs'ti-vō-aw-tūm'nāl) [" + *autumnalis*, pert. to autumn] Pert. to summer and autumn, formerly applied to a type of malaria.

**estradiol** (ēs-trā-dī'ōl) C<sub>18</sub>H<sub>24</sub>O<sub>2</sub>, a steroid produced by the ovary and possessing estrogenic properties. Large quantities are found in the urine of pregnant women and of mares and stallions, the latter two serving as sources of the commercial product that is used to treat estrogen deficiencies, e.g. menopause. Estradiol is effective when given subcutaneously or intramuscularly but not when given orally. It is converted to es-

trone in the body. SEE: *diethylstilbestrol*; *estrogen*.

**estrin** (ēs'trīn) Estrogen.

**estrinization** (ēs'trīn-ī-zā'shūn) The production of vaginal epithelial changes characteristic of estrogen stimulation.

**estriol** (ēs'trē-ōl)  $C_{18}H_{24}O_3$ , an estrogenic hormone considered to be the metabolic product of estrone and estradiol. It is found in the urine of women.

**estrogen** (ēs'trō-jěn) [Gr. *oistros*, mad desire, + *gennan*, to produce] Any natural or artificial substance that induces estrus and the development of female sex characteristics; more specifically, the estrogenic hormones produced by the ovary; the female sex hormones. Estrogens are responsible for cyclic changes in the vaginal epithelium and endometrium of the uterus. Natural estrogens include estradiol, estrone, and their metabolic product, estriol. When used therapeutically, estrogens are usually given in the form of a conjugate such as ethinyl estradiol, conjugated estrogens, or the synthetic estrogenic substance diethylstilbestrol. These preparations are effective when given by mouth.

Estrogens provide a satisfactory replacement hormone for treating menopausal symptoms and for reducing the risk of osteoporosis and cardiovascular disease in postmenopausal women. It is important to observe patients closely for any malignant changes in the breast or endometrium. Estrogen should be administered intermittently and in the lowest effective dose.

**conjugated e.** An estrogenic drug, principally estrone and equilin, used to treat menopausal symptoms and to prevent osteoporosis.

**estrogenic** (ēs'trō-jěn'ik) Causing estrus; acting to produce the effects of an estrogen.

**estrogen replacement therapy** ABBR: ERT. Administration of estrogen to women who have a deficiency of this hormone (e.g., menopausal and postmenopausal women) and women with hypothalamic amenorrhea. The safety of estrogen to treat menopause was questioned by the Women's Health Initiative (WHI), which found that postmenopausal women who took estrogen and progesterone had an increased risk of breast cancer, heart attack, stroke, and venous thromboembolism relative to controls. Estrogen and estrogen-like compounds can be used in men to treat prostate cancer. SEE: *conjugated estrogen*; *hormone replacement therapy*.

Reported health benefits are vigorously debated. ERT is credited with retarding bone loss and lowering the risk of osteoporotic fractures. In addition, ERT relieves some symptoms associ-

ated with menopause (e.g., hot flashes, night sweats, and insomnia).



Women who have a history of thromboembolic disorders, current tobacco use, impaired liver function, undiagnosed vaginal bleeding, endometrial cancer, or estrogen-stimulated tumors should not receive ERT. Estrogen replacement should be used with caution in women who have a family history of breast cancer or who have diseases of the liver, kidney, or gallbladder.

**estrone** (ēs'trōn)  $C_{18}H_{22}O_2$ , an estrogenic hormone found in the urine of pregnant women and mares. Also prepared synthetically, it is used in the treatment of estrogen deficiencies. It is less active than estradiol but more active than estriol.

**estropiate** (ēs'trō-pī'pāt) Estrogen manufactured synthetically from plant sources.

**estrual** (ēs'troo-āl) [Gr. *oistros*, mad desire] Pert. to the estrus of animals.

**estruation** (ēs'troo-ā'shūn) The sexually fertile period in female mammals. In lay terminology, the period of heat.

**estrus, oestrus** (ēs'trūs) [Gr. *oistros*, mad desire] The cyclic period of sexual activity in nonhuman female mammals, marked by congestion of and secretion by the uterine mucosa, proliferation of vaginal epithelium, swelling of the vulva, ovulation, and acceptance of the male by the female. During estrus, the animal is said to be "in heat."

**estrus cycle** The sequence from the beginning of one estrus period to the beginning of the next. It includes proestrus, estrus, and metestrus followed by a short period of quiescence called diestrus.

**e.s.u.** *electrostatic unit*.

**état criblé** (ā-tā'krēb-lā') [Fr., sievelike state] Multiple irregular perforations of Peyer's patches of the intestines. These patches are characteristic of typhoid fever.

**etching** (ēch'ing) [Ger. *ätzen*, to feed] Application of a corrosive or abrasive material to a glass or metal surface to create a pattern or design.

**acid e.** A dental procedure used to prepare the surface of tooth enamel for better retention in bonding material to the tooth structure. Phosphoric acid is placed on the enamel surface. The acid removes the organic portion of the enamel, leaving microscopic pores (micropores) in the enamel approx.  $5 \mu\text{m}$  in length. The micropores allow for improved retention of dental restorations.

**ETEC** Enterotoxigenic *Escherichia coli*.

**e-text, electronic text book** (ē'tēkst') Any online instructional resource that

organizes knowledge and guides learning.

**ethanol** (ĕth'ă-nŏl) Ethyl alcohol. SEE: *alcohol*.

**ethene** (ĕth-ĕn') Ethylene.

**ether** (ĕth'ĕr) [Gr. *aither*, air] Any organic compound in which an oxygen atom links with carbon chains. The ether used for anesthesia is diethyl ether, C<sub>2</sub>H<sub>10</sub>O. As an anesthetic it causes postoperative nausea and profuse salivation. **ethereal** (ĕ-thĕ'rĕ-ăl), *adj.*



Ether is highly flammable and should be handled with great care. Also, it should not be stored once its container has been opened because toxic products form when ether is exposed to light.

**ethical reasoning** (ĕth'ĭ-kĭl) Reasoning about what one ought to do as a guide for what one actually does, moral reasoning.

**ethical review** A formal evaluation of the moral grounding of a proposed academic or research project before it is begun. The review is an attempt to ensure that the research will treat its subjects fairly and safely, without exposing them or society at large to undue risk.

**ethical will** A formal but not legally binding document in which individuals relay their blessings, concerns, feelings, regrets, thoughts, moral guidance, or life instructions to others.

**ethics** [Gr. *ethos*, moral custom] A system of moral principles or standards governing conduct. SEE: *Declaration of Geneva*; *Declaration of Hawaii*; *Hippocratic oath*; *Nightingale Pledge*.

**biomedical e.** Moral inquiry into issues raised by health care education, practice, and research.

**dental e.** A system of principles governing dental practice; a moral obligation to render the best possible quality of dental service to the patient and to maintain an honest relationship with other members of the profession and society at large.

**environmental e.** The application of moral principles to human (especially commercial or industrial) interactions with nature. It is an important principle of occupational safety and public health because of the potential threats posed to health when biological agents, pollutants, toxins, or other commercial waste products are not carefully managed.

**medical e.** A system of principles governing medical conduct. It deals with the relationship of a physician to the patient, the patient's family, fellow physicians, and society at large. SEE: *advance directive*; *do not attempt resus-*

*citation*; *euthanasia*; *Hippocratic oath*; *living will*.

**nursing e.** A system of principles governing the conduct of a nurse. It deals with the relationship of a nurse to the patient, the patient's family, associates and fellow nurses, and society at large. SEE: *Nightingale Pledge*.

**ethics committee** Committee, patient care advisory

**Ethics in Patient Referrals Act** ABBR: EPRA. An American federal law that makes it illegal for a physician to refer a patient to a health care facility in which the physician (or a family member) has a financial interest. Also known as the *Stark Act*.

**ethinyl estradiol** (ĕth'ĭ-nĭl) SEE: *estradiol*.

**ethionine** (ĕ-thĭ'ō-nĭn) A progestational agent used in some oral contraceptives.

**ethmoid** (ĕth'moyd) [Gr. *ĕthmos*, sieve, + *eidōs*, form, shape] Cribriform.

**ethmoidal** (ĕth-moy'-dl) Pert. to the ethmoid bone or its air cells.

**ethmoidectomy** (ĕth-moy-dĕk'tō-mĕ) [" + *eidōs*, form, shape, + *ektōme*, excision] Excision of the ethmoid sinuses that open into the nasal cavity.

**ethmoiditis** (ĕth'moy-dĭ'tĭs) [" + " + *itis*, inflammation] Inflammation of the ethmoidal sinuses. This may be acute or chronic.

**SYMPTOMS:** Symptoms include headache, acute pain between the eyes, and a nasal discharge.

**ethmoid sinus** An air cavity or space within the ethmoid bone, opening into the nasal cavity.

**ethnic** (ĕth'nĭk) [Gr. *ethnikos*, of a nation] Concerning groups of people within a cultural system who desire or are given a distinct classification based on traits such as religion, culture, language, or appearance.

**ethnobiology** (ĕth'nŏ-bĭ-ŏl'ŏ-jĕ) [Gr. *ethnos*, race, + *bios*, life, + *logos*, word, reason] The study of the biological characteristics of various races.

**ethnocentrism** (ĕth'nŏ-sĕn'trĭzĭm) **1.** A belief that one's own way of viewing and experiencing the world is superior to other perspectives; a mindset that judges the actions and beliefs of others according to one's own cultural rules. **2.** In health care, a perspective that supports the worldview of the caretaker, rather than considering the patient's perspective of health and illness. **ethnocentric**, *adj.*

**ethnogerontology** (ĕth'nŏ-jĕ-rŏn-tŏl'ŏ-jĕ) The study of aging and population groups in reference to race, national origin, and cultural practices. Ethnogerontology addresses the causes, processes, heritage, and consequences specific to these groups.

**ethnography** (ĕth-nŏg'ră-fĕ) [" + *graphein*, to write] The study of the cul-

ture of a single society. Data are gathered by direct observation during a period of residence with the group. SEE: *anthropology*.

**ethnology** (ĕth-nŏl'ō-jē) [*"* + *logos*, word, reason] The comparative study of cultures using ethnographic data. SEE: *anthropology*.

**ethology** (ĕ-, ĕ-thŏl'ō-jē) [Gr. *ethos*, manners, habits, + *logos*, word, reason] The scientific study of the behavior of animals in their natural habitat and in captivity.

**ethyl** (ĕth'ĭl) [Gr. *aither*, air, + *hyle*, matter] In organic chemistry, the radical  $C_2H_5^-$ , which is contained in many compounds, including ethyl ether, ethyl alcohol, and ethyl acetate.

**ethylamine** (ĕth'ĭl-ām'in) An amine,  $CH_3CH_2NH_2$ , formed in the decomposition of certain proteins.

**ethylcellulose** (ĕth'ĭl-sĕl'ū-lŏs) An ether of cellulose, used in preparing drugs.

**ethylene** (ĕth'ĭl-ĕn) A flammable, explosive, colorless gas,  $CH_2CH_2$ , prepared from alcohol by dehydration. It is present in illuminating gas. It is colorless and has a sweetish taste but a pungent, foul odor. It is lighter than air and diffuses when liberated.

**e. glycol** The simplest glycol,  $C_2H_6O_2$ ; a colorless alcohol used as an antifreeze. Fomepizole is a specific antidote for intoxications with ethylene glycol. SEE: *Poisons and Poisoning Appendix*.

**e. oxide** ABBR: ETO. A chemical,  $C_2H_2O$ , that in its gaseous state is used to sterilize materials that cannot withstand heat or steam. It is also used as a fumigant.

**ethynyl** (ĕth'ĭ-nĭl) An organic radical,  $HC\equiv C-$ .

**etic** (ĕ'tĭk) In anthropology and transcultural nursing, related to a kind of analysis that relies on objective criteria; the description of an illness by an observer of a phenomenon rather than by someone experiencing that phenomenon. SEE: *emic*.

**etio-** Combining form meaning *causation*.

**etiocholanolone** (ĕ'tē-ŏ-kŏ-lăn'ō-lŏn) A steroid produced by testosterone catabolism. It is excreted in the urine.

**etiology** (ĕ'tē-ŏl'ō-jē) [Gr. *aitia*, cause, + *logos*, word, reason] **1.** The study of the causes of disease. **2.** The cause of a disease. **etiologic, etiological** (-ŏ-lŏj'ĭk, -ĭ-kăl), *adj.*

**etiotropic** (ĕ'tē-ŏ-trŏp'ĭk) [Gr. *aita*, cause, + *tropos*, turning] Directed against the cause of a disease; used of a drug or treatment that destroys or inactivates the causal agent of a disease. Opposite of nosotropic.

**ETO** *ethylene oxide*.

**etodolac** (ĕt'ŏ-dŏ'lăk) A nonsteroidal anti-inflammatory agent.

**etretinate** (ĕ-trĕt'ĭn-ăt) A tretinoin drug formerly used to treat severe recalcitrant psoriasis.



Etretinate must not be used by women who are pregnant or who intend to become pregnant. It should be prescribed only by physicians knowledgeable in the systemic use of retinoids.

**etymology** (ĕt'ĭ-mŏl'ō-jē) [L. *etymon*, origin of a word, + *logos*, word, reason] The science of the origin and development of words. Most medical words are derived from Latin and Greek, but many of those from Greek have come through Latin and have been modified by it. Generally, when two Greek words are used to form one word, they are connected by the letter "o." Many medical words have been formed from one or more roots—forms used or adapted from Latin or Greek—and many are modified by a prefix, a suffix, or both. A knowledge of important Latin and Greek roots and prefixes will reveal the meanings of many other words. SEE: *Abbreviations Appendix; Prefixes and Suffixes Appendix*.

**Eu** Symbol for the element europium.

**eu-** [Gr. *eus*, good] Combining form meaning *healthy; normal; good; well*.

**Eubacteria** (ū'băk-tĕr'ĕ-ă) A group of single-celled organisms without a defined cell nucleus or organelles. They contain peptidoglycans in their cell walls. Eubacteria are prokaryotes and include many familiar microorganisms, (e.g., *Escherichia*, *Helicobacter*, *Legionella*, nitrogen-fixing bacteria, *Spirochetes*, and staphylococci.) In some classification systems the other prokaryotes also include the archaeobacteria and cyanobacteria. In other taxonomic systems the archaeobacteria are considered to be a separate kingdom or domain.

**Eubacterium** (ū'băk-tĕr'ĕ-ŭm) A genus of gram-positive, anaerobic bacilli, part of the resident flora of the human colon and skin. They are opportunists in necrotic tissue.

**eubiotics** (ū'bĭ-ŏt'ĭks) [*"* + *bios*, life] The science of healthy and hygienic living.

**eucalyptol, eucalyptus oil** (ū'kă-lĭp'tŏl) [*"* + *kalyptein*, to cover] Aromatic substances derived from eucalyptus leaves, occasionally used as expectorants.

**eucapnia** (ū-kăp'nĕ-ă) [*"* + *kapnos*, smoke] The presence of normal amounts of carbon dioxide in the blood.

**euchlorhydria** (ū'klor-hĭ'drĕ-ă) The presence of the normal amount of free hydrochloric acid in gastric juice.

**eucholia** (ū-kŏ'lĕ-ă) [*"* + *chole*, bile] The normal condition of bile regarding

its constituents and the amount secreted.

**euchromatin** (ū-krō'mă-tĭn) [" + *chroma*, color] Unfolded or uncondensed portions of chromosomes during interphase. Transcription of DNA by messenger RNA occurs, and proteins are synthesized. SEE: *heterochromatin*.

**eucreasia** (ū-kră'sē-ă) [" + *krasis*, mixture] Normal health; the state of the body in which all activities are in normal balance.

**eutaimonia** (ū'dī-mōn'ē-ă, dī) [Gr. *eudaimonia*, good fortune, happiness] A sense of fulfillment that arises from achieving one's full potential as a human being.

**audiaphoresis** (ū'dī-ă-fō-rēs'is) [" + *dia*, through, + *pherein*, to carry] Normal perspiration.

**eugenics** (ū-jĕn'ĭks) [" + *gennan*, to produce] The study of improving a population by selective breeding in the belief that desirable traits will become more common and undesirable traits will be eliminated. This practice may have some utility in controlled animal populations, but it is unethical in humans.

**eugenol** (ū'jĕn-ōl) A material obtained from clove oil and other sources. It is used as a topical analgesic in dentistry. It is also mixed with zinc oxide to form a material that hardens sufficiently to be used as a temporary dental filling.

**euglobulin** (ū-glōb'ū-lĭn) A true globulin, or one that is insoluble in distilled water and soluble in dilute salt solution. SEE: *pseudoglobulin*.

**euglycemia** (ū-glī-sē'mē-ă) A normal concentration of glucose in the blood.

**eugonic** (ū-gōn'ĭk) [" + " + "] Growing rapidly in culture; said of some bacteria.

**eukaryon** (ū-kăr'ē-ōn) [" + *karyon*, nucleus] The nucleus of a eukaryote cell.

**eukaryote** (ū-kăr'ē-ōt) An organism in which the cell nucleus is surrounded by a membrane. SEE: *prokaryote*.

**Eulenburg's disease** (oyl'ĕn-bürgz) [Albert Eulenburg, Ger. neurologist, 1840–1917] Myotonia congenita.

**Eumycetes** (ū'mī-sē'tēz) [" + *mykes*, fungus] A subkingdom of the Kingdom Fungi; it includes all the true fungi and may also be designated Eumycota.

**eunuch** (ū'nŭk) [Gr. *eune*, bed, + *echēin*, to guard] A castrated man; one who has had his testicles removed, esp. before puberty so that secondary sexual characteristics do not develop. Absence of the male hormones produces a high-pitched voice and loss of hair on the face. In Middle Eastern and some Asian countries, eunuchs were employed to guard the women of a harem.

**eunuchism** (ū'nŭk-ĭzm) [" + " + *-ismos*, condition] A condition resulting from complete lack of male hormones. It

may be due to atrophy or removal of the testicles.

**pituitary e.** A condition produced by failure of the anterior lobe of the pituitary to secrete gonadotrophic hormones; secondary hypogonadism.

**euuichoid** (ū'nŭ-koyd) [" + " + *eidōs*, form, shape] Having the characteristics of a eunuch, such as retarded development of sex organs, absence of beard and bodily hair, high-pitched voice, and striking lack of muscular development.

**eunuchoidism** (ū'nŭk-oyd-ĭzm) [" + " + " + *-ismos*, condition] Deficient male hormone production by the testes.

**eupancratism** (ū-păn'krĕ-ă-tĭzm) [Gr. *eus*, good, + *pankreas*, pancreas, + *-ismos*, condition] The normal condition of the pancreas.

**eupepsia** (ū-pĕp'sē-ă) [" + *pepsis*, digestion] Normal digestion as distinguished from dyspepsia. **eupeptic**, *adj.*

**euphonia** (ū-fōn'ē-ă) [" + *phone*, voice] The condition of having a normal clear voice.

**euphoria** (ū-for'ē-ă) [" + *phoros*, bearing] **1.** A condition of good health. **2.** An exaggerated feeling of well-being or elation.

**euphoriant** (ū-for'ē-ănt) Any agent or drug that induces an extraordinary sense of well-being.

**euplastic** (ū-plăs'tĭk) [" + *plastikos*, formed] Healing quickly and well.

**euploidy** (ū-ploy'dē) [" + *ploos*, fold, + *eidōs*, form, shape] In genetics, the state of having complete sets of chromosomes.

**eupnea** (ūp-nē'ă) Normal, unimpaird respiration.

**Euroglyphus** (ūr'o-glĭ-fŭs) [L. *Europa*, Europe + Gr. *glyphein*, to carve] A common house dust mite that causes allergic rhinitis and contact dermatitis in sensitized people. It inhabits beds, linens, carpets, and other places in the home.

**europium** (ūr-rō'pē-ŭm) SYMB: Eu. A rare element of the lanthanide series with atomic number 63 and an atomic weight of 151.96.

**Eurotium** (ūr-rō'shē-ŭm) [Gr. *euros*, mold] A genus of molds that rarely causes disease.

**eury-** (ūr'rē) [Gr. *eurys*, wide] Combining form meaning *broad*.

**eurycephalic** (ūr'rē-sē-făl'ĭk) [" + *kephale*, head] Having a broad or wide head.

**EUS** An abbreviation for endoscopic ultrasound.

**eustachian** (ū-stă'kĕ-ăn, -shĕn) [Bartolomeo Eustachio (Eustachi), It. anatomist, 1520–1574] Pert. to the auditory tube. SEE: *ear*; *eustachian tube*.

**eustachianography** (ū-stă'shē-ăn-ōg'ră-fĕ, stă'kĕ-) Radiography of the eustachian tube and middle ear after the introduction of a contrast medium.



**eustachian tube** The auditory tube, extending from the middle ear to the nasopharynx, 3 to 4 cm long and lined with mucous membrane. Occlusion of the tube leads to the development of otitis media. SYN: *auditory tube*; *otopharyngeal tube*. SEE: *pulitzerization*.

**eustachian valve** The valve at the entrance of the inferior vena cava.

**eustachitis** (ū'stā-ki'tis) Inflammation of the eustachian tube.

**eusystole** (ū-sis'tō-lē) [" + "] The normal, healthy systolic contraction of the myocardium.

**euthanasia** (ū-thā-nā-zē-ā) [Gr. *eus*, good, + *thanatos*, death] **1.** An easy, quiet, and painless death. **2.** The deliberate ending of the life of people (or in veterinary practice, animals) with incurable or terminal illnesses or unbearable suffering. The ethical ramifications are actively debated and unresolved: Should patients have the right to choose death? When is death imminent, or suffering intolerable? Does participation by a health care provider (e.g., a doctor, nurse, or pharmacist) violate personal, professional, religious, or social mores? SEE: *advance directive*; *death, assisted*; *suicide, assisted*; *death*; *death with dignity*; *do not attempt resuscitation*; *dying*; *living will*.

**PATIENT CARE:** Active euthanasia (sometimes called "mercy killing") occurs when a person, usually a physician or nurse, performs an act (e.g., administering a lethal injection) to end a patient's life. Additional descriptors for euthanasia include "voluntary" (i.e., the patient requests euthanasia), "involuntary" (i.e., the patient specifically refuses euthanasia), and "nonvoluntary" (i.e., the patient is not able to inform others of his wishes concerning euthanasia). Currently euthanasia is illegal in most countries except for the Netherlands, which allows limited, voluntary euthanasia. The general terms "assisted death" and "aid in dying" apply to actions intended to hasten death and include both assisted suicide (AS) and active euthanasia. "Withdrawing or withholding life-sustaining therapy" (WWLST) is the discontinuance or foregoing of therapies that may keep someone alive (e.g., cardiopulmonary resuscitation [CPR], mechanical ventilation, artificially provided nutrition and hydration, and antibiotics or other drug therapies). Most patients who die in acute care settings, particularly in intensive care units, do so after the withholding or withdrawing of CPR or other life-prolonging therapies. The U.S. Supreme Court has consistently upheld the right of patients to refuse such therapies via living wills or advanced medical directives. Euthanasia, however, is

illegal and may be treated by the courts as an act of murder.

**involuntary e.** Euthanasia performed without a competent person's consent.

**nonvoluntary e.** Euthanasia provided to an incompetent person according to a surrogate's decision.

**euthenics** (ū-thén'iks) [Gr. *euthenia*, well-being] The science of improvement of a population through modification of the environment.

**Eutheria** (ū-thēr'ē-ā) A subclass of mammals with a true placenta.

**euthyroid** (ū-thī'royd) Having a normally functioning thyroid gland.

**euthyroid sick syndrome** Any derangement in thyroid hormone blood levels in patients affected by another (usually critical) illness. The altered levels of thyroid hormones are not caused by primary thyroid dysfunction; they return to normal when the underlying illness is successfully treated.

**eutomer** (ū't'ō-mēr) An isomer that causes beneficial effects when it is administered.

**Eutrombicula** (ū'trōm-bīk'ū-lā) A genus of mites.

**eutrophication** (ū-trōf'ī-kā'shūn) [Gr. *eutrophein*, to thrive] Alteration of the environment by increasing the nutrients required by one species to the disadvantage of other species in the ecosystem, esp. in an aquatic environment.

**euvolemic** (ū-vō-lēm'ik) Having appropriate hydration (neither excessively hydrated nor dehydrated). SYN: *normovolemic*.

**ev, eV, EV** *electron volt*.

**evacuant** (ē-vāk'ū-ānt) [L. *evacuans*, making empty] A drug that stimulates the bowels to move. A laxative.

**evacuate** (ī-vāk'ū-āt') [L. *evacuatio*, emptying] **1.** To discharge, esp. from the bowels; to empty the uterus. **2.** To move patients from the site of an accident or catastrophe to a hospital or shelter.

**evacuation** (ē-vāk'ū-ā'shūn) **1.** The act of emptying (e.g., the bowels). In obstetrics, the term refers to emptying the uterus of the products of conception, as in abortion or removal of retained placental fragments. **2.** The material discharged from the bowels; stool. **3.** Removal of air from a closed container; production of a vacuum. **4.** The act of moving people to a safe place, esp. from a disaster or a war-torn area.

**air e.** Transport of patients from one location to another by specially equipped helicopters or other aircraft. Indications for air transport include severe trauma, burns, and other conditions requiring immediate skilled care and treatment.

**evacuator** (ē-vāk'ū-ā-tor) A device for

emptying, as the bowels, or for irrigating the bladder and removing calculi.

**evagination** (ē-vāj-i-nā'shūn) **1.** Emergence from a sheath. **2.** Protrusion of an organ or part. SEE: *invagination*. **evaginate** (-nāt), *adj.*

**evaluation** (ī-vāl'ū-ā'shūn) **1.** A rating or assessment, e.g., of the accuracy of a diagnosis, the effectiveness of a plan of care, or the quality of care. **2.** An appraisal of the health or status of an individual, based on specific criteria. **3.** A clinical judgment. SEE: *nursing assessment*; *nursing intervention*; *nursing process*; *planning*; *problem-oriented medical record*.

**work capacity e.** ABBR: WCE. A comprehensive assessment of functional status based on simulated physical demands of a job. Typically, a comprehensive work capacity evaluation includes timed, performance-based demonstrations of standing, sitting, walking, kneeling, crawling, pushing, pulling, lifting, reaching, carrying, balance, flexibility, dexterity, hand strength, and coordination. SEE: *functional assessment*.

**evanescent** (ēv'ā-nēs'ēnt) [L. *evanescere*, to vanish] Not permanent; of brief duration.

**Evans blue** (ēv'ānz) [Herbert M. Evans, U.S. anatomist, 1882–1971] A diazo dye occurring as a blue-green powder, very soluble in water. It is used intravenously as a diagnostic agent.

**Evans syndrome** [Robert S. Evans, U.S. physician, b. 1912] An autoimmune disease characterized by thrombocytopenia and hemolytic anemia.

**evaporation** [L. *e*, out, + *vaporare*, to steam] **1.** Change from liquid to vapor. **2.** Loss in volume due to conversion of a liquid into a vapor.

**evenomation** (ē-vēn'ō-mā'shūn) [L. *ex*, from, + *venenum*, poison] Removal of venom from a biting insect or reptile; removal of venom from the victim of a bite.

**eventration** (ē'vēn-trā'shūn) [L. *e*, out, + *venter*, belly] **1.** Partial protrusion of the abdominal contents through an opening in the abdominal wall. **2.** Removal of the contents of the abdominal cavity.

**event recorder** A portable heart rhythm monitor worn by a patient who suffers intermittent palpitations or loss of consciousness of unclear cause. The device transmits the patient's heart rhythms by telephone to a central laboratory, where symptomatic and asymptomatic dysrhythmias (such as atrial fibrillation and atrioventricular nodal re-entrant tachycardias) or heart blocks can be detected.

**events odds ratio** Odds ratio.

**eversion** (ē-vēr'zhūn) [L. + *vertere*, to turn] Turning outward. SEE: *cheilectropion*.

**evert** To turn outward.

**Everything Added to Food in the United States** ABBR: EAFUS. An inventory of the more than 3000 food additives included in human food in the U.S.

**evidement** (ā-vēd-mōn') [Fr., a scooping out] Scraping away of diseased tissue.

**evidence** In forensic medicine, all the tangible items and record materials pertinent to the legal considerations.

**anecdotal e.** Clinical lore based on the analysis of individual cases, rather than the study of scientifically randomized groups of patients.

**material e.** In medicolegal considerations, facts or evidence important to proving or disproving matters of dispute.

**evil** [AS. *yfel*] An infrequently used term for disease or illness.

**evil eye** Mal de ojo.

**eviration** (ē'vī-rā'shūn) [L. *e*, out, + *vir*, man] **1.** Castration. **2.** In psychiatry, delusion in a man who thinks he has become a woman.

**evisceration** (ē'vīs'er-ā'shūn) [L. + *viscera*, viscera] **1.** Removal of the viscera or of the contents of a cavity. **2.** Spilling out of abdominal contents resulting from wound dehiscence.

**PATIENT CARE:** The patient's surgeon should be contacted immediately. The wound is covered with a sterile towel moistened with warm sterile physiological saline solution. Tension on the abdomen is decreased by placing the patient in the low Fowler's position and raising the knees or by instructing the patient to flex the knees and support them with a pillow. Vital signs are monitored, and fluid therapy is initiated via IV line. The patient is reassured and prepared for surgical repair.

**evisceroneurotomy** (ē'vīs'er-ō-nū-rōt'ō-mē) [L. + + Gr. *neuron*, nerve, + *tome*, incision] Scleral evisceration of the eye with division of the optic nerve.

**Evista** Raloxifene.

**evocation** (ēv'ō-kā'shūn) [L. + *vocare*, to call] **1.** Re-creation by recollection or by imagination. **2.** In the embryo, the induction or formation of a tissue in response to an evocator.

**evocator** (ēv'ō-kāt'or) A chemical produced by one part of an embryo that stimulates organ and tissue development in another part.

**evoked potential** The electroencephalographic record of electrical activity produced at one of several levels in the central nervous system by stimulation of an area of the sensory nerve system. Analysis of the response can provide important information concerning the function of the peripheral and central nervous systems. SYN: *evoked response*. SEE: *brainstem auditory evoked potential*; *somatosensory evoked response*; *visual evoked response*.

**evoked response** Evoked potential.

**evolution** (ĕv'ō-lū'shūn) [L. *e*, out, + *volvere*, to roll] A process of orderly and gradual change or development. More generally, any orderly and gradual process of modification whereby a system, whether physical, chemical, social, or intellectual, becomes more highly organized.

**theory of e.** The theory that all living species, including humans, have developed as a result of changes in their genetic material over time. SEE: *natural selection*.

**evulsion** (ĕ-vūl'shūn) Avulsion.

**Ewing's tumor, Ewing's sarcoma** (ū'ingz) [James Ewing, U.S. pathologist, 1866–1943] An aggressive bone cancer, occurring principally in childhood or adolescence, and often involving the pelvis, femur, lower leg, arms, or ribs. It occurs more commonly in boys than girls. Treatments include local surgery, radiation, and systemic chemotherapy.

**ex-** [L., Gr. *ex*, out] Combining form meaning out; *away from*; *completely*.

**exa-** (ĕk'sā) [Fm. *hexa-*, representing the sixth power of a thousand] A prefix used in the International System of Units (SI units) to signify 10<sup>18</sup>.

**exacerbation** (ĕks-ās'ēr-bā'shūn) [ʹ + *acerbus*, harsh] Aggravation of symptoms or increase in the severity of a disease.

**exaltation** (ĕks-āl-tā'shūn) [L. *exaltare*, to lift up] A mental state characterized by feelings of grandeur, excessive joy, elation, and optimism; an abnormal feeling of personal well-being or self-importance.

**examination** [L. *examinare*, to examine] Inspection of the body to determine the presence or absence of disease.

A *physical* examination is a hands-on assessment of audible, palpable, and visual anomalies. Procedures include inspection, palpation, percussion, and auscultation.

A *laboratory* examination includes urinalysis, blood tests, microbiological cultures, and other tests of body fluids.

A *radiological* examination includes various means of visualizing body spaces and organs and their functions, e.g., with computed tomography, fluoroscopy, magnetic resonance imaging, ultrasonography, or related techniques.

An *endoscopic* examination involves direct visualization of an internal organ with a fiberoptic tube, often accompanied by biopsy of suspicious lesions.

**bimanual e.** SEE: *pelvic e.*

**dental e.** The visual, digital, and radiographic inspection of the teeth and surrounding structures, including the head and neck. The depth of the gingival sulcus is also probed and measured around each tooth to assess the state of health of the periodontium. The examination is completed with a mirror, ex-

plorer, periodontal probe, and dental radiographs.

**double-contrast e.** A radiographic examination in which a radiopaque and a radiolucent contrast medium are used simultaneously to visualize internal anatomy.

**focused history and physical e.** ABBR: FHPE. In emergency medicine, a combination of appropriate questions (i.e., SAMPLE, History, and OPQRST) and physical examination directed to the specific body system (i.e., cardiopulmonary, neurological, musculoskeletal) that an EMS provider suspects may be causing a patient's presenting problem. The assessment is conducted after the initial assessment has been completed and differs for medical or trauma patients.

**Folstein Mini Mental Status E.** SEE: *Folstein Mini Mental Status Exam*.

**pelvic e.** Physical examination of the vagina and adjacent organs. A speculum is used first to visualize anatomical structures. During speculum examination, cultures and Pap test specimens may be obtained. After the speculum is removed, the pelvic organs and rectum are examined manually by the examiner. SEE: *illus.*

**rapid trauma e.** Rapid trauma assessment.

**rectoabdominal e.** Physical examination of the abdomen and rectum (e.g., to determine the cause of abdominal pain or to identify occult bleeding).

**Examinations, National Board** Examinations administered to test the qualifications of medical, dental, and other professional students. Successful completion of the basic science and clinical parts of the examinations is required for licensure in most states.

**exanthem** (ĕks-ān'thĕm) *pl.* **exanthemas** [Gr. *exanthema*, eruption] Any eruption or rash that appears on the skin, as opposed to one that appears on the mucous membranes (enanthem). The term is often used to describe childhood or infectious rashes (e.g., measles or scarlet fever) but it also applies to other rashes.

**exanthematous** (-ān-thĕm'ā-tūs), *adj.*

**e. subitum** Sixth disease.

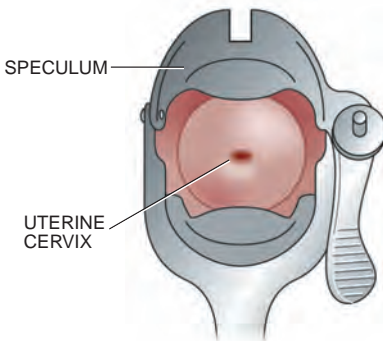
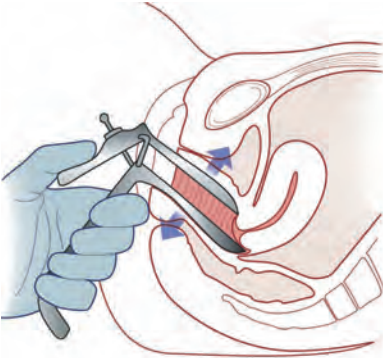
**exanthema** (ĕks-ān-thĕ'mā) *pl.* **exanthemas** *pl.* **-mata** [Gr.] Exanthem.

**exanthrope** (ĕks'ān-thrōp) [Gr. *ex*, out, + *anthropos*, man] A cause or source of a disease originating outside the body.

**exarticulation** (ĕks'ār-tĭk-ū-lā'shūn) [L. *ex*, out, + *articulus*, joint] 1. Amputation of a limb through a joint. 2. Excision of a part of a joint.

**excavation** (ĕks'kā-vā'shūn) [ʹ + *cavus*, hollow] 1. A hollow or depression. 2. Formation of a cavity.

**atrophic e.** A cupped appearance of the optic nerve due to atrophy of the nerve fibers.



#### PELVIC EXAM WITH PAP SMEAR

**caries e.** The removal of the diseased portion of a tooth, before it is filled. It may be accomplished with air, burs, chemicals, drills, lasers, ultrasound, and other means.

**dental e.** Caries excavation.

**rectouterine e.** The rectouterine pouch or pouch of Douglas.

**excavator** (ĕks'kāv-tor) An instrument for removing tissue or bone. It may be spoon-shaped if used on soft tissue and spoon-shaped with sharp edges if used in dentistry.

**excerebration** (ĕk'sĕr-ĕ-brā'shūn) [*r* + *cerebrum*, brain] Removal of the brain, esp. that of the dead fetus to facilitate delivery.

**excess, base** The difference between the normal and the actual buffer base concentration in a blood sample when titrated by strong acid at pH = 7.40 and PCO<sub>2</sub> = 40 mm Hg. The base excess is usually determined indirectly using measured values for pH and PCO<sub>2</sub> and then calculated using known relationships.

**b. e. of blood** The substance concentration of base in whole blood determined at a pH of 7.40 and PCO<sub>2</sub> of 40 mm Hg. This measurement helps one assess the relative contribution of respiratory versus metabolic components in acid-base imbalances in the blood.

**b. e. of extracellular fluid** ABBR: BE (ecf). The substance concentration of base in extracellular fluid determined at a pH of 7.40 and PCO<sub>2</sub> of 40 mm Hg. Because this quantity cannot be determined directly, a model of extracellular fluid is used as a basis. The model consists of one volume of blood plus two volumes of plasma. As with the base excess of blood, this quantity helps one assess the respiratory versus metabolic components in acid-base balance. In contrast to the base excess of blood, the base excess of extracellular fluid is said to be more representative of the acid-base status of the accessible fluid compartment and thus more appropriate for deciding on and evaluating therapy.

**exchange 1.** To give up or substitute something for something else. **2.** In dietetics, the substitution of an equivalent amount of one food substance for another so that the caloric intake remains the same. Exchange diets are used frequently to help manage diabetes mellitus, and they have been adapted for use in proprietary weight loss programs. **3.** In peritoneal dialysis, to drain fluid from the peritoneal cavity and replace it with fresh dialysate.

**anion e.** SEE: resin, ion-exchange.

**cation e.** The transfer of cations between those in a liquid medium and those in a solid polymer. The polymer is termed the cation exchanger. This technique is used in ion-exchange chromatography.

**sister chromatid e.** The exchange of corresponding parts of homologous maternal and paternal chromosomes during the first meiotic division. This contributes to genetic diversity in the offspring. SYN: crossing over.



**exchange list** A grouping of foods to assist people on special diets. In each group, foods are listed in serving sizes that are interchangeable with respect to carbohydrates, fats, protein, and calories. The groups are starches and bread; meat; vegetables and fruit; milk; and fats. This approach is esp. useful in managing diets for diabetics. The exchange list concept has also been adapted for use in the My Pyramid eating plan (website: [www.mypyramid.gov](http://www.mypyramid.gov)).

**excipient** (ĕk-sĭp'ĕ-ĕnt) [L. *excipiens*, accepting] Any substance added to a medicine so that it can be formed into the proper shape and consistency; the vehicle for the drug.

**excise** (ĕk-sĭz') [L. *ex*, out, + *caedere*, to cut] To cut out or remove surgically.

**excision** (ĕk-sĭ'zhŭn) [L. *excisio*] The act of cutting away or taking out.

**total mesorectal e.** Removal of the mesentery of the rectum, including its lymphoid and vascular tissue, during surgery for rectal adenocarcinoma.

**excitability** (ĕk-sĭt''ā-bĭl'ĭ-tĕ) [L. *excitare*, to arouse] The property of a cell to generate an electrical impulse. This is a function of the permeability of the cell membrane.

**muscle e.** In a muscle fiber, the inducibility to contract. This is a function of the chemical and electrical state of the sarcolemma and the time since a previous stimulus was applied.

**reflex e.** Sensitivity to reflex irritation.

**excitant** (ĕk-sĭt''ant) A stimulant.

**excitation** (ĕk'sĭ-tā'shŭn) [L. *excitatio*] 1. The act of exciting. 2. The condition of being stimulated or excited.

**direct e.** Stimulation of a muscle physically or by placement of an electrode in it.

**indirect e.** Stimulation of a muscle via its nerve.

**excited skin syndrome** The eruption of inflammatory rashes far from an initial exposure to an allergen or irritant. The syndrome can cause false-positive reactions during allergy patch testing.

**excited state** The new state produced when energy is added to a nucleus, atom, or molecule. The energy is added by the absorption of photons or by collisions with other particles.

**exciting** Causing excitement.

**excitometabolic** (ĕk-sĭt''ō-mĕt''ā-bŏl'ĭk) ['' + Gr. *metabole*, change] Inducing metabolic changes.

**excitomotor** (ĕk-sĭt''ō-mŏ'tor) ['' + *motor*, moving] Causing or capable of causing muscular activity.

**excitomuscular** (ĕk-sĭt''ō-mŭs'kŭ-lār) ['' + Gr. *mys*, muscle] Causing muscular activity; excitomotor.

**excitor** (ĕk-sĭ'tor) [L. *excitare*, to arouse] Something that incites to greater activity. SYN: *stimulant*.

**excitosecretory** (ĕk-sĭt''ō-sĕ'krĕ-tor-ĕ) ['' + *secretio*, a hiding] Tending to produce secretion.

**excitotoxin** (ĕk-sĭ'tŏ-tŏks'ĭn) A neurotransmitter (e.g., glutamate or aspartate) that can cause brain cell injury or death if its action is unabated. Brain damage is mediated by excitotoxins during prolonged seizure activity and stroke.

**exclusion** (ĕks-kloo'zhŭn) [L. *exclusio*, fr. *ex*, out, + *cludere*, to shut]

1. Shutting off or removing from the main part. 2. In medical insurance programs, a list of specific hazards, perils, or conditions for which the policy will not provide benefits or coverage payments. Common exclusions include pre-existing conditions such as cancer, heart disease, diabetes, hypertension, a pregnancy that began before the effective date of the policy, self-inflicted injuries, combat injuries, plastic surgery for cosmetic reasons, and on-the-job injuries covered by workers' compensation.

**exclusivity** (ĕks'kloo-sĭv'ĭ-tĕ) [Med. L.] In the pharmaceutical industry, patent protection for drug manufacturers who may produce a therapeutic agent without competition from other drug suppliers.

**excoriation** (ĕks-kŏ-rĕ-ā'shŭn) ['' + *corium*, skin] An abrasion of the skin or of the surface of other organs by scratching, traumatic injury, chemicals, burns, or other causes. On the skin, the lesion is typically linear and scaly.

**excrement** (ĕks'krĕ-mĕnt) [L. *excrementum*] Waste material passed out of the body, esp. feces. SEE: *excretion*. **excrementitious** (ĕks'krĕ-mĕn-tĭsh'ŭs), *adj.*

**excrecence** (ĕks-krĕs'ĕns) [L. *ex*, out, + *crescere*, to grow] Any abnormal growth from the surface of a part.

**excreta** (ĕks-krĕ'tā) [L.] Waste matter excreted from the body, including feces, urine, and perspiration. SYN: *excretion*.; SEE: *Standard Precautions Appendix*.

**excrete** (ĕks-krĕt') [L. *excretus*, sifted out] To expel or eliminate waste material from the body, blood, or organs.

**excretion** (ĕks-krĕ'shŭn) [L. *excretio*] 1. Excreta. 2. The elimination of waste products from the body.

**excretory** (ĕks'krĕ-tŏ-rĕ) [L. *excretus*, sifted out] Pert. to or bringing about excretion.

**excretory urography** An occasionally used synonym for intravenous pyelography (IVP).

**exculpatory** (ĕks-kŭl'p-ŭ-tŏr'ĕ) ['' + L. *culpare*, to blame] Granting a waiver or yielding a legal right. Exculpatory language that asks human subjects in research projects to waive their rights in informed consent agreements is unethical and illegal.



## Exercise: Energy Required\*

Calories Required per Hour of Exercise	Activity†
80	Sitting quietly, reading
200	Golf with use of powered cart
250	Walking 3 miles/hr (4.83 km/hr); housework; light industry; cycling 6 miles/hr (9.7 km/hr)
330	Heavy housework; walking 3.5 miles/hr (5.6 km/hr); golf, carrying own bag; tennis, doubles; ballet exercises
400	Walking 5 miles/hr (8 km/hr); cycling 10 miles/hr (16.1 km/hr); tennis, singles; water skiing
500	Manual labor; gardening; shoveling
660	Running 5.5 miles/hr (8.9 km/hr); cycling 13 miles/hr (20.9 km/hr); climbing stairs; heavy manual labor
1020	Running 8 miles/hr (12.9 km/hr); climbing stairs with 30-lb (13.61-kg) load

\* These estimates are approximate and can serve only as a general guide. They are based on an average person who weighs 160 lb (72.58 kg).

† Energy requirements for swimming are not provided because of variables such as water temperature, whether the water is fresh or salt, buoyancy of the individual, and whether the water is calm or not.

**excursion** (ĕks-kŭr'zhŭn) [L. *excursio*]

1. Wandering from the usual course.
2. The extent of movement of a part such as the extremities or eyes.

**diaphragmatic e.** In respiration, the movement of the diaphragm from its level during full exhalation to its level during full inhalation. Normal diaphragmatic excursion is 5 to 7 cm bilaterally in adults. It may be seen during fluoroscopic or ultrasonographic examinations of the chest, or percussed during physical examination of the chest wall.

**excursion** (ĕks'kŭr-vā'shŭn) [Gr. *ex*, out, + L. *curvus*, bend] A curvature outward.

**excuse of infancy** A legal standard that limits the culpability of minors. It states that an unlawful act may not be criminal if it is committed by a minor who, by virtue of age alone, may not have enough understanding of right and wrong to act with criminal intent.

**excystation** (ĕk'sis-tā'shŭn) [" + *kystis*, cyst] The escape of certain organisms (parasitic worms or protozoa) from an enclosing cyst wall or envelope. This process occurs in the life cycle of an intestinal parasite after the encysted form is ingested.

**exempt** (ĕg-zĕmpt', ĭg-) [L. *eximere*, to take out, release, free] Free from oversight or supervision by any regulation or authority.

**exemption** (ĕg-zĕmp'shŭn) [L. *exemptio*, removal] Legal relief from an obligation, e.g., from the requirement that children be vaccinated before attending school, or that certain medications or devices be tested according to standard protocols before they are released to consumers.

**exempt research** Any research investigation that does not need to follow stan-

dard protocols or provide usually expected protection to its subjects.

**encephalia** (ĕks'ĕn-sĕf-ā'lĕ-ă) [" + *enkephalos*, brain] A congenital anomaly in which the brain is located outside the skull; a term for encephalocele, hydrancephalocele, and meningocele.

**enteration** (ĕks-ĕn'tĕr-ă'shŭn) [" + *enteron*, intestine] Evisceration.

**exercise** [L. *exercitus*, having drilled] A physical or mental activity performed to maintain, restore, or increase normal capacity. Physical exercise involves activities that maintain or increase muscle tone and strength, esp. to improve physical fitness or to manage a handicap or disability. SEE: table; *physical fitness*; *risk factor*; *sedentary lifestyle*.

Daily physical activity for a minimum of 35 min will increase exercise capacity and the ability to use oxygen to derive energy for work, decrease myocardial oxygen demands for the same level of work, favorably alter lipid and carbohydrate metabolism, prevent cardiovascular disease, and help to control body weight and body composition. An exercise program should include developing joint flexibility and muscle strength, esp. in the trunk and limbs. This is of particular importance as people age. Exercise can have a beneficial effect in patients with depression or anxiety. It is thought to have a positive effect on balance, endurance, attitude, and outlook.

An exercise program should be neither begun nor continued if the individual or the person prescribing the exercise program has evidence that the activity is painful or harmful. Persons have died while exercising, and heavy physical exertion may precede acute myocardial infarction, particularly in

people who are habitually sedentary. SEE: *exercise prescription*.

Mental exercise involves activities that maintain or increase cognitive faculties. Daily intellectual stimulation improves concentration, integration, and application of concepts and principles; enhances problem-solving abilities; promotes self-esteem; facilitates self-actualization; counteracts depression associated with social isolation and boredom; and enhances the quality of one's life. This is particularly important during aging. SEE: *reminiscence therapy*.

Most of the negative aspects of aging can be either altered or diminished by a lifelong healthy lifestyle. For example, the loss of physical fitness and strength, an inevitable consequence of aging, can be altered by an individualized fitness and strength program. Progressive loss of bone mass due to osteoporosis may be either prevented or slowed by a program of regular exercise. Loss of cardiac fitness can be forestalled by an ongoing aerobic fitness program. Many cases of type 2 diabetes can be controlled by exercise and an appropriate diet. Arthritic stiffness and loss of flexibility can be influenced favorably by exercise, e.g., by walking and jogging; for patients who experience joint pain with impact exercise, swimming is an alternative. Obesity and loss of muscle mass can be prevented or minimized.

Exercise stimulates release of endorphins, and people who participate in regular exercise programs express positive feelings toward living. Exercise programs can be adapted for patients who are confined to wheelchairs. An important consideration for any exercise program is that it be enjoyable. No matter how beneficial the program may be, if it is not enjoyable or rewarding, it will not be continued.

**e. accumulation** Physical exertion that is divided into several short bouts of exercise scattered throughout the day, instead of during a single longer workout.

**active e.** A type of bodily movement performed by voluntary contraction and relaxation of muscles.

**aerobic e.** Exercise during which oxygen is metabolized to produce energy. Aerobic exercise is required for sustained periods of physical exertion and vigorous athletic activity. SEE: *anaerobic exercise*.

**anaerobic e.** Exercise during which the energy needed is provided without use of inspired oxygen. This type of exercise is limited to short bursts of vigorous activity. SEE: *aerobic exercise*.

**aquatic e.** The use of a pool or tank of water for early exercise in the treatment of musculoskeletal injuries and for

partial or non-weight-bearing activities in early rehabilitation training. SEE: *hydrotherapy*.

**assistive e.** A type of bodily movement performed by voluntary muscle contractions that are augmented by an extrinsic force such as a clinician or mechanical device.

**Bates e.** SEE: *Bates exercises*.

**blowing e.** An exercise in which the patient exhales into a tube with high end-expiratory pressure to open regions of the lung that may have collapsed and to prevent atelectasis. This encourages deep breathing, which tends to aid lung expansion. SEE: *atelectasis; empyema; pneumonia*.

**breathing e.** Exercise that enhances the respiratory system by improving ventilation, strengthening respiratory muscles, and increasing endurance.

**Buerger's postural e.** SEE: *Buerger's postural exercise*.

**Codman's e.** SEE: *Codman's exercise*.

**concentric e.** A form of isotonic exercise in which the muscle fibers shorten as tension develops. SEE: *muscle contraction, concentric; muscle contraction, eccentric*.

**corrective e.** Use of specific exercises to correct deficiencies caused by trauma or inactivity.

**dynamic stabilization e.** Stabilization e.

**eccentric e.** An exercise in which there is overall lengthening of the muscle in response to an external resistance. SEE: *muscle contraction, concentric; muscle contraction, eccentric*.

**flexibility e.** An exercise designed to increase joint range of motion and extensibility of muscle.

**free e.** An exercise carried through with no external assistance.

**isokinetic e.** An exercise with equipment that uses variable resistance to maintain a constant velocity of joint motion during muscle contraction, so that the force generated by the muscle is maximal through the full range of motion.

**isometric e.** Contraction and relaxation of a skeletal muscle or group of muscles in which the force generated by the muscle is equal to the resistance. There is no change in muscle length, and no movement results. SEE: *illus.* SYN: *muscle-setting exercise; static exercise*.

**isotonic e.** An active muscle contraction in which the force exerted remains constant and muscle length changes.

**Kegel e.** SEE: *Kegel exercise*.

**kinetic chain e.** An exercise that requires the foot (or hand) to apply pressure against a plate, pedal, or ground. This rehabilitation concept was determined by the anatomical functional re-



### ISOMETRIC EXERCISE

Isometric exercise of the upper extremities

relationship in the lower extremities. Kinetic chain exercises are more functional than open-chain exercises, in which the foot is off the ground and the force is generated by the muscles against a shin plate.

Kinetic chain exercises can either be open or closed. The term, "kinetic chain" describes how forces occur during human motion and how segments of the body are linked together. Open kinetic chain applies to unrestricted movement in space of a peripheral segment of the body. In closed kinetic chain exercises, the distal segment meets with external resistance, and remains fixed.

**muscle-setting e.** Isometric e.

**neurobic e.** Brainteasers, association tasks, calculations, puzzles, and other mental and physical exercises designed to stimulate thinking, problem solving, and other cerebral functions.

**passive e.** A therapeutic exercise technique used to move a patient's joints through a range of motion without any effort on the part of the patient. It is accomplished by a therapist, an assistant, or the use of a machine. SYN: *passive motion*; *passive movement*.

**pelvic floor e.** Kegel exercise.

**pendulum e.** Codman's exercise.

**progressive resistive e.** ABBR: PRE.

A form of active resistive exercise based on a principle of gradual increase in the amount of resistance in order to achieve maximum strength.

**range-of-motion e.** Movement of a joint through its available range of motion. It can be used to prevent loss of motion. SEE: *illus*.

**regressive resistive e.** ABBR: RRE. A form of active resistive exercise that advocates gradual reduction in the amount of resistance as muscles fatigue.

**resistive e., resistance exercise** Exercise in which a muscle contraction is opposed by force. Mechanical resistance exercise is exercise in which the opposition to muscle contraction is applied by weights or machinery; in *manual re-*

sistance exercise the opposition is applied by a person. In either case the objective is to increase muscular strength or endurance.

**stabilization e.** The application of fluctuating resistance loads while the patient stabilizes the part being trained in a symptom-free position. Exercises begin easily so that control is maintained, and progress in duration, intensity, speed, and variety. SYN: *dynamic stabilization exercise*.

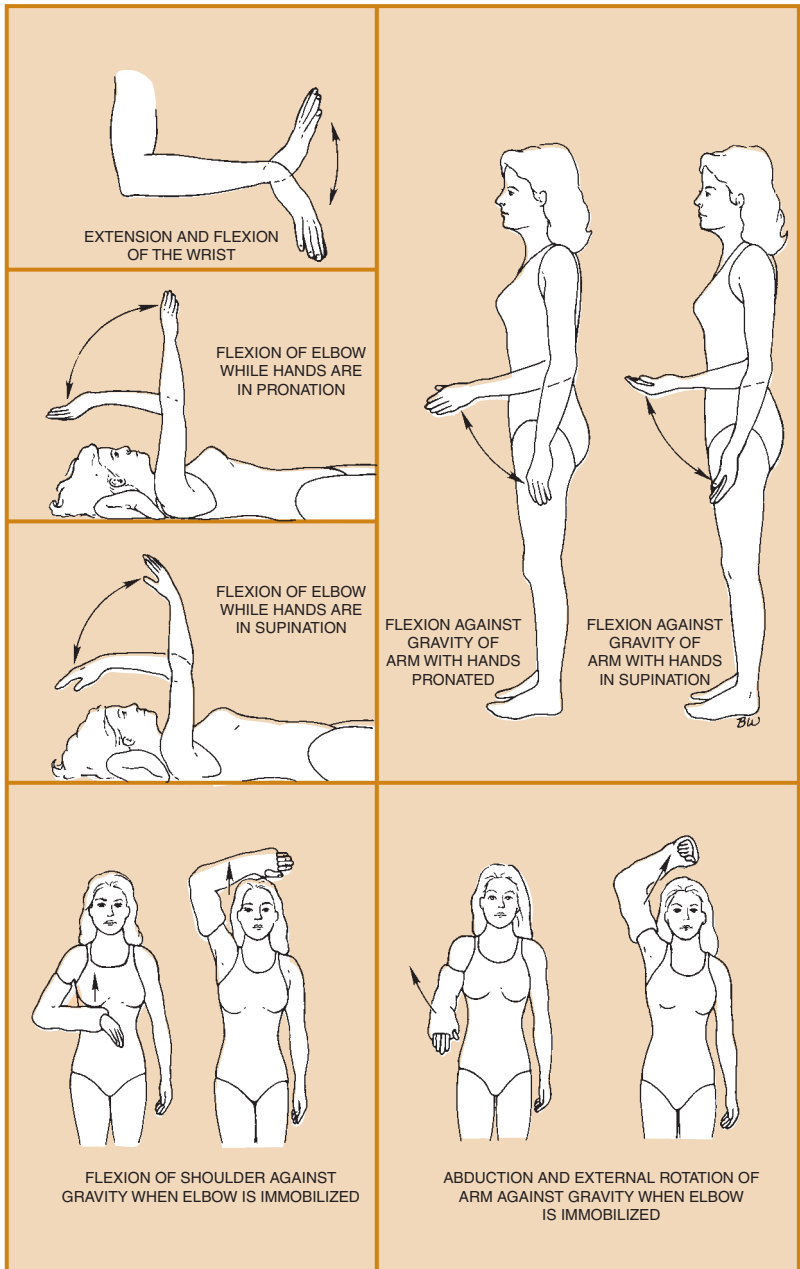
**static e.** Isometric e.

**stretching e.** A therapeutic exercise maneuver, using physiological principles, designed to increase joint range of motion or extensibility of pathologically shortened connective tissue structures.

**therapeutic e.** Scientific application of physical activity as an intervention for 1) improving function, general health, and sense of well-being in patients; 2) preventing complications and further functional loss; or 3) improving or maintaining functional performance in healthy clients. Therapeutic exercise interventions may include techniques to improve motion, strength, motor control, muscle and cardiopulmonary endurance, and efficiency, posture, balance, and coordination.

**exercise capacity** The ability of a person to increase oxygen uptake above his or her oxygen uptake at rest. While lying comfortably in bed each individual's body uses a basal (resting) level of oxygen to perform basic metabolic functions. This level of oxygen usage is referred to as one metabolic equivalent, or informally, as 1 MET. While walking on level ground the average person doubles his oxygen uptake, that is, his oxygen uptake increases to 2 MET. Higher levels of exercise (such as jogging) can only be achieved by individuals with greater exercise capacity; jogging at 6 miles per hour requires 6 MET. Highly trained athletes can achieve 15 MET or more. Studies have shown that the lower one's exercise capacity, the more likely that person is to die from heart disease.

**exercise tolerance test** A measure of cardiovascular (or cardiopulmonary) fitness, in which people exert themselves while having their heart rate, blood pressure, oxygen saturation, and electrocardiographic response monitored. A treadmill or ergometer is typically used as the testing device. The amount of exercise the patient must perform is increased gradually over several minutes, until the patient experiences excessive symptoms (such as fatigue, shortness of breath, chest pain, or claudication) or until objective findings of cardiopulmonary malfunction are demonstrated (such as arrhythmias, decreases in blood pressure, or ST-segment changes



**RANGE-OF-MOTION EXERCISES**

on the electrocardiogram). SYN: *stress test*.

Exercise tests are used most often to help diagnose symptoms or signs suggestive of coronary ischemia. They also

are used frequently after patients have suffered a myocardial infarction or an exercise-induced arrhythmia. In these situations, the test may provide patients with important information

about their likelihood of suffering further cardiac events or about the efficacy of their medical regimens in controlling their symptoms. When used in the evaluation of patients with cardiovascular disease, exercise testing often is combined with echocardiography or nuclear imaging of the heart to improve the predictive value, sensitivity, and specificity of the assessment.

In sports medicine, exercise testing can be used to help athletes train to achieve peak performance.

**exerxis** (ĕks-ĕr'ĕ-sĭs) [Gr. *exairesis*, taking out] Excision of any part.

**exergonic** (ĕk'sĕr-gŏn'ĭk) [Gr. *ex*, out, + *ergon*, work] Pert. to a chemical reaction that produces energy.

**exflagellation** (ĕks'flăj-ĕ-lă'shŭn) [ + L. *flagellum*, whip] The formation of microgametes (flagellated bodies) from the microgametocytes. This process occurs in the malarial organism (*Plasmodium*) in the stomach of a mosquito.

**exfoliatin** (ĕks'fŏ-lĕ-ă-tĭn) A toxin, produced by certain strains of *Staphylococcus aureus*, responsible for the major dermatological changes in staphylococcal "scalded skin" syndrome in neonates and adults.

**exfoliation** (ĕks'fŏ'lĕ-ăt'ĭn) [ + L. *folium*, leaf] The shedding or casting off of a body surface (e.g., the outer layer of skin cells, the outer table of bone, the primary set of teeth).

**exhalation** (ĕks'hă-lă'shŭn) [ + L. *halare*, to breathe] The process of breathing out; emanation of a gas or vapor. Opposite of inhalation.

**exhaustion** [ + L. *haurire*, to drain] **1.** A state of extreme fatigue or weariness; loss of vital powers; inability to respond to stimuli. **2.** The process of removing the contents or using up a supply of anything. **3.** The act of drawing or letting out.

**heat e.** An acute reaction to a hot, humid environment marked by profuse sweating, dizziness, nausea, headache, and profound fatigue as the result of excess fluid loss from the body. Heat exhaustion differs from heat stroke in that the body's thermoregulatory system is still functioning; if untreated, heat exhaustion can progress to heat stroke. SEE: table.

**SYMPTOMS:** The patient's rectal temperature will be elevated to about 102.5°F (39.0°C). The patient's pulse may be rapid but weak; blood pressure is decreased. The patient may appear disoriented and complain of thirst. Nausea and vomiting may also be noted.

**PREVENTION:** See heat stroke for preventive measures.

**TREATMENT:** The patient should be removed from the hot, humid environment to a cooler, well-ventilated location (e.g., indoors, under a shade tree)

and placed in a head-low position. Clothing should be loosened and the patient's body cooled by placing cold packs in the axilla, on the neck, groin, and behind the knees. Fluid consumption, in the form of water or electrolyte drinks, should be administered to conscious patients. Intravenous infusion of isotonic saline may be required. Prognosis is favorable if the patient is properly treated in the acute stages. SYN: *heat prostration*.

**exhibitionism** [ + Gr. *-ismos*, condition] **1.** A tendency to attract attention to oneself by any means. **2.** A sexual identity disorder manifesting itself in an abnormal impulse that causes one to expose one's genitals to a stranger.

**exhibitionist** **1.** A person with an abnormal desire to attract attention. **2.** A person who yields to an impulse to expose the genitals to a stranger.

**exhilarant** (ĕg-zĭl'ăr-ănt) [L. *exhilarare*, to gladden] Something that is mentally stimulating.

**exhumation** (ĕks'hŭ-mă'shŭn) [L. *ex*, out, + *humus*, earth] Removal of a dead body from the grave after it has been buried.

**exigency** (ĕk'sĭ-jĭn-sĕ, ĕg-zĭj'ĭn-) [L. *exigere*, to drive out, demand] A situation requiring immediate management. SEE: *emergency*.

**exitus** (ĕk'sĭ-tŭs) [L., going out] Death. **exo-** [Gr. *exo*, outside] Combining form meaning *without*; *outside of*.

**exoantigen** (ĕks'ŏ-ăn'tĭ-jĕn) [ + + ] A soluble antigen found on the surface of a microorganism, identified in the supernatant of a culture of that organism.

**exobiology** (ĕk'sŏ-bĭ-ŏl'ŏ-jĕ) The biological science of the universe, exclusive of our planet.

**exocardia** (ĕk'sŏ-kăr'dĕ-ă) [ + *kardia*, heart] A congenitally abnormal position of the heart.

**exocardial** (ĕk'sŏ-kăr'dĕ-ăl) Occurring outside the heart.

**exocataphoria** (ĕks'ŏ-kăt-ă-for'ĕ-ă) [ + *kata*, down, + *phoros*, bearing] A condition in which the visual axes are turned downward and outward.

**exocolitis** (ĕks'ŏ-kŏ-lĭ'tĭs) [ + *kolon*, colon, + *itis*, inflammation] Inflammation of the peritoneum of the colon.

**exocrine** (ĕks'ŏ-krĭn) [ + *krinein*, to separate] **1.** A term applied to the external secretion of a gland. Opposite of endocrine. **2.** A term applied to glands whose secretion reaches an epithelial surface either directly or through a duct.

**exocytosis** (ĕks'ŏ-sĭ-tŏ'sĭs) [ + *kytos*, cell, + *osis*, condition] The discharge of particles from a cell. They are too large to pass through the cell membrane by diffusion. SEE: *pinocytosis*.

**exodeviation** (ĕk'sŏ-dĕ'vĕ-ă'shŭn) A turning outward. When this condition



## Comparison of Heatstroke and Heat Exhaustion

Heat Exhaustion	Heatstroke
<b>Definition</b> A state of weakness produced by exposure to heat, humidity, and excessive loss of fluids and electrolytes	<b>Definition</b> A derangement of thermoregulation with altered mental status and high body temperature
<b>History</b> <i>Nonexertional</i> Same as for heatstroke Use of medications that increase heat production or inhibit perspiration Absence of fans or air conditioners Demographics: urban poor, elderly, obese	<b>History</b> <i>Nonexertional</i> Exposure to high temperatures and high humidity
<i>Exertional</i> Same as for heatstroke Demographics: outdoor laborers, athletes, military recruits	<i>Exertional</i> Excessive exercise under tropical conditions
<b>Physical Exam</b> <i>Rectal temperature:</i> <104°F <i>Pulse:</i> weak, thready, and rapid <i>Blood pressure:</i> usually normotensive <i>Skin:</i> Exertional—Signs of profuse sweating may be present <i>Neurological:</i> Normal mental status	<b>Physical Exam</b> <i>Rectal temperature:</i> usually >104°F <i>Pulse:</i> tachycardic <i>Blood pressure:</i> variable <i>Skin:</i> Nonexertional—Absence of sweating is common <i>Neurological:</i> Altered mental status, possible convulsions or coma
<b>Treatment</b> Rest Removal of patient from hot environment Administration of fluids and electrolytes by mouth or by vein Administration of fluids and electrolytes Cease cooling when rectal temperature returns to the upper limits of normal. Avoidance of alcohol bath (risk of intoxication); and of antipyretics (ineffective)	<b>Treatment</b> Rest Removal of patient from hot environment Active cooling by any available means, often by bathing or spraying skin with water, then fanning the patient
<b>Mortality</b> Rare	<b>Mortality</b> Common

occurs in the eyes, it is termed exotropia.

**exodontia** (ĕks-ō-dŏn'shĕ-ă) [" + *odous*, tooth] Dental extraction of teeth.

**exoenzyme** (ĕk-sŏ-ĕn'zĭm) [" + *en*, in, + *zyme*, leaven] An enzyme that does not function within the cells that secrete it.

**exoerythrocytic** (ĕk'sŏ-ĕ-rĭth'rŏ-sĭ'tĭk) [" + *erythros*, red, + *kytos*, cell] Occurring outside the red blood cells. Most of the life cycle of the malaria parasite in a human host is inside the red blood cell, where it causes symptoms; the rest is outside the red blood cell, and latent (i.e., exoerythrocytic).

**exogamy** (ĕks-ŏg'ă-mĕ) [" + *gamos*, marriage] **1.** Marriage outside a particular group. **2.** In biology, conjugation between protozoan gametes of different ancestry.

**exogastritis** (ĕks'ŏ-gă-s-trĭ'tĭs) [" + *gas-*

*ter*, belly, + *itis*, inflammation] Inflammation of the peritoneal coat of the stomach.

**exogenous** (ĕks-ŏj'ĕ-nŭs) [" + *gennan*, to produce] Originating outside an organ or part.

**exomphalos** (ĕks-ŏm'fă-lŭs) [Gr. *ex*, out, + *omphalos*, navel] **1.** An umbilical protrusion. **2.** An umbilical hernia.

**exon** (ĕk'sŏn) One of the coding regions of the DNA of genes. SEE: *intron*.

**exophasy** (ĕk'sŏ-fă'zĕ) The expression of thought by spoken or written words and the understanding of spoken or written words of others. It is also called external speech. SEE: *endophasy*.

**Exophiala** (ĕk'sŏ-fi-ă'lă) [NL.] A widespread genus of dematiaceous fungi that have brown hyphae and two-celled blastoconidia. Exophiala species may cause skin, heart, and brain infections in humans, esp. in those with immunosuppressive illnesses.

**E. dermatitidis** A species of the imperfect fungi that is usually a soil saprophyte but has caused meningitis following steroid therapy.

**exophoria** (èks'ò-fò-rè-à) [ʹ + *phoros*, bearing] A tendency of the visual axes to diverge outward. Opposite of esophoria.

**exophthalmometer** (èk'sòf-thäl-mòm'è-tèr) A device for measuring the degree of protrusion of the eyeballs.

**exophthalmos, exophthalmia, exophthalmus** (èks'òf-thäl'mòs, -müs) Abnormal anterior protrusion of the eyeball. This may be due to thyrotoxicosis, tumor of the orbit, orbital cellulitis, leukemia, aneurysm, or vascular malformation. **exophthalmic** (-mìk), *adj.*

**pulsating e.** Exophthalmos accompanied by pulsation and bruit due to an aneurysm behind the eye.

**exoplasm** (èk'sò-pläzm) [ʹ + LL. *plasma*, form, mold] Ectoplasm.

**exoserosis** (èks'ò-sèr-ò'sís) [ʹ + *serum*, whey, + Gr. *osis*, condition] An oozing of serum or discharge of an exudate from the skin.

**exoskeleton** (èk'sò-skél'è-tòn) [ʹ + *skeleton*, a dried-up body] The hard outer covering of certain invertebrates such as the mollusks and arthropods. It is composed of chitin, calcareous material, or both.

**exosome** (èks'ò-sòm") [ʹ + Gr. *soma*, body] An intracellular complex that degrades and processes messenger RNA molecules.

**exosplenopexy** (èks'ò-splèn'ò-pèks'è) [ʹ + *splen*, spleen, + *pexis*, fixation] Suturing of the spleen to an opening in the abdominal wall.

**exostosis** (èks'òs-tò'sís) *pl.* **exostoses** [ʹ + *osteon*, bone] A bony growth that arises from the surface of a bone, often involving the ossification of muscular attachments. SYN: *hyperostosis*; *osteoma*.

**e. bursata** An exostosis arising from the epiphysis of a bone and covered with cartilage and a synovial sac.

**e. cartilaginea** An exostosis consisting of cartilage underlying the periosteum.

**multiple osteocartilaginosa e.** A hereditary growth disorder marked by the development of multiple exostoses, usually on the diaphyses of long bones near the epiphyseal lines. It causes irregular growth of the epiphyses and often secondary deformities.

**retrocalcaneal e.** Abnormal bone growth over the Achilles tendon's attachment on the calcaneus. The colloquial term "pump bumps" is derived from this condition's association with the wearing of tight-fitting, high-heeled shoes. SYN: *Haglund deformity*.

**SYMPTOMS:** A hard nodule is present over the Achilles tendon attachment.

The area appears inflamed and is sensitive to the touch. Patients often demonstrate hindfoot rigidity and decreased foot pronation. The patient may complain of pain during resisted plantar flexion (e.g., during the toe-off phase of gait). Symptoms may increase when wearing tight-fitting shoes.

**TREATMENT:** Physical agents and anti-inflammatory medications are used to minimize the inflammatory response. The patient should be instructed to wear loose-fitting shoes or open-backed shoes such as sandals, whenever practical. Improper foot biomechanics should be corrected, if applicable.

**exothermal, exothermic** (èk'sò-thèr'mäl, èk'sò-thèr'mìk) [Gr. *exo*, outside, + *therme*, heat] Pert. to a chemical reaction that produces heat.

**exothymopexy** (èks'ò-thí'mò-pèks'è) [ʹ + *thymos*, thymus, + *pexis*, fixation] Formerly performed suturing of an enlarged thymus gland to the sternum.

**exothyropexy** (èks'ò-thí'rò-pèks'è) Formerly performed suturing of the thyroid gland and external fixation to induce atrophy.

**exotic** (èg-zòt'ík) [Gr. *exotikos*] Not native; originating in another part of the world.

**exotoxin** (èks'ò-tòks'in) [Gr. *exo*, outside, + *toxikon*, poison] A poisonous substance produced by bacteria, including staphylococci, streptococci, *Vibrio cholerae*, *Pseudomonas* species, and *Escherichia coli*. The actions of specific exotoxins vary with the organism. Staphylococcal exotoxins stimulate release of gamma interferon and can cause systemic inflammatory response syndrome. Inactivated exotoxins are used as the basis for diphtheria and tetanus vaccines. SEE: *bacterium*; *sepsis*; *systemic inflammatory response syndrome*; *toxoid*.

**exotropia** (èks'ò-trò'pè-ä) [ʹ + *tropos*, turning] Divergent strabismus; abnormal turning outward of one or both eyes.

**expanded access** Any of several methods used by the U.S. Food and Drug Administration to make available experimental treatments to patients who are not participating in formal clinical trials.

**expander** (èk-spän'dèr) [L. *expandere*, to spread out] Something that increases the size, volume, or amount of something.

**expectant treatment** (èk-spèk'tínt trèt'mínt) Relief of symptoms as they arise (i.e., not directed at the specific cause).

**expected date of confinement** ABBR: EDC. The predicted date of childbirth. SEE: *Naegele's rule*; *pregnancy* for table.

**expectorant** (èk-spèk'tò-ránt) [Gr. *ex*, out, + L. *pectus*, breast] An agent, such as guaifenesin, that promotes the

clearance of mucus from the respiratory tract.

**expectoration** (ĕk-spĕk"tō-rā'shŭn)

**1.** The act or process of spitting out saliva or coughing up materials from the air passageways leading to the lungs.

**2.** The expulsion of mucus or phlegm from the throat or lungs. It may be mucoid, mucopurulent, serous, or frothy. In pneumonia, it is viscous and tenacious, sticks to anything, appears rusty, and contains blood. In bronchitis, it is mucoid, often streaked with blood, and greenish-yellow from pus. In advanced tuberculosis, it varies from small amounts of frothy fluid to abundant, offensive greenish-yellow sputum often streaked with blood. SEE: *sputum*.

**expedite** (ĕk'spĕ-dīt") [L. *expeditus*, unencumbered] To facilitate or speed up any process, e.g., to review and publish the results of important research rapidly.

**expel** (ĕks-pĕl') [L. *expellere*] To drive or push out.

**experience** **1.** To encounter something personally or undergo an event. **2.** The knowledge or wisdom obtained from one's own observations.

**experience rating** **1.** A projection of the cost of an insurance policy (e.g., of a malpractice insurance policy) based on the claims history of the person or party seeking to be insured. **2.** A calculation of future insurance payments based on historical data.

**experiment** [L. *experimentum*, to test] A scientific procedure used to test the validity of a hypothesis, gain further evidence or knowledge, or test the usefulness of a drug or type of therapy that has not been tried previously.

**expert consensus** An agreed-upon set of principles for the care of a particular disease or condition, established after a review of contemporary knowledge by specialists in the field.

**expert system** A computer program using a set of rules that analyzes information and simulates the judgment and behavior of a specialist in a particular field to provide analysis and to possibly recommend a course of action.

**expiration** (ĕks'pī-rā'shŭn) [Gr. *ex*, out, + *L. spirare*, to breathe] **1.** Expulsion of air from the lungs in breathing. Normally the duration of expiration is shorter than that of inspiration. In general, if expiration lasts longer than inspiration, a pathological condition such as emphysema or asthma is present. SEE: *diaphragm* for ill.; *inspiration*; *respiration*. **2.** Death.

**active e.** Expiration accomplished as a result of muscular activity, as in forced respiration. The muscles used in forced expiration are those of the abdominal wall (external and internal oblique, rectus, and transversus abdom-

inis), the internal intercostalis, serratus posterior inferior, platysma, and quadratus lumborum.

**passive e.** Expiration, performed during quiet respiration, that requires no muscular effort. It is brought about by the elasticity of the lungs, and by the ascent of the diaphragm and the weight of the descending chest wall, which compress the lungs.

**expiration date** The last day on which a drug or other therapeutic agent is still considered potent.

**expiratory** (ĕks-pī'rā-tor"ē) Pert. to expiration of air from the lungs.

**expiratory pause time** ABBR: TEP. The interval between the end of one exhalation and the beginning of the next.

**expiratory trigger sensitivity** The adjustment of a pressure-support ventilator to the neurally mediated end of expiration. This machine adaptation to the patient's respiratory efforts is a refinement of mechanical ventilation that decreases patient discomfort and the work of breathing.

**expire** (ĕk-spī'ēr) **1.** To breathe out or exhale. **2.** To die.

**explant** (ĕks-plānt') [" + *L. planta*, sprout] **1.** To remove a piece of living tissue from the body and transfer it to an artificial culture medium for growth, as in tissue culture. Opposite of implant. **2.** To remove a donor organ for transplantation. **3.** An organ removed for transplantation.

**explicit** (ĕk-splī'sīt) [L. *explicare*, to unfold, set forth] **1.** Clearly and definitively stated. **2.** Unequivocal.

**explode** (ĕks-plōd') [L. *explodere*, fr. *ex*, out, + *plaudere*, to clap the hands] In epidemiology, to appear suddenly or have rapid onset.

**exploration** [L. *explorare*, to search out] Examination of an organ or part by various means. **exploratory**, *adj.*

**explorer** (ĕks-plor'ēr) An instrument used in exploration, esp. a device used to locate foreign bodies or to define passageways in body sinuses or cavities.

**dental e.** A sharp-pointed instrument used to detect unsound enamel, carious lesions, or imperfect margins of restorations in teeth.

**exponent** (ĕks'pō-nĕnt) In mathematics, the number that indicates the power to which another number is to be raised. It is written as a superscript (e.g., 10<sup>2</sup> or x<sup>2</sup> indicates that 10 and x are to be squared, or multiplied by themselves). The exponent can have any numerical value and may be positive or negative; it does not have to be a whole number. SEE: *Scientific Notation in Units of Measurement Appendix*.

**expose** **1.** To open, as in surgically opening the abdominal cavity. **2.** To cause someone or something to lack heat or shelter. **3.** To place in contact with an

infected person or agent. **4.** To display one's genitals publicly, esp. when members of the opposite sex are present. **5.** To deliver an amount of radiation.

**exposure 1.** The amount of radiation delivered or received over a given area or to the entire body or object. **2.** Contact with an agent able to cause disease or injury, such as a bacterium or other contagious microbe; a chemical; an infected animal or person; or a physical agent, such as a radioactive source. **3.** The making visible of a body part, e.g., in a surgical procedure. **4.** The placing of an object or person in a particular environment, e.g., in warm or cold water. **5.** The physical consequences of being outdoors for a long time, including lowered body temperature; damage to skin, muscles, or nerves; altered judgment; coma; or, in some instances, death.

**acute e.** Exposure to radiation that is of short duration and usually of high intensity.

**double e.** Two exposures on one photographic or radiographic film or image.

**pulp e.** An opening in the dentin that exposes the pulp of a tooth to the oral cavity.

**exposure assessment** A formal study of the impact of a hazardous substance on people, places, or things. It includes determination of the source(s) of the substance, its diffusion through the environment, its concentration, its duration and half-life, and the populations or media that are vulnerable to its effects.

**exposure limit** The maximum concentration of a substance with which an organism can have contact without suffering adverse effects.

**exposure pathway** The route that an infectious, toxic, or radioactive substance takes as it enters the body. Airborne toxins, for example, usually enter the body by inhalation, although they may be deposited on the skin and be absorbed transcutaneously. Foodborne toxins typically enter the body by ingestion.

**exposure response prevention therapy** A treatment for obsessive-compulsive disorder in which a person is repeatedly exposed to something that would normally trigger a stereotyped or ritualistic response but is prevented from engaging in the ritual.

**express** [L. *expressare*] **1.** To squeeze out. **2.** To speak; to use language or symbols to communicate with others. **3.** To translate a gene into a protein.

**expression 1.** Expulsion by pressure. **2.** Facial disclosure of feeling or a physical state. SYN: *facies*. SEE: *face*.

**differential gene e.** The biochemical processes that determine which genes are actively transcribed and translated into mRNA and proteins in a cell and under what conditions.

**expressive language disorder** Failure of a child to learn how to speak, write, or use sign language properly, despite having normal understanding of language and otherwise normal cognitive functions. The impairment in language use is apparent in the child's abnormal composition of sentences, frequent grammatical errors, limited word choices, and difficulty in learning new vocabulary.

**expressivity** The extent to which a heritable trait is manifest in the individual carrying the gene.

**expulsion rate** In gynecology, the rate of spontaneous rejection of intrauterine contraceptive devices in the group of women who use them. It is usually expressed with respect to the time elapsed following implantation.

**expulsive** (ĕks-pŭl'siv) [L. *expellere*, to drive out] Having a tendency to expel.

**exsanguinate** (ĕks-săn'gwĭn-ăt) [Gr. *ex*, out, + *sanguis*, blood] To lose blood to the point at which life can no longer be sustained.

**exsanguination** (ĕk-săn'gwĭn-ă'shŭn) Massive bleeding.

**exsanguine** (ĕks-săn'gwĭn) Anemic; bloodless.

**exsiccant** (ĕk-sĭk'ănt) [L. *exsiccare*, to dry out] **1.** Absorbing or drying up a discharge. **2.** An agent that absorbs moisture. **3.** A dusting or drying powder.

**exsiccation** (ĕk'sĭ-kă'shŭn) **1.** The process of drying up. **2.** In chemistry, removing the water from compounds or solutions. SYN: *desiccation*.

**exsorption** (ĕk-sorp'shŭn) Movement of material including cells and electrolytes from the blood to the lumen of the intestines. In pathological conditions such as intestinal obstruction, this process may greatly increase pressure inside the affected area of the intestinal tract.

**extrophy** (ĕks'trô-fĕ) [ʹ + *strephein*, to turn] Congenital turning inside out of an organ. SEE: *eversion*.

**exsufflation** (ĕk'sŭ-flă'shŭn) [ʹ + *sufflatio*, blown up] Forceful expulsion of air from a cavity by artificial means, such as use of a mechanical exsufflator.

**ext** [L. *extractum*] extract.

**extein** (ĕk'stĕ-in) [ʹ + (*pro*)*tein*] Fragments of a protein that link to form a new protein after an internal sequence (an intein) of the larger molecule is removed by post-translational splicing.

**extemporaneous** (ĕks-tĕm'pô-răn'ĕ-ŭs) [LL. *extemporaneus*] Not prepared according to formula but devised for the occasion.

**extend** (ĕk-stĕnd') [Gr. *ex*, out, + L. *tendere*, to stretch] **1.** To straighten a joint such as the knee or elbow by increasing the angle formed by the proximal and distal bones. **2.** To move for-

ward. **3.** To increase the angle between the bones forming a joint.

**extended care facility** A medical care institution for patients who require long-term custodial or medical care, esp. for a chronic disease or one requiring prolonged rehabilitation therapy.

**extender** (ĕk-stĕn'dĕr) Something that increases duration or effect. The time required for absorption of some medicines given intramuscularly may be increased by injecting them with a substance such as an oil, which slows absorption.

**leg e.** A device added to lengthen the legs of furniture (e.g., beds, tables, chairs) to accommodate the needs of persons with functional limitations.

**extension** (ĕks-tĕn'shŭn) [L. *extensio*]

**1.** The movement that pulls apart both ends of any part. **2.** A movement that brings the members of a limb into or toward a straight position. Opposite of flexion. **3.** The application of a pull (traction) to a fractured or dislocated limb.

**Buck's e.** SEE: *Buck's extension*.

**extensive limb swelling** ABBR: ELS. A large localized tissue reaction in an arm or a leg after the injection of certain vaccines. DTaP (diphtheria, tetanus, and acellular pertussis) vaccination, e.g., results in injection site swelling of muscle and subcutaneous tissue in approx. 2% to 6% of children receiving booster doses of the vaccine. The swelling resolves spontaneously in about 4 days without complications.

**extensor** (ĕks-tĕn'sor) [L.] A muscle that extends a part of the body.

**external** [L.] Outside of; external; opposite of interior or internal.

**exteriorize** (ĕks-tĕr'ĕ-o-rĭz) **1.** To mobilize without the body, a part temporarily in surgery. SEE: *marsupialization*. **2.** In psychiatry, to turn one's interests outward.

**extern** (ĕks'tĕrn) [L. *externus*, outside] A medical student, living outside a hospital, who assists in the medical and surgical care of patients. SEE: *intern*.

**external** Exterior; the opposite of interior or internal.

**external fixator** A device for holding fractured bones in place by use of external rather than internal fixation. SEE: *illus*.

**externalia** (ĕks'tĕr-nā'lĕ-ă) [L. *exter*, outside, + *genitalis*, genital] The external genitals.

**externalize** (ĕks-tĕr'nā-lĭz) **1.** In surgery, to provide exposure to the outside. **2.** In psychiatry, to direct one's inner conflicts to the outside rather than keeping them hidden inside.

**exteroceptive** (ĕks'tĕr-ō-sĕp'tĭv) [L. *externus*, outside, + *receptus*, having received] Pert. to receptors detecting external (environmental) stimuli.

**exteroceptor** (ĕks'tĕr-ō-sĕp'tor) A sense organ (e.g., in the eye, ear, or skin)

adapted for the reception of stimuli from outside the body.

**extinction** [L. *extinctus*, having extinguished] **1.** The process of extinguishing or putting out. **2.** The complete inhibition of a conditioned reflex through failure to reinforce it.

**extinguish** (ĕks-tĭng'gwĭsh) [L. *extinguere*, to render extinct] To abolish, esp. to remove a reflex, by surgical, psychological, or pharmacological means, depending on the type of reflex involved.

**extirpation** (ĕks-tĭr-pā'shŭn) [L. *extirpare*, to root out] Complete removal of a part.

**extorsion** (ĕks-tor'shŭn) [Gr. *ex*, out, + L. *torsio*, twisting] Rotation of an organ or limb outward.

**extra-** [L. *extra*, outside] Prefix meaning *outside of; in addition to; beyond*.

**extra-articular** (ĕks'trā-ăr-tĭk'ŭ-lăr) [ + *articulus*, joint] Outside a joint.

**extra beat** Extrasystole.

**extracapsular** (ĕks'trā-kăp'sŭ-lăr) Outside a capsule (e.g., a joint capsule or the capsule of the lens of the eye).

**extracapsular extension** The spread of a tumor outside the organ in which it arose, specifically, outside the tissue that separates the organ from neighboring anatomical structures.

**extracellular** (ĕks'trā-sĕl'ŭ-lăr) Outside the cell.

**extrachromosomal** (ĕks'trā-kro'mō-sō'măl) Not connected to the chromosomes; exerting an effect other than through chromosomal action.

**extracorporeal** (ĕks'trā-kor-por'ĕ-ăl) [ + *corpus*, body] Outside the body.

**extracorporeal membrane oxygenator** ABBR: ECMO. An external device that oxygenates blood delivered to it from the body and then returns it to the patient. It has been used experimentally in patients with acute respiratory failure. It has also been used to treat newborns with meconium aspiration syndrome, pneumonia, and persistent pulmonary hypertension, who have failed to respond to standard treatments.

**extracorporeal shock wave lithotripsy, extracorporeal shock wave therapy** ABBR: ESWL. The fragmentation of kidney stones with an extracorporeal shock wave lithotripter. In addition to breaking up gallstones and kidney stones, shock wave lithotripsy may be used in some orthopedic applications (orthotripsy), e.g., in the treatment of nonunion of fractures and bone spurs.

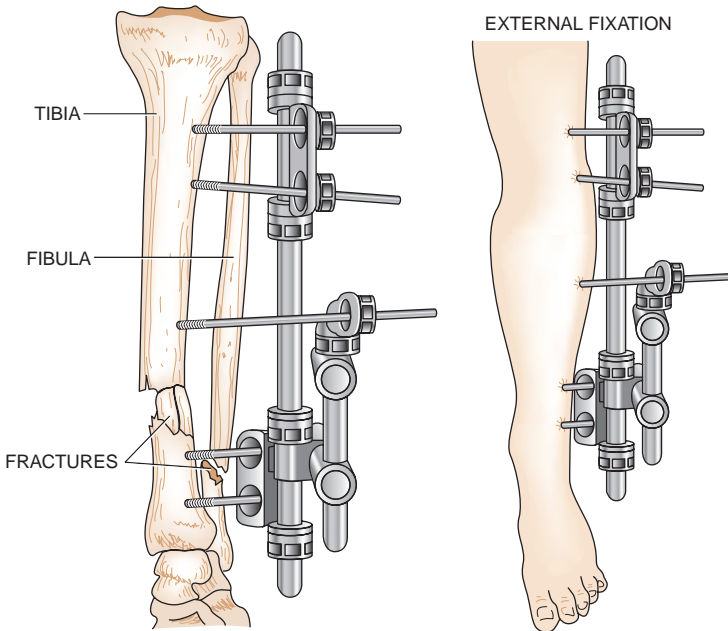


ESWL for gallstones or kidney stones is contraindicated during pregnancy.

**extracorporeal shock-wave lithotripter**

A device used to fragment calcified ob-





EXTERNAL FIXATION OF FRACTURES OF THE TIBIA AND FIBULA

jects within the body, such as kidney stones. After the patient is given analgesics and anesthetic drugs, electrically generated shock waves are focused on the object in an attempt to disrupt it. In the case of kidney stones and gallstones, the stone fragments may subsequently pass either into the urine or the bile. SEE: *percutaneous ultrasonic lithotripter*.

**extracortical** (ĕks"trā-kor"tī-kō-spī'nāl) Outside the corticospinal tract of the central nervous system.

**extracranial** (ĕks"trā-krā'nē-āl) Outside the skull.

**extract** (ĕks-trākt', ĕks'trākt) [L. *extractum*] **1.** To surgically remove or remove forcibly, as to extract a tooth. **2.** A solid or semisolid preparation made by removing the soluble portion of a compound by using water or alcohol as the solvent and evaporating the solution. **3.** The active principle of a drug obtained by distillation or chemical processes.

**compound e.** An extract prepared from more than one drug or substance.

**fluid e.** An extract of a vegetable drug made into a solution. It contains medicinal components.

**liver e.** A dry brown powder obtained from mammalian livers that was once used as a crude source of vitamin B<sub>12</sub> and other vitamins.

**red yeast rice e.** A dietary herbal supplement derived from the mold *Mon-*

*ascus purpureus*. Red yeast rice extract is promoted for its effect in lowering serum cholesterol levels.



Side effects can include dizziness, gastritis, heartburn, flatulence, and elevated hepatic enzymes. It is chemically related to the statin class of cholesterol-lowering medications.

**soft e.** An extract with the consistency of honey.

**solid e.** An extract made by evaporating the fluid part of a solution.

**extraction** (ĕks-trāk'shūn) [L. *extractum*, drawing out] **1.** Surgical removal, as a tooth. **2.** The removal of the active portion of a drug from its vehicle.

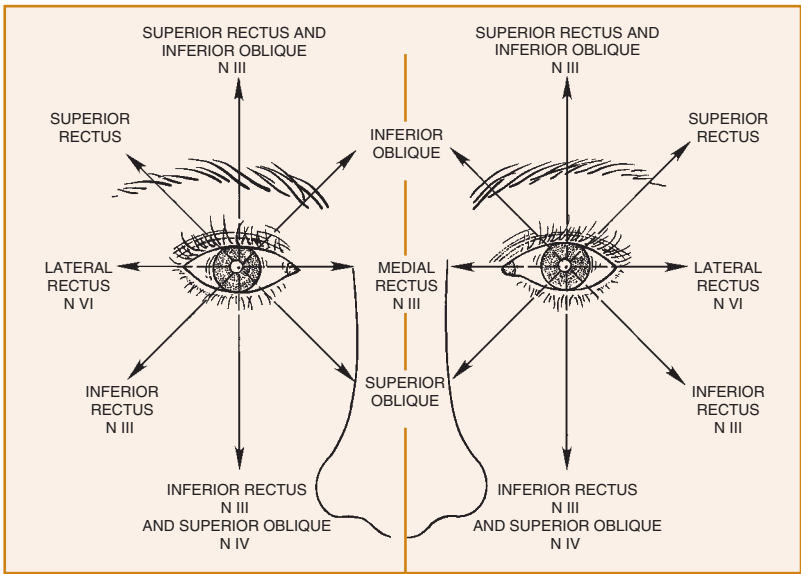
**breech e.** SEE: *delivery, breech*.

**extracapsular e.** A surgical technique for cataract removal. The nucleus, cortex, and anterior capsule are removed; the posterior capsule is left intact. This is often done by phacoemulsification under local anesthesia using a microscope.

**extractive** (ĕks-trāk'tiv) Something that has been extracted or removed.

**extractor** (ĕks-trāk'tor) An instrument for removing foreign bodies. Varieties include esophageal, throat, bronchial, and tissue extractors.

**extractum** (ĕks-trāk'tūm) *pl. extracta* [L., a drawing out] An extract. SEE: *fluid extract*.



**EXTRAOCULAR EYE MUSCLES**

Movements produced and cranial nerve supply

**extracystic** (èks"trä-sís'tík) [L. *extra*, outside, + Gr. *kystis*, bladder] Outside or unrelated to a bladder or cystic tumor.

**extradural** (èks-trä-dū'räl) [ʹ + *durus*, hard] 1. On the outer side of the dura mater. 2. Unconnected with the dura mater.

**extraembryonic** (èks"trä-ëm"brë-ön'ík) [ʹ + Gr. *embryon*, something that swells in the body] Apart from and outside the embryo (e.g., concerning the amnion).

**extrafusal fibers** (èk"strä-füz'äl) The muscle fibers surrounding a muscle spindle.

**extragenital** (èks"trä-jën'i-täl) [ʹ + *genitalis*, genital] Outside or unrelated to the genital organs.

**extrahepatic** (èks"trä-hë-pät'ík) [L. *extra*, outside, + Gr. *hepatos*, liver] Outside or unrelated to the liver.

**extramarginal** (èks"trä-mär'ji-näl) [ʹ + *margo*, margin] Pert. to subliminal consciousness.

**extramastoiditis** (èks"trä-mäs'toyd-i'tis) [ʹ + Gr. *mastos*, breast, + *eidos*, form, shape, + *itis*, inflammation] Inflammation of tissues contiguous to the mastoid process.

**extramedullary** (èks"trä-mëd'ü-lä-rë) [ʹ + *medulla*, marrow] Outside the medulla or the bone marrow.

**extramural** (èks"trä-mü'räl) [ʹ + *murus*, wall] Outside the wall of an organ or vessel.

**extraneous** (èks-trä'në-üs) [L. *extra-*

*neus*, external] Outside and unrelated to an organism.

**extranet** A private network that uses Internet technology and the public telecommunication system to secure a business's information or operations with suppliers, vendors, partners, customers, or other businesses. It is an extension of an intranet with added security features.

**extranuclear** (èks"trä-nü'klë-är) [L. *extra*, outside, + *nucleus*, kernel] Outside a nucleus.

**extraocular** (èks"trä-ök'ü-lär) [ʹ + *oculus*, eye] Outside the eye, as in extraocular eye muscles. SEE: *extraocular eye muscle* SEE: *illus. (Extraocular Eye Muscles)*.

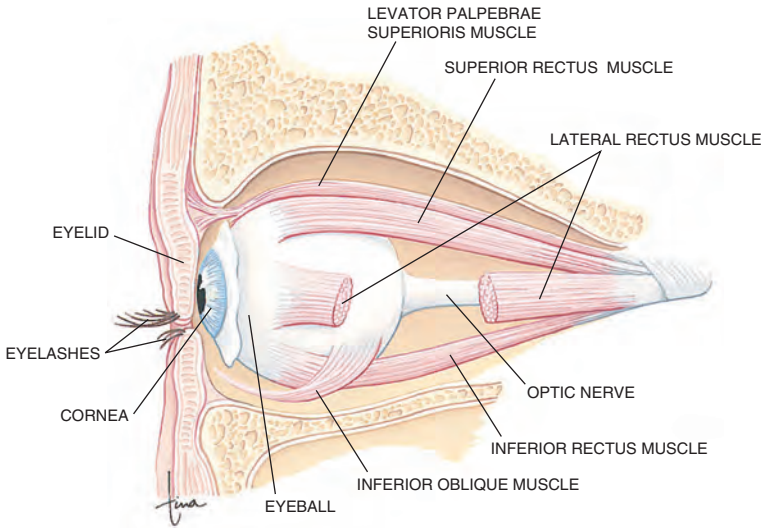
**extraperitoneal** 1. Outside the peritoneum. 2. Not completely enveloped by the peritoneum.

**extrapolar** (èks"trä-pō'lär) [ʹ + *polus*, pole] Outside instead of between poles, as the electrodes of a battery.

**extrapolate** (èks"trä'pō-lät') To infer a point between two given, or known, points on a graph or progression. Thus, if an infant weighed 20 lb at a certain age and 4 months later weighed 23 lb, it could be inferred that at a point halfway between the two time periods, the infant might have weighed 21.5 lb.

**extrapyramidal** (èks"trä-pi-räm'i-däl) Outside the pyramidal tracts of the central nervous system.

**extrapyramidal disease** Any of several degenerative diseases of the nervous



### EXTRAOCULAR EYE MUSCLES

Lateral view, left eye (superior oblique and medial rectus not shown)

system that involve the extrapyramidal system and the basal ganglion of the brain. Symptoms include tremors, chorea, athetosis, and dystonia. Parkinsonism is a form of extrapyramidal disease.

**extrapyramidal motor system** The functional system that includes all descending fibers arising in cortical and subcortical motor centers that reach the medulla and spinal cord by pathways other than recognized corticospinal tracts. The system is important in maintenance of equilibrium and muscle tone.

**extrapyramidal side effects of medications** ABBR: EPS. Muscular rigidity, tremor, bradykinesia, and difficulty walking induced by neuroleptic medications; drug-induced parkinsonism.

**extrapyramidal syndrome** Any of several degenerative nervous system diseases that involve the extrapyramidal system and the basal ganglion of the brain. The symptoms include tremors, chorea, athetosis, and dystonia. Parkinsonism is an extrapyramidal syndrome.

**extrasensory** (ĕks"trā-sĕn'sō-rĕ) Pert. to forms of perception, such as thought transference, that are not dependent on the five primary senses.

**extrasystole** (ĕks"trā-sĭs'tō-lĕ) [" + Gr. *systole*, contraction] Premature contraction of the heart. It may occur in the presence or absence of organic heart disease. It may be of reflex origin or may be triggered by stimulants (e.g., caffeine, cocaine, or theophylline), hypoxia, psychological stress, electrolyte abnormalities, thyroid disorders, or myocardial infarction.

**atrial e.** Premature contraction of the atrium.

**junctional e.** Nodal e.

**nodal e.** Extrasystole occurring as a result of an impulse originating in the atrioventricular node. SYN: *junctional extrasystole*.

**ventricular e.** Premature ventricular beat.

**extrathoracic** (ĕks"trā-thō-rās'ĭk) Outside the thorax.

**extratubal** (ĕks"trā-tū'bāl) Outside a tube, esp. the uterine tube.

**extrauterine** (ĕks"trā-ū'tĕr-ĭn) [" + *uterus*, womb] Outside the uterus.

**extravaginal** (ĕks"trā-vāj'i-nāl) [" + *vagina*, sheath] Outside the vagina.

**extravasate** (ĕks-trāv'ā-sāt) [" + *vas*, vessel] 1. To escape from a vessel into the tissues, said of serum, blood, or lymph. 2. Fluid escaping from vessels into surrounding tissue.

**extravasation** (ĕks-trāv'ā-sā-shŭn) The escape of fluid from its physiologic contained space, e.g., bile, blood, cerebrospinal fluid (CSF), into the surrounding tissue. SYN: *suffusion*.

**extravascular** (ĕks"trā-vās'kū-lār) [" + *vasculum*, vessel] Outside a vessel.

**extraventricular** (ĕks"trā-vĕn-trĭk'ū-lār) [" + *ventriculus*, little belly] Outside any ventricle, esp. one of the heart.

**extremely low birth weight** ABBR: ELBW. SEE: under *birth weight*.

**extremital** (ĕks-trĕm'ĭ-tāl) [L. *extremus*, outermost] Pert. to an extremity. SYN: *distal*.

**extremity** (ĕks-trĕm'ĭ-tĕ) 1. The terminal part of anything. 2. An arm or leg.

**lower e.** The lower limb, including the hip, thigh, leg, ankle, and foot.

**upper e.** The upper limb, including the shoulder, arm, forearm, wrist, and hand.

**extrinsic** (ĕks-trĭn'sĭk) [LL. *extrinsecus*, outer] From, or coming from, outside.

**extrinsic factor** **1.** A synonym sometimes used for clotting factor VII. **2.** An old and infrequently used synonym for vitamin B<sub>12</sub>. SEE: *anemia*, *pernicious*.

**extroversion** (ĕks'trō-vĕr'zhŭn) [ʹ + *vertere*, to turn] **1.** Eversion; turning inside out. **2.** The direction of attention and energy outward from the self. SEE: *introversion*.

**extrovert** (ĕks'trō-vĕrt') An outgoing or extremely sociable person interested mainly in external objects and actions.

**extrude** (ĕks-trŭd') [L. *extrudere*, to squeeze out] To push or force out.

**extrusion** (ĕks-troo'zhŭn) **1.** Something occupying an abnormal external position. **2.** In dentistry, the overeruption or migration of a tooth beyond its natural occlusal plane. This condition often follows the removal of an opposing tooth. **3.** A herniated nucleus pulposus in which the nuclear material ruptures through the outer fibers of the annulus fibrosis and is present in the spinal canal but still partially within the disk and still attached to it.

**extrusion reflex** An infantile reflex in which the tongue moves outward after it has been touched. It is present from birth to 4 months.

**extubation** (ĕks'tŭ-bā'shŭn) [Gr. *ex*, out, + L. *tuba*, tube] Removal of a tube, as an endotracheal tube.

**unplanned endotracheal e.** The inadvertent removal of an endotracheal tube (ET) by patients who are either not responsible for or not aware of their actions. To prevent a recurrence, the health care provider must be skilled in securing the ET. The tube needs to be firmly secured, tube-related discomfort minimized, and the patient's delirium and agitation controlled. This may require careful patient monitoring, or occasionally, sedation, paralysis, or the application of physical restraints. Immediate reintubation may be indicated in a patient who is unable to oxygenate or ventilate on his own.

**exuberant** (ĕg-zŭ'bĕr-ĕnt) [L. *exuberare*, to be very fruitful] **1.** Excessive, as in the increased and excessive growth of granulation tissue or bacterial culture. **2.** Joyful, happy.

**exudate** (ĕks'ŭ-dĕt) [L. *exsudare*, to sweat out] Any fluid released from the body with a high concentration of protein, cells, or solid debris.

Exudates may be classified as fibrinous, hemorrhagic, diphtheritic, purulent, and serous. A fibrinous exudate may wall off a cavity, resulting e.g.,

in adhesions following surgery, or in restrictive lung disease, following an empyema. SEE: *empyema*; *infection*; *inflammation*; *pus*; *resorption*; *transudate*.

**exudation** (ĕks'ŭ-dā'shŭn) Pathological oozing of fluids, usually the result of inflammation. SEE: *exudate*. **exudative** (ĕks'ŭ-dā'tĭv), *adj.*

**exude** (ĕg-zŭd') [L. *exsudare*, to sweat out] To ooze out of tissues; said of a semisolid or fluid.

**exumbilication** (ĕks'ŭm-bĭl'ĭ-kā'shŭn) [Gr. *ex*, out, + L. *umbilicus*, navel] Protrusion of the navel. SYN: *exomphalos*. SEE: *umbilical hernia*.

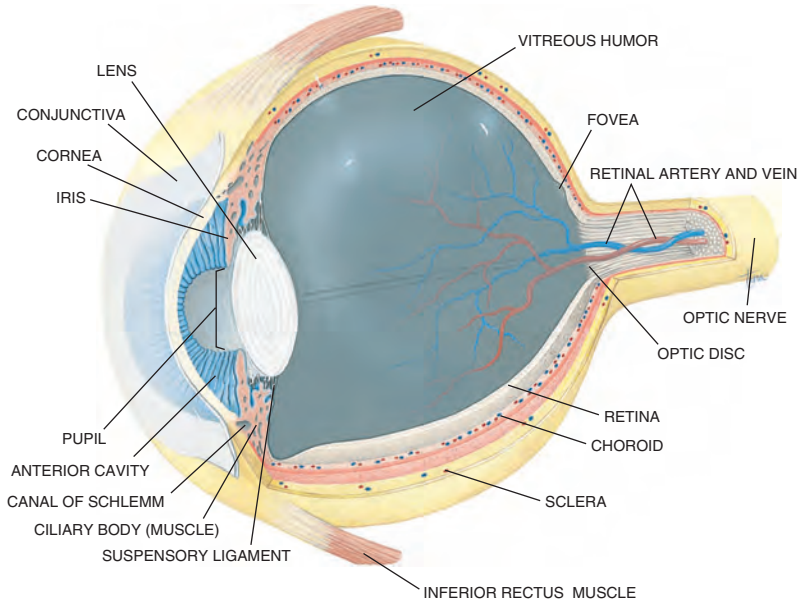
**Eyach virus** ABBR: EYAV. A European tick-borne coltivirus, implicated in some cases of meningitis and encephalitis.

**eye** [AS. *eage*] The organ of vision. SEE: *illus*.

**ANATOMY:** The eyeball has three layers: the inner retina, which contains the photoreceptors; the middle uvea (choroid, ciliary body, and iris); and the outer sclera, which includes the transparent cornea. The eyeball contains two cavities. The smaller anterior cavity is in front of the lens and is further divided by the iris into an anterior chamber and a posterior chamber, both filled with watery aqueous humor. The smaller anterior chamber is in front of the lens and is filled with aqueous humor. Behind the lens is the larger posterior cavity, which contains the jellylike vitreous body (humor). The lens is behind the iris, held in place by the ciliary body and suspensory ligaments called zonules. The visible portion of the sclera is covered by the conjunctiva, a membrane that continues as the lining of the eyelids. Six extrinsic muscles move the eyeball: the superior, inferior, medial, and lateral rectus muscles, and the superior and inferior oblique muscles.

**Nerve supply:** The optic (second cranial) nerve contains the fibers from the retina. The eye muscles are supplied by the oculomotor, trochlear, and abducens (third, fourth, and sixth cranial) nerves. The lid muscles are supplied by the facial nerve to the orbicularis oculi and the oculomotor nerve to the levator palpebrae. Sensory fibers to the orbit are furnished by ophthalmic and maxillary fibers of the fifth cranial (trigeminal) nerve. Sympathetic postganglionic fibers originate in the carotid plexus, their cell bodies lying in the superior cervical ganglion. They supply the dilator muscle of the iris. Parasympathetic fibers from the ciliary ganglion pass to the lacrimal gland, ciliary muscle, and constrictor muscles of the iris.

**PHYSIOLOGY:** Light entering the eye passes through the cornea, then through the pupil, an opening in the iris, and on through the crystalline lens



ANATOMY OF THE EYE

and the vitreous body to the retina. The cornea, aqueous humor, lens, and vitreous body are the refracting media of the eye. Changes in the curvature of the lens are brought about by its elasticity and the contraction of the ciliary muscle. These changes focus light rays on the retina, thereby stimulating the rods and cones, the sensory receptors. The rods detect light in general, and the cones detect colors in the visible spectrum. The visual area of the cerebral cortex, located in the occipital lobe, registers them as visual sensations. The amount of light entering the eye is regulated by the iris; its constrictor and dilator muscles change the size of the pupil in response to varying amounts of light. The eye can distinguish nearly 8 million differences in color. As the eye ages, objects appear greener. The principal aspects of vision are color sense, light sense, movement, and form sense.

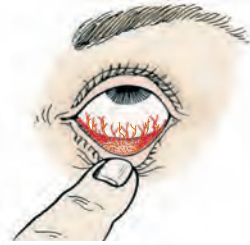
**PATIENT CARE:** When injury to the eye occurs, visual acuity is assessed immediately. If the globe has been penetrated, a suitable eye shield, not an eye patch, is applied. A penetrating foreign body should not be removed. All medications, esp. corticosteroids, are withheld until the patient has seen an ophthalmologist.

The patient is assessed for pain and tenderness, redness and discharge, itching, photophobia, increased tearing, blinking, and visual blurring. When any prescribed topical eye medications

(drops, ointments, or solutions) are administered, the health care provider should wash his or her hands thoroughly prior to administering the agent. The patient's head is turned slightly toward the affected eye, and his or her cooperation is sought in keeping the eye wide open. Drops are instilled in the conjunctival sac (not on the orb), and pressure is applied to the lacrimal apparatus in the inner canthus if it is necessary to prevent systemic absorption. Ointments are applied along the palpebral border from the inner to the outer canthus, and solutions are instilled from the inner to the outer canthus. Touching the dropper or tip of the medication container to the eye should be avoided, and hands should be washed immediately after the procedure.

Both patient and family are taught correct methods for instilling prescribed medications. Patients with visual defects are protected from injury, and family members taught safety measures. Patients with insufficient tearing or the inability to blink or close their eyes are protected from corneal injury by applying artificial tears and by gently patching the eyes closed. The importance of periodic eye examinations is emphasized. Persons at risk should protect their eyes from trauma by wearing safety goggles when working with or near dangerous tools or substances. Tinted lenses should be worn to protect the eyes from excessive exposure to





FINGER IS PLACED OVER LASHES AND GENTLY MOVED DOWN TO EXPOSE CONJUNCTIVA. AT THE SAME TIME, THE PATIENT IS ASKED TO LOOK UP.



FINGER IS PLACED OVER LASHES AND GENTLY MOVED UP. AT THE SAME TIME, THE PATIENT IS ASKED TO LOOK DOWN.



PULL UPPER LID DOWN AND PLACE SMOOTH STICK OVER UPPER LID



WITH THE STICK IN PLACE, THE UPPER LID IS PULLED UP AND OVER THE STICK SO THE UPPER CONJUNCTIVA IS NOW COMPLETELY VISIBLE.

#### TECHNIQUE FOR EXAMINATION OF CONJUNCTIVA

bright light. Patients should avoid rubbing their eyes to prevent irritation or possibly infection. SEE: *eyedrops*; *tears*, *artificial*.



Corticosteroids should not be administered topically or systemically until the patient has been seen by a physician, preferably an ophthalmologist.

**aphakic e.** An eye from which the crystalline lens has been removed.

**arc e.** Eye burn caused when welders fail to wear protective eye shields while welding or following extended periods of welding even though protective eye gear was worn. Irrigation of the eyes with copious amounts of sterile saline may be necessary for several hours in addition to pain medication and instillation of anti-inflammatory eye drops and other medications.

**artificial e.** A prosthesis for placement in the orbit of an individual whose eye has been removed. SEE: *ocularist*.

**black e.** Bruising, discoloration, and swelling of the eyelid and tissue around the eye due to trauma.

**TREATMENT:** Application of ice packs during the first 24 hr will inhibit swelling. Hot compresses after the first day may aid absorption of the fluids that produce discoloration.

**crossed e.** Manifest inward deviation of the visual axis of one eye toward that of the other eye when looking at an object. SYN: *esotropia*. SEE: *squint*; *strabismus*.

**dark-adapted e.** An eye that has become adjusted for viewing objects in dim light; one adapted for scotopic, or rod, vision. Dark adaptation depends on the regeneration of rhodopsin, the light-sensitive glycoprotein in the rods of the eye.

**e. deviation** In eye muscle imbalance and "crossed eyes," the abnormal visual axis of the eye that is not aligned.

**dominant e.** The eye to which a person unconsciously gives preference as a source of stimuli for visual sensations. The dominant eye is usually used in sighting down a gun or looking through a monocular microscope.

**dry e.** Insufficient tear quantity and/or quality caused by aging, the environment, hormonal changes, or disease. This condition produces pain and discomfort in the eyes. Dry eye may occur in any disorder that scars the cornea (e.g., erythema multiforme, trachoma, or corneal burns), Sjögren's syndrome, lagophthalmos, Riley-Day syndrome, absence of one or both of the lacrimal glands, paralysis of the facial or trigeminal nerves, medication with atropine, deep anesthesia, and debilitating diseases. Suitably prepared water-soluble polymers are effective in treating this condition.

**exciting e.** In sympathetic ophthalmia, the damaged eye, which is the source of sympathetic influences.

**fixating e.** In strabismus, the eye that is directed toward the object of vision.

**Klieg e.** SEE: *Klieg eye*.

**lazy e.** Amblyopia.

**light-adapted e.** An eye that has become adjusted to viewing objects in bright light; one adapted for photopic, or cone, vision. In this type of eye, most rhodopsin has been broken down.

**squinting e.** An eye that deviates from the object of fixation in strabismus.

**sympathizing e.** In sympathetic ophthalmia, the uninjured eye, which reacts to the pathological process in the injured eye.

**trophic ulceration of e.** A noninfectious ulceration of the corneal epithelium of the eye due to repeated trauma.

**eyeball** The globe of the eye. Tension and position of the globe in relation to the orbit should be noted.

**PATHOLOGY:** Pathological conditions include enophthalmos (recession of the eyeball) and exophthalmos (protrusion of the eyeball).

**eyeball, voluntary propulsion of** The ability to voluntarily cause the globe of the eye to protrude by as much as 10 mm (0.4 in). This is not harmful to the eye or visual acuity.

**eye bank** An organization that collects and stores corneas for transplantation.


**eyebrow** The arch over the eye; also its covering, esp. the hairs.

**eye contact** The meeting of the gaze of two persons; a direct look into the eyes of another.

**eyecup** 1. The optic vesicle, an evagination of the embryonic brain from which the retina develops. 2. A small cup that fits over the eye, used for bathing its surface.

**eyedrops** Any medicinal substance dropped in liquid form onto the conjunctiva.

In applying eyedrops, the head should be held back; the drops will not pass from under the upper lid to under the lower lid or vice versa. The smaller the eyedrops, the better. Too much liquid in the eye causes the patient to blink, and the medication is then washed away by the increased lacrimal secretion.

 Many medicines are not absorbed from the conjunctiva; they may be readily absorbed from the nasolacrimal duct. For this reason, esp. in children, it is advisable to close off the duct by applying pressure to the inner canthus of the eye for a few minutes after each instillation.

**eye-gaze communicator** An electronic device that allows a person to control a computer by looking at words or commands on a video screen. A very low intensity light shines into one of the user's

eyes. A television camera picks up reflections from the cornea and retina. As the direction of the person's gaze moves, the relative position of the two reflections changes, and the computer uses this information to determine the area at which the person is looking. The computer then executes the selected command.

**eyeglass** A glass lens used to correct a defect in visual acuity or to prevent exposure to bright light if the lens is tinted. SEE: *glasses*.

**eyeground** The fundus of the eye, seen with an ophthalmoscope.

**eyelash** A stiff hair on the margin of the eyelid. SYN: *cilium*.

**eyelid** One of two movable protective folds that cover the anterior surface of the eyeball when closed. They are separated by the palpebral fissure. The upper (palpebra superior) is the larger and more movable. It is raised by contraction of the levator palpebrae superioris muscle. Angles formed at the inner and outer ends of the lids are known as the canthi. The cilia, or eyelashes, arise from the edges of the eyelids. The posterior surface is lined by the conjunctiva, a mucous membrane.

**drooping e.** Ptosis of the eyelid.


**fused e.** A congenital anomaly resulting from failure of the fetal eyelids to separate.

**eyelid closure reflex** Contraction of the orbicularis palpebrarum muscle with closure of lids resulting from percussion above the supraorbital nerve. SYN: *McCarthy's reflex*; *supraorbital reflex*.

**eye muscle imbalance** A pathological condition of the extraocular muscles of one or both eyes. It causes the eyes to be misaligned in one or more axes. SEE: *eye, crossed*; *esophoria*; *exophoria*; *squint*; *strabismus*.

**eyepiece** (ī'pēs) The portion of an optical device closest to the viewer's eye.

**eye protection** Goggles, plastic or glass face masks, or shatterproof glasses to prevent injury to the eye during work or play.

 Protective eye wear should be worn in surgery (and other health care settings where splashes or splatters are common), in many sports, and in most vocations or occupations where splinters, cinders, hooks, or other small objects may injure the cornea, lens, or ocular bulb.

**eyestrain** Tiredness of the eye due to overuse or use of an improper corrective lens.

**eyewash** Any suitable liquid used to rinse the eyes (e.g., sterile physiological saline or sterile water).

**eyeworm** Colloquial term for *Loa loa*.