



H Symbol for the element hydrogen.

H, h *haustus*, a draft of medicine; *height*; *henry*; *hora* or *hour*; *horizontal*; *hypermetropia*.

h Symbol for hecto, a term used in SI units.

ħ Symbol for Planck's constant, which is the amount of energy in a photon ($\hbar = 6.626068 \times 10^{-34} \text{ m}^2 \text{ kg/s}$)

H⁺ Symbol for hydrogen ion.

[H⁺], cH⁺ Symbol for hydrogen ion concentration.

¹H Symbol for protium.

²H Symbol for deuterium, an isotope of hydrogen.

³H Symbol for tritium, an isotope of hydrogen.

HA *hospital-acquired*.

Ha Symbol for hahnium.

Haab's reflex (hōbz) [Otto Haab, Swiss ophthalmologist, 1850–1931] Contraction of pupils without alteration of accommodation or convergence when gazing at a bright object. It may indicate a cortical lesion.

Haab's striae Breaks in Descemet's membrane associated with congenital glaucoma.

HAAg *hepatitis A antigen*.

HAART *Highly active antiretroviral therapy*.

habena (hā-bē'nā) *pl. habenae* [L., rein] **1.** A frenum. **2.** Habenula. **habenar**, **habenar**, *adj.*

habenula (hā-bēn'ū-lā) *pl. habenulae* [L., little rein, strap] **1.** A frenum or any reinlike or whiplike structure. **2.** A peduncle or stalk attached to the pineal body of the brain. Fibers that travel posteriorly along the dorsomedial border of the thalamus to the habenular ganglia (epithalamus) resemble reins. **3.** A narrow bandlike stricture. **habenular**, *adj.*

h. urethralis One of two whitish bands between the clitoris and meatus urethra in young females.

habenular (hā-bēn'ū-lār) *Pert. to the habenula*, esp. the stalk of the pineal body.

h. commissure A band of transverse fibers connecting the two habenular areas.

h. trigone A depressed triangular area located on the lateral aspect of the posterior portion of the third ventricle. It contains a medial and lateral habenular nucleus.

Haber-Weiss reaction [Joseph Weiss and Fritz Haber (1868–1934), 20th-century physical chemists] The generation of toxic oxygen and hydroxyl radicals from hydrogen peroxide and superoxide. These radicals contribute to cell injury

in many diseases, e.g., in the brain or heart after a stroke or heart attack.

habilitation (hā-bīl'ī-tā'shūn) **1.** The process of educating or training persons with functional limitation to improve their ability to function in society. **2.** Qualification for office. **3.** Academic accreditation. SEE: *rehabilitation*.

habit [L. *habere*, *habitus*, to have, hold] **1.** A motor pattern executed with facility following constant or frequent repetition; an act performed at first in a voluntary manner but after sufficient repetition as a reflex action. Habits result from the passing of impulses through a particular set of neurons and synapses many times. **2.** A particular type of dress or garb. **3.** Mental or moral constitution or disposition. **4.** Bodily appearance or constitution, esp. as related to a disease or predisposition to a disease. SYN: *habitus*. **5.** Addiction to the use of drugs or alcohol.

chorea h. An obsolete term for tic.

masticatory h. An individual's sequence and pattern of jaw movement in chewing. It is influenced by the type of food, occlusal problems or missing teeth, personal habits, or state of mind and may be unilateral or bilateral. Under some conditions it would be recognized as a clenching or bruxing habit. SEE: *bruxism*.

habit disorder A tension-discharging phenomenon such as head banging, body rocking, thumb sucking, nail biting, hair pulling, tics, or teeth grinding, usually beginning in childhood. The habit's importance depends upon its etiology and persistence. Almost all children will demonstrate one or more of these disorders during their development, but if it does not interfere with function it should be of no concern.

habitation (hā'bīch'oo-ā'shūn) **1.** The process of becoming accustomed to a stimulus as a result of frequent exposure or use. **2.** The newborn's unconscious suppression or extinction of automatic physiological responses to selective levels of commonly experienced stimuli, such as environmental noise.

newborn h. The rapid development of decreased sensitivity to specific common postbirth stimuli, such as environmental noise, light, and heelsticks. This adaptive response protects the newborn against overstimulation.

habitus (hāb'ī-tūs) [L., habit] A physical appearance, body build, or constitution.

HACCP *hazard analysis and critical control point.*

HACEK An acronym for *Haemophilus, Actinobacillus, Cardiobacterium, Eikenella, Kingella.*

HAD *HIV-associated dementia.*

hadron (häd'rön) A member of a group of subatomic particles including the proton and the neutron. Tightly focused beams of hadrons are used in radiation therapy to destroy cancerous tissue.

hadron therapy (häd'rön) Particle beam therapy.

Haecckel's law Biogenetic law.

haem- SEE: *hem-*.

Haemadipsa (hē'mă-dīp'să) [Gr. *haima*, blood + *dipsa*, thirst] A genus of terrestrial leeches found in Asia that attach to humans and animals.

H. ceylonica A species of leech found in certain humid, tropical areas.

Haemagogus (hē'mă-gōg'ūs) ["/ + *agogos*, leading] A genus of mosquitoes that includes species that are vectors of yellow fever.

Haemaphysalis (hēm'ă-fis'ă-līs) ["/ + *physallis*, bubble] A genus of ticks that includes species that are vectors for tick-borne viral diseases including hemorrhagic fever.

Haemophilus (hē-mōf'īl-ūs) ["/ + *phil-*, to love] A genus of gram-negative, nonmotile bacilli; some are normal flora of the upper respiratory tract, and others cause serious illness.

H. aegyptius A species that can cause bacterial conjunctivitis and a potentially life-threatening pediatric infection called Brazilian purpuric fever.

H. aphrophilus A species that often colonizes the upper respiratory tract, but may occasionally cause endocarditis, brain abscesses, meningitis, or osteomyelitis.

H. ducreyi The causative organism of chancroid or soft chancre. SEE: *chancroid.*

H. influenzae A species that causes acute respiratory infections and meningitis, esp. in children. Encapsulated type b is the form most commonly seen, but nonencapsulated forms also cause infections. Infections may be mild (e.g., pharyngitis, tonsillitis, otitis media) or severe and life-threatening (e.g., epiglottitis, septicemia, meningitis, post-viral pneumonia, endocarditis). SEE: *epiglottitis; meningitis.*

***H. influenzae* type b** ABBR: HIB. An important vaccine-preventable cause of meningitis. In children, this organism also causes acute epiglottitis, pneumonia, septic arthritis, and cellulitis.

TREATMENT: A cephalosporin that penetrates into the cerebrospinal fluid, such as cefotaxime or ceftriaxone, should be used.

PREVENTION: Administer the HIB

vaccine three or four doses beginning at 2 months of age. Because the various forms of HIB vaccine are administered on different schedules, it is important to check the package insert for the appropriate information. Booster doses may be required. SEE: *Recommended Immunization Schedules Appendix.*

H. parainfluenzae An organism that normally colonizes the human respiratory tract and sometimes causes serious infections, including abscesses, endocarditis, and sepsis.

hafnium (häf'nē-üm) [L. *Hafnia*, Copenhagen] SYMB: Hf. A rare chemical element; atomic weight 178.49, atomic number 72, specific gravity 13.31.

Hagedorn needle (hă'gē-dorn) [Werner Hagedorn, Ger. surgeon, 1831–1894] A curved surgical needle with flattened sides.

Haglund deformity, Haglund spur A bone spur at the upper outer border of the calcaneus. It can cause pain felt behind the heel or in the Achilles tendon.

Hahnemann, Samuel (hă'nē-măn) [German physician, 1755–1843] The founder of homeopathy. He proposed that highly diluted substances (medications, herbs, metals, organic, and inorganic compounds, and tissue extracts) could be used to treat disease.

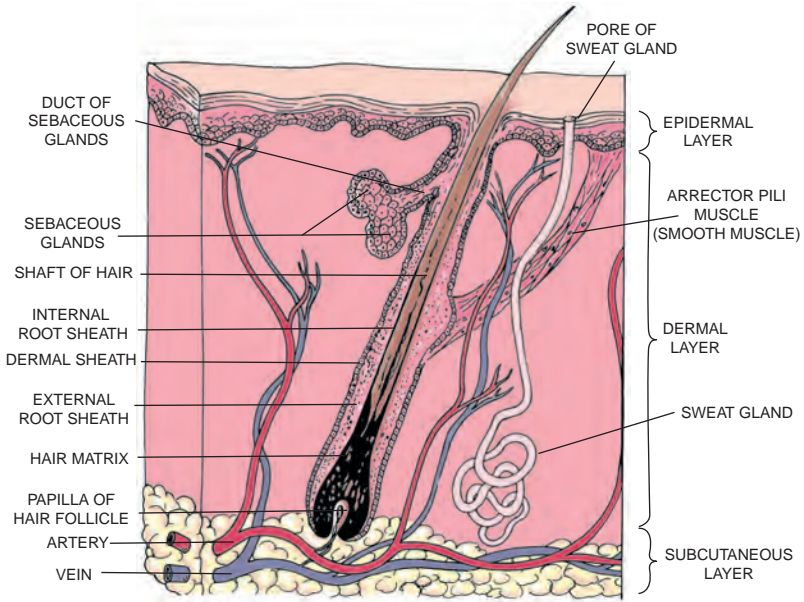
Hailey-Hailey disease (hă'lē-hă'lē) [W. H. Hailey, 1898–1967; H. E. Hailey, b. 1909, U.S. dermatologists] Benign familial pemphigus. SEE: *pemphigus.*

hair [AS. *haer*] **1.** A keratinized, threadlike outgrowth from the skin of mammals. **2.** Collectively, the threadlike outgrowths that form the fur of animals or that grow on the human body.

A hair is a thin, flexible shaft of cornified cells that develops from a cylindrical invagination of the epidermis, the hair follicle. Each consists of a free portion or shaft (*scapus pili*) and a root (*radix pili*) embedded within the follicle. The shaft consists of three layers of cells: the cuticle or outermost layer; the cortex, forming the main horny portion of the hair; and the medulla, the central axis. Hair color is due to pigment in the cortex. SEE: *illus.*

Hair in each part of the body has a definite period of growth, after which it is shed. In the adult human there is a constant gradual loss and replacement of hair. Hair of the eyebrows lasts only 3 to 5 months; that of the scalp 2 to 5 years. Baldness or alopecia results when replacement fails to keep up with hair loss. It may be hereditary or due to pathologic conditions such as infections or irradiation injury. Cytotoxic agents used in cancer chemotherapy may cause temporary loss of hair. SEE: *alopecia.*

auditory h. The stereocilia of a specialized epithelial cell. These are



HAIR AND ADJACENT STRUCTURES OF CROSS-SECTION OF SKIN

present in the ear in the spiral organ of Corti, concerned with hearing; and in the crista ampullaris, macula utriculi, and macula sacculi, concerned with equilibrium.

bamboo h. Sparse, brittle hair with bamboo-like nodes. These apparent nodes are actually partial fractures of the hair shaft, caused by an atrophic condition of the hair. Also called *trichorrhexis nodosa*.

beaded h. Swellings and constrictions in the hair shaft caused by a developmental defect known as monilethrix.

burrowing h. A hair that grows horizontally under the skin, causing a foreign body reaction.

ingrown h. A hair that reenters the skin, causing a foreign body reaction.

kinky h. Short, sparse, tightly twisted hair that may be poorly pigmented.

lanugo h. SEE: *lanugo*.

moniliform h. Monilethrix.

moth-eaten h. Patchy areas of baldness, with poorly defined borders. This type of alopecia is one of the cutaneous hallmarks of syphilis.

h. papilla A projection of the corium that extends into the hair bulb at the bottom of a hair follicle. It contains capillaries through which a hair receives nourishment.

pubic h. Hair over the pubes, which appears at onset of sexual maturity. The distribution is somewhat different in

men than in women. SEE: *mons veneris*; *mons pubis*.

sensory h. Specialized epithelial cells with hairlike processes.

tactile h. Hair that is receptive to touch or contact.

terminal h. The long, coarse, pigmented hair of the adult.

twisted h. Congenitally deformed hair that is short, brittle, and coiled.

hair analysis Investigation of the chemical composition of hair. It is used in studying exposure to toxic chemicals in the environment, in poisoning investigations, in nutritional studies, and in monitoring the course of certain diseases. The sample should be obtained from new-growth hair within 5 cm of the scalp to reduce the chance of contamination of the hair by air pollutants. The technique of hair analysis has not been scientifically validated.

hairball Trichobezoar.

hair specimen analysis The testing of a plucked hair for chemical, chromosomal, drug, or mineral content or for forensic purposes (e.g., in rape investigations).

halal (hā-lāl') Pert. to food prepared and served according to Muslim dietary laws.

halation (hāl-ā'shūn) [Gr. *alos*, a halo] A blurring of vision caused by light being scattered to the side of the source.

halazone (hāl'ā-zōn) A chloramine disinfectant. SEE: *water, emergency preparation of safe drinking*.

Haldane effect (hăl'dän) The oxygenation of hemoglobin, which lowers its affinity for carbon dioxide. SEE: *Bohr effect*.

half-life (hăl'lif) **1.** Time required for half the nuclei of a radioactive substance to lose their activity by undergoing radioactive decay. **2.** In biology and pharmacology, the time required by the body, tissue, or organ to metabolize or inactivate half the amount of a substance taken in. This is an important consideration in determining the proper amount and frequency of dose of drug to be administered. **3.** Time required for radioactivity of material taken in by a living organism to be reduced to half its initial value by a combination of radioactive decay and biological elimination.

half-value thickness, half-value layer The thickness of a substance that, when placed in the path of a given beam of radiation, will lower its intensity to one half of the initial value. Half-value layers are stated in millimeters of aluminum equivalency (mm/AlEq).

halfway house (hăl'wā) A facility to house psychiatric patients who no longer need hospitalization but are not yet ready for independent living.

halide (hăl'id) A compound containing a halogen (i.e., bromine, chlorine, fluorine, or iodine) combined with a metal or some other radical.

halitosis (hăl-i-tō'sis) [L. *halitus*, breath, + Gr. *osis*, condition] Offensive odor of the breath. Its origin may be in the mouth or nose, lungs, blood, or digestive tract. Many individuals have halitosis due to drying of the oral mucosa. On awakening, those who snore or sleep with their mouths open may have particularly noticeable bad breath. Bad breath may also be due to an ingested food, such as onions or garlic. Other causes are respiratory infections such as bronchiectasis or lung abscess, acute necrotizing gingivitis, herpetic gingivostomatitis, periodontal disease, dental caries, cigarette smoking, hepatic failure, or diabetic ketoacidosis.

halitus (hăl'i-tūs) **1.** The breath. **2.** Warm vapor.

Haller's anastomotic circle (hăl'ärz) [Albrecht von Haller, Swiss physiologist, 1708–1777] The circle of arteries around the intraocular portion of the optic nerve. It is composed of branches of the posterior ciliary arteries.

Hallervorden-Spatz disease, H.-S. syndrome (hăl'ar-vor'den-späts') [Julius Hallervorden, 1882–1965; H. Spatz, 1888–1969, Ger. neurologists] An inherited or sporadically appearing neurological disease, beginning in childhood, affecting the globus pallidus, red nucleus, and reticular part of the sub-

stantia nigra of the brain. Clinical characteristics include progressive rigidity, retinal degeneration, athetotic movements, and mental and, late in the disease, emotional retardation. There is no effective therapy. SYN: *neurodegeneration with brain iron accumulation*.

hallex (hăl'ëks) *pl.* **hallices** [L.] Hallux. **Hallpike maneuver, Hallpike-Dix maneuver** (hol'pik) [Charles Skinner Hallpike, neurologist, 1900–1979] A test performed to diagnose benign positional vertigo. The patient is moved from a sitting position to recumbency with the head tilted down over the end of the bed and turned toward either shoulder. If vertigo develops after a delay of several seconds, the test is subjectively positive. If vertigo is associated with visible nystagmus, it is objectively positive. Vertigo and nystagmus that occur immediately, rather than after a delay, are suggestive of intracranial, rather than labyrinthine, disease. SEE: *benign positional vertigo*.

hallucination (hä-loo-si-nä'shün) [L. *hallucinari*, to wander in mind] A false perception having no relation to reality and not accounted for by any exterior stimulus; a dreamlike (or nightmarish) perception occurring while awake. It may be visual (esp. in medical illnesses or drug withdrawal syndromes), auditory (esp. in psychoses), tactile, gustatory, or olfactory. Affected patients typically appear confused and agitated. They are unable to distinguish between the real and the imaginary.

auditory h. An imaginary perception of sounds, usually voices. Auditory hallucinations are a hallmark of psychotic illnesses but are also heard by patients with acquired hearing impairments and by some persons with temporal lobe seizures.

command h. An auditory hallucination in which a person hears a voice demanding that he or she engage in a specific (and often, a dangerous) behavior. Command hallucinations are characteristic of both schizophrenia and some forms of drug intoxication. Affected people may report receiving instructions to kill themselves or others; to comply or be punished; or to undertake a particular behavior to make amends for prior faults or sins they have committed.

extracampine h. A hallucination that arises from outside the normal sensory field or range, as people having the sensation of seeing something behind them.

gustatory h. The sense of tasting something that is not present.

haptic h. A hallucination pert. to touching the skin or to sensations of temperature or pain.

hypnagogic h. A presleep phenome-

non having the same practical significance as a dream but experienced during consciousness. It may include a sense of falling, of sinking, or of the ceiling moving.

kinetic h. A sensation of flying or of moving the body or a part of it. SYN: *motor hallucination*.

microptic h. A hallucination in which things seem smaller than they are.

motor h. Kinetic h.

olfactory h. A hallucination involving the sense of smell.

somatic h. A sensation of pain attributed to visceral injury.

stump h. SEE: *phantom limb*.

tactile h. A false sense of touching something or of objects moving on the skin. This abnormal perception is a hallmark of some withdrawal states, such as delirium tremens in alcohol withdrawal. SEE: *formication*.

visual h. The sensation of seeing objects that are not really there. This is a hallmark of alcohol and drug withdrawal and of other medical illnesses that adversely affect the brain.

hallucinogen (hă-loo'sī-nō-jěn) [*h* + Gr. *gennan*, to produce] A drug that produces hallucinations (e.g., LSD, peyote, mescaline, PCP, and sometimes ethyl alcohol).

hallucinosi (hă-loo'sīn-ō'sis) [*h* + Gr. *osis*, condition] The state of having hallucinations more or less persistently. SEE: *hallucination*.

acute alcoholic h. Alcohol withdrawal, marked by visual hallucinations, extreme agitation, tachycardia, hypertension, and other signs and symptoms of cerebral and autonomic hyperactivity.

hallus (hăl'ūs) Hallux.

hallux (hăl'üks) *pl.* **halluces** [L.] The great toe.

h. dolorosus Pain in the metatarsophalangeal joint of the great toe resulting from flatfoot.

h. flexus Hallux malleus.

h. malleus Hammertoe of the great toe.

h. rigidus A restriction or loss of motion of the joint connecting the great toe to the metatarsal. Pain occurs upon walking.

h. valgus Displacement of the great toe toward the other toes.

h. varus Displacement of the great toe away from the other toes.

hallux limitus Limitation of range of motion of the first metatarsophalangeal joint, usually with arthritic degeneration of the joint and pain. The most advanced form of hallux limitus is called hallux rigidus.

halo [Gr. *halos*, a halo] **1.** The areola, esp. of the nipple. **2.** A ring surrounding the macula lutea in ophthalmoscopic

images. **3.** A circle of light surrounding a shining body.

Fick's h. A colored halo around light observed by some persons as a result of wearing contact lenses.

glaucomatous h. The visual perception of rainbow-like colors around lights, caused by glaucoma-induced corneal edema.

senile peripapillary h. A ring of chorioretinal atrophy around the head of the optic nerve, a condition that may occur in the aged.

h. symptom The perception of one or more colored circles around lights, seen by patients with glaucoma or cataract.

halo effect The giving of an inflated performance appraisal or grade to an employee or student because of the appraiser's tendency to regard all subordinates fondly.

halogen (hăl'ō-jěn) [Gr. *hals*, salt, + *gennan*, to produce] Any one of the elements (chlorine, bromine, iodine, fluorine, and astatine) forming Group VII of the periodic table. These elements have very similar chemical properties, combining with hydrogen to form acids and with metals to form salts.

haloperidol (hăl'ō-pēr'ī-dōl) A neuroleptic drug used to treat patients with psychotic illnesses, extreme agitation, or Tourette's syndrome.

halophilic (hăl'ō-fil'ik) [*h* + *philein*, to love] Concerning or having an affinity for salt or any halogen.

halothane (hăl'ō-thān) A fluorinated hydrocarbon used as a general anesthetic.

halo vest, halo vest orthosis A device used to immobilize the head and cervical spine following vertebral injury or surgery, designed to provide inline traction of the cervical spine while allowing for a moderate amount of functional independence. The halo vest consists of three parts: 1) the halo, which is secured into the skull through the use of four pins or screws; 2) the vest, which is worn over the shoulders and trunk to support the weight of the halo, skull, and cervical spine; and 3) four metal bars that connect the halo to the vest.

PATIENT CARE: The screws attaching the halo to the skull must be kept clean to reduce the risk of infection. Hygiene consists of cleaning each pin two to three times per day as prescribed by a physician. The patient should be instructed on how to use a mirror to inspect the sites for signs of infection such as redness of the skin, or purulent drainage from around the pins. If the vest becomes wet, it should be dried with a hairdryer, set on its lowest temperature setting. The shoulders and thorax should be inspected for signs of irritation from the vest. Additional padding may be required around pressure-sensitive areas.





Complications reported with halo vest use include:

1. incomplete cervical fracture healing (in about 10% to 15% of patients);
2. impairments in balance, vision, and some activities of daily living;
3. infection;
4. loosening of pins;
5. scarring of skin at pin insertion sites.

Halsted's operation (hăl'stêdz) [William Stewart Halsted, U.S. surgeon, 1852–1922] **1.** An operation for inguinal hernia. **2.** A radical mastectomy for cancer of the breast.

Halsted's suture An interrupted suture for intestinal wounds.

halzoun [Lebanese city, Ain El Hala-zoun] An allergic reaction in the mouth and nasopharynx in persons who have eaten incompletely cooked food infested with the parasite *Linguatula serrata*. Typical symptoms include hoarseness, difficulty swallowing, cough, headache, and rash. The causative parasite is geographically limited to the Middle East, where its primary host is the dog.

hamartoma (häm-är-tō'mă) [Gr. *hamartia*, defect, + *oma*, tumor] A tumor resulting from new growth of normal tissues. The cells grow spontaneously, reach maturity, and then do not reproduce. Thus, the growth is self-limiting and benign.

multiple h. A congenital malformation that presents a slowly growing mass of abnormal tissue in multiple sites. The tissues are appropriate to the organ in which the hamartomas are located but are not normally organized. They may appear in blood vessels as hemangiomas, and in the lung and kidney. They are not malignant but cause symptoms because of the space they occupy.

hamartomatosis (häm"är-tō-mă-tō'sis) [" + " + *osis*, condition] Existence of multiple hamartomas.

hamate (häm'ät) **1.** Hooked; unciform. SYN: *hamular*. **2.** Hamate bone.

hamatum (hă-mă'tum) [L. *hamatus*, hooked] Hamate bone.

Hamman, Louis (häm'än) U.S. physician, 1877–1946.

H.'s disease Spontaneous mediastinal emphysema with a crunching sound heard during auscultation of the heart.

H.'s syndrome Previously used term for idiopathic pulmonary fibrosis.

hammer **1.** An instrument with a head attached crosswise to the handle for striking blows. **2.** The common name for the malleus, the hammer-shaped bone of the middle ear.

dental h. A mallet or motor-driven hammer used for condensing direct-fill-

ing gold or silver amalgam during the placement of fillings in teeth.

percussion h. A hammer with a rubber head used for tapping surfaces of the body in order to produce sounds for diagnostic purposes. SEE: *plexor*.

reflex h. A hammer used for tapping body parts such as a muscle, tendon, or nerve in order to test nerve function.

hammer toe, hammer toe (häm'ër-tō") A toe posture characterized by hyperextension of the metatarsophalangeal and distal interphalangeal joints and flexion of the proximal interphalangeal joint. SYN: *hallux malleus*.

HAMRSA Hospital-acquired methicillin-resistant *Staphylococcus aureus*.

Hamster zona-free ovum test Sperm penetration assay.

hamstring (häm'strîng) [AS. *haum*, haunch] **1.** One of the tendons that form the medial and lateral boundaries of the popliteal space. **2.** Any one of three muscles on the posterior aspect of the thigh, the semitendinosus, semimembranosus, and biceps femoris. They flex the leg and adduct and extend the thigh.

inner h. One of the tendons of the semimembranosus, semitendinosus, and gracilis muscles (the pes anserine muscle group).

outer h. A tendon of the biceps femoris muscle along the back of the thigh.

Ham test A test for diagnosing paroxysmal nocturnal hemoglobinuria, in which red cells are assessed for resistance to lysis during incubation with acidified serum.

hamular (häm'ü-lär) [L. *hamulus*, a small hook] Hamate.

hamulus (häm'ü-lüs) *pl.* **hamuli** [L., a small hook] **1.** Any hook-shaped structure. **2.** The hooklike process on the hamate bone.

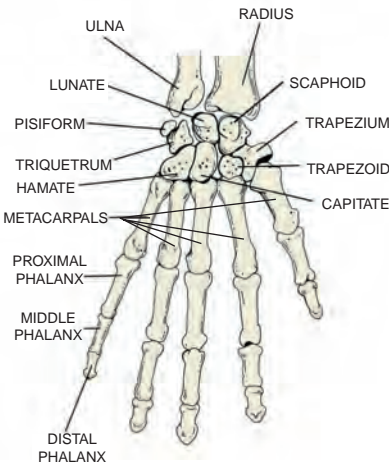
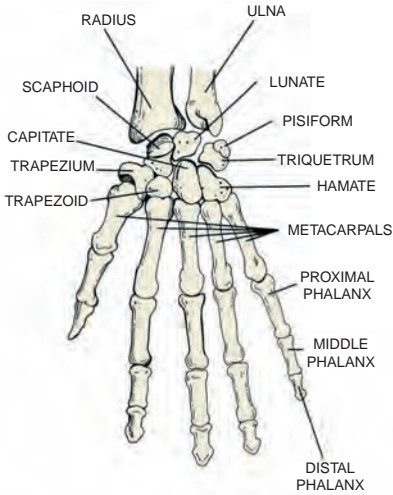
h. cochleae The hooklike process at the tip of the osseous spiral lamina of the cochlea.

h. lacrimalis The hooklike process on the lacrimal bone.

h. pterygoideus The hooklike process at the tip of the medial pterygoid process of the sphenoid bone.

hand [AS.] The body part attached to the forearm at the wrist. It includes the wrist (carpus) with its eight bones, the metacarpus or body of the hand (ossa metacarpalia) having five bones, and the fingers (phalanges) with their 14 bones. In some occupations and recreational endeavors, workers use their hands as hammers, which may damage the ulnar nerve and artery, with consequent signs of ischemia and neuropathy. SYN: *manus*. SEE: *illius*.

ape h. A deformity of the hand in which the thumb is permanently extended, usually caused by a median



BONES OF THE RIGHT HAND AND WRIST

Top) View from palmar side; Bottom) view from back of hand

nerve injury. Paralysis and atrophy of the thenar muscles result.

benediction h. Condition of the hand in which there is flexion of some of the fingers, especially of the terminal phalanges. The hand at the wrist may be extended. The condition may be caused by paralysis of the ulnar and median nerves.

claw h. Clawhand.

cleft h. A bipartite hand resulting from failure of a digit and its corresponding metacarpal to develop.

diabetic h. Stiffness and fibrotic contractures of the metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints in patients with advanced diabetes mellitus.

drop h. Wrist drop.

functional position of h. The principle used in splint fabrication whereby the wrist is dorsiflexed 20 to 35 degrees, a normal transverse arch is maintained, and the thumb is in abduction and opposition and aligned with the pads of the four fingers. Proximal interphalangeal joints are flexed 45 to 60 degrees.

lobster-claw h. Cleft h.

obstetrician's h. The position of the hand in tetany with extension at the metacarpophalangeal and the interphalangeal joints, and adduction of the thumb. It is named for the position of the obstetrician's hand during vaginal examination.

opera-glass h. A deformity of the hand caused by chronic arthritis in which the phalanges appear to be telescoped into one another like an opera glass.

resting position of h. The principle used in splint fabrication whereby the forearm is midway between pronation and supination, the wrist is at 12 to 20 degrees dorsiflexion, and the phalanges are slightly flexed. The thumb is in partial opposition and thumb.

writing h. A deformity of the hand in which the tips of the thumb and first finger are touching and the other fingers are flexed as if holding a writing instrument. This is seen in Parkinson's disease.

hand-arm vibration syndrome (händ'ärm') ABBR: HAVS. Injury to the nerves, muscles, and tendons of the wrist and hand due to the repetitive use of vibrating hand tools. SYN: *vibration-induced neuropathy*.

SYMPTOMS: Patients may report intolerance of cold, muscular weakness, tingling sensations, or changes of color in the hand, fingers, or wrist.

H and E *hematoxylin and eosin*, a stain used in histology.

handedness The tendency to use one hand in preference to the other. Preferential use of the left hand is called *sinistrality* and of the right hand *dextrality*.

More than 90% of people are right-handed. Being left-handed may be hereditary or due to disease of the left cerebral hemisphere in early life.

hand-foot-and-mouth disease An infectious disease characterized by painful oral ulcers and vesicles, papules, or pustules on the hands and feet. It is caused by enteroviruses and typically affects children. The disease usually begins with a fever, followed by the appearance

of a distinctive rash, which resolves spontaneously in about a week.

handicap A term frequently used as a synonym for “disability” or “functional limitation.” The word “handicap” is now viewed as a pejorative term by many individuals. Handicap has been viewed by the International Classification of Impairments, Disabilities, and Handicaps as the social consequence of the inability to carry out tasks or access certain aspects of the environment due to one or more impairments; in some social settings, it has been equated with social disadvantage relative to one’s peers. The terms “activity limitation” or “participation restriction” are preferred by many specialists in physical, occupational, and speech therapy as well as those in related fields.

handle, built-up The portion of an implement that has been increased in diameter to accommodate its use by persons with limited or weak grasp.

handoff The transfer of patient care from one health care provider to another or from one health care facility to another.

handpiece, dental (händ’pēs) A motor-driven device used in dentistry. The three basic designs are based on the shape of the handpiece and include the straight, contra-angle, and right angle handpiece. Handpieces are classified according to the speed of their rotation. They contain a chuck for holding tools used in preparing teeth for restoration, polishing, and condensing. SYN: *drill*.



The Centers for Disease Control recommends that all dental handpieces be heat sterilized after each use.

contra-angle d.h. A handpiece with one or more bends so that the shaft of the rotary instrument is at an angle to the handpiece to reach less accessible areas of the mouth for dental work.

high-speed d.h. A dental handpiece that operates at speeds about 100,000 to 800,000 rpm. The high-speed or ultrasound handpiece operates with a water spray and may have a fiberoptic light to facilitate better visibility. A water spray is necessary to reduce the temperature within the handpiece and surgical site. SYN: *turbine dental handpiece*.

low-speed d.h. A dental handpiece that operates at speeds about 6,000 to 10,000 rpm. Low-speed handpieces are used to polish and finish dental procedures.

turbine d.h. High-speed dental handpiece.

handrub (händ’rüb”) A rapidly drying solution that contains ethanol or propanol and is applied to the hands after contact with patients. It is used as a topical disinfectant.

Hand-Schüller-Christian disease [Alfred Hand, Jr., U.S. pediatrician, 1868–1949; Artur Schüller, Austrian neurologist, b. 1874; Henry A. Christian, U.S. physician, 1876–1951] Histiocytosis.

handsock (händ’sök) A type of glove that covers the hand but, because it has no individual spaces for the fingers, makes grasping objects difficult. Use of handsocks during infancy may inhibit the rate of development of hand skills.

hands-on assistance Physical support of one person by another so that activities of daily living can be carried out without fall or injury.

handwashing Hand hygiene. SEE: *precautions, standard; Standard Precautions Appendix*.

handwriting 1. The writing of letters, numbers, words, or symbols with a hand-held pen or pencil. **2.** Penmanship. Flawed penmanship is characteristic of several childhood learning disorders and of some adult illnesses, such as Parkinson’s disease (“micrographia”).

hangnail [AS. *ang-*, tight, painful, + *naegel*, nail] Partly detached piece of skin at the root or lateral edge of the finger or toenail.

hangover A nontechnical term for the malaise that may be present after ingesting a considerable amount of an alcoholic beverage or other central nervous system depressant. Symptoms usually present upon awakening from a sleep include some if not all of the following: mental depression, headache, thirst, nausea, irritability, fatigue. Symptoms and their severity will vary with the individual. The presence of congeners in alcoholic beverages is thought to be related to the development of a hangover. There is no specific therapy. SEE: *alcoholism, acute; delirium tremens*.

Hansen’s bacillus (hän’sēnz) [Gerhard H. A. Hansen, Norwegian physician, 1841–1912] *Mycobacterium leprae*, the cause of leprosy, which Hansen discovered in 1871.

Hansen’s disease Leprosy.

Hantavirus (hän’tä-vi’rüs) A genus of viruses of the family Bunyaviridae, and the cause of epidemic hemorrhagic fever and hantavirus pulmonary syndrome. The natural reservoir is rodents. In the U.S., identified species of *Hantavirus* include the Bayou virus, Black creek virus, New York virus, and Sin Nombre virus. On other continents, epidemic hantaviruses include the Dobrava, Hantaan, Puumala, and Seoul viruses.

hantavirus cardiopulmonary syndrome Hantavirus pulmonary syndrome.

hantavirus pulmonary syndrome ABBR: HPS. An acute respiratory illness, characterized by acute noncardiogenic pulmonary edema. It first appeared in

the southwestern U.S. in 1993 and is caused by several strains of hantaviruses. The Sin Nombre virus is the most common in the U.S., but other pathogenic strains have been identified throughout the world. SYN: *hantavirus cardiopulmonary syndrome*.

ETIOLOGY: Hantaviruses are single-stranded RNA viruses. They are carried by rodents, of which the deer mouse is the most common in the U.S. Infection usually is the result of inhalation of aerosolized excreta from rodents infected with the virus, but person-to-person transmission was documented in Argentina with infection from the Andes hantavirus. As of 2004, less than 400 cases of HPS have been identified in the U.S. The disease has had a mortality of about 35%. The incidence rises after warm, wet winters during which few rodents die. All cases originated in rural areas in people who were involved in rodent control activities, or camped or hiked in rodent-infested areas.

SYMPTOMS: After an incubation period of about 5 to 33 days (median 18), patients usually report myalgia, fever, headache, nausea, vomiting, and diarrhea. The abrupt onset of dyspnea and nonproductive cough follows, which rapidly progresses to noncardiogenic pulmonary edema and shock. Disseminated intravascular coagulation and renal failure are common.

DIAGNOSIS: HPS is diagnosed by clinical presentation, the presence of IgM antibodies to the virus in the blood, and Western blot enzyme-linked immunosorbent assays, among other tests.

TREATMENT: No effective antiviral drug therapy has been identified. Patients are given supportive care in the intensive care unit, with oxygen, mechanical ventilation, intravenous fluids, and vasopressors. Arterial blood gases, pulmonary status, neurological status, serum electrolytes and renal function, and hemodynamics are monitored closely, and airway patency maintained by careful suctioning. Fluid replacement should be based on hemodynamic monitoring. Vaccines against the virus provide a possible source of protection for persons at risk of exposure.

PATIENT CARE: People living in or visiting areas where the disease has been reported need to be educated about being careful under porches, in basements, and in attics or storage areas, where mouse droppings may be present. Mouse droppings should not be vacuumed or swept with a broom; these practices increase the risk of inhalation. Instead, individuals should cover infestations with a 10% solution of household bleach, wipe them up while wearing protective clothing and a HEPA filter mask, and place them in a bag for dis-

posal. Dead rodents should be sprayed with a disinfectant, then double-bagged along with the cleaning material and disposed of according to local statutes. Health care providers should promptly report to state or federal public health agencies (e.g., the Centers for Disease Control and Prevention [CDC]) any disease outbreak to protect public health. Consider the possibility of bioterrorism if the disease occurs outside an endemic area, at an unusual time of year, or in an unusual pattern. Vacation cottages should be aired before anyone enters. Campers should avoid burrows and sleep on cots or mattresses rather than the bare ground. Children must be taught not to try to catch or play with deer mice, chipmunks, moles, or other rodents. A safety pamphlet is available from the Centers for Disease Control, Atlanta, Georgia. www.cdc.gov.

hpalonychia (hăp"äl-ō-nik'ē-ä) [Gr. *hapalos*, soft, + *onyx*, nail] Onychomylacia.

haphalgnesia (hăf"äl-jē'zē-ä) [Gr. *haphē*, touch, + *algēsis*, sense of pain] A sensation of pain upon touching the skin lightly or with a nonirritating object.

haplodont (hăp'lō-dōnt) [l' + *odont*, tooth] Having teeth without ridges or tubercles on the crown.

haploid (hăp'loyd) [Gr. *haploos*, simple, + *ēidos*, form, shape] Possessing half the diploid or normal number of chromosomes found in somatic or body cells. Such is the case of the germ cells—ova or sperm—following the reduction divisions in gametogenesis, the haploid number being 23 in humans. SEE: *chromosome*; *diploid*.

haploidy (hăp'loy-dē) The state of being haploid.

haploinsufficient (hăp'lō-īn'sū-fish'īnt) [Fr. Gr. *haploos*, simple + *insufficient*] Having only one copy of a wild-type allele at a genetic locus. This results in an abnormal phenotype.

haploopia (hăp-lō'pē-ä) [l' + *ops*, vision] Single vision; a condition in which an object viewed by two eyes appears as a single object, in contrast to diplopia, in which it appears as two objects.

haplotype (hăp'lō-tīp) The combination of several alleles in a gene cluster.

happiness (hăp'ē-nēs) [ME.] A subjective sense of well-being. A bright and positive outlook toward life.

haptēn (hăp'tēn, -tēn) [Gr. *haptēin*, to seize] A substance that does not act as an antigen or stimulate an immune response on its own but can do so when combined with an immunogenic carrier molecule. SYN: *haptin*.

haptic (hăp'tik) [Gr. *haptēin*, to touch] Tactile.

haptics (hăp'tiks) The techniques and technology of using the sense of touch to drive computer or mechanical applica-

tions. Haptics has been applied to the rehabilitation of victims of stroke and sensory loss and to clinician education (e.g., in telemedicine).

haptin (hăp'tin) Hapten.

haptoglobin (hăp'tō-glō'bīn) A mucoprotein to which hemoglobin released from lysed red cells into plasma is bound. It is increased in certain inflammatory conditions and decreased in hemolytic disorders.

Harada-Mori culture A stool culture used to demonstrate the presence of hookworm larvae and other gastrointestinal parasites, e.g., *Strongyloides stercoralis*.

hardening [AS. *heardian*, to harden]

1. Rendering a pathological or histological specimen firm or compact, for making thin sections for microscopic study.
2. The development of increased resistance to extremes of environmental temperature. SEE: *acclimation*.

h. of the arteries Colloquial expression used for arteriosclerosis.

hardiness (hă'r'dē-nēs) [ME.] Those physical and/or psychological characteristics that contribute to resiliency or the ability to withstand stress.

hard metal disease A respiratory disorder caused by the inhalation of cobalt and metal carbides, esp. tungsten carbide. Its primary symptoms are cough and breathlessness during exertion. Lung biopsies show markedly abnormal giant cells in the interstitium of the lung. The disease is occasionally fatal if untreated. SYN: *cobalt lung*.

hardness **1.** A quality of water containing certain substances, esp. soluble salts of calcium and magnesium. These react with soaps, forming insoluble compounds that are precipitated out of solution, thus interfering with their cleansing action. **2.** The quality or penetrating power of x-rays. Hardness increases as wavelengths become shorter. **3.** The quality of firmness or density of a material imparted by the cohesion of the particles that compose it.

hardness test A test designed to determine the relative hardness of materials by correlating the size or depth of an indent produced by a particular instrument with a known amount of compressive force. SEE: *hardness number*.

hardy Resourceful and resilient.

harelip (hăr'lip) [AS. *hara*, hare, + *lippa*, lip] Cleft lip.

harlequin sign (hăr'lē-kwīn, -kīn) A benign transient color change seen in neonates in which one half of the body blanches while the other half becomes redder, with a clear line of demarcation.

harm pl. harms Anything that impairs or adversely impacts the safety of patients in clinical care, drug therapy, research investigations, or public health. Harms include adverse drug reactions, side effects of treatments, and other undesir-

able consequences of health care products and services.

harmful drinking Any level of alcohol consumption that results in physical, psychological, or social complications or injury; e.g., drinking during pregnancy.

harmonic In physics, concerning wave forms, an oscillation or frequency that is a whole number multiple of the basic frequency.

harmony (hăr'mō-nē) Agreement, balance, or compatibility.

functional occlusal h. Ideal occlusion of the teeth such that in all mandibular positions during chewing the teeth function efficiently and without trauma to supporting tissues.

harness In postamputation rehabilitation, the part of an upper extremity prosthesis that fits around the shoulder and back to permit mechanical control of the terminal device and hold the socket firmly around the stump.

harpoon (hăr-poon') [Gr. *harpazein*, to seize] A device with a hook on one end for obtaining small pieces of tissue such as muscle for examination.

Harrison Narcotic Act A law enacted in 1914 that classified certain drugs as habit forming and restricted their sale and distribution.

Hartmann's procedure (hărt'mănz, ärmönz') [Henri Hartmann, Fr. surgeon, 1860–1952] The surgical removal of a diseased portion of the distal colon or proximal rectum with formation of an end colostomy, accompanied by oversewing of the distal colonic or rectal remnant. This procedure may be the first stage of a two-part operation, in which at a later date, the colostomy and the oversewn remnant are reconnected. The Hartmann procedure is most often employed in debilitated patients or in emergent circumstances in which primary anastomosis or complete distal segment excision would not be appropriate.

Hartmann's solution (hărt'mănz) [Alexis F. Hartmann, U.S. pediatrician, 1849–1931] Lactated Ringer's injection used for fluid and electrolyte replacement. A sterile solution of 0.6 g of sodium chloride, 0.03 g of potassium chloride, 0.02 g of calcium chloride, and 0.31 g of sodium lactate is diluted with water for injection to make 100 ml.

Hartnup disease (hărt'nüp) [*Hartnup*, the family name of the first reported case] A rare autosomal recessive metabolic disease in which absorption, excretion, and kidney resorption of amino acids, esp. tryptophan, is abnormal. Clinical signs resemble pellagra, with a rash that is worsened by exposure to sunlight.

harvest **1.** To obtain samples or remove bacteria or other microorganisms from

a culture. 2. Removal of donor organs for transplantation.

Harvey, William (hă'r'vē) British physician, 1578–1657, who described the circulation of the blood.

Hashimoto's thyroiditis (hă'shē-mō'tōz) [Hakaru Hashimoto, Japanese surgeon, 1881–1934] An autoimmune illness in which there is inflammation, and then destruction and fibrosis of the thyroid gland, ultimately resulting in hypothyroidism. Autoantibodies against thyroglobulin and receptors for thyroid stimulating hormone cause the progressive destruction. Hashimoto's is the most common cause of hypothyroidism in areas of the world where there are inadequate levels of iodine. It affects people of all ages, but is most common in older women and those with a family history of autoimmune diseases. Thyroid hormone replacement is required. SEE: *thyroid gland*.

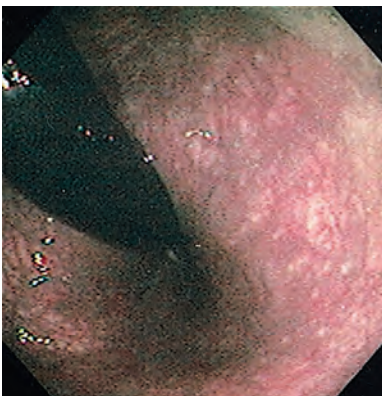
hashish (hăsh'ish) [Arabic, hemp, dried grass] A more or less purified extract prepared from the flowers, stalks, and leaves of the hemp plant *Cannabis sativa*. The gummy substance is smoked or chewed for its euphoric effects. SEE: *cannabis*; *marijuana*.

Hassall's corpuscle (hăs'älz) [Arthur H. Hassall, Brit. chemist and physician, 1817–1894] A spherical or oval body present in the medulla of the thymus. It consists of a central area of degenerated cells surrounded by concentrically arranged flattened or polygonal cells. SYN: *Gierke's corpuscle*.

hatchet, enamel A hand-held cutting instrument with a blade set continuous with the handle.

haunch (haw'nsh) [Fr. *hanche*] The hips and buttocks.

haustration (haws-tră'shūn) The formation of segment or recess, esp. in the bowel. SEE: *illus*.



HAUSTRATION, SEEN ENDOSCOPICALLY

haustrum (haw'strūm) *pl.* **haustra** [L. *haurire*, to draw, drink] One of the sacculations of the colon caused by longitudinal bands of smooth muscle (taeniae coli) that are smoother than the gut. **haustral** (haw'sträl), *adj.*

HAV *hepatitis A virus*.

Haverhill fever (hă'vēr-īl) [Haverhill, MA, U.S., where the initial epidemic occurred] A febrile disease transmitted to humans by rats, usually by rat bite. *Streptobacillus moniliformis* is the etiological agent. SYN: *rat-bite fever*.

haversian canal (hă-vēr'zhān) SEE: *under canal*.

haversian canaliculus One of many channels extending from the lacuna of an osteocyte into the bone matrix, to a canaliculus of an adjacent osteocyte. By way of these channels osteocytes remain in contact with one another to transmit nutrients and gases. SEE: *bone* for *illus*.

haversian system The structural unit of compact bone; it consists of a central haversian canal surrounded by concentric cylinders of osteocytes within the calcium matrix. SEE: *bone* for *illus*; *osteon*.

Havrix (häv'rīks) Hepatitis A vaccine, inactivated.

hawthorn (haw'thawrn") [AS. hagu-thorn] An herbal remedy from the berries and leaves of the hawthorn tree (*Crataegus laevigata*), also known as haghorn, haw, hazel, May, Mayblossom, and whitethorn. Hawthorn is promoted for its effect in treating cardiovascular conditions, including hypertension and congestive heart failure. SYN: *Crataegus laevigata*.

Hawthorne effect (haw'thawrn") [The Hawthorne plant of the Western Electric Company] The tendency of research outcomes to be altered by virtue of their being studied.

hay fever A seasonal illness, marked by sneezing, sniffing, runny nose, and itchy or watery eyes. This condition, which affects 10% to 20% of the U.S. population, results from a type I hypersensitivity reaction involving the mucous membranes of the nose and upper air passages. It is the most common manifestation of atopic (inherited) allergy. SYN: *allergic rhinitis*; *pollinosis*. SEE: *allergen*; *desensitization*; *hypersensitivity reaction*; *Nursing Diagnoses Appendix*.

ETIOLOGY: Airborne pollens, fungal spores, dust, and animal dander cause hay fever. It is most commonly triggered in the spring by pollen from trees, in the summer by grass pollen, and in the fall by pollen from wildflowers (e.g., ragweed). Nonseasonal rhinitis may result from inhalation of animal dander, dust from hay or straw, or house dust mites.

TREATMENT: Seasonal usage of antihistamines, cromolyn, and corticoste-

roid nasal sprays are the usual therapy in the U.S. Prophylaxis through desensitization is also useful but is less convenient and usually more expensive. Avoiding allergens is also effective but not always possible.



Overuse of corticosteroids may damage the nasal mucosa, and absorption of the drug can cause adverse side effects.

Hayflick's limit (hā'flicks) [Leonard Hayflick, U.S. microbiologist, b. 1928] The maximum number of cell divisions that will take place in human cells prior to their death. In 1961 Hayflick and P. S. Moorehead showed that human cells can reproduce themselves a finite number of times. This limited replication ability is postulated to correlate with the aging, failure, and eventual death of organs and individuals. Hayflick's limit is exceeded by some cell lines that exist solely to reproduce themselves, such as blood-forming cells and cancer cells. It can also be extended artificially by manipulation of a cellular enzyme known as telomerase. Experiments on the functions of telomerase may lead to new understanding of the aging process, the replication ability of cancer cells, and mortality.

Haygarth's deformities (hā'gārths) [John Haygarth, Brit. physician, 1740–1827] Exostoses or bony tumors on joints in rheumatoid arthritis.

hazard analysis and critical control point ABBR: HACCP. A food safety program designed initially for astronauts and adopted by the U.S. Food and Drug Administration and other international agencies. It consists of seven principles: 1. identify potential hazards to a nutrient or the food supply; 2. find the critical control points in food production where interventions can block the hazard; 3. establish protocols for preventing each identified hazard at the control points; 4. establish monitoring standards to identify problems arising at those control points; 5. develop policies to correct monitoring failures; 6. develop procedures to verify that the system functions well; 7. establish and implement policies for record keeping.

hazardous material ABBR: hazmat. A toxic material that may cause personal injury or property damage. The hazard of any material is determined by its chemical, physical, and biological properties and by the possibility of exposure to that material. SEE: *health hazard; permissible exposure limits; right-to-know law.*

hazard ratio (hāz'ird) [ME.] In biostatistics, the calculated likelihood that a

particular intervention will make a study outcome more or less likely to occur. A hazard ratio of 1.0 indicates that the variable has no impact on the outcome. A hazard ratio of less than 1.0 indicates that the variable decreases the likelihood of the outcome. A ratio exceeding 1.0 indicates that the variable increases the likelihood of the outcome. A ratio of 2.0 suggests that the variable doubles the likelihood of the outcome. A ratio of 0.5 suggests that it halves the risk of the outcome.

haze In ophthalmology, a clouding of vision that makes viewed objects appear smoky or indistinct. Opacification of the cornea is the cause.

hazmat (hāz'mät) Contraction for hazardous material.

Hb *hemoglobin.*

HB Ag An obsolete term for any one of the hepatitis B antigens. SEE: *hepatitis B.*

HbCo *Carboxyhemoglobin.*

Hbg *hemoglobin.*

H2 blockers SEE: *H2-receptor antagonists.*

HBV *hepatitis B virus.*

HCFA *Health Care Financing Administration.*

HCG, hCG *human chorionic gonadotropin.*

HCl *hydrochloric acid.*

HCO₃⁻ Chemical formula for bicarbonate ion.

H₂CO₃ Chemical formula for carbonic acid.

HCV *hepatitis C virus.*

hcy *homocystine.*

H.D. *hearing distance.*

h.d. *L. hora decubitus, the hour of going to bed.*

HDCV *human diploid cell vaccine* (for rabies).

H disease *Hartnup disease.*

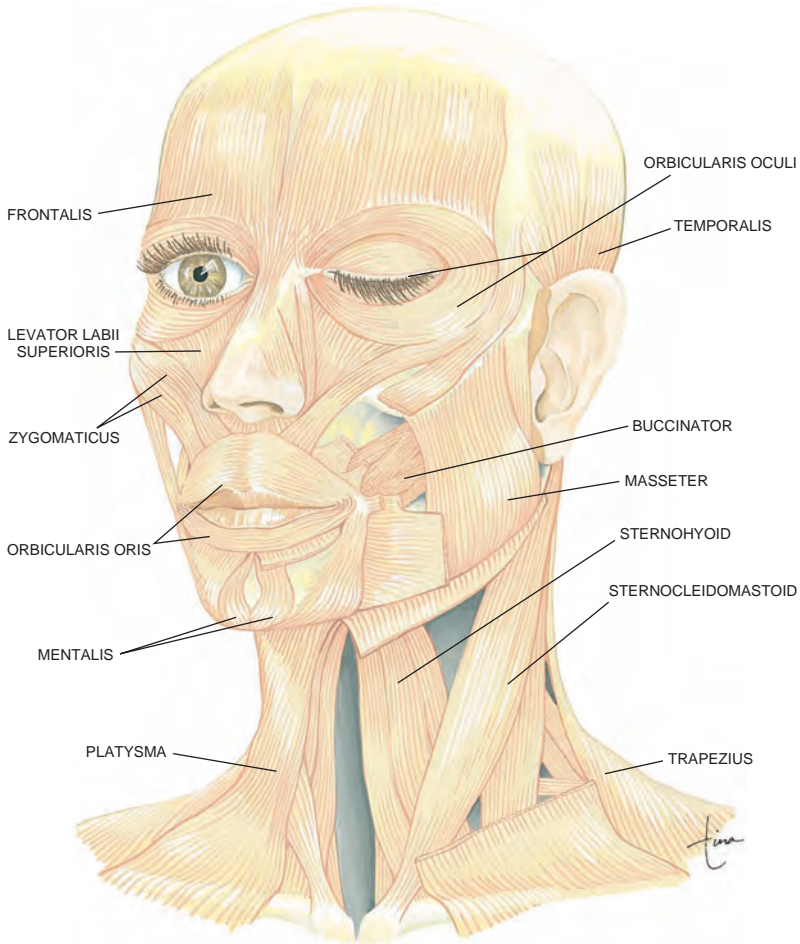
HDL *high-density lipoprotein.*

He Symbol for helium.

head [AS. *heafod*] 1. Caput; the part of the body containing the brain and organs of sight, hearing, smell, and taste and including the facial bones. SEE: *illus.* 2. The larger extremity of any organ.

ABNORMALITIES: An abnormal fixation of the head may be caused by post-pharyngeal abscess, arthritis deformans, swollen cervical glands, rheumatism, traumatism of the neck, sprains of cervical muscles, congenital spasmodic torticollis, caries of a molar tooth, burn scars, or eye muscle imbalance (hyperphoria). An inability to move the head may be due to caries of the cervical vertebrae and diseases of articulation between the occiput and atlas or paralysis of neck muscles.

Abnormal movements of the head include habit spasms such as nodding. Rhythmical nodding is seen in aortic re-



MUSCLES OF THE HEAD AND NECK

(Anterior view)

gurgitation, chorea, and torticollis. A retracted head is seen in acute meningitis, cerebral abscess, tumor, thrombosis of the superior longitudinal sinus, acute encephalitis, laryngeal obstruction, tetanus, hydrophobia, epilepsy, spasmodic torticollis, strychnine poisoning, hysteria, rachitic conditions, and painful neck lesions at the back.

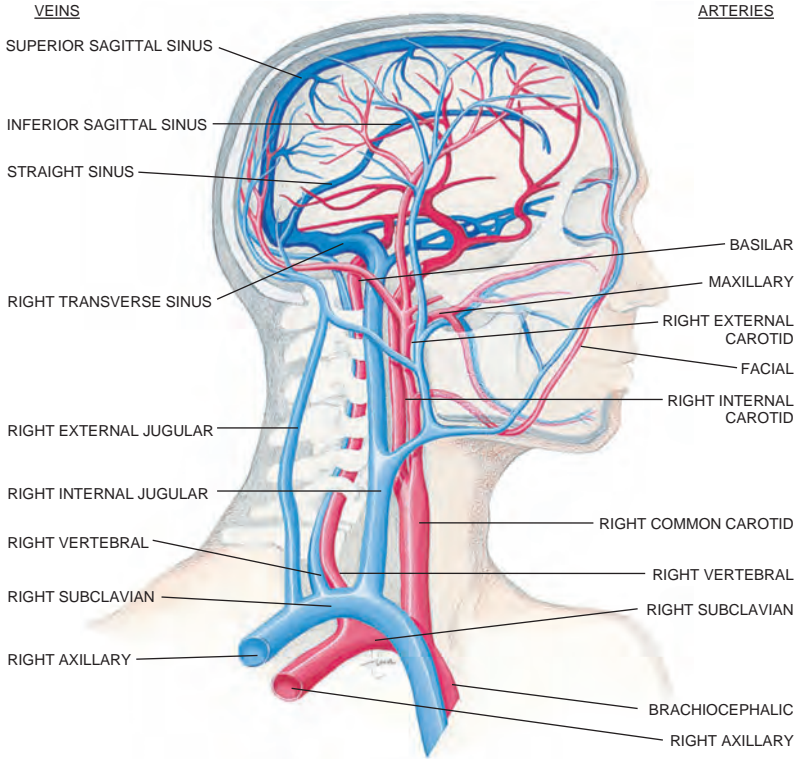
after-coming h. Childbirth with the head delivered last.

articular h. A projection on bone that articulates with another bone.

headache [AS. *heafod*, head, + *acan*, to ache] ABBR: HA. Pain felt in the forehead, eyes, jaws, temples, scalp, skull, occiput, or neck. Headache is exceptionally common; it affects almost every per-

son at some time. From a clinical perspective, benign HA must be distinguished from HA that may be life-threatening. Types of benign HA include tension, migraine, cluster, sinus, and environmentally induced (e.g., "ice cream" HA or "caffeine-withdrawal" HA). Life-threatening HA may be caused by rupture of an intracranial aneurysm, subarachnoid hemorrhage, hemorrhagic stroke, cranial trauma, encephalitis, meningitis, brain tumors, or brain abscesses. SYN: *cephalalgia*. SEE: *migraine*.

Typically, benign HAs have a recurrent or chronic history with which the patient is familiar. The tension HA sufferer, for example, develops bandlike



ARTERIES AND VEINS OF THE HEAD

(Right lateral view)

pressure around the head at the end of a difficult or stressful day. The onset of the HA is gradual and progressively worsens but is usually not severe or intense.

The migraine HA sufferer also typically has a history of recurrent HA, often dating back to childhood. Migraine HA is often of rapid onset, unilateral, throbbing, or beating in character. It may be preceded by a visual disturbance (flickering lights or wavy visual disturbances), technically called *scotoma*, and can be associated with nausea, vomiting, or even transient neurological deficits, such as hemibody weakness. The HA may be triggered by eating chocolate, monosodium glutamate, or some cheeses, drinking alcohol, or taking certain medications, such as the hormone estrogen. By contrast, an HA that is life-threatening may have some of the following hallmarks:

1. The first, or the worst, HA a patient has ever suffered (e.g., subarachnoid hemorrhage should be suspected)
2. Occurring for the first time in a pa-

tient with a history of cancer (metastatic tumor)

3. Accompanied by fever, stiff neck, or photophobia (meningitis, intracranial hemorrhage)

4. Associated with loss of consciousness or severely altered mental status (intracerebral hemorrhage, brain embolism, encephalitis, meningitis)

5. Associated with neurological deficits that do not quickly resolve (intracerebral hemorrhage, brain embolism, brain abscesses)

6. Occurring in a patient with recent head trauma (hemorrhage, carotid artery dissection) or a history of recent foreign travel (neurocysticercosis; falciparum malaria)

7. Occurring in a patient with acquired immunodeficiency syndrome (cryptococcal meningitis, *Toxoplasma gondii*, central nervous system lymphoma).

Only a few examples are given here. Almost any disturbance of body function may cause HA, including sunstroke, motion sickness, insomnia, altitude sick-

ness, spinal puncture, alcohol withdrawal, prolonged fasting, exposure to loud noise, menstruation, psychological stressors, or new medications (e.g., nitrates).

TREATMENT: Mild HA often responds to rest, massage, acetaminophen, or listening to relaxing music. Moderate HA typically requires nonsteroidal anti-inflammatory drug therapy. Caffeine helps ameliorate many mild to moderate HAs. Antiemetics, such as prochlorperazine or metoclopramide, help relieve moderate to severe HAs, esp. those accompanied by nausea; ergotamines and the triptan drugs are particularly suited to treating migraines. Cluster HAs often resolve after treatment with corticosteroids or high-flow oxygen. The HA of temporal arteritis also responds to high-dose steroids, but these agents must be continued for months or years until the syndrome remits. Narcotic analgesics relieve HA pain, but habitual use may diminish their effectiveness or result in dependence.

PATIENT CARE: A description of the headache is obtained and documented, including the character, severity, location, radiation, prodromata, or associated symptoms, as well as any palliative measures that have brought relief. Temporal factors and any relationship of recurring headaches to other activities are also documented. The patient is taught to avoid precipitating or exacerbating factors. Noninvasive comfort measures (lying down in a quiet, darkened room with an ice pack on the forehead or cool compresses on the eyes) and prescribed drug therapy are instituted, and the patient is taught about these and evaluated for desired responses and any adverse reactions. If nausea and vomiting precede or accompany HA, the patient is taught to use antiemetics, and to drink fluids for rehydration once the medication has taken effect.

analgesic-rebound h. A headache that occurs when a patient with chronic or recurring headaches stops using pain relievers. Analgesic rebound is a common cause of daily headache pain; it may respond to treatment with antidepressant medications and withdrawal of the offending analgesics.

caffeine withdrawal h. Headache, usually mild to moderate in intensity, that begins as someone stops drinking coffee, tea, or other caffeinated drinks. This type of headache usually occurs only in persons who habitually consume more than 4 cups of caffeine daily and is often accompanied by fatigue and malaise.

cervicogenic h. A headache that begins in the superior segments of the cervical spine and radiates to one side of

the neck, forehead, and/or shoulder. It typically is worsened by movements or postures of the head or neck, or by pressure applied directly to the neck. It may be relieved by massage, manipulation, or occipital nerve blocks.

cluster h. A series of headaches, typically occurring in men, that are intense, recurring, felt near one eye, and often associated with nasal congestion, rhinorrhea, and watering of the affected eye. They typically occur 1 or 2 hr after the patient has fallen asleep, last for about 45 min, and recur daily for several weeks before spontaneously resolving. The etiology of the headaches is unknown, but their recurrence during certain seasons of the year and certain times of day may suggest a circadian or chronobiological mechanism.

TREATMENT: Medications that may alleviate cluster headaches include corticosteroids, ergotamines, gabapentin, lithium, melatonin, nonsteroidal anti-inflammatory agents, sumatriptan and other "triptan" drugs, and high-flow oxygen. Surgery is sometimes used to cut affected nerves.

coital h. A headache that begins suddenly during coitus or immediately after orgasm. These are uncommon, occur more frequently in men than in women, and may last for minutes or hours.

exertional h. An acute headache of short duration that appears after strenuous physical activity. Usually benign, it is relieved by aspirin and prevented by changing to a less strenuous exercise.

histamine h. A headache resulting from ingestion of histamine (found in some wines), injection of histamine, or excessive histamine in circulating blood. This type of headache is due to dilatation of branches of the carotid artery. SEE: *cluster h.*

hypnic h. A headache that awakens a patient from sleep. Hypnic headaches are typically bilateral, and are experienced more often by the elderly than by other patients. Unlike cluster headaches, which also occur during rest or sleep, the hypnic headache is not felt on one side of the face, and not associated with tearing of the eye or painful congestion of the sinuses.

migraine h. Migraine.

mixed h. Headache that may have features of some combination of migraine headache, tension headache, and analgesic withdrawal.

postdural puncture h. Postlumbal puncture h.

postlumbal puncture h. A headache occurring after a spinal tap that is felt mostly in the front and the back of the head. It is markedly worse when the patient sits up, and better when the patient lies down. The headache is sometimes associated with double vision.

ETIOLOGY: It is caused by the leakage of spinal fluid through a hole that fails to close when the spinal needle is removed from the dura mater. It is less likely to occur when pencil-point needles are used for lumbar puncture and when the spinal needle has a small diameter (e.g., 25 gauge).

TREATMENT: Bedrest in a completely flat and prone position (without a pillow), forced oral and intravenous fluids, and administration of cortical steroids are useful in treating the headache. If the headache persists in spite of therapy, it may be possible to stop the leakage of spinal fluid by injection of 10 ml of the patient's blood in the epidural space at the site of the lumbar puncture. The blood may "patch" the hole in the dura. **SYN:** *postdural puncture headache*.

tension h. **1.** A headache associated with chronic contraction of the muscles of the neck and scalp. **2.** A headache associated with emotional or physical strain.

thundering h. A sudden acute headache that may accompany intracranial hemorrhage. Its absence, however, does not rule out intracranial hemorrhage.

weight-lifter's h. A form of exertional headache that occurs after straining during workouts with free weights or weight-training machines.

head banging In children, a tension-discharging action in which the head is repeatedly banged against the crib; may be part of a temper tantrum.

headgear **1.** A covering for the head, esp. a protective one, such as a helmet used by soldiers and those who participate in contact sports, auto racing, bicycle riding, or aviation. **2.** Extraoral traction and anchorage used to apply force to the teeth and jaws.

headrest (hěd' rĕst) **1.** A pad made of soft material placed beneath the occiput, around the neck or lower face or both, designed to limit head movement during surgery or to prevent neck pain in cervical arthritis. **2.** A padded device used in cars, airplanes, or boats to prevent neck trauma during accidents. **3.** A padded device used in some types of wheelchairs to support the head and neck of patients with flaccid muscles or other neurological conditions.

SEE: *assistive technology*.

head-tilt chin-lift maneuver A maneuver used to open the airway of an unconscious patient who may need ventilatory assistance. With the patient in the supine position, the head is tilted back into a hyperextended position with one hand and the bony part of the mandible is gently lifted by the other hand. The procedure helps to prevent the tongue from occluding the airway. This technique should not be used if there is any

mechanism for injury to the head or neck. **SEE:** *cardiopulmonary resuscitation* for illus.

heal (hĕl) [AS. *hael*, whole] To cure; to make whole or healthy.

healer An individual who cures diseases, eases discomfort, or relieves the suffering of others.

healing The restoration to a normal mental or physical condition, esp. of an inflammation or a wound. Tissue healing usually occurs in predictable stages:

Blood clot formation at the wound
Inflammatory phase (during which plasma proteins enter the injured part)

Cellular repair (with an influx of fibroblasts and mesenchymal cells)

Regrowth of blood vessels (angiogenesis)

Synthesis and revision of collagen fibers (scar formation)

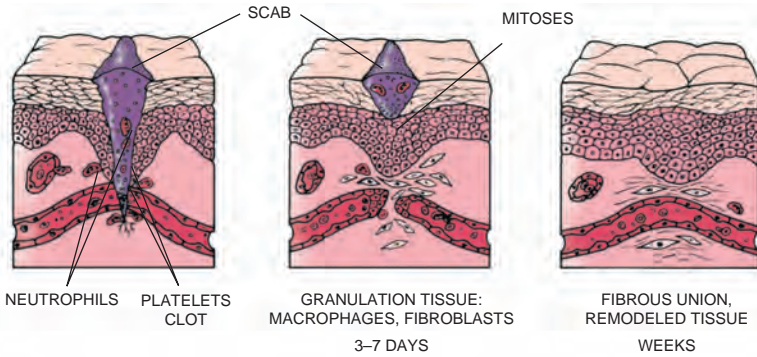
In skin lesions, regrowth of epithelial tissues also occurs. The many processes involved in the healing of a wound take 3 weeks or more to complete. Many factors may delay tissue healing, including malnutrition, wound infection, and co-existing conditions (e.g., diabetes mellitus, advanced age, tobacco abuse, cancer), as well as the use of several drugs, including corticosteroids. **SEE:** *illus*.

COMPLICATIONS: These may result from the formation of a scar that interferes with the functioning of a part and possible deformity; the formation of a keloid, the result of overgrowth of connective tissue forming a tumor in the surface of a scar; necrosis of the skin and mucous membrane that produces a raw surface, which results in an ulcer; a sinus or fistula, which may be due to bacteria or some foreign substance remaining in the wound; proud flesh, which represents excessive growth of granulation tissue.

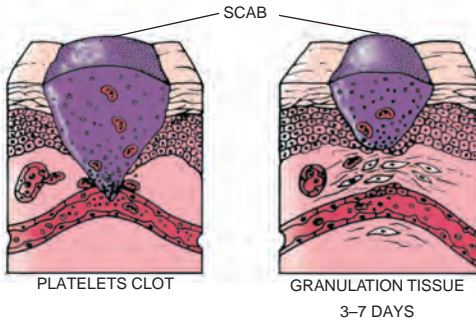
h. by first intention A process that closes the edge of a wound with little or no inflammatory reaction and in such a manner that little or no scar is left to reveal the site of the injury. New cells are formed to take the place of dead ones, and the capillary walls stretch across the wound to join themselves to each other in a smooth surface. New connective tissue may form an almost imperceptible but temporary scar. In repairing lacerations and surgical wounds, the goal is to produce a repaired area that will heal by first intention.

h. by second intention Healing by granulation or indirect union. Granulation tissue is formed to fill the gap between the edges of the wound with a thin layer of fibrinous exudate. Granulation tissue also excludes bacteria from the wound and brings new blood vessels to the injured part. Healing by second intention takes longer than healing by

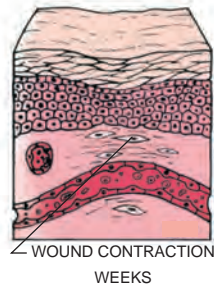
HEALING BY FIRST INTENTION



HEALING BY SECOND INTENTION



HEALING BY THIRD INTENTION



WOUND HEALING

primary intention and typically results in the formation of a prominent scar; wounds that heal by second intention show signs of failure if the wound loses the normal red-gray appearance of granulation tissue and becomes pale, dry, or insubstantial. When granulations first form at the top instead of the bottom of the wound, the base of the wound may have to be kept open with wicks or drains to promote healthy tissue repair.

h. by third intention Delayed wound healing that occurs in the base of ulcerated or cavitory wounds, esp. those that have become infected. The wound fills very slowly with granulation tissue and often forms a large scar. Wound revision surgery, including use of grafting, may be needed.

holistic h. Holism.

health (hēlth) [AS. *hæalth*, wholeness] A condition in which all functions of the body and mind are normally active. The World Health Organization defines health as a state of complete physical, mental, or social well-being and not

merely the absence of disease or infirmity.

bill of h. A public health certificate stating that passengers on a public conveyance or ship are free of infectious disease.

board of h. A public body, appointed or elected, concerned with administering the laws pert. to the health of the public.

h. certificate An official statement signed by a physician attesting to the state of health of a particular individual.

department of h. The branch of a government (city, county, or nation) that regulates, coordinates, and oversees food and drug safety, immunization services, control of epidemic diseases, maternal and child care, substance abuse services, elder care, health statistics, and awareness of health improvement strategies.

h. education An educational process or program designed for the improvement and maintenance of health. It is directed to the general public, in con-

trast to a health education program organized for instructing persons who will become health educators.

h. hazard Any organism, chemical, condition, or circumstance that may cause injury or illness. With respect to chemicals, a substance is considered a health hazard if at least one study, conducted in accordance with established scientific principles, documents that acute or chronic effects may occur in connection with use of or exposure to that chemical. SEE: *hazardous material*; *permissible exposure limits*; *right-to-know law*; *health indicator* for table.

industrial h. The health of employees of industrial firms.

h. insurance Indemnification to cover some or all of the costs of treating injury or disease.

h. literacy 1. The ability to understand the causes, prevention, and treatment of disease. 2. The degree of communication that enhances people's ability to understand and act on health-related information.

PATIENT CARE: Patient teaching specific to the individual's needs is vital to health literacy.

mental h. Psychological adjustment to one's circumstance or environment; the ability to cope with or make the best of changing stresses and stimuli. Individuals are considered mentally healthy if they have adjusted to life in such a way that they are comfortable with themselves and, at the same time, are able to live so that their behavior does not conflict with their associates or the rest of society. Inherent in this, for most individuals, are feelings of self-worth and accomplishment and the ability to be gainfully employed with sufficient reward for that employment to satisfy economic needs.

h. promotion SEE: *health promotion*.

public h. SEE: *public health*.

h. risk appraisal An analysis of all that is known about a person's life and health including personal and family medical history, occupation, and social environment in order to estimate his or her risk of disability or death as compared with the national averages. The data used for comparison will vary with the patient's age, sex, ethnic background, and income, and the skill of the evaluator and the sensitivity and specificity of the tests used in the evaluation.

Gestures that modify health risks include: 1. talking with the patient about alcohol or drug use; obesity; regular exercise, and the use of seat belts while driving. 2. assessing patient blood glucose, blood pressure, and lipid status; 3. performing screening tests in appropriate populations, such as mammography in women over the age of 40 or colon

cancer screening tests in patients over 50. SEE: *risk factor*.

h. screening SEE: *h. risk appraisal*.

Health Belief Model ABBR: HBM. A theory used to explain health-seeking or health-avoiding behavior that is based on the assumption that attitude and belief motivate action. The model proposes that an individual facing health-related decisions weighs: 1. the likelihood that she may be at risk for a disease; 2. the gravity of the disease, were she to succumb to it; 3. the value of making choices that will prevent the illness; 4. the costs or challenges of making those choices. Health-benefiting actions will be taken when: a. cues/reminders to take that action are delivered to her and b. she believes that she has the capability to make her efforts count.

health care All of the services made available by medical professionals to promote, maintain, or preserve life and well-being. Its major objectives are to relieve pain; treat injury, illness, and disability; and provide comfort and hope.

evidence-based h.c. The concept that the practice of medicine should be based on firm data rather than anecdote, tradition, intuition, or belief. SYN: *evidence-based medicine*; *evidence-based practice*.

h.c. proxy A legal document that allows individuals to name someone they know and trust to make health care decisions for them if, for any reason and at any time, the individual becomes unable to make or communicate those decisions. Some states limit the age at which such a proxy may be established and prohibit certain persons, such as an estate administrator or an employee of a health care facility in which the person making the proxy is a resident, from being appointed to make health care decisions unless he or she is related to the person by blood, marriage, or adoption. SEE: *advance directive*; *do not attempt resuscitation*; *living will*; *power of attorney, durable, for health care*; *donor card for illus*.

healthcare-associated pneumonia A synonym, preferred in some health care communications, for nosocomial pneumonia. It includes both ventilator-associated pneumonias and other lower respiratory tract infections that are contracted during a stay in a hospital or health care facility.

Healthcare Common Procedure Coding System ABBR: HCPCS. A standardized coding system used to process claims for insurance payments by the Centers for Medicare and Medicaid Services. It consists of two parts: a coding system devised by the American Medical Association called the Current Procedural Terminology, which describes

Some Public Health Indicators

Environmental	General	Maternal-Child	Prevention and Screening	Treatment
Air quality advisories	Birth rate	Infant mortality rate	Mammography use	Access to care
Motor vehicle emissions	Life expectancy	Birth weight of infants	Pap testing	Availability of primary care providers
Pesticide levels in foods	Obesity	Maternal mortality rate	Tobacco counseling	Waiting times for diagnostic services
Source (drinking) water contaminants	Self-reported health levels	Prenatal visits	Vaccination rates	Waiting times for therapeutic services

procedures and services provided by health care professionals; and a system that identifies health-related products and services that are not provided by physicians, e.g., emergency medical services, durable medical equipment, supplies, and orthotics.

Health Care Financing Administration ABBR: HCFA. The former name of the Centers for Medicare and Medicaid Services, the U.S. government agency responsible for funding and supervising health care provided under Medicare and Medicaid.

health care system An organization that manages and provides treatments and preventive services for the healthy, the sick, and the injured. The system includes physicians and their assistants, dentists and their assistants, nurses and their surrogates, the various levels of diagnostic and care facilities, voluntary organizations, medical administrators in hospitals and government agencies, the medical insurance industry, and the pharmaceutical and medical device manufacturers. An ideal health care system emphasizes preventive medicine and encourages preventive self-care; enables access to primary care for assessment of and assistance with health problems; provides secondary or acute care involving emergency medical services and complex medical and surgical services; facilitates tertiary care for patients who need referral to facilities that provide rehabilitative services; offers respite care to allow families temporary relief from the daily tasks of caring for individuals for whom they are responsible; provides continuing supportive services for those whose mental or physical illness or disability is such that they need assistance with everyday tasks of living (e.g., home health and nursing home care); and provides hospice care for those with terminal illnesses, all at a reasonable cost.

health educator An individual professionally trained to instruct clients, families, or students about health-related topics, such as the diagnosis or the care of people with specific diseases or conditions.

healthful Conducive to good health.

health indicator A limited but measurable element of the health of a community that is used to gauge public health as a whole. SEE: table.

health information technician A technician who ensures the accuracy, completeness, coding, security, storage, and retrieval of health care-related data, esp. in medical records. The work may involve various aspects of health care (e.g., epidemiology, ethics, law, management, patient care, and research).

health information technology ABBR: HIT. Application of information technology to the collection, storage, processing, retrieval, and communication of information relevant to patient care within a health care system.

Health Insurance Portability and Accountability Act of 1996 ABBR: HIPAA. A group of federal laws that establish rights, protections, and other standards of care for working people with pre-existing medical conditions. These laws affect obstetrical and neonatal care, the health care of women in general, the treatment of people with psychiatric illnesses, the confidentiality of medical records, and other aspects of health care.

health maintenance, ineffective Inability to identify, manage, and/or seek out help to maintain health. SEE: *Nursing Diagnoses Appendix*.

Health Maintenance Organization ABBR: HMO. A prepaid health care program of group practice that provides comprehensive medical care, esp. preventive care, while aiming to control health care expenditures.

Health On the Net Foundation ABBR:

HON. A not-for-profit organization based in Switzerland, which in 1995 developed a Code of Conduct to guide the reader of health care information available on the Internet. The set of rules allows the reader to know the source and the purpose of the data being read.

health physics The scientific discipline devoted to the establishment and promotion of radiation safety. See the website of the Health Physics Society, <http://www.hps.org>.

Health Plan Employer Data and Information Set ABBR: HEDIS. A set of benchmarks used to assess the quality of care provided to patients by managed-care organizations. Included in these benchmarks are the numbers of immunizations administered by the plans and the extent of health screening tests provided by them.

health promotion Any process that fosters improvements in an individual's or a community's health and well-being. It may include formal education for patients, behavior modeling by influential people or community leaders, and mass media/communications. In the U.S. major health promotion goals include eliminating vaccine-preventable illnesses; improving the early treatment of stroke; decreasing cardiovascular risk factors related to inappropriate diet, high blood pressure, obesity, and use of tobacco; and reducing high-risk behavior that may contribute to the spread of acquired immunodeficiency syndrome (AIDS), hepatitis, and other illnesses.

Health Promotion Model A theory of nursing developed by Nola J. Pender that focuses on health promotion and disease prevention. The HPM can be used to structure nursing protocols and interventions that will help clients to develop skill and confidence in caring for themselves and their dependents and ultimately to live healthier and more productive lives. SEE: *Nursing Theory Appendix*.

health-seeking behaviors Alterations in personal health habits or the environment in order to move toward a higher level of health. Stable health status is defined as age-appropriate illness prevention measures achieved, client reports good or excellent health, and signs and symptoms of disease, if present, are controlled. SEE: *Nursing Diagnoses Appendix*.

health team rounds Scheduled discussions about patients' health problems, therapies, and discharge needs by nurses, physicians, allied health providers, and other members of the health care team. SEE: *case management*.

healthy Being in a state of good health.

Healthy People 2010 An initiative of the United States Department of Health

and Human Services created to promote healthy behaviors. The plan identifies ten targets for health improvement in the U.S.: physical activity, overweight and obesity, tobacco use, mental health, responsible sexual behavior, injury and violence, substance abuse, environmental quality, immunization, and access to health care services. Private agencies have joined state and local governments in promoting and establishing educational and interventional programs to reduce acute and chronic disease in these areas.

healthy persons, medical evaluation of The examination of asymptomatic individuals to screen for and prevent future illnesses.

hearing [AS. *hieran*] The sense or perception of sound. The normal human ear can detect sounds with frequencies ranging from about 20 Hz to 20,000 Hz but is most sensitive to sounds in the 1500-Hz to 3000-Hz frequency range, which is the range most often used in speech. Hearing deficits occur when sound waves are not conducted properly to the cochlea, when lesions interrupt the workings of the cochlear nerve, or when central nervous system pathways involved in the processing of auditory stimuli are injured.

FUNCTION TESTS: Hearing acuity can be determined by measuring the distance at which a person can hear a certain sound such as a water tick, by using audiometers, and by bone conduction. In audiometers, electrically produced sounds are conveyed by wires to a receiver applied to the subject's ear. Intensity and pitch of sound can be altered and are indicated on the dials. Results are plotted on a graph known as an audiogram. In bone conduction tests, a device such as a tuning fork or an apparatus that converts an electric current into mechanical vibrations is applied to the skull. This is of value in distinguishing between perceptive and conductive deafness. Conductive hearing loss may be diagnosed with the Weber test. Having the patient hum produces no difference in the sound heard if hearing is normal. The sound is perceived as louder in the ear with conductive hearing loss.

conductive h. loss Hearing loss resulting from any condition that prevents sound waves from being transmitted to the auditory receptors. It may result from wax obstructing the external auditory meatus, inflammation of the middle ear, ankylosis of the ear bones, or fixation of the footplate of the stirrup. SYN: *conduction deafness*. SEE: *otosclerosis*; *Rinne test*; *Weber test*.

h. distance The distance at which a given sound can be heard.

h. impaired Having any degree of

hearing loss that interferes with communication, development, learning, or interpersonal interactions.

h. loss A decreased ability to perceive sounds as compared with what the individual or examiner would regard as normal. In the U.S., about 1 million school-age children and 25 million adults have some degree of hearing loss. SEE: *audiogram; audiometry.*

noise-induced h. loss Hearing loss that results from exposures to very loud sounds (over 85 dB). The loss is usually most profound at a frequency of 4000 Hz. Working with noisy machinery, listening to loud music, or discharging rifles, guns, or explosives may be causative. Wearing ear plugs or earmuffs may be preventive.

sensorineural h. loss Hearing loss caused by permanent or temporary damage to the sensory cells or nerve fibers of the inner ear.

sudden h. loss Hearing loss that occurs in 72 hr or less. It may be temporary or permanent. Some of the most common causes include cerumen impaction, medication toxicities, acute infections, ear trauma, Ménière's disease, and ischemia.

hearing aid An electroacoustical device that amplifies sounds. It is typically used by those with hearing loss. Common forms of hearing aids are those that fit within the ear ("in the ear," abbreviated ITE), or within the auditory canal ("in the canal," or ITC); those that are worn behind the ear (BTE), and those that are carried on the body.

hearing dog A dog specially trained to assist people with diminished hearing or deafness. Also known as a *signal dog*.

hearsay Statements overheard and repeated, rather than personally witnessed.

heart (*hárt*) [AS. *heorte*] A hollow, muscular organ, the pump of the circulatory system. Its wall has three layers: the outer epicardium, a serous membrane; the middle myocardium, made of cardiac muscle; and the inner endocardium, endothelium that lines the chambers and covers the valves. The heart is enclosed in the pericardium, a fibrous sac; the potential space between the parietal pericardium and the epicardium is called the pericardial cavity, which contains serous fluid to prevent friction as the heart beats. SEE: *illus. (The Heart); circulation, coronary for illus.; cardiomyopathy, hypertrophic.*

CHAMBERS: The upper right and left atria are thin-walled receiving chambers separated by the interatrial septum. The lower right and left ventricles are thick-walled pumping chambers separated by the interventricular septum; normally the right side has no communication with the left. The right

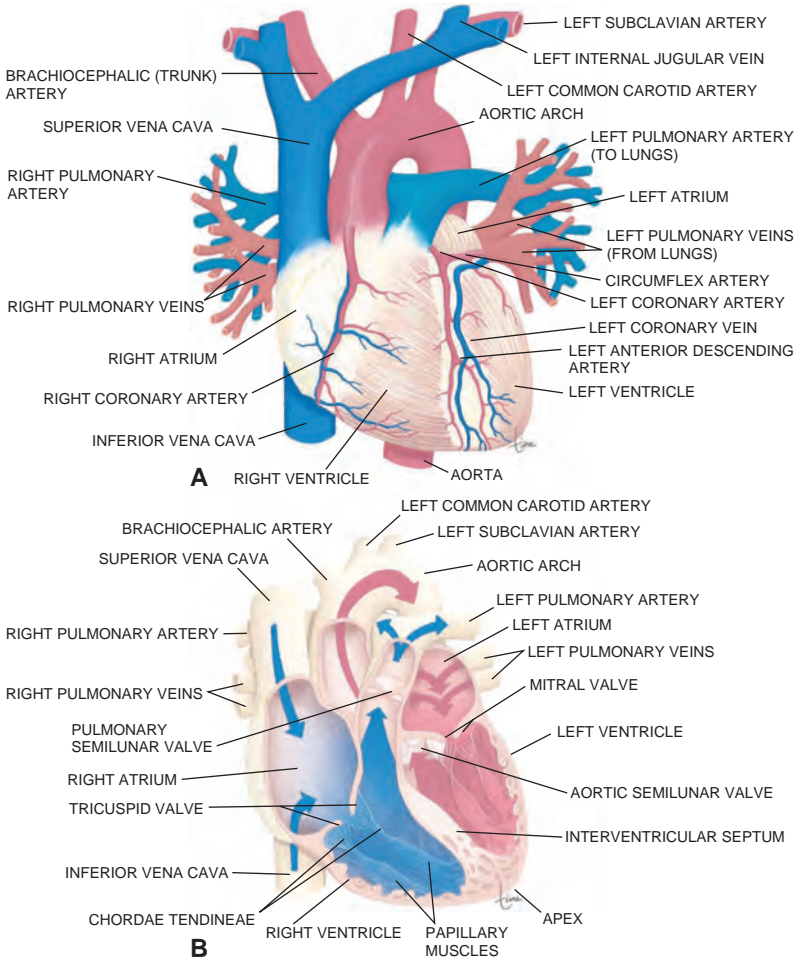
side receives deoxygenated blood via the venae cavae from the body and pumps it to the lungs; the left side receives oxygenated blood from the lungs and pumps it via the aorta and arteries to the body. Contraction of the heart chambers is called systole; relaxation with accompanying filling with blood is called diastole. The sequence of events that occurs in a single heartbeat is called the cardiac cycle, with atrial systole followed by ventricular systole. For a heart rate of 70 beats per minute, each cycle lasts about 0.85 sec.

VALVES: In the healthy state, all four cardiac valves prevent backflow of blood. The atrioventricular valves are at the openings between each atrium and ventricle; the tricuspid valve, between the right atrium and ventricle; and the bicuspid or mitral valve, between the left atrium and ventricle. The pulmonary semilunar valve is at the opening of the right ventricle into the pulmonary artery; the aortic semilunar valve is at the opening of the left ventricle into the aorta.

FUNCTION: In adults, the cardiac output varies from 5 L/min at rest to as much as 20 L/min during vigorous exercise. At the rate of 72 times each minute, the adult human heart beats 104,000 times a day, 38,000,000 times a year. Every stroke forces approx. 5 cu in (82 ml) of blood out into the body, amounting to 500,000 cu in (8193 L) a day. In terms of work, this is the equivalent of raising 1 ton (907 kg) to a height of 41 ft (12.5 m) every 24 hr.

BLOOD SUPPLY: The myocardium receives its blood supply from the coronary arteries that arise from the ascending aorta. Blood from the myocardium drains into several cardiac veins.

NERVE SUPPLY: The heart initiates its own beat, usually from 60 to 80 beats per minute, but the rate may be changed by impulses from the cardiac centers in the medulla oblongata. Accelerator impulses are carried by sympathetic nerves. Preganglionic neurons in the thoracic spinal cord synapse with postganglionic neurons in the cervical ganglia of the sympathetic trunk; their axons continue to the heart. Sympathetic impulses are transmitted to the sinoatrial (SA) node, atrioventricular (AV) node, bundle of His, and myocardium of the ventricles and increase heart rate and force of contraction. Inhibitory impulses are carried by the vagus nerves (parasympathetic). Preganglionic neurons (vagus) originating in the medulla synapse with postganglionic neurons in terminal ganglia in the wall of the heart. Parasympathetic impulses are transmitted to the SA and AV nodes and decrease the heart rate. Sensory nerves from the heart serve for the



THE HEART

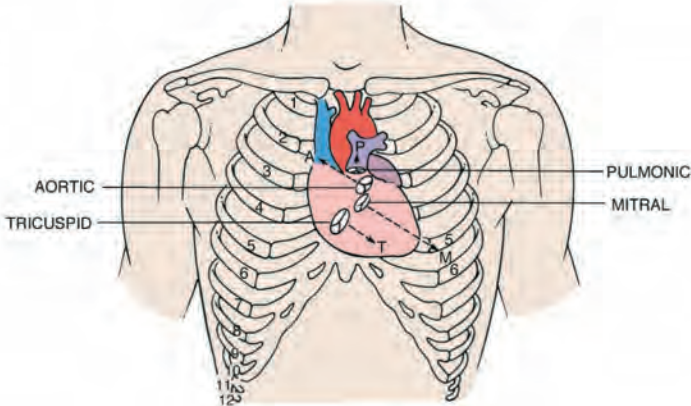
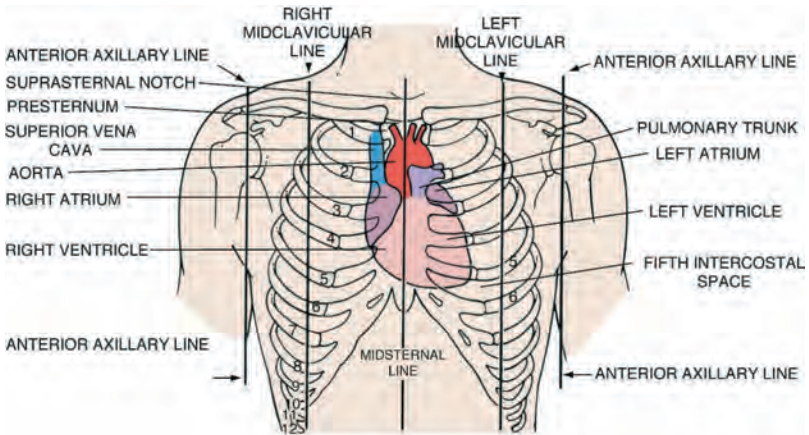
(A) anterior view, (B) frontal section

sensation of pain, which is caused by an insufficient supply of oxygen to the myocardium. The vagus and glossopharyngeal are the sensory nerves for reflex changes in heart rate. These nerves arise from pressoreceptors or chemoreceptors in the aortic arch and carotid sinus, respectively.

AUSCULTATION: Listening to the heart with a stethoscope reveals the intensity, quality, and rhythm of the heart sounds and detects any adventitious sounds (e.g., murmurs or pericardial friction). The two separate sounds heard by the use of a stethoscope over the heart have been represented by the syllables "lubb," "dupp." The first sound (systolic), which is prolonged and dull, results from the contraction of the ven-

tricle, tension of the atrioventricular valves, and the impact of the heart against the chest wall and is synchronous with the apex beat and carotid pulse. The first sound is followed by a short pause, and then the second sound (diastolic) is heard, resulting from the closure of the aortic and pulmonary valves. This sound is short and high pitched. After the second sound there is a longer pause before the first is heard again. A very useful technique for listening to the variation in sounds between one area and another is to move the stethoscope in small steps from site to site.

PROCEDURE: The patient should be recumbent when the examination begins. After all possible signs have been



PROJECTION OF HEART, GREAT VESSELS, AND VALVES ON CHEST WALL

(Top) Projection of heart and great vessels; (Bottom) projection of heart and valves. Heart sounds from each valve are heard best over areas shown

elicited, the examination should be repeated with the patient sitting, standing, or leaning forward, and any variations from this change of position should be noted. Auscultation is performed first while the patient is breathing naturally, next while he holds the breath in both deep inspiration and expiration, and finally while the patient takes three or four forced inspirations. By listening over the entire thoracic cavity, the examiner should try to localize the points at which heart sounds, both normal and abnormal, are heard with the greatest intensity. The examination should proceed from below upward and from left to right.

The normal location of valves should be noted for auscultation. The aortic valve is in the third intercostal space,

close to the left side of the sternum; the pulmonary valve is in front of the aorta, behind the junction of the third costal cartilage with the sternum, on the left side. The tricuspid valve is located behind the middle of the sternum about the level of the fourth costal cartilage. Finally, the mitral valve is behind the third intercostal space about 1 in (2.5 cm) to the left of the sternum. **SEE: [illus.](#)**

Both heart sounds either are heard better or are actually accentuated in increased heart action from any cause, normal or abnormal (e.g., anemia, vigorous exercise, cardiac hypertrophy, thin chest walls, and lung consolidation as found in pneumonia). Accentuation of the aortic second sound results from hypertrophy of the left ventricle, increased

arterial resistance (as in arteriosclerosis with hypertension), or aortic aneurysm. Accentuation of the pulmonary second sound results from pulmonary obstruction (as in emphysema, pneumonia, or hypertrophy of the right ventricle). Both heart sounds are poorly heard or are actually decreased in intensity in general obesity, general debility, degeneration or dilatation of the heart, pericardial or pleural effusion, and emphysema.

The reduplication of heart sounds is probably due to a lack of synchronous action in the valves of both sides of the heart. It results from many conditions but notably from increased resistance in the systemic or the pulmonary circulation (as in arteriosclerosis and emphysema). It is also frequently noted in mitral stenosis and pericarditis.

A murmur (an abnormal sound heard over the heart or blood vessels) may result from obstruction or regurgitation at the valves following endocarditis; dilatation of the ventricle or relaxation of its walls rendering the valves relatively insufficient; aneurysm; a change in the blood constituents (as in anemia); roughening of the pericardial surfaces (as in pericarditis); and irregular action of the heart are called endocardial; those outside, exocardial; those produced in aneurysms, bruits; those produced by anemia, hemic murmurs.

Hemic murmurs, which are soft and blowing and usually systolic, are heard best over the pulmonary valves. They are associated with symptoms of anemia.

An aneurysmal murmur (bruit) is usually loud and booming, systolic, and heard best over the aorta or base of the heart. It is often associated with an abnormal area of dullness and pulsation and with symptoms resulting from pressure on neighboring structures.

Pericardial friction sounds are superficial, rough, and creaking, to and fro in tempo, and not transmitted beyond the precordium. These sounds may be modified by the pressure of the stethoscope.

Murmur intensity and configuration: The intensity (loudness) of murmurs may be graded from I to VI as follows:

1. Grade I—faint, can be heard only with intense listening in a quiet environment.
2. Grade II—quiet but can be heard immediately.
3. Grade III—moderately loud.
4. Grade IV—quite loud; a thrill (like the purring of a cat) is usually felt over the heart.
5. Grade V—loud enough to be heard with the stethoscope not completely in contact with the chest wall.
6. Grade VI—loud enough to be heard

with the stethoscope close to but not actually touching the chest.

The configuration of sound intensity of a murmur may begin low and rise in intensity (crescendo) or be relatively loud and then decrease in intensity (decrescendo) or some combination of those features or may exhibit the same intensity from beginning to end.

PALPATION: This process not only determines position, force, extent, and rhythm of the apex beat but also detects any fremitus or thrill. A thrill is a vibratory sensation like that when the hand is placed on the back of a purring cat. Thrills at the base of the heart may result from valvular lesions, atheroma of the aorta, aneurysm, and roughened pericardial surfaces (as in pericarditis). A presystolic thrill at the apex is almost pathognomonic of mitral stenosis. In children especially, a precordial bulge, substernal thrust, or apical heave suggests cardiac enlargement.

PERCUSSION: This procedure determines the shape and extent of cardiac dullness. The normal area of superficial or absolute percussion dullness (the part uncovered by the lung) is detected by light percussion and extends from the fourth left costosternal junction to the apex beat; from the apex beat to the juncture of the xiphoid cartilage with the sternum; and thence up the left border of the sternum. The normal area of deep percussion dullness (the heart projected on the chest wall) is detected by firm percussion and extends from the third left costosternal articulation to the apex beat; from the apex beat to the juncture of the xiphoid cartilage with the sternum; and thence up the right border of sternum to the third rib. The lower level of cardiac dullness fuses with the liver dullness and can rarely be determined. The area of cardiac dullness is increased in hypertrophy and dilatation of the heart and in pericardial effusion; it is diminished in emphysema, pneumothorax, and pneumocardium.

abdominal h. A heart displaced into the abdominal cavity.

apex of the h. The tip of the left ventricle, opposite the base of the heart. The apex of the heart moves considerably with each heartbeat, and the point of maximal impulse (PMI) can be felt on the chest wall above the apex.

artificial h. A device that pumps the blood the heart would normally pump. It may be located inside or outside the body. SEE: *heart-lung machine*.

athlete's h. Enlargement of the heart as a result of prolonged physical training (e.g., the aerobic exercise of running). This is not known to be a predisposing factor for any form of heart disease.

beriberi h. Heart failure caused by

thiamine (vitamin B₁) deficiency (e.g., in patients with chronic alcoholism or malnutrition).

boatshaped h. A heart in which one ventricle is dilated and hypertrophied as a result of aortic regurgitation.

cervical h. A heart displaced into the neck.

conduction system of the h. Specialized myocytes in the heart that conduct the electrical impulses throughout the heart. In order of normal conduction, it consists of the sinoatrial node, the intra-atrial tracts, the atrioventricular node, the bundle of His, the right and left bundle branches, and the Purkinje fibers. **SEE: illus.**

dilation of the h. Enlargement of the

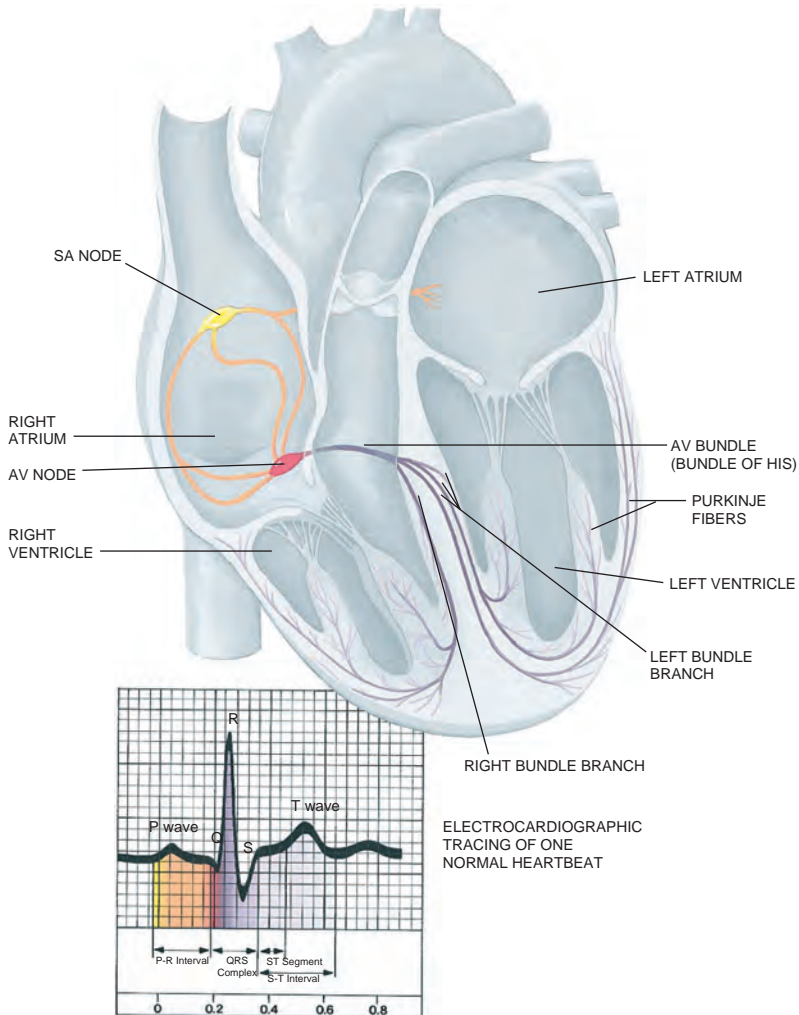
chambers of the heart, typically because of diseases of the heart valves or cardiomyopathy. It may result in congestive heart failure.

fatty degeneration of the h. Fatty infiltration of the heart.

fatty infiltration of the h. An abnormal accumulation of triglycerides in the myocardium, seen on biopsy specimens as clear vacuoles or droplets. **SYN: fatty degeneration of the heart.**

fibroid h. An obsolete term for scarring of the myocardium (e.g., after myocardial infarction).

hypertrophy of the h. A regional or generalized increase in myocardial mass. It may be caused by exercise, chronic hypertension, genetic illnesses,



CONDUCTION SYSTEM OF THE HEART

or valvular dysfunction. SYN: *cardiac hypertrophy*.

left h. The left atrium and ventricle. The left atrium receives oxygenated blood from the lungs; the left ventricle pumps this blood into the systemic circulation.

right h. The right atrium and ventricle. The right atrium receives deoxygenated blood from the body; the right ventricle pumps this blood to the lungs.

heart attack Myocardial infarction.

heartbeat The rhythmic contraction of the heart.

heart block Interference with the normal transmission of electrical impulses through the conducting system of the heart. The condition is seen on electrocardiogram as a prolongation of the P-R interval, a widening of the QRS complex, a delay in the appearance of an expected beat, the loss of synchrony of atrial and ventricular beats, or dropped (missing) beats.

ETIOLOGY: Heart block may be produced by temporary changes in vagal tone, drugs or toxins (e.g., some antiarrhythmics or antihypertensives), infections (e.g., infective endocarditis or Lyme disease), fibrosis or other degenerative diseases of the conducting system, ischemia or infarction, or other mechanisms.

atrioventricular h.b. SEE: *block, atrioventricular*.

bilateral bundle branch h.b. SEE: *block, atrioventricular*.

bundle branch h.b. Bundle branch block.

complete h.b. A condition in which there is a complete dissociation between atrial and ventricular systoles. Ventricles may beat from their own pacemakers at a rate of 30 to 40 beats per minute while atria beat independently. SEE: *illus.*

congenital h.b. Heart block present at birth, caused by faulty cardiac development in the womb, autoimmune diseases, or other causes.

fascicular h.b. A conduction defect in either or both of the subdivisions of the left bundle branch.

first-degree h.b. First-degree atrioventricular block.

interventricular h.b. Bundle branch block.

second-degree h.b. A form of atrioventricular block in which only some atrial impulses are conducted to the ventricles. Two variants exist: Mobitz I (Wenckebach) and Mobitz II. In Mobitz I, the P-R intervals become progressively longer until a QRS complex is dropped. Because of the dropped beats, the QRS complexes appear to be clustered ("grouped beating") on the electrocardiogram. In Mobitz II, P-R intervals have a constant length, but QRS complexes are dropped periodically, usually every second, third, or fourth beat.

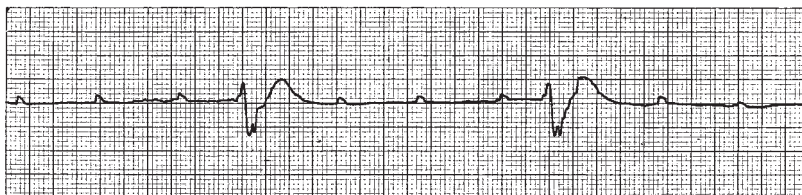
sinoatrial h.b. A partial or complete heart block characterized by interference in the passage of impulses from the sinoatrial node. SYN: *sinoatrial block*. SEE: *sick sinus syndrome*.

third-degree h.b. Complete heart block.

heartburn A burning sensation felt in the mid-epigastrium, behind the sternum, or in the throat caused by reflux of the acid contents of the stomach into the esophagus and usually related to reduced lower esophageal sphincter action, hiatal hernia, or increased abdominal pressure. SYN: *brash; pyrosis*. SEE: *gastroesophageal reflux disease*.

TREATMENT: Antacids, H₂-receptor antagonists (e.g., famotidine), and proton pump inhibitors (e.g., esomeprazole) are potentially effective remedies.

PATIENT CARE: Patients are helped to identify the time of occurrence in relation to food intake, if position changes exaggerate discomfort, precipitating factors (such as type and amount of food), and factors that aggravate the discomfort. For many people mints, chocolates, alcohol, late meals, and anti-inflammatory drugs all worsen the symptom. If antacids are used to treat heartburn, their ability to limit the effect of other oral medications is explained and a schedule established to prevent interactions. Sitting upright during and after eating and elevating the head of the bed 6 to 8 in for sleep often reduces the problem. Patients should be advised that further diagnostic studies may be required if heartburn



MCL

COMPLETE HEART BLOCK

persists despite therapy. Persistent, untreated heartburn can lead to esophageal damage and cancer.

heart disease Any pathological condition of the coronary arteries, heart valves, myocardium, or electrical conduction system of the heart.

ischemic h.d. A lack of oxygen supply to the heart altering cardiac function. The most common cause of myocardial ischemia is atherosclerosis of the coronary arteries. Depending upon several factors, including oxygen demand of the myocardium, degree of narrowing of the lumen of the arteries, and duration of the ischemia, the end result is temporary or permanent damage to the heart. SEE: *risk factors for h.d.; coronary artery; coronary artery disease.*

risk factors for ischemic h.d. Conditions that predispose people to ischemic heart disease (coronary artery disease). These may be divided into those that are not reversible (aging, male gender, menopause, genetic factors) and those that are potentially reversible (tobacco use, hypertension, hyperlipidemia, diabetes mellitus, left ventricular hypertrophy, obesity, and sedentary lifestyle).

heart failure Inability of the heart to circulate blood effectively enough to meet the body's metabolic needs. Heart failure may affect the left ventricle, right ventricle, or both. It may result from impaired ejection of blood from the heart during systole or from impaired relaxation of the heart during diastole. In the U.S., about 400,000 people are diagnosed with heart failure each year, and about 10% to 20% of affected persons die of the disease annually. Heart failure is one of the most common causes of hospitalization and rehospitalization in the U.S. The prognosis for patients with heart failure depends on the ejection fraction, that is, the proportion of blood in the ventricle that is propelled from the heart during each contraction. In healthy patients, the ejection fraction equals about 55% to 78%. SYN: *congestive heart failure.* SEE: *ejection fraction; pulmonary edema.*

DIAGNOSIS: Heart failure is easily diagnosed in a patient with typical symptoms and signs, esp. when these findings are accompanied by a chest x-ray that shows an enlarged heart and pulmonary edema. In patients with an uncertain presentation, elevated levels of B-type natriuretic peptide (BNP) may aid in the diagnosis.

SYMPTOMS: Difficulty breathing is the predominant symptom of heart failure. In patients with mild impairments of ejection fraction (e.g., 45% to 50%), breathing is normal at rest but labored after climbing a flight of stairs or lifting lightweight objects. Patients with advanced heart failure (e.g., ejection frac-

tion 20%) may have such difficulty breathing that getting out of bed or taking a few steps is very tiring.

Difficulty breathing while lying flat (orthopnea) or awakening at night with shortness of breath (paroxysmal nocturnal dyspnea) are also hallmarks of heart failure, as are exertional fatigue and lower extremity swelling (edema).

ETIOLOGY: Heart failure may result from myocardial infarction, myocardial ischemia, arrhythmias, heart valve lesions, congenital malformation of the heart or great vessels, constrictive pericarditis, cardiomyopathies, or conditions that affect the heart indirectly, including renal failure, fluid overload, thyrotoxicosis, severe anemia, and sepsis. Of the many causes of heart failure, ischemia and infarction are the most common.

TREATMENT: Diuretics (including furosemide and bumetanide), neurohormonal agents (e.g., angiotensin-converting enzyme inhibitors or angiotensin receptor blockers), beta blockers (e.g., carvedilol or bisoprolol) are often combined in the acute and chronic treatment of heart failure. Other drugs that have been shown to be effective are nitrates with hydralazine, and aldosterone (a potassium-sparing diuretic). All of these medications must be monitored closely for side effects. In patients with heart failure caused by valvular heart disease, valve replacement surgery may be effective. Cardiac transplantation can be used in advanced heart failure when donor organs are available.

PATIENT CARE: In the patient who presents for medical attention in heart failure, signs and symptoms are assessed, and vital signs, cardiac rhythm, and neurological status are closely monitored. A 12-lead ECG is examined for evidence of acute coronary syndromes and cardiac monitoring is instituted. Hemodynamic monitoring is initiated based on the severity of patient symptoms. The chest is auscultated for abnormal heart sounds and for lung crackles or gurgles. Daily weights are obtained to detect fluid retention, and the extremities are inspected for evidence of peripheral edema. If the patient is confined to a bed, the sacral area of the spine is assessed for edema. Fluid intake and output are monitored (esp. if the patient is receiving diuretics). Blood urea nitrogen and serum creatinine, potassium, sodium, chloride, and bicarbonate levels are monitored frequently. The complete blood count, liver function tests, thyroid function tests, and kidney functions should be evaluated to determine whether any comorbid conditions such as anemia, nephrotic syndrome, cirrhosis, or hyperthyroidism are contributing to or worsening heart failure.

Echocardiography helps measure ejection fraction, a key component in distinguishing between systolic heart failure and diastolic dysfunction. It is also used to estimate ventricular dysfunction, measure intracardiac pressures and wall motion, assess ventricular relaxation and compliance, and demonstrate abnormal chamber sizes, valve deformities, pericardial effusions, and ventricular thrombi. Multiple gated acquisition (MUGA) scans may be used as an alternative. Cardiac catheterization, recommended for patients with angina or large ischemic areas, can exclude pinpoint coronary artery disease as a cause of HF. Cardiopulmonary exercise testing, employing computers and gas analyzers to determine maximal oxygen consumption, evaluates ventricular performance during exercise. Acceptable total oxygen uptake is 20 ml/kg/m or higher. A result of less than 12 indicates severe HF. Continuous ECG monitoring is provided during acute and advanced disease stages to identify and manage dysrhythmias promptly. The patient's blood pressure and pulse are assessed while the patient is supine, sitting, and standing to detect orthostasis, esp. during diuretic therapy. The legs are assessed for symmetrical pitting edema, a common finding. The patient is placed in high Fowler's position and on prescribed bedrest, and high concentration oxygen is administered as prescribed to ease the patient's breathing. Prescribed medications, such as carvedilol, candesartan, digoxin, furosemide, lisinopril, spironolactone, and potassium, are administered and evaluated for desired responses and any adverse reactions. All patient activities are organized to maximize rest periods. To prevent deep venous thrombosis due to vascular congestion, the caregiver assists with range-of-motion exercises and applies antiembolism stockings or uses heparins or warfarin. Any deterioration in the patient's condition is documented and reported immediately. To help curb fluid overload, the patient should avoid foods high in sodium content, such as canned and commercially prepared foods and dairy products, restricting dietary sodium to 2 to 3 grams a day and fluid intake to 2 liters a day. The importance of regular medical checkups is emphasized, and the patient is advised to notify the health care practitioner if the pulse rate is unusually irregular, falls below 60, or increases above 120, or if the patient experiences palpitations, dizziness, blurred vision, shortness of breath, persistent dry cough, increased fatigue, paroxysmal nocturnal dyspnea, swollen ankles, decreased urine output, or a weight gain of 3 to 5 lb (1.4 to 2.3 kg) in 1 week. Patients and their fami-

lies and other care givers must understand the action of each of the medications prescribed, along with their possible adverse reactions and actions to be taken if a dose is missed. The importance of renewing prescriptions in a timely manner so that doses are available when needed should be stressed.

Patient activity as tolerated is encouraged with tasks divided into small segments to avoid shortness of breath.

Annual influenza vaccines and a pneumococcal vaccine (repeated every 5 years) help patients minimize the risk of systemic infections. Smokers are encouraged to quit. Frequent rehospitalizations are the rule rather than the exception in heart failure. Effective treatment may depend on a multidisciplinary approach that includes active participation by the patient, the primary care provider and nurse educator, case managers, pharmacists, dietitians, and social workers, among others. Evidenced-based clinical pathways for managing heart failure are available from the American Heart Association and other agencies.

backward h.f. Heart failure in which blood congests the lungs, and often the right ventricle, liver, and lower extremities.

congestive h.f. ABBR: CHF. Heart failure. SEE: *Nursing Diagnoses Appendix*.

forward h.f. Heart failure in which forward flow of blood to the tissues is inadequate because the left ventricle is unable to pump blood with enough force to the systemic circulation (e.g., as a result of cardiomyopathy, muscular stunning, or infarction) or because outflow from the left ventricle is obstructed (e.g., in aortic stenosis).

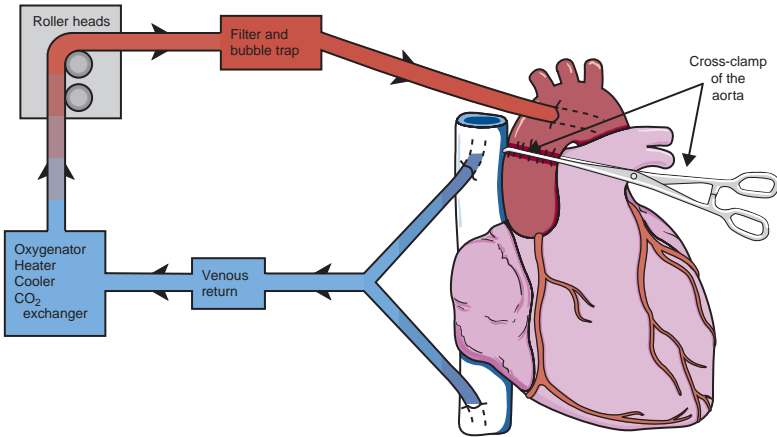
high output h.f. Heart failure that occurs in spite of high cardiac output, for example, in severe anemia, thyrotoxicosis, arteriovenous fistulae, or other diseases.

left ventricular h.f. Failure of the heart to maintain left ventricular output.

low output h.f. Heart failure.

right ventricular h.f. Failure of the heart to maintain right ventricular output.

heart-lung machine A device that maintains the functions of the heart and lungs while either or both are unable to continue to function adequately. The device pumps, oxygenates, and removes carbon dioxide from the blood. In animal studies and in open heart surgery, these machines take over the function of the heart and lungs while these organs are being treated or possibly replaced. The function of the heart-lung machine is also called heart-lung bypass. SEE: *illus.*



HEART-LUNG MACHINE

heart rate, target zone A heart rate that is 50% to 80% of an individual's maximum heart rate. Persons who exercise to attain or maintain physical fitness should attempt to exercise vigorously enough to produce a heart rate that is both safe and effective. When an exercise program is begun, the heart rate should be at the lower end of the 50% to 80% range for the first few months. Then it should be gradually built up to 80%.

heart rate recovery ABBR: HRR. The decrease in heart rate that occurs one minute after maximal exercise. Normal people decrease their heart rates by at least 12 beats per minute (bpm) a minute after stopping maximal exercise. People whose heart rate does not decrease by 12 bpm have an increased risk of cardiac death.

heart size The dimensions of the cardiac image as seen on radiographs, echocardiographs, computed tomography, angiography, or magnetic resonance imaging of the thorax.

heart valve, prosthetic SEE: *valve, prosthetic heart*.

heat [AS. *haetu*] **1.** The condition or sensation of being hot; opposite of cold. **2.** Higher than normal body temperature; generalized fever or localized warmth caused by an infection. Calor (fever), dolor (pain), rubor (redness), and tumor (swelling) are the four classic signs of inflammation. SEE: *febrile convulsion; fever*. **3.** Estrus. **4.** Energy that increases the temperature of surrounding tissues or objects by conduction, convection, or radiation. SEE: *table*.

acclimatization to h. The adjustment of an organism to heat in the environment. Exposure to high environmental temperature requires a period of adjustment in order for the body to function

efficiently. The amount of time required depends on the temperature, humidity, and duration of daily exposure. Significant physiological adjustments occur in 5 days and are completed within 2 weeks to a month.

application of h. Placing an object, warmed above body temperature, on a body part to increase blood flow or provide relief of pain.

! Heat should not be applied to extremities with reduced blood supply, as could be the case in most forms of arteriosclerosis or advanced diabetes.

Dry or moist heat sources may be used. Dry applications include hot water bottles, radiant heat, electric pads, and diathermy. Moist heat is considered more penetrating than dry heat, but

Elimination of Body Heat

Mode of Elimination	Percentage of Heat Lost
Radiation	55%*
Convection and conduction	15%*
Evaporation through skin	25%*
Warming inspired air	3%*
Warming ingested food and water, and loss through feces and urine	2%*

* Figures are approximate and vary with physiological activity of the body, type of clothing worn, relative humidity, and degree of acclimatization to a particular environment.

this is due more to the fact that water-soaked materials lose heat slower than dry ones. The application should be approx. 120°F (48.9°C). Compresses may be kept warm by keeping hot water bottles at the proper temperature next to them. Do not use electric heating devices next to moist dressings. Devices that force hot water at a selected temperature through soft flexible tubing surrounding a part are available. These may be used to heat wet or dry compresses.

conductive h. Heat transferred by conduction from a heat source to a colder object when the two materials are in contact with each other.

convective h. The flow of heat to an object or part of the body by passage of heated particles, gas, or liquid from the heat source to the colder body.

diathermy h. Diathermy.

dry h. Heat that has no moisture. It may take the form of a hot dry pack, hot water bottle, electric light bath, heliotherapy, hot bricks, resistance coil, electric pad or blanket, hot air bath, or therapeutic lamp.

h. of evaporation The heat absorbed per unit of mass when a substance is converted from a liquid to a gas, such as the change of water to steam when it is heated sufficiently. For water, the amount of heat required to transform water into steam is 540 cal/g of water.

initial h. Muscular heat produced during contraction when tension is increasing, during maintenance of tension, and during relaxation when tension is diminishing.

latent h. SEE: *latent heat*.

luminous h. Heat derived from light. This form may be tolerated better than other forms of radiation. Light may be converted into heat. Short infrared rays penetrate subcutaneous tissues to a greater extent than long invisible rays.

mechanical equivalent of h. The value of heat units in terms of work units. One Calorie (kilocalorie) is equal to 4.1855×10^4 joules.



moist h. Heat that has moisture content. It may be applied as hot bath pack, hot wet pack, hot foot bath, or vapor bath. The patient should be observed for dizziness, headache, or weakness.

molecular h. The result of multiplying a substance's molecular weight by its specific heat.

prickly h. SEE: *prickly heat*.

radiant h. The heat given off from a heated body passing through the air in form of waves.

specific h. The heat needed to raise the temperature of 1 g of a substance 1°C.

heat and moisture exchanger A filter that retains some warmth and moisture from expired air and returns it to the

intubated or laryngectomized patient during the following inspiration. The device prevents the patient from inhaling excessively cool, dry air that may damage the lower airway.

heated in aqueous solution The technically accurate synonym for *pasteurization*.

heat escape lessening position ABBR: HELP. A body posture that decreases the rate of heat loss when a person is immersed in water. It is an important component of aquatic safety. The HELP position safeguards the head, neck, chest, and groin from rapid heat loss, delaying the onset of hypothermia. The position is assumed by floating on the back with the head and neck above the water line, the arms crossed on the chest, and the legs crossed with the knees drawn up toward the perineum. The body is sustained in a stable floating position in the water by a personal flotation device.

heat gun A device used in splint fabrication that produces heated air to render thermoplastic splinting materials malleable for fitting.

heatstroke A condition caused by failure of the body's heat-regulating mechanisms during or after exposure to heat and high relative humidity (normally air temperatures of greater than 79°F (26.1°C) and relative humidity greater than 70%). In the U.S., 250 people die of heatstroke each year. In young, healthy people it most often follows strenuous physical activity; in inactive individuals or the elderly it commonly is related to cardiovascular disease or use of drugs that influence temperature regulation. SYN: *sunstroke*. SEE: *Nursing Diagnoses Appendix*.

SYMPTOMS: Heatstroke is marked by high body temperature, usually above 105°F (40.6°C); headache; numbness and tingling; confusion preceding sudden onset of seizures, delirium, or coma; tachycardia; rapid respiratory rate; and increased blood pressure followed by hypotension. Patients with an insidious (non-activity-related) onset of heatstroke may have hot, dry, red skin; the skin of active people may still be damp from perspiration, but sweating will cease as the condition worsens.

TREATMENT: Effective, immediate treatment in an inpatient setting to lower the body's core temperature can save the patient's life. Airway, breathing, and circulation should be monitored and maintained. The patient's clothes should be removed immediately and the patient actively cooled with ice packs on arterial pressure points and a hypothermia blanket. For several days the patient should be observed for signs of fluid and electrolyte imbalance and renal failure.

PATIENT CARE: The patient suspected of heatstroke is assessed for airway patency, breathing adequacy, circulation, mental status using AVPU, and other associated signs and symptoms such as: shock, weakness, dizziness, nausea, vomiting, blurred vision, infection, and skin findings. Vital signs are obtained and, using a rectal or core probe, the caregiver monitors the patient's temperature; initially it may be extremely elevated. In the hospital setting, laboratory studies, including blood chemistry, arterial blood gases, urinalysis, complete blood count, and appropriate cultures are obtained to aid in treatment management. Cooling procedures are promptly instituted in the field and continued in the hospital. Intravenous therapy is begun to replace fluids in the dehydrated patient and high-concentration oxygen is administered. Fluid intake and urinary output are monitored. A nasogastric tube is inserted to prevent aspiration, and an indwelling urinary catheter may also be required. Seizure activity is controlled or prevented with diazepam. Dobutamine is used to correct cardiogenic shock. Invasive hemodynamic monitoring, endotracheal intubation and ventilation, or emergency dialysis may be needed in severe instances.

PREVENTION: Heat-related illnesses (heat cramps, heat exhaustion, heatstroke) are preventable through education of the public. Athletes, soldiers, and laborers are taught to recognize the signs and symptoms of heat problems and the importance of prevention (e.g., by avoiding prolonged exposure to heat, and by increasing their electrolyte and water intake) and prompt treatment of symptoms. High-risk patients (those who are elderly, obese, diabetic, or alcoholic, those with cardiac disease and other chronic debilitating illnesses, and those taking phenothiazines or anticholinergics) are advised to take the following precautions: wear loose-fitting, lightweight clothing; take frequent rest breaks, esp. during strenuous activities; ingest adequate amounts of fluids, including electrolyte drinks; avoid hot, humid environments if possible; use proper room cooling (fans and open windows) or air conditioner and seek air-conditioned areas for relief. As necessary, the patient is referred to a social service agency for assistance with home cooling. Patients who have experienced heatstroke should be warned that they may experience hypersensitivity to high temperatures for several months.

heat unit ABBR: HU. The amount of heat created at the anode during the production of x-ray photons. It is the product of the milliamperage times the

seconds of exposure times the kilovoltage peak.

heaves (hēvs) Vomiting.

heavy chain disease ABBR: HCD. Any one of several abnormalities of immunoglobulins in which excessive quantities of alpha, gamma, delta, epsilon, or mu chains are produced. The immunoglobulins formed are incomplete, causing, in some cases, distinct clinical signs and symptoms including weakness, recurrent fever, susceptibility to bacterial infections, lymphadenopathy, hepatosplenomegaly, nephrotic syndrome and renal failure, anemia, leukopenia, thrombocytopenia, and eosinophilia. The disease may be diagnosed with immunoelectrophoresis or biopsy of affected organs.

alpha h.c.d. A form of heavy chain disease that is related to Mediterranean lymphoma and celiac sprue. The principal organ involved is the small intestine, although respiratory tissues are occasionally affected. The symptoms and signs may include malabsorption, diarrhea, abdominal pains, and weight loss. In some patients there is peripheral adenopathy and splenomegaly with no signs of intestinal or respiratory tract changes. Diagnosis is made through tests for the abnormal immunoglobulins. Chemotherapy may produce long-term remissions. SYN: *Seligmann's disease*.

gamma h.c.d. A rare disease whose hallmark is the production of abnormal immunoglobulins (made of gamma heavy chains) by malignant B-lymphocytes. Clinical findings may include lymphadenopathy, hepatosplenomegaly, arthritis, edema of the uvula, and infiltration of the skin and thyroid gland. Treatment includes therapy for the underlying disorders, including the particular type of lymphoma present. SEE: *heavy chain disease*.

mu h.c.d. A heavy chain disease with presenting symptoms of a lymphoproliferative malignancy, especially chronic lymphocytic leukemia. Treatment focuses on the underlying disorders.

heavy metals Metals such as mercury, lead, chromium, cadmium, and arsenic that have known toxic effects on internal organs, such as the kidneys, brain, bone, or retina. SEE: *Poisons and Poisoning Appendix*.

Heberden's nodes Hard nodules or enlargements of the distal interphalangeal joints of the fingers; seen in osteoarthritis.

hebetude (hēb'ē-tūd) [L. *hebet*, dull] Dullness or lethargy.

hecatomeromic, hecatomeromic (hēk'ä-tēr'ō-mēr'ik, hēk'ä-tō-mēr'ik) [Gk. *hecateros*, each of two, + *meros*, part] Having two processes on a spinal neu-

ron, one supplying each side of the spinal cord.

hecto- [Gr. *hekatón*, hundred] In the metric system, a prefix indicating 100 times (10^2) the unit named. Thus, hectoliter (10^2 liters) is 100 L.

hectogram (hĕk'tō-grām") [l' + *gramma*, small weight] One hundred grams, or 3.527 avoirdupois ounces.

hectoliter (hĕk'tō-lĕ'tĕr) [l' + *litra*, a pound] One hundred liters.

hectometer (hĕk-tōm'ĕ-tĕr) [l' + *metron*, measure] One hundred meters.

HEDIS *Health Plan Employer Data and Information Set.*

hedonic (hĕ-dŏn'ĭk) [Gr. *hedonikos*, pleasurable] Pertaining to pleasure and its perception.

hedonism (hĕd'ŏn-ĭzm) [Gr. *hedone*, pleasure, + *-ismos*, condition] **1.** The pursuit of pleasure or the gratification of the senses as a primary goal of ethical living. **2.** Self-indulgence.

heel [AS. *huela*, heel] Rounded posterior portion of the foot under and behind the ankle. SYN: *calc.*

h. puncture A method for obtaining a blood sample from a newborn or premature infant.



The puncture should be made in the lateral or medial area of the plantar surface of the heel, while avoiding the posterior curvature of the heel. The puncture should go no deeper than 2.4 mm. Previous puncture sites should not be used.

Thomas h. A corrective shoe in which the heel is approx. 12 mm longer and 4 to 6 mm higher on the medial edge. This produces varus of the foot and prevents depression of the head of the talus.

HEENT *head, eyes, ears, nose, throat.*

Heerfordt's disease (hār'forts) [C. F. Heerfordt, Danish ophthalmologist, 1871–1953] Uveoparotid fever, a form of sarcoidosis, marked by enlargement of the parotid gland, inflammation of the uveal tract, and prolonged low-grade fever.

Hegar's sign (hā'gärz) [Alfred Hegar, Ger. gynecologist, 1830–1914] Softening of the lower uterine segment; a probable sign of pregnancy that may be present during the second and third months of gestation. On bimanual examination, the lower part of the uterus is easily compressed between the fingers placed in the vagina and those of the other hand over the pelvic area. This is due to the overall softening of the uterus related to increasing vascularity and edema and because the fetus does not fill the uterine cavity at this point, so the space is empty and compressible.

Heidenhain's demilunes (hĭ'dĕn-hĭnz)

[Rudolph Peter Heinrich Heidenhain, Ger. physiologist, 1834–1897] Crescent-shaped groups of serous cells at the base, or along the sides, of the mucous alveoli of the salivary glands, esp. sublingual and submandibular. SYN: *Gian-nuzzi's cells.*

height (hit) [AS. *hiehthu*] The vertical distance from the bottom to the top of an organ or structure.

h. of contour A line encircling a structure, designating its greatest diameter in a specified plane. In dentistry, the term refers to the largest circumferential measurement around a tooth. The height of contour must be maintained during restoration of a tooth to maintain the normal flow of food over the tooth.

fundal h. The distance (in centimeters) from the portion of the uterus above the insertion of the fallopian tubes to the symphysis pubis. *Antepartum:* When compared against gestational norms, this measurement is helpful in confirming the estimated number of weeks elapsed since conception and in monitoring intrauterine fetal growth. The fundus is first palpable at the level of the symphysis pubis during gestational week 12. *Postpartum:* Maintain as presented.

Heimlich maneuver (hĭm'lik) [H. J. Heimlich, U.S. physician, b. 1920] A technique for removing a foreign body, such as a food bolus, from the trachea or pharynx, where it is preventing air flow to and from the lungs. Also called *abdominal thrust maneuver.*

For a conscious victim, the maneuver consists of the rescuer applying subdiaphragmatic pressure by: (1) wrapping his or her arms around the victim's waist from behind; (2) making a fist with one hand and placing it against the patient's abdomen between the navel and the rib cage; and (3) clapping the fist with the free hand and pressing in with a quick forceful upward thrust. This procedure should be repeated several times if necessary. If one is alone and experiences airway obstruction caused by a foreign body, this technique may be self-applied.

For the unconscious victim starting CPR is now the recommended procedure since chest compressions are often effective and for the simplicity of training the public.

When the patient is a child and he or she can speak, breathe, or cough, the maneuver is unnecessary. If the maneuver is done it should be applied as gently as possible but still forcibly enough to dislodge the obstruction. The abdominal viscera of children are more easily damaged than those of adults.

This treatment is quite effective in dislodging the obstruction by forcing air

against the mass much as pressure from a carbonated beverage forcibly removes a cork or cap from a bottle. The average air flow produced is 225 L/min. **SEE: illness; choking.**

Heiner's syndrome (hīn'ēr) [Douglas Heiner, U.S. physician] Allergic intolerance to cow's milk. This disorder is primarily identified in young children with recurrent episodes of rhinitis, earache, and bleeding into the lungs, usually associated with stunted growth. Affected children do well with a diet that minimizes exposure to cow's milk or its derivatives. Corticosteroids are sometimes used during acute episodes to reduce inflammation in the lungs.

Heinz, Robert (hīns, hīnz) German pathologist, 1865–1924.

H. bodies Granules in red blood cells usually attached to the red blood cell membrane, seen in blood smears of persons with hemoglobinopathies, thalassemias, and after splenectomy. The bodies are best seen when the blood is stained with a special stain.

H. body anemia Hemolytic anemia associated with the finding of Heinz bodies in red blood cells.

Heister, spiral valve of (hī'stēr) [Lorenz Heister, Ger. anatomist, 1683–1758] A spiral fold of the mucous membrane lining the cystic duct of the gallbladder. It keeps the lumen open.

HeLa cells (hē'lá) **SEE: cell, HeLa.**

helicoid (hēl'koyd) [Gr. *helkos*, ulcer, + *eidōs*, form, shape] Resembling an ulcer.

helcosis (hēl-kō'sīs) [l' + *osis*, condition] Ulceration.

helical (hēl'ī-kāl) In the shape of a helix.
helicase (hēl'ī-kās") A donut-shaped enzyme that uncoils double-stranded DNA, allowing it to replicate. Syndromes in humans in which helicase is deficient predispose these people to premature aging or cancer.

helicine (hēl'ī-sīn) [Gr. *helix*, coil] 1. Spiral. 2. Pert. to a helix or coil.

h. arteries Tortuous arteries in the cavernous tissue of the penis, clitoris, and uterus.

Helicobacter pylori (hēl'ī-kō-bāk-tēr) [Gr. *helix*, a twist + *NL bacter*, from *bacterium*] ABBR: *H. pylori*. A motile, spiral, gram-negative bacterium that causes 90% of peptic ulcers, 80% of gastric ulcers, and, in some patients, gastric cancer or mucosal-associated lymphoid-type lymphomas. Treatment consists of the suppression of gastric acidity in addition to combined antibiotics.

DIAGNOSIS: Noninvasive diagnostic tests for *H. pylori* include stool antigen tests, urea breath tests, and serum antibody levels. Invasive tests include endoscopy, gastric biopsy, and biopsy with bacterial culture for *H. pylori*.

helicoid (hēl'ī-koyd) [l' + *eidōs*, form, shape] Resembling a helix or spiral.

helicopodia (hēl'ī-kō-pō'dē-ā) [l' + *pous*, foot] A peculiar movement in which the foot, when brought forward, drags and describes a partial arc, resulting in a gait such as that seen in spastic hemiplegia.

helicotrema (hēl'ī-kō-trē'mā) [l' + *trema*, a hole] The opening at the tip of the cochlear canal where the scala tympani and scala vestibuli unite.

heliophobia (hē'lē-ō-fō'bē-ā) [Gr. *helios*, sun, + *phobos*, fear] An abnormal fear of the sun's rays, esp. by one who has suffered sunstroke.

heliotaxis (hē'lē-ō-tāk'sīs) [l' + *taxis*, arrangement] A reaction in plants that causes them to respond negatively or positively to sunlight.

negative h. A turning away from the sun.

positive h. A turning toward the sun.

heliotherapy (hē'lē-ō-thēr'ā-pē) [l' + *therapeia*, treatment] Exposure to sunlight for therapeutic purposes.

heliotropism (hē'lē-ōt'rō-pīzəm) [l' + *trepein*, to turn, + *-ismos*, condition] The tendency of living organisms to turn or grow toward the sun.

heliox (hē'lē-ōks) A therapeutic gas mixture of helium and oxygen.

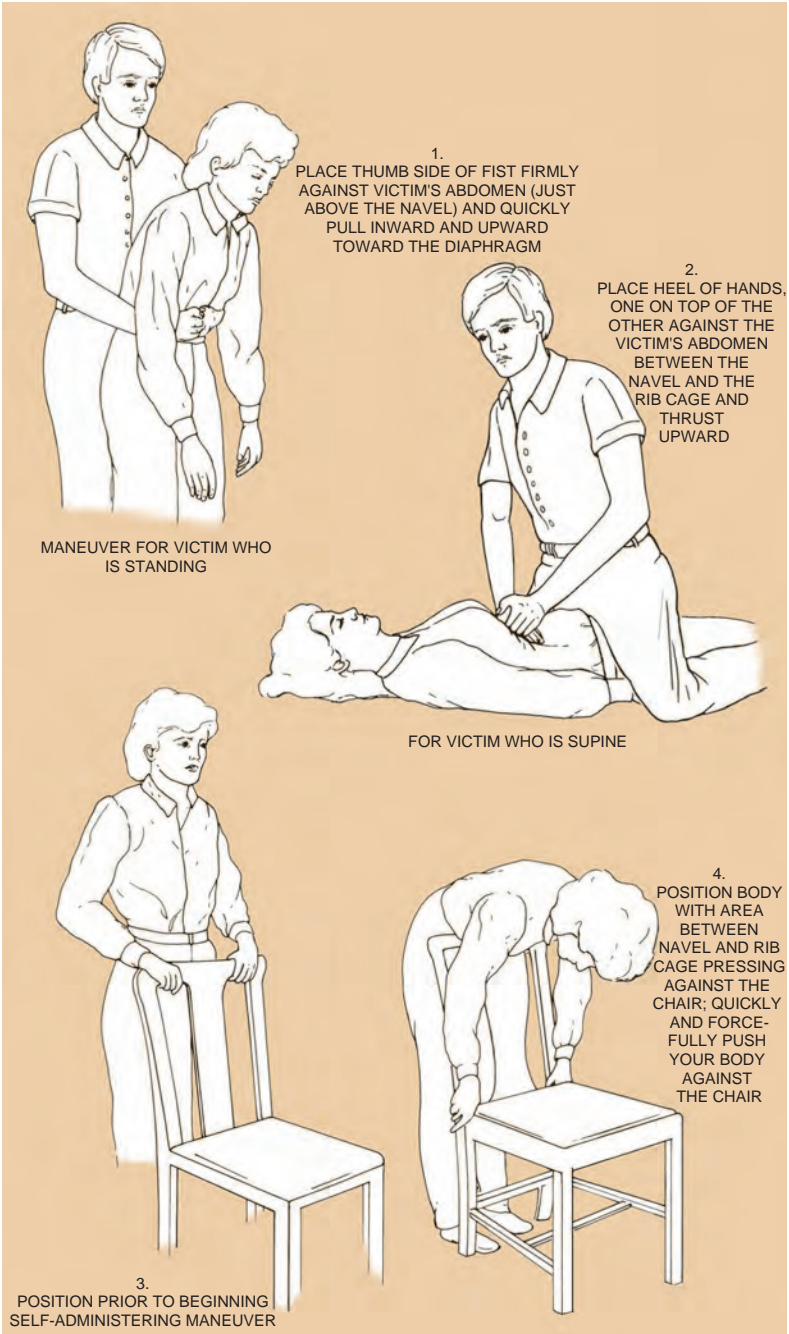
helipad (hēl'ī-pād") [Fr. *heli(copter)* + (*landing pad*)] A designated landing site for helicopters. Helipads are used at hospitals for the emergent transport of critically ill and injured patients.

helium (hē'lē-ūm) [Gr. *helios*, sun] **SYMB:** He. A gaseous element; atomic weight 4.0026; atomic number 2. A liter of the gas at sea level pressure and 0°C weighs 0.1785 g. The second lightest element known, it is given off by radium and other radioactive elements in the form of charged helium ions known as alpha rays. Because of its low density, it is mixed with air or oxygen and used in the treatment of various respiratory disorders. Because of its low solubility, it is mixed with air supplied to workers laboring under high atmospheric pressure, as in caissons. When so used, it reduces the time required to adjust to increasing or decreasing air pressure and reduces the danger of bends.

helium 3 ABBR: ³He. An isotope of helium whose nucleus contains two protons and a single neutron. Helium 3 is a stable gas. The isotope is polarizable, making it suitable as a gaseous contrast agent for use in magnetic resonance imaging.

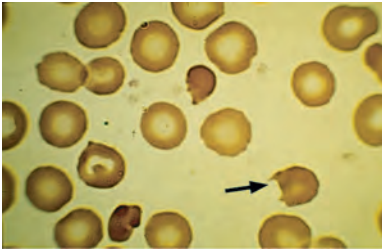
helix (hē'liks) [Gr., coil] 1. A coil or spiral. 2. The margin of the external ear.

Hellerwork (hēl-ēr-wōrk) [Joseph Heller, U.S. engineer, b. 1940] A therapeutic approach emphasizing deep massage, movement exercises, and verbal dialogue to encourage relaxation, re-



HEIMLICH MANEUVER

(FOR REMOVAL OF A FOREIGN BODY BLOCKING THE AIRWAY)



HELMET CELL (ARROW)

(Orig. mag. $\times 640$)

lease tight connective tissue, and promote general health.

Hellin's law (hĕl'ins) [Dyonizy Hellin, Polish pathologist, 1867–1935] A law stating that twins occur once in 80 pregnancies, triplets once in 6400 (80^2) pregnancies, quadruplets once in 512,000 (80^3) pregnancies.

HELLP An acronym derived from the first letters of the terms that describe the following laboratory findings: Hemolysis, Elevated Liver enzymes, and Low Platelet count.

HELLP syndrome A laboratory diagnosis of a combination of events signaling a variation of severe pre-eclampsia marked by hemolysis anemia, elevated liver enzymes, and low platelet count. This potentially life-threatening condition usually arises in the last trimester of pregnancy. Initially, affected patients may complain of nausea, vomiting, epigastric pain, headache, and vision problems. Complications may include acute

renal failure, disseminated intravascular coagulation, liver failure, respiratory failure, or multiple organ system failure. SEE: *pre-eclampsia*.

TREATMENT: Treatment includes management of coagulation disorders and hypertension, and preventing seizures. Corticosteroids may be given to increase maturity of the fetal lung. If the health of the mother or the fetus is endangered early delivery is necessary.

helmet cell A schistocyte or fragmented blood cell, seen in hemolytic anemias. SEE: *illus.*

helminth (hĕl'minth) [Gr. *helmins*, worm] **1.** A wormlike animal. **2.** Any animal, either free-living or parasitic, belonging to the phyla Platyhelminthes (flatworms), Acanthocephala (spiny-headed worms), Nemathelminthes (threadworms or roundworms), or Annelida (segmented worms). SEE: *illus.*

helminthagogue (hĕl-minth'ă-gōg) [" + *agogos*, leading] Anthelmintic.

helminthemesis (hĕl-mĭn-thĕm'ĕ-sĭs) [" + *emesis*, vomiting] The vomiting of intestinal worms.

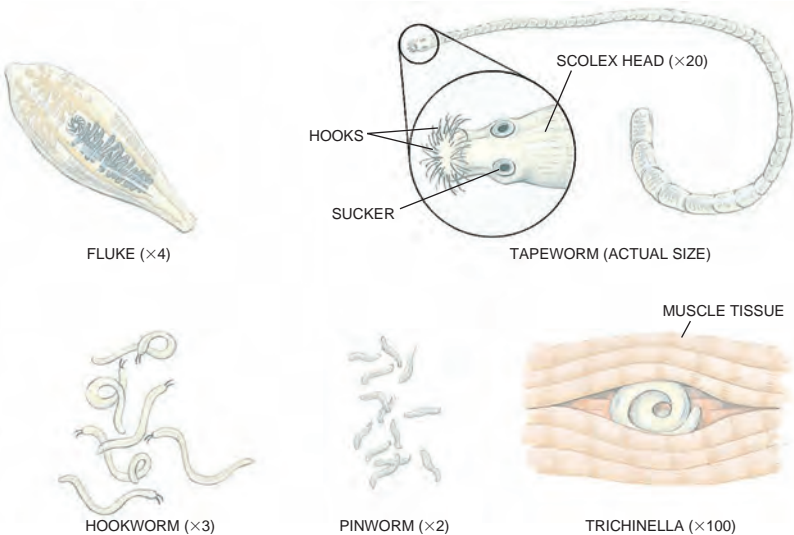
helminthiasis (hĕl-mĭn-thĭ'ă-sĭs) [" + *iasis*, condition] Infestation with worms.

helminthic (hĕl-mĭn'thĭk) **1.** Pert. to worms. **2.** Pert. to that which expels worms. SYN: *anthelmintic*; *vermifugal*.

helminthicide (hĕl-mĭn'thĭ-sĭd) [" + *L. cidus*, kill] Anthelmintic.

helminthoid (hĕl-mĭn'thoyd) [" + *eidōs*, form, shape] Wormlike or resembling a worm.

helminthology (hĕl'mĭn-thōl'ō-jĕ) [" + *logos*, word, reason] The study of worms.



REPRESENTATIVE HELMINTHS

helminthoma (hěl'mín-thō'mă) [" + *oma*, tumor] A tumor caused by parasitic worms.

heloderma (hē'lō-dēr'mă) Fibromas that form on the extensor surfaces of the proximal interphalangeal joints of the hands.

heloma (hē-lō'mă) [Gr. *helos*, nail, + *oma*, tumor] Clavus.

helotomy (hē-lōt'ō-mē) [" + *tome*, incision] The surgical treatment of corns.

HELP *Heat escape lessening position.*

helper T cells SEE: *cell, helper T.*

helplessness A feeling of dependence, powerlessness, defenselessness, or depression, e.g., in the face of crisis or overwhelming circumstances. SEE: *hopelessness; powerlessness.*

learned h. A passive fatalistic behavior that one cannot influence one's environment, or alter one's existence. This condition may sometimes arise in persons who have chronic illnesses, depression, phobias, or loss of functional independence.

hem-, hema-, hemo- [Gr. *haima*, blood] Combining forms meaning *blood*. SEE: *hemat-*.

hemacytotoon, hematocytotoon, hematozoon, hemocytotoon, hemozoon (hē'mă-sī'tă-zō'ōn, hē'mă-tō-sī'tă-zō'ōn, hē'mă-tă-zō'ōn, hē'mă-sī'tă-zō'ōn, hē'mă-zō'ōn) [" + *zoon*, animal] A blood parasite (e.g., *Babesia microti* or *Plasmodium falciparum*) infesting red blood cells.

hemad (hē'măd) [Gr. *haima*, blood, + *L. ad*, toward] Hemal (2).

hemadsorption (hēm'ăd-sorp'shūn) The adherence of red blood cells to other cells or surfaces.

hemagglutination, hemoagglutination (hēm'ă-gloo-tī-nă'shūn) [" + *L. agglutinare*, to paste to] The clumping of red blood cells. SEE: *agglutination*.

h. inhibition A laboratory test in which the lack of agglutination (clumping) of red blood cells (RBCs) indicates that antibodies are present in the patient's blood. Certain viruses (e.g., mumps, measles, rubella, adenovirus) bind with RBCs and cause clumping. However, antibodies, if present, quickly bind with the virus, preventing viral binding to RBCs and the resulting agglutination. SEE: *agglutination*.

hemagglutinin (hēm'ă-gloo-tī-nīn) An antibody that induces clumping of red blood cells. SEE: *agglutination; agglutinin*.

cold h. Cold agglutinin.

warm h. Warm agglutinin.

hemagogue (hē'mă-, hēm'ă-gōg) [" + *agogos*, leading] An agent that promotes the flow of blood, esp. menstrual flow. SEE: *emmenagogue*.

hemal (hē'măl) 1. Pert. to the blood or blood vessels. 2. Pert. to the ventral side of the body, in which the heart is lo-

cated, as opposed to the neural or dorsal side. SYN: *Hemad; hemic*.

hemangi-, hemangio- Combining forms meaning *blood vessel*.

hemangiectasis (hēm'măn-, hēm'ăn-jē-ĕk'tă-sis) [" + *angeion*, vessel, + *ektasis*, dilatation] Dilatation of the blood vessels.

hemangioblast (hē-măn'jē-ō-blăst) [" + " + *blastos*, germ] A mesodermal cell that can form either vascular endothelial cells or hemocytoblasts.

hemangioblastoma (hē-măn'jē-ō-blăst-ō'mă) [" + " + *oma*, tumor] A hemangioma of the brain, usually in the cerebellum. SYN: *angioblastoma*.

hemangioendothelioblastoma (hē-măn'jē-ō-ĕn'dō-thē-lē-ō'mă) [" + " + *endon*, within, + *thelē*, nipple, + *blastos*, germ, + *oma*, tumor] A neoplasm of the epithelial cells that line the blood vessels.

hemangioendothelioma (hē'măn'jē-ō-ĕn'dō-thē-lē-ō'mă) [" + " + " + " + *oma*, tumor] A tumor of the endothelium of the minute capillary vessels. It varies in size and is commonly seen in the capillary net of the meninges.

hemangiofibroma (hē-măn'jē-ō-fī-brō'mă) [" + " + *L. fibra*, fiber, + *Gr. oma*, tumor] A fibrous hemangioma.

hemangioma (hē-măn'jē-ō'mă) *pl. hemangiomas pl. -mata* [" + *angeion*, vessel, + *oma*, tumor] A benign tumor composed of dilated blood vessels and often encapsulated within a fibrous shell. Also called "cavernous hemangioma." It may be found on the skin, or in an internal organ. SEE: *illust.*

strawberry h. A dull red benign lesion, usually present at birth or appearing within 2 to 3 months thereafter. This type of birthmark is usually found on the face or neck and is well demarcated from the surrounding skin. It grows rapidly and then regresses. It is caused by a proliferation of immature capillary vessels in active stroma. SYN: *strawberry nevus*.

TREATMENT: If removal is necessary, plastic surgical excision using the carbon dioxide, argon, or potassium titanium oxide phosphate laser is effective in ablating this lesion.



The use of laser treatment necessitates observance of all laser safety precautions.

hemangiomas (hē-măn'jē-ō-mă-tō'sis) [" + " + " + *osis*, condition] Multiple angiomata of the blood vessels.

hemangiopericytoma (hē-măn'jē-ō-pēr'ĕ-sī-tō'mă) A tumor arising in the capillaries, composed of pericytes.

hemangiosarcoma (hē-măn'jē-ō-sărk-ō'mă) [" + " + *sarkos*, flesh, +



HEMANGIOMAS IN A NEONATE



CAVERNOUS HEMANGIOMA

oma, tumor] A malignant neoplasm originating from the blood vessels. SYN: *angiosarcoma*.

hemapheresis (hēm"ā-fē-rē'sis) SEE: *plasmapheresis*.

hemarthros, hemarthrosis (hēm-ār'thrōs, hēm-ār-thrō'sis) [" + *arthron*, joint] A bloody effusion within a joint.

hemat-, hemato- [Gr. *haimatos*, blood] Combining forms meaning *blood*. SEE: *hem-*.

hematopostema (hēm"āt-ā-pōs-tē'mā) [Gr. *haimatos*, blood, + *apostema*, abscess] An abscess that contains blood.

hematemesis (hēm"ā-tēm'ē-sis) [" + "] The vomiting of blood. SEE: *hemoptysis* for table; *hemorrhage*.

ETIOLOGY: The lesions most likely to cause vomiting of blood are duodenal or gastric ulcers, esophageal varices, esophagitis, gastritis, duodenitis, Mallory-Weiss tears in the esophagus, arteriovenous malformations, or, rarely, fistulae between the aorta and the upper gastrointestinal tract. Typically, the vomiting of blood implies that the responsible lesion is located in the upper gastrointestinal tract (i.e., above the ligament of Treitz).

SYMPTOMS: The blood may be clotted, fluid, or mixed with food. Subsequent stools may be black and tarry (melanic). If blood loss is severe enough, shock and collapse may occur.

TREATMENT: The patient should be resuscitated with intravenous fluids.

Transfusions are given when blood loss is massive, prolonged, or life-threatening. Endoscopy of the upper gastrointestinal tract may reveal a lesion susceptible to coagulation, sclerosis, ligation, or surgical excision. H₂-receptor antagonists (e.g., famotidine) or proton pump inhibitors (e.g., omeprazole, pantoprazole) may be given when bleeding results from peptic disease.

PATIENT CARE: Vital signs and mental status are monitored, often in an intensive care unit. Vomitus is inspected and its character and quantity documented, along with associated signs and symptoms. Management is focused at determining the underlying cause of bleeding. The patient is supported in an upright position (or turned to the left side) to prevent aspiration. Oral hygiene is provided after episodes of vomiting and as needed while the patient is not taking anything by mouth. Hematemesis can be very frightening to both the patient and family. A calm quiet environment should be provided, and realistic reassurance given. All diagnostic and treatment procedures should be briefly explained, questions answered as honestly and completely as possible, and continued emotional support provided.

hematencephalon (hēm"āt-ēn-sēf'ā-lōn) [" + *enkephalos*, brain] A cerebral hemorrhage.

hemathermal (hēm"ā-, hē'mā-thēr'māl) [" + *therme*, heat] Warm blooded; applied to animals whose blood remains at a fairly constant temperature.

hematidrosis, hematidrosis (hēm-māt'hī-drō'sis) [Gr. *haimatos*, blood, + *hidros*, sweat, + *osis*, condition] A condition in which sweat contains blood. SYN: *hematohidrosis*.

hematic (hē-māt'ik) Hematinic.

hematin (hēm'ā-tin) The nonprotein portion of the hemoglobin molecule wherein the iron is in the ferric (Fe³⁺) rather than the ferrous (Fe²⁺) state. SEE: *ferritin*; *heme*.

hematinemia (hē-mā-, hēm-ā-tin-ē'mē-ā) Hematin in the circulating blood.

hematinic (hē-mā-, hēm-ā-tin'ik) [Gr. *haima*, blood] **1.** Pert. to blood. **2.** An agent that facilitates blood formation, used in treating anemia. SYN: *hematic*.

hemato- SEE: *hemat-*.

hematobilia (hēm"ā-tō-bil'ē-ā) [" + L. *bilis*, bile] Blood in the bile or bile ducts.

hematobium (hē'mā-, hēm'ā-tō'bē-ūm) [" + *bios*, life] Hemocytzoön.

hematoblast (hē'mā-, hēm'ā-tō-blāst) [" + *blastos*, germ] Stem cell.

hematocele (hē'mā-, hēm'ā-tō-sēl) [" + *kele*, tumor, swelling] **1.** A blood cyst. **2.** The effusion of blood into a cavity. **3.** A swelling due to effusion of blood into the tunica vaginalis testis.

parametric h. A tumor formed by

blood in the cul-de-sac of Douglas walled off by adhesions.

pudental h. A blood-filled swollen area of the labium.

hematocelia (hēm"ă-tō-sē'lē-ă) [" + *koilia*, cavity] Bleeding into the peritoneal cavity.

hematochezia (hēm"ă-tō-kē'zē-ă) [" + *chezein*, to go to stool] The passage of bright red blood in the stool. SEE: *melena*.

hematochromatosis (hēm"ă-tō-krō"mă-tō'sis) [" + *chroma*, color, + *osis*, condition] Hemochromatosis.

hematochyluria (hēm"ă-, hēm"ă-tō-kilū'rē-ă) [" + *chylos*, juice, + *ouron*, urine] Blood and chyle in the urine.

hematocolpos (hēm"ă-, hēm"ă-tō-kōl'pōs) Retention of menstrual blood in the vagina, caused by an imperforate hymen.

hematocrit (hē-măt'ō-krīt) [" + *kri-nein*, to separate] **1.** An obsolete term for a centrifuge for separating solids from plasma in the blood. **2.** The volume of erythrocytes packed by centrifugation in a given volume of blood. The hematocrit is expressed as the percentage of total blood volume that consists of erythrocytes or as the volume in cubic centimeters of erythrocytes packed by centrifugation of blood. Approximate normal values at sea level: men, average 47%, range 40% to 54%; women, average 42%, range 37% to 47%; children, varies with age from 35% to 49%; newborn, 49% to 54%. SEE: *blood*.

hematocyst (hē"mă-, hēm"ă-tō-sist) [Gr. *haimatos*, blood, + *kystis*, a bladder] **1.** Hemorrhage into a cyst or into the urinary bladder. **2.** A blood-filled cyst.

hematocystic spots Focal red marks seen on esophageal varices. They consist of aneurysms of the wall of the dilated blood vessel. Their presence increases the likelihood that the varix may bleed.

hematocytoblast (hēm"ă-tō-sī'tō-blăst) [" + " + *blastos*, germ] Stem cell.

hematocytometer (hēm"ă-, hēm"ă-tō-sītōm'ē-ter) [" + " + *metron*, measure] SEE: *hemocytometer*.

hematocyturia (hēm"ă-, hēm"ă-tō-sitū'rē-ă) [" + " + *ouron*, urine] Red blood cells in the urine; hematuria, as differentiated from hemoglobinuria.

hematogenesis (hēm"ă-, hēm"ă-tō-jěn'ē-sis) [" + *genesis*, generation, birth] Hematopoiesis.

hematogenic, hematogenous (hēm"ă-, hēm"ă-tō-jěn'ik, -tōj'ē-nūs) [" + *gennan*, to produce] **1.** Hematopoietic. **2.** Pert. to or originating in the blood.

hematohidrosis (hēm"ă-, hēm"ă-tō-hī-drō'sis) [" + *hidros*, sweat, + *osis*, condition] Hemathidrosis.

hematoidin (hēm"ă-, hēm"ă-toy'din) The yellow crystalline substance, biliverdin, that remains when red blood cells are destroyed in bruised tissue.

hematologist (hēm"ă-, hēm"ă-tōl'ō-jist) [" + *logos*, word, reason] A physician who specializes in the diagnosis and treatment of disorders of blood and blood-forming tissues.

hematology (hēm"ă-, hēm"ă-tōl'ō-jē) The science concerned with blood and the blood-forming tissues.

hematolymphangioma (hēm"ă-, hēm"ă-tō-limf-ăn'jē-ō'mă) [" + L. *lymph*, lymph, + Gr. *angeion*, vessel, + *oma*, tumor] A tumor consisting of dilated blood vessels and lymphatics. SYN: *hemolymphangioma*.

hematolytic (hēm-ă-tō-lit'ik) Hemolytic.

hematoma (hēm"ă-, hēm"ă-tō'mă) [Gr. *haimatos*, blood, + *oma*, tumor] A swelling comprising a mass of extravasated blood (usually clotted) confined to an organ, tissue, or space and caused by a break in a blood vessel.

h. auris An effusion of blood, causing a hard swelling between perichondrium and the cartilage of the pinna of the ear. it is common in fighters and wrestlers. SYN: *othematoma*. SEE: *cauliflower ear*.

epidural h. A hematoma above the dura mater, usually arterial, except in posterior fossa.

intracerebral h. A hemorrhage localized in one area of the brain.

pelvic h. A hematoma present in the cellular tissue of the pelvis.

subarachnoid h. A hemorrhage between the arachnoid membrane and the pia mater; usually caused by the rupture of a congenital intracranial aneurysm or berry aneurysm, hypertension, or trauma.

subdural h. Bleeding into the space between the dura mater and arachnoid layer, usually the result of a head injury. Symptoms may be delayed in appearing, but include severe headaches, forgetfulness, disorientation, and confusion. History of a fall, older age, and use of oral anticoagulants all increase the risk for bleeding.

PATIENT CARE: Health care professionals who suspect a patient has suffered intracranial bleeding should initiate cardiac monitoring and obtain a 12-lead ECG, provide supplemental oxygen, establish an IV access, obtain blood samples for CBC, electrolytes, cardiac markers, and coagulation studies, and prepare the patient for a noncontrast CT of the head. The patient with a confirmed bleed may then undergo a craniotomy to evacuate the clot. Recovery should be in a neurosurgery intensive care unit, with close monitoring for complications such as increased intracranial pressure, recurrent hematoma, seizures, and infection. After recovery discharge teaching should review any medications the patient takes, and educate the patient and family about safety measures and fall prevention. A home health care practitioner should carry out an evaluation of

home safety issues, and assist the family in making appropriate changes based on any new neurological deficits suffered as a result of the injury.

vulvar h. Extravasation of blood into the soft tissues of the external female genitalia. The bleeding may occur after childbirth or as a result of trauma (e.g., rape trauma). Postpartum bleeding usually is due to the shearing of submucosal tissues during a difficult or forceps-assisted delivery.

PATIENT CARE: The woman usually complains of severe vulvar pain. Inspection may reveal a unilateral firm area of the labia majora that is extremely painful to the touch. Prompt application of an ice pack may limit further bleeding; however, large or enlarging hematomas may require surgical intervention (i.e., ligation and evacuation).

hematmediastinum (hēm'mă-, hēm'ă-tō-mē'dē-ă-stī'nŭm) [" + L. *mediastinus*, in the middle] Hemomediastinum.

hematometra (hēm'mă-, hēm'ă-tō-mē'tră) [" + *metra*, uterus] **1.** Hemorrhage in the uterus. **2.** An accumulation of menstrual blood in the uterus. SEE: *hematocolpos*; *hydrometra*; *pyometra*.

hematophalocoele (hēm'mă-, hēm'ăt-ôm-fäl'ô-sēl) [" + *omphalos*, navel, + *kele*, tumor, swelling] The effusion of blood into an umbilical hernia.

hematomyelia (hēm'mă-, hēm'ă-tō-mī-ē'lē-ă) [" + *myelos*, marrow] Hemorrhage into the spinal cord. SYN: *myelapoplexy*.

hematomyelitis (hēm'mă-, hēm'ă-tō-mī'ēl-ī'tis) [" + " + *itis*, inflammation] An inflammation of the spinal cord accompanied by bloody effusion.

hematonephrosis (hēm'mă-, hēm'ă-tō-nē-frō'sis) [" + *nephros*, kidney, + *osis*, condition] Hemonephrosis.

hematopathology (hēm'mă-, hēm'ă-tō-păth-ôl'ô-jē) [" + *pathos*, disease, suffering, + *logos*, word, reason] The study of pathologic conditions of the blood.

hematopericardium (hēm'mă-, hēm'ă-tō-pēr'ī-kăr'dē-ŭm) [" + *peri*, around, + *kardia*, heart] A bloody effusion into the pericardium.

hematoperitoneum (hēm'mă-, hēm'ă-tō-pēr'ī-tō-nē'ŭm) [" + *peritoneion*, peritoneum] Hemoperitoneum.

hematophagia (hēm'ă-tō-fă'jē-ă) The ingestion of blood.

hematophagous (hēm-ă-tôf'ă-gŭs) Feeding on blood; blood-sucking. Said, e.g., of mosquitoes, ticks, and some bats.

hematoplastic (hēm'mă-, hēm'ă-tō-plăs'tik) [" + *plassein*, to form] Hematopoietic.

hematopoiesis (hēm'mă-, hēm'ă-tō-poy-ē'sis) [" + "] The production and development of blood cells, normally in the bone marrow.

extramedullary h. The production of

blood cells in tissues other than bone marrow (e.g., in the liver or spleen), which occurs in severe anemia and other diseases affecting the blood.

hematopoietic (hēm'mă-, hēm'ă-tō-poy-ēt'ik) **1.** Pert. to the production and development of blood cells. **2.** A substance that assists in or stimulates the production of blood cells. SYN: *hematogenic*; *hematoplastic*.

h. growth factors Any of a group of at least seventeen substances involved in the production of blood cells, including several interleukins and erythropoietin.

h. malignancies Cancers that arise from unregulated clonal proliferation of hematopoietic stem cells, such as leukemia and lymphoma. In these disorders, genetically abnormal blood-forming cells (derived from precursors of granulocytes, lymphocytes, platelets, or red blood cells) reproduce in an unchecked fashion, consume nutrients, infiltrate various tissues, and replace the body's normally functioning cells. SEE: *leukemia*; *lymphoma*.

hematopoietic system The blood-forming tissues and organs of the body. It includes the bone marrow, spleen, and lymphatic tissue.

hematopoietin (hēm'mă-tō-poy'ē-tin, hēm") [" + Gr. *poiein*, to make] Any growth factor that influences the development of blood cells.

hematoporphyrin (hēm'mă-, hēm'ă-tō-por'fi-rin) [" + *porphyr*, purple] Iron-free heme, a decomposition product of hemoglobin present in the urine in certain conditions.

hematoporphyrinuria (hēm'mă-, hēm'ă-tō-por'fi-rin-ŭ'rē-ă) [" + " + *ouron*, urine] Hematoporphyrin in the urine.

hematorrhachis (hēm-ă-tor'ă-kis) [" + *rhachis*, spine] Hemorrhage into the spinal cord.

hematosalpinx (hēm'mă-, hēm'ă-tō-săl'pinks) [" + *salpinx*, tube] Retained menstrual fluid in a fallopian tube. SYN: *hemosalpinx*.

hematospermatocoele (hēm'ă-tō-spēr-măt'ô-sēl) [" + *sperma*, seed, + *kele*, tumor, swelling] A blood-filled spermatocoele.

hematospermia (hēm'ă-tō-spēr'mē-ă) Semen that contains blood. SYN: *hemospermia*.

h. spuria Hematospermia coming from the prostatic urethra.

h. vera Hematospermia coming from the seminal vesicles.

hematostatic (hēm'ă-tō-stăt'ik) [Gr. *haimatos*, blood, + *stasis*, standing] Hemostatic.

hematosteon (hēm-ă-tôs'tē-ôn) [" + *osteon*, bone] Bleeding into bone marrow.

hematothorax (hēm'ă-tō-thō'răks) [" + *thorax*, chest] Hemothorax.

hematotropic (hēm'ă-tō-trôp'ik) [" +

tropos, a turning] Having a special affinity for red blood cells.

hematotympanum (hēm"ā-tō-tīm'pān-ŭm) [" + *tympanon*, drum] Hemotympanum.

hematoxylin (hēm"ā-tōk'sī-līn) C₁₆H₁₄O₆; a dye widely used in histology, often in conjunction with eosin. It has an affinity for cell nuclei, which stain a deep blue.

hematozymosis (hē"mā-, hēm"ā-tō-zī-mō'sīs) [" + *zymosis*, fermentation] Blood fermentation.

hematuria (hē"mā-, hēm"ā-tū'rē-ā) [" + *ouron*, urine] Blood in the urine.

ETIOLOGY: Blood may appear in the urine as a result of a wide variety of conditions, including contamination during menstruation or the puerperium; internal trauma or kidney stones; vigorous exercise; urinary tract infections or systemic infections with renal involvement; some cases of glomerulonephritis; vascular anomalies of the urinary tract; or cancers of the urethra, bladder, prostate, ureters, or kidneys.

FINDINGS: The urine may appear tea-colored, slightly smoky, reddish, or frankly bloody.

DIAGNOSIS: The clinical history may help determine the cause of bleeding in the urine. Kidney stones often cause hematuria associated with intense flank pain that radiates into the groin. Hematuria in a child with recent sore throat, new edema, and hypertension may reflect a poststreptococcal glomerulonephritis. Urinary bleeding in a patient with abdominal pain and an enlarged or prosthetic aorta may have a fistulous connection to a ureter—a true surgical emergency. In the laboratory, microscopic examination of the urine also provides clues to the cause of bleeding. Red blood cells from the upper urinary tract often are deformed or misshapen, whereas those from the urethra or bladder have a normal microscopic appearance.

benign familial h. An inherited structural abnormality of the kidneys in which small numbers of red blood cells are found in the urine. On biopsy the glomeruli of affected patients are found to have thin basement membranes. The condition is not associated with progressive kidney failure or other progressive renal diseases. SYN: *thin basement membrane disease*.

microscopic h. Red blood cells that are not grossly obvious but are found instead on microscopic examination of a urine specimen. They may be found in patients with tumors of the urinary tract (kidneys, ureters, or bladder); glomerular diseases; kidney or ureteral stones; urinary tract infections; trauma; or in patients without obvious or demonstrable pathology. SYN: *microhematuria*.

renal h. Hematuria in which the blood comes from the upper tract. On gross examination, the urine is often smoky, red, or cola-colored. Some causes include: glomerular diseases, kidney tumors, kidney stones, among others.

urethral h. Urinary bleeding that may result from urethral trauma, surgery, adenomas, or other lesions of the lower urinary tract. The voided urine usually is bright red at the onset of urination and more dilute in appearance as the stream continues.

vesical h. Urinary bleeding typically produced by bladder malignancies, stones, or cystitis.

heme (hēm) An iron-containing nonprotein portion of the hemoglobin molecule wherein the iron is in the ferrous (Fe²⁺) state. Disorders of heme synthesis are known as the *porphyrias*. SEE: *ferritin*; *hematin*.

heme oxygenase ABBR: HO. An enzyme that cleaves the ring structure of heme, releasing biliverdin, carbon monoxide, and iron. It is present in humans in two active forms: HO-1 and HO-2.

hemeralopia (hēm"ēr-āl-ō'pē-ā) [Gr. *hemera*, day, + *alao*s, blind, + *ops*, eye] Diminished vision in bright light. The term formerly was erroneously applied to night blindness or nyctalopia. Nyctalopia indicates inability to see in dim light, though vision is normal otherwise.

In hemeralopia, the sight is poor in sunlight and in good illumination; it is good at dusk, at twilight, and in poor illumination. This is noted in albinism, retinitis with central scotoma, toxic amblyopia, coloboma of the iris and chorioid, opacity of the crystalline lens or cornea, and in conjunctivitis with photophobia.

heme synthetase The enzyme that catalyzes the chelation of iron (Fe²⁺) to porphyrin, a crucial step in the synthesis of heme. SYN: *ferrochelatase*.

hemi- (hēm'ē) [Gr.] Prefix meaning *half*.

hemicephalus (hēm"ē-ā-sēf'ā-lūs) [" + *a-*, not, + *kephale*, head] A malformed fetus with a markedly defective head. SEE: *anencephalus*.

hemichromatopsia (hēm"ē-ā-krō-mā-tōp'sē-ā) [" + " + *chroma*, color, + *opsis*, vision] Color blindness in one-half, or in corresponding halves, of the vision field. SYN: *hemichromatopsia*.

hemigeusia (hēm"ē-ā-gū'zē-ā) [" + " + *geusia*, taste] Hemigeusia.

hemialbumin (hēm"ē-āl-bū'mīn) [" + L. *albumen*, white of egg] A product resulting from the digestion of albumin.

hemialbumose (hēm"ē-āl'bū-mōs) An albumoid product from the digestion of certain proteins. It is found in bone marrow.

hemialbumosuria (hēm"ē-āl-bū'mō-

sū'rē-ä) [ʹ + " + Gr. *ouron*, urine] Hemialbumose in the urine.

hemialgia (hēm-ē-äl'jē-ä) [ʹ + *algos*, pain] Pain in half of the body.

hemiaurosis (hēm"ē-äm"ō-rō'sīs) [ʹ + *amaurosis*, darkness] Hemianopia.

hemiambyopia (hēm"ē-äm"blē-ō'pē-ä) [ʹ + *amblys*, dim, + *ops*, sight] Hemianopia.

hemiamyosthenia (hēm"ē-ä'mī-ōs-thē'nē-ä) [Gr. *hemi*-, half, + *a-*, not, + *mys*, muscle, + *sthenos*, strength] Hemiplegia.

hemianacusia (hēm"ē-än"ä-kū'zē-ä) [ʹ + *an-*, not, + *akousis*, hearing] Deafness in one ear.

hemianalgesia (hēm"ē-än-äl'jē'zē-ä) [ʹ + " + *algos*, pain] Lack of sensibility to pain (analgesia) on one side of the body.

hemianencephaly (hēm"ē-än"ēn-sēf'ä-lē) [ʹ + *an-*, not, + *enkephalos*, brain] Congenital absence of half of the brain.

hemianesthesia (hēm"ē-än-ēs-thē'zē-ä) [ʹ + " + *aisthesis*, sensation] Anesthesia of half of the body.

hemianopia, hemianopsia (hēm"ē-än-ōp'ē-ä, -nōp'sē-ä) [ʹ + *an-*, not, + *ops*, eye] Blindness in one-half of the visual field. SYN: *hemiamaurosis*; *hemiambyopia*. **hemianopic, adj.**

altitudinal h. Blindness in upper or lower half of the visual field of one or both eyes.

binasal h. Blindness in the nasal half of the visual field in each eye.

bitemporal h. Blindness in the temporal half of the visual field in each eye.

complete h. Blindness in half the visual field.

crossed h. Either bitemporal or binasal hemianopsia. SYN: *heteronymous hemianopia*.

heteronymous h. Crossed h.

homonymous h. Blindness of nasal half of the visual field of one eye and temporal half of the other, or right-sided or left-sided hemianopsia of corresponding sides in both eyes.

incomplete h. Blindness in less than half of the visual field of each eye.

quadrant h. Blindness of symmetrical quadrant of the field of vision in each eye.

unilateral h. Hemianopsia affecting only one eye.

hemianopic reaction (hēm"ē-ä-nōp'ík) A reaction in which the pupils of both eyes fail to react to a thin pencil of light from the blind side but react normally to light from the normal side. It is seen in some forms of homonymous hemianopia.

hemianosmia (hēm"ē-än-ōs'mē-ä) [Gr. *hemi*-, half, + *an-*, not, + *osme*, smell] Loss of sense of smell in one nostril.

hemipraxis (hēm"ē-ä-präks'ē-ä) [ʹ + *a-*, not, + *prassein*, to do] Incapacity

to exercise purposeful movements on one side of the body.

hemiarthrosis (hēm"ē-är-thrō'sīs) [ʹ + *arthron*, joint, + *osis*, condition] A false articulation between two bones. SYN: *synchondrosis*.

hemiasynergia (hēm"ē-ä'sin-ēr'jē-ä) [ʹ + *a-*, not, + *syn*, with, + *ergon*, work] A lack of muscular coordination of parts affecting one side of the body. SYN: *hemidysergia*.

hemiataxia (hēm"ē-ä-täks'ē-ä) [ʹ + *ataxia*, lack of order] Impaired muscular coordination causing awkward movements of the affected side of the body.

hemiatetosis (hēm"ē-äth'ē-tō'sīs) [ʹ + *athetos*, without fixed position, + *osis*, condition] Athetosis of one side of the body.

hemiatrophy (hēm-ē-ät'rō-fē) [ʹ + *atrophia*, atrophy] Impaired nutrition resulting in atrophy of one side of the body or of an organ or part.

hemiballism (hēm-ē-bäl'izm) [ʹ + *ballismos*, jumping] Jerking and twitching movements of one side of the body.

hemiblock (hēm'ī-blök) In heart block, a failure of conduction in one of the two main divisions of the left bundle branch.

hemic (hē'mik, hēm'ik) [Gr. *haima*, blood] Pert. to blood. SYN: *hema* (1).

hemicaardia (hēm-ē-kär'dē-ä) [ʹ + *kardia*, heart] Half of a four-chambered heart.

hemicastration (hēm"ē-käs-trä'shün) [ʹ + *L. castrare*, to prune] The removal of one ovary or testicle. At one time, removal of the left testicle was done on the erroneous assumption that sperm from the right testicle produced only sons.

hemicellulose (hēm-ē-sēl'ū-lös) One of a group of polysaccharides that differ from cellulose in that they may be hydrolyzed by dilute mineral acids, and from other polysaccharides in that they are not readily digested by amylases. The group includes pentosans, galactosans (agar-agar), and pectins.

hemicephalia (hēm"ē-sē-fä'lē-ä) [ʹ + *kephale*, head] The congenital absence of one half of the skull and brain.

hemicephalus (hēm"ē-sēf'ä-lus) A congenital deformity in which the child has only one cerebral hemisphere.

hemicerbrum (hēm"ē-sēr'ē-brüm) [ʹ + *L. cerebrum*, brain] Half of the cerebral hemisphere.

hemichorea (hēm-ē-kō-rē-ä) [ʹ + *chorēia*, dance] Chorea affecting only one side of the body.

hemichromatopsia (hēm"ē-krō-mä-tōp'sē-ä) [ʹ + *chroma*, color, + *opsis*, vision] Hemiachromatopsia.

hemicolectomy (hēm"ē-kō-lēk'tō-mē) [ʹ + *kolon*, colon, + *ektome*, excision] Surgical removal of half (either left or right) or less of the colon.

hemikorpectomy (hēm"ē-kor'pō-rēk'tō-mē) [ʹ + *L. corpus*, body, +

Gr. *ektome*, excision] Surgical removal of the lower portion of the body, including the pelvis, pelvic contents, and the lower extremities.

hemisrania (hēm'ē-krā'nē-ā) [" + *kranion*, skull] **1.** Unilateral head pain, usually migraine. **2.** A malformation in which only one half of the skull is developed.

h. continua A long-lasting, one-sided headache of moderate to severe intensity. It responds to treatment with nonsteroidal anti-inflammatory drugs, such as indomethacin.

hemisraniectomy (hēm'ē-krā-nē-ēk'tō-mē) [" + " + *ektome*, excision] The surgical division of the cranial vault from front backward, exposing half of the brain.

hemisraniosis (hēm'ē-krā-nē-ō'sis) [" + " + *osis*, condition] An enlargement of half of the cranium or face.

hemidesmosome (hēm'ē-dēs'mō-sōm) The half of a desmosome produced by epithelial cells for attachment of the basal surface of the cell to the underlying basement membrane or the enamel or cementum tooth surface in the case of junctional epithelium.

hemidiaphoresis (hēm'ē-dī'ā-for-ē'sis) [" + *dia*, through, + *pherein*, to carry] Sweating on one side of the body. SYN: *hemidrosis*; *hemihidrosis*.

hemidiaphragm (hēm'ē-dī'ā-frām) [" + " + *phragma*, wall] Half of the diaphragm.

hemidysergia (hēm'ē-dis-ēr'jē-ā) [Gr. *hemi-*, half, + *dys*, bad, + *ergon*, work] Hemiasynergia.

hemidysesthesia (hēm'ē-dis-ēs-thē'zē-ā) [" + " + *aisthesis*, sensation] Impaired sensation of half of the body.

hemidystrophy (hēm'ē-dis'trō-fē) [" + " + *trophe*, nourishment] An inequality in development of the two sides of the body.

hemiectromelia (hēm'ē-ēk-trō-mē'lē-ā) [" + *ektro*, abortion, + *melos*, limb] Deformed extremities on one side of the body.

hemipilepsy (hēm'ē-ēp'ī-lēp-sē) [" + *epilepsia*, seizure] Epilepsy with convulsions confined to one side of the body.

hemifacial (hēm'ē-fā'shāl) [" + L. *facies*, face] Pert. to one side of the face.

hemifacial microsomia (mī'krō-sō'mē-ā) ABBR: HFM. A rare congenital anomaly, usually inherited sporadically, in which one side of the body, usually the right, fails to develop equally with the left. The ear, nose, and maxilla on the affected side are hypoplastic. In addition the right lung and kidney may be smaller than normal, and affected children often have ventriculoseptal defects. Surgical treatment of facial defects associated with HFM is often undertaken by combined teams of oral and maxillofacial surgeons. SYN: *facio-auriculo vertebral*

syndrome; *Goldenhar syndrome*; *oculoauricular vertebral dysplasia*.

hemigastrectomy (hēm'ē-gās-trēk'tō-mē) [" + *gaster*, belly, + *ektome*, excision] Excision of half of the stomach.

hemigeusia (hēm'ē-gū'sē-ā) [" + *geusis*, taste] A loss of the sense of taste on one side of the tongue. SYN: *hemiageusia*.

hemiglossal (hēm'ē-glōs'sāl) [" + *glossa*, tongue] Concerning one side of the tongue.

hemiglossectomy (hēm'ē-glōs-sēk'tō-mē) [" + " + *ektome*, excision] The surgical removal of one side of the tongue.

hemiglossitis (hēm'ē-glō-sī'tis) [" + " + *itis*, inflammation] Herpetic vesicular eruption on half of the tongue and the inner surface of the cheek.

hemignathia (hēm'ē-nāth'ē-ā) [" + *gnathos*, jaw] Congenital absence of one half of the lower jaw.

hemihepatotomy (hēm'ē-hēp'ā-tēk'tō-mē) [" + *hepatos*, liver, + *ektome*, excision] The surgical removal of half of the liver.

hemihidrosis (hēm'ē-hī-drō'sis) [" + *hidros*, sweat, + *osis*, condition] Hemidiaphoresis.

hemihydrate (hēm'ē-hī'drāt) A chemical compound with one molecule of water for every two molecules of the other substance. In dentistry, calcium sulfate hemihydrate is mixed with water to produce a hardened plaster or stone (calcium sulfate dihydrate), which, in turn, is commonly used to produce dental models.

hemihypalgnesia (hēm'ē-hī'pāl-jē'zē-ā) [" + *hypo*, under, + *algesis*, sense of pain] Partial anesthesia on one side of the body.

hemihyperesthesia (hēm'ē-hī-pēr-ēs-thē'zē-ā) [" + *hyper*, over, + *aisthesis*, sensation] Abnormal sensitivity to touch or pain on one side of the body.

hemihyperidrosis, hemihyperhidrosis (hēm'ē-hī-pēr-ī-drō'sis, -hī-drō'sis) [" + " + *hydrosis*, sweating] Excessive perspiration confined to one side of the body.

hemihyperplasia (hēm'ē-hī'pēr-plā'zē-ā) [" + " + *plassein*, to form] The excessive development of one side or one half of the body or of an organ.

hemihypesthesia, hemihypoesthesia (hēm'ē-hī'pēs-thē'zē-ā, -pō-ēs-thē'zē-ā) [Gr. *hemi-*, half, + *hypo*, under, + *aisthesis*, sensation] Diminished sensibility on one side of the body.

hemi-inattention (hēm'ē-īn-ā-tēn'shūn) Unilateral inattention.

hemikaryon (hēm'ē-kār'ē-ōn) [" + *karyon*, nucleus] A cell nucleus with half the diploid number of chromosomes.

hemilaminectomy (hēm'ē-lām'ī-nēk'tō-mē) [" + L. *lamina*, thin plate, + Gr. *ektome*, excision] The surgical removal

of the lamina of the vertebral arch on one side.

hemilaryngectomy (hēm"ē-lār"īn-jĕk'tō-mē) [*l* + *larynx*, *larynx*, + *ektome*, excision] The surgical removal of the lateral half of the larynx.

hemilateral (hēm"ē-lāt'ēr-āl) [*l* + *L. latus*, side] Relating to one side only.

hemilingual (hēm"ē-ling'gwāl) [*l* + *L. lingua*, tongue] Affecting or concerning one lateral half of the tongue.

hemimacroglossia (hēm"ē-māk"rō-glōs'ē-ā) [*l* + *makros*, large, + *glossa*, tongue] Enlargement of one lateral half of the tongue.

hemimandibulectomy (hēm"ē-mān-dīb-ū-lĕk'tō-mē) [*l* + *L. mandibula*, lower jawbone, + *Gr. ektome*, excision] The surgical removal of half of the mandible.

hemimelus (hēm"ī-mē'lūs) [*l* + *melos*, limb] A fetal malformation with defective development of the extremities, esp. the distal portion.

hemin (hē'mīn) [*Gr. haima*, blood] A brownish-red crystalline salt of heme formed when hemoglobin is heated with glacial acetic acid and sodium chloride. The iron is present in the ferric (Fe³⁺) state. Hemin is used in testing for presence of blood. SYN: *crystal of hemin*. SEE: *heme*.

heminephrectomy (hēm"ē-nĕ-frĕk'tō-mē) [*Gr. hemi-*, half, + *nephros*, kidney, + *ektome*, excision] The excision or removal of a portion of a kidney.

hemiopalgia (hēm"ē-ōp-āl'jĕ-ā) [*l* + *ops*, eye, + *algos*, pain] Pain in one side of the head and the eye on that side.

hemiopia (hēm-ē-ō'pĕ-ā) [*l* + *ops*, eye] Hemianopia.

hemiopic (hēm-ē-ōp'īk) [*l* + *ops*, eye] Pert. to hemiopia.

hemiopic pupillary reaction A reaction in which light from one side causes the iris to contract but light from the other side does not cause the contraction. It is seen in certain cases of hemianopia.

hemipagus (hēm-īp'ā-gūs) [*l* + *pagos*, a thing fixed] Twins fused at the navel and thorax.

hemiparalysis (hēm"ē-pār-āl'ī-sīs) [*l* + *paralyein*, to disable] Hemiplegia.

hemiparaplegia (hēm"ē-pār-ā-plĕ'jĕ-ā) [*l* + " + *plege*, stroke] Paralysis of a single leg, or of the distal hemibody. It is considered a rare condition.

hemiparesis (hēm"ē-pār-ĕ-sīs, hēm-ē-pār-ĕ'sīs) [*l* + *paresis*, paralysis] Hemiplegia.

hemiparesthesia (hēm"ē-pār-ĕs-thĕ'zĕ-ā) [*l* + "] Numbness, tingling, or other unpleasant sensations affecting one half of the body.

hemipelvectomy (hēm"ē-pĕl"vĕk'tō-mē) [*l* + *L. pelvis*, basin, + *Gr. ektome*, excision] The surgical removal of half of the pelvis, and the corresponding lower extremity.

hemiplegia (hēm-ē-plĕ'jĕ-ā) [*l* + *plege*,

a stroke] Paralysis of one side of the body, usually resulting from damage to the corticospinal tracts of the central nervous system. SYN: *hemiamyos-thenia*; *hemiparalysis*; *hemiparesis*. SEE: *Benedikt's syndrome*; *paralysis*; *thalamic syndrome*.

ETIOLOGY: The most common cause of hemiplegia is stroke caused by thrombosis, brain hemorrhage, or cerebral embolism. Tumors and spinal cord injuries are responsible for hemiplegia in a smaller number of patients.

SYMPTOMS: The patient will be unable to move the arm and/or leg or facial muscles on one side of the body. Usually the paralysis is more complete in the proximal muscles (e.g., at the shoulder or hip muscles) than it is in the more distal muscles of the hands or feet. If the nondominant parietal lobe of the brain is injured (e.g., after an occlusion of the middle cerebral artery on that side), the patient may neglect the paralyzed side of the body. He or she may deny neurological deficits on that side and may be unable to see or feel stimuli presented to the affected hemibody or visual field. SEE: *visual anosognosia*.

PATIENT CARE: Depending upon which part of the central nervous system is affected, the patient may also have other neurological deficits (e.g., visual field disturbances, aphasia, dysphagia, vertigo, sensory changes and/or personality changes), which may impact rehabilitation. Assistance is provided with active range-of-motion exercises to unaffected limbs and passive exercises to affected limbs. Correct body positioning and alignment of extremities are maintained, and measures are taken to prevent foot drop, contractures, and pressure ulcers. The patient is assessed for dysphagia, and a nutritional plan developed to provide adequate calories and fluids. Active participation in rehabilitation through physical therapy and occupational therapy is encouraged. The patient is taught to use the unaffected limbs to move and exercise the affected limbs to maintain joint mobility and prevent contractures and to maintain muscle tone and strength. The patient is protected from injury through the use of supportive devices to prevent subluxation or dislocation of affected joints. The patient and the family are taught how to use assistive devices (e.g., slings, splints, walkers), and the goals and processes involved in rehabilitation are explained. Accurate information, realistic reassurance, and emotional support are provided to assist with coping. Both patient and family may benefit from referral to local support groups and the National Stroke Association (800-787-6537; www.stroke.org).

capsular h. Hemiplegia resulting

from a lesion of the internal capsule of the brain.

cerebral h. Hemiplegia caused by a brain lesion.

facial h. Paralysis of the muscles on one side of the face.

hypoglossal alternating h. Medulla lesion paralyzing the tongue by involving the 12th nerve fibers as they course through the uncrossed pyramid. The pathology may extend across the midline or dorsally, involving the medial fillet, causing contralateral anesthesia.

pontile h. Hemiplegia due to a lesion of the pons. The arm and leg on one side and the face on the opposite side are affected.

spastic h. Increased muscular tone occurring in half of the body. It results from an upper motor neuron lesion, such as a stroke, central nervous system trauma, or tumor.

spinal h. Hemiplegia resulting from a lesion of the spinal cord. SEE: *Brown-Séquard's syndrome*.

hemiplegic (hēm-ē-plē'jĭk) **1.** Pert. to hemiplegia. **2.** A colloquial reference to a patient having hemiplegia.

Hemiptera (hēm-ĭp'tēr-ā) [Gr. *hemi-*, half, + *pteron*, wing] The true bugs; an order of insects characterized by piercing and sucking mouth parts. The first pair of wings is leathery at the base and membranous at the tip; the second pair is membranous. Metamorphosis is incomplete. The order includes bedbugs, kissing bugs, and several other species that are pests or vectors of pathogenic organisms.

hemirachischisis (hēm"ē-rā-kĭs'kĭ-sĭs) [" + *rachis*, spine, + *schisis*, a splitting] Spina bifida occulta.

hemisacralization (hēm"ē-sā'krāl-ĭ-zā'shŭn) The abnormal development of one half of the fifth lumbar vertebra so that it is fused with the sacrum. SEE: *sacralization*.

hemisection (hēm"ē-sĕk'shŭn) [" + L. *sectio*, a cutting] Bisection.

hemisomus (hēm"ē-sō'mŭs) [" + *soma*, body] A fetus with the lateral half of the body either missing or malformed.

hemispasm (hēm"ē-spāzm) [" + *spasmos*, a convulsion] A spasm of only one side of the body or face.

hemisphere (hēm"ĭ-sfēr) [" + *sphaira*, sphere] Either half of the cerebrum or cerebellum.

dominant h. The cerebral hemisphere (usually the left hemisphere of the brain) that controls both language use and the hand a person uses for most fine motor functions.

nondominant h. In neurology, the hemisphere of the brain that does not control speech or the predominantly used hand.

hemispherectomy (hēm"ĭ-sfēr-ĕk'tō-mē) Surgical removal of one hemisphere of

the brain; an operation sometimes used to treat severe brain diseases such as refractory epilepsy.

hemispheric specialization (hēm"ĭ-sfēr'ĭk) The control of distinct neurological functions by the right and left hemispheres of the brain. In most people, the left hemisphere controls language use, analytical thought, and abstract thinking, while the right manages visual and spatial relations, musical abilities, and other functions.

hemisindrome (hēm"ē-sĭn'drōm) [" + *syndrome*, a running with] A syndrome indicating a unilateral lesion of the spinal cord.

hemithermoanesthesia (hēm"ē-thēr"mō-ān"ēs-thē-zē-ā) [Gr. *hemi-*, half, + *therme*, heat, + *an-*, not, + *aisthesis*, sensation] The unilateral loss of sensitivity to heat and cold.

hemithorax (hēm"ē-thō'rāks) [" + *thorax*, chest] One half of the chest.

hemithyroidectomy (hēm"ē-thĭ'royd-ĕk'tō-mē) [" + *thyreos*, shield, + *eidōs*, form, shape, + *ektome*, excision] The surgical removal of one half of the thyroid gland tissue.

hemitremor (hēm"ē-trĕm'or) A tremor present in one lateral half of the body.

hemivertebra (hēm"ē-vĕr'tĕ-brā) The congenital absence of or the failure to develop half of a vertebra.

hemizygoty (hēm"ē-zĭ-gōs'ĭ-tē) [" + *zygotos*, yoked] Possessing only one of the gene pair that determines a particular genetic trait.

hemlock (hēm'lōk) [AS. *hemleac*] **1.** A species of evergreen plant. **2.** The volatile oil from either *Conium maculatum* or *Cicutula maculata* containing cicutoxin. Ingestion of these hemlock plants, esp. their roots, may cause fatal poisoning.

Hemlock Society (hēm'lōk") An organization that publishes information about physician-assisted suicide, and decisions by patients regarding end-of-life choices. Address: P.O. Box 101810, Denver, CO 80250. Telephone: 800-247-7421. Website: www.hemlock.org.

hemo- SEE: *hem-*.

hemoagglutination (hēm"mō-ā-gloo'tĭ-nā'shŭn) [Gr. *haima*, blood, + L. *agglutinans*, gluing] The clumping of red blood corpuscles.

hemoagglutinin (hēm"mō-ā-gloo'tĭ-nĭn) An agglutinin that clumps the red blood corpuscles.

hemobilia (hēm"mō-bĭl'ē-ā) Blood in the bile or bile ducts.

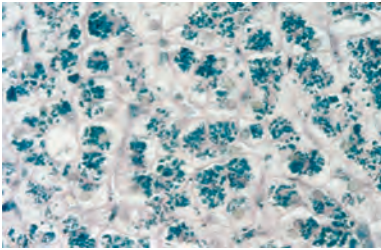
hemobinuria (hēm"mō-bĭl-ĭn-ū-rē-ā) [" + L. *bilis*, bile, + Gr. *ouron*, urine] Urobilin in the blood and urine.

hemochromatosis (hēm"mō-krō'mā-tō'sĭs) [" + *chroma*, color, + *osis*, condition] A genetic disease marked by excessive absorption and accumulation of iron in the body. The disease is caused by one of several recessive mutations that result in ex-

cessive absorption of iron from the gastrointestinal tract. It is not caused by secondary iron overload, as may occur in patients who have received multiple transfusions or who have hemolytic anemia. The disease is often diagnosed before it causes symptoms. SYN: *bronze diabetes*.

SYMPTOMS: At the time of diagnosis, the patient may be asymptomatic. Symptomatic patients may experience weakness, fatigue, arthralgias, abdominal pain, liver failure (cirrhosis), symptoms of diabetes mellitus or heart failure, thyroid disorders, or impotence. These symptoms are caused by the deposition of excess iron into multiple organ systems.

DIAGNOSIS: Physical findings include gray or bronzed skin pigmentation changes, enlarged liver, arthritis, signs of congestive heart failure, and in males, testicular atrophy. Laboratory studies used to screen for the disease include transferrin saturation or ferritin tests. Liver biopsies from affected persons show excessive stainable iron. Genetic testing is available to identify patients with the most common forms of hemochromatosis. SEE: *illus.*



HEMOCHROMATOSIS

TREATMENT: Treatment includes phlebotomy (blood drawing) done at regular intervals until the patient's iron stores drop to below normal. Typically, the ferritin level is monitored to ensure that this has occurred. Initially, approximately 1 unit of blood is removed each week until the desired ferritin level is reached. Maintenance therapy consists of removal of blood at 1- to 4-month intervals. Iron chelators such as deferoxamine are used if phlebotomy is not possible, but they are much less effective at decreasing iron stores than is blood drawing.



Blood removed from patients with iron overload cannot be used for transfusion.

PATIENT CARE: The need for phlebotomy and its role in the removal of excess iron are explained to the patient. To prevent dizziness or hypotension, the patient is encouraged to drink plenty of

fluids and to abstain from vigorous exercise for the first 24 hr after the procedure.

hemochromogen (hē'mō-krō'mō-jěn) [" + *chroma*, color, + *gennan*, to produce] A compound, such as hemoglobin, in which heme is combined with a nitrogen-containing molecule; e.g., protein.

hemochromoprotein (hē'mō-krō'mō-prō'tē-īn) Any protein combined with hemoglobin.

hemoclip (hē'mō-klīp) A metal or absorbable clip used to ligate blood vessels.

hemococoncentration (hē'mō-kōn-sēn-trā'shūn) A relative increase in the number of red blood cells resulting from a decrease in the volume of plasma (e.g., in dehydration).

hemoculture (hē'mō-kōl'chēr) [" + "] The isolation of bacterial or parasitic infectious agents from blood incubated in the laboratory on special nutrients, such as glucose or nitrates.

hemocuprein (hē'mō-kū'prē-īn) A blue copper-containing compound present in red blood cells.

hemocyte (hē'mō-sīt) [" + *kytos*, cell] **1.** Any blood cell. **2.** A red blood cell.

hemocytoblast (hē'mō-sī'tō-blāst) [" + " + *blastos*, germ] An undifferentiated stem cell found in mesenchymal tissues that may give rise to any type of blood cell. SEE: *illus.*

hemocytology (hē'mō-sī-tōl'ō-jē) [" + " + *logos*, word, reason] The study of the structure and function of blood cells.

hemocytometer, hemacytometer, hematocytometer (hē'mā-sī-tōm'ē-tēr, hē'mā-tō-sī-tōm'ē-tēr) [" + " + *metron*, measure] A device for determining the number of cells in a stated volume of blood.

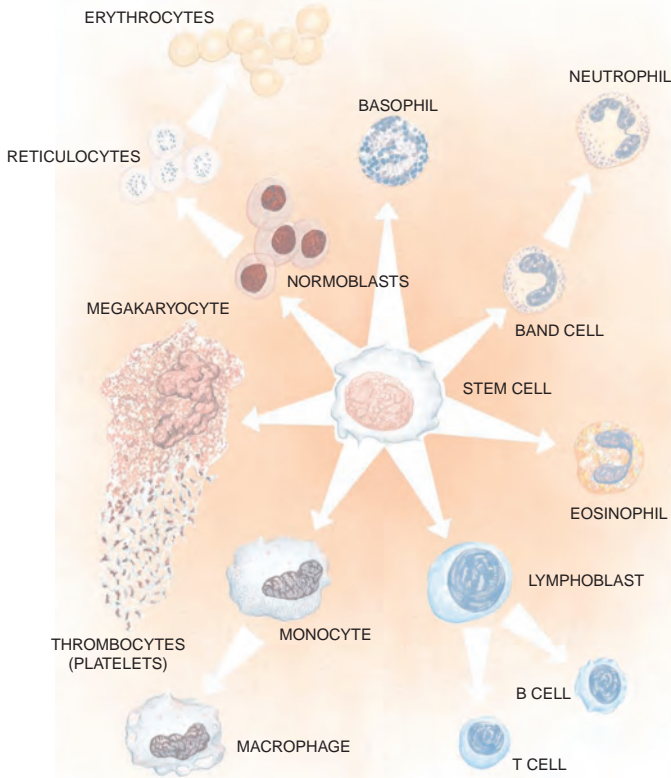
hemocytophagia (hē'mō-sī'tō-fā-jē-ā) The phagocytic ingestion of red blood cells.

hemocytotripsis (hē'mō-sī'tō-trīp'sīs) [" + " + *tribein*, to rub] The destruction of red blood cells caused by extreme pressure.

hemodiafiltration (hē'mō-dī'ō-fīl-trā'shūn) [" + *Gk. dia*, through + "] A method of ultrafiltration in which a patient's blood is directed through a hemofilter and then dialyzed by a countercurrent solution before it is returned to the patient. Volume, electrolytes, metabolites, or toxins are removed from the blood before it re-enters the body.

hemodiagnosis (hē'mō-dī'āg-nō'sīs) [" + *dia*, through, + *gnosis*, knowledge] Examination of the blood for diagnostic purposes.

hemodialysis (hē'mō-, hēm'ō-dī-āl'ī-sīs) [" + " + *lysis*, dissolution] The use of an artificial kidney to clear urea, metabolic waste products, toxins, and excess fluid from the blood. This procedure is used to treat end-stage renal



HEMOCYTOBLAST (STEM CELL) AND BLOOD CELLS

failure, transient renal failure, and some cases of poisoning or drug overdose. In the U.S., more than 345,000 patients undergo hemodialysis regularly for end-stage renal disease. The primary use of hemodialysis is to manage renal failure, a disorder in which fluids, acids, electrolytes, and many drugs are ineffectively eliminated in the urine. Hyperkalemia, uremia, fluid overload, acidosis, and uremic pericarditis are other indications for hemodialysis. SEE: *table; hemoperfusion; Nursing Diagnoses Appendix.*

The technique of hemodialysis separates solutes by differential diffusion through a cellophane membrane placed between the blood and the dialysate solution, and involves the following:

1. Establishing access to the circulation (e.g., via an arteriovenous fistula, cannula, or via a synthetic or bovine graft or temporary catheter)
2. Anticoagulating the patient's blood to prevent extracorporeal clotting
3. Pumping the blood to a dialysis membrane

4. Adjusting the diffusion of solutes from the blood into a buffered dialysate solution

5. Returning the cleansed and buffered blood to the patient.

Adequacy of hemodialysis is determined by the amount of fluid and solute (esp. urea) removed from the body. Typically, hemodialysis lasts about 3 or 4 hr per treatment and is repeated several times a week.

Even with regular hemodialysis sessions, patients with end-stage renal disease have high mortality rates. In the U.S., about 25% of all patients receiving hemodialysis die each year, usually because of heart disease, stroke, or pre-existing diabetes mellitus. SEE: *dialysis; hemofiltration; uremia.*



Hemodialysis has many potential complications, including hypotension, access site infection, sepsis, air embolism, hypersensitivity reactions, dialysis disequilibrium, muscle cramping, anemia, and bleeding.

Routine Precautions for the Care of All Hemodialysis Patients

Patients should have specific stations assigned to them, and their chairs and beds should be cleaned after each use.
Ancillary supplies, such as trays, blood pressure cuffs, clamps, scissors, and non-disposable items, should not be shared by patients.
Non-disposable items should be cleaned or disinfected appropriately after each use.
Medications and supplies should not be shared among patients, and medication carts should not be used.
Medications should be prepared and distributed from a centralized area.
Clean areas and contaminated areas should be separated (e.g., handwashing, handling of blood samples, and equipment cleaning should be kept distinct from areas for preparation of food, drink, and medications).

Adapted from Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. *Morbidity and Mortality Weekly Report* 47(N0. RR-19), Centers for Disease Control and Prevention.

PATIENT CARE: *Preprocedure:* If this is the patient's first hemodialysis session, the purpose of the treatment and expected results are explained. First, the patient undergoes a surgical procedure to create a vascular access. After the access site has been created and matured, the patient is readied for dialysis. The patient's weight is obtained and vital signs are checked; blood pressure is measured in the nonaccessed arm while the patient is in both supine and standing positions. The hemodialysis equipment is prepared according to the manufacturer's guidelines and the institution's protocol. Strict aseptic technique is maintained to avoid introducing pathogens into the patient's bloodstream during treatment. The patient is placed in a supine or low Fowler position and made as comfortable as possible, with the venous access site well supported and resting on a sterile drape over sterile barrier shield.

During the procedure: Health care providers follow standard precautions by wearing appropriate gloves and protective eye shields throughout the procedure. The patient is monitored continually throughout dialysis. Vital signs are checked and documented every 30 min to detect possible complications. Fever may indicate infection from pathogens in the dialysate or equipment and should be reported to the physician. Hypotension may indicate hypovolemia, sepsis, or a decreased hematocrit level, for example due to bleeding; IV fluid supplements or blood should be administered as prescribed. Rapid respirations may signal hypervolemia or hypoxemia; supplemental oxygen should be administered as prescribed. Approximately every hour, a blood sample is drawn for analysis of clotting time. The patient is weighed regularly on the dialyzing unit's bed scale or a portable scale to ensure adequate ultrafiltration during treatment. The dialyzer's blood

lines also are checked periodically to ensure that all connections are secure, and the lines are monitored for clotting. The patient is assessed for headache, muscle twitching, backache, nausea or vomiting, and agitation or seizures, which may indicate disequilibrium syndrome caused by rapid fluid removal and electrolyte changes. If this syndrome occurs, the physician should be notified immediately; he or she may reduce the blood flow rate or stop the dialysis. Muscle cramps also may result from rapid fluid and electrolyte shifts. Cramps may be relieved by injecting prescribed 0.9% sodium chloride solution into the venous line. Health care providers are esp. alert for signs of air embolism, a potentially fatal complication characterized by sudden hypotension; dyspnea; chest pain; cyanosis; and a weak, rapid pulse. If these signs occur, the patient is turned onto the left side, the head of the bed lowered (to help keep air bubbles on the right side of the heart, where they can be absorbed from the pulmonary vasculature), and the physician notified immediately.

Postprocedure: The venous access site is monitored for bleeding. If bleeding is excessive, pressure is maintained on the site and the physician notified. To prevent clotting and other blood flow problems, the arm used for venous access is not used for any other procedures, including IV line insertion, blood pressure monitoring, and venipuncture. At least four times daily, circulation at the access site is assessed by auscultating for a bruit and by palpating for a thrill. The patient is instructed in these assessment techniques and in the care of the venous access site, cleaning the incision daily and keeping it dry until healing is complete (usually 10 to 14 days). Any pain, swelling, redness, or drainage in the accessed arm should be reported immediately. The patient also should

Hemodynamic Parameters Frequently Measured in Critical Care

Parameter	Formula	Normal Values
cardiac index (CI)	cardiac output/body surface area	2.5-4 L/min
cardiac output (CO)	heart rate x stroke volume	4-8 L/min
central venous pressure (CVP)		2-8 mm Hg
cerebral perfusion pressure (CPP)	mean arterial pressure – intracranial pressure	80-100 mm Hg
ejection fraction (EF)	(ventricular end systolic volume/end diastolic volume) x 100	55-70%
heart rate (HR)		60-100 beats/min
left atrial pressure		8-12 mm Hg
mean arterial pressure (MAP)	systolic blood pressure + (diastolic blood pressure x 2)/3	70-110 mm Hg
pulmonary artery pressure (PAP)		systolic: 15-30 mm Hg; diastolic: 5-12 mm Hg
pulmonary artery wedge pressure (PAWP)		8-12 mm Hg
right atrial pressure		2-8 mm Hg
stroke volume (SV)	(cardiac output/heart rate) x 1000	60-120 ml/beat
systemic vascular resistance (SVR)	[(mean arterial pressure – right atrial pressure)/cardiac output] x 100	800-1200 dynes/sec/cm ²
urinary output (UO)		>0.5 ml/hr/kg

avoid putting excessive pressure on the arm, such as sleeping on it, wearing constricting clothing, or lifting heavy objects. He or she should avoid showering, bathing, or swimming for several hours after dialysis. The patient is instructed to use exercises to promote venous dilation and to enhance blood flow in the affected arm.

If the patient will perform hemodialysis at home, both the patient and a family member must thoroughly understand all aspects of the procedure. They are provided with the phone number of the dialysis center and encouraged to call if any questions or concerns arise. The patient also is advised to arrange for another (trained) person to be present during dialysis in case any problems occur and to contact the National Association of Patients on Hemodialysis and Transplantation or the National Kidney Foundation for information and support.

hemodialyzer (hē'mō-dī'ā-līz'ēr) A device used in performing hemodialysis.

hemodilution (hē'mō-dī-lū'shūn) A relative increase in the volume of blood plasma, resulting in a decrease in the measured concentration (but not in the absolute number) of red blood cells.

hemodynamic monitoring (hē'mō-dī-nām'īk) A general term for determining the functional status of the cardiovascular system as it responds to acute

stress such as myocardial infarction and cardiogenic or septic shock. This may include frequent assessments of blood pressure, pulse, mental status, urinary output, intracardiac pressure changes, and cardiac output. The data obtained permit the critical care team to follow the patient's course closely. SEE: table.

hemodynamics (hē'mō-dī-nām'īks) [Gr. *haima*, blood, + *dynamis*, power] A study of the forces involved in circulating blood through the body.

hemoendothelial (hē'mō-ēn-dō-thē'lē-āl) Pert. to the relationship between blood of the mother and the endothelium of the chorionic vessels. SEE: *placenta*.

hemofiltration (hē'mō-fīl-trā'shūn) An ultrafiltration technique to remove excess metabolic products from the blood. The technical aspects are similar to those of hemodialysis in that the blood flows from the patient to the hemofilter and is then returned.



Depending on the type of filter membrane used, essential materials may be removed from the blood. It is important to replace the excess crystalloids removed.

continuous arteriovenous h. ABBR: CAVH. Continuous renal replacement therapy.

continuous venovenous h. Continuous renal replacement therapy.

hemoflagellate (hēm'ō-flāj'ĕ-lāt') [" + *L. flagellum*, whip] Any flagellate protozoan of the blood. Two important genera are *Trypanosoma* and *Leishmania*.

hemofuscin (hēm'ō-fū'sĭn) [" + *L. fuscus*, brown] A brown pigment, derived from hemoglobin, which produces a reddish color in urine.

hemoglobin (hēm'ō-, hēm'ō-glō'bĭn) [" + *L. globus*, globe] ABBR: Hb, Hbg, Hgb. The iron-containing pigment of red blood cells that carries oxygen from the lungs to the tissues. The amount of hemoglobin in the blood averages 12 to 16 g/100 ml in women, 14 to 18 g/100 ml in men, and somewhat less in children. Hemoglobin is a crystallizable, conjugated protein consisting of heme and globin. In the lungs, 1 g of hemoglobin combines readily with 1.36 cc of oxygen by *oxygenation* to form oxyhemoglobin, an unstable compound. In the tissues where oxygen concentration is low and carbon dioxide concentration is high (low pH), hemoglobin releases its oxygen. Hemoglobin also acts as a buffer for the hydrogen ions produced in red blood cells (RBCs) when carbon dioxide is converted to bicarbonate ions for transport in the plasma.

When old RBCs are phagocytized by macrophages in the liver, spleen, and red bone marrow, the iron of hemoglobin is reused immediately to produce new RBCs or is stored in the liver until needed. The globin is converted to amino acids for the synthesis of other proteins. The heme portion is of no further use and is converted to bilirubin, a bile pigment excreted by the liver in bile.

Hemoglobin combines with carbon monoxide (in carbon monoxide poisoning) to form the stable compound carboxyhemoglobin, which renders hemoglobin unable to bond with oxygen and results in hypoxia of tissues. Oxidation of the ferrous iron of hemoglobin to the ferric state produces methemoglobin.

Hundreds of different types of hemoglobin have been discovered. SEE: *blood*.

h. A A hemoglobin molecule composed of two alpha and two beta chains.

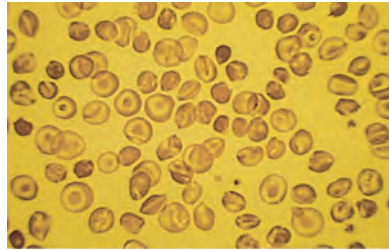
h. A_{1c} ABBR: Hb A_{1c}. Hemoglobin A that contains a glucose group linked to the terminal amino acid of the beta chains of the molecule. The amount of glucose bound to the hemoglobin depends on the average concentration of glucose in the blood over time. In patients with diabetes mellitus, when the blood glucose level is optimally and carefully regulated over 5 to 6 weeks, the Hb A_{1c} level is normal or slightly elevated. If the blood glucose level has not been controlled (and has been abnormally elevated) in the preceding 5 to 6 weeks, the Hb A_{1c} blood level is in-

creased. Hb A_{1c} is a good indicator of long-term glycemic control. The blood test for it may be performed when the patient is not fasting. SYN: *glycohemoglobin*; *glycated hemoglobin*; *glycosylated hemoglobin*.

Bart's h. A form of thalassemia in which the affected individual carries two copies of the alpha thalassemic globin gene from each parent. This condition causes erythroblastosis fetalis, which leads to intrauterine death or death within a few hours of birth.

h. C A hemoglobin molecule in which lysine is substituted for glutamic acid at the sixth position of the beta chain. This substitution decreases the solubility of the hemoglobin molecule and increases the rigidity of the red blood cell membrane.

h. C disease A genetic variant of the hemoglobin molecule that causes a chronic hemolytic anemia with splenomegaly, arthralgias, and abdominal pain. SEE: *illius*.



HEMOGLOBIN C DISEASE

h. E A hemoglobin molecule in which lysine is substituted for glutamic acid at the 26th position of the beta chain. This variation is found most often in people of Southeast Asian ancestry.

h. E disease A genetic variant of hemoglobin that produces a mild form of hemolytic anemia. It is primarily in persons of Southeast Asian origin, in whom it may provide protection against falciparum malaria.

fetal h. The type of hemoglobin found in the erythrocytes of the normal fetus. It has better oxygen-binding capacity than adult hemoglobin and is able to extract oxygen from the placenta to meet the needs of the fetus, which depends entirely on maternal oxygen for its survival.

PATIENT CARE: The induction of fetal hemoglobin (with drugs such as hydroxyurea) in patients with sickle cell anemia often improves their clinical status because fetal hemoglobin does not deform or "sickle" in the circulation. It is capable of taking up and giving off oxygen at lower oxygen tensions than the hemoglobin in adult erythrocytes.

glycated h. h. A_{1c}.

glycosylated h. h. A_{1c}.

h. H disease A genetic variant of hemoglobin that causes a chronic hemolytic anemia marked by hypochromic erythrocytes with inclusion bodies. Sometimes called *thalassemia intermedia*.

h. Lepore A variant hemoglobin formed by an unequal crossover and fusion of the beta and delta genes. A single copy of the variant gene causes thalassemia minor. Homozygotes have thalassemia intermedia.

h. M disorder A genetic variant of hemoglobin that causes cyanosis and methemoglobinemia. The iron in this type of hemoglobin is in the ferric (Fe³⁺) state and cannot combine with oxygen.

mean cell h. The hemoglobin content of the average red blood cell, usually expressed in picograms per red cell and calculated by multiplying the number of grams of hemoglobin/100 ml by 10 and dividing by the red cell count. SYN: *mean corpuscular hemoglobin*.

mean corpuscular h. ABBR: MCH. Mean cell h.

h. S disease A genetic variant of hemoglobin that causes sickle cell trait in heterozygotes and sickle cell disease in homozygotes. It is esp. common in persons of African ancestry in whom sickle cell trait is found in 8% to 10% of the population. SEE: *sickle cell anemia*.

h. SC disease A disease of people who have inherited two abnormal forms of hemoglobin, S and C. Affected people may have vaso-occlusive crises similar to those seen in sickle cell anemia, with bony and visceral infarcts.

hemoglobinemia (hĕmō-glō-bīn-ē'mē-ă) [Gr. *haima*, blood, + L. *globus*, globe, + Gr. *haima*, blood] The presence of hemoglobin in the blood plasma.

hemoglobinocholia (hĕmō-glō'bīn-ō-kō'lē-ă) [" + " + Gr. *chole*, bile] Hemoglobin in the bile.

hemoglobinolysis (hĕmō-glō-bīn-ōl'ī-sis) [" + " + Gr. *lysis*, dissolution] The dissolution of hemoglobin.

hemoglobinometer (hĕmō-glō-bīn-ōm'ē-ter) [" + " + Gr. *metron*, measure] A device for determining the amount of hemoglobin in the blood.

hemoglobinopathy (hĕmō-glō'bī-nōp'ă-thē) Any one of a group of genetic diseases caused by or associated with the presence of one of several forms of abnormal hemoglobin in the blood. SEE: *hemoglobin*.

hemoglobinophilic (hĕmō-glō-bīn-ō-fī'līk) [" + " + Gr. *philein*, to love] Pert. to organisms that grow better in the presence of hemoglobin.

hemoglobinous (hĕmō-glō'bī-nūs) Pert. to or containing hemoglobin.

hemoglobinuria (hĕmō-glō-bīn-ū'rē-ă) [" + L. *globus*, globe, + Gr. *ouron*, urine] The presence in urine of hemo-

globin free from red blood cells. This condition occurs when the amount of hemoglobin from disintegrating red blood cells or from rapid hemolysis of red cells exceeds the ability of the blood proteins to combine with the hemoglobin. **hemoglobinuric**, *adj.*

ETIOLOGY: Causes of this condition include hemolytic anemia, scurvy, purpura, exposure to or ingestion of certain chemicals, such as arsenic and phosphorus, typhoid fever, and septicemia.

cold h. Hemoglobinuria following local or general exposure to cold. SYN: *paroxysmal hemoglobinuria*.

epidemic h. Hemoglobinuria of the newborn characterized by jaundice, cyanosis, and fatty degeneration of heart and liver. SYN: *Winckel's disease*.

intermittent h. Paroxysmal nocturnal hemoglobinuria.

malarial h. Blackwater fever.

march h. Urinary bleeding that occurs following strenuous exercise (e.g., running a marathon).

paroxysmal h. Intermittent, recurring attacks of bloody urine following exposure to cold (cold hemoglobinuria) or strenuous exercise (march hemoglobinuria). Results from increased fragility of red blood cells or presence of a thermolabile autohemolysin.

paroxysmal nocturnal h. ABBR: PNH. A rare form of an acquired hemolytic anemia that results from a defect in membrane-anchored proteins of red blood cells.

SYMPTOMS: The syndrome is characterized by acute onset of fevers and chills, back and extremity pain, and abdominal cramps. Hemoglobinuria occurs if enough red blood cells have been destroyed.

TREATMENT: Erythropoietin may be used to treat the anemia of PNH.

toxic h. Hemoglobinuria resulting from toxic substances such as muscarine or snake venom; toxic products of infectious diseases such as yellow fever, typhoid fever, syphilis, and certain forms of hemolytic jaundice; organisms such as *Plasmodium malariae*, which destroy red blood cells; and foreign protein in blood, e.g., following blood transfusion.

hemolith (hĕmō-līth) [" + *lithos*, stone] A stone in the wall of a blood vessel.

hemolymphangioma (hĕmō-līm-fān'jē-ō'mă) Hematolymphangioma.

hemolysate (hĕ-mōl'ī-sāt) The product of hemolysis.

hemolysin (hĕ-mōl'ī-sīn) [" + *lysis*, dissolution] A toxic agent or condition that destroys red blood cells. SYN: *hemotoxin*.

hemolysin BL ABBR: HBL. An enterotoxin produced by *Bacillus cereus*, which causes epithelial necrosis, inva-

sion of blood vessels, and destruction of blood cells.

hemolysis (hē-mōl'ī-sīs) [*h* + *lysis*, dissolution] The destruction of red blood cells (RBCs) because of RBC diseases (e.g., spherocytosis or sickle cell disease) or because of their exposure to drugs, toxins, artificial heart valves, antibodies, some infections, or snake venoms. The cell membranes are destroyed directly or through antibody-mediated lysis. Donor antibodies in blood products cause hemolysis associated with transfusion reactions. Autoantibodies develop as the result of disease (esp. hematological cancers), in response to certain drugs (e.g., alpha-methyl dopa), or in Rh-negative mothers carrying an Rh-positive fetus. Viral and bacterial infections are frequent causes of hemolysis in children, whose RBC membranes are very fragile. Organisms causing hemolysis include certain streptococci, staphylococci, and the tetanus bacillus. It also occurs in smallpox and diphtheria and following severe burns.

When the RBCs are destroyed, hemoglobin is released into the surrounding plasma and lost through the kidneys, turning the urine red, a condition called hemoglobinuria.

When hemolysis is gradual, patients compensate for the resulting anemia, reporting only fatigue and a slight tachycardia with physical exertion. Laboratory tests show decreased RBC count, hemoglobin, haptoglobin, and hematocrit, as well as elevated levels of lactate dehydrogenase and unconjugated bilirubin. Fragments of RBCs may sometimes be seen under the microscope. SEE: *autoantibody*; *fragility of red blood cells*; *hemolytic anemia*.

colloid osmotic h. The swelling and rupture of red blood cells when they become excessively permeable to sodium and fill with water.

hemolytic (hē'mō-lit'ik) Pert. to the breaking down of red blood cells.

h. disease of the newborn Neonatal disease characterized by anemia, jaundice, liver and spleen enlargement, and generalized edema (hydrops fetalis). SYN: *erythroblastosis fetalis*. SEE: *Rh blood group*.

ETIOLOGY: This disease is caused by transplacental transmission of maternal antibody, usually evoked by maternal and fetal blood group incompatibility. Incompatibilities of the ABO system are common but are not severe because maternal antibodies are too large to cross the placenta readily. Rh incompatibility, however, can result in profound fetal anemia, causing death in utero.

Rh incompatibility may develop when an Rh-negative woman carries an Rh-positive fetus. At the time of delivery,

fetal red blood cells may enter maternal circulation, stimulating antibody production against the Rh factor. In a subsequent pregnancy, these antibodies cross the placenta to the fetal circulation and destroy fetal red blood cells.

TREATMENT: In cases of Rh incompatibility, the condition can be controlled during pregnancy by following the anti-Rh titer of the mother's blood and the bilirubin level of the fetus by amniocentesis. These indices show whether the pregnancy should be allowed to go to full term and if intrauterine transfusion is indicated; or if labor should be induced earlier. Delivery should be as free of trauma as possible and the placenta should not be manually removed. The infant with hemolytic disease should be immediately seen by a physician who is capable of and has the facilities and blood supplies available for exchange transfusion. The use of Rh (D) immune globulin after abortion, at 28 weeks' gestation, and within 72 hr of delivery has been beneficial.

h. uremic syndrome An acute condition consisting of microangiopathic hemolytic anemia, thrombocytopenia, and acute nephropathy. *Escherichia coli* 0157:H7 is a causative agent that may be acquired from eating contaminated raw or rare hamburger or other meats. Children are most often affected. Onset may initially involve gastroenteritis and diarrhea or an upper respiratory tract infection. Hallmarks of the acute phase are a purpuric rash, irritability, and lethargy. Findings include oliguria, splenomegaly, mild jaundice, seizures (in some patients), hepatomegaly, pulmonary edema, and renal failure. The acute phase may last from 1 to 2 weeks in mild cases and much longer in severe cases.

TREATMENT: The treatment of this syndrome is management of the renal failure and anemia. Antibiotics are ineffective.

PROGNOSIS: The usual outcome is complete recovery, but about 5% of affected persons die and 10% of patients develop end-stage renal disease and require life-long hemodialysis.

PATIENT CARE: If the child has been anuric for 24 hours or demonstrates oliguria with seizures and hypertension, the physician places a peritoneal catheter and the nurse institutes peritoneal dialysis as prescribed, with fluid replacement based on estimated sensible and insensible losses. Fluid and electrolyte balance, complete blood count, body weight, sensorium, and vital signs are carefully monitored, and BUN and azotemia levels are followed to evaluate therapy. Hypertension is reported and controlled with antihypertensive drugs. Severe anemia is treated with fresh,

washed packed red blood cells; careful assessment is required throughout the transfusion to prevent circulatory overload, hypertension, and hyperkalemia. Seizures are managed by treating specific causes when known (hypertension, hyponatremia, hypocalcemia), and with anticonvulsant drugs as required. The patient is protected from injury during seizure activity, with the airway guarded. Heart and breath sounds are auscultated periodically, as cardiac failure with pulmonary edema can occur in association with hypervolemia. Prevention and treatment include water and sodium restriction and diuretic therapy, if prescribed. Meeting the child's nutritional needs can be difficult, as concentrated foods must be ingested without fluids and the child may be nauseated. The dietitian should be consulted for nutrition management. The child who is quite ill also may be irritable, restless, anxious, and frightened by frequent painful and stress-producing tests and treatments. Comfort and stability are provided in this threatening environment. Whenever possible, arrangements are made for one or both parents to remain with their child at all times. Support and reassurance are given to the parents and significant others, who are stressed by the severity of the illness and who may experience a degree of guilt if the illness resulted from ingestion of contaminated or raw foods. The family benefits not only from explanations about tests and treatments and information about their child's progress but also from sympathetic listening.

hemolytic transfusion reaction The destruction of donated and infused red blood cells by antibodies in the person receiving the transfusion. SEE: under *transfusion reaction*.

hemolytic unit The amount of inactivated immune serum that causes complete hemolysis of 1 ml of a 5% emulsion of washed red blood cells in the presence of complement.

hemolyze (hē'mō-līz) To destroy red blood cells.

hemomediastinum (hē'mō-mē'dē-ă-stī-nūm) [Gr. *haima*, blood, + L. *mediastinus*, in the middle] Effusion of blood into mediastinal spaces. SYN: *hematomediastinum*.

hemometra (hē'mō-mē'trā) [" + *metra*, uterus] Hematometra.

hemonephrosis (hē'mō-nē-frō'sīs) [" + *nephros*, kidney, + *osis*, condition] Accumulation of blood in the renal pelvis. SYN: *hematonephrosis*.

hemopathic (hē'mō-pāth'ik) [" + *pathos*, disease, suffering] Relating or due to disease of the blood.

hemopathology (hē'mō-pā-thōl'ō-jē) [" + " + *logos*, word, reason] The science of blood disorders.

hemoperfusion (hē'mō-pēr-fū'zhūn) The perfusion of blood through substances, such as activated charcoal or ion-exchange resins, to remove toxic materials. The blood is then returned to the patient. This technique differs from hemodialysis in that the blood is not separated from the chemicals or solutions by a semipermeable dialysis membrane. SEE: *hemodialysis*.

hemopericardium (hē'mō-pēr'ī-kār'dē-ūm) [" + *peri*, around, + *kardia*, heart] Accumulation of blood in the pericardium.

hemoperitoneum (hē'mō-pēr'ī-tō-nē'ūm) [" + *peritonaion*, peritoneum] Bleeding into the peritoneal cavity.

hemophage (hē'mō-fāj) [" + *phagein*, to eat] A cell that destroys red blood cells by phagocytosis.

hemophagocyte (hē'mō-fāj'ō-sīt) [" + " + *kytos*, cell] A phagocyte that ingests red blood cells.

hemophagocytosis (hē'mō-fāj'ō-sī-tō'sīs) [" + " + " + *osis*, condition] The ingestion of red blood cells by phagocytes.

hemophil (hē'mō-fil) [" + *philein*, to love] A type of bacteria that grows very well on agar that contains blood.

hemophilia (hē'mō-, hēm'ō-fil'ē-ă) [" + *philein*, to love] A group of hereditary bleeding disorders marked by deficiencies of blood-clotting proteins. Hemophilias are rare. Hemophilia A affects 1 in 5,000 to 10,000 boys; hemophilia B is present in about 1 in 30,000 boys. SEE: *blood*; *Nursing Diagnoses Appendix*.

ETIOLOGY: There are two principal types: hemophilia A (in which blood clotting factor VIII: C is either missing from the bloodstream or defective) and hemophilia B (in which blood clotting factor IX is deficient or defective). Both of these disorders are sex-linked (i.e., caused by X chromosome mutations) and occur in boys only.

SYMPTOMS: Bleeding after minor trauma is the hallmark of the hemophilias. Typically, bleeding occurs in the joints (hemarthrosis), in soft tissues, and in the urinary tract. Bleeding may also occur during dental procedures and surgery. Intracranial bleeding and bleeding into deep body sites may be life-threatening.

TREATMENT: Deficient clotting factors can be replaced intravenously, but doing so has carried significant risks. In the 1980s, for example, the injection of contaminated clotting factors spread hepatitis C and human immunodeficiency virus to many patients with hemophilia. Before these epidemics, these patients had life expectancies of about 65 years. Acquired immunodeficiency syndrome and other blood-borne infections decreased the average lifespan of patients with hemophilia to about 50

years. Today, the purification of clotting factors has resulted in safer treatment for patients with hemophilia.

Genetic counseling: Females are the carriers of sex-linked hemophilias and have a 50% chance of transmitting the affected X gene to each daughter (who would then also be a carrier) and a 50% chance of transmitting the affected X gene to each son, who would be born with hemophilia.

Expression of the disease: The severity of hemophilia is determined by the degree of factor deficiency: mild—factor levels 5% to 40% of normal; moderate—factor levels 1% to 5% of normal; severe—factor levels less than 1% of normal. Mild hemophilia may not be diagnosed until adulthood if the patient does not bleed spontaneously or after minor trauma.

Replacement of clotting factors: Factor replacement products include cryoprecipitate, lyophilized factor VIII or IX, and fresh frozen plasma. Other agents that aid blood clotting, such as desmopressin DDAVP (administered intravenously or intranasally) and epsilon-aminocaproic acid, are also helpful in managing or preventing bleeding episodes. The goal of treatment is to limit bleeding and prevent the irreversible destructive arthritis that results from repeated hemarthrosis and synovial hypertrophy.



Patients with hemophilia should avoid drugs that interfere with anticoagulation and should avoid sports or other activities in which there is a high likelihood of traumatic injury. In addition, they should wear bracelets identifying their illness to medical personnel.

PATIENT CARE: In the bleeding patient, vital signs are monitored, and the patient is observed for signs and symptoms of decreased tissue perfusion (i.e., restlessness, anxiety, confusion, pallor, cool and clammy skin, chest pain, decreased urine output, hypotension, tachycardia). Clotting factors are administered as prescribed. Repeat infusions will be required until bleeding stops, as the body uses up these factors in 48 to 72 hr. The skin, mucous membranes, and wounds are inspected for bleeding. Emergency care is provided for external bleeding; wounds are cleaned; and gentle, consistent pressure is applied to stop the bleeding. The injured part is elevated and cold compresses or ice bags applied to the site. Oral analgesics are provided as prescribed to manage pain (IM or SC administration could result in hematoma formation), and the patient and family are taught to avoid aspirin, aspirin-containing drugs, and NSAIDs because

they decrease platelet adherence and thus may increase bleeding. Safety measures are instituted to prevent injury, and the patient and family are instructed in these measures. The patient is assessed for development of hemarthrosis, and appropriate care is provided, which includes elevating the affected part, immobilizing the joint in a slightly flexed position, and applying ice intermittently. Replacement of the deficient factor will be needed pre- and post-surgery, and possibly even for dental extractions or other dental care, although DDAVP may be used for dental concerns. The patient is monitored for adverse reactions to blood products, such as flushing, headache, tingling, fever, chills, urticaria, and anaphylaxis. Movement of the injured part is restricted, and exercise and weight bearing are prohibited for 48 hours until bleeding has stopped and swelling has subsided. Gentle passive range-of-motion exercises are then provided, with gradual progression to active-assisted and then active exercise. Intracranial, muscle, subcutaneous, renal, and cardiac bleeding are monitored and managed according to protocols or as prescribed by the hematologist. Fluid balance is monitored throughout emergencies, and adequate fluid replacement is instituted as needed.

Both the patient and family are encouraged to verbalize their fears and concerns, and accurate information, realistic reassurance, and emotional support are provided. Health care providers remain with the anxious or fearful patient or family. Gentle, careful, but thorough oral care is provided with a soft toothbrush or sponge-stick (toothette) to prevent inflamed and bleeding gums, and the patient is instructed in this method. Regular dental examinations are recommended. Regular isometric exercise is encouraged to strengthen muscles, which in turn protects joints by reducing the incidence of hemarthrosis. Use of safety measures to protect the patient from injury is encouraged, while unnecessary restrictions that impair normal development are discouraged. The patient should remain independent and self-sufficient; assistance is provided to both the patient and family to identify safe activities. Techniques are taught for managing bleeding episodes at home. The use of transfusion therapy is explained, and information is provided on all available methods of obtaining such therapy (including how to administer cryoprecipitate at home if appropriate). The seriousness of head injuries and the need for their immediate treatment are explained. Diver-sional activities and private time with family and friends are provided to help

Comparison of Hemoptysis and Hematemesis

Hemoptysis	Hematemesis
Blood is coughed up. Blood is frothy, bright red, and alkaline.	Blood is vomited. Blood is either dark or bright red, usually not frothy, and acid. It may have a coffee-ground appearance.
Blood may be mixed with sputum. Dyspnea, pleuritic pain, or other chest discomfort is common.	Blood may be mixed with food or bile. Nausea or abdominal pain is common.
Underlying diagnoses commonly include bronchitis, pneumonia, tuberculosis, nosebleed, lung cancer, pulmonary embolism or infarct, foreign bodies, and, rarely, autoimmune illnesses.	Underlying diagnoses commonly include peptic ulcers, gastritis, esophagitis, duodenitis, esophageal varices, upper GI tumors, vascular malformations, nosebleed, and tears in the esophagus.

the patient overcome feelings of isolation. The patient's and family's knowledge of the disease and its treatment, as well as the impact on the patient, siblings, and parents' marital relationship, are continually assessed. The patient and family are encouraged to talk with others in similar circumstances through local support groups and services, and they are referred for genetic counseling and for information and support to the National Hemophilia Foundation (800-42-HANDI; www.hemophilia.org).

h. A Hemophilia due to a deficiency of blood coagulation factor VIII C.

h. B Hemophilia due to a deficiency of blood coagulation factor IX (plasma thromboplastin component). This condition can be treated with a lyophilized product that contains concentrated factor IX. SYN: *Christmas disease*.

h. C Hemophilia due to a deficiency of blood coagulation factor XI.

hemophilic (hē'mō-fil'ē-āk) One afflicted with hemophilia.

hemophilic (hē'mō-fil'ik) 1. Fond of blood; said of bacteria that grow well in culture media containing hemoglobin. 2. Pert. to hemophilia or hemophiliacs.

Hemophilus (hē-mōf'i-lūs) *Haemophilus*.

hemophobia (hē'mō-fō'bē-ā) [Gr. *haima*, blood, + *phobos*, fear] An aversion to seeing blood or to bleeding.

hemophthalmia, hemophthalmus (hē'mōf-thāl'mē-ā, -mūs) [ʹ + *ophthalmos*, eye] An effusion of blood into the eye.

hemopneumopericardium (hē'mō-nū'mō-pēr'i-kār-dē-ūm) [ʹ + *pneuma*, air, + *peri*, around, + *kardia*, heart] Blood and air in the pericardium.

hemopneumothorax (hē'mō-nū-mō-thō'rāks) [ʹ + ʹ + *thorax*, chest] Hemorrhage and the release of air into the chest, often as a result of trauma, but occasionally occurring spontaneously.

hemopoiesis (hē'mō-poy-ē'sis) [ʹ + *poiesis*, formation] Hematopoiesis.

hemoprecipitin (hē'mō-prē-sīp'ī-tin) A precipitin in the blood.

hemoprotein (hē'mō-prō'tē-īn) Any protein combined with the heme blood pigment.

hemopsonin (hē'mōp-sō'nīn) [ʹ + *opsonin*, to buy food] An antibody that makes red blood cells more susceptible to phagocytosis.

hemoptysis (hē-mōp'tī-sis) [ʹ + *ptyein*, to spit] The expectoration of blood that arises from the larynx, trachea, bronchi, or lungs. Massive hemoptysis, which occurs rarely, should be managed by a pulmonary specialist experienced in bronchoscopy. Small amounts of hemoptysis may occur in many illnesses, including acute bronchitis, pneumonia, pulmonary tuberculosis, and cancers of the lung. Management depends on the underlying disorder. A careful history and physical examination, along with chest x-ray examination and laboratory studies, often help identify the underlying cause. SEE: table; *bleeding*; *hematemesis*; *hemorrhage*; *Nursing Diagnoses Appendix*.

PATIENT CARE: Vital signs are monitored to determine the patient's stability; special emphasis is placed on evaluations of respiration and hemodynamics. Standard precautions are used when blood and secretions are handled and when the patient is cleansed. Expectorated blood is inspected to assist in determining the site of bleeding. Blood and secretions are saved for the physician's inspection and possible laboratory analysis. A quiet, calm, and reassuring environment is maintained. The patient is placed on bedrest with the head slightly elevated and turned to keep the bleeding side, if known, down. Oral care is provided and fluids are administered as ordered. Excessive coughing is discouraged. Anticoagulants are withheld.

hemorrhage (hēm'ē-rīj) [ʹ + *rhegnynai*, to burst forth] Blood loss. The term is usually used to describe episodes of

bleeding that last more than a few minutes, compromise organ or tissue perfusion, or threaten life. The most hazardous forms of blood loss result from arterial bleeding, internal bleeding, or bleeding into the cranium. The risk of uncontrolled bleeding is greatest in patients who have coagulation disorders or take anticoagulant drugs. SEE: table.

SYMPTOMS: Orthostatic dizziness, weakness, fatigue, shortness of breath, and palpitations are common symptoms of hemorrhage. Signs of hemorrhage include tachycardia, hypotension, pallor, and cold moist skin.

TREATMENT: Pressure should be applied directly to any obviously bleeding body part, and the part should be elevated. Caution may be used to stop bleeding from visible vessels. Ligation of blood vessels, surgical removal of hemorrhaging organs, or the instillation of sclerosants is often effective in managing internal hemorrhage. Procoagulants (e.g., vitamin K, fresh frozen plasma, cryoprecipitate, desmopressin) may be administered to patients with primary or drug-induced bleeding disorders. Transfusions of red blood cells may be given if bleeding compromises heart or lung function or threatens to do so because of its pace or volume.

For trauma patients with massive bleeding, the experienced nurse or emergency care provider may apply pneumatic splints or antishock garments during patient transportation to the hospital. These devices may prevent hemorrhagic shock.



Standard precautions should be used for all procedures involving contact with blood or wounds.

antepartum h. Excessive blood loss during the prenatal period, most commonly associated with spontaneous or

induced abortion, ruptured ectopic pregnancy, placenta previa, or abruptio placentae.

arterial h. A hemorrhage from an artery. In arterial bleeding, which is bright red, the blood ordinarily flows in waves or spurts; however, the flow may be steady if the torn artery is deep or buried.

FIRST AID: Almost all arterial bleeding can be controlled with direct pressure to the wound. If it cannot be controlled with applied pressure, the responsible artery may need to be surgically ligated. SEE: *arterial bleeding* for table; *pressure point*.

capillary h. Bleeding from minute blood vessels, present in all bleeding. When large vessels are not injured, capillary bleeding may be controlled by simple elevation and pressure with a sterile dry compress.

carotid artery h. Bleeding from the carotid artery. This type of hemorrhage can be rapidly fatal because it may be profuse and may deprive the brain of oxygen.

FIRST AID: The wound should be compressed with the thumbs placed transversely across the neck, both above and below the wound, and the fingers directed around the back of the neck to aid in compression. Urgent surgical consultation is required.

cerebral h. Bleeding into the brain, a common cause of stroke. SEE: *stroke*.

ETIOLOGY: It usually results from rupture of aneurysm, extremely high blood pressure, brain trauma, or brain tumors.

SYMPTOMS: Most people with intracerebral bleeding experience headache. This type of hemorrhage may cause symptoms of stroke (e.g., unconsciousness, apnea, vomiting, hemiplegia) and death. There may be speech disturbance, incontinence of the bladder and rectum, or other findings, depending on the area of brain damage.

TREATMENT: Supportive therapy is needed to maintain airway and oxygenation. Neurosurgical consultation should be promptly obtained. Hydration and fluid and electrolyte balance should be maintained. Rehabilitation may include physical therapy, speech therapy, and counseling.

choroidal h. Bleeding into the choroid of the eye, a complication of systemic anticoagulation, hypertension, macular degeneration, some ocular surgeries, and ocular metastases of malignant tumors. Visual impairment resulting from the bleeding is usually significant.

eight-ball h. A hyphema in which the anterior chamber of the eye fills completely with blood.

fibrinolytic h. A hemorrhage due to a

Common Sites of Bleeding

Location	Descriptive Term
Biliary tract	Hemobilia
Fallopian tubes	Hemosalpinx
Lower GI tract	Hematochezia; melena
Upper GI tract	Hematemesis
Joints	Hemarthrosis
Lungs/Bronchi (coughed up)	Hemoptysis
Nasal passages	Epistaxis
Skin	Ecchymosis
Urinary tract	Hematuria

defect in the fibrin component in blood coagulation.

gastrointestinal h. Gastrointestinal bleeding.

internal h. Hemorrhage into an area where it is not visible. SYN: *occult bleeding*.

intracranial h. ABBR: ICH. Bleeding into the cranium. It is a devastating form of stroke with a high rate of mortality.

PATIENT CARE: Patients with ICH should be treated emergently with infusions of recombinant factor VIIa in an intensive care unit, where minute-to-minute monitoring of intracranial pressures, blood glucose levels, neurological status, and hemodynamics can be carried out. Patients should initially be kept at bedrest with the head of the bed elevated. Fever should be suppressed and seizures prevented with the administration of anticonvulsant drugs. As the patient stabilizes, rehabilitation supervised by occupational therapists, physical therapists, and speech therapists should be initiated.

h. of the knee Bleeding from the knee.

TREATMENT: If the bleeding is at the knee or below, a pad should be applied with pressure. If the bleeding is behind the knee, a pad should be applied at the site and the leg bandaged firmly. The bandage should be loosened at 12-min to 15-min intervals to prevent arterial obstruction.

lung h. Hemorrhage from the lung, with bright red and frothy blood, frequently coughed up.

petechial h. Hemorrhage in the form of small rounded spots or petechiae occurring in the skin or mucous membranes.

postmenopausal h. Bleeding from the uterus after menopause.

postpartum h. ABBR: PPH. Hemorrhage that occurs after childbirth. It is a major cause of maternal morbidity and mortality in childbirth. *Early postpartum hemorrhage* is defined as a blood loss of more than 500 ml of blood during the first 24 hr after delivery. The most common cause is loss of uterine tone caused by overdistention. Other causes include prolonged or precipitate labor; uterine overstimulation; trauma, rupture, or inversion; lacerations of the lower genital tract; or blood coagulation disorders. *Late postpartum hemorrhage* occurs after the first 24 hr have passed. It usually is caused by retained placental fragments.

PATIENT CARE: Many instances of PPH can be prevented with the administration of oxytocin, misoprostol, or other uterotonic medications. The woman's prenatal, labor, and delivery records are reviewed. The presence of

risk factors is noted, and the woman's pulse, blood pressure, fundal and bladder status, and vaginal discharge are assessed every 15 min. If the fundus is boggy, it is massaged to stimulate uterine contractions, and then the status of the woman's bladder is assessed. If the bladder is distended, the patient is encouraged to void and then postvoiding fundal status is assessed; if the fundus remains firm after massage, the fundus and vaginal flow are reassessed in 5 min. SEE: *fundal massage*.

If bleeding does not respond to the above measures or if the fundus remains firm and the patient exhibits bright red vaginal discharge, retained placental fragments or cervical or vaginal laceration should be suspected; the practitioner who delivered the baby should be notified. Continued massage at this point is contraindicated; the physician or nurse midwife may order uterotonic agents to stimulate uterine contractions. Vital signs should be closely monitored. Common findings in hemorrhage include an increase in pulse rate, often associated with a drop in blood pressure. Pharmacological agents such as methylergonovine or prostaglandin F₂ analogs may be administered intramuscularly or intravenously. If blood loss has been extensive, intravenous infusions or blood transfusion may be needed to combat hypovolemic shock. If the patient exhibits signs of a clotting defect, prompt life-saving treatment is imperative. SEE: *disseminated intravascular coagulation*.

The patient is prepared for and the primary caregiver is assisted with examination of the uterine cavity, removal of any placental fragments, or repair of any lacerations. To reduce the patient's anxiety, all procedures are explained, support and comfort are provided, and the mother is assured that her newborn is receiving good care.

primary h. A hemorrhage immediately following any trauma.

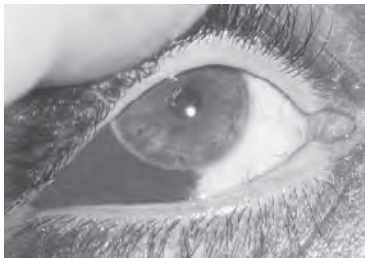
retroperitoneal h. Bleeding into the retroperitoneal space.

secondary h. 1. A hemorrhage occurring some time after primary hemorrhage, usually caused by sepsis and septic ulceration into a blood vessel. It may occur after 24 hr or when a ligature separates, usually between the 7th and 10th days. **2.** Bleeding from the mother's uterus or the infant's umbilicus, resulting from a septic infection.

subarachnoid h. ABBR: SAH. Bleeding into the subarachnoid space of the brain, usually because of the rupture of an intracranial aneurysm or arteriovenous malformation, and occasionally because of hypertensive vascular disease. The bleeding causes intense headache pain, often with nau-

sea and vomiting, loss of consciousness, paralysis, and, in some cases, coma, decerebrate posturing, and brain death. About 30,000 Americans are affected annually. Prompt diagnosis is facilitated by neuroimaging or lumbar puncture. A neurosurgical consultation should be obtained.

subconjunctival h. Rupture of the superficial capillaries with associated hemorrhage into the subconjunctival space. **SEE:** *illus.*



SUBCONJUNCTIVAL HEMORRHAGE

ETIOLOGY: Subconjunctival hemorrhage can result from blunt trauma to the eye or from increased intracranial or intraocular pressure.

SYMPTOMS: Patients have visible bleeding between the sclera and the conjunctiva.

TREATMENT: A subconjunctival hemorrhage normally resolves within 1 to 7 days.

thigh h. Bleeding at the upper part of the thigh, near the groin.

TREATMENT: A pad or gauze should be inserted into the wound and pressure applied. Failure of the bleeding to stop requires surgical consultation.

typhoid h. Gastrointestinal (GI) bleeding due to ulceration of the upper GI tract, typically during the second or third week of untreated typhoid.

uterine h. Hemorrhage into the cavity of the uterus. The three types of pathologic uterine hemorrhage are essential uterine hemorrhage (*metropathia haemorrhagica*), which occurs with pelvic, uterine, or cervical diseases; intrapartum hemorrhage, which occurs during labor; and postpartum hemorrhage, which occurs after the third stage of labor. The last may be caused by rupture, lacerations, relaxation of the uterus, hematoma, or retained products of conception, including the placenta or membrane fragments.

ETIOLOGY: Common causes are trauma; congenital abnormalities; pathologic processes (e.g., tumors; infections, esp. of the alimentary, respiratory, and genitourinary tracts); and generalized vascular disorders such as purpuras and coagulation defects. Hemorrhage may also result from premature separation

of the placenta, particularly with extravasation into the uterine musculature, and from retained products of conception after abortion or delivery. **SEE:** *abruptio placentae; Couvelaire uterus.*

TREATMENT: An umbrella pack will apply pressure to the uterine arterial supply. When ultrasonography reveals that retained placental fragments are the source of hemorrhage, they are usually removed by suction or surgical curettage. If the uterus is flaccid, it can usually be stimulated to contract by administering intravenous oxytocin. The patient may need transfusion and, in some cases, surgery to prevent fatal hemorrhage.

venous h. Hemorrhage from a vein, characterized by steady, profuse bleeding of rather dark blood.

PATIENT CARE: The patient should be reassured while direct pressure to the wound is applied and the affected body part is elevated. If bleeding does not stop after 15 min of direct pressure, evaluation by a health care provider is advisable. Vital signs should be monitored whenever bleeding does not stop with direct pressure, and IV fluids should be initiated as necessary to prevent hypovolemic shock.

vicarious h. Hemorrhage from one part as a result of suppression of bleeding in another part. **SEE:** *menstruation, vicarious.*

hemorrhagenic (hēm"ō-ră-jěn'ik) [*" + rhexnynai*, to burst forth, + *gennan*, to form] Producing hemorrhage.

hemorrhagic (hēm-ō-răj'ik) Pert. to or marked by hemorrhage.

h. disease of the newborn Hemorrhaging due to an inadequate supply of prothrombin received from the mother or a delay in the establishment of the bacterial intestinal flora that produces vitamin K. Parenteral vitamin K given to the infant within 6 hr of birth prevents this condition.

h. fever with renal syndrome An arthropod-borne viral disease caused by Hanta virus or related viruses. **SEE:** *hantavirus pulmonary syndrome.*

h. nephrosonephritis An acute infectious disease caused by the Hanta virus, with abrupt onset of fever that lasts 3 to 8 days, conjunctival injection, prostration, anorexia, and vomiting. Renal involvement may be mild or progress to acute renal failure, which may last several weeks. The mode of transmission is unknown but is apparently not from person to person. The incubation period varies from 9 to 35 days. Shock and renal failure should be treated symptomatically. There is no specific therapy. Also known as *epidemic hemorrhagic fever* and *Korean hemorrhagic fever.*

viral h. fever **ABBR:** VHF. One of a

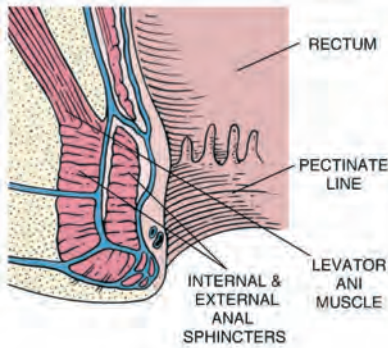
group of diseases caused by arthropod-borne viruses, esp. the Bunyaviridae group, including Lassa, Marburg, Ebola, Rift Valley, and Congo-Crimean hemorrhagic fever viruses.

hemorrhoid (hēm'ō-royd) [Gr. *haimorrhōis*] Veins of the internal or external hemorrhoidal plexuses and the immediately surrounding tissues. Hemorrhoids are most often referred to only when diseased (i.e., enlarged, painful, bleeding). Other anorectal conditions (e.g., anal fissure, condylomata, anal cancers) may produce similar symptoms and must be distinguished from hemorrhoids by appropriate examination. SYN: *piles*. SEE: *illus.*; *Nursing Diagnostics Appendix*.

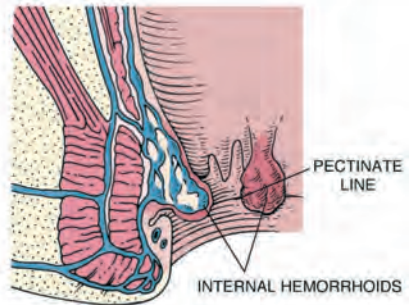
TREATMENT: Therapy depends on the severity of the symptoms, not the extent of the hemorrhoids. In many instances, the only therapy required is improvement in anal care, adherence to

appropriate fluid intake and diet if necessary, and administration of stool softeners to prevent straining to have a bowel movement. Measures to reduce local pain and congestion include the temporary use of local anesthetic agents, lubrication, cold compresses, warm sitz baths, and thermal packs. The necessity of surgery or other modalities of direct intervention (e.g., latex band ligation, sclerotherapy, cryosurgery, infrared photocoagulation, laser surgery) need not be applied until the acute process resolves except in cases of significant bleeding, intractable pain, recurrent episodes, and various individualized considerations. SEE: *hemorrhoidectomy*.

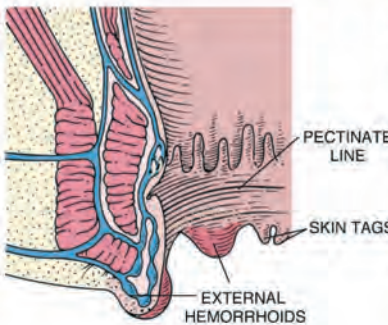
external h. Hemorrhoid located at or distal to the pectinate line (dentate margin), covered by anodermal epithelium or skin and extremely sensitive to most stimuli. SEE: *hemorrhoid* for *illus.*



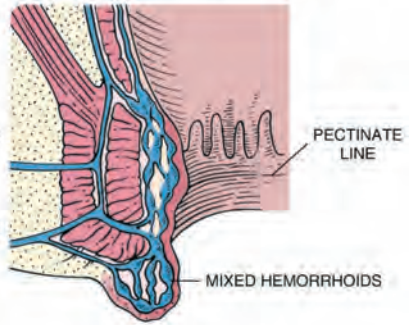
ANATOMY OF RECTUM



ORIGIN OF HEMORRHOIDS IS ABOVE PECTINATE LINE (INTERNAL PLEXUS)



ORIGIN OF HEMORRHOIDS IS BELOW PECTINATE LINE (EXTERNAL PLEXUS)



ORIGIN OF HEMORRHOIDS IS ABOVE AND BELOW PECTINATE LINE (INTERNAL AND EXTERNAL PLEXUS)

HEMORRHOIDS

internal h. Hemorrhoid located proximal to the pectinate line, covered by mucous membrane and relatively insensitive to direct noxious stimuli. SEE: *hemorrhoid* for *illius*.

mixed (or combined) h. Hemorrhoid that incorporates both internal and external components.

prolapsed h. The protrusion of an internal hemorrhoid through the anus. SEE: *illius*.



PROLAPSED HEMORRHOIDS

strangulated h. A prolapsed hemorrhoid that is trapped by the anal sphincter, thus compromising blood flow to the vein in the hemorrhoid.

hemorrhoidal (hēm-ō-roy'dāl) **1.** Relating to hemorrhoids. **2.** Pert. to anal structures, e.g., inferior hemorrhoidal nerve, hemorrhoidal venous plexuses, and inferior hemorrhoidal arteries, etc.

hemorrhoidectomy (hēm'ō-royd-ĕk'tō-mē) [Gr. *haimorrhōis*, vein liable to bleed, + *ektome*, excision] The excision or destruction of hemorrhoids by one of several techniques, including traditional surgery, cryosurgery, laser surgery, infrared photocoagulation, latex band ligation, and sclerotherapy. The latter three modalities are used exclusively for internal hemorrhoids. SEE: *Nursing Diagnoses Appendix*.

PATIENT CARE: Preparation for diagnostic testing is explained. The patient is taught about the use of stool softeners and is encouraged to increase fluid and fiber intake (unless otherwise restricted) and to exercise to prevent constipation. The patient should not sit on the toilet for longer than necessary in order to avoid venous congestion. The need for good anal hygiene is emphasized, and the patient is cautioned against vigorous wiping and the use of harsh soaps and toilet tissues containing dyes or perfumes.

If hemorrhoidectomy is indicated, physical and psychological preparation is conducted; details of postoperative care are explained to the patient. Postoperatively, vital signs and fluid balance are monitored, dressings are checked, and excessive drainage or

bleeding is reported. The patient's ability to void within the designated period is ensured. Perianal care is provided and taught to the patient; analgesics and local measures (sitz baths) to reduce pain and swelling are provided. The patient is encouraged to assume a prone position for 15 minutes every few hours to reduce edema at the surgical site. When oral intake is tolerated, a bulk-forming or stool-softening laxative is administered as prescribed to ease defecation. Before discharge the patient is instructed to report increased rectal bleeding, purulent drainage, fever, constipation, or rectal spasm. The patient also is cautioned against overuse of laxatives.

hemosalpinx (hē'mō-sāl'pinks) [Gr. *haima*, blood, + *salpinx*, tube] Hematosalpinx.

hemosiderin (hē'mō-sīd'ēr-in) [" + *sideros*, iron] An iron-containing pigment derived from hemoglobin from disintegration of red blood cells. It is one form in which iron is stored until it is needed for making hemoglobin.

hemosiderosis (hē'mō-sīd-ēr-ō'sīs) [" + *osis*, condition] A condition characterized by the deposition, esp. in the liver and spleen, of hemosiderin. It occurs in diseases associated with excess iron accumulation in the body (e.g., the iron storage diseases) and hemolytic anemias and after multiple transfusions. SEE: *hemochromatosis*.

hemospermia (hē'mō-spēr'mē-ā) [" + *sperma*, seed] Hematospermia.

hemostasis, hemostasia (hē'mōs'tā-sīs, hē'mō-stā'zē-ā) [" + *stasis*, standing still] **1.** An arrest of bleeding or of circulation. **2.** Stagnation of blood.

hemostat (hē'mō-stāt) [" + *statikos*, standing] **1.** A device or medicine that arrests the flow of blood. **2.** A compressor for controlling hemorrhage of a bleeding vessel.

hemostatic (hē'mō-stāt'ik) **1.** Arresting hemorrhage. **2.** Any drug, medicine, surgical device, or blood component that serves to stop bleeding, such as vasopressin, gamma-aminobutyric acid, vitamin K, whole blood, or epinephrine applied locally.

hemostyptic (hē-mō-stīp'tik) [" + *styp-tikos*, astringent] An astringent that stops bleeding; a chemical hemostatic.

hemothorax (hē'mō-thō'rāks) [" + *thorax*, chest] Blood or bloody fluid in the pleural cavity caused by rupture of blood vessels resulting from inflammation of the lungs in pneumonia or pulmonary tuberculosis, lung cancer, or trauma. SEE: *Nursing Diagnoses Appendix*.

hemotoxin (hē'mō-tōks'in) [" + *toxikon*, poison] Hemolysin.

hemotrophe (hē'mō-trōf) [" + *trophe*, nourishment] Nutrition carried to the

developing embryo by the maternal blood.

hemotrophic (hē-mō-trōf'ik) [*h* + *trophe*, nourishment] Pert. to nutrients carried in the blood.

h. nutrition Transplacental passage of nutrients from the maternal bloodstream to the fetal circulation.

hemotropic (hē-mō-trōp'ik) [*h* + *tropos*, turning] Attracted to or having an affinity for blood or blood cells.

hemotympanum (hē'mō-tim'pā-nūm) [*h* + *tympanon*, drum] Blood in the middle ear, a finding sometimes identified in serious traumatic brain injury. SYN: *hematotympanum*.

Henderson, Virginia (hēn'dēr-sŏn) A U.S. nursing educator, 1897–1996, who developed a definition of nursing that was adopted by the International Council of Nurses. SEE: *Nursing Theory Appendix*.

H. definition of nursing A definition, adopted by the International Council of Nurses, stating that the unique function of the nurse is to help sick or well individuals to perform activities that contribute to health, recovery, or a peaceful death. SEE: *Nursing Theory Appendix*.

Henderson-Hasselbalch equation (hēn'dēr-sŏn-hās'ĕl-bälk) [Lawrence Joseph Henderson, U.S. biochemist, 1878–1942; K. A. Hasselbalch, Danish physician, 1874–1962] An equation that describes the dissociation constant of an acid. In fluid and electrolyte balance, this important equation may be expressed in terms of the bicarbonate (HCO_3^-) system as: $\text{pH} = 6.095 + \log \frac{\text{HCO}_3^-}{\alpha (\text{PaCO}_2)}$, where $\alpha = 0.0307 \text{ mM/L/mm Hg}$ at 37°C . At the normal pH of the blood, 7.4, the ratio of HCO_3^- to $\alpha (\text{PaCO}_2)$ is 20 to 1.

Henle, Friedrich G. J. (hēn'lē) German anatomist, 1809–1885.

H.'s layer The outer layer of cells of the inner root sheath of the hair follicle.

H.'s ligament The combined tendons of the transversus abdominus and internal oblique inserted on the linea alba and pubic bone.

H.'s loop The U-shaped portion of a renal tubule lying between the proximal and distal convoluted portions. It consists of a thin descending limb and a thicker ascending limb.

H.'s tubules The portion of the nephron following the proximal tubule. SEE: *nephron*.

Henoch's chorea A form of progressive electric chorea.

Henoch-Schönlein disease Idiopathic thrombocytopenic purpura.

Henoch-Schönlein purpura (hēn'ŏk-shān'lin) [Eduard H. Henoch, Ger. pediatrician, 1820–1910; Johann Lukas Schönlein, Ger. physician, 1793–1864] A form of small vessel vasculitis of unknown cause that affects children, esp.

between the ages of 3 and 5, more often than adults. It is marked by a purpuric rash on the buttocks and legs, and, in some patients, abdominal pain or gastrointestinal bleeding, polyarticular joint disease, and renal involvement (e.g., glomerulonephritis). The illness usually lasts about 2 weeks before resolving spontaneously. In some instances (more commonly in adults than in children) renal failure can complicate the illness. SYN: *anaphylactoid purpura*. SEE: *illus.*



HENOCH-SCHÖNLEIN PURPURA

TREATMENT: Joint symptoms respond to rest and administration of nonsteroidal anti-inflammatory drugs. Corticosteroid drugs, such as prednisone, are used to treat patients with severe gastrointestinal or renal involvement. Hemodialysis is used to support patients who develop chronic renal failure.

henry (hēn'rē) [Joseph Henry, U.S. physicist, 1797–1878] A unit designating electrical inductance.

Henry's law (hēn'rēz) [William Henry, Brit. chemist, 1774–1836] The weight of a gas dissolved by a given volume of liquid at a constant temperature is directly proportional to the pressure.

Hensen's body (hēn'sēns) A modified Golgi net found in the hair cells of the organ of Corti.

Hensen's cells (hēn'sēns) [Victor Hensen, Ger. anatomist and physiologist, 1835–1924] Tall columnar cells that form the outer border cells of the organ of Corti of the cochlea.

Hensen's disk (hēn'sēns) The band in the center of the A disk of a sarcomere of striated muscle. During contraction it appears lighter than the remaining portion and in its center, a dark stripe, the M line, is seen. SYN: *H band*.

Hensen's stripe (hēn'sēns) A dark band on the undersurface of the tectorial membrane of the inner ear.

hepacivirus (hē-pās'i-vī'rūs) A family of flaviviruses that includes both the hepatitis C and hepatitis G viruses.

hepadnavirus Hepatitis DNA virus. The hepatitis DNA virus that infects humans is hepatitis B.

HEPA filter *high efficiency particulate air filter*.

hepar (hē'pār) [Gr. *hepatos*, liver] The liver.

heparin (hēp'ā-rīn) A parenteral anticoagulant drug with a faster onset than warfarin or its derivatives. It is composed of polysaccharides that inhibit coagulation by forming an antithrombin that prevents conversion of prothrombin to thrombin and by preventing liberation of thromboplastin from platelets. Because heparin is poorly absorbed from the gastrointestinal tract, it is usually administered intravenously or subcutaneously as a sodium or calcium salt.

USES: Heparin is used as an anticoagulant in the prevention and treatment of thrombosis and embolism. It is an important agent in the management of acute coronary syndromes (such as unstable angina pectoris or acute myocardial infarction). Because heparin compounds are too large to cross the placental barrier, they are the preferred anticoagulants in pregnant women. The antagonist for an overdose is protamine sulfate. The most common side effect of heparin is abnormal bleeding.

h. lock A device attached to an intravenous catheter to prevent it from clotting. It is used for intermittent administration of fluids or medication. **SEE:** *heparin lock flush solution; venous access device.*

low molecular weight h. The most bioavailable fraction of heparin; it has a more precise anticoagulant effect than unfractionated heparins. It is used to prevent and treat deep venous thrombosis, pulmonary embolism, and acute coronary syndromes.

h. sulfate A sulfated mucopolysaccharide that accumulates in the connective tissue in abnormal amounts in some mucopolysaccharidoses. **SEE:** *mucopolysaccharidosis.*

heparinize (hēp'ā-rī-nīz") To inhibit blood coagulation with heparin.

heparinoid (hēp'ā-rī-noyd") A substance that prevents or breaks blood clots. Heparinoids have a lower risk for bleeding and thrombocytopenia than heparin.

hepat- **SEE:** *hepato-*.

hepatalgia (hēp'ā-tāl'jē-ā) [Gr. *hepatos*, liver, + *algos*, pain] Pain in the liver.

hepatalgic (hēp'ā-tāl'jik), *adj.*

hepatatrophía (hēp'āt-ā-trōf'ē-ā) [" + *atrophia*, atrophy] Atrophy of the liver.

hepatectomy (hēp'ā-tēk'tō-mē) [" + *ektome*, excision] Excision of part or all of the liver.

hepatic (hē-pāt'ik) [Gr. *hepatikos*] Pert. to the liver.

h. vein The vein that takes blood from the liver to the inferior vena cava.

hepaticoduodenostomy (hē-pāt'ī-kō-dū'ō-dē-nōs'tō-mē) [" + L. *duodeni*, duodenum, + Gr. *stoma*, mouth] Hepatoduodenostomy.

hepaticoenterostomy (hē-pāt'ī-kō-ēn-tēr-

ōs'tō-mē) [" + *enteron*, intestine, + *stoma*, mouth] An operation to create an artificial opening between the hepatic duct and intestine.

hepaticogastrostomy (hē-pāt'ī-kō-gās-trōs'tō-mē) [" + *gaster*, stomach, + *stoma*, mouth] An operation to create a passage between the hepatic duct and the stomach.

hepaticojejunostomy (hē-pāt'ī-kō-jē'jū-nōs'tō-mē) [" + L. *jejunum*, empty, + Gr. *stoma*, mouth] The surgical joining of the hepatic duct and the jejunum. **SEE:** *hepaticoenterostomy.*

hepaticolithotomy (hē-pāt'ī-kō-lī-thōt'ō-mē) The surgical removal of gallstones from the hepatic duct.

hepaticolithripsy (hē-pāt'ī-kō-līth'ō-trīp-sē) [" + *lithos*, stone, + *tripsis*, a crushing] Crushing of a biliary calculus in the hepatic duct.

hepaticostomy (hē-pāt'ī-kōs'tō-mē) [" + *stoma*, mouth] The establishment of a permanent fistula into the hepatic duct.

hepaticotomy (hē-pāt'ī-kōt'ō-mē) [" + *tome*, incision] An incision into the hepatic duct.

hepatitis (hēp'ā-tī'tis) [" + ""] Inflammation of the liver, usually caused by exposure to an infectious agent (e.g., a hepatitis virus), a toxin (e.g., alcohol), or a drug (e.g., acetaminophen). The illness may be mild or life-threatening, chronic or acute. Chronic cases may be detected only by the discovery of elevated liver enzymes in the blood. Acute cases are marked by jaundice, hepatic enlargement, and occasional bleeding, altered mental status, and multiple organ system failure.

PATHOLOGY: Damage to liver cells is caused by direct injury from the causative agent or indirectly as a result of inflammatory or autoimmune responses. During acute inflammation, the swollen hepatocytes are less able to detoxify drugs; to produce clotting factors, cholesterol, plasma proteins, bile, and glycogen; to store fat-soluble vitamins; or to perform other functions. All of the hepatitis viruses may cause fulminant hepatitis, but hepatitis B and D are the most common causes. Drug overdoses, ingestion of toxins, and shock are also responsible for rapid liver deterioration.

PATIENT CARE: Patients are not generally hospitalized unless they experience significant liver damage or complications; the more severely affected need supportive medical and psychological care. Patients at home should be instructed about the nature and course of the illness, its care and treatment, and signs and symptoms of complications. When hepatitis is foodborne, scrupulous washing of the hands, food handling, and cleaning of dishes and silverware

are necessary to prevent transmission to household members. The patient should avoid intimate contact until antigen and antibody levels are reduced. The patient is advised to schedule frequent rest periods and to rest between major activities. Diversions activities should be included to help reduce anxiety. Good nutrition is encouraged (small, high calorie, low-protein, nutrient-dense, frequent meals, and fluids to 4 qt (4 L)/day). Fluid intake and output, and weight, color, consistency, and frequency of stools should be recorded. The hospitalized patient is assessed for complications (e.g., hepatic coma, pneumonia, vascular problems, and pressure ulcers). The patient is advised to avoid alcohol during the period of acute illness and for at least 6 months after recovery. Depression may occur because of the patient's concerns about his illness, but the depression may also be linked to changes in body chemistry or adverse drug reactions. Hepatitis is the primary reason for liver transplants, and the concerns of potential need and treatment should be explained to the patient. Emotional support and reassurance should be offered to the patient because there may be considerable interference with the patient's habits and lifestyle. SEE: *Nursing Diagnoses Appendix; Standard Precautions Appendix; hepatitis A; autoimmune hepatitis; hepatitis E; fulminant hepatitis.*

h. A Hepatitis caused by hepatitis A virus (HAV), an RNA virus without an envelope. Because hepatitis A can be contracted through contaminated water or food, young adults and children in institutional settings and travelers in areas with minimal sanitation are at greatest risk for infection; small epidemics have been seen among people eating at restaurants that served contaminated shellfish. The course of the illness is usually mild although it can be severe; the incubation period is 2 to 6 weeks, the acute stage lasts 2 to 12 weeks, and complete recovery takes weeks to months. The infection affects about 90,000 people every year, about half of whom develop clinically obvious infection. Hepatitis A does not produce a carrier state and does not cause chronic hepatitis. The two antibodies produced in response to hepatitis A antigen serve as markers for infection; one of these, IgG anti-HAV, provides immunity against reinfection. Hepatitis A previously was called *infectious hepatitis*.

TREATMENT: No drugs specifically treat hepatitis A. Immune globulin containing IgG anti-HAV antibodies may be prescribed for family members; it provides passive immunity for 6 to 8 weeks. Preventive education focuses on

good personal hygiene, esp. washing of the hands; use of good judgment in choice of food and eating places; and, in some areas of the world, basic sanitation. Hepatitis A vaccine prevents infection either before or immediately after exposure to the virus and is recommended for health care workers, travelers to developing countries, day care workers, people with liver disease, and others at high risk.



Hepatitis A is transmitted by fecal-oral contact. To prevent the spread of the disease, those infected should not prepare food for others to eat.

acute anicteric h. Hepatitis marked by slight fever, gastrointestinal upset, and anorexia but without jaundice.

amebic h. The syndrome of a tender, enlarged liver; pain over the liver; fever; and leukocytosis in a patient with amebic colitis. This name is a misnomer because the liver changes are not due to an infestation of that organ with amebae but are a part of the nonspecific reaction to the infection in the intestinal tract. Nevertheless, a liver abscess will occasionally develop, and the walls of the abscess will contain amebae.

TREATMENT: Metronidazole plus iodoquinol, or chloroquine phosphate plus either emetine or dehydroemetine, are used to treat amebic hepatitis. These latter two drugs are toxic and should be given only if their course can be carefully observed by a cardiac monitor. The drugs should not be given to a patient who has cardiac disease or is pregnant. Needle aspiration of the abscess may be needed.

autoimmune h. Persistent hepatic inflammation and necrosis, in the setting of hypergammaglobulinemia and autoantibodies, and in the absence of other common causes of liver injury.

h. B Injury to liver cells caused by hepatitis B virus (HBV), a double-stranded DNA virus. It may appear as an asymptomatic, acute, chronic, or fulminant infection. Acute infection often is marked by jaundice, nausea and vomiting, joint pains, rashes, and marked elevations in serum liver function tests. Chronic infection typically is asymptomatic and may be detected only by blood tests until it causes late complications (e.g., cirrhosis, portal hypertension, or hepatocellular carcinoma). Fulminant hepatitis B infection occurs when the patient suffers hepatic encephalopathy within 8 weeks of the onset of the disease.

The virus is transmitted by exposure to the blood or body fluids of an infected person. The incubation period is approximately 2 to 6 months. Acute infection

usually resolves in less than 6 months. When hepatitis B virus surface antigen does not clear from the blood within 6 months, chronic hepatitis is said to have developed. Each year in the U.S., about 300,000 people are infected with hepatitis B virus. Worldwide, chronic hepatitis affects about 300 million people.

Those at greatest risk for infection include intravenous drug abusers, people with multiple sex partners, men who have sex with men, infants born of HBV-infected mothers, and health care workers. Blood banks now routinely screen for HBV antigens, which has greatly reduced the transmission of infection by transfusion.



People who have not been vaccinated against HBV and receive a needlestick or have mucous membrane contact with blood or other body secretions should contact their occupational health department. Hepatitis B virus immune globulin (HBIG) can be given to provide temporary protection.

ANTIGENS AND ANTIBODIES: The primary antigenic markers used to diagnose hepatitis B infection include the following:

1. Hepatitis B surface antigen (HBsAg), the first marker to appear in the blood. It is sometimes detected before serum levels of hepatic enzymes rise.

2. Hepatitis Be antigen (HBeAg) and hepatitis B DNA, markers of active viral replication and high infectivity.

3. Hepatitis B core antibodies (antibodies against the core antigen of hepatitis B), which indicate infection of a patient with hepatitis B virus. IgM antibodies against the core antigen (IgM anti-HBc) are present early in the course of infection and may sometimes be the only detectable evidence of an acute infection. IgG antibodies against the core antigen (anti-HBc) are present in any patient infected with the virus, either acutely or at some time in the past.

Protective IgG antibodies to the HB surface antigen (HBsAB), which develop late in the disease, persist for life and protect against reinfection. As hepatitis B surface antibody levels rise, HBsAg levels fall, indicating resolution of acute infection. Antibodies against hepatitis B core antigen and hepatitis Be antigen are not protective. Approx. 5% to 10% of patients develop chronic infection.

PREVENTION: Hepatitis B vaccine, which contains the HB surface antigen, provides active immunity and is recommended for persons at increased risk (e.g., children, health care workers, he-

modialysis patients, intravenous drug abusers). All pregnant women should be screened for infection. Hepatitis B immune globulin, which contains antibodies against hepatitis HBV, provides passive immunity to those who have not been vaccinated and are exposed to the virus.

TREATMENT: No drug therapy is available that controls acute HBV infection, and treatment for this phase of the illness is supportive. Alpha interferon has been effective in some patients with chronic infection. Antiviral drugs such as adefovir, entecavir, and lamivudine are used to treat chronic hepatitis B infections.

h. B immune globulin ABBR: HBIG. A sterilized solution of antibodies against hepatitis B surface antigen obtained from plasma of human donors who have high titers of antibodies. It provides passive immunity against infection for those who have not been vaccinated and are exposed to HBV. SEE: *h. B*; *h. B virus vaccine*.

h. B virus vaccine A recombinant vaccine used to vaccinate children and people at high risk for coming in contact with either hepatitis B carriers or blood or fluids from such people. It contains noninfectious hepatitis B surface antigen (HBsAg), which stimulates the production of antibodies and provides active immunity. Included in the high-risk group are health care workers, hemodialysis patients, police officers and other public safety workers, people with other forms of chronic hepatitis, intravenous drug users, family members and sexual partners of those infected with HBV, and people who travel extensively abroad. SEE: *h. B immune globulin*.

h. C A chronic bloodborne infection believed to affect roughly 3,200,000 people in the U.S. Hepatitis C (formerly known as non-A, non-B hepatitis) is caused by a single-stranded RNA virus transmitted from person to person by exposure to blood or body fluids. In the past it was the most common form of hepatitis transmitted by transfusions of blood or blood products and by organ transplantation.

About 30,000–40,000 new cases occur each year in the U.S., most of which result from needle sharing during intravenous drug abuse. A smaller number of infections are acquired as a result of exposure to tainted blood at work (e.g., in health care). About 6% of cases are the result of the transmission of the virus from mother to child during childbirth. Tattooing, body piercing, and cocaine snorting are associated with some cases. Sexual transmission of the virus seems rare. Long-term infection develops in 55% to 85% of those infected and 5% to 20% develop cirrhosis over 20 to 30

years. Death from cirrhosis or liver cancer rarely occurs. The incubation period is usually 6 to 12 weeks, although it can be longer, and the acute phase lasts approx. 4 weeks. Signs and symptoms of acute infection are often milder than with hepatitis A and B.

Infection with hepatitis C virus (HCV) is usually identified (often years after exposure) when an asymptomatic person is found to have repeatedly elevated liver enzymes on routine blood tests. Antibodies to HCV or HCV RNA in the blood confirm the infection. Antibody production is stimulated by HCV RNA, but antibodies against HCV do not destroy the virus or provide immunity.

PATIENT CARE: Antiviral agents such as pegylated alpha interferon in combination with ribavirin can often cure hepatitis C if given for prolonged courses (about 24 to 48 weeks, depending on the viral genotype). Genotype 1, the type most often found in the U.S., responds to treatment about 30% of the time. Genotypes 2 and 3 respond to combination therapy more than 60% of the time. The treatment can cause significant side effects, including high fevers, chills, malaise, muscle aches, and other flu-like symptoms. Prevention of hepatitis C in health care professionals stresses using safely engineered sharps, providing safe sharps disposal, limiting contact with blood and body fluids, and properly sterilizing instruments. Public health teaching regarding prevention for the general public includes use of properly sterilized instruments for body piercing, single-use needles for tattooing, and avoiding needle sharing and taking advantage of needle-replacement programs (for intravenous drug users). Health care providers can provide invaluable education to affected patients by giving them written and verbal information on high-risk behavior, including the need to avoid needle sharing by users of intravenous drugs, having unprotected sex, or drinking alcohol. Regular consumption of alcohol increases the risk of liver cancer dramatically for a person with HCV.

Other recommendations for people infected with hepatitis C are summarized in the following list:

1. Do not donate blood, blood products, tissue, or semen.
2. Avoid sharing cosmetic/personal grooming items that may be contaminated by blood (e.g., toothbrushes or razors).
3. Avoid the use of over-the-counter, herbal, or prescription medications unless they have been approved by a knowledgeable health care provider.
4. Get vaccinations for hepatitis A

and B to avoid additional viral insults to the liver.

Community support groups and Internet-based resources may help those infected learn more about disease management, e.g., <http://www.liverfoundation.org>. Regular professional care may help optimize health and well-being.

chronic h. Hepatic inflammatory and necrotic changes that continue for more than 6 months. The most common causes are hepatitis B, C, and D viruses. Chronic liver inflammation may also result from abuse of alcohol or other drugs, exposure to toxic chemicals, fatty infiltration of the liver, or autoimmune processes. Patients may be asymptomatic or present with only elevated serum transaminase, fatigue, anorexia, malaise, or mild jaundice. In other patients, the disease actively progresses, eventually leading to cirrhosis and death. Depending on the underlying cause, corticosteroids, interferons, or antiviral agents such as ribavirin may be used to manage chronic hepatitis. In alcoholic patients, abstinence from alcohol may allow the liver to heal.

h. C core antigen A protein released by the hepatitis C virus (HCV) into the bloodstream of infected patients. Because hepatitis C core antigen is detectable in the blood before HCV antibodies are produced, it can be used as a marker of early infection (e.g., in donated blood or plasma). It can also measure the response of HCV infection to treatment protocols; antigen levels drop with effective treatment.

h. D A form of hepatitis caused by the hepatitis delta virus (HDV). It is considered a "defective" virus because it can produce infection only when hepatitis B virus (HBV) is present and therefore can be prevented through hepatitis B vaccination. It is rare in the U.S. In healthy people, coinfection with HDV and HBV usually causes acute disease and recovery with immunity. In patients with chronic hepatitis B, it may produce severe acute disease or, more commonly, chronic progressive disease that may lead to cirrhosis. Mortality is approx. 10%. Hepatitis D antigens (HDV RNA) are found in the blood and liver and stimulate production of an antibody that is present only briefly during early acute infection. Hepatitis D virus is also sometimes referred to as delta hepatitis. SEE: *hepatitis B*.

PREVENTION: Because hepatitis D only occurs in people already infected with hepatitis B, vaccination against hepatitis B helps prevent the spread of this virus.

h. E A form of hepatitis similar to hepatitis A, occurring primarily in regions with contaminated water supplies, or in travelers returning from

abroad. It is caused by an RNA virus that produces acute infection only.

fulminant h. Acute liver failure.

hypoxic h. Ischemic h.

infectious h. Term previously used for hepatitis A virus infection.

ischemic h. Acute, severe liver injury that results from an episode of hypotension, typically in someone with underlying heart or lung disease. This type of hepatitis may result in bleeding, encephalopathy, coma, or death. SYN: *hypoxic hepatitis*.

serum h. Term previously used for hepatitis B virus infection.

toxic h. Inflammation of the liver caused by the ingestion or absorption of toxins or drugs into the body. Included in the great number of agents known to be able to cause this type of hepatitis are common drugs and chemicals (e.g., halothane, isoniazid, anabolic steroids, carbon tetrachloride, trichlorethylene) used in either the treatment of disease or in the workplace.

hepatitis G virus An RNA flavivirus found in blood in about 2% of blood donors that may be transmitted by injection, drug abuse, sexual contact, transfusions, and childbirth (from mother to infant). It is remotely related to hepatitis C virus. It causes chronic viremia but does not seem to cause hepatitis or liver damage. SYN: *GB virus type C*.

hepatization (hĕp'ă-tī-ză'shŭn) The second and third stages in consolidation in lobar pneumonia, in which the lung's surface looks solid, like the liver.

hepato-, hepat- [Gr. *hepatikos*] Combining forms meaning *liver*.

hepatoblastoma (hĕp'ă-tō-blăs-tō'mă) [" + "] A rare, aggressive malignant tumor of the liver, typically found in children age 3 or younger. It may consist of epithelial cells, fetal cells, or mesenchymal tissues.

hepatocarcinogen (hĕp'ă-tō-kăr-sin'ō-jĕn) Anything that causes cancer of the liver.

hepatocarcinoma (hĕp'ă-tō-kăr'sin-ō'mă) [" + *karkinos*, crab, + *oma*, tumor] Carcinoma of the liver.

hepatocoele (hĕp'ă-tō-sĕl) [+ *kele*, tumor, swelling] Hernia of the liver.

hepatocellular (hĕp'ă-tō-sĕl'ŭ-lăr) Concerning the cells of the liver.

hepatocholangiocystoduodenostomy (hĕp'ă-ō-kō-lăn'jĕ-ō-sīs'tō-dŭ'ō-dĕ-nōs'tō-mĕ) [" + *chole*, bile, + *angeion*, vessel, + *kystis*, bladder, + L. *duodenum*, duodenum, + Gr. *stoma*, mouth] The establishment of drainage of bile ducts into the duodenum through the gallbladder.

hepatocholangioduodenostomy (hĕp'ă-tō-kō-lăn'jĕ-ō-dŭ-ō-dĕ-nōs'tō-mĕ) [" + " + " + L. *duodenum*, duodenum, + Gr. *stoma*, mouth] The establishment

of drainage of (hepatic) bile ducts into the duodenum.

hepatocholangioenterostomy (hĕp'ă-tō-kō-lăn'jĕ-ō-ĕn'tĕr-ōs'tō-mĕ) [" + " + " + *enteron*, intestine, + *stoma*, mouth] The establishment of a passage between the hepatic bile ducts and intestine.

hepatocholangiostomy (hĕp'ă-tō-kō-lăn'jĕ-ō-găs-trōs'tō-mĕ) [" + " + " + *gaster*, belly, + *stoma*, mouth] The establishment of drainage of bile ducts into the stomach.

hepatocholangiostomy (hĕp'ă-tō-kō-lăn-jĕ-ōs'tō-mĕ) [" + " + " + *stoma*, mouth] Establishing free drainage by making an opening into the hepatic bile duct.

hepatocholangitis (hĕp'ă-tō-kō-lăn-jī'tis) [" + " + " + "] Inflammation of the liver and bile ducts.

hepatocolic (hĕp'ă-tō-kōl'ik) [" + *kolon*, colon] Relating to the liver and colon.

hepatocystic (hĕp'ă-tō-sīs'tik) [" + *kystis*, bladder] Relating to the gallbladder or to both liver and gallbladder.

hepatocyte (hĕp'ă-tō-sīt) A parenchymal liver cell.

hepatoduodenostomy (hĕp'ă-tō-dŭ'ō-dĕ-nōs'tō-mĕ) [" + L. *duodenum*, duodenum, + Gr. *stoma*, mouth] The establishment of an opening from the hepatic bile duct into the duodenum. SYN: *hepaticoduodenostomy*.

hepatoenteric (hĕp'ă-tō-ĕn-tĕr'ik) [" + *enteron*, intestine] Relating to the liver and intestines.

hepatogastric (hĕp'ă-tō-găs'trik) [Gr. *hepatikos*, liver, + *gaster*, belly] Relating to the liver and stomach.

hepatogenous (hĕp'ă-tōj'ĕ-nŭs) Originating in the liver.

hepatography (hĕp'ă-tōg'ră-fĕ) [" + *graphein*, to write] Radiography of the liver, usually after injection of a radiographic contrast medium.

hepatojugular (hĕp'ă-tō-jŭg'ŭ-lăr) Concerning the liver and jugular vein.

hepatolenticular (hĕp'ă-tō-lĕn-tik'ŭ-lăr) [" + L. *lenticula*, lentil, lens] Relating to the liver and lenticular nucleus of the eye.

hepatolienography (hĕp'ă-tō-lī'ĕ-nōg'ră-fĕ) [" + L. *lien*, spleen, + Gr. *graphein*, to write] Radiography of the liver and spleen, usually after intravenous injection of a contrast medium.

hepatolienomegaly (hĕp'ă-tō-lī'ĕ-nō-mĕg'ă-lĕ) [" + " + *megas*, large] Hepatosplenography.

hepatolithectomy (hĕp'ă-tō-lī-thĕk'tō-mĕ) [" + *lithos*, stone, + *ektome*, excision] The surgical removal of a stone from the hepatic duct.

hepatolithiasis (hĕp'ă-tō-lī-thī'ă-sīs) [" + " + *-iasis*, disease condition] A condition characterized by stones in the intrahepatic ducts.

hepatologist (hĕp"ă-tōl'ō-jĭst) [" + *logos*, word, reason] A specialist in diseases of the liver.

hepatology (hĕp"ă-tōl'ō-jĕ) [" + *logos*, word, reason] The study of the liver.

hepatolytic (hĕp"ă-tō-lĭt'ĭk) Destructive to tissues of the liver.

hepatoma (hĕp"ă-tō'mă) [" + *oma*, tumor] Any liver tumor, benign or malignant. The term is usually used to describe a hepatocellular carcinoma.

hepatomalacia (hĕp"ă-tō-mă-lă'sĕ-ă) [" + *malakia*, softening] A softening of the liver.

hepatomegaly (hĕp"ă-tō-mĕg'ă-lĕ) [" + *megas*, large] An enlargement of the liver.

hepatomelanosis (hĕp"ă-tō-mĕl'ă-nō'sĭs) [" + *melas*, black, + *osis*, condition] Pigmented deposits or melanosis in the liver.

hepatomphalocoele (hĕp"ă-tōm'fă-lō-sĕl") [Gr. *hepatikos*, liver, + *omphalos*, navel, + *kele*, tumor, swelling] The protrusion of a part of the liver, which is covered by a membrane, through the umbilicus.

hepatonecrosis (hĕp"ă-tō-nĕkrō'sĭs) [" + "] The destruction of liver cells by any cause (e.g., insufficient blood flow, toxins, viruses).

hepatonephric (hĕp"ă-tō-nĕf'rĭk) [" + *nephros*, kidney] Concerning the liver and kidney.

hepatonephritis (hĕp"ă-tō-nĕ-frĭ'tĭs) [" + " + "] Inflammation of the liver and kidneys (e.g., in leptospirosis).

hepatonephromegaly (hĕp"ă-tō-nĕf'rō-mĕg'ă-lĕ) [" + " + *megas*, large] Hypertrophy of the liver and kidneys.

hepatoperitonitis (hĕp"ă-tō-pĕr'ĭ-tō-nĭ'tĭs) [" + *peritonaion*, peritoneum, + *itis*, inflammation] Perihepatitis.

hepatopexy (hĕp"ă-tō-pĕks'ĕ) [" + *pexis*, fixation] Fixation of a movable liver to the abdominal wall.

hepatopleural (hĕp"ă-tō-ploo'răl) [" + *pleura*, side] Concerning the liver and pleura.

hepatopneumonic (hĕp"ă-tō-nū-mōn'ĭk) [" + *pneumonikos*, of the lungs] Relating to the liver and lungs.

hepatoptosis, hepatoptosis (hĕp"ă-tōp-tō'sĕ-ă, -tō'sĭs) [" + *ptosis*, a dropping] A downward displacement of the liver.

hepatopulmonary syndrome (hĕp"ă-tō-pŭl'mō-năr'ĕ) [" + L. *pulmo*, lung] A combination of liver disease, decreased arterial oxygen concentration, and dilatation of the blood vessels of the lung. Clinically the patient may have signs and symptoms of liver disease, including gastrointestinal bleeding, esophageal varices, ascites, palmar erythema, and splenomegaly. Pulmonary signs include clubbing of the fingers, cyanosis, dyspnea, and decreased arterial oxygen concentration while in an upright position (orthodeoxia).

hepatorenal (hĕp"ă-tō-rĕ'năl) [" + L. *renalis*, kidney] Pert. to the liver and kidneys.

hepatorenal syndrome ABBR:HRS. Renal failure that results from abnormal kidney perfusion in patients with cirrhosis and ascites. Patients with HRS are typically critically ill and have a very poor prognosis. Liver transplantation or portosystemic shunts are occasionally effective treatments.

hepatorrhaphy (hĕp"ă-tōr'ă-fĕ) [" + *rhaphe*, seam, ridge] The suturing of a wound of the liver.

hepatorrhexis (hĕp"ă-tō-rĕks'ĭs) [" + *rhexis*, rupture] A rupture of the liver.

hepatoscan (hĕp"ă-tō-skăn) A radioautograph of the liver.

hepatoscopy (hĕp"ă-tōs'kō-pĕ) [" + *skopein*, to examine] Inspection of the liver.

hepatosplenomegaly (hĕp"ă-tō-splĕ'nō-mĕg'ă-lĕ) [" + " + "] Enlargement of the liver and spleen.

hepatosplenopathy (hĕp"ă-tō-splĕ-nōp'ă-thĕ) [" + " + *pathos*, disease, suffering] A disease that affects the liver and spleen.

hepatotherapy (hĕp"ă-tō-thĕr'ă-pĕ) [" + *therapeia*, treatment] **1.** The treatment of liver disease. **2.** The use of liver or liver extract.

hepatotomy (hĕp"ă-tōt'ō-mĕ) [" + *tome*, incision] An incision into the liver.

hepatotoxemia (hĕp"ă-tō-tōks-ĕ'mĕ-ă) [" + *toxikon*, poison, + *haima*, blood] Autointoxication due to malfunctioning of the liver.

hepatotoxic (hĕp"ă-tō-tōks'ĭk) Toxic to the liver.

hepatotoxin (hĕp"ă-tō-tōk'sĭn) A cytotoxin specific for liver cells.

hepcidin (hĕp'sĭd-in) A protein secreted by the liver that acts as a regulatory hormone that controls the amount of iron in the body. Elevated levels of hepcidin in the blood prevent iron from being taken up by red blood cells. Heparin levels rise in many chronic illnesses and infections, causing the anemia of chronic disease. Proteins that block the action of hepcidin result, by contrast, in iron overload diseases such as hemochromatosis.

hept-, hepta- Combining forms meaning seven.

heptachromic (hĕp'tăkrō'mĭk) [Gr. *hepta*, seven, + *chroma*, color] Possessing normal color vision.

heptapeptide (hĕp'tă-pĕp'tĭd) [" + *peptin*, to digest] A polypeptide containing seven amino acids.

heptaploidy (hĕp'tă-ploy'dĕ) [" + *ploos*, fold] Having seven sets of chromosomes.

heptose (hĕp'tōs) A sugar containing seven carbon atoms in its molecule.

heptosuria (hĕp"tō-sū'rĕ-ă) [*"* + *ouron*, urine] Heptose in the urine.

herb (ĕrb) [L. *herba*, grass] An annual, biennial, or perennial plant with a soft stem containing no wood, esp. an aromatic plant used in medicine or seasoning. The plant usually produces seeds and then dies back at the end of the growing season.

herbalist (ĕrb'ă-list) A practitioner who has studied the use of herbs to promote healing, wellness, and disease prevention.

herbals (ĕrb'bĭlz) Botanical (plant-derived) substances used for preventive or therapeutic purposes. They may be prescribed individually or in combination with dietary supplements or medicinal preparations. Some may be chewed or ingested directly; others are prepared in capsules or pills or are brewed, extracted, and administered as lozenges, ointments, compresses, liniments, or put into baths.

PATIENT CARE: Patients should be advised to inform their health care providers about all herbal supplements they take. Herbal products can cause health problems in some instances (e.g., high doses of vitamin E) or when they are combined with other prescribed or OTC drugs (e.g., warfarin sodium). Pregnant or breastfeeding women should discuss herbal supplements with their health care providers prior to taking them, as some may harm the fetus or infant. Herbal products should never be taken for a serious medical condition in place of or concurrently with proven therapies without first discussing them with a health care provider or licensed pharmacist.

herbicide (ĕrb'ĭ-sĭd) A chemical that kills plants or inhibits their growth.

herbivorous (hĕr-bĭv'ō-rūs) [*"* + *vorare*, to eat] Vegetarian.

herbology (ĕr-bŏl'ŏ-jĕ) [*"* + *"*] The study of the uses and effects of herbs.

herd [AS. *heord*] Any large aggregation of people or animals.

hereditary (hĕ-rĕd'ĭ-tĕr-ĕ) [L. *hereditarius*, an heir] Pert. to a genetic characteristic transmitted from parent to offspring. SEE: *chromosome*; *gene*.

hereditary arthro-ophthalmopathy Stickler syndrome.

heredity (hĕ-rĕd'ĭ-tĕ) [L. *hereditas*, heir] The transmission of genetic characteristics from parent to offspring.

heredo- [L. *hereditas*, heir] Prefix meaning *heredity*.

heredoataxia (hĕr'ĕ-dŏ-ă-tăks'ĕ-ă) [*"* + Gr. *ataxia*, lack of order] Friedreich's ataxia.

heredodegeneration (hĕr'ĕ-dŏ-dĕ-jĕn"ĕr-ă'shŭn) Any genetically inherited disorder marked by progressive decline in neurological structure and function. Some examples include: Leber's dis-

ease, Marie's ataxia, and Machado-Joseph disease.

heredofamilial (hĕr'ĕ-dŏ-fă-mĭl'ĕ-ăl) Referring to any disease that occurs in families owing to an inherited defect.

heritable (hĕr'ĭ-tă-bl) Able to be inherited.

heritage The genetic and other characteristics transmitted to offspring.

hermaphroditism (hĕr-măf rŏ-dĭzm) Hermaphroditism.

hermaphrodite (hĕr-măf rŏ-dĭt) [Gr. *Hermaphroditos*, mythical son of Hermes and Aphrodite, who was man and woman combined] An individual possessing genital and sexual characteristics of both sexes. The clitoris is usually enlarged, resembling the male penis. SYN: *androgynae*.

hermaphroditism (hĕr-măf rŏ-dĭt-ĭzm) A condition in which both ovarian and testicular tissue exist in the same individual, occurring rarely in humans. SYN: *hermaphroditism*. SEE: *intersex*.

bilateral h. A condition in which an ovary and testicle are present on both sides.

complex h. A form of hermaphroditism in which the person has internal and external organs of both sexes.

dimidiate h. Lateral h.

false h. Pseudohermaphroditism.

lateral h. A condition in which a testis is present on one side and an ovary on the other. SYN: *dimidiate hermaphroditism*.

transverse h. Hermaphroditism characterized by having the outward organs of one sex and the internal organs of the other.

true h. Hermaphroditism in which the individual possesses both ovarian and testicular glands.

unilateral h. Hermaphroditism in which an ovary and a testis or an ovotestis is present on one side and either an ovary or a testis is present on the other side.

hermetic (hĕr-mĕt'ĭk) [L. *hermeticus*] Airtight.

hernia (hĕr'nĕ-ă) [L.] The protrusion of an anatomical structure through the wall that normally contains it. SYN: *rupture* (2). SEE: *herniotomy*.

ETIOLOGY: Hernias may be caused by congenital defects in the formation of body structures, defects in collagen synthesis and repair, trauma, or surgery. Conditions that increase intra-abdominal pressures (e.g., pregnancy, obesity, weight lifting, straining [the Valsalva maneuver], and abdominal tumors) may also contribute to hernia formation.

TREATMENT: Surgical or mechanical reduction is the treatment of choice.

abdominal h. A hernia through the abdominal wall.

acquired h. A hernia that develops any time after birth in contrast to one

that is present at birth (congenital hernia).

bladder h. The protrusion of the bladder or part of the bladder through a normal or abnormal orifice. SYN: *cystic hernia*.

Cloquet's h. A type of femoral hernia. SEE: *femoral h.*

complete h. A hernia in which the sac and its contents have passed through the aperture.

concealed h. A hernia that is not easily palpated.

congenital h. A hernia existing from birth.

crural h. A hernia that protrudes behind the femoral sheath.

cystic h. Bladder h.

direct inguinal h. Inguinal h.

diverticular h. The protrusion of an intestinal congenital diverticulum.

encysted h. A scrotal protrusion that, enveloped in its own sac, passes into the tunica vaginalis.

epigastric h. A hernia through a defect in the linea alba above the umbilicus.

fascial h. Protrusion of muscular tissue through its fascial covering.

fatty h. The protrusion of fatty tissue through the abdominal wall.

femoral h. Any hernia into the femoral canal.

hiatal h. The protrusion of the stomach into the chest through the esophageal hiatus of the diaphragm. SEE: *illus.*; *Nursing Diagnoses Appendix*.

incarcerated h. A hernia in which the presenting content cannot be returned to its site of origin, e.g., a hernia in which a segment of intestine cannot be returned to the abdominal cavity. It may produce pain or intestinal obstruction. If left untreated, an incarcerated hernia may cause strangulation of the bowel.

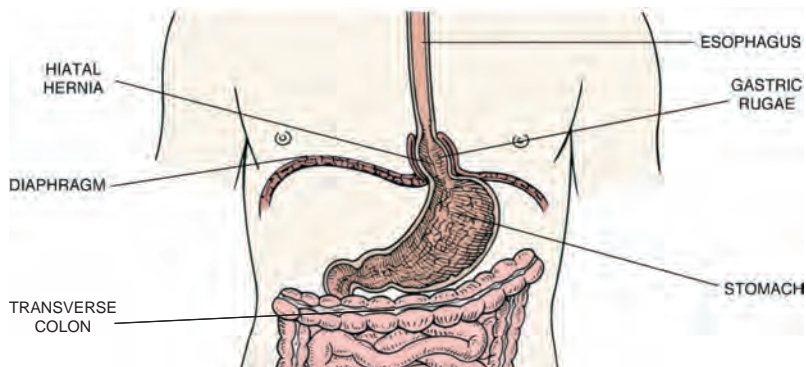
incisional h. A hernia through a surgical scar.

incomplete h. A hernia that has not gone completely through the aperture.

indirect inguinal h. Inguinal h.

inguinal h. The protrusion of a hernial sac containing intraperitoneal contents (e.g., intestine, omentum, or ovary) at the superficial inguinal ring. In an indirect inguinal hernia, the sac protrudes through the internal inguinal ring into the inguinal canal, often descending into the scrotum. In a direct inguinal hernia, the sac protrudes through the abdominal wall within Hesselbach's triangle, a region bounded by the rectus abdominus muscle, inguinal ligament, and inferior epigastric vessels. A variety of indirect inguinal hernia is the sliding hernia, in which a portion of the wall of the protruding cecum or sigmoid colon is part of the sac, the remainder composed of parietal peritoneum. Femoral hernias occur where the femoral artery passes into the femoral canal. Indirect and direct inguinal hernias and femoral hernias are collectively referred to as groin hernias. Inguinal hernias account for about 80% of all hernias. SYN: *direct inguinal hernia*; *indirect inguinal hernia*; *lateral hernia*; *medial hernia*; *oblique hernia*.

PATIENT CARE: *Preoperative:* The surgical procedure and expected postoperative course are explained to the patient. The patient should understand that the surgery will repair the defect caused by the hernia but that surgical failures can occur. If the patient is undergoing elective surgery, recovery usually is rapid; if no complications occur, the patient probably will return home the same day as surgery and usually can resume normal activity within 4 to 6 weeks. Patients who undergo emergency surgery for a strangulated or incarcerated hernia may remain hospitalized longer commensurate with the degree of intestinal involvement. The patient is prepared for surgery.



HIATAL HERNIA

Postoperative: Vital signs are monitored. The patient is instructed on the changing of position to avoid undue stress on the wound area. Stool softeners may be administered to prevent straining during defecation, and the patient is instructed in their use. Early ambulation is encouraged, but other physical activities are modified according to the surgeon's instructions. The patient should void prior to discharge and be able to tolerate oral fluids. The patient is taught to check the incision and dressing for drainage, inflammation, and swelling and to monitor his/her temperature for fever, any of which should be reported to the surgeon. Analgesics are administered as prescribed, and the patient is taught about their use and supplied with a prescription for home use. Male patients are advised that scrotal swelling can be reduced by supporting the scrotum on a rolled towel and applying an ice bag. The patient is warned to avoid lifting heavy objects or straining during bowel movements. Drinking plenty of fluids should help the patient prevent constipation and maintain hydration. The patient is advised to make and keep a postoperative surgical visit and to resume normal activity and return to work only as permitted by the surgeon.

inguinocrural h. A hernia that is both femoral and inguinal.

internal h. A hernia that occurs within the abdominal cavity. It may be intraperitoneal or retroperitoneal.

interstitial h. A form of inguinal hernia in which the hernial sac lies between the layers of the abdominal muscles.

irreducible h. A hernia that cannot be returned to its original position out of its sac by manual methods. SEE: *incarcerated h.*

labial h. The protrusion of a loop of bowel or other intraperitoneal organ into the labia majora.

lateral h. Inguinal h.

lumbar h. A hernia through the inferior lumbar triangle (Petit) or the superior lumbar triangle (Grynfelt).

medial h. Inguinal h.

mesocolic h. A hernia between the layers of the mesocolon.

Nuckian h. A hernia into the canal of Nuck.

oblique h. Inguinal h.

obturator h. A hernia through the obturator foramen.

omental h. A hernia containing a portion of the omentum.

ovarian h. The presence of an ovary in a hernial sac.

perineal h. Perineocele.

phrenic h. A hernia projecting through the diaphragm into one of the pleural cavities.

posterior vaginal h. A hernia of Douglas' sac downward between the rectum and posterior vaginal wall. SYN: *enterocele* (2).

properitoneal h. A hernia located between the parietal peritoneum and the transversalis fascia.

reducible h. A hernia whose contents can be replaced by manipulation.

retroperitoneal h. A hernia protruding into the retroperitoneal space, e.g., duodenojejunal hernia, Treitz's hernia.

Richter's h. A hernia in which only a portion of intestinal wall protrudes, the main portion of the intestine being excluded from the hernial sac and the lumen remaining open. The patient may present with groin swelling and vague abdominal complaints; when incarcerated the hernia may produce bowel ischemia and related complications.

scrotal h. A hernia that descends into the scrotum.

sliding h. A hernia in which a wall of the cecum or sigmoid colon forms a portion of the sac, the remainder of the sac being parietal peritoneum.

Spigelian h. A defect that occurs at or below the linea semicircularis but above the point at which the inferior epigastric vessels cross the lateral border of the rectus abdominis muscle. This type of hernia may contain preperitoneal fat or may be a peritoneal sac containing intraperitoneal contents. It is rare and difficult to diagnose unless large, because it is typically not palpable when small. Large Spigelian hernias may be mistaken for sarcomas of the abdominal wall. Ultrasonography or computed tomography scans are often used in diagnosis.

TREATMENT: Small Spigelian hernias are easily repaired; larger ones may require a prosthesis.

strangulated h. A hernia in which the protruding viscus is so tightly trapped that gangrene results, requiring prompt surgery. Once strangulation of the contents occurs, a nonsurgical attempt to reduce it may severely compromise treatment and outcome.

synovial h. Protrusion of a portion of synovial membrane through a tear in the stratum fibrosum of a joint capsule.

umbilical h. A hernia occurring at the navel, seen mostly in children. Usually it requires no therapy if small and asymptomatic. Umbilical hernia usually resolves when the child begins to walk (and muscles strengthen).

uterine h. The presence of the uterus in the hernial sac.

vaginal h. The hernial protrusion of the vaginal wall into the surrounding area, usually the pouch of Douglas.

vaginolabial h. A hernia of a viscus into the posterior end of the labia majora.

ventral h. A hernia through the abdominal wall. SEE: *incisional h.*

herniated (hĕr'nĕ-ăt'ĕd) Enclosed in or protruding like a hernia.

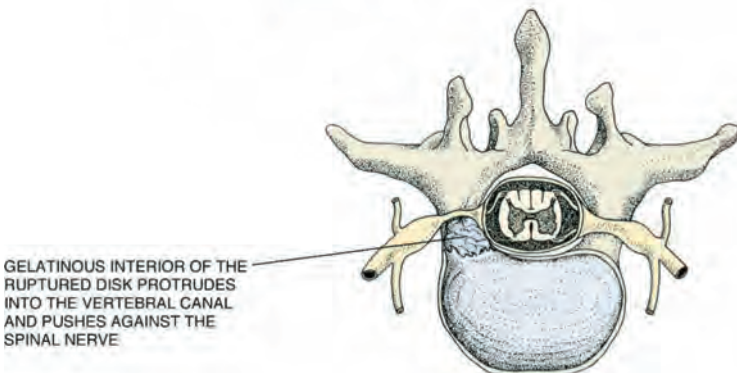
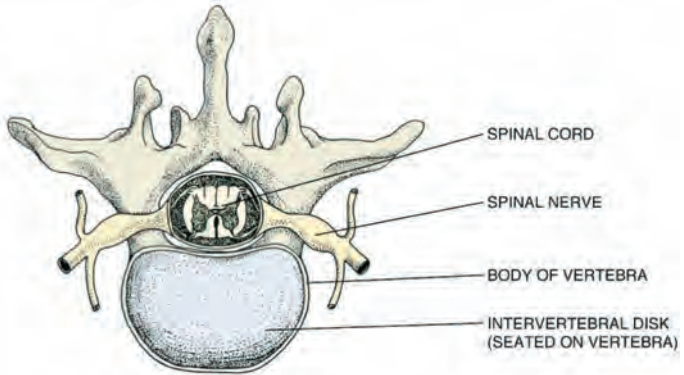
herniation (hĕr-nĕ-ă'shŭn) The displacement of body tissue through an opening or defect.

cerebral h. Downward displacement of the brain (usually as a result of cerebral edema, hematoma, or tumor) into the brainstem. The resulting injury to brainstem functions rapidly leads to coma, nerve palsies, and death if treatment is ineffective.

h. of nucleus pulposus Prolapse of the nucleus pulposus of a ruptured intervertebral disk into the spinal canal. This often results in pressure on a spinal nerve, which causes lower back pain that may radiate down the leg, a condition known as sciatica. SEE: *illus.; Nursing Diagnoses Appendix.*

PATIENT CARE: A history is obtained of any unilateral low back pain that radiates to the buttocks, legs, and feet. Almost all herniations occur in the lumbar and lumbosacral region; 8% in the cervical region and only 1% to 2% in the

thoracic region. When herniation follows trauma, the patient may report sudden pain, subsiding in a few days, then a dull, aching sciatic pain in the buttocks that increases with Valsalva's maneuver, coughing, sneezing, or bending. The patient may also complain of muscle spasms accompanied by pain that subsides with rest. The health care professional inspects for a limited ability to bend forward, a posture favoring the affected side, and decreased deep tendon reflexes in the lower extremity. In some patients, muscle weakness and atrophy may be observed. Palpation may disclose tenderness over the affected region. Tissue tension assessment may reveal radicular pain from straight leg raising (with lumbar herniation) and increased pain from neck movement (with cervical herniation). Thorough assessment of the patient's peripheral vascular status, including posterior tibial and dorsalis pedis pulses and skin temperature of the arms and legs, may help to rule out ischemic disease as the cause of leg numbness or pain.



NORMAL AND HERNIATED SPINAL DISKS

The patient is prepared for diagnostic testing by explaining all procedures and expected sensations. Tests may include radiographic studies of the spine (to show degenerative changes and rule out other abnormalities), myelography (to pinpoint the level of herniation), computed tomography scanning (to detect bone and soft tissue abnormalities and possibly show spinal compression resulting from the herniation), magnetic resonance imaging (to define tissues in areas otherwise obscured by bone), electromyography (to confirm nerve involvement by measuring the electrical activity of muscles innervated by the affected nerves), and neuromuscular testing (to detect sensory and motor loss as well as leg muscle weakness).

Pain and its management are often crucial elements of care; levels of pain are monitored, prescribed analgesics are administered, the patient is taught about noninvasive pain relief measures (such as relaxation, transcutaneous nerve stimulation, distraction, heat or ice application, traction, bracing, or positioning), and the patient's response to the treatment regimen is evaluated. During conservative treatment, neurological status is monitored (esp. in the first 2 to 3 weeks after beginning treatment) for signs of deterioration, which may indicate a need for surgery. Neurovascular assessments of the patient's affected and unaffected extremities (both legs or both arms) are performed to check color, motion, temperature, sensation, and pulses. Vital signs are monitored, bowel sounds are auscultated, and the abdomen is inspected for distention. The disorder and the various treatment options are explained to the patient, including bedrest and pelvic (or cervical) traction, local heat application, a physical therapy designed exercise program, muscle-relaxing and anti-inflammatory drug therapy, injection of local anesthetic and steroid drugs, acupuncture, and surgery.

Both the patient and family are encouraged to express their concerns about the disorder; questions are answered honestly, and support and encouragement are offered to assist the patient and family to cope with the frustration of impaired mobility and the discomfort of chronic back pain. The patient is encouraged to perform self-care to the extent that immobility and pain allow, to take analgesics before activities, and to allow adequate time to perform activities at a comfortable pace.

Walking and gentle stretching are encouraged as part of daily exercise during conservative therapy. If the patient is restricted to bedrest (or in traction), the patient should increase fluid intake and use incentive spirometry to avoid pul-

monary complications. Skin care and a fracture bedpan are provided if the patient is not permitted bathroom or commode privileges.

For patients who require surgery, the patient is prepared physically and psychologically for the specific procedure (laminectomy, spinal fusion, microdiskectomy) and postoperative care regimen, and informed consent is obtained. The patient may donate blood prior to surgery for later autotransfusion as needed.

Postoperative Care: Bedrest is enforced for the prescribed period, the blood drainage system in use is managed, and the amount and color of drainage are documented. Any colorless moisture or excessive drainage should be reported; the former may indicate cerebrospinal fluid leakage. A log-rolling technique is used to turn the patient from side to side, and the patient is taught how to turn in this manner when moving about or getting up from bed at home. Analgesics are administered as prescribed, esp. 30 min before early attempts at mobilization. The health care professional assists the patient with prescribed mobilization. Depending on the surgery required, the patient may require a back brace (individually fitted) for a period of time after surgery, and this is carefully fitted and the patient taught about its use.

Before discharge, proper body mechanics are reviewed with the patient: bending at the knees and hips (never the waist), standing straight, and carrying objects close to the body. The patient is advised to lie down when tired and to sleep on the side or back (never on the abdomen) on an extra-firm mattress or a bed board. All prescribed medications are reviewed, including dosage schedules, desired actions, and adverse reactions to be reported. Referral for home health care or physical/occupational therapy may be necessary to help the patient manage activities of daily living.

tonsillar h. The protrusion of the cerebellar tonsils through the foramen magnum. It causes pressure on the medulla oblongata and may be fatal.

transtentorial h. A herniation of the uncus and adjacent structures into the incisure of the tentorium of the brain. It is caused by increased pressure in the cranium. SYN: *uncal herniation*.

uncal h. Transtentorial h.

hernioenterotomy (hĕr'nĕ-ō-ĕn'tĕr-ō'tō-mĕ) [" + Gr. *enteron*, intestine, + *tome*, incision] Herniotomy and enterotomy done during the same surgical procedure.

herniography (hĕr'nĕ-ōg'rā-fĕ) [" + Gr. *graphein*, to write] The radiographical

examination of a hernia after the introduction of a contrast medium.

hernioplasty (hĕr'nĕ-ō-plās'tē) [ʹ + Gr. *plassein*, to form] Surgical repair of a hernia.

herniopuncture (hĕr'nĕ-ō-pŭnk'chŭr) [ʹ + *punctura*, prick] The puncture of a hernia with a hollow needle to withdraw fluid or gas.

herniorrhaphy (hĕr-nĕ-or'ā-fĕ) [ʹ + Gr. *rhaphe*, seam, ridge] A surgical procedure for repair of a hernia.

herniotomy (hĕr-nĕ-ōt'ō-mĕ) [ʹ + Gr. *tome*, incision] Surgery for the relief of a hernia; an operation for the correction of irreducible hernia, esp. strangulated hernia.

heroic measures In medical practice, the undertaking of a procedure or therapy in an attempt to save or sustain the life of a patient with life-threatening injuries or illness.

heroin (hĕr'ō-in) An opioid derived from morphine, whose importation, sale, and use are illegal in the U.S. SYN: *diacetylmorphine*. SEE: *drug addiction*; *endorphin*.

black tar h. A form of illicitly manufactured diacetylmorphine known for its tarry appearance and increased potency relative to "white" heroin.

h. toxicity Poisoning by heroin. SEE: *opiate poisoning*.

herpangina (hĕrp-ān-jī'nā, -ān'jī-nā) [Gr. *herpes*, creeping skin disease, + L. *angina*, a choking] A benign infectious disease of children and, less commonly, of young adults, caused by one of several strains of group A coxsackievirus and rarely other enteroviruses. Epidemics occur worldwide, most often in summer and early fall.

SYMPTOMS: This disease is marked by sudden onset of fever, severe sore throat, nausea, vomiting, excess salivation, and malaise. The throat and posterior area of the mouth are covered with vesicles 1 to 2 mm in diameter that rupture and form ulcers.

TREATMENT: The treatment is symptomatic and supportive. There is no specific therapy, but recovery is prompt, usually within 3 to 6 days.

herpes (hĕr'pĕz) [Gr. *herpes*, creeping skin disease] Vesicular eruption caused by a virus, esp. herpes simplex or herpes zoster. SEE: *Nursing Diagnoses Appendix*.

h. corneae Inflammation of the cornea caused by herpesvirus.

h. facialis A form of herpes simplex that occurs on the face.

h. febrilis Herpes simplex of the lips and nasal mucosa.

genital h. A persistent, recurring eruption of the genital or anorectal skin or mucous membranes, caused by herpes simplex virus (usually herpes simplex virus type II). It usually affects ad-

olescents and young adults, is spread by intimate contact, and is classified as a sexually transmitted disease. Worldwide about 85 to 90 million people are infected. SEE: *illus*.



GENITAL HERPES

SYMPTOMS: Patients often experience local pain, itching, burning, dysuria, or other uncomfortable sensations that sometimes begin before a rash or lesion(s) appears on the skin. The skin lesion consists of a reddened patch or small blisters (vesicles) or pustules that ulcerate before healing. These typically take about 10 days to heal. Regional lymph nodes often enlarge and become tender. Systemic symptoms (e.g., fever and malaise) sometimes accompany the initial outbreak or recurrences. However, asymptomatic shedding of the virus is common and may represent the most common way in which the virus is transmitted from person to person.

POTENTIAL COMPLICATIONS: Genital herpes may be transmitted to the newborn during childbirth and may cause serious complications, including respiratory illnesses, retinal infection, liver infection, encephalitis, mental retardation, blindness, deafness, seizures, microcephaly, and diabetes insipidus. Cesarean delivery or maternal suppression of the virus with acyclovir are two methods used to prevent newborn infection. Poor hand hygiene may transmit the virus to the eye(s), resulting in herpetic keratoconjunctivitis.

TREATMENT: Oral acyclovir or its derivatives can treat both the initial outbreak and subsequent recurrences and diminish asymptomatic viral shedding.



Herpetic lesions are contagious, and those caring for the patient must avoid contact with the exudates. Wearing gloves when in contact with mucous membranes, followed by good hand hygiene helps health care professionals prevent herpetic whitlow (finger infections). SEE: *Standard Precautions Appendix*.

PATIENT CARE: The patient should be taught to avoid all skin-to-skin con-

tact when lesions are present and to practice safe sex. Patients should not share towels or other personal care items. Patients with genital herpes often experience anger, self-doubt, fear, or guilt, esp. at the time of initial diagnosis or during recurrences. Counseling and support may help the patient address these issues. Patient education improves understanding of the prevalence of the disease in the general population, the recurring nature of the eruption, safe sexual practices, medication use, and psychosocial and relationship issues.

h. gestationis An autoimmune rash usually occurring in pregnancy or trophoblastic disease, characterized by red, itchy, blistering, or papular lesions. The lesions stain positive for the third component of complement on immunofluorescent microscopy.

human h. virus 8 A herpesvirus thought to cause Kaposi's sarcoma. It has also been implicated in the pathogenesis of some lymphomas and lymphomatoid illnesses.

h. labialis A form of herpes simplex that occurs on the lips. SEE: *cold sore*; *fever blister*; **illus.**



HERPES LABIALIS

h. menstrualis Herpetic lesions appearing at the time of the menstrual period.

ocular h. Herpes of the eye.

h. simplex virus ABBR: HSV-1, HSV-2. Human DNA viruses that cause repeated painful vesicular eruptions on the genitals and other mucosal surfaces and on the skin. After initial contact with the skin or mucous membranes, the virus migrates along nerve fibers to sensory ganglia, where it establishes a latent infection. Under a variety of stimuli, such as sexual contact, exposure to ultraviolet light, febrile illnesses, or emotional stress, it may reappear, traveling back to the site of initial contact. The rash caused by the infection has a red base, on which small blisters cluster. Herpetic rashes on the mouth or nose are called "cold sores" or "fever blisters." SYN: *herpesvirus hom-*

inis. SEE: *illus*; *Nursing Diagnoses Appendix*.



HERPES SIMPLEX

Herpetic whitlow

In immunosuppressed patients, the virus can cause a widely disseminated rash. Some infections with HSV may involve the brain and meninges; these typically cause fevers, headaches, altered mental status, seizures, or coma, requiring parenteral therapy with antiviral drugs. In newborns, infection involving the internal organs also may occur occasionally. Experienced ophthalmologists should manage ocular infection with herpes simplex viruses. Health care providers are at risk for herpetic whitlow (finger infections) from contact with infected mucous membranes if gloves and meticulous hand hygiene are not used.

TREATMENT: Acyclovir and related drugs (e.g., famciclovir, valacyclovir) may be used to treat outbreaks of HSV I and II, and are also effective in preventing disease recurrences.

PATIENT CARE: Standard precautions prevent spread of the virus. Prescribed antiviral agents and analgesics are administered; their use is explained to the patient, with instruction given about adverse effects to report.

The patient with HSV-1 is instructed to avoid skin-to-skin contact with uninfected individuals when lesions are present or prodromal symptoms are felt. To decrease the discomfort from oral lesions, the patient is advised to use a soft toothbrush or sponge stick, a saline- or bicarbonate-based (not alcohol-based) mouthwash, and oral anesthetics, such as viscous lidocaine, if necessary. He or she should eat soft foods. Use of lip balm with sunscreen reduces reactivation of oral lesions.

The patient with genital herpes should wash the hands carefully after bathroom use. He or she also should avoid sexual intercourse during the active stage of the disease and should practice safe sex. The pregnant patient must be advised of the potential risk to the infant during vaginal delivery and the use of cesarean delivery if she has an HSV outbreak when labor begins and her membranes have not ruptured. The patient with genital herpes may experience normal feelings of powerlessness;

he or she requires assistance to identify coping mechanisms, strengths, and support resources. The patient with genital herpes is encouraged to voice feelings about perceived changes in sexuality and behavior, and is provided with current information about the disease and treatment options. A referral is made for additional counseling as appropriate.



Caregivers with active oral or cutaneous lesions should avoid providing patient care.

traumatic h. Herpes at a wound site.

h. zoster Reactivation of varicella virus years after the initial infection with chickenpox. It is marked by inflammation of the posterior root ganglia of only a few segments of the spinal or cranial peripheral nerves. A painful vesicular eruption occurs along the course of the nerve (called a dermatome) and almost always is unilateral. The trunk is the region most often affected, but the face, the groin, or the limbs may also be affected. The virus may cause meningitis or affect the optic nerve or hearing. Chickenpox (varicella zoster) virus incorporates itself into nerve cells and lies dormant there after patients recover from the initial infection. Normally, immunity is boosted by exposure to infected children; as more children are vaccinated against chickenpox, adult immunity against herpes zoster is decreased.

The incubation period is from 7 to 21 days. The total duration of the disease from onset to complete recovery varies from 10 days to 5 weeks. If all the vesicles appear within 24 hr, the total duration is usually short. In general, the disease lasts longer in adults than in children. It is estimated that about 50% of people who live to age 80 will have an attack of herpes zoster. This infection is more common in persons with a compromised immune system: older adults, those with AIDS or illnesses such as Hodgkin's disease and diabetes, those taking corticosteroids, or those undergoing cancer chemotherapy.

Pain often develops along affected skin and persists for months after resolution of the rash. This discomfort, which may be severe in patients older than 50, is known as postherpetic neuralgia. It may intensify at night or worsen when clothes rub against the skin. SYN: *shingles*. SEE: *illus*; *h. zoster ophthalmicus*; *Nursing Diagnoses Appendix*.

DIAGNOSIS: Diagnosis usually is made based on clinical assessment. If further studies are required, the CDC recommends direct fluorescent antibody testing of specimens collected by rub-



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bing a swab on the base of an open lesion.

TREATMENT: In healthy adults, acyclovir, famciclovir, and valacyclovir are effective in reducing viral shedding and nerve pain damage if administered within 3 days of onset of the rash. Corticosteroids, gabapentin, pregabalin, nonsteroidal anti-inflammatory drugs, some antidepressants, and narcotics may decrease the pain of postherpetic neuralgia. Itching may be reduced with colloidal oatmeal or other topical treatments. Capsaicin cream (an extract of hot chili peppers) may be applied topically for pain relief, but this should be done only after active lesions have subsided.

PATIENT CARE: The prescribed antiviral agent is administered and explained to the patient, along with information about desired and adverse effects. Skin lesions are inspected daily for signs of healing or secondary infection; the patient's response to treatment is evaluated regularly, and he or she is monitored for associated complications. Prescribed analgesics are given on a schedule to minimize neuralgic pain. Patients experiencing neuralgia following the acute stage of the disease should be referred for ongoing therapy. He or she is reassured that HSV pain will subside eventually, that the prognosis for complete recovery is good, and that the infection seldom recurs.

PREVENTION: Reactivation of varicella zoster virus (VZV) may be prevented with a vaccine. VZV vaccination is approved for use in the U.S. in adults at age 60.

h. zoster ophthalmicus Herpes zoster affecting the first division of the fifth cranial nerve. The area of the face, eye, and nose supplied by this nerve is affected. Ocular complications may threaten sight. It is important that the eye be treated early with antiviral agents and that therapy be supervised by an ophthalmologist. SEE: *illus*.

herpesviruses (hĕr'pĕz-vī'rŭs-ĕs) Any virus of a family, Herpesviridae, of structurally similar DNA viruses, all of which produce chronic infections, and



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some of which can transform normal cells into malignant ones. Included in this family are the herpes simplex viruses, cytomegalovirus, Epstein-Barr virus, varicella-zoster virus, and human herpesviruses 6, 7, and 8.

herpesvirus hominis Herpes simplex virus.

herpesvirus simian encephalomyelitis A severe, almost always fatal encephalomyelitis caused by the herpesvirus simiae (also called B virus). It occurs among veterinarians, laboratory workers, and others who come in contact with infected monkeys.

herpetic (hēr-pēt'ik) [Gr. *herpes*, creeping skin disease] Pert. to herpes.

h. sore throat Herpetic tonsillitis or pharyngotonsillitis.

herpetiform (hēr-pēt'ī-form) [f + L. *forma*, form] Resembling herpes.

Herring bodies (hēr'ing) [Percy T. Herring, Brit. physiologist, 1872–1967] Secretory granules found in the terminal nerve endings of the hypothalamus and hypophyseal tract.

hersage (ār-sāzh') [Fr., a harrowing] The splitting of a nerve trunk into separate fibers.

Hertwig's root sheath (hért'wīgz) [Wilhelm August Oscar Hertwig, Ger. physiologist, 1849–1922] A downgrowth of epithelium from the cervical loop of the enamel organ that induces dentin formation of the forming tooth root and determines its shape. The epithelial diaphragm, a horizontal extension of the Hertwig's root sheath, will determine the number and size of the tooth roots.

hertz (hértz) [Heinrich R. Hertz, Ger. physicist, 1857–1894] ABBR: Hz. A unit of frequency equal to 1 cycle/sec. (CPS)

Heschl's gyrus (hēsh'īlz) One of a set of short transverse gyri in the temporal

lobe along the lateral sulcus. The gyri of Heschl include the primary auditory cortex.

hesitancy Involuntary delay in initiating urination. This symptom may be caused by drugs, such as tricyclic antidepressants, by abnormal relaxation of the detrusor muscle of the bladder, by prostatic hyperplasia, and by other urinary tract disorders.

hesperidin (hēs-pēr'ī-dīn) A citrus bioflavonoid found in the membranes and peel of lemons and oranges.

Hesselbach's hernia (hēs'ēl-bōks) [Franz K. Hesselbach, Ger. surgeon, 1759–1816] A lobated hernia that passes through the cribriform fascia of the anterior thigh.

Hesselbach's triangle The interval in the groin bounded by Poupart's ligament, the edge of the rectus muscle, and the deep epigastric artery.

hetastarch (hēt'ā-stārch") A synthetic polymer plasma volume expander composed of more than 90% amylopectin molecules. It has an average molecular weight of 450,000. SEE: *fluid replacement*.

hetero- SEE: *hetero-*.

heterecious (hēt'er-ē'shūs) [f + *oikos*, house] Denoting a parasite living in different hosts at different stages of development. SYN: *metoxenus*.

heterecism (hēt'er-ē'sizm) The state of being heterecious; the development of different cycles of existence in different hosts, said of certain parasites.

heteresthesia (hēt'er-ēs-thē'zē-ā) [f + *aisthesis*, sensation] The variation in degree (plus or minus) of sensory response to cutaneous stimuli.

hetero-, heter- [Gr. *heteros*, other] Prefixes indicating *different; relationship to another*.

heteroagglutination (hēt'er-ō-ā-gloo'tī-nā'shūn) The agglutination by one animal's serum of the red blood cells of an animal of another species.

heteroagglutinin (hēt'er-ō-ā-glū'tī-nīn) **1.** Agglutinin formed as the result of an injection of an antigen from an animal of a different species. **2.** Agglutinin capable of agglutinating blood cells of other species of animals.

heteroalbumose (hēt'er-ō-āl'bū-mōs) [f + L. *albumen*, white of egg] Albumose insoluble in water but soluble in saline solutions or in acid or alkaline solutions. SYN: *hemialbumose*.

heteroantibody (hēt'er-ō-ān'tī-bōd'ē) An antibody corresponding to an antigen from another species.

heteroantigen (hēt'er-ō-ān'tī-jēn) An antigen in one species that produces a corresponding antibody in another species.

heteroblastic (hēt'er-ō-blās'tik) [f + *blastos*, germ] Developing from several kinds of tissue.

heterocellular (hĕt'ĕr-ō-sĕl'ū-lār) Composed of different kinds of cells.

heterocephalus (hĕt'ĕr-ō-sĕf'ā-lūs) [" + *kephale*, head] Congenitally deformed fetus with two heads of unequal size.

heterochiral (hĕt'ĕr-ō-kī'rāl) [" + *cheir*, hand] Reversed as to right and left but otherwise of the same form and size; said of images in a plane mirror and of the hands.

heterochromatin (hĕt'ĕr-ō-krō'mā-tĭn) [" + *chroma*, color] Highly condensed or folded portions of chromosomes during interphase. They stain less distinctly than euchromatin. There is apparently no transcription of the DNA by messenger RNA (mRNA); these portions may be inactive genes. SEE: *euchromatin*.

heterochromatosis (hĕt'ĕr-ō-krō-mā-tō'sis) [" + " + *osis*, condition] 1. A pigmentation of the skin from foreign substances. 2. Heterochromia.

heterochromia (hĕt'ĕr-ō-krō'mĕ-ā) A difference in color. SYN: *heterochromatosis* (2).

h. iridis Different colors of the iris or sector of the iris in the two eyes. It may occur naturally or as a result of previous disease in the lighter-colored eye. Rarely it is associated with Waardenberg syndrome.

heterochromosome (hĕt'ĕr-ō-krō'mō-sōm) 1. The X and Y or sex chromosomes. 2. A chromosome containing material, heterochromatin, that stains differently from the remainder of the chromatin material.

heterochromous (hĕt'ĕr-ō-krō'mūs) [" + *chroma*, color] Having an abnormal difference in coloration.

heterochronia (hĕt'ĕr-ō-krō'nĕ-ā) [" + *chronos*, time] Denoting an abnormal time for the occurrence of a phenomenon or production of a structure.

heterochronic (hĕt'ĕr-ō-krōn'ĭk) Occurring at different or at abnormal times.

heterocyclic (hĕt'ĕr-ō-sĭk'lĭk) [" + *kyklos*, circle] Pert. to ring compounds that contain one or more elements other than carbon in the ring.

heterodermic (hĕt'ĕr-ō-dĕr'mĭk) [" + *derma*, skin] Pert. to a method of skin grafting in which grafts are taken from another person.

heterodont (hĕt'ĕr-ō-dōnt) [" + *odous*, tooth] SEE: *under dentition*.

heterodromus (hĕt'ĕr-ō-d'rō-mūs) [" + *dromos*, running] Acting, arranged, or moving in the opposite direction.

heterogametic (hĕt'ĕr-ō-gā-mĕt'ĭk) [" + *gamos*, marriage] Pert. to the production of unlike gametes, applied esp. to a male that produces two types of sperm, one containing the X chromosome, the other the Y chromosome. SEE: *homogametic*.

heterogamy (hĕt'ĕr-ō-g'ā-mĕ) The union of gametes that are dissimilar in size

and structure. This union occurs in higher plants and animals. SEE: *isogamy*.

heterogeneity (hĕt'ĕr-ō-jĕ-nĕ'ĭ-tĕ) The quality of being heterogeneous.

heterogeneous (hĕt'ĕr-ō-jĕ'nĕ-ūs) [" + *genos*, type] Of unlike natures; composed of unlike substances; the opposite of homogeneous.

heterogeneous system Any system whose components may be separated mechanically.

heterogenesis (hĕt'ĕ-rō-jĕn'ĕ-sĭs) [" + *genesis*, generation, birth] The production of offspring that have different characteristics in alternate generations, as in the regular alternation of asexual with sexual reproduction. This characteristic is found in some fungi. SYN: *metagenesis*. SEE: *homogenesis*.

heterogenetic (hĕt'ĕ-rō-jĕ-nĕt'ĭk) Relative to heterogenesis.

heterogeusia (hĕt'ĕr-ō-gū'sĕ-ā) [" + *geusis*, taste] The perception of an inappropriate quality of taste when food is present in the mouth or being chewed. The taste sensation is unexpected and unusual but not necessarily unpleasant.

heterograft (hĕt'ĕ-rō-grāft) [" + L. *graphein*, stylus] A graft taken from another individual or an animal of a different species from the one for whom it is intended. SEE: *autograft*; *graft*; *isograft*.

heterography (hĕt'ĕr-ōg'rā-fĕ) [" + *graphein*, to write] 1. Writing different words from those the writer intended. 2. Spelling different from current or standard usage. 3. Use of the same letter or sequence of letters for different sounds, as *th* in "*thin*" and "*then*."

heterohemagglutination (hĕt'ĕr-ō-hĕm'ā-gloo'tĭ-nā'shŭn) The agglutination of red blood cells by hemagglutinins from another species.

heterohemagglutinin (hĕt'ĕr-ō-hĕm'ā-gloo'tĭ-nĭn) Hemagglutinin from one species that will agglutinate red blood cells from another species.

heterohypnosis (hĕt'ĕ-rō-hĭp-nō'sĭs) [" + "'] Hypnosis induced by another person, or by programmed CDs, tapes, videos, or related technologies.

heteroimmunity (hĕt'ĕr-ō-ĭm-mū'nĭ-tĕ) Having immunity to an antigen from another species.

heterokeratoplasty (hĕt'ĕr-ō-kĕr'ā-tō-plās'tĕ) [" + *keras*, horn, + *plassein*, to form] Plastic surgery of the cornea using tissue from the cornea from another species.

heterolalia (hĕt'ĕr-ō-lā'lĕ-ā) [" + *lalia*, babbling] Heterophasia.

heteroliteral (hĕt'ĕr-ō-lĭt'ĕr-āl) In speaking, pert. to an incorrect letter being substituted for the correct one.

heterologous (hĕt'ĕr-ō-l'ō-gūs) [" + *logos*, word, reason] 1. Containing tissue not usually found, e.g., in an organ.

2. Obtained from a different individual or species with respect to tissue, cells, or blood. SEE: *autologous*; *homologous*.

heterolysin (hĕt'ĕr-ŏl'ĭ-sĭn) [ʹ + *lysis*, solution] A lysin formed from an antigen from an animal of a different species. SEE: *autolysis*; *hemolysis*.

heteromeric (hĕt'ĕr-ŏ-mĕr'ĭk) [ʹ + *meros*, a part] 1. Pert. to spinal neurons with processes extending to the opposite side of the spinal cord. 2. Possessing a different chemical composition.

heterometaplasia (hĕt'ĕr-ŏ-mĕt'ă-plă'zĕ-ă) [ʹ + *meta*, beyond, + *plassein*, to form] The transformation of tissue into a type foreign to the part where it was produced.

heterometropia (hĕt'ĕr-ŏ-mĕ-trŏ'pĕ-ă) The ability of one eye to refract differently than the other, which produces perceived images of different sizes. The condition is probably prevalent in many individuals who are completely unaware of it.

heteromorphosis (hĕt'ĕr-ŏ-mawr'fă-sĭs) [ʹ + *morphe*, form, + *osis*, condition] The regeneration of an organ different from the one that it replaced.

heteromorphous (hĕt'ĕr-ŏ-mŏr'fŭs) [ʹ + *morphe*, form] Deviating from the normal type.

heteronomous (hĕt'ĕr-ŏn-ŏ-mŭs) [ʹ + *nomos*, law] Abnormal; differing from type.

heterophasia (hĕt'ĕr-ŏ-fă'zĕ-ă) [ʹ + *phasis*, speech] Expression of meaningless words instead of those intended. SYN: *heterolalia*; *heterophemia*.

heterophemia, heterophemy (hĕt'ĕr-ŏ-fĕ'mĕ-ă, hĕt-ĕr-ŏ-fĕ'mĕ) [ʹ + *pheme*, speech] Heterophasia.

heterophil(e) (hĕt'ĕr-ŏ-fĭl, -fĭl) [ʹ + *philein*, to love] 1. Pert. to an antibody reacting with other than the specific antigen. 2. Pert. to a tissue or microorganism that takes a stain other than the ordinary one. 3. Pert. to antigens that occur in more than one species of animal and that may be immunologically related to plant or microbe antigens.

heterophile antibody test A laboratory test for infectious mononucleosis.

heterophilic (hĕt'ĕr-ŏ-fĭl'ĭk) [Gr. *heteros*, other, + *philein*, to love] 1. Having an affinity for something abnormal. 2. Having an antibody response to an antigen other than the specific one.

heterophonia (hĕt'ĕr-ŏ-fŏ'nĕ-ă) [ʹ + *phone*, voice] A change of voice, esp. that which occurs at puberty.

heterophoria (hĕt'ĕ-rŏ-for'ĕ-ă) [ʹ + *phoros*, bearing] A tendency of the eyes to deviate from their normal position for visual alignment, esp. when one eye is covered; latent deviation or squint. This tendency is caused by an imbalance or weakness of the ocular muscles. SEE: *phoria*.

Heterophyes (hĕt'ĕr-ŏ-fi'ĕz'ŏ) [ʹ + *phye*, stature] A genus of flukes belonging to the family Heterophyidae.

H. heterophyes A species of intestinal fluke commonly infesting humans. In heavy infestations, it may cause diarrhea, nausea, and abdominal discomfort.

heterophyiasis (hĕt'ĕr-ŏ-fi-ĭ-ă-sĭs) [ʹ + ʹ + *-iasis*, diseased condition] Infestation by any fluke belonging to the family Heterophyidae.

heteroplasia (hĕt'ĕr-ŏ-plă'zĕ-ă) [ʹ + *plassein*, to mold] The development of tissue at a location where that type of tissue would not normally occur. SYN: *alloplasia*.

heteroplasmy (hĕt'ĕr-ŏ-plă'z'mĕ) Having two or more mitochondrial DNA sources within a person, cell, or mitochondrion.

heteroplastic (hĕt'ĕr-ŏ-plă's'tĭk) Relating to heteroplasia.

heteroploid (hĕt'ĕr-ŏ-ployd) [ʹ + *ploos*, fold] Possessing a chromosome number that is not a multiple of the haploid number common for the species.

heteropsia (hĕt'ĕr-ŏp'sĕ-ă) [ʹ + *opsis*, vision] An inequality of vision in the two eyes.

heteroptics (hĕt'ĕr-ŏp'tĭks) A perversion of vision, such as seeing objects that do not exist or misinterpreting what is seen.

heteropyknosis (hĕt'ĕr-ŏ-pĭk-nŏ'sĭs) [ʹ + *pyknos*, dense, + *osis*, condition] The property whereby various parts of a chromosome stain with varying degrees of intensity. This is thought to be due to variations in the concentration of nucleic acid.

heteroresistance (hĕt'ĕr-ŏ-rĭ-zĭs'tĭns) [ʹ + ʹ] The presence within a population of a pathogen of some organisms that are susceptible to an antimicrobial drug and some that are not. Heteroresistance may explain why failure to eradicate an infection occurs in some patients treated with a seemingly appropriate antibiotic. **heteroresistant**, *adj.*

heterosexual (hĕt'ĕr-ŏ-sĕk'shŭ-ăl) [ʹ + *L. sexus*, sex] 1. Pert. to the opposite sex. 2. A person who has sexual interest in or sexual intercourse exclusively with partners of the opposite sex.

heterosexuality (hĕt'ĕr-ŏ-sĕk'shŭ-ăl'ĭ-tĕ) Sexual attraction for one of the opposite sex.

heterosis (hĕt-ĕr-ŏ'sĭs) [Gr., alteration] Greater strength, size, vigor, and growth rate seen in the first hybrid generation.

heterosmia (hĕt'ĕr-ŏs'mĕ-ă) [Gr. *heteros*, other, + *osme*, odor] The consistent perception of an inappropriate smell when an odorant is inhaled. The smell perceived is unusual and unexpected but not unpleasant. SYN: *allosmia*.

heterotaxia (hět"ēr-ō-tāk'sē-ä) [*"* + *taxis*, arrangement] An abnormal position of organs or parts. SEE: *dextrocardia*; *situs inversus viscerum*.

heterotherm (hět"ēr-ō-thěrm") An animal whose temperature varies considerably in different situations. SEE: *heterothermy*.

heterothermy (hět"ēr-ō-thěrm'mē) [*"* + *therme*, heat] Condition in which an animal's temperature varies considerably in different situations but is not poikilothermic.

heterotopia (hět"ēr-ō-tō'pē-ä) [*"* + *topos*, place] 1. The appearance of a cluster of normal cells in an abnormal location (e.g., of a cluster of cells from the adrenal glands found in a tissue specimen taken from the ovaries). 2. The displacement of an organ or body part from its normal location. **heterotopic**, *adj.*

heterotopy (hět"ēr-ōt'ō-pē) [*"* + *topos*, place] Heterotopia (2).

heterotoxin (hět"ēr-ō-tōk'sīn) [*"* + *toxikon*, poison] A toxin introduced from outside the patient's body.

heterotransplant (hět"ēr-ō-trāns'plānt) [*"* + *L. trans*, across, + *plantare*, to plant] An organ, tissue, or structure taken from an animal and grafted into or on another animal of a different species. Such transplants usually atrophy.

heterotrichosis (hět"ēr-ō-trī-kō'sīs) [*"* + *trichosis*, growth of hair] The growth of different kinds or colors of hair on the scalp or body.

heterotroph (hět"ēr-ō-trōf) [*"* + *trophe*, food] An organism such as a human requiring complex organic food in order to grow and develop; in contrast to plants, which can synthesize food from inorganic materials.

heterotropia (hět"ēr-ō-trō'pē-ä) [*"* + *topos*, a turning] A manifest deviation of the eyes resulting from the absence of binocular equilibrium. SEE: *strabismus*.

heterotypic (hět"ēr-ō-tīp'īk) Concerning something of a different type than that which is being discussed or examined, esp. a tissue.

heterovaccine (hět"ēr-ō-vāk'sēn) [*"* + *L. vaccinus*, pert. to a cow] A vaccine from a microbial source other than that causing the disease it is intended to prevent.

heteroxenous (hět"ēr-ōk'sē-nūs) [*"* + *xenos*, stranger] The property of a parasite that requires two different hosts in order to complete its life cycle.

heterozygosis (hět"ēr-ō-zī-gō'sīs) [*"* + *zygone*, yoke, pair, + *osis*, condition] The state of having different alleles at a specific locus. SEE: *homozygosis*.

heterozygote (hět"ēr-ō-zī'gōt) An individual with different alleles for a given characteristic. SEE: *allele*.

heterozygous (hět"ēr-ō-zī'gūs) Possess-

ing different alleles at a given locus. SEE: *homozygous*.

Heubner, Johann Otto L. (hojb'nēr) German pediatrician, 1843–1926.

H.-Herter disease Nontropical sprue in infants.

heuristic (hū-ris'tīk) [Gr. *heuriskein*, to find out, discover] A rule or model used to simplify problem solving or the interpretation of complex sets of data.

hevein (hē'vē-īn) A protein allergen found in natural rubber latex that stimulates neutrophils to release oxygen radicals. Hevein is a lectin responsible for the IgE-mediated hypersensitivity response to latex products.

HEW U.S. Department of Health, Education and Welfare. This agency is now the U.S. Department of Health and Human Services.

hex-, hexa- [Gr. *hex*, six] Prefixes indicating six.

hexabasic (hěks"ä-bä'sīk) [Gr. *hex*, six, + *basis*, base] An acid that contains six hydrogen (H) atoms that can be replaced by six hydroxyl (OH) radicals.

hexacanth (hěk'sä-kānth) [Gr. *hex*, six, + *akantha*, hook, thorn] The embryonic stage in the life cycle of the tapeworm that has six hooklets to penetrate the intestinal mucosa. SYN: *oncosphere*.

hexachlorophene (hěks"ä-klō'rō-fēn) An antibacterial compound typically used in soaps and scrubs and experimentally used as a cholinesterase inhibitor.

hexachromic (hěks"ä-krō'mīk) [*"* + *chroma*, color] Able to distinguish only six of the seven colors of the spectrum or unable to distinguish violet from indigo.

hexad (hěk'sād) 1. Six similar things. 2. An element with a valence of six.

hexadactylism (hěks"ä-dāk'tīl-izm) [*"* + *daktylos*, finger, + *-ismos*, condition] The presence of six fingers or six toes on one hand or foot.

hexadecimal (hěks"ä-dēs'ī-mūl) [*"* + *L. decimus*, tenth] In computers, a number system using base 16 rather than base 2 (binary) or 10 (decimal).

hexaploidy (hěk'sä-ploy'dē) [*"* + *ploos*, fold] A condition of having six sets of chromosomes.

Hexapoda (hěks-äp'ō-dä) [*"* + *pous*, foot] Insecta.

hexatomic (hěks"ä-tōm'īk) [*"* + *atomos*, indivisible] Pert. to a compound consisting of six atoms or one with six replaceable hydrogen or univalent atoms.

hexavalent (hěks"ä-vā'lēnt) [*"* + *L. valere*, to have power] Having a chemical valence of six.

hexavitamin (hěks"ä-vī'tä-mīn) A standardized vitamin preparation containing vitamins A, D, C, and B, riboflavin, and niacinamide.

hexokinase (hěks"ō-kī'nās) [*"* + *kinein*, to move, + *-ase*, enzyme] An enzyme

in cells that in the presence of ATP catalyzes the conversion of glucose to glucose-6-phosphate, the first step in glycolysis.

hexosamine (hĕk'sŏs'ă-mĕn") A sugar containing an amino group in place of a hydroxyl group (e.g., glucosamine).

hexose (hĕk'sŏs) Any monosaccharide of the general formula $C_6H_{12}O_6$; the group includes glucose, fructose, and galactose.

hexosephosphate (hĕks'ŏs-fŏs'fāt) [Gr. *hex*, six, + *phosphoros*, phosphorus] A phosphoric acid ester of glucose; one of several esters formed in the muscles and other tissues in the metabolism of carbohydrates.

HF 1. *Hageman factor*; blood coagulation factor XII. 2. *high frequency*. 3. *hydrofluoric acid*

Hf Symbol for the element hafnium.

HFE protein A protein normally found intracellularly in duodenal crypt enterocytes and the placenta. It is closely associated with transferrin receptors for iron, and regulates iron absorption. HFE is a homologue of class I major histocompatibility complex (MHC) molecules. The C2824 and H63D mutations on chromosome 6 in the HFE gene cause hemochromatosis.

HFJV *high-frequency jet ventilation*.

Hg [L. *hydrargyrum*] Symbol for the element mercury.

Hgb *hemoglobin*.

HgCl₂ Symbol for mercuric chloride; corrosive sublimate.

Hg₂Cl₂ Symbol for mercurous chloride; calomel.

HGE *human granulocytic ehrlichiosis*.

HGF 1. *human growth factor*. 2. *hyperglycemic-glycogenolytic factor* (glucagon).

HgI₂ Symbol for mercuric iodide.

HgO Symbol for mercuric oxide.

HgS Symbol for mercuric sulfide.

HGSIL *high-grade squamous intraepithelial lesion*.

HgSO₄ Symbol for mercuric sulfate.

Hhb *reduced hemoglobin (deoxyhemoglobin)*.

Hh blood group A rare blood group in Western populations (found most often in individuals of Taiwanese or Indian descent) that is determined by a particular oligosaccharide on the surface of red blood cells. The absence of the H antigen, the determining oligosaccharide of this blood group, can result rarely in severe transfusion reactions when an H-deficient person receives blood from any ABO blood group donor.

HHNC *Hyperglycemic hyperosmolar nonketotic coma*.

HHS U.S. Department of Health and Human Services.

5-HIAA *5-hydroxyindoleacetic acid*.

hiatus (hī-ă'tūs) [L., an opening] An opening or aperture; a foramen.

h. aorticus An opening in the dia-

phragm through which pass the aorta and the thoracic duct.

h. canalis facialis A hiatus of the canal for the greater petrosal nerve.

h. esophageus The opening in the diaphragm through which the esophagus passes.

h. maxillaris The opening of the maxillary sinus into the nasal cavity, located on the nasal surface of the maxillary bone.

sacral h. The opening on the inferior-posterior surface of the sacrum into the sacral canal.

h. semilunaris The groove in the external wall of the middle meatus of the nasal fossa into which the frontal sinus, maxillary sinus, and anterior ethmoid sinuses drain. The opening may be blocked in patients with acute or chronic sinusitis.

Hib *Haemophilus influenzae type b*.

hibernation (hī'bĕr-nă'shŭn) [L. *hiberna*, winter] The condition of spending the winter asleep and in an almost comatose state. Some animals adapt to winter by this method.

artificial h. A state of hibernation produced therapeutically by use of drugs alone or drugs and hypothermia. This greatly reduces the metabolic rate during procedures such as open heart surgery.

hibernoma (hī'bĕr-nŏ'mă) A rare multilobular encapsulated tumor that contains fetal fat tissue closely resembling the fat stored in the foot pads of hibernating animals.

hiccup, hiccough (hĭk'ŭp) [probably of imitative origin] A spasmodic periodic closure of the glottis following spasmodic lowering of the diaphragm, causing a short, sharp, inspiratory cough. Hiccups may occur transiently or may occasionally be intractable, lasting days, weeks, or longer. SYN: *singultus*.

ETIOLOGY: Phrenic nerve or diaphragmatic irritation, distention of the stomach, chest or abdominal surgery, metabolic disorders (e.g., hyponatremia), and intracerebral lesions (e.g., tumors, infections) commonly cause prolonged hiccuping.

TREATMENT: Hiccups may be treated by antiemetic drugs, rebreathing in a paper bag, briefly applying ice cubes to both sides of the neck at the level of the larynx, or inhalation of carbon dioxide. Stimulation of the nasopharynx with a soft rubber tube or placement of a thin coating of dry granulated sugar in the hypopharynx may also be tried. If these are not effective, anesthetization of the phrenic nerve may be helpful.

Hickman catheter (hĭk'măn) A tunneled central venous catheter commonly used to administer solutions by central intravenous therapy for a prolonged period.

Applications include total parenteral nutrition, antibiotic therapy, or blood transfusion.

HIDA scan An imaging procedure used to evaluate diseases of the liver, gallbladder, and biliary ducts. Hydroxy-iminodiacetic acid (HIDA), a radioactive tracer that is preferentially taken up by liver cells, is injected into the bloodstream. Its excretion through the biliary tract is observed with a scintillation counter in a nuclear medicine laboratory. Normally HIDA travels from the bile ducts through the cystic duct and into the gallbladder, then out the common bile duct through the sphincter of Oddi into the duodenum. When the flow of bile is obstructed by disease (e.g., a stone, stricture, or malignancy), the passage of the tracer through the biliary tree is slowed or undetectable. SEE: *cholescintigraphy*.

hidr-, hidro- Combining forms meaning *sweat*.

hidradenitis (hī-drād-ĕ-nī'tis) [Gr. *hidros*, sweat, + *aden*, gland, + *itis*, inflammation] An inflammation of the sweat glands.

hidradenoma (hī'drād-ĕ-nō'mă) [" + " + *oma*, tumor] Adenoma of the sweat glands.

hidrocystoma (hī'drō-sīs-tō'mă) [" + *kystis*, cyst, + *oma*, tumor] Hydrocystoma.

hidropoiesis (hī'drō-poy-ĕ'sis) [" + *poiesis*, formation] The formation of sweat. **hidropoietic** (-poy-ĕt'ik), *adj.*

hidrosadenitis (hī'drōs-ăd'ĕ-nī'tis) [" + *aden*, gland, + *itis*, inflammation] Hidradenitis.

hidrosis (hī-drō'sis) [" + *osis*, condition] **1.** The formation and secretion of sweat. **2.** Excessive sweating.

hidrotic (hī-drōt'ik) **1.** Causing the secretion of sweat. SYN: *diaphoretic*; *sudorific*. **2.** Any drug or medicine that induces sweating.

hierarchy (hī'rār-kē) The ordering or classification of anything in ascending or descending order of importance, or value in the case of numerical data. For example, the needs of a human being might be listed in order of theoretical importance, e.g., air, water, food, health, protection from the elements and predators, security, esteem, and love.

HIFU *High-intensity focused ultrasound*.

high colonic (hī kō-lōn'ik) Irrigation of the bowel with large volumes of fluid. It is promoted as a form of internal cleansing and detoxification.



Colonic irrigation poses a potential risk of bowel perforation and electrolyte disturbances, among other potential injuries to the patient.

high endothelial venule ABBR: HEV. A

postcapillary venule found in gut-associated lymphoid tissue, e.g., Peyer's patches, and in lymph nodes. It regulates the movement of lymphocytes in and out of the blood.

higher order aberration In ophthalmology, a refractive error that cannot be corrected by bending light into the eye with eyeglasses or contact lenses.

high frequency chest compressions During emergency cardiac care, chest compressions that are given at a rate of more than 100 per minute.

high-grade squamous intraepithelial lesion A premalignant squamous lesion, found on Papanicolaou test, which may be moderate dysplasia, severe dysplasia, or carcinoma in situ (also referred to as CIN 1 and CIN 2).

high-intensity focused ultrasound ABBR: HIFU. A noninvasive treatment in which ultrasonic energy is used to generate heat for therapeutic purposes within the body. HIFU has been used, for example, to cauterize internal blood vessels that are bleeding or to cavitate or coagulate growths or solid malignancies (such as breast, liver, pancreatic, or prostate cancers). The ultrasound transducer is placed on the skin and the energy from the transducer is directed at radiographically localized tissue depths and volumes. HIFU is an example of thermotherapy.

highly active antiretroviral therapy ABBR: HAART. The combined use of antiviral agents from three or more classes of drugs to treat patients with human immunodeficiency virus (HIV) infection. HAART reduces the number of viruses circulating in the blood (viral load), and prolongs life and disease-free survival. Reverse transcriptase inhibitors, nonnucleoside reverse transcriptase inhibitors, and protease inhibitors are used in HAART. SEE: *acquired immunodeficiency syndrome*.

highly reliable organization ABBR: HRO. An institution that consistently makes fewer mistakes than others working in the same field despite conditions that are stressful, fast-paced, or full of risk. Health care institutions strive to be HROs, i.e., to copy the performance achieved by other industries such as airlines, power plants, and utilities. Becoming an HRO requires a commitment to quality as well as productivity, to open communication, and a culture that encourages self-driven improvement.

Highmore, antrum of (hī'mawr") [Nathaniel Highmore, Brit. surgeon, 1613–1685] The maxillary sinus. SEE: *antrocele*.

Highmore's body (hī'mawrz") Medias-tinum testis.

high-pressure relief valve A safety device built into a ventilator circuit that pro-

tecs the patient from excessively high airway pressures by venting excess pressure into the atmosphere.

hila (hī'lā) [L.] Pl. of hilum.

hilar (hī'lār) Concerning or belonging to the hilum.

hilitis (hī'li'tis) [L. *hilus*, a trifle, + Gr. *itis*, inflammation] An inflammation of any hilum, esp. the hilum of the lung.

Hill diarrhea (hīl) Tropical sprue.

hillock (hīl'ök) [ME. *hilloc*] A small eminence or projection.

axon h. A small conical elevation on the cell body of a neuron from which the axon arises.

Hill-Sachs lesion (hīl'sāks') An indentation fracture of the posterolateral humeral head that occurs following an anterior dislocation of the glenohumeral joint. The lesion involves the cartilage of the humeral head, causing instability that may predispose the individual to subsequent anterior glenohumeral dislocations.

ETIOLOGY: A Hill-Sachs lesion occurs in about 40% of all first-time anterior dislocations and up to 80% of recurrent dislocations. The relative size of the lesion, as determined through an arthroscopy or diagnostic imaging, can be used to ascertain the relative magnitude of the original dislocation.

SYMPTOMS: Although many Hill-Sachs lesions are asymptomatic, pain may arise from the posterolateral humeral head when the glenohumeral joint is abducted to 90°, and passive external rotation is applied.

TREATMENT: Surgical repair may be needed to increase anterior stability of the glenohumeral joint.

Hill sign (hīl) [Sir Leonard Erskine Hill, Brit. physiologist, 1866–1952] A physical finding formerly used to determine aortic regurgitation. When the blood pressure in the leg is 20 to 40 mm Hg higher than in the arm, this sign is considered positive and indicative of aortic regurgitation.

Hilton's law (hīl'tōnz) [John Hilton, Brit. surgeon, 1804–1878] A law stating that the trunk of a nerve sends branches not only to a particular muscle but also to the joint moved by that muscle and to the skin overlying the insertion of that muscle.

hilum (hī'lūm) *pl.* **hila** [L., a trifle] **1.** A depression or recess at the exit or entrance of a duct into a gland or of nerves and vessels into an organ. **2.** The root of the lungs at the level of the fourth and fifth dorsal vertebrae. The hilum, on the medial side of each lung, is where the main bronchus, pulmonary arteries, bronchial arteries, and nerves enter the lung and where the pulmonary veins, bronchial veins, and lymphatic vessels leave the lung.

hilus (hī'lūs) *pl.* **hili** [L.] Hilum.

hilus cell An androgen-producing cell found in the ovarian hilum. It is analogous to the male Leydig cell.

hilus cell tumor A rare, steroid-hormone-producing tumor of the ovary. It is an occasional cause of virilization (deepening voice, facial hair growth, and male pattern baldness) in women.

himantosis (hī'mān-tō'sis) [Gr. *himan-tosis*, a long strap] An abnormal lengthening of the uvula.

hindbrain (hīnd'brān) [AS. *hindan*, behind, + *bragen*, brain] The most caudal of the three divisions of the embryonic brain. It differentiates into the metencephalon, which gives rise to the cerebellum and pons; and the myelencephalon, which develops into the medulla oblongata. SYN: *rhombencephalon*.

hindfoot (hīnd'fōt) The posterior part of the foot consisting of the talus and calcaneus.

hindgut (hīnd'gūt) The caudal portion of the endodermal tube, which develops into the alimentary canal. It gives rise to the ileum, colon, and rectum.

hip [AS. *hype*] The region lateral to the ilium of the pelvic bone.

anterior h. dislocation A dislocation of the hip through the obturator foramen, on the pubis, in the perineum, or through a fractured acetabulum.

SYMPTOMS: Pain, tenderness, and immobility accompany this condition. Shortening is present in the pubic and suprapubic forms; lengthening in the obturator and perineal forms.

TREATMENT: Hyperextension and direct traction are used to treat this condition, followed by flexion, abduction with inward rotations, and adduction.

congenital dislocation of the h. A congenital defect of the hip joint, probably caused by multifactorial effects of several abnormal genes.

dislocation of the h. Physical displacement of the head of the femur from its normal location in the acetabulum. It is very often accompanied by a fracture.

SYMPTOMS: Pain, rigidity, and loss of function characterize this condition. The dislocation may be obvious by the abnormal position in which the leg is held or by seeing or feeling the head of the femur in an abnormal position.

DIAGNOSIS: The person has great difficulty in straightening the hip and leg. The knee on the injured side resists inward points toward the other knee.

FIRST AID: The patient should be placed on a large frame, gurney, or support, such as that used for a fractured back. A large pad such as a pillow should be placed under the knee of the affected side. The patient should be treated for shock if required.



fracture of the h. A fracture of the proximal portion of the femur, i.e., of either the head, neck, intertrochanteric or subtrochanteric regions of that bone. Hip fracture occurs each year in approximately 225,000 Americans older than 50. It is more common in women than men as a result of osteoporosis and is esp. common in slender, elderly women. Mortality rates following hip fracture are influenced by the patient's age, general physical health, and the type of fracture.

ETIOLOGY: Osteoporosis predisposes an elderly person to hip fracture.

SYMPTOMS: Pain in the knee or groin is the classic presenting sign of a hip fracture. If the femur is displaced, shortening and rotation of the leg may be present.

TREATMENT: Preoperatively, Buck's traction may be used short term to alleviate muscle spasms. An open reduction, internal fixation of the hip to realign the bone ends for healing is the preferred surgical treatment, or a femoral prosthesis may be used for femoral neck or head fractures. The bone takes 6 to 12 weeks to heal in an elderly patient.

PATIENT CARE: During hospitalization, general patient care concerns apply. The patient is prepared physically and emotionally for surgery according to agency or the orthopedic surgeon's protocol, and postsurgical care and pain control (epidural or intravenous patient-controlled analgesia [PCA]) is discussed. Neurovascular status of the affected limb is assessed according to protocol and compared to the unaffected limb. The patient is referred for physical and occupational therapy and uses a walker until the bone is completely healed. Pain relief and prevention and monitoring of postoperative complications, including infection, hip dislocation, and deep venous thrombosis or pulmonary embolism, are primary concerns. Use of an incentive spirometer is encouraged to prevent atelectasis and respiratory complications. Prophylactic antibiotics and anticoagulants are administered as prescribed, and hip precautions are implemented to prevent dislocation. These precautions include having the patient avoid hip adduction (usually using an abductor wedge), rotation, and flexion greater than 90° during transfer and ambulation activities and by using a raised toilet seat and semi-reclining chair. The patient is typically hospitalized for 2 to 4 days and then discharged to a nursing home, subacute unit, transitional care unit, rehabilitation center, or home for rehabilitation for several weeks.

inferior h. dislocation A rare type of hip dislocation that is treated with trac-

tion in the flexed position, followed by outward rotation and extension.

posterior h. dislocation A dislocation of the hip onto the dorsum ilii or sciatic notch. Most posterior hip dislocations occur when the hip is flexed and adducted and a violent longitudinal force is applied to the femur that forces the femoral head posterior relative to the acetabulum. This mechanism is often seen in automobile accidents.

SYMPTOMS: The condition is characterized by an inward rotation of the thigh, with flexion, inversion, adduction, and shortening; pain and tenderness; and a loss of function and immobility.

TREATMENT: The patient should first be anesthetized and then laid in the dorsal position with the leg flexed on the thigh, and the latter upon the abdomen. The thigh is adducted and rotated outward. Circumduction is performed outwardly across the abdomen and then back to the straight position. Traction may be required.

snapping h. SEE: *snapping hip*.

total h. replacement Surgical procedure used in treating severe arthritis of the hip. Both the head of the femur and the acetabulum are replaced with synthetic components or augmented by artificial components. SEE: *arthroplasty; illius*.



TOTAL HIP REPLACEMENT

(Prosthesis)

PATIENT CARE: *Preoperative:* The patient is educated about the procedure, postoperative care, and the expected surgical outcomes. The patient may donate blood prior to the elective procedure for use if needed, and blood-saving techniques are used during the surgery. Postoperative limitations, hip abduction methods, use of a trapeze, mobility regimen, gluteal and quadriceps setting, and triceps exercises are also instructed. The importance of respiratory toilet is explained, and the proper technique for use of incentive spirometry is taught. Prescribed antibiotics and other drugs are administered. Reports of laboratory and radiological studies are reviewed, and the physician is notified of

any abnormal findings. The patient is informed about pain evaluation techniques and the availability of analgesics is explained. Epidural or intravenous PCA may be employed. Preoperative preparations are carried out (skin, gastrointestinal tract, urinary bladder, and premedication), and their significance is explained to the patient. The patient should be encouraged to verbalize feelings and concerns.

Postoperative: Dressings and drainage devices are monitored for excessive bleeding, and the area beneath the buttocks is inspected for gravity pooling of drainage. Dressings are replaced or reinforced according to the surgeon's protocol, using aseptic technique. Vital signs are monitored, and neurovascular status of the affected extremity is checked frequently, comparing it to the unaffected limb. Analgesics are administered as prescribed and required, and the patient is evaluated for response. The patient is repositioned frequently in prescribed positions, and the integrity of all supportive equipment (splints, pillows, traction devices) is maintained during repositioning. The patient should avoid leg crossing and internal rotation, which enhance the potential for prosthesis dislocation and interfere with venous return. Respiratory status is assessed and incentive spirometry and deep breathing and coughing are encouraged to prevent pulmonary complications. An exercise program and early ambulation (often on postoperative day number 1) should begin as prescribed by the surgeon (type and extent of weight bearing on affected limb) and in collaboration with the physical therapist. Raised toilet seats and semireclining chairs are used to prevent hip flexion. A diet high in protein and vitamin C is provided, wound healing assessed, and skin breakdown prevented. Antiembolic devices and anticoagulant drugs are given if prescribed, and the patient is assessed for such complications as thrombophlebitis, embolism, and dislocation. The patient usually will be transferred to a rehabilitation center or may rehabilitate at home. Discharge teaching focuses on the exercise regimen and activity limitations, stressing the importance of swimming and walking programs. Outpatient orthopedic follow-up and therapy are arranged as required. The patient should participate in a weight reduction program if necessary.

HIPAA *Health Insurance Portability and Accountability Act.*

Hippel's disease, von Hippel-Lindau disease (hĭp'ĕlz, vŏn hĭp'ĕl-lĭn'dow) [Eugen von Hippel, Ger. ophthalmologist, 1867–1939; Arvid Lindau, Swedish pathologist, 1892–1958] Angiomas of

the retina and various areas of the body including the central nervous system, spinal cord, and visceral organs.

hippocampal (hĭp'ŏ-kām'pāl) [Gr. *hippokampus*, seahorse] Pert. to the hippocampus.

h. formation Olfactory structures lying along the medial margin of the pallium. They include the hippocampus, dentate gyrus, supracallosal gyrus, longitudinal striae, subcallosal gyrus, diagonal band of Broca, and hippocampal commissure.

hippocampus (hĭp'ŏ-kām'pūs) An elevation of the floor of the inferior horn of the lateral ventricle of the brain, occupying nearly all of it. The hippocampus seems to be important in establishing new memories.

Hippocrates (hĭ-pŏk'rā-tēz) [ca. 460–375 B.C.] A Greek physician referred to as the Father of Medicine because he was the first healer to attempt to record medical experiences for future reference. By so doing he established the foundation for the scientific basis of medical practice. SEE: *Hippocratic oath*.

Hippocratic oath A moral code for medical practitioners promulgated by Hippocrates ~ 400 B.C. It precludes the use of surgery, euthanasia, or abortion by medical practitioners; requires that practitioners give professional courtesy to their instructors (and their children); recommends the use of diet as a primary therapeutic tool; and specifies that medical practitioners always maintain the confidentiality of patient information. SEE: *Declaration of Geneva; Declaration of Hawaii; Nightingale Pledge*.

hip protector A padded garment worn around the buttocks, iliac crest, and proximal femur designed to absorb the shock of a fall and decrease the likelihood of a hip fracture, esp. in athletes, older adults, or persons with osteoporosis.

hippurase (hĭp'ū-rās) Hippuricase.

hippuria (hĭ-pū'rĕ-ă) [Gr. *hippos*, horse, + *ouron*, urine] Large quantities of hippuric acid in the urine.

hippuric acid (hĭp-ūr'ĭk) C₆H₅CONHCH₂COOH; an acid formed and excreted by the kidneys. It is formed in the human body from the combination of benzoic acid and glycine, the synthesis taking place in the liver and, to a limited extent, in the kidneys.

hippuricase (hĭ-pūr'ĭ-kās) An enzyme found in the liver, kidney, and other tissues that catalyzes the synthesis of hippuric acid from benzoic acid and glycine. SYN: *hippurase*.

hippus (hĭp'ūs) [Gr. *hippos*, horse] The rhythmic, spasmodic dilation and contraction of the pupil in response to light. It is usually normal and is often more evident in younger people.

respiratory h. A dilatation of the pupil during inspiration and contraction on expiration.

Hirayama's syndrome (hī-rā-yā'mā) Monomelic amyotrophy.

hircismus (hīr-sīs'mūs) A malodorous condition of the axillae caused by bacterial action on the sweat.

hircus (hīr'kūs) *pl.* **hirci** [L., goat] An axillary hair.

Hirschberg's reflex (hīrsh'bērgz) [Leonard Keene Hirschberg, U.S. neurologist, b. 1877] Adduction of the foot when the sole at the base of the great toe is irritated.

Hirschsprung's disease (hīrsh'sprūngz) [Harald Hirschsprung, Dan. physician, 1830-1916] The most common cause of lower gastrointestinal obstruction in neonates. Patients with this disease exhibit signs of an extremely dilated colon and accompanying chronic constipation, fecal impaction, and overflow diarrhea. It occurs in 1 in 5000 children, with a male-to-female ratio of 4:1. About 15% of cases are diagnosed in the first month of life, 64% by the third month, and 80% by age 1 year. Only 8% remain undiagnosed by 3 years of age. SYN: *aganglionic megacolon*. SEE: *megacolon*.

ETIOLOGY: The condition is caused by congenital absence of some or all the normal bowel parasympathetic ganglion cells, beginning at the anus and extending variable lengths proximally, though 75% of cases are limited to the immediate rectosigmoid area. The aganglionic bowel segment contracts but there is no reciprocal relaxation, so feces cannot be propelled onward through the bowel. Unless diagnosed and treated quickly, the colonic obstruction caused by Hirschsprung's may result in fecal stagnation, bacterial overgrowth with toxin production, enterocolitis, overflow diarrhea, hypovolemic shock, and infant death.

DIAGNOSIS: Barium contrast enema (BE) is usually used for diagnosis, but for mild cases when the BE result is negative, rectal biopsy is the diagnostic standard.

TREATMENT: Treatment is surgical excision of the affected segment and reanastomosis of healthy bowel, by any of several procedures.

PATIENT CARE: In the neonatal period, health care providers assist the parents to adjust to their child's congenital defect and foster infant-parent bonding. They prepare the parents intellectually and emotionally for medical-surgical intervention and teach them about care of the infant's colostomy (if complete obstruction necessitates this) after discharge.

Preoperative patient care focuses on ensuring adequate nutrition to withstand surgery and aid healing. Surgical

preparation in any baby other than a newborn (whose bowel is sterile) requires bowel cleansing and sterilization, using saline enemas and antibiotic therapy. A nasogastric tube may be inserted to manage or prevent abdominal distention. Progressive abdominal distention signals worsening bowel obstruction; the abdominal circumference is measured at the umbilicus each time that vital signs are checked. Psychological preparation for surgery is dictated by the child's age; spacing explanations appropriately can prevent anxiety and confusion. Parents and older children should be reminded that the colostomy (if needed) will be temporary.

Postoperative care is similar to that for any infant or child experiencing abdominal surgery in which colostomies are required. Appropriate analgesics are prescribed and provided, and the parents are assured that the infant's pain will be managed and comfort maintained. Fluid and electrolyte balance is monitored, as are cardiac and ventilatory status. If a nasogastric tube was placed, it may be clamped periodically for brief periods when drainage decreases, assessing for abdominal distention. Once bowel sounds return and distention is absent, oral intake is initiated in a stepwise fashion. Parents are instructed to secure diapers below the area of incision to prevent urine contamination of the wound. Before discharge, the ability of parents to carry out colostomy care and skin protection is evaluated; children from preschool age up should be involved in self-care as appropriate. Follow-up care includes attention to the child's nutrition and well-being. After a variable duration of healing, the colostomy is taken down and reconnected to the remnant bowel. For continuity of care, the child and family are referred to a home health care agency. The community nurse also assists in preparing the family for subsequent surgery. The family may be referred to a social worker, psychologist, or other service agency as appropriate if financial assistance or further psychological support is required.

hirsute (hūr'sūt) [L. *hirsutus*, shaggy] Hairy.

hirsuties (hūr-sū'shē-ēz) Hirsutism.

hirsutism (hūr'sūt-izm) Condition characterized by the excessive growth of hair or the presence of hair in unusual places, esp. in women. Hirsutism in women is usually caused by abnormalities of androgen production or metabolism, or it may be a side effect of medication or hormonal therapies. In patients who do not have an adrenal tumor, this condition may be treated symptomatically by shaving, depilatories, or electrolysis. The goal of medical

therapy is to decrease androgen production. This may involve the use of various agents, including hormones or an anti-androgen (cyproterone acetate).

hirudicide (hī-rū'dī-sīd) [L. *hirudo*, a leech, + *caedere*, to kill] Any substance that destroys leeches.

hirudin (hī-rū'dīn) A substance present in the secretion of the buccal glands of the leech that prevents coagulation of the blood by inactivating thrombin. Hirudin can be used to treat acute myocardial infarction and unstable angina pectoris.

Hirudinea (hīr'ū-dīn'ē-ā) A class of Annelida. This group is hermaphroditic, lacks setae or appendages, usually has two suckers, and includes the blood-sucking leeches. SEE: *hirudin*; *leech*.

hirudiniasis (hīr'ū-dīn-ī'ā-sīs) Infestation by leeches. SEE: *leech*.

external h. The attachment of leeches to the skin. After the leeches drop off, bleeding may continue as a result of the action of hirudin. Bites may become infected or ulcerate.

internal h. A condition resulting from accidental ingestion of leeches in drinking water. They may attach themselves to the wall of the pharynx, nasal cavity, or larynx.

Hirudo (hī-roo'dō) [L., leech] A genus of leeches belonging to the family Gnathobdellidae.

His, Wilhelm Jr. (his) German physician, 1863–1934.

bundle of H. The atrioventricular (AV) bundle, a group of modified muscle fibers, the Purkinje fibers, forming a part of the impulse-conducting system of the heart. It arises in the AV node and continues in the interventricular septum as a single bundle, the crux commune, which divides into two trunks that pass respectively to the right and left ventricles, fine branches passing to all parts of the ventricles. It conducts impulses from the atria to the ventricles, which initiates ventricular contraction.

H. disease Trench fever.

histaminase (his-tām'ī-nās) An enzyme widely distributed in the body that inactivates histamine.

histamine (his'tā-mīn, -mēn) C₅H₉N₃; a substance produced from the amino acid histidine, which causes dilation of blood vessels, increased secretion of acid by the stomach, smooth muscle constriction (e.g., in the bronchi), and mucus production, tissue swelling, and itching (during allergic reactions). The release of histamine from mast cells is a major component of type I hypersensitivity reactions, including asthma.

h. blocking agent Antihistamine.

histaminemia (his-tām'ī-nē'mē-ā) [*histamine* + Gr. *haima*, blood] Histamine in the blood.

histamine test 1. Injection of histamine subcutaneously to stimulate gastric secretion of hydrochloric acid. 2. A test for vasomotor headache; a histamine injection precipitates the onset of a headache in persons with this disease.

histenzyme (hīst-ēn'zīm) [Gr. *histos*, tissue, + *en*, in, + *zyme*, leaven] A renal enzyme that splits up hippuric acid into benzoic acid and glycine. SYN: *histozyme*.

histidase (hīs'tī-dās) Histidine ammonia-lyase.

histidine (hīs'tī-dīn, -dēn) An essential amino acid, C₆H₉N₃O₂, that is, one that must be consumed in the diet.

h. ammonia-lyase A liver enzyme that catalyzes L-histidine with the resultant formation of urocanic acid and ammonia. Deficiency of this enzyme causes histidinemia.

histidinemia (hīs'tī-dī-nē'mē-ā) A hereditary metabolic disease caused by lack of the enzyme histidine ammonia-lyase, which is normally present in the urine.

histidinuria (hīs'tī-dī-nū'rē-ā) The presence of histidine in the urine.

histioblast (hīs'tē-ō-blāst") A tissue histiocyte.

histiocyte (hīs'tē-ō-sīt") [Gr. *histon*, little web, + *kytos*, cell] A monocyte that has become a resident in tissue. SYN: *histocyte*; *macrophage*.

histiocytoma (hīs'tē-ō-sī-tō'mā) [" + " + *oma*, tumor] A tumor containing histiocytes.

histiocytosis (hīs'tē-ō-sī-tō'sīs) [" + " + *osis*, condition] An abnormal amount of histiocytes in the blood.

Langerhans' cell h. A number of clinical conditions, most commonly seen in infants and children, caused by disease of Langerhans' cell histiocytes. These cells, which are characteristic of all of the variants of the disease, cause granulomas. The great variation in the signs and symptoms produced depends upon their location and how widely spread they are. Almost any organ system including the skeleton may be involved. These diseases were previously given names such as histiocytosis X, Hand-Schüller-Christian disease, Letterer-Siwe disease, and eosinophilic granuloma. Treatment may consist of surgical removal of bone lesions and radiation therapy for lesions threatening vital functions such as sight and hearing. Corticosteroids or cytotoxic agents are useful in controlling soft-tissue disease and multiple skeletal lesions. Bone marrow transplantation has been used in recurrent and progressive Langerhans' cell histiocytosis.

lipid h. Niemann-Pick disease.

histiogenic (hīs-tē-ō-jēn'ik) [" + *genan*, to form] Histiogenous.

histo- [Gr. *histos*, web, tissue] Combining form meaning *tissue*.

histoblast (hĭs'tō-blăst) [ʰ + *blastos*, germ] A tissue-forming cell.

histochemistry (hĭs'tō-kĕm'ĭs-trĕ) The study of chemistry of the cells and tissues. It involves use of both light and electron microscopy and special chemical tests and stains.

histoclastic (hĭs'tō-klăs'tĭk) [ʰ + *klas-tos*, breaking] The ability to break down tissues, said of certain cells.

histocompatibility (hĭs'tō-kōm-păt'ĭ-bĭl'ĭ-tĕ) Cell-mediated immunological similarity or compatibility.

histocyte (hĭs'tō-sĭt) [ʰ + *kytos*, cell] Histiocyte.

histodiagnosis (hĭs'tō-dĭ''ăg-nō'sĭs) [ʰ + *dia*, through, + *gnosis*, knowledge] A diagnosis made from examination of the tissues, esp. by use of microscopy.

histodifferentiation (hĭs'tō-dĭf''ĕr-ĕn'shĕ-ă'shŭn) The process of tissue maturation during which cells become specialized.

histogenesis (hĭs'tō-jĕn'ĕ-sĭs) [ʰ + *genesis*, generation, birth] The development into differentiated tissues of a germ layer; the origin and development of tissue. **histogenetic** (hĭs'tō-jĕ-nĕt'ĭk), *adj.*

histogenous (hĭs'tōj'ĕ-nŭs) Made by the tissues. SYN: *histiogenic*.

histogram (hĭs'tō-gram) [L. *historia*, observation, + Gr. *gramma*, something written] A graph showing frequency distributions.

histohematin (hĭs'tō-hĕm'ă-tĭn) [ʰ + *haima*, blood] A hemoglobin pigment in various tissues.

histohematogenous (hĭs'tō-hĕm'ă-tōj'ĕ-nŭs) [ʰ + " + *gennan*, to form] Arising from the tissues and the blood.

histoincompatible (hĭs'tō-in'kōm-păt'ĭ-bl) Immunologically incompatible (e.g., for tissue transplantation).

histokinesis (hĭs'tō-kĭ-nĕ'sĭs) [ʰ + *kinesis*, movement] Movement in the tissues of the body.

histological technician (hĭs'tă-lōj'ĭ-kĭl tĕk-nĭsh'in) A technician who works with pathologists in the sectioning, embedding, fixation, staining, and mounting of tissues and body fluids for diagnostic analysis.

histological technologist (hĭs'tō-lōj'ĭk) A technologist who performs all the functions of the histological technician, as well as more complex procedures for processing tissues, such as identifying tissue structures, cell components, their staining characteristics, and their relation to physiology. He or she may also implement and test new techniques and procedures.

histologist (hĭs-tōl'ō-jĭst) [ʰ + *logos*, word, reason] A specialist in the microscopic study of cells and tissues.

histology (hĭs-tōl'ō-jĕ) The study of the

microscopic structure of tissue. **histological** (hĭs'tō-lōj'ĭ-kăl), *adj.*

normal h. The microscopic study of healthy tissue.

pathologic h. Histopathology.

histolysis (hĭs-tōl'ĭ-sĭs) [ʰ + *lysis*, dissolution] Disintegration of the tissues.

histolytic (hĭs'tō-lĭt'ĭk), *adj.*

histoma (hĭs-tō'mă) [ʰ + *oma*, tumor] A tumor composed of tissue.

histomorphometry (hĭs'tō-mōr-fōm'ĕ-trĕ) The quantitative analysis of tissue structure (e.g., its components, its strength, or its deterioration in stress or illness).

histone (hĭs'tōn, -tōn) [Gr. *histos*, web, tissue] One of the five kinds of proteins that are part of chromatin in eukaryotic cells. Their positive charge attracts the negatively charged DNA that is folded around them into units called nucleosomes. Histones also regulate some of the further folding of DNA in chromosomes about to undergo mitosis.

histonuria (hĭs-tōn-ŭ-rĕ-ă) [ʰ + *ouros*, urine] Excretion of histones in the urine.

histopathology (hĭs'tō-pă-thōl'ō-jĕ) [ʰ + *pathos*, disease, suffering, + *logos*, word, reason] The microscopic study of diseased tissues. SYN: *pathologic histology*.

histophysiology (hĭs'tō-fĭz'e-ōl'ō-jĕ) [ʰ + *physis*, nature, + *logos*, word, reason] The study of the functions of cells and tissues.

Histoplasma (hĭs'tō-plăz'mă) [ʰ + LL. *plasma*, form, mold] A genus of parasitic fungi.

H. capsulatum The causative agent of histoplasmosis. SEE: *illus.*



HISTOPLASMA CAPSULATUM IN CULTURE

histoplasmin (hĭs'tō-plăz'mĭn) An antigen prepared from cultures of *Histoplasma capsulatum* and used as a skin test for the diagnosis of histoplasmosis.

histoplasmosis (hĭs'tō-plăz-mō'sĭs) [ʰ + " + Gr. *osis*, condition] A systemic fungal respiratory disease caused by *Histoplasma capsulatum*. The reservoir for this fungus is in soil with a high organic content and undisturbed bird droppings, esp. around old chicken houses; caves harboring bats; and star-

ling, blackbird, and pigeon roosts. In the U.S., the infection is endemic in the Ohio River valley. Disseminated histoplasmosis is a common opportunistic infection in patients with acquired immunodeficiency syndrome (AIDS) and other immunosuppressing illnesses.

SYMPTOMS: The signs and symptoms vary from those of a mild self-limited infection (in primary acute histoplasmosis) to a severe or fatal disease in disseminated disease). Immunocompromised persons are esp. susceptible. In disseminated disease there are fever, anemia, enlargement of the spleen and liver, leukopenia, pneumonia, adrenal necrosis, and gastrointestinal tract ulcers. Chronic pulmonary histoplasmosis produces lung cavitations similar to those in tuberculosis.

DIAGNOSIS: Diagnosis is based on a history of exposure, a positive histoplasmin skin test or urine antigen test, and rising complement fixation and agglutination titers. It is confirmed by stained tissue biopsy or culture of *H. capsulatum* from sputum, blood, lymph nodes, or bone marrow.

TREATMENT: The treatment is high-dose or long-term intravenous amphotericin B or other potent antifungal agents (azoles). Patients with acquired immunodeficiencies require lifelong treatment using fluconazole.

PATIENT CARE: In patients with severe pneumonia, respiratory status is monitored every 8 hr (or more frequently as necessary) to assess for diminished breath sounds, pleural friction rub, or effusion; cardiovascular status every 8 hr (or more frequently as necessary) to document and immediately report any muffling of heart sounds, jugular vein distention, pulsus paradoxus, or other signs of cardiac tamponade; and neurological status every 8 hr (or more frequently as necessary) to document and report any changes in level of consciousness or any nuchal rigidity (either of which may be evidence of fungal meningitis). The patient is assessed for signs and symptoms of hypoglycemia and hyperglycemia, indicating adrenal dysfunction. All stools are tested for occult blood, and its presence is documented and reported. Prescribed antifungal therapy (amphotericin B, itraconazole, or ketoconazole) is administered and evaluated for desired effects and any adverse reactions. If needed, oxygen therapy is administered. Glucocorticoids are administered if adrenal insufficiency occurs. A dietitian is consulted to construct an appetizing and nutritious diet incorporating the patient's food preferences. If the patient has oropharyngeal ulceration, soothing oral hygiene and soft, bland

foods are provided. (Parenteral nutrition may be required if ulcerations are severe, resulting in dysphagia.) Emotional support is offered to the patient with chronic or disseminated histoplasmosis, and referral to a social worker, psychologist, or occupational therapist for further counseling and support may be necessary to help the patient cope with long-term therapy. The nurse assists parents of a child with this disease to arrange for home-bound instruction. The patient is advised that follow-up care on a regular basis will be required for at least a year. Cardiac and pulmonary signs and symptoms that may indicate effusions should be reported to the health care provider immediately. To help prevent disseminated histoplasmosis, persons in endemic areas are taught to watch for early signs of this infection and to seek treatment promptly. Persons who risk occupational exposure to contaminated soil are instructed to wear face masks.

historical control (group) (hīs-tōr-ī-kīl)

In a research study a person or group of persons who were treated in the past and who provide contrast and comparison to participants currently being studied. Because a wide variety of variables may change over time, the use of historical controls as opposed to a contemporary control group is often an indication that an investigation has less methodological rigor.

history, medical history (hīs'tō-rē) [Gr. *historia*, inquiry] A systematic record of past events as they relate to a person and his or her medical background. A carefully taken medical, surgical, and occupational history will enable diagnosis in about 80% of patients.

TECHNIQUE: The patient should be given the opportunity to describe his or her symptoms in his/her own words, fully and completely, without interruption. The examiner encourages the patient to speak by maintaining a sympathetic and nonjudgmental attitude. After the patient's explanations are completed, the examiner usually asks carefully chosen questions to elicit details about an illness and gain deeper insights. SEE: *nursing assessment*.

case h. The complete medical, family, social, and psychiatric history of a patient up to the time of admission for the present illness.

dental h. A record of all aspects of a person's oral health, previous evaluations and treatments, and the state of general physical and mental health. SEE: *oral diagnosis*.

family h. A record of the state of health and medical history of members of the patient's immediate family, which may be of interest to the physician be-

cause of genetic or familial tendencies noted.

occupational h. A semistructured interview process used by occupational therapists to determine a person's roles, approach to tasks, and sense of identity.

histo spots Scarring of the macula found in patients infected with *Histoplasma capsulatum*, a fungus that is endemic in the Ohio and Mississippi river valleys.

histotoxic (hīs'tō-tōk'sīk) [ʹ + *toxikon*, poison] Toxic to tissue.

histotropic (hīs'tō-trōp'īk) [ʹ + *trope*, a turning] Having attraction for tissue cells, as certain parasites, stains, or chemicals.

histozoic (hīs'tō-zō'īk) [ʹ + *zoe*, life] Living within or on tissues, said of certain protozoan parasites.

histozyme (hīs'tō-zīm) [ʹ + *zyme*, leaven] A renal enzyme that converts hippuric acid into benzoic acid and glycine, causing fermentation.

HIT *Health information technology.*

hitchhiker's thumb A hyperextended thumb or the ability to extend the distal interphalangeal joint of the thumb more than 45 degrees. It is an autosomally inherited trait.

hitting bottom A colloquial term for reaching the lowest limits of depression or depravity. The term is often used by addicts in support groups to describe the depths to which their addiction has taken them.

HIV *human immunodeficiency virus.* SEE: AIDS; *human immunodeficiency virus.*

hives (hīvz) [origin uncertain] Urticaria.

HIV positive SEE: *Nursing Diagnoses Appendix.*

hl *hectoliter.*

HLA *histocompatibility locus antigen; human lymphocyte antigen.*

HLA complex SEE: *major histocompatibility complex.*

HLA mismatch, human leukocyte antigen mismatch The number of human leukocyte antigens (HLAs) found on the cells of a donor organ but not found on the cells of the organ recipient. The greater the disparity between the antigens, the lower the probability of a successful transplantation.

HMD *hyaline membrane disease.*

HMG *human menopausal gonadotropin.*

HMO *health maintenance organization.*

HNO₂ Symbol for nitrous acid.

HNO₃ Symbol for nitric acid.

hnRNA Long RNA molecules (heterogeneous nuclear) found in the cell nucleus. They are fashioned into mature RNA by splicing introns.

Ho Symbol for the element holmium.

H₂O Symbol for water.

H₂O₂ Symbol for hydrogen peroxide.

hoarseness [AS. *has*, harsh] A rough quality of the voice.

ETIOLOGY: Hoarseness may be caused by simple chronic inflammations secondary to chronic nasopharyngitis, chemical irritants, tobacco, or alcohol. Specific causes of chronic laryngitis include syphilis, tuberculosis, leprosy, neoplasms, papilloma, angioma, fibroma, singer's nodes, carcinoma, paralysis, overuse of the vocal cords, and prolapse of the ventricle of the larynx. Female virilization also usually causes hoarseness.

Hochsinger's sign (hōk'zīng-ērz) [Karl Hochsinger, Austrian pediatrician, b. 1860] Closure of the fist in tetany when the inner side of the biceps muscle is pressed.

Hodge's plane [Hugh Lennox Hodge, U.S. physician, 1796–1873] A plane running parallel to the pelvic inlet and passing through the second sacral vertebra and the upper border of the os pubis.

Hodgkin's disease (hōj'kīns) [Thomas Hodgkin, Brit. physician, 1798–1866] ABBR: HD. A malignant lymphoma whose pathological hallmark is the Reed-Sternberg cell, a giant, multinucleated cell, usually a transformed B lymphocyte. The disease may affect persons of any age but occurs most often in adults in their early 30s. The incidence of the disease is higher in males than in females. It is slightly more common in Caucasians than in other racial groups. The disease has a bimodal age distribution; it is common in people between the ages of 15 and 35, and in another group of patients older than 50. About 7500 new cases of the disease are diagnosed annually in the U.S. This lymphoma typically begins in a single lymph node (esp. in the neck, axilla, groin, or near the aorta) and spreads to adjacent nodes if it is not recognized. It may metastasize gradually to lymphatic tissue on both sides of the diaphragm or disseminate widely to tissues outside the lymph nodes. The degree of metastasis defines the stage of the disease; early disease (stage I or II) is present in one or a few lymph nodes, whereas widespread disease has disseminated to both sides of the diaphragm (stage III) or throughout the body (stage IV). The lower the stage of the disease, the better the prognosis. Patients with stage I Hodgkin's lymphoma have a 90% survival 5 years after diagnosis. SEE: *non-Hodgkin's lymphoma*; *Reed-Sternberg cell*; *Nursing Diagnoses Appendix.*

ETIOLOGY: Epstein-Barr virus has been found in the cells of nearly half of all patients with Hodgkin's disease.

SYMPTOMS: Early stage patients may have no symptoms other than a painless lump or enlarged gland in the armpit or neck. Others may develop fevers, night sweats, loss of appetite, and weight loss.

DIAGNOSIS: The presence of the giant, multinucleated Reed-Sternberg (RS) cell in tissue obtained for biopsy is diagnostic.

TREATMENT: The goal of therapy is cure, not just palliation of symptoms. Treatment depends on accurate staging. Combinations of radiation therapy with chemotherapy have been traditionally used (radiation alone for stages I and II, radiation and chemotherapy for stage III, and chemotherapy for stage IV), although chemotherapies that rely on multiple agents used together may be as effective. Autologous bone marrow transplant or autologous peripheral blood stem cell transfusion (along with high-dose chemotherapy) also have been used in treatment, esp. among younger patients. Antiemetics, sedatives, antidiarrheals, and antipyretic drugs are given for patient comfort.

PATIENT CARE: All procedures and treatments associated with the plan of care are explained. The patient is assessed for nutritional deficiencies and malnutrition by obtaining regular weights, checking anthropomorphic measurements, and monitoring appropriate laboratory studies (serum protein levels, transferrin levels) and, as necessary, energy panels. A well-balanced, high-calorie, high-protein diet is provided. The patient is observed for complications during chemotherapy, including anorexia, nausea, vomiting, mouth ulcers, alopecia, fatigue, and bone marrow depression as well as for adverse reactions to radiation therapy, such as hair loss, anorexia, nausea, vomiting, and fatigue. Supportive care is provided as indicated for adverse reactions to chemotherapy or radiation therapy. Comfort measures are provided to promote relaxation, and periods of rest are planned because the patient will tire easily. Hematologic studies are followed closely during treatment, and colony-stimulating factors are administered as necessary to stimulate red and white blood cell production. Antiemetic drugs are administered as prescribed. The importance of gentle but thorough oral hygiene to prevent stomatitis is stressed. To control pain and bleeding, a soft toothbrush or sponge-stick (toothette), cotton swabs, and a soothing or anesthetic mouthwash, such as a sodium bicarbonate mixture or viscous lidocaine, are used as prescribed. The patient can apply petroleum jelly to the lips and should avoid astringent mouthwashes. The patient is advised to pace activities to counteract therapy-induced fatigue and is taught relaxation techniques to promote comfort and rest and reduce anxiety. The patient should avoid crowds and any person with a known in-

fection and should notify the health care provider if any signs or symptoms of infection develop. Health care providers should stay with the patient during periods of stress and anxiety and provide emotional support to the patient and family. Referral to local support groups may be helpful. Women of childbearing age should delay pregnancy until long-term remission occurs. Follow-up care includes regular examinations with an oncologist, and blood tests or radiographic studies to assess for disease recurrence. As necessary, both patient and family are referred for respite or hospice care. The American Cancer Society (through local chapters) provides information and counseling and can assist the patient in obtaining financial assistance if needed. (800-ACS-2345; www.cancer.org.)

Hodgson's disease (høj'sónz) [Joseph Hodgson, Brit. physician, 1788–1869] Aneurysmal dilatation of the aorta.

Hoffbauer cell (hóf'bow-ér) [J. Isidore Hoffbauer, U.S. gynecologist, 1878–1961] A macrophage found in the connective tissue of the chorionic villi.

Hoffa's syndrome Fat pad syndrome.

Hoffmann's reflex, Hoffmann's sign (hóf'mänz) [Johann Hoffmann, Ger. neurologist, 1857–1919] An abnormal reflex found in patients with damaged pyramidal tracts of the brain. Flexion of the distal interphalangeal joint of the middle finger makes the thumb of the same hand flex and adduct.

hol-, holo- [Gr. *holos*, entire] Combining forms meaning *complete, entire, or homogeneous*.

holandric (höl-än'drik) [ʹ + *aner*, man] Transmitted only by a gene in the non-homologous portion of the Y chromosome. SEE: *hologynic*.

Holden's line (höl'dénz) [Luther Holden, Brit. anatomist, 1815–1905] A wrinkle or indistinct furrow in the groin at the junction of the thigh and the abdomen laterally indicating the position of the capsule of the hip joint.

holding area An Emergency Department area in which patients are kept temporarily before being transferred to an intensive care unit.

holiday heart syndrome The association of cardiac arrhythmias, esp. atrial fibrillation, with binge drinking.

holism (höl'izm) The philosophy based on the belief that, in nature, entities such as individuals and other complete organisms function as complete units that cannot be reduced to the sum of their parts. The philosophy was originally discussed by Jan C. Smuts. The view of the person in holism encompasses the individual's body, mind, and spirit as well as the environment and the society in which a person lives. SEE:

- holistic medicine.* **holistic** (hō-lis'tik), *adj.*
- Hollenhorst plaques, Hollenhorst bodies** (hōl'ēn-horst") [R. W. Hollenhorst, U.S. ophthalmologist, b. 1913] Atheromatous plaques that have lodged in the retinal vessels after having been broken off from the lining of other vessels. They appear as shiny irregular patches in the vessels of the retina.
- hollow** (hōl'ō) **1.** Having a cavity or space inside. **2.** A depressed area, lower than the surrounding tissue.
- Seibeleau's h.** A depression in the floor of the mouth between the tongue and the sublingual glands.
- Holmgren's test** (hōlm'grēnz) [Alarik F. Holmgren, Swedish physiologist, 1831–1897] An obsolete test in which the patient matches colored skeins of yarn to test for color blindness.
- holmium** (hōl'mē-ūm) **SYMB:** Ho. A rare earth metal, whose atomic weight is 164.930 and atomic number is 67.
- holoacardius** (hōl'ō-āk-ā-r'dē-ūs) [Gr. *holos*, entire, + *a-*, not, + *kardia*, heart] A congenitally deformed monozygotic twin fetus with no heart. The in utero circulation is obtained from the heart of the twin to which the deformed fetus is attached.
- holocrine** (hōl'ō-krīn) [" + *krinein*, to secrete] Pert. to a secretory gland or its secretions consisting of altered cells of the same gland, the opposite of merocrine. **SEE:** *apocrine*.
- holodiastolic** (hōl'ō-dī-ā-stōl'īk) [" + *diastellein*, to expand] Relating to the entire diastole, esp. a murmur that occurs during all of diastole.
- holoenzyme** (hōl'ō-ēn'zīm) [" + *en*, in, + *zyme*, leaven] A type of enzyme consisting of a protein portion (apoenzyme) and a non-amino acid portion or prosthetic group. **SEE:** *apoenzyme; prosthetic group*.
- holography** (hōl-ōg'rā-fē) [" + *graphein*, to write] A method of producing pictures in which the image appears as a three-dimensional representation of the original object. The picture obtained is called a hologram (i.e., whole message).
- hologynic** (hōl'ō-jīn'īk) [" + *gyne*, woman] Transmitted only by a gene in the nonhomologous portion of the X chromosome. **SEE:** *holandric*.
- holophytic** (hōl'ō-ft'īk) [" + *phyton*, plant] Resembling a plant, esp. protozoa that are capable of photosynthesis.
- holoprosencephaly** (hōl'ō-prōs'ēn-sēf'ā-lē) [" + *proso*, before, + *enkephalos*, brain] A congenital defect caused by an extra chromosome, either trisomy 13–15 or trisomy 18, which causes deficiency in the forebrain.
- holorachischisis** (hōl'ō-rā-kīś'kī-sīs) [" + *rhachis*, spine, + *schisis*, a splitting] Complete spina bifida.
- holosystolic** (hōl'ō-sīs-tōl'īk) [" + *systellein*, to draw together] Relating to the entire duration of systole.
- holotetanus, holotonia** (hōl-ō-tēt'ā-nūs, hōl'ō-tō-nē-ah) [" + *tetanus*, tetanus, " + *tonos*, tension] A muscular spasm of the entire body.
- holotrichous** (hōl-ōt'rī-kūs) [" + *thrix*, hair] Covered entirely with flagella, said of certain protozoa and bacteria.
- holozoic** (hōl'ō-zō'īk) [" + *zoion*, animal] Resembling an animal with respect to the ingestion of food.
- Holter monitor** (hōl'tēr) [Norman Jeffrey Holter, U.S. biophysicist, 1914–1983] A portable device small enough to be worn by a patient during normal activity. It consists of an electrocardiograph and a recording system capable of storing up to 24 hr of the individual's ECG record. It is particularly useful in obtaining a record of cardiac arrhythmias that would not be discovered by means of an ECG of only a few minutes' duration. Ambulatory electrocardiographic monitoring also can be used to diagnose losses of consciousness or palpitations of unclear etiology, to assess episodes of unrecognized myocardial ischemia, and to evaluate how well therapeutic interventions against such illnesses are working.
- Holthouse's hernia** (hōlt'howz-ēs) [Carsten Holthouse, Brit. surgeon, 1810–1901] An inguinal hernia protruding along the folds of the groin.
- Holt-Oram syndrome** (hōlt-ōr'ām) [Mary Clayton Holt, contemporary Brit. physician; Samuel Oram, contemporary Brit. physician] An inherited disorder, transmitted as an autosomal trait, that is marked by anomalies of the upper limbs and heart. Clinical manifestations vary from minimal radiographic changes to overt structural changes in the hands and arms and single or multiple atrial and ventricular defects that may be life-threatening.
- homalocephalus** (hōm'ā-lō-sēf'ā-lūs) [Gr. *homalos*, level, + *kephale*, head] A person with a flat skull.
- Homans' sign** (hō'mānz) [John Homans, U.S. surgeon, 1877–1954] Pain in the calf when the foot is passively dorsiflexed. This is a physical finding suggestive of venous thrombosis of the deep veins of the calf; however, diagnostic reliability is limited, that is, elicited calf pain may be associated with conditions other than thrombosis, and an absence of calf pain does not rule out thrombosis.
- homaxial** (hō-māk'sē-āl) [Gr. *homos*, same, + L. *axis*, axis] Having all axes alike, as a sphere.
- home** A residence where individuals return regularly to eat, live, recreate, rest, and sleep.
- home assessment** An evaluation of the home environment of older persons and

of persons with functional impairments, usually by an occupational therapist or home care specialist, in order to prevent falls and injuries, identify architectural barriers and safety hazards, and recommend modifications or devices for improving mobility, safety, and independent function. SYN: *home evaluation*.

home drug infusion therapy Out-of-hospital management of diseases or disorders that require intravenous administration of therapeutic agents.



Patients who receive this form of therapy must be carefully selected and trained. Their home care providers must also be experienced in the procedures. If these qualifications are not met, the patients are at high risk for adverse events including severe infection, shock, and even death.

home evaluation Home assessment.

home health care The provision for the medical, nursing, and social needs of a person in his or her own residence or in the residence of a family member.

homeless (hōm'lēss) Having no permanent or usual domicile. Persons with no fixed home are often economically disadvantaged, socially isolated, unemployed, and/or uninsured. They may have limited access to preventive and acute health care and may suffer from untreated acute, chronic, or infectious illnesses.

home maintenance, impaired Inability to independently maintain a safe, growth-promoting immediate environment. SEE: *Nursing Diagnoses Appendix*.

home modification Any physical modification to a residence that increases its usage, safety, security, and independence, esp. for those with motor or sensory limitations.

homeo- [Gr. *homios*, like, similar] Prefix indicating *likeness*; *resemblance*; *constant unchanging state*.

homeodynamics (hō'mē-ō-dī-nām'īks) Three principles proposed by nursing theorist, Martha Rogers, which suggest that human nature is dynamic, ever-changing, and holistic. Rogers calls the homeodynamic principles "helicy," "resonancy," and "integrality." She asserts that human beings are an integral part of their environment rather than creatures that merely adapt to their environment. Nursing assessment should therefore focus on a person's experiences, expressions, and perceptions, rather than on his or her coping mechanisms, modes of adaptation, or reactions to illness.

homeomorphous (hō'mē-ō-mor'fūs) [" + *morphe*, form] Of like shape but different compositions.

homeo-osteoplasty (hō'mē-ō-ōs'tē-ō-plās'tē) [" + *osteon*, bone, + *plassein*, to form] Grafting of a piece of bone that is like the one onto which it is grafted.

homeopath, homeopathist (hō'mē-ō-pāth', hō-mē-ōp'ā-thist) One who practices homeopathy.

homeopathy (hō-mē-ōp'ā-thē) [Gr. *homios*, like, + *pathos*, disease] A school of American healing, founded by Dr. Samuel Christian Friedrich Hahnemann (1755–1843) in the late 18th century, based on the proposal that very dilute doses of extracts, medicines, or other substances that produce symptoms of a disease in healthy people will cure that disease in affected patients. This is loosely based on the theory that "like cures like." Homeopathy differs from traditional (allopathic) medicine in that it emphasizes stimulating the body to heal itself. SYN: *homeotherapy*. SEE: *allopathy*. **homeopathic** (hō'mē-ō-pāth'ik), *adj.*

homeoplasia (hō'mē-ō-plā'zē-ā) [" + *plassein*, to form] The formation of new tissue similar to that already existing in a part.

homeoplastic (hō'mē-ō-plās'tik) Relating to or resembling the structure of adjacent parts.

homeostasis (hō'mē-ō-stā'sis) [" + *stasis*, a standing] The state of dynamic equilibrium of the internal environment of the body that is maintained by the ever-changing processes of feedback and regulation in response to external or internal changes. **homeostatic** (-stāt'ik), *adj.*

homeotherapy (hō'mē-ō-thēr'ā-pē) [" + *therapeia*, treatment] **1.** Any treatment employed in homeopathy. **2.** A synonym for the discipline known as homeopathy.

homeotherm (hōm'ē-ō-thēr'm) [" + *therme*, heat] A warm-blooded organism that maintains a constant body temperature despite fluctuating environmental temperatures; the opposite of poikilotherm. SEE: *homotherm*; *endoderm*.

homeothermal (hō'mē-ō-thēr'māl) [" + *therme*, heat] Pert. to a homeotherm.

homeotypical (hō'mē-ō-tīp'ī-kāl) [" + *typos*, type] Resembling the typical or normal.

home safety checklist A documentation tool to evaluate, anticipate, and prevent injuries (usually caused by accidental falls) to an impaired individual in his or her own home.

homesharing The occupation of a residence by two or more unrelated people. Rent-free living is provided to one of the persons, typically in exchange for services, e.g., housekeeping or meal preparation, for the other.

homesickness [AS. *ham*, home, + *seoc*, ill] Sadness, depression, and anxiety

- related to being away from home or loved ones.
- home visitation** The practice by a health care professional of going to a patient's residence to provide care.
- homework** A task assigned by a mental health counselor for a patient to complete between-therapy sessions.
- homicide** (hóm'í-síd) [L. *homo*, man, + *caedere*, to kill] **1.** Murder. **2.** A murderer. **homicidal**, *adj.*
- homing** (hóm'ing) Movement of a cell toward specific tissues, cytokines, or antigens.
- hominid** (hóm'í-níd) [ʹ + *eidōs*, form, shape] A primate of the Hominidae family. Humans are the only surviving species.
- Hominidae** (hō-mōn'í-dē) [L. *homo*, man, + Gr. *ideos*, pert. to] A family of primates that includes ancient and modern humans.
- Homo** (hō'mō) [L., man] A genus of primates of the family Hominidae. The sole existing species is humankind, *Homo sapiens*. Evidence from fossils indicates extinct species (e.g., *H. habilis*, *H. erectus*, *H. australopithecus*).
- homo-** [Gr. *homos*, same] Prefix meaning *the same* or *a likeness*.
- homoblastic** (hō'mō-blás'tík) [ʹ + *blastos*, germ] Developing from one kind of tissue.
- homocentric** (hō'mō-sēn'trík) [ʹ + *kentron*, center] Having the same center.
- homochronous** (hō-mōk-rō'nūs) [ʹ + *chronos*, time] Occurring at the same time or at the same age in each generation.
- homocysteine** (hō'mō-sís-tē'ín) ABBR: hcy. $\text{HSCH}_2\text{CH}_2\text{CH}(\text{NH}_2)\text{COOH}$; an amino acid produced by the catabolism of methionine. With serine, it forms a complex that eventually produces cysteine and homoserine. There is evidence that a high level of homocysteine in the blood may be associated with an increased risk of developing atherosclerosis. Blood homocysteine levels may be lowered by eating foods rich in folic acid (e.g., green leafy vegetables and fruits) and by vitamin B₆ or B₁₂ supplementation.
- homocystine** (hō'mō-sís'tín) $\text{H}_{16}\text{N}_2\text{O}_4\text{S}_2$; a homologue of cystine formed by condensation of two molecules of homocysteine.
- homocystinuria** (hō'mō-sís-tín-ū'rē-ā) An inherited disease caused by the absence of the enzyme essential to the metabolism of homocystine. Patients are mentally retarded and have subluxated lenses, a tendency toward seizures, liver disease, an increased risk of atherosclerosis and blood clotting disorders, and growth retardation (short stature).
- homocytotropic** (hō'mō-sí'tō-trōp'ík) [ʹ + *kytos*, cell, + *tropos*, a turning] Having an affinity for cells of the same species.
- homosexual** (hō'mō-ě-rōt'ík) Homosexual.
- homogametic** (hō'mō-gā-mēt'ík) [ʹ + *gamos*, marriage] Pert. to the production of one kind of gamete with regard to the sex chromosome. In humans, the XX female is the homogametic sex, as all ova produced contain the X chromosome. SEE: *heterogametic*.
- homogenate** (hō-mōj'ē-nāt) The material obtained when something is homogenized.
- homogeneous** (hō'mō-jē'nē-ūs) [ʹ + *genos*, kind] Uniform in structure, composition, or nature; the opposite of heterogeneous.
- homogeneous system** Any system whose components cannot be separated mechanically.
- homogenesis** (hō-mō-jēn'ē-sīs) [ʹ + *genesis*, generation, birth] Reproduction by the same process in succeeding generations; the opposite of heterogenesis.
- homogenize** (hō-mōj'ē-nīz) To make homogeneous; to produce a uniform emulsion or suspension of two substances normally immiscible.
- homograft** (hō'mō-grāft) Allograft.
- homoiopodal** (hō'moy-ōp'ō-dāl) [Gr. *homoios*, like, + *pous*, *pod-*, foot] Having only one kind of cellular process, such as a neuron with only an axon.
- homokeratoplasty** (hō'mō-ker'ā-tō-plās'tē) A homograft of corneal tissue.
- homolateral** (hō'mō-lāt'ēr-āl) [Gr. *homos*, same, + L. *latus*, side] Ipsilateral.
- homologous** (hō-mōl'ō-gūs) [ʹ + *logos*, word, reason] Similar in fundamental structure and in origin but not necessarily in function (e.g., the arm of a man, forelimb of a dog, and wing of a bird). SEE: *heterologous*.
- homologue** (hōm'ō-lōg) **1.** An organ or part common to a number of species. **2.** One that corresponds to a part or organ in another structure. **3.** In chemistry, any member of a series that resembles the other members in action and general structure but has a constant compositional difference such as a methyl, CH₃, group.
- homology** (hō-mōl'ō-jē) [ʹ + *logos*, word, reason] Similarity in structure but not necessarily in function; the opposite of analogy.
- homolysin** (hō-mōl'ī-sin) [ʹ + *lysis*, dissolution] An agent in serum destructive to erythrocytes.
- homonomous** (hō-mōn'ō-mūs) [ʹ + *nomos*, law] Pert. to parts arranged in a series that are similar in form and structure, as metameres of a segmented animal or the fingers and toes of a mammal.

homonymous (hō-mōn'ī-mūs) [*"* + *onyma*, name] Having the same name.

homophil (hō-mō-fīl) [*"* + *philein*, to love] Pert. to an antibody reacting only with a specific antigen.

homophile (hō-mō-fīl') Homosexual.

homophily The selection of peers because of their perceived similarity to oneself. The making of friendships and the modeling of one's behavior on others with whom one feels kinship.

homophobe (hō'mā-fōb'') One who fears or dislikes homosexuals.

homophobia (hō'mā-fō-bē-ă) An abnormal fear of homosexuals.

homoplastic (hō'mō-plās'tīk) [*"* + *plassein*, to form] Having a similar form and structure.

Homo sapiens (hō'mō sā'pē-ēnz) [L. *homo*, man, + *sapiens*, wise, sapient] The species to which modern humans belong. SEE: *Homo*.

homoserine lactone (hō'mō-sēr'ēn lāk'tō'n) A signaling chemical used by gram-negative bacteria in quorum sensing.

homosexual (hō'mō-sēks'ū-ăl) [Gr. *homos*, same, + L. *sexus*, sex] A person who has sexual interest in or sexual intercourse exclusively with members of his or her own sex.

homosexuality (hō'mō-sēks'ū-ăl'ī-tē) A condition in which the libido is directed toward one of the same sex.

homostimulant (hōm'ō-stīm'ū-lānt) [*"* + L. *stimulare*, to arouse] A substance that will stimulate the organ from which it is derived, e.g., the hormone gastrin.

homotherm (hō'mō-thērm) [*"* + *therme*, heat] Endotherm. **homothermal** (hōm'ō-thēr'māl), *adj.*

homotopic (hōm'ō-tōp'īk) [*"* + *topos*, place] Occurring at the same site on the body.

homotransplantation (hō'mō-trāns'plānt-ā'shūn) [*"* + L. *trans*, across, + *plantare*, to plant] Allotransplantation.

homotype (hō'mō-tīp) [*"* + *typos*, type] One organ or part similar in form and function to another, as one of two paired parts or organs.

homotypic (hō'mō-tīp'īk) Of the same form and type.

homovanillic acid (hō-mō-vā-nīl'īk) ABBR: HVA. A catecholamine that is a metabolite of dopamine. It is found in excessive quantities in patients with neuroendocrine tumors, such as pheochromocytoma or neuroblastoma.

homozygosis (hōm'ō-zī-gō'sīs) [*"* + *zygon*, yoke, pair, + *osis*, condition] The formation of a zygote by the union of gametes that have one or more identical alleles. SEE: *heterozygosis*.

homozygote (hōm'ō-zī'gōt) A homozygous individual; an individual developing from gametes with similar alleles

and thus possessing like pairs of genes for a given hereditary characteristic.

homozygous (hōm'ō-zī'gūs) **1.** Produced by similar alleles. **2.** Said of an organism when germ cells transmit nearly identical alleles as a result of inbreeding.

homunculus (hō-mūn'kū-lūs) [L. diminutive of *homo*, man] **1.** A dwarf in whom the body parts develop in their normal proportions. **2.** An anatomic device for representing the innervation of body parts in the central nervous system.

HON *Health on the Net Foundation.*

honey [AS. *hunig*] A sweet thick liquid substance produced by bees via the enzymatic digestion of the sucrose in nectar into fructose and glucose. The honey's color and flavor are determined by the flowers from which the nectar was obtained. Honey has been used by humans as a food since ancient times. Honey is composed of mostly fructose and glucose with a typical moisture content of about 17%. It is unsafe for human infants to consume honey because it can contain *Clostridium botulinum* spores. This is usually not an issue for older individuals, as their stomach acid is sufficient to inhibit the growth of this organism.

honeymoon **1.** A disease remission, used esp. to describe the brief period after the diagnosis of type 1 diabetes mellitus during which no insulin therapy is required. **2.** A period of celebration, travel, or increased sexual activity after a wedding.

honorific [L. *honorificus*, honor-making] To convey honor upon a person, esp. while writing or speaking about an individual. SEE: *pejorative*.

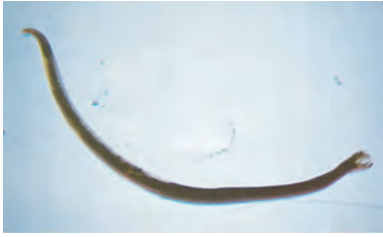
Hoodia gordonii A cactuslike herb promoted as a dietary supplement for weight loss. There is no evidence that the herb is effective, and its potentially toxic effects on the liver make it an unwise choice for dieters.

hook (hook) [AS. *hok*, an angle] **1.** A curved instrument. **2.** The terminal device in an upper extremity orthosis.

Hooke's law (hooks) The stress used to stretch or compress a body is proportional to the strain as long as the elastic limits of the body have not been exceeded.

hookworm A parasitic nematode belonging to the superfamily Strongyloidea, esp. *Ancylostoma duodenale* and *Necator americanus*. SEE: *illius*.

HOOKEWORM DISEASE: Hookworm eggs deposited on the soil in feces mature into larvae capable of penetrating the skin, esp. the bare skin of the foot. An allergic or inflamed rash may develop at the entry site. The larvae pass from the skin into the venous circulation and travel to the alveolar capil-



ADULT HOOKWORM

(Orig. Mag. $\times 10$)

laries of the lungs, up the bronchi and trachea and into the gastrointestinal tract. There they mature, attach to the mucous membrane of the intestine, and begin feeding on host blood. The adults secrete an anticoagulant, which promotes additional bleeding. Eventually, the host develops iron-deficiency anemia. Patients sometimes report nausea, colicky abdominal pain, bloating, and pica. Affected children may suffer growth retardation. The adult worms produce eggs that are excreted in the feces, perpetuating the cycle of infection. The detection of these eggs in the stool provides the basis for diagnosis of the disease.

TREATMENT: Mebendazole and pyrantel pamoate are used to eradicate the infection. Iron supplements are needed to treat the anemia.

hope The expectation that something desired will occur. One of the bases of professional health care is encouraging and supporting the presence of hope while providing accurate information and realistic reassurance.

hope, readiness for enhanced A pattern of expectations and desires that is sufficient for mobilizing energy on one's own behalf and can be strengthened. SEE: *Nursing Diagnoses Appendix*.

hopelessness Despair; loss of faith in the possibility of a positive outcome. Loss of trust in one's prospects may give rise to depression, desperation, or antisocial behaviors. SEE: *grief reaction; helplessness; Nursing Diagnoses Appendix*.

hordeolum (hor-dé'ó-lüm) [L., barley-corn] Sty(e).

horizontal [L. *horizontalis*] **1.** Parallel to or in the plane of the horizon. **2.** A transverse plane of the body that is at right angles to the vertical axis of the body.

hormesis (hor-mé'sis) [Gr. *hormesis*, rapid motion] **1.** The stimulating effect of a low dose of a substance that is toxic in higher doses. **2.** The controversial hypothesis that very low doses of ionizing radiation may not be harmful and may even have beneficial effects.

hormone (hór'môn) [Gr. *horman*, to excite, urge on] **1.** A substance originat-

ing in an organ, gland, or body part, conveyed through the blood to another body part, and chemically stimulating that part to increase or decrease functional activity or to increase or decrease secretion of another hormone. **2.** The secretion of the ductless glands (e.g., insulin from the pancreas). SEE: *endocrine gland*. **hormonal** (hór-môn'ál), *adj.*

adrenocortical h. ABBR: ACH. A hormone (e.g., aldosterone or cortisol) that is secreted by the cortex of the adrenal gland. SEE: *adrenal gland*.

adrenocorticotrophic h. ABBR: ACTH. A hormone that is secreted by the anterior lobe of the pituitary gland and controls the development and functioning of the adrenal cortex, including its secretion of glucocorticoids and androgens. SYN: *corticotropin*.

adrenomedullary h. Any of several hormones (e.g., epinephrine and norepinephrine) produced by the adrenal medulla.

androgenic h. A hormone that regulates the development and maintenance of the male secondary sexual characteristics; an androgen. Androgens include testosterone, androsterone, and dehydroandrosterone and are secreted by the interstitial tissue of the testis and by the adrenal cortex of both sexes.

anterior pituitary h. Any of several hormones secreted by the anterior lobe of the pituitary, including corticotropin, follicle-stimulating hormone, gonadotropin, growth hormone, luteinizing hormone, melanocyte-stimulating hormone, prolactin, and thyrotropin.

antidiuretic h. ABBR: ADH. A peptide hormone that plays a crucial role in limiting the amount of water excreted by the kidneys. Deficiency of ADH causes central diabetes insipidus, excess causes water retention and hyponatremia. SYN: *vasopressin*.

ADH is produced by the hypothalamus and stored in the posterior pituitary gland; it is secreted when the osmolarity of plasma rises. Secretion of ADH increases the concentration of the urine by preventing water losses from the renal tubules. ADH also causes constriction of arterioles (raising blood pressure) and increases levels of clotting factor VIII.

bioidentical natural h. Bioidentical synthetic hormone.

bioidentical synthetic h. ABBR: BSH. A compound extracted from plants or formulated in the laboratory and used to replace or increase concentrations of hormones found in the body. The most commonly manufactured and marketed BSHs are the sex steroid hormones (estrogen, progesterone, and testosterone). SYN: *bioidentical natural hormone*.

corpus luteum h. Progesterone. It

stimulates development of secretory uterine endometrium and facilitates implantation of the fertilized ovum by reducing uterine motility.

cortical h. Adrenocortical h.

corticotropin-releasing h. ABBR: CRH. A hormone that is released from the hypothalamus and acts on the anterior pituitary to increase secretion of adrenal corticotropin hormone. In response to stress CRH causes hyperglycemia, increased oxygen consumption, increased cardiac output, and decreased sexual activity; suppresses release of growth hormone; diminishes gastrointestinal function; stimulates respiration; and causes behavioral changes. SYN: *corticotropin-releasing factor*.

counterregulatory h. Any hormone that opposes the effects of insulin. Examples include glucagon, epinephrine, norepinephrine, cortisol, and growth hormone.

digestive h. Any of a group of hormones produced by the stomach or small intestinal mucosa and stimulating various tissues to release enzymes, produce fluids, or affect gastrointestinal motility. The digestive hormones include gastrin, motilin, secretin, cholecystokinin, and vasoactive intestinal peptide.

estrogenic h. A hormone that stimulates the development and maintenance of female sexual characteristics. Estrogens are secreted by the ovaries and the placenta in women and by the adrenal cortex in both sexes. Estrogenic hormones include estradiol, estrone, and estriol.

follicle-stimulating h. ABBR: FSH. A hormone secreted by the anterior lobe of the pituitary that stimulates maturation of the ovarian follicles in women. In men, the hormone is important in maintaining spermatogenesis.

follicle-stimulating h. releasing hormone ABBR: FSH-RH. A hormone from the hypothalamus that regulates release of follicle-stimulating hormone.

gonadotropic, gonadotrophic h. Gonadotropin.

gonadotropin-releasing h. ABBR: Gn-RH. The hormone produced in the hypothalamus that causes the pituitary to release luteinizing hormone and follicle-stimulating hormone. This hormone is used in treating endometriosis. SYN: *luteinizing hormone-releasing hormone*.

growth h. ABBR: GH. A hormone secreted by the anterior pituitary and regulating the cell division and protein synthesis necessary for normal growth. It is a protein made from a single chain of amino acids; molecular weight 22 kDa. SYN: *somatotropin*.

growth hormone-releasing h. ABBR: GH-RH. A hormone from the

hypothalamus that stimulates the release of growth hormone.

immunoregulatory h. A hormone that influences components of the immune system, including the number and activity of the white blood cells. Such hormones are secreted by almost all of the glands in the body, particularly the hypothalamus and adrenal glands.

inhibitory h. Any of a group of substances limiting the release of hormones from the pituitary. Somatostatin, which inhibits the release of growth hormone, is included in this group.

interstitial cell-stimulating h. ABBR: ICSH. An obsolete term for luteinizing hormone (LH).

intestinal h. Any of several hormones produced by the mucosa of the intestine. These include cholecystokinin, motilin, secretin, and vasoactive inhibitory peptide.

lipolytic h. Any hormone (e.g., epinephrine, glucagon, and cortisol) that promotes release of free fatty acids from fat tissue.

luteal h. Progesterone.

luteinizing h. ABBR: LH. A hormone produced by the anterior lobe of the pituitary, in females stimulating the development of the corpus luteum and helping in the secretion of progesterone, and in males stimulating the development of interstitial cells of the testes to produce testosterone.

luteinizing hormone-releasing h. ABBR: LH-RH. A hormone from the hypothalamus that stimulates the release of luteinizing hormone. SYN: *gonadotropin-releasing hormone*.

luteotropic h. ABBR: LTH. Luteinizing h.

melanocyte-stimulating h. ABBR: MSH. A hormone of the anterior pituitary gland that causes pigmentation of the skin in humans. SYN: *intermedin*.

ovarian h. A hormone produced by the ovary. SEE: *estradiol; estriol; estrogen; estrone; progesterone*.

pancreatic h. A hormone produced by the islets of Langerhans of the pancreas. SEE: *glucagon; insulin*.

parathyroid h. ABBR: PTH. A hormone secreted by the parathyroid glands that regulates blood levels of calcium and phosphorus. Its deficiency results in hypoparathyroidism and hypocalcemia; in excess, it causes hyperparathyroidism and hypercalcemia. SYN: *parathormone*.

placental h. Any of the hormones secreted by the placenta, including estrogen, progesterone, and human chorionic gonadotropin.

posterior pituitary h. Any of the hormones secreted by the posterior lobe of the pituitary (e.g., vasopressin and oxytocin). SEE: *antidiuretic h.*

progestational h. Progesterone.

releasing h. ABBR: RH. Any of a group of substances secreted by the hypothalamus that control or inhibit the release of various hormones. Thyrotropin-releasing hormone, gonadotropin-releasing hormone, dopamine, growth hormone-releasing hormone, corticotropin-releasing hormone, and somatostatin are included in this group. Dopamine and somatostatin act to inhibit release of the hormones they act upon.

sex h. An androgenic or estrogenic hormone.

somatotropic h. ABBR: STH. Somatotropin.

somatotropin-releasing h. Growth hormone-releasing h.

synthetic human growth h. A growth hormone made with recombinant DNA techniques.

testicular h. A hormone produced by the interstitial tissue of the testis (e.g., testosterone and inhibin).

thyroid h. Either of two hormones, thyroxine (T_4) or triiodothyronine (T_3), secreted by the follicles of the thyroid gland. The hormones act on receptors in tissues throughout the body to increase the production of cellular proteins, the metabolic rate, and the activities of the sympathetic nervous system. Deficiency of thyroid hormone produces clinical hypothyroidism; excess causes hyperthyroidism.

thyroid-stimulating h. ABBR: TSH. A hormone secreted by the anterior lobe of the pituitary that stimulates the thyroid gland to secrete thyroxine and triiodothyronine. SYN: *thyrotropin*.

thyrotropic h. Thyrotropin.

thyrotropin-releasing h. ABBR: TRH. A hormone secreted by the hypothalamus that stimulates the anterior pituitary to release thyrotropin.

tropic h. A hormone secreted by one gland (e.g. the pituitary gland) that stimulates another gland to secrete its hormone(s).

hormone replacement therapy ABBR:

HRT. The administration of supplemental conjugated estrogen and progestin to treat hormonal deficiency states, relieve menopausal vasomotor symptoms, and manage postmenopausal atrophic vaginitis. It may also be used, with caution, as adjunctive therapy for osteoporosis. HRT may increase a woman's risk of dying from heart disease, pulmonary embolism, stroke, and breast and endometrial cancers.

hormonogenesis (hor'mō-nō-jěn'ĕ-sīs)

[+ *genesis*, generation, birth] Hormonopoiesis. **hormonogenic** (-jěn'ĭk), *adj.*

hormonopoiesis (hor'mō-nō-poy-ĕ'sīs) [+

poiesis, formation] The production of hormones. SYN: *hormonogenesis*.

hormonopoietic (-ĕt'ĭk), *adj.*

hormonotherapy (hor'mō-nō-thĕr'ă-pĕ)

The therapeutic use of hormones. SYN: *cytotherapy* (1); *endocrinotherapy*; *glandular therapy*; *organotherapy*.

horn A cutaneous outgrowth composed chiefly of keratin; a hornlike projection. SYN: *cornu*.

h. of Ammon Hippocampus.

anterior h. of the spinal cord The horn-shaped portion of the gray matter of the ventral part of the spinal cord. SEE: *spinal cord*.

cicatricial h. A cutaneous horn originating in scar tissue.

cutaneous h. A hard, horny outgrowth from the skin. It is slow-growing, benign, and may be small or large, 10 to 12 cm, in diameter.

dorsal h. The posterior horn of the gray matter of the spinal cord.

posterior h. of the spinal cord The horn-shaped portion of the gray matter of the dorsal part of the spinal cord. SEE: *spinal cord*.

sebaceous h. A hard protrusion from a sebaceous gland.

uterine h. Either of the two upper corners of the uterus into which the uterine tubes enter.

ventral h. The anterior horn of the gray matter of the spinal cord.

warty h. A hard outgrowth from a wart.

Horner's syndrome (hor'nĕrz) [Johann

F. Horner, Swiss ophthalmologist, 1831–1886] A syndrome characterized by contraction of the pupil, partial ptosis of the eyelid, enophthalmos, and sometimes loss of sweating over one side of the face. The syndrome is caused by paralysis of the cervical sympathetic nerve trunk, often as a result of an anesthetic mishap or a tumor in the superior sulcus of the lung.

horoiter (hō-röp'tĕr) [Gr. *horos*, limit, + *opter*, observer] The sum of all points in space that have a corresponding point on the retina of the eye.

horripilation (hor'ĭ-pĭ-lă'shŭn) [L. *hor-rere*, to bristle, + *pilus*, hair] Piloerection.

horror Intense fear, revulsion, or dread caused by seeing or hearing something that is terrifying, shocking, or perceived to be life-threatening to the individual or to others.

horse chestnut (hawrs chĕs'nŭt')

[translation of NL. *Castanea equina*] An herbal remedy from the horse chestnut tree (*Aesculus hippocastanum*), promoted as a dietary supplement for venous insufficiency, nocturnal leg cramps, and edema in the lower extremities as well as a topical agent for hemorrhoids, skin ulcers, and sports injuries.

horsepower A unit of power equal to 745.7 watts or 550 foot pounds per second.

horseshoe crab (hōrs'shoo", hōrsh'oo krāb) *Limulus polyphemus*, a species of arthropod more related to the arachnids than to the crustaceans. Its blood is based on copper rather than iron and is used in testing drugs for bacterial contamination.

hospice (hōs'pīs) An interdisciplinary program of palliative care and supportive services that addresses the physical, spiritual, social, and economic needs of terminally ill patients and their families. This care may be provided in the home or a hospice center. To obtain information about locating a hospice program, contact the National Hospice Organization (<http://www.nho.org/>), telephone 800-658-8898; or Hospice Foundation of America (<http://www.hospicefoundation.org/>), telephone 202-638-5419.

hospital [L. *hospitālis*, pert. to a guest] An institution for treatment of the sick and injured.

base h. 1. A hospital unit within the lines of an army that receives wounded and sick patients from the front line. 2. A hospital that a paramedic unit is assigned to and most frequently calls into for medical control orders.

camp h. An immobile military unit for the care of the sick and wounded.

evacuation h. A mobile advance hospital unit that replaces field hospitals and supplements base hospitals.

field h. A portable military hospital beyond the zone of conflict and the dressing stations.

magnet h. Hospitals with leadership style and policies that increase the recruitment and retention of registered professional nurses.

nonprofit h. A hospital that is exempt from paying income and property taxes. In such a facility, funds earned are reinvested in the hospital and its services instead of being paid as dividends to shareholders.

teaching h. A hospital concerned with instructing medical students, house officers (residents), and allied health personnel in addition to providing medical care. The teaching programs may or may not be part of degree-granting programs, but most provide practical and didactic training that is needed to gain licensure in the health professions.

hospital-at-home care A form of community-based treatment in which acute medical problems are actively addressed in the patient's home by trained health care specialists in place of similar care provided in-hospital. It has been used to treat both medical issues (e.g., congestive heart failure, COPD, or end-of-life) as well as postoperative recuperation. Although hospital-at-home care has been proposed as a low-cost alternative to inpatient care, its cost

structure is not clearly more favorable than inpatient treatment.

hospitalism [L. *hospitālis*, pert. to a guest, + Gr. *-ismos*, condition] 1. The air of depression and apathy that often surrounds a group of seriously ill patients, esp. if they are in an overcrowded ward. 2. A neurotic tendency to seek hospitalization and, once hospitalized, to resist being discharged.

hospitalist A physician in charge of caring for hospitalized patients. These practitioners are rarely involved in outpatient care; they concentrate their efforts on caring for emergency patients, critical care patients, and patients confined to wards.

hospitalization The confinement of a patient in a hospital.

hospital twinning The sharing of resources between two or more hospitals, typically one in an urban, industrialized area and another in a less developed country or region. Twinning is a practice designed to make the technical expertise, infrastructure, and human resources of industrialized health care available to areas with extensive health care needs but relatively limited assets.

host [L. *hospes*, a stranger] 1. The organism from which a parasite obtains its nourishment. 2. In embryology, the larger and more relatively normal of conjoined twins. 3. In transplantation of tissue, the one who receives the graft.

accidental h. A host other than the usual or normal one.

alternate h. Intermediate h. (1).

h. defense mechanisms A complex interacting system that protects the host from endogenous and exogenous microorganisms. It includes physical and chemical barriers, inflammatory response, reticuloendothelial system, and immune responses. SEE: *cytokine; interleukin-1; interferon*.

definitive h. 1. The final host or the host in which the parasite reaches sexual maturity. SYN: *final host*. 2. The vertebrate, when the intermediate host is an invertebrate.

final h. Definitive h. (1).

immunocompromised h. SEE: *immunocompromised*.

intermediate h. 1. The host in which a parasite passes through its larval or asexual stages of development. SYN: *alternate host*. 2. The invertebrate host, when the final host is a vertebrate.

h. of predilection The host preferred by a parasite.

reservoir h. A host other than the usual or normal one, in which a parasite is capable of living. The reservoir host is a source of infestation.

transfer h. An interim host that is not essential for the completion of the life cycle of the parasite.

hostility (hō-stīl'ī-tē) The manifestation

of anger, animosity, or antagonism in a situation in which such a reaction is unwarranted. Hostility may be directed toward oneself, others, or inanimate objects. It is almost always a symptom of depression.

hot [AS. *hat*, *hot*] **1.** Possessing a high temperature. **2.** Actively conducting an electric current. **3.** Contaminated with dangerous radioactive material.

hot-cathode roentgen-ray tube An evacuated glass envelope containing a positive anode and negative cathode separated by a gap that produces x-ray photons. Electrons are supplied from a heated cathode in the form of a stream that interacts with the anode when a potential difference is placed between the anode and cathode.

hot-cathode tube A vacuum tube in which the cathode is electrically heated to incandescence and in which the supply of electrons depends on the temperature of the cathode.

hot flash In women, a common but not universal symptom of declining ovarian function, falling estradiol levels, and impending menopause, marked by the sensation of sudden, brief flares of heat, followed by sweating. During the event, the face and anterior chest wall flush and radiate warmth. These symptoms may occur during the day, or they may interrupt sleep. In men, these same symptoms often occur during androgen ablation therapy for prostate cancer. SYN: *hot flush*.

TREATMENT: For women, discriminant use of hormone replacement therapy may be effective in eliminating symptoms within 1 month; herbal remedies or soy protein have also been suggested but not unequivocally substantiated by research; however, in the absence of supplemental estrogen, spontaneous resolution occurs in about 2 to 3 years. Men with hot flashes during treatment for prostate cancer may respond to antidepressant medications, such as venlafaxine. SEE: *menopause*; *estrogen replacement therapy*; *hormone replacement therapy*.

hot foot syndrome (*hōt'foot'*) Painful tender nodules appearing on the soles of the feet of patients infected with *Pseudomonas aeruginosa*.

hot knife An electric, ultrasonic, or radiation-powered scalpel that cuts and coagulates tissues simultaneously

hotline A continuously managed telephone line for communicating with professionals who can help people experiencing crises, such as abuse or neglect, illicit drug distribution, impending suicide, intoxications and poisoning, domestic violence, or rape.

hot water bag Rubber or plastic bag of various shapes and sizes for applying

dry heat to circumscribed areas and for keeping moist applications warm.

Hounsfield unit (*hownz'fēld*) In computed tomography (CT), a number or value that represents the attenuation of x-rays through a voxel (volume element) in the body and is assigned to the corresponding pixel (picture element) on the image. This number is relative to the standard, which is the absorption of x-rays in water on a scale of +1,000 to -1,000. It is also known as a CT unit.

housefly *Musca domestica*, a fly belonging to the order Diptera. It may be a mechanical carrier of pathogenic microorganisms.

Howell-Jolly bodies (*howl-zhō-lē*) [William H. Howell, U.S. physiologist, 1860-1945; Justin Jolly, Fr. histologist, 1870-1953] Spherical granules (the remnants of nuclear chromatin) seen in erythrocytes in red blood cells of persons who are splenic and in hemolytic and pernicious anemias.

Howship's lacuna (*how'shīps*) [John Howship, Brit. surgeon, 1781-1841] One of several small pits, grooves, or depressions found where bone is resorbed by osteoclasts. SEE: *osteoclast*.

Hoxsey herbal therapy (*hōk'sē*) [Harry Hoxsey, 1901-1974, Am. herbalist] An alternative therapy for cancer consisting of a tonic of barberry, cascara, clover, licorice, pokeroor, and other herbs) and a diet enriched in grape juice, iron, calcium, vitamin C, and yeast. The therapy has been proven to be ineffective.

Hp *haptoglobin*.

HPG *human pituitary gonadotropin*.

HPL *human placental lactogen*.

HPLC *high-pressure or high-performance liquid chromatography*.

HP₃ *Metaphosphoric acid*.

H₃PO₂ *Hypophosphorous acid*.

H₃PO₃ *Phosphorous acid*.

H₃PO₄ *Orthophosphoric acid*.

H₄P₂O₆ *Hypophosphoric acid*.

HpSA *Helicobacter pylori stool antigen*.

HPV *Human papillomavirus*.

HPV DNA test A test to determine whether cancer-causing variants of human papillomavirus are present in the endo- or ectocervix of patients undergoing Papanicolaou (PAP) testing. The test is performed by swabbing the cervix and endocervix carefully and then submitting the specimen for laboratory analysis. It detects the most common types of human papilloma virus that may, in some patients, cause cervical cancer. It may be used to follow up abnormal PAP test results, e.g., atypical squamous cells of uncertain significance, or it may be employed in conjunction with PAP testing. Women whose PAP test results are normal and who have a negative human papilloma virus test have a very low risk for cervical cancer. SYN: *hybrid capture test*.

HQ *hazard quotient.*

hr *hour.*

H₂-receptor antagonists Drugs that inhibit gastric acid secretion by blocking the effects of histamine or acetylcholine on receptors found on parietal cells. They are used to treat peptic ulcers and gastroesophageal reflux disease. They are also known as H₂ blockers.

H reflex [after Johann Hoffmann, who described it in 1918] In electrodiagnostic studies of spinal reflexes, the time required for a stimulus applied to a sensory nerve to travel to the spinal cord and return down the motor nerve. SEE: *F response.*

HRT *hormone replacement therapy.*

H.S. *house surgeon.*

h.s. *hora somni, at bedtime.*

H₂S Hydrogen sulfide.

HSA *human serum albumin.*

H₂SO₃ Sulfurous acid.

H₂SO₄ Sulfuric acid.

HSV *herpes simplex virus.*

5-HT *5-hydroxytryptamine, serotonin.*

ht *height.*

HTLV-1 induced lymphoproliferative syndrome A disease seen in persons infected with human T-cell leukemia-lymphoma virus (HTLV-1). The clinical signs are lymphadenopathy, hepatomegaly, splenomegaly, cutaneous infiltration with neoplastic T cells, hypercalcemia, lymphocytosis, and skeletal changes. Most of these patients develop T-cell leukemia.

TREATMENT: Patients are treated with combination chemotherapy. The median duration of remission is 12 months.

HTLV-I *human T-cell lymphotropic virus type I.*

HTLV-II *human T-cell lymphotropic virus type II.*

HTLV-III *human T-cell lymphotropic virus type III.*

Huang Ti [b. approx 2700 B.C., d. approx. 2600 B.C.] The Yellow Emperor of ancient China. He wrote the first medical text—the one that forms the foundation of traditional Chinese medical practices.

hub (hüb) A central structure into which other structures are anchored, attached, or stabilized.

Hubbard tank (hüb'ärd) A tank of suitable size and shape for use in active or passive underwater exercises. It is also used for débridement of burn and other wounds.

Huguier's canal (ü-gē-äz') [Pierre C. Huguier, Fr. surgeon, 1804–1873] The canal through which the chorda tympani nerve exits from the cranium.

Huhner test (hoon'ër) [Max Huhner, U.S. urologist, 1873–1947] Postcoital examination of cervical mucus. Assessments include characteristics of the mucus as correlated with the phase of the

woman's menstrual cycle, and the number, morphology, motility, and ability of the sperm to cross the cervical mucus. To maximize potential for coincidental conception, the test may be scheduled 1 to 2 days before the expected date of ovulation and within 2 to 3 hr after intercourse. SYN: *postcoital test.* SEE: *infertility.*

hum A soft continuous sound.

venous h. SEE: *venous hum.*

human [L. *humanus*, human] Pert. to or characterizing people.

human chorionic somatomammotropin ABBR: HCS. human placental lactogen.

human factor An umbrella term for several areas of research that include human performance, technology, design, and human-computer interaction. It is a profession that focuses on human abilities, limitations, and characteristics as they relate to their environment.

Human Genome Project An international research effort to map each human gene and to sequence the 3.1 billion chemical bases that make up human DNA. The U.S. National Human Genome Research Institute and Celera Genomics announced the initial deciphering of the genetic code in June 2000. This scientific milestone is expected to improve the way diseases are diagnosed, treated, and prevented, but it presents ethical, legal, and social issues regarding the use of genetic information.

human herpesvirus 1 ABBR: HHV1. Herpes simplex virus 1.

human herpesvirus 2 ABBR: HHV2. Herpes simplex virus 2.

human herpesvirus 3 ABBR: HHV3. Varicella zoster virus.

human herpesvirus 4 ABBR: HHV4. Epstein-Barr virus.

human herpesvirus 5 ABBR: HHV5. Cytomegalovirus.

human herpesvirus 6 A DNA virus that causes exanthem subitum (also known as roseola infantum) and childhood febrile seizures. It causes infections in immunocompromised patients (e.g., patients who have received organ transplants and patients with human immunodeficiency virus infection). Among children, infants between 6 months and 2 years of age are at highest risk for this infection, and asymptomatic or unrecognized infection is probably common. The incubation period is about 5 to 15 days.

human immunodeficiency virus ABBR: HIV. A retrovirus of the subfamily lentivirus that causes acquired immunodeficiency syndrome (AIDS). The most common type of HIV is HIV-1, identified in 1984. HIV-2, first discovered in West Africa in 1986, causes a loss of immune function and the subsequent develop-

ment of opportunistic infections identical to those associated with HIV-1 infections. The two types developed from separate strains of simian immunodeficiency virus. In the U.S., the number of individuals infected with HIV-2 is very small, but blood donations are screened for both types of HIV. **SEE: *illus.*; *acquired immunodeficiency syndrome.***

humanism The concept that human interests, values, and dignity are of utmost importance. This is integral to the actions and thoughts of those who care for the sick.

human T-cell lymphotropic virus type I ABBR: HTLV-I. A virus associated with adult T-cell leukemia.

human T-cell lymphotropic virus type II ABBR: HTLV-II. A virus associated with hairy cell leukemia.

human T-cell lymphotropic virus type III ABBR: HTLV-III. The former name for *human immunodeficiency virus.*

humectant (hū-mĕk'tānt) [L. *humectus*, moist] A moistening agent.

humeral (hū'mĕr-əl) [L. *humerus*, upper arm] Pert. to the humerus.

humeroradial (hū'mĕr-ō-rā'dĕ-āl) [ʹ + *radius*, wheel spoke, ray] Pert. to the humerus and radius, esp. in comparison of their lengths.

humeroradial ratio The ratio of the length of the humerus to that of the radius of an arm.

humeroulnar (hū'mĕr-ō-ŭl'nār) [ʹ + *ulna*, elbow] Pert. to the humerus and ulna, esp. in comparison of their lengths.

humeroulnar ratio The ratio of the length of the humerus to the length of the ulna of a given arm.

humerus (hū'mĕr-ŭs) [L., upper arm] The bone of the upper arm; it articulates with the scapula at the shoulder and with the ulna and radius at the elbow. **SEE: *illus.***

anatomical neck of h. The constricted segment of the humerus between the head and the greater tubercle.

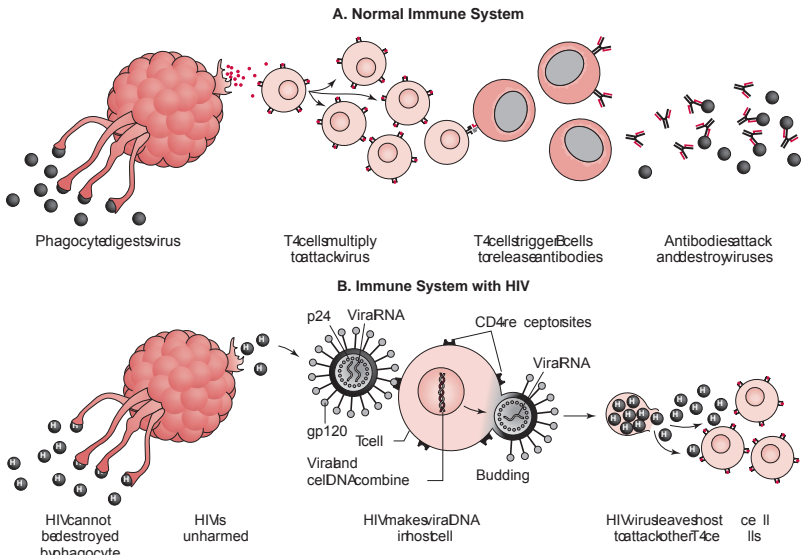


fracture of h. Disruption of the bony cortex of the upper arm. If the fracture is of the upper end of the humerus, the arm is abducted and splinted for about 4 weeks. Movements of the elbow and wrist are started early, and active movements of the shoulder are begun in about 3 weeks. **SEE: *acromiohumeral; capitellum; cubitus; glenoid cavity.***

In a fracture of the shaft and lower end of the humerus, the limb is put in a cast in a position midway between pronation and supination with the humerus at right angles to the forearm. Movement of the shoulder, wrist, and finger is allowed.

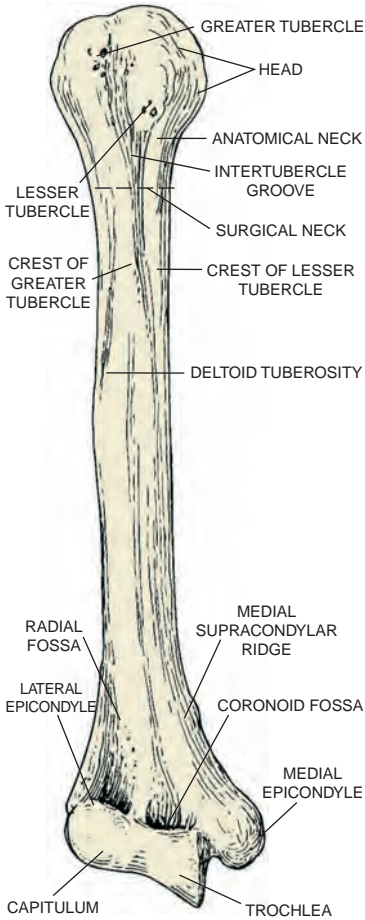
humid [L. *humidus*, moist] Moist, damp, esp. when pert. to air.

humidifier (hū-mĭd'ī-fī'ēr) An apparatus

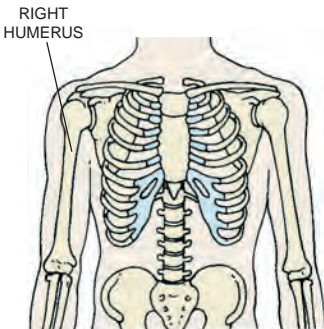


EFFECT OF HIV ON IMMUNE SYSTEM

HIV contains several proteins: gp 120 protein around it and viral RNA and p24 protein inside. The gp 120 proteins attach to CD4+ receptors of T lymphocytes; HIV enters the cell and makes viral DNA; the enslaved host cell produces new viruses that bud, which destroys the host cell's membrane, causing cellular death and allowing the virus to leave to attack other CD4+ lymphocyte cells.



A) ANTERIOR VIEW OF RIGHT HUMERUS



B) PARTIAL ANTERIOR VIEW OF SKELETON
RIGHT HUMERUS

to increase or regulate the moisture content of air in a room or ventilator circuit.

passover h. A device that passively adds moisture to a CPAP device. It works best at a water temperature of at least 30°C. It is used to reduce drying of the nasal passages.

wick h. An active humidification system in which gas flow is exposed to a material saturated with water.

humidifier fever A form of allergic alveolitis caused by exposure to inhaled antigens and marked by flulike symptoms (fever or chills, body aches, cough).

SEE: *alveolitis*. SYN: *humidifier lung*.

humidity [L. *humiditas*] Moisture in the atmosphere.

The moisture content of air usually is expressed as relative humidity. This indicates the amount of water vapor in the air compared with the maximum amount of moisture the air could contain at that temperature and atmospheric pressure. Air that is fully saturated with moisture has 100% relative humidity. When air that is fully saturated is cooled, the excess moisture condenses, as in the case of dew or moisture on a cold glass in the summer.

absolute h. The actual mass of water vapor in a volume of gas, expressed as grams per cubic meter or milligrams per liter. It usually refers to ambient air or gas in the mechanical ventilator circuit.

relative h. The ratio of the amount of water vapor present in an air sample to the amount that could be present if the sample were saturated with water vapor. This value depends on the temperature of the air sample.

humor (hū'mor) [L. *humor*, fluid] Any fluid or semifluid in the body. **humoral** (-āl), *adj.*

aqueous h. The clear tissue fluid that circulates through the anterior cavity of the eye. It is produced by the ciliary processes and passes from the posterior to the anterior chamber and then to the venous system by way of the canal of Schlemm.

crystalline h. The fluid-like substance of the crystalline lens of the eye.

ocular h. Either of the humors of the eye (aqueous and vitreous).

vitreous h. The vitreous body; a transparent semisolid in the posterior cavity between the lens and retina; one of the four refractive media of the eye.

humor therapy The promotion of good health through an appreciation of fun, playfulness, and conviviality. SYN: *laughter therapy*; *therapeutic humor*.

Humulin 50/50 Human insulin consisting of equal parts regular and NPH insulin. SEE: *human insulin*.

Humulin 70/30 Human insulin consisting of 70% NPH and 30% regular insulin. SEE: *human insulin*.

hunchback SEE: *kyphosis*.

hunger [AS. *hungur*] **1.** A sensation resulting from lack of food, characterized by a dull or acute pain referred to the epigastrium or lower part of chest. It is usually accompanied by weakness and an overwhelming desire to eat. Hunger pains coincide with powerful contractions of the stomach. Hunger is distinguished from appetite in that hunger is the physical drive to eat, while appetite is the psychological drive to eat. Hunger is affected by the physiological interaction of hormones and hormone-like factors, while appetite is affected by habits, culture, taste, and many other factors. **2.** To have a strong desire.

air h. Dyspnea; breathlessness.

hungry bone syndrome Hypocalcemia that develops in hyperparathyroid patients treated with parathyroidectomy or in patients with end-stage renal disease treated with calcimimetic drugs. It is caused by a sudden decrease in serum parathyroid hormone levels, which in turn increase the uptake of calcium, magnesium, and phosphate by bone. Clinical consequences include tetany (repetitive muscle twitching) esp. in patients whose calcium deficiency is severe.

Hunner's ulcer (hūn'ērz) [Guy LeRoy Hunner, U.S. surgeon, 1868–1957] Interstitial cystitis.

Hunter's canal (hūn'tērz) [John Hunter, Scot. anatomist and surgeon, 1728–1793] Adductor canal.

Hunter's disease [Charles H. Hunter, Canadian physician, 1873–1955] Mucopolysaccharidosis II.

hunterian chancre Indurated, syphilitic chancre. SEE: *chancre*.

Huntington's chorea, Huntington's disease [George Huntington, U.S. physician, 1850–1916] A dominantly inherited disease of the central nervous system, marked by choreoathetosis (involuntary writhing, ballistic, or dance-like movements), gradually worsening emotional and behavioral disturbances, and eventual dementia. This neurodegenerative disease is rare, affecting about 5 persons in 100,000. Symptoms usually become obvious in adulthood, often after individuals who carry the causative gene have already transmitted it to their offspring. The movement disorder, behavioral decline, and loss of cognitive function that are hallmarks of the illness may take decades to come into being fully. Death usually occurs more than 15 yr after diagnosis. Post-mortem examination of affected patients reveals atrophy of the putamen and caudate nucleus of the brain.

DIAGNOSIS: The diagnosis is straightforward when typical symptoms develop in a son or daughter of a parent known to have the disease. Genetic testing for the illness is available, although its use

presents difficult ethical questions for couples who want to start a family.

TREATMENT: Dopamine agonist drugs, such as haloperidol or risperidone, can help control the movement disorder but must be used carefully because of the potential risk of movement-related side effects. There is no known treatment to stop the degeneration of the affected portions of the brain.

Hunt's neuralgia, Hunt's syndrome (hūnts) [Ramsey Hunt, U.S. neurologist, 1872–1937] Ramsay Hunt syndrome.

Hunt's tremor A tremor associated with all voluntary movements. It is present in certain cerebellar lesions.

Hurler's syndrome (hoor'lērz) [Gertrud Hurler, Ger. pediatrician, 1889–1965] Mucopolysaccharidosis I-H.

Hurter and Driffchild curve ABBR: H and D curve. Sensitometric curve.

Hürthle cells (hēr'tél) [Karl Hürthle, Ger. histologist, 1860–1945] Large, granular cells found in pathological sections in some thyroid diseases. SEE: *Hürthle cell tumor*.

Hürthle cell tumor A benign or malignant tumor of the thyroid gland. The cells are large and acidophilic.

Hutchinson, Sir Jonathan (hūch'in-sōn") British surgeon, 1828–1913.

H.-Gifford disease Progeria.

H.'s incisors Hutchinson's teeth.

H.'s patch A salmon-colored area of the cornea seen in interstitial keratitis caused by syphilis.

H.'s pupil A condition in which one pupil is dilated and the other is not. The pupil on the side of the lesion is dilated and the other is contracted. This condition is usually due to compression of the third cranial nerve in meningitis.

H.'s teeth A congenital condition marked by pegged, lateral incisors and notched central incisors along the cutting edge. It is a sign of congenital syphilis. SYN: *Hutchinson's incisors*.

H.'s triad A syndrome characteristic of congenital syphilis consisting of notched teeth, interstitial keratitis, and eighth-nerve deafness due to meningeal involvement.

Huxley's layer (hūks'lēz) [Thomas H. Huxley, Brit. physiologist and naturalist, 1825–1895] The inner layer of nucleated cells forming the inner root sheath of a hair follicle.

HVA homovanillic acid.

hyalin (hī'ā-līn) [Gr. *hyalos*, glass] **1.** A proteinaceous substance present in tissues that have undergone amyloid degeneration. **2.** Material deposited in the glomerulus in certain forms of glomerulonephritis.

hyaline (hī'ā-līn) **1.** A normal glassy appearance, such as hyaline cartilage. **2.** A glassy appearance acquired as the re-

sult of tissue injury or degeneration. SYN: *hyaloid*.

hyaline body A homogeneous substance resulting from colloid degeneration; found in degenerated cells. SEE: *degeneration, hyaline*.

hyaline membrane disease Respiratory distress syndrome of the newborn.

hyalinization (hī'ā-lin'ī-zā'shūn) Transformation of a tissue to a glassy appearance.

hyalinosis (hī'ā-lin-ō'sis) [Gr. *hyalos*, glass, + *osis*, condition] Waxy or hyaline degeneration.

hyalinuria (hī'ā-lin-ū'rē-ā) [" + *ouron*, urine] Hyalin present in the urine.

hyalitis (hī-ā-lī'tis) [" + *itis*, inflammation] Inflammation in the vitreous, often accompanied by uveitis (vitritis). SYN: *hyaloiditis*.

asteroid h. One of the spherical or star-shaped bodies in the vitreous of the eye, caused by inflammation.

h. punctata A form of hyalitis marked by minute opacities in the vitreous humor.

h. suppurativa A purulent inflammation of the vitreous humor.

hyalo- [Gr. *hyalos*, glass] Combining form indicating resemblance to glass.

hyaloenchondroma (hī'ā-lō-ēn'kōn-drō'mā) [" + *en*, in, + *chondros*, cartilage, + *oma*, tumor] A chondroma composed of hyaline cartilage.

hyalogen (hī-āl'ō-jēn) [" + *gennan*, to produce] A protein in cartilage and the vitreous humor.

hyalohyphomycosis (hī'ā-lō-hī'fō-mī-kō'sīs) [" + Gr. *hyphos*, *hyphe*, web, net + "'] A cutaneous or subcutaneous infection caused by a fungus that does not produce dark pigments. SEE: *phaeohyphomycosis*.

hyaloid (hī'ā-loyd) [" + *eidos*, form, shape] Hyaline.

hyaloiditis (hī'ā-loyd-ī'tis) [" + *eidos*, form, shape, + *itis*, inflammation] Hyalitis.

hyalomere (hī'ā-lō-mēr") The peripherally located region of a platelet that stains light blue.

hyalomucoid (hī'ā-lō-mū'koyd) [" + L. *mucus*, mucus, + Gr. *eidos*, form, shape] Glycoprotein in the vitreous body.

hyalonyxis (hī'ā-lō-nīk'sīs) [" + *nyxis*, puncture] The surgical procedure of puncturing the vitreous body.

hyalophagia, hyalophagy (hī'ā-lō-fā'jē-ā, -lōf'ā-jē) [" + *phagein*, to eat] The eating of glass.

hyalosis (hī'ā-lō'sis) [" + *osis*, condition] Pathological changes in the vitreous humor of the eye.

asteroid h. Suspended spherical white bodies, made of calcium salts, in the vitreous humor of the eye. Usually in one eye and not associated with decreased vision.

hyalosome (hī-āl'ō-sōm) [" + *soma*, body] A faintly staining intranuclear structure that resembles a nucleolus.

hyaluronan (hī'ā-lū-rōn'ēn) Hyaluronic acid.

hyaluronidase (hī'ā-lūr-ōn'ī-dās) An enzyme that disrupts or destroys the extracellular framework of body tissues. It is found in many animal tissues and can be synthesized for therapeutic use. In the testes and the acrosomes of spermatozoa, along with other acrosomal enzymes, it degrades the hyaluronic acid in the corona radiata, facilitating the entry of sperm. In malignant tumors, it participates in the invasion of cancer cells through the basement membranes of blood vessels. It is also a component of the venoms of several animals (including vipers, stonefish, and bees and wasps) and contributes to the tissue destruction that may follow bites or stings from these animals. Some infectious bacteria that invade fascial planes (e.g., *Clostridia*) release it as an exotoxin.

USES: Synthetic hyaluronidase can be used to facilitate diffusion of injected local anesthetics (e.g., in cataract surgery).

hybrid (hī'brīd) [L. *hybrida*, mongrel] The offspring of parents that are different, such as different species.

hybrid capture test HPV DNA test.

hybrid diabetes A form of diabetes mellitus that has characteristics of both type 1 and type 2 diabetes mellitus. A patient with this disorder may have episodes of diabetic ketoacidosis, but marked insulin resistance and an obese body type.

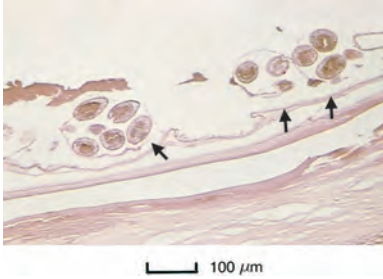
hybridization (hī'brīd-ī-zā'shūn) The production of hybrids by crossbreeding.

hybridoma (hī'brī-dō'mā) A cell produced by the fusion of a spleen cell from a mouse immunized with a specific antigen and a human multiple myeloma cell (a cancerous plasma B cell that makes antibodies). After the fusion, cells are screened to identify those capable of producing a continuous supply of monoclonal antibodies to the specific antigen. SEE: *monoclonal antibody*.

hydantoin (hī-dān'tō-in) A colorless base, glycolyl urea, C₃H₄N₂O₂, derived from urea or allantoin.

hydatid (hī'dā-tīd) [Gr. *hydatis*, watery vesicle] 1. A cyst formed in the tissues, esp. the liver, from the development of the larval stage of the dog tapeworm, *Echinococcus granulosus*. The cyst develops slowly, forming a hollow bladder from the inner surface of which hollow brood capsules are formed. These may be attached to the mother cyst by slender stalks or may fall free into the fluid-filled cavity of the mother cyst. Scolices form on the inner surface of the older brood capsules. Older cysts have a gran-

ular deposit of brood capsules and scolices called hydatid sand. Hydatids may grow for years, sometimes to an enormous size. Ibandazole, mebendazole, and praziquantel have been used to treat the disease. The cyst should be removed surgically or percutaneously drained. **SEE: illus.: echinococcosis.**
2. A small cystic remnant of an embryonic structure. **SEE: choriocarcinoma; hydatid mole.**



HYDATID CYST

Three brood capsules shown (arrows)
 (orig. mag. $\times 100$)

h. of Morgagni A cystlike remnant of the müllerian duct attached to the fallopian tube.

sessile h. Morgagnian hydatid connected with a testicle.

stalked h. Morgagnian hydatid connected with a fallopian tube.

hydatid disease The disease produced by the cysts of the larval stage of the tapeworm *Echinococcus*. **SYN: echinococcosis.**

hydatidocele (hī'dā-tīd'ō-sēl) [" + *kele*, tumor, swelling] A hydatid cyst of the scrotum or testicle.

hydatidoma (hī'dā-tīd-ō'mā) [" + *oma*, tumor] A tumor consisting of hydatids.

hydatidosis (hī'dā-tīd-ō'sīs) [Gr. *hydatis*, watery vesicle, + *osis*, condition] A condition caused by hydatid infestation.

hydatidostomy (hī'dā-tī-dōs'tō-mē) [" + *stoma*, mouth] The evacuation of a hydatid cyst by means of surgery.

hydatism (hī'dā-tīzm) [" + *-ismos*, condition] The sound produced by fluid in a cavity.

hydr- **SEE: hydro-**

hydradenitis (hī'drād-ēn-ī'tīs) [Gr. *hydros*, sweat, + *aden*, gland, + *itis*, inflammation] Inflammation of a sweat gland.

hydradenoma (hī'drād-ē-nō'mā) [" + *oma*, tumor] A tumor of a sweat gland.

hydramnion, hydramnios (hī-drām'nē-ōn, -ōs) [" + *amnion*, a caul on a lamb] An excess of amniotic fluid in the uterus.

hydranencephaly (hī'drān-ēn-sēf'ā-lē) [" + *an-*, not, + *enkephalos*, brain] Internal hydrocephalus caused by congenital absence of the cerebral hemispheres.

hydrarthrosis (hī'drār-thrō'sīs) [" + *arthron*, joint, + *osis*, condition] A joint effusion.

intermittent h. Recurring attacks of swelling of the large joints, lasting 2 to 5 days and then remitting spontaneously. The condition affects men and women equally. The period between attacks is commonly 2 to 4 weeks, during which time the joint is normal. The knee is usually involved, but the elbow, hip, and ankle also may be affected.

hydrase (hī'drās) An enzyme that catalyzes the addition or withdrawal of water from a compound without hydrolysis occurring.

hydrate (hī'drāt) A crystalline substance formed by water combining with various compounds.

hydrated (hī'drā-tēd) [L. *hydratus*]

1. Combined chemically with water, forming a hydrate. **2.** Replete with fluids.

hydration (hī-drā'shūn) **1.** The chemical combination of a substance with water. **2.** The addition of water to a substance, tissue, or patient.

hydraulics (hī-draw'lik) [Gr. *hydor*, water, + *aulos*, pipe] The science of fluids.

hydrazine (hī'drā-zēn) **1.** A colorless gas, H_4N_2 , with a peculiar odor; soluble in water. **2.** One of a class derived from hydrazine.

h. sulfate A chemical promoted for the treatment of cancer. There are no evidence-based studies supporting the efficacy of hydrazine sulfate for cancer.

hydrema (hī-drē'mē-ā) [Gr. *hydor*, water, + *haima*, blood] An excess of watery fluid in the blood.

hydrancephalocele (hī'drēn-sēf'ā-lō-sēl) [" + *enkephalos*, brain, + *kele*, tumor] Hydroencephalocele.

hydrancephalomeningocele (hī'drēn-sēf'ā-lō-mē-nīng'ō-sēl) [" + " + *meninx*, membrane, + *kele*, tumor, swelling] A herniation through a defect in the skull. It contains brain and cerebrospinal fluid covered by meningeal tissues.

hydrocephalus (hī'drēn-sēf'ā-lūs) Hydrocephalus.

hydropigastrium (hī'drēp-ī-gās'trē-ūm) [" + *epi*, upon, + *gaster*, belly] An accumulation of fluid between the peritoneum and the abdominal muscles.

hydride (hī'drīd) A chemical compound containing hydrogen and an element or radical.

hydro-, hydr- [Gr. *hydor*, water] Combining forms pert. to water or to hydrogen.

hydroa (hīd-rō'ă) Any bullous skin eruption.

hydroappendix (hī'drō-ă-pĕn'dīks) [" + *L. appendere*, to hang upon] Watery fluid distending the vermiform appendix.

hydroa vacciniforme (hī-drō'ă vāk-sīn-ĭ-fōr'mē) ABBR: HV. A vesicular rash that heals with crusting and scarring of sun-exposed regions of the skin. HV is a rare disease, typically occurring in children under 10 years old. The rash heals with scars that resemble skin vaccination scars. HV may be prevented by wearing protective clothing or by using sunscreens.

hydrobilirubin (hī'drō-bīl'ĭ-roo'bīn) [" + *L. bilis*, bile, + *ruber*, red] A brownish-red bile pigment, derived from bilirubin and thought to be identical to stercobilin and urobilin.

hydrobromate (hī'drō-brō'māt) [" + *bromos*, stench] A salt of hydrobromic acid.

hydrocalycosis (hī'drō-kāl'ĭ-kō'sīs) [" + *kalyx*, cup, + *osis*, condition] Cystic dilation of the renal calyx owing to obstruction.

hydrocarbon (hī'drō-kār'bōn) [" + *L. carbo*, coal] A compound made up primarily of hydrogen and carbon.

alicyclic h. A hydrocarbon that contains cyclic and straight-chain components.

aliphatic h. A straight-chain hydrocarbon that contains no cyclic component.

aromatic h. A hydrocarbon in which the carbon atoms are in a ring, or cyclic, configuration.

cyclic h. A ring-shaped hydrocarbon.

saturated h. A hydrocarbon in which the carbon atoms are linked by a single electron pair and in which all valences are satisfied.

unsaturated h. A hydrocarbon in which carbon atoms share two or three pairs of electrons.

hydrocele (hī'drō-sĕl) [" + *kele*, tumor, swelling] The accumulation of serous fluid in a saclike cavity, esp. in the tunica vaginalis testis.

acute h. The most common hydrocele. The majority of cases occur suddenly between the second and fifth years, usually the result of inflammation of the epididymis or testis.

cervical h. A hydrocele in the neck resulting from the accumulation of serous fluid in the persistent cervical duct or cleft.

chronic h. A hydrocele usually seen in middle-aged men. It may result from filariasis.

congenital h. A hydrocele present at birth, resulting from failure of closure of the vaginal process.

encysted h. A hydrocele in the vaginal process in which openings to the

scrotal and peritoneal cavities are closed.

h. feminae A cystlike sac of serous fluid in the labia majora or canal of Nuck. SYN: *hydrocele muliebris*.

h. hernialis A condition in which a hernia accompanies infantile or congenital hydrocele and peritoneal fluid accumulates in a hernial sac.

infantile h. Peritoneal fluid in the tunica vaginalis and vaginal process with the latter closed at the abdominal ring.

h. muliebris Hydrocele feminae.

spermatic h. Spermatic fluid in the tunica vaginalis of the testes.

h. spinalis Spina bifida cystica.

hydrocelectomy (hī'drō-sĕ-lĕk'tō-mē) [" + " + *ektome*, excision] Surgical removal of a hydrocele.

hydrocephalocoele (hī'drō-sĕf'ă-lō-sĕl) [" + *kephale*, head, + *kele*, tumor] Hydroencephalocoele.

hydrocephaloid (hī'drō-sĕf'ă-loyd) [" + " + *eidōs*, form, shape] Resembling or pert. to hydrocephalus.

hydrocephaloid disease A condition resembling hydrocephalus, except that the fontanel of the infant are depressed owing to dehydration.

hydrocephalus (hī'drō-sĕf'ă-lūs) [" + *kephale*, head] The accumulation of excessive amounts of cerebrospinal fluid (CSF) within the ventricles of the brain, resulting from blockage or destruction of the normal channels for CSF drainage. Common causes include congenital lesions (e.g., spina bifida or aqueductal stenosis), traumatic lesions, neoplastic lesions, and infections such as meningoenephalitis. Sometimes the accumulated fluid leads to increased intracranial pressure (ICP). SYN: *hydroencephalus*. SEE: *Nursing Diagnoses Appendix*. **hydrocephalic** (hī'drō-sĕ-fāl-ĭk), *adj.*

TREATMENT: Several neurosurgical procedures are used to treat hydrocephalus. The most commonly used procedure has been to establish a conduit for CSF (called a "shunt") from the ventricles of the brain to the peritoneal cavity or the right atrium.

PROGNOSIS: The prognosis for an uncomplicated course is excellent when hydrocephalus is promptly treated by use of a surgically instituted shunt.

PATIENT CARE: Vital signs and neurological status are monitored hourly or as necessary according to institutional protocol or the surgeon's directions. The infant's anterior fontanel is inspected for bulging and the head circumference measured (an indelible ink mark on the forehead ensures that all measurements are at the same location). The patient is positioned as directed by the surgeon, usually on the nonoperative side with the head level with the body. Fluid intake and output are monitored,

and IV fluids are administered as prescribed. The patient is assessed for vomiting (an early sign of increased ICP and shunt malfunction). The patient is monitored for signs of infection (esp. meningitis) such as fever, stiff neck, irritability, or tense fontanelles. The area over the shunt tract also is inspected for redness, swelling, and other signs of local infection. Dressings are checked for drainage and the wound redressed as necessary using aseptic technique. The patient also is observed for other signs and symptoms of postoperative complications, such as adhesions, paralytic ileus, peritonitis, migration of the shunt, intestinal perforation (with peritoneal shunt), and dehydration and septicemia. The infant's head, neck, and shoulders are moved as a unit with the rest of the body to prevent neck strain during position changes. The family is taught postoperative care measures, including watching for signs of shunt malfunction, infection, and paralytic ileus. Maternal bonding is encouraged. The parents are assisted to set goals consistent with the patient's ability and potential; the family should focus on the child's strengths rather than weaknesses. They should be made aware that shunts will need to be surgically lengthened periodically as the child grows, and that surgery also may be required to correct shunt malfunctions. Special education programs also are discussed with the parents; the infant's need for sensory stimulation appropriate to age is emphasized.

communicating h. Hydrocephalus that maintains normal communication between the fourth ventricle and subarachnoid space.

congenital h. Hydrocephalus occurring in newborns, typically caused by birth defects such as spina bifida, aqueductal stenosis, or birth trauma with ventricular hemorrhage.

In congenital hydrocephalus, the faulty drainage of CSF from the ventricles of the brain often results in rapidly increasing head circumference, malformation of the skull (thin bone with widened fontanelles and separated sutures), distended scalp veins, thin, shiny scalp skin, weak neck muscles incapable of supporting the head, and abnormal development of psychomotor and cognitive or language skills. In untreated cases of congenital hydrocephalus, the outcome is fatal in about half of the patients due to infection, malnutrition, or increased intracranial pressure. The parents of infants treated neurosurgically for congenital hydrocephalus are instructed in signs and symptoms that may indicate surgical complications: fever and headache, irritability, poor feeding, inconsolability.

external h. An accumulation of fluid in subdural spaces.

h. ex vacuo The appearance on brain imaging of enlarged lateral ventricles, caused by atrophy of the brain.

internal h. An accumulation of fluid within ventricles of the brain.

noncommunicating h. Hydrocephalus in which a blockage at any location in the ventricular system prevents flow of cerebrospinal fluid to the subarachnoid space.

normal pressure h. A type of hydrocephalus with enlarged ventricles of the brain with no increase in the spinal fluid pressure or no demonstrable block to the outflow of spinal fluid. Shunting fluids from the dilated ventricles to the peritoneal cavity may be helpful. The classic triad of symptoms includes disturbances of gait, progressive dementia, and urinary incontinence.

secondary h. Hydrocephalus following injury or infections such as meningitis or syphilis.

hydrochlorate (hī'drō-klō'rāt) [Gr. *hydro*, water, + *chloros*, green] Any salt of hydrochloric acid.

hydrochloride (hī'drō-klō'rīd) An alkalioid or other base combined with hydrochloric acid.

hydrochlorothiazide (hī'drō-klō'rō-thī'ā-zīd) ABBR: HCTZ. A thiazide diuretic used to treat high blood pressure. A common side effect is hypokalemia.

hydrocholeretic (hī'drō-kō'lēr-rēt'īk) Any agent that increases the output of bile without increasing the solids secreted in it.

hydrocircosele (hī'drō-sīr'sō-sēl) [" + *kirsos*, varix, + *kele*, tumor, swelling] A hydrocele combined with varicose veins of the spermatic cord.

hydrocodone bitartrate (hī'drō-kō'dōn) A very commonly prescribed opioid pain reliever.

hydrocolloid (hī'drō-kōl'loid) [" + *koloides*, glutinous] A colloidal suspension in which water is the liquid.

irreversible h. A hydrosol of alginic acid whose physical state is changed by an irreversible chemical reaction, forming insoluble calcium alginate. This substance is called alginate or dental alginate. Alginate is used in dentistry as a primary impression material. SYN: *alginate*.



Care should be taken not to inhale the dust created by alginate.

hydrocolpos (hī'drō-kōl'pōs) [" + *kolpos*, vagina] Retention cyst of the vagina containing watery, nonsanguineous fluid or mucus.

hydrocortisone (hī'drō-kor'ti-sōn) A steroid hormone produced by the adrenal cortex and synthesized for medical

use. It has anti-inflammatory, glucocorticoid, and sodium-retaining (mineralocorticoid) properties. It is used clinically to reduce the pain and inflammation of various conditions, including rashes, hemorrhoids, arthritis, and inflammatory bowel disease. It also is used as steroid replacement therapy in patients with adrenal insufficiency. SYN: *cortisol*.

hydrocyst (hī'drō-sīst) [Gr. *hydor*, water, + *kystis*, bladder] A cyst containing watery fluid.

hydrocystoma (hī'drō-sīs-tō'mă) [" + " + *oma*, tumor] A benign cystic lesion developing from apocrine glands, typically found on the eyelids or other facial structures. SYN: *hidrocystoma*.

hydrodensitometry (hī'drō-dēn'sī-tōm'ē-trē) The weighing of an object immersed in water and subsequent measurement of the water displaced. The specific gravity of the body can be estimated from that information, and the percentage of the body fat can be estimated. SEE: *lean body mass*.

hydrodissection (hī'drō-dī-sēk'shūn) Technique employing a pressurized fine stream of water (jet) to develop tissue planes or to divide certain soft tissues less traumatically than ordinary sharp dissection. Examples of its use include division of brain and hepatic tissue without destroying smaller blood vessels and other tubular structures. In abdominal surgery, open or laparoscopic hydrodissection is used to develop tissue planes and separate adhesions. It facilitates dissection of diseased parietal pleura in order to treat malignant pleural effusion. A modification is used in ophthalmological surgery (e.g., phacoemulsification).

hydrodynamics (hī'drō-dī-nām'īks) The study of fluids in motion.

hydroencephalocele (hī'drō-ēn-sēf'ă-lō-sēl) [" + *enkephalos*, brain, + *kele*, tumor, swelling] Brain substance expanded into a watery sac protruding through a cleft in the cranium. SYN: *hydroencephalocele*.

hydrogel (hī'drō-jēl) [" + L. *gelare*, to congeal] A colloid containing hydrophilic polymers. Hydrogels are used in numerous applications, including glucose sensors, breast implants, soft contact lenses, and sterile dressings.

hydrogen (hī'drō-jēn) [" + *gennan*, to produce] SYMB: H. An element existing as a colorless, odorless, and tasteless gas, possessing one valence electron; atomic weight 1.0079, atomic number 1, specific gravity 0.069. A liter of the gas at sea level and at 0°C weighs 0.08988 g. Three isotopes of hydrogen (protium, deuterium, and tritium) exist, having atomic weights of approx. 1, 2, and 3, respectively.

OCCURRENCE: Hydrogen is present

in the sun and stars. Even though it is the most abundant element in the known universe, its concentration in the earth's atmosphere is only 0.00005%. Hydrogen occurs in its free state (in natural gases and volcanic eruptions) only in minute quantities. It occurs principally on the earth as hydrogen oxide (water, H₂O) and is a constituent of all hydrocarbons. Hydrogen is present in all acids and in ionic form is responsible for the properties characteristic of acids. Hydrogen is present in nearly all organic compounds and is a component of all carbohydrates, proteins, and fats.

USES: It is highly flammable and used in the oxyhydrogen flame in welding; in hydrogenation of oils for solidifying purposes; as a reducing agent; and in many syntheses.

h. cyanide Hydrocyanic acid.

h. dioxide Hydrogen peroxide.

h. donor In oxidation-reduction reactions, a substance that gives up hydrogen atoms to another substance, the acceptor. SEE: *h. acceptor*.

h. iodide Hydroiodic acid.

h. sulfide H₂S; a poisonous, flammable, colorless compound with a characteristic odor of rotten eggs. SYN: *hydro-sulfuric acid*. SEE: *Poisons and Poisoning Appendix*.

hydrogenase (hī'drō-jēn-ās) An enzyme that catalyzes reduction by molecular hydrogen.

hydrogenate (hī'drō-jēn-āt') To combine with hydrogen.

hydrogenation (hī'drō-jēn-ā'shūn) A process of changing an unsaturated fat to a solid saturated fat by the addition of hydrogen in the presence of a catalyst.

hydrogen peroxide H₂O₂; a colorless syrupy liquid with an irritating odor and acrid taste. It decomposes readily, liberating oxygen. Because light is particularly effective in decomposing H₂O₂, it should be stored in tightly sealed glass jars in a dark place. SYN: *hydrogen dioxide*.

USES: It is used as a commercial bleaching agent; as an oxidizing and reducing agent; and, in a 3% aqueous solution, as a mild antiseptic, germicide, and cleansing agent.

hydrohematonephrosis (hī'drō-hēm'ă-tō-nēf-rō'sis) [" + *haima*, blood, + *nephros*, kidney, + *osis*, condition] Bloody urine distending the pelvis of the kidney.

hydrokinetics (hī'drō-kī-nēt'īks) [" + *kinesis*, movement] The science of fluids in motion.

hydrolabile (hī'drō-lā'bīl) **1.** Chemically unstable in the presence of water. **2.** Having the tendency to lose weight because of fluid loss possibly owing to gastrointestinal disease or because of decreased salt or carbohydrate intake.

hydrolase (hī'drō-lās) An enzyme that causes hydrolysis.

hydrology (hī-drōl'ō-jē) [" + *logos*, word, reason] The scientific study of water. It is considered one of the earth sciences.

hydrolysate (hī-drōl'ī-sāt) That which is produced as a result of hydrolysis.

protein h. The amino acids obtained from splitting proteins by hydrolysis; used as a source of amino acids in certain diets.

hydrolysis (hī-drōl'ī-sīs) [" + *lysis*, dissolution] Any reaction in which water is one of the reactants, more specifically the combination of water with a salt to produce an acid and a base, one of which is more dissociated than the other. It involves a chemical decomposition in which a substance is split into simpler compounds by the addition or the taking up of the elements of water. This kind of reaction occurs extremely frequently in life processes. The conversion of starch to maltose, of fat to glycerol and fatty acid, and of protein to amino acids are examples of hydrolysis, as are other reactions involved in digestion. A simple example is the reaction in which the hydrolysis of ethyl acetate yields acetic acid and ethyl alcohol: $C_2H_5C_2H_3O_2 + H_2O = CH_3COOH + C_2H_5OH$. Usually such reactions are reversible; the reversed reaction is called esterification, condensation, or dehydration synthesis. SEE: *assimilation; enzyme; hydrolytic* (-drō-lit'ik), *adj.*

hydrolyze (hī'drō-līz) To cause to undergo hydrolysis.

hydroma (hī-drō'mā) [Gr. *hydor*, water, + *oma*, tumor] Hygroma.

hydromassage (hī'drō-mā-sāzh') A massage produced by a stream of water.

hydromeiosis (hī'drō-mī-ō'sīs) [" + *meiosis*, diminution] The swelling of the epidermis after it is exposed to water, with consequent blockage of the sweat ducts. This phenomenon limits fluid loss from sweating when the body is immersed in water.

hydro meningitis (hī'drō-mēn'īn-jī'tīs) [" + *meninx*, membrane, + *itis*, inflammation] 1. An inflammation of membranes of the brain with serous effusion. 2. An inflammation of Descemet's membrane.

hydro meningocoele (hī'drō-mēn'īn-gō-sēl) [" + " + *kele*, tumor, swelling] Protrusion of the meninges or spinal cord in a sac of fluid.

hydrometer (hī-drōm'ē-tēr) [" + *metron*, measure] An instrument that measures the density of a liquid by the depth to which a graduated scale sinks into the liquid. SEE: *urinometer*.

hydrometra (hī'drō-mē'trā) [" + *metra*, uterus] The collection of watery fluid or mucus in the uterus.

hydrometrocolpos (hī'drō-mē'trō-kōl'-

pōs) [" + *metra*, uterus, + *kolpos*, vagina] The distention of the uterus and vagina by a collection of watery fluid.

hydromicrocephaly (hī'drō-mī'krō-sēf'ā-lē) [" + *mikros*, small, + *kephale*, head] A condition in which the head is abnormally small and contains an increased amount of cerebrospinal fluid.

hydromorphone hydrochloride (hī'drō-mor'fōn) An opioid pain reliever.


hydromphalus (hī-drōm'fā-lūs) [" + *omphalos*, navel] Edematous enlargement of the umbilicus.

hydromyelia (hī'drō-mī-ē'lē-ā) [" + *myelos*, marrow] Increased fluid in the central canal of the spinal cord. SYN: *hydrorrhachis*.

hydromyelocele (hī'drō-mī-ē'lō-sēl) [" + " + *kele*, tumor, swelling] The protrusion of a sac with cerebrospinal fluid through a defect in a wall of the spinal canal.

hydromyelomeningocoele (hī'drō-mī-ē-lō-mē-nīng'gō-sēl) [" + *myelos*, marrow, + *meninx*, membrane, + *kele*, tumor, swelling] Spinal deformity in which a fluid-filled sac containing spinal cord and surrounding membranes protrudes through the spine.

hydromyoma (hī'drō-mī-ō'mā) [" + *mys*, muscle, + *oma*, tumor] An encapsulated, benign, cystic tumor of the uterine myometrium. SEE: *intramural fibroma*.

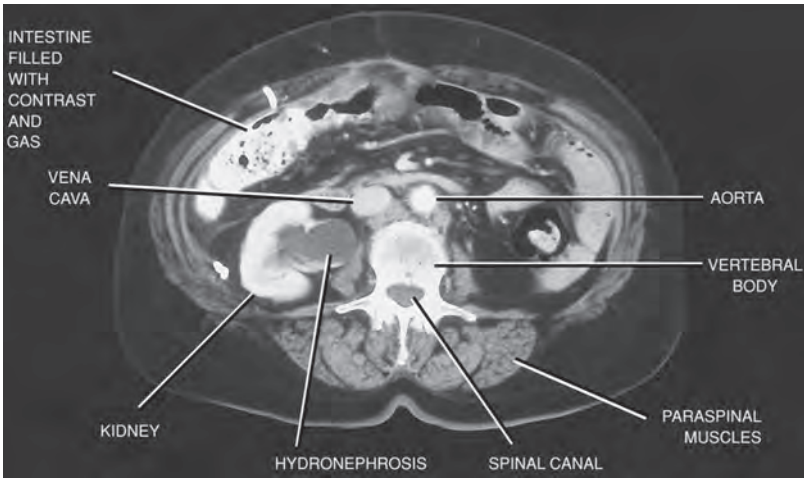
hydronephrosis (hī'drō-nēf-rō'sīs) [" + *nephros*, kidney, + *osis*, condition]  Stretching of the renal pelvis as a result of obstruction to urinary outflow. SYN: *nephrydrosis*. SEE: *ilus*.

ETIOLOGY: Anything that obstructs the ureter or bladder may cause hydronephrosis. Lodged kidney stones are a common cause of unilateral hydronephrosis; bilateral hydronephrosis often results from bladder outlet obstruction (e.g., in men who have hyperplasia of the prostate). Neurogenic bladder dysfunction, pregnancy, urogenital cancer, urinary tract inflammation, congenital malformations, urethral strictures, and even parasites (schistosomiasis) may cause hydronephrosis. If urinary flow is not restored, the kidney tissue dilates and atrophies, and chronic renal failure may occur.

SYMPTOMS: Hydronephrosis often causes no localizing symptoms, except when it is associated with kidney stones (when the primary symptom is severe flank and abdominal pain that radiates to the groin).

DIAGNOSIS: Ultrasonography of the urinary tract, excretory urography, abdominal CT scan or MRI imaging are used to confirm the diagnosis.

TREATMENT: Unilateral hydronephrosis caused by a kidney stone resolves spontaneously if the stone



HYDRONEPHROSIS

CT scan of abdomen shows kidney with distended pelvis (Courtesy of Harvey Hatch, MD, Curry General Hospital)

passes. If the stone does not pass, procedures such as shock wave lithotripsy, surgical removal of the stone, nephrotomy, or nephrostomy tube drainage of the kidney or placement of a ureteral stent may be needed. Bilateral hydronephrosis caused by prostatic hyperplasia may be relieved if a catheter can be inserted through the obstructed urethra into the bladder, a cystostomy tube is inserted, or the enlarged prostate gland is surgically treated. Hydronephrosis caused by other diseases (e.g., tumors) is often treated with surgical debulking, radiation, or chemotherapy.

PATIENT CARE: Renal function studies (e.g., blood urea nitrogen, serum creatinine, and serum potassium levels) are monitored daily. The condition, planned diagnostic procedures, and expected sensations are explained to the patient and family; if the patient is scheduled for a surgical procedure, the surgeon's explanations of the planned procedure are reinforced.

Postoperatively, intake and output, vital signs, and fluid and electrolyte balance are monitored (a rising pulse rate and cool, clammy skin may signal impending hypovolemia or hemorrhage and shock). Prescribed analgesics and noninvasive measures are used to relieve pain as necessary. Postobstructive diuresis may cause the patient to lose great volumes of dilute urine over hours or days along with excessive electrolyte loss. If this occurs, IV fluids are administered at a prescribed constant rate plus an amount equal to a given percentage of the patient's hourly urine output to safely replace intravascular

volume. A dietitian can provide assistance to plan a diet consistent with the treatment plan while including foods that the patient enjoys and will eat. If a nephrostomy tube has been inserted, the tube is irrigated as specifically prescribed, checked for patency, and never clamped or allowed to kink. Meticulous skin care is provided to the tube entry site; if urine leaks around the tube, a protective skin barrier is provided to prevent excoriation, and the wound area is bagged to preserve the patient's dignity and to help prevent infection.

If the patient will be discharged with the nephrostomy tube in place, proper care of the tube and skin at the insertion site is taught. Prescribed drug therapies, such as antibiotics, are administered, and the patient is taught about expected outcomes, adverse effects to report, and the necessity to complete the prescribed course of therapy even if feeling better.

hydronium ion (hī-drō'nē-ŭm) [G. *Hydronium*, contr. of *Hydroxonium*] A hydrated hydrogen ion, H_3O^+ . It is formed when an acid dissolves in water.

hydroparasalpinx (hī'drō-pār'ā-sāl'pinks) [Gr. *hydor*, water, + *para*, beside, + *salpinx*, tube] An accumulation of serous fluid in the accessory tubes of the fallopian tube.

hydroparotitis (hī'drō-pār'ō-tī'tis) [" + " + *ous*, ear, + *itis*, inflammation] An accumulation of fluid in the parotid gland.

hypopenia (hī'drō-pē'nē-ā) [" + *penia*, poverty] A deficiency of water in the body.

hydropericarditis (hī'drō-pēr-ī-kār-dī'tis)

[" + *peri*, around, + *kardia*, heart, + *itis*, inflammation] A serous effusion accompanying pericarditis.

hydropericardium (hī'drō-pēr'ī-kār'dē-ūm) A dated term for a pericardial effusion.

hydroperinephrosis (hī'drō-pēr'ī-nē-frō'sīs) [" + *peri*, around, + *nephros*, kidney, + *osis*, condition] An accumulation of the serum of the connective tissue surrounding the kidney.

hydroperion (hī'drō-pēr'ē-ōn) [" + " + *oon*, egg] Fluid present between the decidua capsularis and the decidua parietalis, occurring early in pregnancy.

hydroperitoneum (hī'drō-pēr'ī-tō-nē-ūm) [" + *peritonaion*, peritoneum] Ascites.

hydrophilia, hydrophilism (hī-drō-fīl'ē-ā, -drōf'ī-līzm) [" + *philein*, to love] Attracting water molecules, as do molecules with many polar covalent bonds.

hydrophilic, adj.

hydrophilous (hī-drōf'ī-lūs) Taking up moisture. SYN: *bibulous*; *hygroscopic*.

hydrophobia (hī-drō-fō'bē-ā) [Gr. *hydor*, water, + *phobos*, fear] 1. Repelling water molecules, as do molecules with few or no polar covalent bonds. 2. Fearful or intolerant of water, as in rabies. SEE: *rabies*. **hydrophobic, adj.**

hydrophthalmos (hī'drōf-thāl'mōs) [" + *ophthalmos*, eye] Distention of the eyeball owing to an accumulation of fluid within it. SEE: *glaucoma*.

hydroptic (hī-drōp'īk) [Gr. *hydropikos*] Edematous, or pert. to edema.

hydropneumatois (hī'drō-nū'mā-tō'sīs) [" + *pneumatosis*, inflation] Liquid and gas in the tissues producing combined edema and emphysema.

hydropneumopericardium (hī'drō-nū'mō-pēr-ī-kār'dē-ūm) [" + " + *peri*, around, + *kardia*, heart] Serous effusion with gas in the pericardium.

hydropneumoperitoneum (hī'drō-nū'mō-pēr'ī-tō-nē-ūm) [" + " + *peritonaion*, peritoneum] Gas and serous fluid in the peritoneal cavity.

hydropneumothorax (hī'drō-nū'mō-thō'rāks) [" + " + *thorax*, chest] Gas and serous effusion in the pleural cavity. SYN: *pneumohydrothorax*.

hydrops, hydropsy (hī'drōps, -drōp'sē) [Gr.] Edema.

h. abdominis Ascites.

endolymphatic h. Labyrinthine h.

h. fetalis The clinical condition in infants with cardiac decompensation and hepatosplenomegaly, respiratory distress, and circulatory distress. This may be caused by erythroblastosis fetalis; infections; tumors; pulmonary, hepatic, or renal disease; diabetes mellitus; Gaucher's disease; or multiple congenital anomalies. SEE: *erythema infectiosum*; *erythroblastosis fetalis*.

h. folliculi An accumulation of fluid in the graafian follicle of the ovary.

h. gravidarum Edema accompanying pregnancy.

labyrinthine h. Excessive fluid in the organ of balance in the inner ear. It may cause pressure or a sense of fullness in the ears, hearing loss, and vertigo. It often is found in Ménière's disease. SYN: *endolymphatic hydrops*.

h. tubae Hydrosalpinx.

h. tubae profluens Intermittent hydrosalpinx.

hydroponephrosis (hī'drō-pī'ō-nēf-rō'sīs) [Gr. *hydor*, water, + *pyon*, pus, + *nephros*, kidney, + *osis*, condition] Dilatation of the kidney and pelvis with pus and urine.

hydroquinone (hī'drō-kwīn'ōn) A metabolite of benzene, sometimes topically applied to the skin.

hydrorheostat (hī'drō-rē'ō-stāt) [" + *rheos*, current, + *histanai*, to place] A device used to control the flow of electric current by changes in water resistance.

hydrorrhachis (hī-dror'ā-kīs) [" + *rhachis*, spine] Hydromyelia.

hydrorrhachitis (hī-dror-ā-kī'tīs) [" + " + *itis*, inflammation] A serous effusion within the spinal cord or its membranes, with inflammation of the cord.

hydrorrhea (hī'drō-rē'ā) [" + *rhoia*, flow] Copious watery discharge from any part, as from the nose.

h. gravidarum The discharge of a watery fluid from the vagina during pregnancy.

hydrosalpinx (hī'drō-sāl'pīnks) [" + *salpinx*, tube] Distention of the fallopian tube by clear fluid. SYN: *hydrops tubae*.

intermittent h. Edema of the fallopian tube in which the distention is so great that the tube is forced by the pressure to empty itself via the uterus. SYN: *hydrops tubae profluens*.

hydrosarcocele (hī'drō-sār'kō-sēl) [" + *sarx*, flesh, + *kele*, tumor, swelling] A hydrocele with chronic swelling of the testis.

hydrosol (hī'drō-sōl) The fluid state of a colloidal solution (sol) in which the colloid particles, separated by water in a continuous phase, are free to move about. SEE: *hydrogel*.

hydrostat (hī'drō-stāt) [" + *statikos*, standing] A device that maintains the water level in a container at a predetermined level.

hydrostatic (hī'drō-stāt'īk) [" + *stati-kos*, standing] Pert. to the pressures on and exerted by fluids when they are in equilibrium, i.e., not moving.

h. densitometry An underwater weighing technique for the determination of an individual's specific gravity. The amount of water displaced by the body is corrected for the air contained in the lungs. This technique can be used to estimate the percentage of body fat. SYN: *hydrostatic weighing*.

h. test A test to determine if an infant breathed prior to its death. The infant's lungs are put in water; if they float, prior breathing is proven.

h. weighing Hydrostatic densitometry.

hydrostatics (hī'drō-stăt'iks) The science of the properties of fluids in equilibrium.

hydrosulfuric acid (hī'drō-sül-fūr'ik) Hydrogen sulfide.

hydrotaxis (hī'drō-tāk'sis) [" + *taxis*, arrangement] The movement of an organism or cell toward or away from moisture. SEE: *hydrotropism*.

hydrotherapist (hī'drō-thēr'ă-pist) One who specializes in hydrotherapy.

hydrotherapy (hī'drō-thēr'ă-pē) [" + *therapeia*, treatment] The use of water (in baths, jetted, as a douche, packed as ice, heated, etc.) for irrigation, massage, relaxation, or as an anti-inflammatory.

hydrothermic (hī'drō-thēr'mik) Concerning the effect of heated water.

hydrothionemia (hī'drō-thi'ō-nē'mē-ă) [" + " + *haima*, blood] A condition caused by hydrogen sulfide in the blood.

hydrothorax (hī'drō-thō'răks) [" + *thorax*, chest] Fluid in the pleural space; a pleural effusion.

hydrotropism (hī'drō-trō'pizm) [" + *tropē*, a turning] The response of plants toward moisture (positive hydrotropism) or away from it (negative hydrotropism).

hydrotubation (hī'drō-tū-bă'shūn) Injection of saline solution or liquid medication into the uterus and fallopian tubes to dilate or treat them.

hydrotypanum (hī'drō-tim'pă-nŭm) [" + *tyimpanon*, drum] Fluid in the middle ear.

hydroureter (hī'drō-ū-rē'tēr) [" + *oureter*, ureter] The distention of the ureter with fluid owing to obstruction.

hydrous (hī'drŭs) Containing water. SEE: *anhydrous*.

hydrovarium (hī'drō-vă'rē-ŭm) [" + LL. *ovarium*, ovary] Edema or cyst of the ovary.

hydroxide (hī-drōk'sid) [" + *oxys*, sour] A compound that contains the OH⁻ group, such as NaOH (sodium hydroxide), or caustic soda).

hydroxocobalamin (hī-drōk'sō-kō-băl'ă-mĭn) A naturally occurring form of vitamin B₁₂ used to treat B₁₂ deficiency.

hydroxy (hī-dră k'sē) Pertaining to the hydroxyl (OH) moiety.

hydroxyapatite (hī-drōk'sē-ăp'ă-tit) Ca₁₀(PO₄)₆(OH)₂; the calcium- and phosphorus-containing compound that constitutes the bulk of the mineral structure of bones and teeth. In teeth it is soluble in the acids of soft drinks or carbohydrate fermentation, but it becomes decay-resistant fluoroapatite after combining with fluoride ions present in fluoridated water or fluoride toothpastes.

Under some circumstances, it can deposit in and around joints, producing peri-arthritis or calcific tendonitis.

hydroxybenzene (hī-drōk'sē-bĕn'zĕn) Phenol.

25-hydroxycholecalciferol (hī-drōk'sē-kō'lĕ-kăl-sif'ĕ-rōl) A vitamin D derivative.

hydroxyethyl starch ABBR: HES. Any one of several modified starches with differing molecular weights, used as plasma volume expanders because of their colloidal properties. Examples include hetastarch and pentastarch.

hydroxyl (hī-dră k'să-l) ABBR: OH. The chemical moiety made up of a single atom of hydrogen and a single atom of oxygen.

hydroxylase (hī-drōk'si-lās) Any enzyme that catalyzes the introduction of hydrogen into a substrate.

hydroxylysine (hī'drōk-sil'ĭ-sĭn) An amino acid found in collagen.

hydroxyproline (hī-drōk'sē-prō'lin) An amino acid found in collagen.

hydroxypropyl methylcellulose Cellulose hydroxypropyl methyl ester; a substance used to increase the viscosity of solutions.

5-hydroxytryptamine (hī-drōk'sē-trĭp'tă-mĕn) ABBR: 5-HT. Serotonin.

hygiene (hĭ'jĕn) [Gr. *hygieinos*, healthful] **1.** Sanitation. **2.** Healthfulness. **3.** The study of health and observance of health rules and the methods and means of preserving health.

community h. A term sometimes used as a synonym for *public health*.

dental h. Oral h.

hand h. Various methods by which hands are cleaned, including hand-washing with plain and antimicrobial soaps and the use of alcohol-based hand rubs. Hand hygiene is the single most effective method of decreasing nosocomial infections. The Centers for Disease Control and Prevention states that if hands are not visibly soiled, alcohol preparations containing between 60% and 90% ethanol or isopropanol kill microorganisms more effectively than plain or antimicrobial soap and are not as harsh. After the hand rub is applied to the palm of one hand, the hands and fingers should be rubbed together, covering all surfaces, until they are entirely dry. Hands that are visibly dirty or contaminated should still be washed with soap and water for at least 15 seconds. The need for hand hygiene is not eliminated by the use of gloves. Contact dermatitis caused by alcohol hand rubs is very uncommon. However, with increasing use of such products by health care personnel, true allergic reactions will occasionally be encountered. Hospital computers can serve as a reservoir for drug-resistant bacteria such as vancomycin-resistant *Enterococcus faecium*

(VRE), methicillin-resistant *Staphylococcus aureus* (MRSA), and *Pseudomonas aeruginosa*.



Health care personnel should avoid wearing artificial nails and should keep nails less than a quarter of an inch long if they care for patients at high risk of acquiring infections (e.g., patients in ICUs, transplant units, or protective isolation).

industrial h. That branch of hygiene that deals primarily with health of industrial workers, esp. study, treatment, and prevention of occupational diseases.

mental h. The science of developing and maintaining mental health and preventing mental illness.

oral h. Preventive measures to avoid pathological conditions of the teeth and oral cavity. These include discontinuing the use of tobacco products, including “smokeless tobacco” (snuff); brushing the teeth and using dental floss daily; and removal of impacted food debris. Oral hygiene may be performed with manual or mechanical devices such as toothbrushes, floss, and mechanical toothbrushes. Edentulous people with partial restorations or false teeth should be sure that their appliances fit properly and are kept clean. Removal of plaque by a dental hygienist at least twice each year is also important for prevention of periodontal disease. SYN: *dental hygiene*. SEE: *care, mouth, hygienist, dental, toothbrushing*.

hygienic (hī-jē-ēn'ik) 1. Pert. to health or its preservation. 2. In a healthy condition.

hygienist (hī-jē-nīst, hī-jē-ēn-īst) A specialist in hygiene.

dental h. A licensed primary oral health care professional. The dental hygienist is educated to provide dental services that include education, prevention, and therapeutic services. The most common services provided are patient education, oral prophylaxis, dental radiographs, and fluoride applications. The goals of the dental hygienist include the control of oral diseases and the promotion of health. The practice of dental hygiene is regulated by laws called dental practice acts. The laws vary with each licensing jurisdiction.

industrial h. A scientist or engineer engaged in the study, control, and prevention of health risks in the workplace.

hygro- Prefix meaning *moisture*.

hygroma (hī-grō-mā) *pl.* **hygromas** or **hygromata** [ʹ + *oma*, tumor] A sac or bursa containing fluid.

cystic h. A rapidly growing hygroma of lymphatic origin. It is usually located in the neck but may be in the thorax.

hygrometer (hī-grōm'ē-tēr) [ʹ + *met-*

ron, measure] An instrument for measuring the amount of moisture in the air.

hygroscopic (hī-grō-skōp'ik) [ʹ + *skopein*, to examine] 1. Pert. to hygros-copy. 2. Absorbing moisture readily. SYN: *bibulous; hydrophilous*.

hygroscopic heat and moisture exchanger A heat and moisture exchanger that has a chemical coating (usually calcium chloride or lithium chloride) to improve heat and moisture exchange relative to a noncoated heat and moisture exchanger.

hygros-copy (hī-grōs'kō-pē) The estimation of the quantity of moisture in the atmosphere.

hymen (hī'mēn) [Gr.] A fold of mucous membrane that partially covers the entrance to the vagina. Contrary to folklore, the presence or absence (or rupture) of the hymen cannot be used to prove or disprove virginity or history of sexual intercourse. Pregnancy has been known to occur even when the hymen is intact. **hymenal** (-āl), *adj.*

annular h. A hymen with a ring-shaped opening in the center.

h. biforis A vaginal membrane with two openings separated by a thick septum; the structure partially covers the os.

cribriform h. A hymen with many small perforations. SYN: *fenestrated hymen*.

h. denticulatus A hymen with an opening with serrated edges.

fenestrated h. Cribriform h.

imperforate h. A hymen without an opening. Menstruation occurs, but the blood cannot escape from the vagina because of the obstruction of the hymen. The treatment is surgical incision of the hymen. SYN: *unruptured hymen*.

lunar h. A hymen shaped like a crescent moon.

ruptured h. A hymen that has been torn by coitus, injury, or surgery.

septate h. A hymen in which the opening is separated by a thin septum.

unruptured h. Imperforate h.

hymenectomy (hī'mēn-ēk'tō-mē) [ʹ + *ektome*, excision] 1. In surgery and gynecology, the incision or removal of the hymen. 2. The excision of a membrane.

hymenitis (hī-mēn-ī'tīs) [ʹ + *itis*, inflammation] The inflammation of the hymen or of a membrane.

Hymenolepis (hī'mē-nōl'ē-pīs) [ʹ + *lepis*, rind] A genus of tapeworm that is parasitic in birds and mammals.

H. nana The dwarf tapeworm, a parasite in the intestine of rats and mice; also commonly found in humans. It averages about 1 in (2.51 cm) in length and differs from other tapeworms in that it is capable of completing its life cycle within a single host. The

parasite, which in humans lives in the proximal ileum, can cause severe toxic symptoms, esp. in children. Included are diarrhea, abdominal pain, irritability, and convulsions that resemble epilepsy. The detection of eggs and gravid segments in the feces confirms the diagnosis of infestation with this parasite. Treatment is with praziquantel. **SEE:** *illius*.

hymenology (hī'měn-ōl'ō-jē) [*h* + *logos*, word, reason] The science of membranes and their diseases.

Hymenoptera (hī'měn-ōp'tur-ā) [Gr. *hymenopteros*, membrane-winged] An order of insects that includes ants, bees, hornets, and wasps. **SEE:** *bite*, *insect*; *sting*.

hymenorrhaphy (hī'měn-or'ā-fē) [*h* + *rhaphe*, seam, ridge] A plastic operation on the hymen to restore it to the pruruptured state.

hymenotomy (hī'měn-ōt'ō-mē) **1.** An incision of the hymen. **2.** A dissection of a membrane.

hyo- [Gr. *hyooides*, U-shaped] Prefix indicating connection with the hyoid bone.

hyoepiglottic, hyoepiglottidean (hī'ō-ēp'i-glōt'ik, hī'ō-ēp'i-glōt'id'ē-ān) [*h* + *epiglottis*, epiglottis] Relating to the hyoid bone and epiglottis.

hyoglossal (hī'ō-glōs'āl) [*h* + *glossa*, tongue] **1.** Pert. to the hyoglossus. **2.** Extending to the tongue from the hyoid bone.

hyoglossus (hī'ō-glōs'ūs) A muscle arising from the body and greater cornu of the hyoid bone and inserted into the dorsum of the tongue. It draws the sides of the tongue down and retracts it.

hyoid (hī'oyd) [Gr. *hyooides*, U-shaped] **1.** Shaped like the Gr. letter upsilon (*v*). **2.** Pert. to the hyoid bone.

hyoscyamus (hī'ō-sī'ā-mūs) [Gr. *hys*, a pig, + *kyamos*, bean] The dried leaves of the plant *Hyoscyamus niger*; a narcotic that also acts as an antispasmodic. A relative of atropine, hyoscyamus is also known as henbane.

hyp- **SEE:** *hypo-*.

hypacusia, hypacusia, hypacusis (hī'pā-koo'sē-ā, -kū'sē-ā, -sīs) [Gr.

hypo, under, + *akousis*, hearing] Impaired hearing. **SEE:** *hearing*; *presbycusis*.

hypalgesia (hī-pāl-jē'zē-ā) [*h* + *algosis*, sense of pain] A lessened sensitivity to pain; the opposite of hyperalgesia.

hypamnios (hī-pām'nē-ōs) [*h* + *amnion*, caul of a lamb] A deficiency in the amount of amniotic fluid. **SEE:** *oligohydramnios*.

hyper- [Gr. *hyper*, over, above, excessive] Prefix meaning *above*, *excessive*, or *beyond*.

hyperabduction (soo'pēr-āb-dūk'shūn) [*L. super*, over, above, + *abducens*, drawing away] Pronounced or extreme abduction.

hyperacid (hī'pēr-ās'id) [*h* + *L. acidus*, sour] Containing too much acid.

hyperacidity (hī'pēr-ās'id'ī-tē) [*h* + *L. acidus*, sour] **1.** An excess of acid. **2.** An excess of acid in the stomach, as may occur in Zollinger-Ellison syndrome. **SEE:** *hyperchlorhydria*.

hyperactive child syndrome **SEE:** *attention-deficit hyperactivity disorder*; *hyperactivity*.

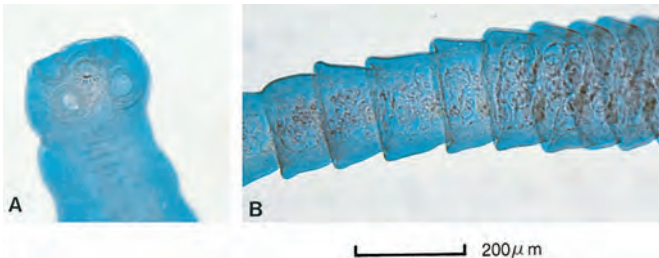
hyperactivity (hī'pēr-āk-tiv'ī-tē) **1.** Increased or excessive activity of any cell, organ, tissue, or organism. **2.** Excessive muscular activity. **3.** Manifestations of disturbed behavior in children or adolescents characterized by constant overactivity, distractibility, impulsiveness, inability to concentrate, and aggressiveness. Hyperkinetic behavior may lessen as a child grows older. **SEE:** *attention-deficit hyperactivity disorder*.

Hyperactivity may be caused by emotional disorders, central nervous system dysfunction, mental retardation, or an exaggeration of a normal personality trait.

hyperacuity (hī'pēr-āk-kū'ī-tē) [Gr. *hyper*, over, above, excessive, + *L. acuitas*, sharpness] Abnormal sensitivity to sensory stimulation.

hyperacusis (hī'pēr-āk-kū'sīs) [*h* + *akousis*, hearing] An abnormal sensitivity to sound. **SYN:** *oxyacusis*.

hyperacute (hī'pēr-āk-kūt') Extremely or excessively acute.



HYMENOLEPIS NANA

(A) Scolex, (B) mature proglottids (orig. mag. $\times 100$)

hyperadiposis, hyperadiposity (hī'pēr-ād'ī-pō'sis, -pōs'ī-tē) [" + L. *adeps*, fat, + Gr. *osis*, condition] Excessive accumulation of body fat.

hyperadrenalism (hī'pēr-ā-drē'nāl-izm) Increased hormonal secretion from the adrenal gland.

hyperadrenocorticalism (hī'pēr-ā-drē'nō-kor'tī-kāl-izm) Increased hormonal secretion from the cortex of the adrenal gland.

hyperalbuminemia (hī'pēr-āl-bū'mī-nē-mē-ā) [" + L. *albumen*, white of egg, + Gr. *haima*, blood] Increased albumin in the blood.

hyperaldosteronism (hī'pēr-āl'dō-stēr'-ōn-izm) The excessive production of aldosterone by the adrenal gland. SEE: *aldosteronism*.

hyperalgesia (hī'pēr-āl-jē'zē-ā) [" + *algesis*, sense of pain] An excessive sensitivity to pain; the opposite of hypalgesia. SYN: *hyperalgia*.

hyperalgia (hī'pēr-āl-jē-ā) [" + *algos*, pain] Hyperalgesia.

hyperalimentation (hī'pēr-āl'ī-mēn-tā'shūn) The enteral and parenteral infusion of a solution that contains sufficient amino acids, glucose, fatty acids, electrolytes, vitamins, and minerals to sustain life, maintain normal growth and development, and provide for needed tissue repair. The gastrointestinal tract is the route of choice if it is functional. Intravenous hyperalimentation must utilize less concentrated formulations because of the potential for chemical phlebitis that may result from osmotic stress. Infusion through a central line catheter into the superior vena cava provides a sufficient blood volume to dilute more hypertonic solutions. One crucial drawback of a central line is the potential for the line to become infected with either bacteria or fungi.

PATIENT CARE: Vital signs, electrolyte values, and fluid balance (intake, output, and daily weight) are monitored for indications of fluid overload or dehydration. Urine specific gravity is measured, and the patient's urine is checked for the presence of glucose and acetone every 6 hours. If the hyperalimentation is enteral, the nurse is aware of the placement of the distal end of the tube (above or below the pyloric sphincter); auscultates for bowel sounds; inspects, percusses, and measures for abdominal distention; and assesses for, documents, reports, and treats nausea, vomiting, or diarrhea. As appropriate, stomach contents are monitored for residual volume. Tube patency as well as volume, rate, and type of feeding are maintained; comfort measures are provided (oral misting, oral hygiene, and analgesic throat sprays); and any indications of infections due to long-term nasal tube

placement, such as sinusitis, aspiration reflux chemical pneumonia, and other infections, are assessed. For example, sinusitis can occur because the tube impedes sinus drainage, allowing organisms to colonize the sinuses and resulting in fever and nasopurulent drainage. Chemical aspiration pneumonias often occur because of silent reflux regurgitation, resulting in acidic stomach contents and gram-negative organisms entering the respiratory tract. If hyperalimentation is via peripheral blood vessels, the insertion site is checked frequently for evidence of phlebitis; if via a central line, the site is monitored for signs of inflammation or infection, and the patient is assessed for signs and symptoms of sepsis. The insertion site is redressed and administration sets and connectors are changed according to institutional protocol; strict asepsis is maintained throughout these procedures. For all parenteral hyperalimentation, the flow rate should never be sped up if an infusion is behind unless this action is specifically prescribed by the physician. The physician is notified if the line becomes occluded or if fluids are stopped or slowed for any reason. The patient is assessed for hypoglycemia or fluid deficit. For all hyperalimentation, the patient is mobilized as possible. Nutritional status is monitored weekly; weight gain or loss, serum protein levels, transferrin levels, and anthropomorphic measurements are documented and reported as directed. Strict asepsis is maintained in handling fluids and equipment, with special vigilance maintained for immobile or paralyzed patients.

hyperalkalinity (hī'pēr-āl-kā-līn'ī-tē) A condition of excessive alkalinity.

hyperaminoacidemia (hī'pēr-ām'ī-nō-ās'ī-dē'mē-ā) An abnormal concentration of amino acids in the blood.

hyperaminoaciduria (hī'pēr-am'ī-nō-ās-i-doo'rē-ā) [" + " + *amine* + Gr. *ouron*, urine] The presence of an excess of amino acids in the urine. SYN: *acid-aminuria*.

hyperammonemia (hī'pēr-ām'mō-nē-mē-ā) An excess concentration of ammonia in the blood. SEE: *ammonia toxicity*.

congenital h. An accumulation of an excess of ammonia in the body due to a congenital deficiency of enzymes, either carbamyl phosphate synthetase or ornithine transcarbamylase, essential to the metabolism of ammonia. Clinical signs of ammonia toxicity are present, including vomiting, lethargy, coma, and, eventually, death.

hyperamylasemia (hī'pēr-ām'īl-ās-ē'mē-ā) Increased blood amylase. It is often found in pancreatitis and/or diseases of

the salivary glands, but may occasionally be present in normal people.

hyperandrogenic (hī'pēr-ān'drō-jēn'ik) Having excessive levels of androgens (male sex hormones) in the body.

hyperaphia (hī'pēr-ā'fē-ā) [" + *haphe*, touch] An excessive sensitivity to touch. SYN: *hyperpselaphesia*. **hyperaphic** (hī-pēr-āf'ik), *adj.*

hyperarousal (hī'pēr-ā-rowz'āl) Excessive responsiveness to sensory stimulation. It is found in alcohol withdrawal, post-traumatic stress disorder, and other conditions.

hyperazotemia (hī'pēr-āz'ō-tē'mē-ā) [" + L. *azotum*, nitrogen, + Gr. *haima*, blood] An increased amount of nitrogenous substances such as urea in the blood.

hyperazoturia (hī'pēr-āz'ō-tū'rē-ā) [" + " + Gr. *ouron*, urine] An excessive concentration of nitrogen-containing compounds in the urine.

hyperbaric Having an increased pressure or density when compared with a standard gas or liquid. Hyperbaric oxygen, e.g., has a greater oxygen concentration than air at sea level, and hyperbaric anesthetics have a greater concentration of dextrose than does the cerebrospinal fluid.

hyperbarism (hī'pēr-bār'izm) The consequences of being exposed to gaseous pressure greater than atmospheric pressure. Miners and deep sea divers are subject to this condition. SEE: *bends*.

hyperbetalipoproteinemia (hī'pēr-bā'tā-līp'ō-prō'tē-in-ē'mē-ā) An excessive amount of β -lipoproteins in the blood. SEE: *hyperlipoproteinemia*.

hyperbilirubinemia (hī'pēr-bīl'i-roo-bīn-ē'mē-ā) [Gr. *hyper*, over, above, excessive, + L. *bilis*, bile, + *ruber*, red, + Gr. *haima*, blood] An excessive amount of bilirubin in the blood; the condition is seen in any illness causing jaundice, including diseases in which the biliary tree is obstructed and those in which blood formation is ineffective. SEE: *jaundice*.

hyperbrachycephaly (hī'pēr-brāk'ē-sēf'ā-lē) [" + *brachys*, short, + *kephale*, head] An excessive degree of brachycephaly; having a cephalic index above 85.

hypercalcemia (hī'pēr-kāl-sē'mē-ā) [" + L. *calx*, lime, + Gr. *haima*, blood] An excessive concentration of calcium in the blood. Causes include primary hyperparathyroidism, lithium therapy, malignancies (e.g., solid tumors and hematological malignancies), vitamin D intoxication, hyperthyroidism, vitamin A intoxication, aluminum intoxication; and milk-alkali syndrome.

SYMPTOMS: Clinically, fatigue, depression, mental confusion, nausea, vomiting, constipation, increased uri-

nation, and occasional cardiac arrhythmias are present. A short Q-T interval is present.

TREATMENT: Patients initially should be given hydration with saline, followed by diuretics after dehydration has been resolved. Bisphosphonates, glucocorticoids, and other drugs may be administered to lower serum calcium levels. Therapy is also directed at the underlying cause of the high serum calcium levels (e.g., by treating underlying malignancies or by excising overactive parathyroid glands).

idiopathic h. A type of hypercalcemia seen in infants, caused by vitamin D intoxication. SEE: *bends*.

hypercalciuria (hī'pēr-kāl'sē-ū'rē-ā) [" + " + Gr. *ouron*, urine] An excessive concentration of calcium in the urine.

hypercapnia (hī'pēr-kāp'nē-ā) [" + *karnos*, smoke] An increase in the partial pressure of carbon dioxide in the blood, typically to levels greater than 45 or 50 mm Hg. Elevated levels of carbon dioxide in the blood result from inadequate ventilation or from massive mismatches between ventilation and perfusion of the blood. When CO₂ levels are greater than 45 mm Hg, cerebral vasodilation can occur. Some of the common symptoms of hypercapnia include dizziness, drowsiness, confusion, tremors, and twitching.

permissive h. Intentionally limiting airway pressures and tidal volumes during mechanical ventilation in order to minimize the risk of lung injury.



Permissive hypercapnia should be avoided in patients who may not tolerate high carbon dioxide levels or acidosis, e.g., patients with sickle cell anemia or those with high intracranial pressures.

hypercarbia (hī'pēr-kār'bē-ā) Hypercapnia.

hypercellularity (hī'pēr-sēl'ū-lār'i-tē) An increased number of cells in any location, but esp. in the bone marrow.

hypercementosis (hī'pēr-sē'mēn-tō'sis) [" + L. *cementum*, cement, + Gr. *osis*, condition] An overgrowth of tooth cement (cementum).

hyperchloremia (hī'pēr-klō-rē'mē-ā) [" + *chloros*, green, + *haima*, blood] An increase in the chloride content of the blood.

hyperchlorhydria (hī'pēr-klor-hī'drē-ā) [" + " + *hydor*, water] An excess of hydrochloric acid in the stomach. SEE: *achlorhydria*; *gastrin*; *gastritis*; *H₂-receptor antagonists*; *hydrochloric acid*; *hypochlorhydria*; *peptic ulcer*; *Zollinger-Ellison syndrome*.

hyperchloridation (hī'pēr-klō'rī-dā'shūn) A dosing with large amounts of sodium chloride.

hypercholesterolemia (hī'pēr-kō-lēs'tēr-ōl-ē-mē-ā) [" + *chole*, bile, + *stereos*, solid, + *haima*, blood] An excessive amount of cholesterol in the blood.

familial h. A type of hyperlipoproteinemia in which low-density lipoproteins are not removed from the bloodstream in normal amounts by lipoprotein receptors in the liver. Affected persons have massively elevated serum lipid levels. SEE: *hyperlipoproteinemia*.

hypercholesterolia (hī'pēr-kō-lēs'tēr-ō'lē-ā) [" + " + *stereos*, solid] Excessive cholesterol in the bile.

hyperchromatic (hī'pēr-krō-māt'ik) [" + *chroma*, color] Overpigmented.

hyperchromatism (hī'pēr-krō'mā-tizm) [" + " + *-ismos*, condition] 1. Excessive pigmentation. 2. The increased staining capacity of any structure.

hyperchromia (hī'pēr-krō'mē-ā) Hyperchromatism.

hyperchromic (hī'pēr-krō'mik) 1. Pert. to excessive pigmentation. 2. Intensely colored.

hyperchylia (hī'pēr-kī'lē-ā) [Gr. *hyper*, over, above, excessive, + *chylus*, juice] An abnormal secretion of gastric juice.

hyperchylomicronemia (hī'pēr-kī'lō-mī'krō-nē'mē-ā) The excessive concentration of chylomicrons in the blood.

familial h. An inherited disorder of lipoprotein metabolism characterized by elevated plasma chylomicrons and triglycerides. It is usually caused by a deficiency of lipoprotein lipase or its cofactor apolipoprotein C-II. Clinical findings include repeated episodes of pancreatitis. The blood of affected patients has a creamy or milky appearance.

hyperCKemia (hī'pēr-sē'kai'ē'mē-ā) Persistent elevations in the serum levels of creatine kinase ("CK"), a muscle enzyme. The condition is sometimes found in persons with congenital muscle diseases, such as muscular dystrophies or other myopathies.

hypercoagulability (hīp'ēr-kō-āg'ū-lā-bil'ī-tē) An increased ability of anything to coagulate, but esp. the blood.

hypercryalgisia (hī'pēr-krī'āl-jē'zē-ā) [" + *kryos*, cold, + *algisia*, sense of pain] Hypercryesthesia.

hypercryesthesia (hī'pēr-krī'ēs-thē'zē-ā) [" + " + *aisthesis*, sensation] An excessive sensitivity to cold. SYN: *hypercryalgisia*.

hypercupremia (hī'pēr-kū-prē'mē-ā) An increased level of copper in the blood. SEE: *Wilson's disease*.

hypercyanotic (hī'pēr-sī'ā-nōt'ik) Severely cyanotic.

hyperdactylia (hī'pēr-dāk-tīl'ē-ā) [Gr. *hyper*, over, above, excessive, + *daktylos*, finger] The state of having an excessive number of fingers or toes.

hyperdefecation (hī'pēr-dēf'ē-kā'shūn) Increased stool frequency without an increase in stool weight above normal. It

may be present in patients with irritable bowel syndrome, hyperthyroidism, or proctitis.

hyperdicrotic (hī'pēr-dī-krōt'ik) [" + *dikrotos*, beating double] Abnormally dicrotic.

hyperdynamia (hī'pēr-dī-nā'mē-ā) [" + *dynamis*, force] Muscular restlessness or hyperactivity.

h. uteri Abnormal uterine contractions in labor.

hyperdynamic (hī'pēr-dī-nām'ik) Overactive or overstimulated; said, for example, of the circulation in cirrhosis, sepsis, and other diseases.

hyperechoic (hī'pēr-ē-kō'ik) Echogenic. **hyperekplexia, hypereplexia** (hī'pēr-ē-plēk'sē-ā, -ēks-) [Gr. *hyper*, over, above, excessive, + *ekplexia*, sudden shock] Excessive startling in response to sound or physical contact. Extreme reflex reaction to neurological stimulation is often an autosomal (dominant or recessive) disorder. It may also occur in some degenerative neurological disorders (e.g., multiple sclerosis).

hyperemesis (hī'pēr-ēm'ē-sīs) [" + *emesis*, vomiting] Excessive vomiting.

h. gravidarum Persistent, continuous, severe, pregnancy-related nausea and vomiting, often accompanied by dry retching. The condition can cause systemic effects such as dehydration, weight loss, fluid-electrolyte and acid-base imbalance leading to metabolic acidosis, and rarely, death. About 2 out of 1000 pregnant women require hospitalization for medical management of the disorder. SEE: *morning sickness*; *Nursing Diagnoses Appendix*.

SYMPTOMS: This condition of unknown etiology may start as a simple vomiting of early pregnancy, but if it persists, dehydration, protein, chloride, sodium and potassium depletion, dehydration, and contraction alkalosis occur.

TREATMENT: Early management includes bedrest; small, frequent, high-carbohydrate feedings; moderate fluid restriction; and mild sedation. In severe cases, the patient is hospitalized for complete bedrest and rehydration. Vitamin and electrolyte-enhanced parenteral fluids are administered. An antiemetic safe for use in early pregnancy may be used to control vomiting. Feeding via total parenteral nutrition is rarely necessary.

When the patient improves, food taken by mouth should consist of a light solid diet given in frequent small feedings, with fruit juice or milk between feedings and a mid-night snack to help stabilize blood glucose levels. Vitamin B may be prescribed intramuscularly or intranasally to begin correction of vitamin deficiencies. Sitting upright during and for 30 to 45 min after meals helps to reduce gastric reflux. Termination of

the pregnancy is indicated only when the woman fails to respond to medical measures and is approaching serious physiological jeopardy.



During therapy the patient's retinas should be monitored for evidence of hemorrhagic retinitis. If it occurs, the pregnancy should be terminated without delay.

PATIENT CARE: The patient's emotional state is assessed. Environmental stimuli are minimized, with rest, relaxation, and verbalization of concerns encouraged. Prescribed treatments are explained and implemented, and psychological support is provided. Ongoing assessments include vital signs and fetal heart rate; the time, amount, and character of any emesis; fluid intake and output; and the woman's response to treatment. Aspects of complementary medicine may be incorporated by using and teaching techniques that induce the relaxation response.

hyperemia (hī'pēr-ē'mē-ă) [*h* + *haima*, blood] **1.** Congestion; an unusual amount of blood in a part. **2.** A form of macula; red areas on the skin that disappear on pressure. **3.** In physical therapy, an increase in the quantity of blood flowing through any part of the body, shown by redness of the skin caused by the application of heat.

active h. Hyperemia caused by increased blood inflow. SYN: *arterial hyperemia*.

arterial h. Active h.

artificial h. Bringing of blood to the superficial tissues by means of counter-irritation, such as may be produced by coining, cupping, or acupuncture.

Bier's h. Passive hyperemia produced by application of an elastic bandage and by suction. SYN: *constriction hyperemia*.

constriction h. Bier's h.

leptomeningeal h. Pia-arachnoid congestion.

passive h. Hyperemia caused by decreased drainage of blood. SYN: *venous hyperemia*.

reactive h. The increased flow of blood into an ischemic tissue area after restoration of blood flow.

venous h. Passive h.

hyperenzymemia (hī'pēr-ēn'zī-mē'mē-ă) [*h* + " + " + "] Excessive secretion of enzymes, esp. the digestive enzymes manufactured by the pancreas.

hypereosinophilic syndrome, idiopathic (hī'pēr-ē'ă-sīn'ă-fīl'ik) Multisystem injury and organ damage caused by excessive numbers of eosinophils in the body. The disease is one of the myelodysplastic disorders. Almost any organ can be affected, but most patients have bone

marrow, cardiac, and central nervous system involvement.

TREATMENT: Anticoagulants and corticosteroids are given. The condition of patients unresponsive to corticosteroids may improve when given cytotoxic agents such as hydroxyurea.

hyperequilibrium (hī'pēr-ē'kwī-lib'rē-ūm) [*h* + *L. aequus*, equal, + *libra*, balance] A tendency to experience vertigo when making even slight turning movements.

hyperergy, hyperergia (hī'pēr-ēr'jē) [*h* + *ergon*, energy] An exaggerated and undesirable immune response to an antigen. SEE: *allergy; anaphylaxis*.

hyperesophoria (hī'pēr-ēs'ō-fō'rē-ă) [*h* + *eso*, inward, + *phorein*, to bear] A tendency of the visual axis to deviate upward and inward owing to muscular imbalance; a form of heterophoria.

hyperesthesia (hī'pēr-ēs-thē'zē-ă) [*h* + *aisthesis*, sensation] An increased sensitivity to sensory stimuli, such as pain or touch. SYN: *algesia; oxyesthesia*. **hyperesthetic** (-ēs-thēt'ik), *adj.*

acoustic h. An abnormal sensitivity to sound.

cerebral h. Hyperesthesia caused by a cerebral lesion.

gustatory h. An oversensitivity of taste.

muscular h. Muscular sensitivity to pain and fatigue.

optic h. An abnormal sensitivity to light.

h. sexualis An abnormal increase in libido.

tactile h. An abnormal sensitivity to touch.

hyperexophoria (hī'pēr-ēks'ō-fō'rē-ă) [*h* + *exo*, outward, + *phorein*, to bear] A tendency of the visual axis to deviate upward and outward owing to muscular imbalance; a form of heterophoria.

hyperextension (hī'pēr-ēks-tēn'shūn) [*h* + *L. extendere*, to stretch out] Extreme or abnormal extension.

hyperfibrinogenemia (hī'pēr-fī-brīn'ō-jē-nē'mē-ă) An increased amount of fibrinogen in the blood; a possible but unproven risk factor for cardiovascular disease.

hyperflexion (hī'pēr-flēk'shūn) Increased flexion of a joint, usually resulting from trauma.

hyperfractionation (hī'pēr-frāk-shūn-ă'shūn) The treatment of a tumor with radiation applied in several small doses several hours apart on the same day instead of in a once-a-day dose. Hyperfractionation decreases the side effects of delivery and may permit a tumor to be treated with a greater total radiation dose than traditional fractionation.

hyperfunction (hī'pēr-fūnk'shūn) [*Gr. functio*, over, above, excessive, + *L. functio*, performance] Excessive activity. **hyperfunctional**, *adj.*

hypergalactia (hī-pēr-gāl-āk'shē-ä) [l' + *gala*, milk] Excessive milk secretion after childbirth.

hypergammaglobulinemia (hī'pēr-gām'ä-glob'ü-lī-nē-mē-ä) An excessive amount of immunoglobulin G (IgG) in the blood. It may occur in patients with monoclonal gammopathy, multiple myeloma, and in some chronic infections.

hypergamy (hī-pēr'gā-mē) [l' + *gamos*, marriage] The tendency of women to reproduce with men of equal or higher social standing.

hypergenesis (hī'pēr-jēn'ē-sīs) [l' + *genesis*, generation, birth] Hyperplasia.

hypergenitalism (hī'pēr-jēn'it-äl-izm) [l' + *L. genitalis*, genital] An excessive development of the genital organs, caused by disturbances in endocrine secretions of the adrenal gland or gonads or by hypothalamic disorders.

hyperglandular (hī'pēr-glän'dū-lär) [l' + *L. glandula*, a little acorn] Having excessive glandular secretions.

hyperglobulinemia (hī'pēr-glob'ü-lī-nē-mē-ä) [l' + *L. globulus*, a globule, + *Gr. haima*, blood] Excessive globulin in the blood.

hyperglycemia (hī'pēr-glī-sē'mē-ä) [l' + *glykys*, sweet, + *haima*, blood] Abnormally high blood sugar levels. Hyperglycemia can cause numerous unwanted effects. It can impair wound healing; decrease the body's ability to fight infections; worsen the neurological deficits found in stroke; increase the risk of death in critically ill patients; and damage the kidneys, peripheral nerves, retinae, blood vessels, and heart. SEE: *diabetes*.

ETIOLOGY: Hyperglycemia may result from damage to the insulin secreting cells of the pancreas; infusions of dextrose; insulin resistance; obesity; overeating; a sedentary lifestyle; the stress of heart attack or other critical illnesses, or treatment with some drugs such as steroids or protease inhibitors.

PATIENT CARE: In patients with diabetes mellitus, controlling blood glucose levels reduces many complications of the disease. In pregnancy management of elevated blood sugars reduces the likelihood of overnutrition of the fetus (microsomia). In the acutely ill patient, maintaining plasma glucose levels below 150 mg/dl reduces the length of hospital stay, helps prevent infection, improves wound healing, and reduces health care costs. Elevated blood sugars in the hospitalized patient can be managed with adjustments in nutrition, intravenous (IV) hydration, and IV insulin. When insulin is infused IV, blood glucose levels should be monitored hourly and insulin doses titrated to achieve levels as close to normal as possible, e.g., 81 to 110 mg/dl, when possi-

ble, and less than 150 mg/dl at the worst.

Among outpatients, high blood sugar levels can be reduced with caloric restriction (dieting) regular exercise, oral hypoglycemic agents, insulin, and/or withholding offending drugs. Self-blood glucose monitoring and the keeping of a blood sugar log helps patients and their health care providers to recognize and manage hyperglycemic trends. Patients with diabetes mellitus need to understand the role maintaining glycemic control plays in preventing complications of their disease. Consultation with a diabetic nurse educator can provide the necessary information (and impetus) for good management of diet, medication regimens, and exercise.

stress-induced h. A transient rise in blood glucose to abnormally high concentrations during acute illness, such as infection or myocardial infarction; trauma, such as burns; or stroke.

hyperglycemic (hī'pēr-glī-sē'mīk) [Gr. *hyper-*, above, excessive, + *glykys*, sweet, + *haima*, blood] 1. Pert. to an elevated blood glucose concentration. 2. An agent that produces an elevated blood glucose level.

hyperglyceridemia (hī'pēr-glīs'ēr-i-dē-mē-ä) Hypertriglyceridemia.

hyperglycinemia (hī'pēr-glī'sī-nē-mē-ä) An accumulation of glycine in the blood. It is caused by a congenital defect in the ability to metabolize the amino acid glycine. There are at least six forms of this disease, all of which are associated with mental and growth retardation.

hyperglycogenolysis (hī'pēr-glī'kō-jēn-öl'i-sīs) [l' + " + *gennan*, to form, + *lysis*, dissolution] Excessive conversion of glycogen into glucose by hydrolysis.

hyperglycorrachia (hī'pēr-glī'kō-rä'kē-ä) [l' + *glykys*, sweet, + *rachis*, spine] An excess of sugar in the cerebrospinal fluid.

hypergonadism (hī'pēr-gō'näd-izm) [l' + *gone*, seed, + *-ismos*, state of] Excessive hormonal secretion of the sex glands.

hypergraphia (hī'pēr-gräf'ē-ä) A compulsion to write. It is found in persons with temporal lobe epilepsy and right hemispheric strokes and tumors, among other brain disorders.

hyperguanidinemia (hī'pēr-gwän'tī-dīn-ē-mē-ä) [l' + *Sp. guano*, dung, + *haima*, blood] An abnormal amount of guanidine in the blood.

hyperhedonia, hyperhedonism (hī'pēr-hē-dō'nē-ä, -hē'dōn-izm) [Gr. *hyper*, over, above, excessive, + *hedone*, pleasure, + *-ismos*, state of] 1. Abnormal pleasure in anything. 2. Abnormal sexual excitement.

hyperhidrosis (hī'pēr-hī-drō'sīs) [l' + *hidros*, sweat, + *osis*, condition] Sweating greater than would be ex-

pected considering the temperature of the environment. SEE: *bromidrosis*; *sweat*.

ETIOLOGY: This symptom may be caused by stimulants, sepsis, hyperthyroidism, menopausal hot flashes, obesity, intense activation of the sympathetic nervous system, and other conditions.

TREATMENT: If the sweating is due to a systemic disease, appropriate therapy for that condition is indicated. If localized, application of a 20% solution of aluminum chloride hexahydrate in absolute alcohol at night using occlusive dressings is beneficial. The dressed sites must be dried before application and the salt washed away in the morning.

hyperhomocysteinemia (hī'pēr-hō'mō-sis-tē'in-ēm'ē-ā) [' + ''] Elevated levels of homocysteine in the bloodstream. High levels of homocysteine are found in the blood of patients with homocystinuria. Mildly elevated levels are found in many persons who consume a Western diet.

hyperhydration (hī'pēr-hī-drā'shūn) [' + ''] Excessive fluid intake, e.g., before athletic events or in some psychiatric illnesses. SEE: *water intoxication*.

Hypericum perforatum (hī'pēr'ī-kūm pēr-fō-rā'tūm) [L., perforated Saint John's wort] The scientific name for Saint John's wort. SEE: *Saint John's wort* for illus.

hyperimmune (hī'pēr-īm-mūn') A state of greater than normal immunity.

hyperimmunoglobulinemia E syndrome (hī'pēr-īm'ū-nō-glōb'ū-līn-ēm'ē-ā, -mū') An autosomal dominant disorder marked by high serum levels of IgE; eczema, mucosal candidiasis, and other cutaneous infections; pulmonary infections; retained primary dentition; scoliosis; and increased frequency of fractures.

hyperinflation (hī'pēr-in-flā'shūn) An excess of air in anything, esp. the lungs.

hyperinosemia (hī'pēr-ī'nō-sē'mē-ā) [' + *inos*, fiber, + *haima*, blood] An abnormal coagulability of the blood; an excess of fibrinogen in the blood.

hyperinsulinemia (hī'pēr-in-sū-līn-ē'mē-ā) In patients with type 2 diabetes mellitus (DM), a condition in which hyperglycemia is present despite high levels of insulin in the bloodstream. Insulin resistance and hyperinsulinemia have been linked to hypertension, obesity, hyperlipidemia, and increased cardiovascular mortality in patients with type 2 DM.

TREATMENT: Diet, exercise, and some oral antidiabetic drugs (e.g., metformin) increase the sensitivity of body tissues to the effects of insulin and decrease hyperinsulinemia.

hyperinsulinism (hī'pēr-in'sū-līn-īzm) [' + L. *insula*, island, + Gr. *-ismos*, con-

dition] A relative or absolute excess of insulin in the blood. The condition is commonly found in insulin-resistant patients with type 2 diabetes mellitus and rarely found in patients with insulin-secreting tumors of the pancreas. In type 2 diabetes, the condition is marked by hyperglycemia, weight gain, hypertension, and atherosclerosis. The resistance of such patients to the effect of insulin prevents hypoglycemia. By contrast, in patients with insulin-secreting tumors, severe hypoglycemia may be present.

congenital h. Persistent infant hyperinsulinemic hypoglycemia.

hyperinvolution (hī'pēr-īn'vō-lū'shūn) [' + L. *involvere*, to enwrap] **1.** Reduction in the size of the uterus to below normal after childbirth. **2.** Reduction in size to below normal of any organ following hypertrophy. SYN: *superinvolution*.

h. uteri Extreme atrophy of the uterus, seen following prolonged lactation or severe puerperal sepsis.

hyperirritability (hī'pēr-īr'ī-tā-bīl'ī-tē) An increased response to a stimulus.

hyperisotonic (hī'pēr-ī'sā-tōn'īk) [' + ''] Pert. to one of two solutions that has the greater osmotic pressure. SYN: *hypertonic*.

hyperkalemia (hī'pēr-kā-lē'mē-ā) [' + L. *kalium*, potassium, + Gr. *haima*, blood] An excessive amount of potassium in the blood. SEE: *hypokalemia*.

ETIOLOGY: It usually is caused by inadequate excretion of potassium or by the shift of potassium from tissues. Causes of inadequate secretion include acute renal failure, severe chronic renal failure, renal tubular disorders, hypoaldosteronism, and decreased renin secretion due to kidney disease or drugs (e.g., nonsteroidal anti-inflammatory agents, ACE inhibitors, or angiotensin receptor blockers) that inhibit potassium excretion. The shift of potassium from tissues occurs in tissue damage due to trauma, hemolysis, digitalis poisoning, acidosis, and insulin deficiency.

SYMPTOMS: Hyperkalemia is often a symptomless condition until very high levels of potassium are present in the blood. The precise level at which cardiac or skeletal muscle toxicities arise varies greatly from patient to patient. Eventually, muscular weakness, electrocardiographic abnormalities (such as peaked T waves, widened QRS complex, prolonged PR interval, flattened or absent P waves, depressed ST segment), and intractable cardiac rhythm disturbances leading to cardiac arrest may result.

PREVENTION: To help prevent hyperkalemia, patients who use salt substitutes containing potassium should be advised to discontinue them if urine output decreases. Predisposed patients,

esp. those with poor urinary output or taking oral or intravenous potassium supplements, require regular laboratory testing to assess their serum potassium levels.

TREATMENT: Mild hyperkalemia can be treated by eliminating its cause, often a medication or a potassium source in the diet or dietary supplement (e.g., potassium chloride taken as a salt substitute). Severe or progressive hyperkalemia can be treated with infusions of calcium gluconate, sodium bicarbonate, or insulin and glucose, or by the administration of potassium-binding resins orally or rectally. Hemodialysis also is effective.

PATIENT CARE: Cardiac rhythm and serum potassium and other electrolyte levels are monitored. Intake and output are recorded. Prescribed drugs are given and their effects on potassium levels are promptly evaluated. A dietitian is consulted to recommend optimal quantities of potassium in foods and fluids. Safety measures are implemented for the patient with muscle weakness. If the patient requires transfused blood, only fresh blood may be used, since older blood contains potassium released by hemolysis.

hyperkeratinization (hī'pēr-kēr'ā-tīn'ī-zā'shūn) [" + *keras*, horn] A thickening of the horny layers of the skin, esp. of the palms and soles. It may be caused by vitamin A deficiency or chronic arsenic toxicity.

hyperkeratomycosis (hī'pēr-kēr'ā-tō-mī-kō'sīs) [" + " + *mykes*, fungus, + *osis*, condition] Hypertrophy of the stratum corneum of the epidermis that is caused by a fungal infection.

hyperkeratosis (hī'pēr-kēr'ā-tō'sīs) [" + " + *osis*, condition] **1.** An overgrowth of the cornea. **2.** An overgrowth of the horny layer of the epidermis.

h. congenitalis Hyperkeratosis in the harlequin fetus.

epidermolytic h. A congenital disorder characterized by hyperkeratosis, erythema, and blisters.

hyperketonemia (hī'pēr-kē'tō-nē'mē-ā) Accumulation of an excess of ketone bodies in the blood.

hyperketonuria (hī'pēr-kē-tō-nūr'ē-ā) An excessive quantity of ketones in the urine.

hyperkinesia, hyperkinesis (hī'pēr-kī-nē'zē-ā, -nē'sīs) [Gr. *hyper*, over, above, excessive, + *kinesis*, movement] Increased muscular movement and physical activity. In children it may be due to attention-deficit hyperactivity disorder (ADHD). SEE: *hyperactivity*.

hyperkinetic disorder **1.** A brain-based motor system disorder characterized by excessive involuntary movements and some amount of hypotonia. The classic hyperkinetic disorder is Huntington's

disease. **2.** The British term for attention deficit and hyperactivity disorder.

hyperlactation (hī'pēr-lāk-tā'shūn) [" + *L. lactare*, to suckle] Excessive milk secretion.

hyperleptinemia (hī'pēr-lēp'tīn-ē'mē-ā) [" + " + "] Excess levels of leptin in the blood. Hyperleptinemia increases body fat content and stimulates appetite.

hyperleukocytosis (hī'pēr-loo'kō-sī-tō'sīs) A concentration of white blood cells that exceeds 100×10^9 cells/mm³. Extremely elevated white blood cell counts can cause blood clotting, heart attack, or stroke due to abnormal blood viscosity.

hyperlexia (hī'pēr-lēk'sē-ā) Early development of advanced reading skills without associated skills in other areas of social or intellectual functioning. Hyperlexia is considered a typical splinter skill in children with autistic disorders.

hyperlipemia (hī'pēr-līp-ē'mē-ā) [" + *lipos*, fat, + *haima*, blood] An excessive quantity of fat in the blood.

hyperlipidemia (hī'pēr-līp'ī-dē'mē-ā) An increase of lipids in the blood.

hyperlipoproteinemia (hī'pēr-līp'ō-prō-tē-īn-ē'mē-ā) Increased lipids in the blood resulting either from an increased rate of synthesis or from a decreased lipoprotein breakdown rate. The lipoproteins transport triglycerides and cholesterol in the plasma. Clinically, an increased lipoprotein level may cause atherosclerosis and pancreatitis. Hyperlipoproteinemias can develop as a result of a primary and inheritable biochemical defect of either lipoprotein lipase activity or one of the cofactors essential to the function of that enzyme. They may also develop secondary to certain endocrine and metabolic disorders, such as diabetes mellitus; glycogen storage disease, type I; Cushing's syndrome; acromegaly; hypothyroidism; anorexia; use of drugs such as alcohol, oral contraceptives, and glucocorticoids; renal disease; liver disease; immunological disorders; and stress. The hyperlipoproteinemias have been divided into five different lipoprotein patterns describing the changes found in the plasma. Types I and III are autosomal recessive traits; types II, IV, and V are autosomal dominant. These patterns are not descriptive of specific diseases. SEE: *cholesterol*; *lipoprotein*.

PATIENT CARE: The patient should receive instruction about and support for a high-fiber calorically restricted diet that is low in saturated fats and total cholesterol. A formal consultation with a nutritionist facilitates this process. Regular exercise lasting at least 35 to 60 min a day also helps the patient to metabolize lipids and raise protective

levels of high-density lipoproteins (HDLs) while decreasing levels of low-density lipoproteins (LDLs). Patient education also should include information about serum lipid-lowering drugs, such as niacin, statins, or bile acid sequestrants and about their side effects and potential drug interactions and the need for follow-up blood work (esp. liver function tests). Other lifestyle and medical interventions may be indicated for patients with hyperlipoproteinemia and other risk factors for coronary artery disease, such as tobacco abuse, obesity, or diabetes mellitus.

hyperliposis (hī'pēr-lī-pō'sīs) [*"* + *lipos*, fat, + *osis*, condition] An abnormal amount of fat in the body.

hyperlucency (hī'pēr-loo'sēn-sē) In radiology, increased radiolucency.

hypermastia (hī'pēr-mās'tē-ā) [*"* + *mastos*, breast] **1.** Excessive enlargement of the breast in women or men. This condition may be unilateral. **2.** The presence of an abnormal number of mammary glands.

hypermature (hī'pēr-mā-tūr') [*"* + *L. maturus*, ripe] **1.** Pert. to anything that has passed the stage of maturity. **2.** Overripe, as a cataract or abscess that has gone past the optimum time for removal or incision.

hypermelanosis (hī'pēr-mēl-ā-nō'sīs) One of several disorders of melanin pigmentation resulting in increased melanin in either the epidermis (melanoderma), in which case the coloration is brown, or in the dermis, in which case it is blue or slate gray (ceruloderma). This disorder may be caused by a number of diseases and conditions, including pregnancy, ACTH-producing tumors, Wilson's disease, porphyria, biliary cirrhosis, chronic renal failure, certain drugs, suntanning, and chronic pruritus. SEE: *hypermelanosis*.

hypermenorrhea (hī'pēr-mēn'ō-rē-ā) [*"* + *men*, month, + *rhoia*, flow] Menorrhagia.

hypermetabolic state (hī'pēr-mēt'ā-bōl'ik) A condition of an abnormally increased rate of metabolism; hypermetabolism.

hypermetabolism (hī'pēr-mē-tāb'ō-lizm) An increased rate of metabolism (e.g., as in fever, salicylate overdose, and other physiological or toxic stresses). SEE: *response*, *stress*.

extrathyroidal h. An increased rate of metabolism not related to thyroid disease.

hypermetaplasia (hī'pēr-mēt'ā-plā'sē-ā) [*"* + *meta-*, after, + *plassein*, to form] Overactivity in tissue replacement or transformation from one type of tissue to another, as cartilage to bone.

hypermetria (hī'pēr-mē'trē-ā) [Gr. *hyper*, over, above, excessive, + *metron*, measure] An unusual range of move-

ment; motor incoordination in which muscular movement causes a person to overreach the objective.

hypermetrope (hī'pēr-mēt'rōp) [*"* + *"* + *ops*, eye] Hyperope.

hypermetropia (hī'pēr-mē-trō'pē-ā) Hyperopia. **hypermetropic** (-trōp'ik), *adj.*

hypermnnesia (hī'pēr-mē'zē-ā) [*"* + *mneme*, memory] **1.** A great ability to remember names, dates, and details. **2.** An exaggeration of memory involving minute details of a past experience. It occurs in the manic phase of manic-depressive psychosis; in delirium and hypnoses; at the moment of shock and fright in life-threatening situations; with fever; during neurosurgical procedures involving temporal lobe stimulation; and following some brain injuries.

hypermobility (hī'pēr-mō-bil'ī-tē) **1.** Excessive joint play (movement) that permits increased mobility. It is present in some connective tissue diseases such as Marfan's or Ehlers-Danlos syndromes. **2.** Excessive movement of any organ or tissue as a result of tissue laxity.

hypermorph (hī'pēr-mōrf) [*"* + *morphe*, form] **1.** A person with disproportionately long limbs whose standing height is high in proportion to the sitting height. **2.** A mutant gene that expresses more than the usual amount of gene product expressed by the wild type. SEE: *hypomorph*; *somatotype*.

hypermotility (hī'pēr-mō-til'ī-tē) [*"* + *L. motio*, motion] Unusual or excessive movement. SYN: *hyperkinesia*.

hypermyesthesia (hī'pēr-mī'ēs-thē'sē-ā) [*"* + *"* + *aisthesis*, sensation] Muscular hyperesthesia.

hypermyotonia (hī'pēr-mī'ō-tō'nē-ā) [*"* + *"* + *tonos*, tone] Excessive muscular tone.

hypermyotrophy (hī'pēr-mī-ōt'rō-fē) [*"* + *"* + *trophe*, nourishment] Abnormal muscular development.

hypernatremia (hī'pēr-nā-trē'mē-ā) [*"* + *L. natron*, sodium, + *Gr. haima*, blood] An elevated concentration of sodium in the bloodstream. Hypernatremia is said to be present when the sodium concentration exceeds about 145 mmol/L. In the vast majority of cases, water deficits (and not salt excesses) cause relative sodium levels to rise; i.e., high serum sodium levels usually result from dehydration or fluid deprivation. Infrequently, hypernatremia results from infusions of concentrated saline.

hypernephroma (hī'pēr-nē-frō'mā) [*"* + *nephros*, kidney, + *oma*, tumor] Renal cell carcinoma.

hyperneurotization (hī'pēr-nū-rōt'ī-zā'shūn) [*"* + *neuron*, nerve] Grafting of a motor nerve into a muscle that has an intact nerve supply.

hypernutrition (hī'pēr-nū-trīsh'ūn) [*"* + *L. nutrire*, to nourish] Overfeeding.

hyperonychias (hī'pēr-ō-nīk'ē-ā) [*"* +

onyx, nail] An overgrowth (hypertrophy) of the nails.

hyperope (hī'pēr-ōp) [" + *ops*, eye] One who is farsighted. SYN: *hypermetropes*.

hyperopia (hī'pēr-ō'pē-ă) [" + *ops*, eye] Farsightedness; a defect in vision in which parallel rays come to a focus behind the retina as a result of flattening of the globe of the eye or of an error in refraction. Symptoms include ocular fatigue and poor vision. SYN: *hypermetropia*. SEE: *emmetropia* for illus.

absolute h. Hyperopia in which the eye cannot accommodate.

axial h. Hyperopia caused by shortness of the eye's anteroposterior axis.

facultative h. Hyperopia that can be corrected by accommodation.

latent h. Hyperopia in which the error of refraction is overcome and disguised by ciliary muscle action.

manifest h. Total amount of hyperopia that can be neutralized by a convex lens without interfering with clarity of vision.

relative h. Hyperopia in which vision is clear only when excessive convergence is made.

total h. Complete hyperopia combining both latent and manifest types; the amount of hyperopia present when accommodation is completely suspended by paralyzing the ciliary muscle, which is done by use of a cycloplegic drug.

hyperorality (hī'pēr-ō-rāl'i-tē) [" + "'] Excessive chewing, sucking, lip smacking, or food craving. It is seen in some neurological disorders (e.g., Klüver-Bucy syndrome and Pick's disease).

hyperorchidism (hī'pēr-or'kid-izm) [Gr. *hyper*, over, above, excessive, + *orchis*, testicle, + *-ismos*, state of] Excessive secretion of male hormones, often accompanied by precocious puberty.

hyperorexia (hī'pēr-ō-rēks'ē-ă) [" + *orexis*, appetite] Abnormal hunger or markedly increased appetite. This occurs in some patients with diabetes mellitus, hyperthyroidism, parasitic infections of the gastrointestinal tract, or bulimia. It also may occur as a side effect of some medications, such as steroids.

hyperorthocytosis (hī'pēr-or'thō-sī-tō'sīs) [" + *orthos*, straight, + *kytos*, cell, + *osis*, condition] Increased white blood cells with normal proportion of various forms and without immature forms.

hyperosmia (hī'pēr-ōz'mē-ă) [" + *osme*, smell] An abnormal sensitivity to odors.

general h. Total h.

partial h. Increased sensitivity to some odors.

total h. Increased sensitivity to all odors. SYN: *general hyperosmia*.

hyperosmolarity (hī'pēr-ōz'mō-lār'i-tē) Increased osmolarity of the blood.

hyperostosis (hī'pēr-ōs-tō'sīs) [" + *osteon*, bone, + *osis*, condition] An abnormal growth of osseous tissue. SYN: *exostosis*; *torus*.

frontal internal h. An osteoma, usually multiple or arising from the internal area of the frontal bone.

infantile cortical h. An increased growth of subperiosteal bone occurring most frequently in the mandible and clavicles, accompanied by fever and irritability. SYN: *Caffey's disease*.

hyperovaria (hī'pēr-ō-vār'ē-ă) [Gr. *hyper*, over, above, excessive, + L. *ovarium*, ovary] Precocious sexual development in young girls owing to excessive ovarian secretion resulting from unusual and premature ovarian development.

hyperovulation (hī'pēr-ōv'ū-lā'shūn) The production of a large number of ova, usually in response to hormonal stimulation. SEE: *clomiphene citrate*; *human menopausal gonadotropin*.

hyperoxaluria (hī'pēr-ōk'sā-lū-rē-ă) Increased oxalic acid in the urine.

enteric h. Hyperoxaluria caused by disease or surgical removal of the ileum.

primary h. An inherited metabolic disease caused by a defect in glyoxalate metabolism. This causes an increased secretion of oxalate in the urine, renal calculi, renal failure, and generalized deficit of oxalate crystals in tissues.

hyperoxemia (hī'pēr-ōk-sē'mē-ă) [" + *oxys*, sharp, + *haima*, blood] Increased oxygen content of the blood.

hyperoxia (hī'pēr-ōk'sē-ă) Increased oxygen in the blood.

hyperoxia test The administration of 100% oxygen to a patient (typically a neonate) to determine the cause of respiratory distress, hypoxemia, cyanosis, and/or shock. The resolution of cyanosis with treatment usually indicates that the cause of the hypoxia is a lung disease (e.g., pneumonia). Failure of neonates to respond to 100% oxygen is an indication of severe congenital heart disease.

hyperoxygenation (hī'pēr-ōk'sī-jēn-ā'shūn) The temporary administration of excess oxygen to a patient to prevent hypoxemia during subsequent therapeutic procedures.

hyperparasitism (hī'pēr-pār'ă-sī'tizm) A condition in which a parasite lives in or upon another parasite.

hyperparathyroidism (hī'pēr-pār'ă-thī'roy-dizm) [" + *para*, beyond, + *thyreos*, shield, + *eidosis*, form, shape, + *-ismos*, condition] A condition caused by excessive levels of parathyroid hormone in the body. Hyperparathyroidism is usually caused by benign tumors of the parathyroid glands (primary hyperparathyroidism), although

occasionally it occurs secondary to renal failure or other systemic illnesses. The consequences of excess parathyroid hormone may include symptomatic or unnoticed hypercalcemia, hypophosphatemia, hyperchlorhydria, kidney stone formation, and bone resorption. Hyperparathyroidism is the most common cause of hypercalcemia, which can lead to central nervous system, musculoskeletal, metabolic, gastrointestinal, and cardiovascular problems when the concentration of calcium in the blood rises to very high levels. SEE: *hypercalcemia; parathyroid glands; osteitis fibrosa cystica*.

PATIENT CARE: The majority of patients with hyperparathyroidism are older women. Mild hyperparathyroidism may initially be managed expectantly without harm to the patient. In most patients a single adenoma produces the excess parathyroid hormone; in only about 15% of patients is hyperparathyroidism caused by generalized hyperplasia of all four parathyroid glands. Severe primary hyperparathyroidism may require surgical removal of the parathyroid gland or glands to prevent potential complications of hyperparathyroidism, including kidney stone disease, degeneration of bone, neuromuscular and neuropsychiatric illnesses, and pancreatitis, among others. In some cancer patients, malignant tumors release a parathyroid-like hormone with hypercalcemia, which mimics hyperparathyroidism.

hyperpathia (hī'pēr-pāth'ē-ā) [" + *pathos*, disease, suffering] Hypersensitivity to sensory stimuli. Includes hyperesthesia, allodynia, and hyperalgesia.

hyperphagia (hī'pēr-fā'jē-ā) [" + Gr. *phagein*, to eat] Eating more food than is required; gluttony or binge eating.

hyperphalangism (hī'pēr-fāl-ān'jīzm) [" + *phalanx*, closely knit row, + *-ismos*, state of] Having an extra phalanx on a finger or toe. SYN: *polyphalangism*.

hyperphasia (hī'pēr-fā'zē-ā) [" + *phasis*, speech] An abnormal desire to talk.

hyperphenylalaninemia (hī'pēr-fēn'īl-āl'ā-nī-nē'mē-ā) An increased amount of phenylalanine in the blood. SEE: *phenylketonuria*.

hyperphonia (hī'pēr-fō'nē-ā) [" + *phone*, voice] 1. Stuttering or stammering due to irritability of the vocal cords. 2. Explosive speech exhibited by those who stammer.

hyperphoria (hī'pēr-fō'rē-ā) [" + *phorain*, to bear] A tendency of one eye to turn upward.

hyperphosphatemia (hī'pēr-fōs'fā-tā-sē'mē-ā) Increased alkaline phosphatase in the blood.

hyperphosphatemia (hī'pēr-fōs'fā-tē'mē-ā) [" + L. *phosphas*, phosphate,

+ Gr. *haima*, blood] An abnormal amount of phosphorus in the blood. SYN: *hyperphospheremia*.

Hyperphosphatemia is caused by increased absorption of phosphorus from the gut, decreased excretion in the urine (seen in renal failure), or increased production. Increased intake can occur as a result of excessive intravenous administration (e.g., in hyperalimentation solutions), or oral ingestion, or excessive vitamin D intake.

hyperphosphaturia (hī'pēr-fōs-fā-tū'rē-ā) [" + " + Gr. *ouron*, urine] An increased amount of phosphates in the urine.

hyperphospheremia (hī'pēr-fōs-fēr-ē'mē-ā) [" + " + Gr. *haima*, blood] Hyperphosphatemia.

hyperphrenia (hī'pēr-frē'nē-ā) [Gr. *hyper*, over, above, excessive, + *phren*, mind] 1. Excessive mental activity, seen in the manic phase of manic-depressive psychosis. 2. Mental ability and capacity much greater than normal.

hyperpigmentation (hī'pēr-pīg'mēn-tā'shūn) Increased pigmentation, esp. of the skin.

hyperpituitarism (hī'pēr-pī-tū'ī-tār-izm) [" + L. *pituita*, mucus, + Gr. *-ismos*, condition] A condition resulting from overactivity of the anterior lobe of the pituitary. SEE: *acromegaly; gigantism*.

hyperplasia (hī'pēr-plā'zē-ā) [" + *plassein*, to form] Excessive proliferation of normal cells in the normal tissue arrangement of an organ. SYN: *hypergenesis*. SEE: *ilus. hyperplastic* (-plās'tik), *adj.*



HYPERPLASIA OF A DERMAL MOLE

angiofollicular lymph node h. Castleman's disease.

benign prostatic h. ABBR: BPH. A nonmalignant enlargement of the prostate gland caused by excessive growth of prostatic nodules. It is the most common benign neoplasm of aging men, found on microscopic examination of the prostate in about 70% of men by age 60, and 90% of men by age 70. More than 440,000 men in the U.S. alone have surgery to

correct the problem each year. SYN: *benign prostatic hypertrophy*. SEE: *Nursing Diagnoses Appendix*; *prostate*; *prostate cancer*; *transurethral resection of the prostate*.

ETIOLOGY: The prostate gland grows as a result of stimulation of the gland by sex hormones. Dihydrotestosterone (a derivative of the male sex hormone, testosterone) directly stimulates the growth of the gland's epithelial and stromal cells; estrogens, which are found in increasing concentrations in aging men, increase the number of hormone receptors in the prostate, making the gland more susceptible to stimulation by male hormones. Under these influences prostate nodules enlarge around the urethra and may compress the urinary outlet limiting the flow of urine from the bladder.

DIAGNOSIS: The diagnosis of BPH is made based on a description of typical symptoms, digital rectal examination, PSA testing, and/or ultrasonography. The American Urological Association (AUA) has developed a self-administered screening tool (The AUA Symptom Index) to determine the frequency and severity of urinary symptoms.

SYMPTOMS: Patients often complain of difficulty starting or stopping their urinary stream, frequent urination, a reduced urinary stream, urinary hesitancy and/or urgency, and frequent awakenings at night to urinate. They may also develop urinary tract infections and sudden obstruction of all urinary flow (acute urinary retention). Urinary retention increases the risk for development of urinary tract infection, pyelonephritis, or renal atrophy. Bladder hypertrophy, hydronephrosis, kidney damage, or sepsis may also develop.

TREATMENT: Men with mild to moderate symptoms often get symptomatic relief from medicines such as alpha-1 adrenergic antagonists (e.g., terazosin) and/or 5-alpha reductase inhibitors (such as finasteride), which block the effect of testosterone on prostatic growth and may reduce the need for prostate surgeries. Two herbal remedies are also commonly employed: saw palmetto and pygeum. When patients have recurrent urinary infections, unmanageable urinary symptoms, urinary retention, or damage to the bladder or kidneys, surgery is performed. Transurethral resection of the prostate (TURP) is the most common procedure—it removes hypertrophied prostatic tissue with a loop-shaped resection device. Alternatives to TURP include transurethral incision of the prostate (TUIP), laser reduction in the size of the gland, transurethral microwave heat treatment, transurethral needle ablation, urethral stent placement, or open prostatectomy.

PATIENT CARE: The patient is evaluated for his ability to effectively empty his bladder, the caliber and force of his urinary stream, reduction in urinary hesitancy and difficulty initiating his stream, dribbling, incontinence, and nocturia.

A midstream urine specimen is collected for culture and sensitivity. Antibiotics are prescribed if the patient is to undergo urethral procedures involving instrumentation.

If urinary retention develops, a urinary catheter is inserted by the nurse or urologist. Sometimes the catheter is inserted with guides. Suprapubic cystostomy is used if a catheter cannot be passed transurethraly. The patient is monitored for rapid bladder decompression and for signs of postobstruction diuresis (increased urine output, hypotension), which may lead to serious dehydration, lowered blood volume, shock, electrolyte losses, and anuria.

The patient with BPH is taught to avoid prescription and over-the-counter drugs that can worsen obstruction (e.g., decongestants, alcohol, caffeine, anticholinergics, tranquilizers, or antidiuretics).

Postoperative Care: Following surgical excision, continuous bladder irrigation and an indwelling catheter with a large balloon may be used to control bleeding. If an open prostatectomy is needed, the patient should receive routine prophylaxis for venous thromboembolism using low-dose unfractionated heparin two or three times a day for a few days postsurgery. The patient also is taught to recognize and report signs of infection, which can worsen obstruction, and to seek medical care immediately if he is unable to void. The patient is advised that regular sexual intercourse will help to relieve prostatic congestion. Men over age 50 (and younger men with a family history of the disease) should be encouraged to have regular prostate checkups.

fibrous h. An increase in connective tissue cells after inflammation.

hyperploidy (hī'pēr-ploy'dē) A condition of having one extra chromosome and thus not balanced sets of chromosomes. SEE: *Down syndrome*; *trisomy 21*.

hyperpnea (hī'pērp-nē'ā) [*h* + *pnoia*, breath] An increased respiratory rate, or breathing that is deeper than that usually experienced during normal activity. A certain degree of hyperpnea is normal after exercise; it may also be caused by pain, a variety of respiratory diseases, fever, heart failure, certain drugs, panic attacks, or atmospheric conditions experienced at high altitude.

hyperpolarization (hī-pēr-pōl'ār-ī-zā'shūn) An increase in the resting potential of a cell membrane (e.g., a cell membrane

of a neuron), causing the inside of the cell to become more negative. This change raises the threshold level for depolarization, thus making the cell relatively less sensitive to stimuli.

hyperpraxia (hī'pēr-prāk'sē-ā) Excessive activity and restlessness.

hyperprolactinemia (hī'pēr-prō'lāk'tīn-ē'mē-ā) An excess secretion of prolactin thought to be due to hypothalamic-pituitary dysfunction. This is usually associated with amenorrhea with or without galactorrhea.

hyperprolinemia (hī'pēr-prō'lī-nē'mē-ā) One of two metabolic diseases of amino acid metabolism that result in an excess of proline in the body.

hyperproteinemia (hī'pēr-prō'tē-īn-ē'mē-ā) [" + *protos*, first, + *haima*, blood] An excess of protein in the blood.

hyperproteinuria (hī'pēr-prō'tē-īn-ū'rē-ā) [" + " + *ouron*, urine] Proteinuria.

hyperpselaphesia (hī'pērp-sēl'ā-fē'zē-ā) [Gr. *hyper*, over, above, excessive, + *pselaphesis*, touch] Hyperaphia.

hyperptyalism (hī'pēr-tī'āl-īzm) [" + *ptyalon*, spittle] Ptyalism.

hyperpyrexia (hī'pēr-pī-rēks'ē-ā) [" + *pyressein*, to be feverish] An elevation of body temperature that is markedly abnormal. It may be produced by physical agents such as hot baths, diathermy, or hot air or by reaction to infection caused by microorganisms. SYN: *hyperthermia*. **hyperpyretic**, **hyperpyrexial** (-rēt'ik, -rēk'sē-āl), *adj.*

malignant h. Malignant hyperthermia.

hyperreactive (hī'pēr-rē-āk'tiv) Pert. to an increased response to stimuli.

hyperreflexia (hī'pēr-rē-flēk'sē-ā) [" + *L. reflexus*, bent back] An increased action of the reflexes.

autonomic h. A serious (emergency) medical condition commonly seen in patients with injury to the upper spinal cord (above T6). It is caused by massive sympathetic discharge of stimuli from the autonomic nervous system. It may be triggered by distention of the bladder or colon, a skin lesion (pressure sore), catheterization or irrigation of the bladder, cystoscopy, or transurethral resection. Symptoms include sudden hypertension, bradycardia, sweating, severe headache, and cold gooseflesh below the trauma lesion level. The stimulus must be quickly identified and eliminated. SEE: *autonomic dysreflexia*.

PATIENT CARE: Vital signs and symptoms are assessed with the patient seated (to decrease blood pressure) and are monitored until the episode resolves. The urinary bladder is assessed for distention (palpation, bladder ultrasound), and (as necessary) drained by catheterization. The indwelling catheter is checked for kinking or other ob-

struction and irrigated with no more than 30 ml of sterile normal saline solution if necessary. If the catheter remains obstructed, it is removed and a new catheter is inserted immediately. The patient's rectum is checked for impaction; a local anesthetic ointment is used for lubrication and for anesthesia if removal of an impaction is necessary. Any other stimuli that may be triggering the response are also removed. A urine specimen is obtained for culture because infection may be a cause. If the cause cannot be rapidly removed, prescribed medications to reduce blood pressure and headache are administered, and the patient's response is evaluated. A calm atmosphere is created, and emotional support is offered throughout the episode. The patient is educated about this complication, and actions are explained to prevent and alleviate it.

hyperresonance (hī'pēr-réz'ō-nāns) [" + *L. resonare*, to resound] An increased resonance produced when an area is percussed.

hypersalivation (hī'pēr-sāl'ī-vā'shūn) [" + *L. salivatio*, salivation] Ptyalism.

hypersecretion (hī'pēr-sē-krē'shūn) [" + *L. secretio*, separation] An abnormal amount of secretion.

hypersensibility (hī'pēr-sēn'sī-bil'ī-tē) [" + *L. sensibilitas*, sensibility] Hypersensitivity.

hypersensitive (hī'pēr-sēn'sī-tiv) [" + "] Excessively and abnormally susceptible to a stimulus (e.g., an antigen like pollen). SYN: *supersensitive*. SEE: *allergy*; *anaphylaxis*; *hay fever*.

hypersensitivity (hī'pēr-sēn'sī-tiv'ī-tē) An abnormal sensitivity to a stimulus of any kind.

visceral h. An abnormally low tolerance for painful stimuli in the internal organs. It is seen, e.g., in patients with irritable bowel syndrome.

hypersensitivity reaction Allergy.

hypersensitization (hī'pēr-sēn'sī-tī-zā'shūn) 1. Producing or inducing increased sensitivity to an organism or drug. 2. The condition of being highly sensitive to something.

hypersomnia (hī'pēr-sōm'nē-ā) [" + *L. somnus*, sleep] 1. Excessive daytime sleepiness resulting from any cause (e.g., inadequate sleep hygiene, the use of intoxicating drugs, or obstructive sleep apnea). 2. Excessive daytime sleepiness lasting more than one hour at a time for every day for several months; the inability to feel refreshed after sleeping; excessively long periods of sleep (total sleep time of more than 10 hours a day); no evidence of cataplexy or narcolepsy. SYN: *idiopathic h.*

idiopathic h. Hypersomnia.

recurrent h. Excessive sleepiness

Classification of Blood Pressure for Adults Age 18 and Older*

Category	Systolic (mm Hg)		Diastolic (mm Hg)
Optimal†	120	and	80
Prehypertension	120–139	or	80–89
Hypertension‡			
Stage 1	140–159	or	90–99
Stage 2	160–179	or	100–109
Stage 3	≥ 180	or	≥ 110

*Not taking antihypertensive drugs and not acutely ill. When systolic and diastolic blood pressures fall into different categories, the higher category should be selected to classify the individual's blood pressure status. For example, 160/92 mm Hg should be classified as stage 2 hypertension, and 174/120 mm Hg should be classified as stage 3 hypertension. Isolated systolic hypertension is defined as systolic BP of 140 mm Hg or greater and diastolic BP below 90 mm Hg and staged appropriately (e.g., 170/82 mm Hg is defined as stage 2 isolated systolic hypertension). In addition to classifying stages of hypertension on the basis of average blood pressure levels, clinicians should specify presence or absence of target organ disease and additional risk factors. This specificity is important for risk classification and treatment.

† Optimal blood pressure with respect to cardiovascular risk is below 120/80 mm Hg. However, unusually low readings should be evaluated for clinical significance.

‡ Based on the average of two or more readings taken after a period of rest and using the correct techniques at each of two or more visits after an initial screening.

SOURCE: Adapted from the Sixth Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High BP, NIH publication No. 98-4080, November 1997, and other sources.

that occurs periodically (e.g., every few weeks or months).

traumatic h. Excessive sleepiness in patients with traumatic brain injury.

hypersplenism (hī'pēr-splēn'izm) Increased sequestration of blood cells by the spleen.

hypersthenia (hī'pēr-sthē'nē-ā) [Gr. *hyper*, over, above, excessive, + *sthenos*, strength] Abnormal strength or excessive tension of part or all of the body.

hypersthenic (hī'pēr-sthēn'ik) 1. Denoting excessive strength or tension. 2. Denoting a body habitus characterized by a broad, deep thorax, short thoracic cavity, and a large abdominal cavity; a massive build.

hypersthenuria (hī'pēr-sthēn-ū-rē-ā) [" + *sthenos*, strength, + *ouron*, urine] The passage of urine with high specific gravity.

hypersusceptibility (hī'pēr-sū-sēp'tī-bīl'ī-tē) [" + "] An exaggerated susceptibility to an antigen, chemical, disease, or other stimulus.

hypersystole (hī'pēr-sīs'tō-lē) [" + *systole*, contraction] Unusual force or duration of systole. **hypersystolic** (-sīs-tōl'ik), *adj.*

hypertelorism (hī'pēr-tēl'or-izm) [" + *telouros*, distant] Abnormal distance between two paired organs, esp. the eyes.

hypertension (hī'pēr-tēn'shūn) [" + L. *tenso*, tension] In adults, a condition in which the blood pressure (BP) is higher than 140 mm Hg systolic or 90 mm Hg diastolic on three separate readings recorded several weeks apart. Hypertension is also present in patients under treatment for the disease, in whom the

disease has normalized with drug therapy. Hypertension is one of the major risk factors for coronary artery disease, heart failure, stroke, peripheral vascular disease, kidney failure, and retinopathy. It affects about 50 million people in the U.S. Considerable research has shown that controlling hypertension increases longevity and helps prevent cardiovascular illnesses. SYN: *high blood pressure*. SEE: *blood pressure*. **hypertensive**, *adj.*

Although all systems for categorizing high BP are somewhat arbitrary, the current consensus is that normal BPs are < 120 mm Hg systolic and < 80 mm Hg diastolic. Borderline high blood pressures, a condition also known as "prehypertension," are between 120 and 139 mm Hg systolic and 80 to 89 mm Hg diastolic. Patients with BP readings between 140/90 and 160/100 mm Hg are said to have stage 1 hypertension.

Stage 2 hypertension denotes a pressure from 160/100 to 179/109 mm Hg. Stage 3 hypertension begins at 180/110 mm Hg and has no upper limit. At each stage of hypertension, from prehypertensive levels through the three stages of hypertension, the risks of strokes, heart attacks, and kidney failure increase. SEE: table.

Hypertension in children has been defined as blood pressure above the 95th percentile for age, height, and weight. As many as 28% of children have secondary hypertension compared to 1% to 5% in adults.

ETIOLOGY: Hypertension results from many different conditions, some curable and others treatable. Curable

forms of hypertension (secondary hypertension), which are relatively rare, may be caused by coarctation of the aorta, pheochromocytoma, renal artery stenosis, primary aldosteronism, and Cushing's syndrome. Excess alcohol consumption (more than two drinks daily) is a common cause of high BP; abstinence or drinking in moderation effectively lowers BP in these cases. Aortic valve stenosis, pregnancy, obesity, and the use of certain drugs (e.g., cocaine, amphetamines, steroids, or erythropoietin) also may lead to hypertension. Usually, however, the cause is unknown; then high BP is categorized as "primary," "essential," or "idiopathic." Primary or essential hypertension may result from the body's resistance to the action of insulin, hyperactivity of the sympathetic nervous system, hyperactivity of the renin-angiotensin-aldosterone system, or endothelial dysfunction.

SYMPTOMS: Hypertension is usually a "silent" (i.e., asymptomatic) disease in the first few decades of its course. Because most patients are symptom-free until complications arise, they may have difficulty taking seriously a condition from which they perceive no immediate danger. Occasionally, patients with hypertension report headache. When complications result from high BPs, patients mention symptoms referable to the affected organs.

TREATMENT: If hypertension is newly diagnosed, routine studies should be done on the patient to establish a baseline for treatment. In addition to a thorough patient history, assessment for risk factors and physical examination, these include an ECG, urinalysis, serum potassium and calcium levels, blood urea nitrogen, fasting glucose level, and cholesterol profile, including triglycerides. The Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC7) guidelines to reduce cardiovascular disease complications recommends a target blood pressure of less than 140/90; 130/80 for patients with diabetes mellitus or renal disease. Because hypertension has been identified as a growing concern among children, JNC7 recommends regular BP checks beginning at age 3. Lifestyle modifications that lower BP include dietary sodium restriction to about 2 g/day made possible by avoiding salted food such as ham, potato chips, and processed foods and by not adding salt to food at the table; maintaining a healthy weight (a body mass index above 24.9 can elevate BP); eating lower calorie foods; restricting total cholesterol and saturated fat intake; quitting smoking; limiting alcohol intake (to about one drink daily); and

participating in a program of regular exercise. When lifestyle modifications fail over the course of several months to control blood pressure naturally, medications should be used. Drug therapy for stage 1 hypertension includes low-dose thiazide diuretics for most patients, although angiotensin converting enzyme (ACE) inhibitors, beta blockers, calcium channel blockers or a combination of these may be prescribed. For stage 2 hypertension, two-drug combinations are prescribed for most patients, usually a thiazide-type diuretic along with a beta blocker, ACE inhibitors, angiotensin receptor blockers, alpha blockers, or centrally active alpha blocking agents. If a woman develops hypertension during pregnancy, treatment should be with methyldopa, a beta blocker, or a vasodilator, as these drugs provide the least risk to the fetus. SEE: *pregnancy-induced h.*

PATIENT CARE: BP should be checked at every health care visit, and patients should be informed of their BP reading and its meaning. Positive lifestyle changes should be encouraged. Adherence to medical regimens is also emphasized, and patients are advised to inform their health care providers of any side effects of therapy that they experience, as these often can be managed with dosage adjustment or a change in medication. The technique of home BP monitoring is taught to receptive patients. Pressures should be measured and recorded for both arms, unless there is a medical prohibition for one arm, indicating which arm was used for each reading. SEE: *Nursing Diagnoses Appendix.*

accelerated h. Significant increase in blood pressure, with some evidence of vascular damage on funduscopic examination of the retina. Prompt treatment is indicated to prevent organ damage. SEE: *malignant h.*

benign intracranial h. Pseudotumor cerebri.

cuff-inflation h. A marked increase in blood pressure in association with inflation of the sphygmomanometer cuff. This does not represent true hypertension.

drug-resistant h. High blood pressure that does not normalize after treatment with appropriate doses of two or more standard antihypertensive medications.

essential h. Hypertension that develops without apparent cause. SYN: *primary.*

gestational h. High blood pressure developing after 20 weeks of pregnancy; it often resolves after delivery. It may be mild, requiring no intervention other than careful monitoring to identify pre-eclampsia.

Goldblatt h. Hypertension that re-

sembles renal hypertension produced in experimental animals by decreasing the blood flow to the kidney.

intracranial h. ABBR: ICH. An increase in the pressure inside the skull from any cause such as a tumor, hydrocephalus, intracranial hemorrhage, trauma, infection, or interference with the venous flow from the brain. SEE: *hydrocephalus*.



Patients with intracranial hypertension should not undergo a lumbar puncture or any other procedure that decreases the cerebrospinal fluid pressure in the vertebral canal.



malignant h. A form of hypertension that progresses rapidly, accompanied by severe vascular damage. It may be life-threatening or cause stroke, encephalopathy, cardiac ischemia, or renal failure.

ocular h. Increased intraocular pressure, typically exceeding 21 mm Hg. This condition, present in glaucoma, may predispose affected persons to optic nerve damage and visual field loss.



portal h. Increased pressure in the portal vein caused by an obstruction of the flow of blood through the liver. Portal hypertension is found in diseases such as cirrhosis, in which it is responsible for ascites, splenomegaly, and the formation of varices.

pregnancy-induced h. ABBR: PIH. A complication of pregnancy marked by increasing blood pressure, proteinuria, and edema. Diagnostic criteria include an increase of 30 mm Hg systolic or 15 mm Hg diastolic over the baseline pressure for the individual woman (or readings of 140/90) on two assessments with at least a 6-hr interval between measures; edema; and proteinuria of at least 300 mg/24 hr. This condition occurs most commonly in the late second trimester or last trimester; however, it may manifest earlier in women with molar pregnancies. It is potentially life-threatening and may worsen rapidly and, if untreated, develop into eclampsia. SEE: *eclampsia*; *HELLP syndrome*; *pre-eclampsia*.

ETIOLOGY: The cause of PIH is unknown but there are several major contributing theories: vasoconstriction and vasospasm, and a possible imbalance between prostaglandins, prostacyclin, and thromboxane A². The incidence is higher among adolescent and older primigravidas, diabetics, and women with pre-existing vascular problems or multiple pregnancies. Geographical, ethnic, racial, familial, low socioeconomic, nutritional, and immunological factors may contribute to PIH. Characteristic complaints include sudden weight gain,

severe frontal headaches, and visual disturbances. Indications of increasing severity include complaints of epigastric or abdominal pain; generalized, presacral, and facial edema; oliguria; and hyperreflexia.

The treatment consists of bedrest, a high-protein diet, and medications including mild sedatives, antihypertensives, and intravenous anticoagulants if indicated. Complications are HELLP syndrome (hemolysis, elevated liver enzymes and low platelets) and eclampsia (the convulsive form of PIH).

PATIENT CARE: To enable the woman to actively participate in her health maintenance, reduce the potential for development of PIH, and facilitate early diagnosis and treatment, the health care provider should emphasize the importance of regular prenatal visits and good prenatal nutrition. Signs to report promptly are identified with the patient: sudden weight gain, swelling of the hands and face, headache, pitting edema of the ankles and legs, and reduced urine output.

At each prenatal visit, the pregnant woman's blood pressure is monitored. The patient also is assessed for albuminuria; weekly weight gain of more than 3 lb (1.36 kg) in the second trimester or more than 1 lb (0.45 kg) in the third trimester; and generalized edema, esp. of the face and hands, and pitting edema of the ankles and legs. Protein intake is monitored to ensure adequate maternal serum protein levels, normal oncotic pressure, limitation of edema formation, and normal fetal development.

As pre-eclampsia progresses, the woman may complain of headaches, blurred vision or other visual disturbances, epigastric pain or heartburn, chest pressure, irritability, emotional tension, and decreased fetal activity. The patient is assessed for hyperreflexia of the deep tendon reflexes and clonus, and, if pre-eclampsia worsens, for oliguria. Treatment goals are to stop progress of the condition and ensure fetal survival and maternal well-being.

Hospitalization may be necessary if the patient exhibits signs of moderate to severe pre-eclampsia and has failed to respond to home management. Intravenous magnesium sulfate may be given, first as a bolus and continued as a maintenance dose, until the severity of the disease decreases. If magnesium sulfate is used, the patient must be assessed frequently for the presence of deep tendon reflexes, respirations over 12 per minute, hourly urine output, and signs and symptoms of magnesium toxicity. Calcium gluconate, if needed, is the antidote for magnesium sulfate.

The clinical status of mother and fe-

tus is continually evaluated; maternal vital signs and fetal heart rate are monitored. The patient is assessed for impending labor, and fetal and maternal responses to labor contractions are evaluated. The obstetrician is notified of any change in the patient's or the fetus' condition. Emergency care is provided during convulsions; prescribed medications are administered as directed, and patient and fetal response are evaluated. Careful monitoring of the administration of magnesium sulfate, intake and output, and the woman's response to the medication is necessary. Health care providers should be esp. alert for signs of toxicity, e.g., an absence of patellar reflexes (hyporeflexia), flushing, and muscle flaccidity.

Psychological support and assistance to develop effective coping strategies are provided to both patient and family, and they are prepared for possible premature delivery. Cesarean birth or oxytocin induction may be required. Although infants of mothers with PIH are usually small for gestational age, they sometimes fare better than other premature infants of similar weight because they have developed adaptive ventilatory and other responses to intrauterine stress. SEE: *Nursing Diagnoses Appendix*.

primary h. Essential h.

pulmonary h. Elevated blood pressures in the pulmonary arteries (above 25 to 30 mm Hg). *Primary pulmonary hypertension* is a rare familial illness in which small pulmonary arteries become blocked as a result of abnormalities in the structure of blood vessels in the lung. *Secondary pulmonary hypertension* is an elevation in pulmonary artery pressure as a result of left ventricular failure, blood clots in the pulmonary arteries, or chronic lung diseases.

rebound h. An increase in blood pressure that follows the withdrawal of an antihypertensive drug.

renal h. 1. Hypertension produced by kidney disease. The mechanism causing an increase in blood pressure is either alteration in the renal regulation of sodium and fluids or alteration in renal secretion of vasoconstrictors, which alter the tone of systemic or local arterioles. **2.** Hypertension produced experimentally by constriction of renal arteries. It is due to a humoral substance (renin) produced in an ischemic kidney.

renovascular h. Hypertension that is caused by decreased blood flow through one or both renal arteries and that normalizes after angioplasty or surgery to open the affected artery. The condition is an uncommon but surgically treatable form of high blood pressure.

white coat h. A colloquial term used to describe an episode of elevated blood

pressure when the reading is taken by a health care professional. It is attributed to anxiety regarding medical examination procedures or fear of possible findings.

hypertensive (hī'pēr-těn'siv) Marked by a rise in blood pressure.

hyperthecosis (hī'pēr-thē-kō'sīs) Hyperplasia of the theca interna of the ovary. Hirsutism, amenorrhea, and an enlarged clitoris may be present.

hyperthelia (hī'pēr-thē'le-ā) [Gr. *hyper*, over, above, excessive, + *thele*, nipple] The presence of more than two nipples.

hyperthermalgesia (hī'pēr-thēr'm'āl-jē'-zē-ā) [" + *therme*, heat, + *algosis*, sense of pain] An unusual sensitivity to heat. SYN: *hyperthermoesthesia*.

hyperthermia (hī'pēr-thēr'mē-ā) [" + *therme*, heat] Body temperature elevated above the normal range; an unusually high fever. SYN: *hyperpyrexia*.

ETIOLOGY: Hyperthermia may be caused by heat stroke; central nervous system diseases; thyroid storm; and infections including encephalitis, malaria, meningitis, or sepsis, esp. due to gram-negative organisms.

PATIENT CARE: To treat hyperthermia, the patient is placed in a cool environment, and tepid water baths may be used to promote reduction in surface temperature by convection and evaporation. Hypothermia blankets may be used if hyperthermia is the result of neurologic dysfunction or initial therapy is ineffective. Fluid intake is increased to at least 3 liters per day (unless otherwise restricted by cardiac or renal disorders) to replace fluids lost through diaphoresis, rapid respirations, and increased metabolic activity. Frequent oral hygiene is provided because dehydration dries the oral mucosa. Shivering is prevented through administration of diazepam.



Rubbing alcohol should not be used to reduce fever.

malignant h. An autosomal dominant disease marked by skeletal muscle dysfunction after exposure to some anesthetics or other stressors. Body temperatures may climb above 105° F. The condition may be fatal. SYN: *malignant hyperpyrexia*.

hyperthermia treatment The use of microwave or radiofrequency energy to increase body temperature. This type of therapy, which is usually combined with chemotherapy or radiation, has been used in treating some malignancies and infectious diseases.

hyperthermoesthesia (hī'pēr-thēr'm'ō-ēs-thē'zē-ā) [" + " + *aesthesia*, sensation] Hyperthermalgesia.

hyperthrombinemia (hī'pēr-thrōm'bin-

ē'mē-ā) [ʹ + *thrombos*, clot, + *haima*, blood] An excess of thrombin in the blood. This tends to promote intravascular clotting.

hyperthymia (hī'pēr-thī-rōy'dīz-m) [ʹ + *thymos*, mind] Pathological sensitivity or excitability.

hyperthyroidism (hī'pēr-thī-royd-īz-m) [ʹ + *thyreos*, shield, + *eidos*, form, shape, + *-ismos*, state of] A disease caused by excessive levels of thyroid hormone in the body. SEE: *Nursing Diagnoses Appendix*.

ETIOLOGY: The condition may result from various disorders such as nodular goiter and toxic adenomas, hyperemesis gravidarum, excessive thyroid hormone replacement, excessive iodine ingestion, or pituitary adenoma; however, the most common cause is Graves' disease. SYN: *thyrotoxicosis*. SEE: *Graves' disease*.

SYMPTOMS: In general, the signs and symptoms of hyperthyroidism are divided into two categories—those secondary to excessive stimulation of the sympathetic nervous system and those due to excessive levels of circulating thyroxine (T_4). The symptoms caused by sympathetic (adrenergic) stimulation include tachycardia, tremor, increased systolic blood pressure, hyperreflexia, eyelid lag (lagophthalmos), staring, palpitations, depression, nervousness, and anxiety. Symptoms caused by increased circulating thyroxine include increased metabolism, hyperphagia, weight loss, and some psychological disturbances. In elderly persons, symptoms of hyperthyroidism are often blunted. SEE: *apathetic h.*

TREATMENT: Definitive therapies include surgical removal of the thyroid gland, radioactive iodine ablation of the gland, or antithyroid drugs. The choice of treatment is individualized for each patient, depending on the size of the goiter, the cause, patient's age, and parity.

PATIENT CARE: Vital signs, fluid balance, and weight are monitored, and activity patterns are documented. Serum electrolyte levels are monitored, blood glucose levels are checked for evidence of hyperglycemia and urine for glycosuria, and the ECG is evaluated for arrhythmias and ST-segment changes. The patient is assessed for classic signs and symptoms (as above) and for indications of thyrotoxic crisis or heart failure. The patient's knowledge of the disorder is determined, misconceptions are corrected, and information on the condition, related problems, and symptom management is provided. Medical treatments, including radioactive iodine, are administered and evaluated for desired response and adverse reactions, and the patient is instructed about these treat-

ments (esp. regarding ^{131}I precautions). If the patient has exophthalmos, isotonic eyedrops are instilled to moisten the conjunctivae, and sunglasses or eye patches are recommended to protect the eyes from light. A high-caloric, high-vitamin, high-mineral diet, including between-meal snacks and avoidance of caffeinated beverages, is encouraged. Frequency and characteristics of the patient's stools are checked, and related skin care is provided as needed. The patient should minimize physical and emotional stress, balance rest and activity periods, and wear loose-fitting cotton clothing. A cool, dim, quiet environment also is recommended. The patient is prepared physically and emotionally for surgery if needed. Both patient and family are reassured that mood swings and nervousness will subside with treatment. The patient is encouraged to verbalize feelings about changes in body image. Assistance is provided to help the patient to identify and develop positive coping strategies. Emotional support is offered, and referral for further counseling is arranged as necessary. Life-long thyroid hormone replacement therapy will be necessary after surgical removal or radioactive iodine ablation treatment. The patient should wear or carry a medical identification device describing the condition and treatment and carry medication with him or her at all times.

apathetic h. Overactivity of the thyroid gland, presenting as heart failure, arrhythmias (such as atrial fibrillation), weight loss, or psychological withdrawal. This is more often a presentation of hyperthyroidism in older than in younger patients. Diagnosis is usually easier in the latter group because they present with the classic symptoms of hyperthyroidism. SYN: *subclinical h.*

subclinical h. Apathetic hyperthyroidism.

hyperthyrosis (hī'pēr-thī-rō'sīs) Hyperthyroidism.

hyperthyroxinemia (hī'pēr-thī-rōk'sī-nē'mē-ā) An excess of thyroxine in the blood.

hypertonia (hī'pēr-tō'nē-ā) [ʹ + *tonos*, tension] Hypertonicity.

hypertonic (hī'pēr-tō'n'ik) 1. Pert. to a solution of higher osmotic pressure than another. 2. In a state of greater than normal tension or of incomplete relaxation, said of muscles; the opposite of hypotonic.

hypertonicity (hī'pēr-tōn-ī'sī-tē) An excess of muscular or arterial tone or intraocular pressure. SYN: *hypertonia*.

hypertonus (hī'pēr-tō'nūs) Increased tension, as muscular tension in spasm.

hypertrichosis (hī'pēr-trī-kō'sīs) [ʹ + *osis*, condition] An excessive growth

of hair, possibly caused by endocrine disease, esp. of the adrenal gland, and in women, disease of the ovary. SYN: *polytrichia*; *polytrichosis*.

hypertriglyceridemia (hī'pēr-trī-glīs'ēr-ī-dē'mē-ā) An increased blood triglyceride level; a possible risk factor for cardiovascular disease.

hypertrophia (hī'pēr-trō'fē-ā) [Gr. *hyper*, over, above, excessive, + *trophe*, nourishment] Hypertrophy.

hypertrophy (hī-pūr'trā-fē) ["] + *trophe*, nourishment] An increase in the size of an organ or structure, or of the body owing to growth rather than tumor formation. This term generally is restricted to an increase in size or bulk that results not from an increase in number of cells, but rather from an increase in cellular components, such as proteins. It sometimes is used to apply to any increase in size as a result of functional activity. SYN: *hypertrophia*. SEE: *hyperplasia*. **hypertrophic** (hī'pēr-trō'fik), *adj.*

adaptive h. Hypertrophy in which an organ increases in size to meet increased functional demands, as the hypertrophy of the heart that accompanies valvular disorders.

adenoid h. Enlargement of the pharyngeal tonsil. It occurs commonly in children and may be congenital or result from infection of Waldeyer's ring.

benign prostatic h. Benign prostatic hyperplasia.

cardiac h. Hypertrophy of the heart.

compensatory h. Hypertrophy resulting from increased function of an organ because of a defect or impaired function of the opposite of a paired organ.

concentric h. Hypertrophy in which the walls of an organ become thickened without enlargement but with diminished capacity.

eccentric h. Hypertrophy of an organ with dilatation.

false h. Hypertrophy with degeneration of one constituent of an organ and its replacement by another.

gingival h. Excessive growth of the gums, sometimes associated with prolonged treatment with medications such as cyclosporine, nifedipine, or phenytoin. Thorough professional cleaning of the teeth, and/or electrosurgical, laser, or conventional surgical treatments can remove the excess tissue.

left ventricular h. ABBR: LVH. An increase in the mass of the left ventricle of the heart to greater than 100 g/m² in women or 131 g/m² in men. An excessively massive left ventricle is associated with an increased risk of death due to cardiovascular disease, stroke, and other causes. The size of the left ventricle can be reduced through regular exercise, weight loss, and by drugs that

control high blood pressure. SYN: *ventricular hypertrophy*.

Marie's h. Chronic periostitis that causes the soft tissues surrounding the joints to enlarge.

numerical h. Hypertrophy caused by an increase in structural elements.

physiological h. Hypertrophy due to natural rather than pathological factors.

pseudomuscular h. A disease, usually of childhood, characterized by paralysis, depending on degeneration of the muscles, which paradoxically become enlarged from a deposition of fat and connective tissue.

SYMPTOMS: This disease causes muscle weakness. The patient is awkward and often seeks support while walking to prevent falls. As the disease progresses, the muscles, particularly those of the calf, thigh, buttocks, and back, enlarge. The upper extremities are less frequently affected. When the patient stands erect, the feet are wide apart, the abdomen protrudes, and the spinal column shows a marked curvature with convexity forward. Rising from the recumbent position is accomplished by grasping the knees or by resting the hands on the floor in front, extending the legs and pushing the body backward. The gait is characterized by waddling. In a few years the paralysis becomes so marked that the patient is unable to leave the bed, which leads to further generalized muscular atrophy.

TREATMENT: Physical therapy helps to prevent contractures, but there is no effective therapy. The prognosis for this disease is unfavorable.

simple h. Hypertrophy due to an increase in the size of structural parts.

true h. Hypertrophy caused by an increase in the size of all the different tissues composing a part.

ventricular h. Left or right ventricular hypertrophy.

vicarious h. Hypertrophy of an organ when another organ of allied function is disabled or destroyed.

hypertropia (hī'pēr-trō'pē-ā) [Gr. *hyper*, over, above, excessive, + *tropos*, turning] Vertical strabismus upward.

hyperuricemia (hī'pēr-ūr'ris-ē'mē-ā) ["] + *ouron*, urine, + *haima*, blood] An excessive amount of uric acid in the blood.

hyperuricuria (hī'pēr-ūr'rik-ūr-ē-ā) ["] + *ouron*, urine] An excessive amount of uric acid in the urine.

hypervalinemia (hī'pēr-vāl'in-ē'mē-ā) An inherited condition caused by a deficiency of the enzymes essential to the metabolism of valine. The condition is marked by mental retardation, nystagmus, vomiting, and failure to thrive.

hypervascular (hī'pēr-vās'kū-lār) ["] +

L. vasculus, vessel] Excessively vascular.

hyperventilation (hī'pēr-vēn'tī-lā'shūn) [*h* + *L. ventilatio*, ventilation] Increased minute volume ventilation, which results in a lowered carbon dioxide (CO₂) level (hypocapnia). It is a frequent finding in many disease processes such as asthma, metabolic acidosis, pulmonary embolism, and pulmonary edema, and also in anxiety-induced states.

TREATMENT: Treatment is directed at the underlying cause. Immediate therapy for panic attacks consists of coaching the patient to slow down the breathing process to decrease the rate of blowing off CO₂. One way to do this is to have the patient breathe through only one nostril, with the mouth closed. Having the patient breathe in and out of a paper bag is discouraged, as it leads to hypoxemia. After the acute phase of the hyperventilation has been managed, the underlying cause of the problem must be determined.

therapeutic h. The use of carefully controlled but exaggerated ventilation to lower carbon dioxide levels in the blood and reduce cerebral blood flow; used to treat cerebral edema (e.g., after head injury). Its use remains controversial despite decades of research. Typically, the partial pressure of carbon dioxide (CO₂) is lowered to about 28 to 32 mm Hg. Lower levels of CO₂ produce reductions in cerebral blood flow that may damage the brain.

hypervigilance (hī'pēr-vī'jī-lāns) Excessive attentiveness to stimuli.

hyperviscosity (hī'pēr-vīs-kōs'ī-tē) [*h* + *L. viscosus*, gummy] Excessive resistance to the flow of liquids. Impaired hydraulic behavior, esp. of the plasma. Hyperviscous plasma is found in several hematological illnesses, including multiple myeloma and Waldenström's macroglobulinemia. In the latter illness, it can be treated with plasma exchange therapy.

hypervitaminosis (hī'pēr-vī'tā-mīn-ō'sīs) [*h* + *L. vita*, life, + *amine* + *Gr. osis*, condition] A condition caused by an excessive intake of vitamins in the diet or through the consumption of supplements; most commonly due to excessive consumption of fat-soluble vitamins.

hypervolemia (hī'pēr-vōl-ē'mē-ā) [*h* + *L. volumen*, volume, + *Gr. haima*, blood] An abnormal increase in the volume of circulating blood.

hypesthesia (hī'pēs-thē'zē-ā) [*Gr. hypo*, under, beneath, below, + *aisthesis*, sensation] A lessened sensibility to touch; variant of hypoesthesia.

hypha (hī'fā) *pl. hyphae* [*Gr. hyphe*, web] A filament of mold or part of a mold mycelium.

hyphedonia (hīp'hē-dō'nē-ā) [*Gr. hypo*, under, beneath, below, + *hedone*, pleasure] An abnormal lack of pleasure in normally pleasurable acts.

hypHEMA (hī-fē'mā) [*Gr. hyphaimos*, suffused with blood] Layer or clot of red blood cells in the anterior chamber of the eye, in front of the iris; usually grossly visible. A total hypHEMA may be red or black. It is often caused by a contusion from a fast-moving object but may sometimes occur spontaneously, e.g., in patients with diabetes mellitus or intraocular tumors.

PATIENT CARE: HypHEMA may be accompanied by an acute rise in intraocular pressure (IOP). When this occurs, urgent treatment is needed. The patient with a small hemorrhage ("microhypHEMA") can often be treated expectantly at home; patients with a larger hemorrhage should be referred to an eye care specialist. After acute treatment the patient should be encouraged to keep follow-up appointments with the eye care specialist.

Hypomycetes (hī'fō-mī-sē'tēz) [*Gr. hyphe*, web, + *mykes*, fungus] In one system of taxonomy, a class of the fungi imperfecti; it includes the genera *Aspergillus*, *Blastomyces*, and *Histoplasma*. This class is equivalent to the phylum Deuteromycotina in another system of taxonomy.

hypnagogic (hīp-nā-gōj'ik) [*Gr. hypnos*, sleep, + *agogos*, leading] 1. Inducing sleep or induced by sleep. SYN: *hypnotic*. SEE: *zone, hypnogenic*. 2. In psychology, pert. to hallucinations or dreams occurring just before loss of consciousness.

h. state A transitional state between sleeping and waking and the delusions that may result therefrom.

hypnagogue (hīp-nā-gōg) Concerning or causing sleep or drowsiness.

hypno- Prefix meaning *sleep*.

hypnoanalysis (hīp'nō-ā-nāl'ī-sīs) [*h* + *analysis*, a dissolving] Combined psychoanalytic therapy and hypnosis.

hypnoanesthesia (hīp'nō-ān'ēs-thē'zē-ā) The use of hypnosis to produce anesthesia.

hypnodontics (hīp'nō-dōn'tīks) The application of controlled suggestion and hypnosis to the practice of dentistry.

hypnogenic (hīp'nō-jēn'īk) [*h* + *genan*, to produce] Producing sleep.

hypnogram (hīp'nō-grām) [*Gr. hypnos*, sleep, + *gramma*, drawing] A chart representing the different stages of sleep in a person studied in a sleep laboratory.

hypnoidal (hīp-noy'dāl) [*h* + *eidōs*, form, shape] Pert. to a condition between sleep and waking, resembling sleep.

hypnoidization (hīp'noy-dī-zā'shūn) [*h* + *eidōs*, form, shape] The induction of hypnosis.

hypnolepsy (hĭp'no-lĕp'sĕ) [ʹ + *lepsis*, seizure] Narcolepsy.

hypnopompic (hĭp'no-pŏm'pĭk) [ʹ + *pompe*, procession] Pert. to dreams or visual images persisting after sleep and before complete awakening.

hypnosis (hĭp-nŏ'sis) [ʹ + *osis*, condition] A condition resembling sleep in which the objective manifestations of the mind are more or less inactive, accompanied by an increased susceptibility to suggestions. SEE: *autohypnosis*; *hypnotism*; *sleepwalking*; *somnambulism*.

hypnotherapy (hĭp'no-thĕr'ă-pĕ) [ʹ + *therapeia*, treatment] Therapeutic use of hypnotism. It has been used to treat phobias and anxiety, to manage pain, and to extinguish habits and addictions.

hypnotic (hĭp-nŏt'ĭk) [Gr. *hypnos*, sleep] 1. Pert. to sleep or hypnosis. 2. An agent that causes an insensitivity to pain by inhibiting afferent impulses or by inhibiting the reception of sensory impressions in the cortical centers of the brain, thus causing partial or complete unconsciousness. Hypnotics include sedatives, analgesics, anesthetics, and intoxicants and are sometimes called somnifacients and soporifics when used to induce sleep.

hypnotic-dependent sleep disorder Inability to sleep without the use of sedative/hypnotic drugs (e.g., benzodiazepines, barbiturates).

hypnotism (hĭp'nŏ-tĭzm) [ʹ + *-ismos*, condition] The act of inducing hypnosis. **self-induced h.** The use of hypnotism by people who seek to achieve specific goals for themselves (e.g., controlling pain, promoting health, improving relaxation, or quitting tobacco use). It is also referred to as auto-hypnosis or simply self-hypnosis.

hypnotist (hĭp'nŏ-tĭst) [Gr. *hypnos*, sleep] One who practices hypnotism.

hypnotize (hĭp'nŏ-tĭz) To put under hypnosis.

hypo (hĭ'pŏ) [Gr. *hypo*, under, beneath, below] Popular name for hypodermic syringe or injection.

hypo-, hyp- [Gr. *hypo*, under, beneath, below] Prefixes meaning *below*, *under*, *beneath*, or *deficient*. SEE: *sub-*.

hypoaacidty (hĭ'pŏ-ă-sĭd'ĭ-tĕ) [ʹ + *L. acidus*, sour] A condition of decreased acid in the stomach caused by lowered hydrochloric acid secretion. This condition may occur secondary to other disorders, such as stomach cancer, pernicious anemia, infection with *Helicobacter pylori*, or treatment with acid-suppressing medications or surgeries.

hypoaacusis (hĭ'pŏ-ă-kŭ'sĭs) [ʹ + *akousis*, hearing] Decreased sensitivity to sound stimuli.

hypoadrenalism (hĭ'pŏ-ăd-rĕ'năl-ĭzm) [ʹ + *L. ad*, to, + *renalis*, pert. to kidney, + Gr. *-ismos*, state of] Adrenal insufficiency.

hypoadrenocorticism (hĭ'pŏ-ă-drĕ'nŏ-kor'tĭ-sĭzm) Decreased secretion, or the effect of adrenal cortical hormones.

hypoalbuminemia (hĭ'pŏ-ăl-bŭ'mĭn-ĕ'mĕ-ă) Decreased albumin in the blood. It is found in people who are malnourished or cachectic, and in individuals with chronic kidney, liver, and pancreatic diseases, among others.

hypoadosteronism (hĭ'pŏ-ă'l'dŏ-stĕr'ŏn-ĭzm) A condition characterized by decreased aldosterone in the blood associated with hypotension and increased salt excretion.

hypoallergenic (hĭ'pŏ-ă'l'ĕr-jĕn'ĭk) [ʹ + ʹ] Having diminished potential for causing an allergic reaction.

hypoazoturia (hĭ'pŏ-ăz-ŏ-tŭ'rĕ-ă) [ʹ + *L. azotum*, nitrogen, + Gr. *ouron*, urine] Diminished urea in the urine.

hypobaric (hĭ'pŏ-băr'ĭk) [ʹ + *baros*, weight] Decreased atmospheric pressure or density when compared with a standard or reference gas or liquid. SEE: *bends*; *edema*, *high-altitude pulmonary*.

hypoblast (hĭ'pŏ-blăst) [ʹ + *blastos*, germ] The inner cell layer or endoderm, which develops during gastrulation. The external layer is called ectoderm. **hypoblastic** (hĭ'pŏ-blăst'ĭk), *adj.*

hypocalcemia (hĭ'pŏ-kăl-sĕ'mĕ-ă) [ʹ + *L. calx*, lime, + Gr. *haima*, blood] Abnormally low blood calcium. This condition occurs transiently in patients with severe sepsis, severe pancreatitis, burns, and acute renal failure. It also may result from multiple transfusions with citrated blood, parathyroidectomy, malabsorption, and medications such as protamine, heparin, and glucagon. Chronic hypocalcemia may be caused by chronic renal failure, hypoalbuminemia, and malnutrition. Clinical manifestations in chronic hypocalcemia include muscle spasm, carpopedal spasm, facial grimacing, possible convulsions, and mental changes such as irritability, depression, and psychosis. Treatment consists of calcium infusions and appropriate therapy for the causative disease.

newborn h. Low serum calcium levels present in the first days of life, caused by maternal disease (e.g., gestational diabetes or parathyroid disorders), diseases and conditions of the child (e.g., congenital hypoparathyroidism), or treatments given the newborn (transfusion therapy or phototherapy). Common symptoms of low calcium in the newborn are tremors or seizures.

hypocalcemic (hĭ'pŏ-kăl-sĕ'mĭk) [Gr.



Gastric hypoaacidty may alter the uptake and metabolism of many commonly used drugs.

- hypo-*, less than, deficient, + *L. calx*, lime, + *Gr. haima*, blood] 1. Pert. to a low concentration of calcium in the blood. 2. An agent that lowers blood calcium levels.
- hypocalcemia** (hī'pō-kāl'sē-ū-rē-ā) Decreased calcium in the urine.
- hypocaloric** (hī'pō-kāl'ūr-īk) 1. Having few calories (e.g., a hypocaloric meal). 2. Calorically restricted (e.g., a hypocaloric diet).
- hypocapnia** (hī'pō-kāp'nē-ā) [*Gr. hypo*, under, beneath, below, + *karnos*, smoke] A decreased amount of carbon dioxide in the blood. An excessively rapid rate of respiration ("hyperventilation") is usually responsible.
- hypocarbica** (hī'pō-kār'bē-ā) Hypocapnia.
- hypocellularity** (hī'pō-sēl'ū-lār'ī-tē) Decreased cell content of any tissue.
- hypochloremia** (hī'pō-klō-rē'mē-ā) [" + *chloros*, green, + *haima*, blood] Deficiency of the chloride content of the blood. SYN: *chloropenia*.
- hypochlorhydria** (hī'pō-klor-hī'drē-ā) [" + " + *hydor*, water] Hypoacidity. SEE: *achlorhydria*; *hyperchlorhydria*.
- hypochlorite** (hī'pō-klō'rīt) A salt of hypochlorous acid used in household bleach and as an oxidizer, deodorant, and disinfectant.
- hypochlorization** (hī'pō-klō'rī-zā'shūn) Diminished sodium chloride in the diet; used in treating hypertension and certain kidney diseases.
- hypochloruria** (hī'pō-klor-ūr-rē-ā) [" + *chloros*, green, + *ouron*, urine] Diminution of chlorides in the urine.
- hypcholesteremia** (hī'pō-kō-lēs-tēr-ē'mē-ā) [" + *chole*, bile, + *stereos*, solid, + *haima*, blood] Decreased blood cholesterol. As cholesterol has some important functions in the body, excessively low cholesterol levels are not desirable.
- hypochondria** (hī'pō-kōn'drē-ā) [" + *chondros*, cartilage] An abnormal concern about one's health, with the false belief of suffering from some disease, despite medical reassurance to the contrary. This is a common symptom among depressed patients. SYN: *hypochondriasis*. SEE: *somatization*.
- hypochondriac** (hī'pō-kōn'drē-āk) 1. Pert. to the region of the hypochondrium or the upper lateral region on each side of the body and below the thorax; beneath the ribs. 2. An individual with a heightened response to physical stimuli who believes his or her physical sensations are indicative of disease. **hypochondriacal** (-kōn-drī'ā-kāl), *adj.*
- h. region** Hypochondrium.
- hypochondriasis** (hī'pō-kōn-drī'ā-sīs) [" + *chondros*, cartilage, + *-iasis*, diseased condition] Hypochondria.
- hypochondrium** (hī'pō-kōn'drē-ūm) The part of the abdomen beneath the lower ribs on each side of the epigastrium.
- hypochromasia** (hī'pō-krō-mā'sē-ā) [" + *chroma*, color] Hypochromia.
- hypochromatism** (hī'pō-krō'mā-tīzm) [" + *chroma*, color] 1. Decreased or lack of color. 2. Decreased pigment in a cell, esp. its nucleus. 3. Decreased hemoglobin in the red cells.
- hypochromia** (hī'pō-krō'mē-ā) Decreased hemoglobin in red blood cells. SYN: *hypochromasia*. **hypochromic** (-krōm'īk), *adj.*
- hypochylia** (hī'pō-kī'lē-ā) [*Gr. hypo*, under, beneath, below, + *chylos*, juice] Lack of normal secretion of gastric juice.
- hypocitraturia** (hī'pō-sī'trāt-ūr'ē-ā, -sī') A decrease in urinary citrate excretion. It increases the likelihood that calcium-containing salts will crystallize in urine and produce obstruction to urinary flow by stones.
- hypocomplementemia** (hī'pō-kōm'plēm-ētē'mē-ā) Decreased complement in the blood.
- hypococone** (hī'pō-kōn) [" + *konos*, cone] The distolingual cusp of an upper molar tooth.
- hypocorticism** (hī'pō-kor'tī-sīzm) Decreased adrenal cortical hormone.
- hypocretin** (hī'pō-krēt'īn) [hypo(thalamus) + (se)cretin] Orexins.
- hypocupremia** (hī'pō-kū-prē'mē-ā) Decreased copper in the blood.
- hypocyclosis** (hī'pō-sī-klō'sīs) [" + *kyklos*, circle] Deficient accommodation of the eye.
- ciliary h.** A weakness of the ciliary muscle.
- lenticular h.** A lack of elasticity in the crystalline lens.
- hypodactylia** (hī'pō-dāk-tīl'ē-ā) [" + *daktylos*, finger] Having less than the normal number of fingers or toes.
- Hypoderma** (hī'pō-dēr'mā) [" + *derma*, skin] A genus of warble flies of the family Oestridae. The larvae of some species attack cattle and, rarely, humans. They cause a subcutaneous channel of inflammation as they burrow under the skin. SEE: *larva migrans*, *cutaneous*.
- hypodermiasis** (hī'pō-dēr-mī'ā-sīs) [" + " + *-iasis*, condition] Infection with *Hypoderma*.
- hypodermic** (hī'pō-dēr'mīk) [" + *derma*, skin] Under or inserted under the skin, as a hypodermic injection. A hypodermic injection may be given subcutaneously (under the skin), intracutaneously (into the skin), intramuscularly (into a muscle), intraspinally (into the spinal canal), or intravascularly (into a vein or artery). It is given to secure prompt action of a drug when the drug cannot be taken by mouth, when it may not be readily absorbed in the stomach or intestines, when it might be changed by the action

of the gastric secretions, or it acts as an anesthetic about the site of injection. SEE: *anesthesia, local*.



When the injected substance is not intended for intravascular injection, the syringe plunger should be pulled back after the needle is inserted to determine if the needle is in a vein or artery. If blood is obtained, the needle must be repositioned and the procedure repeated. It may be necessary to use a fresh needle and syringe. Because medicines not intended for intravenous injection produce serious undesired effects when given by this route, do not inject the medicine if the needle is in a vessel. If the medicine is to be injected into an artery or vein, it must not be administered unless pulling back on the plunger permits blood to freely enter the syringe.

intracutaneous h. Injection into the skin. SEE: *injection*.

intramuscular h. Injection given in the gluteal or lumbar muscular region. This route is used when a drug is not easily absorbed, when it is irritating, or when a large quantity of liquid is to be used.

intraspinal h. Injection into the spinal canal.

intravenous h. Injection into a vein, the usual site being the median basilic or median cephalic vein of the arm.

subcutaneous h. Injection given just under the skin, usually in the outer surface of the arm and forearm.

hypodermis (hī'pā-dēr'mīs) Superficial fascia.

hypodermoclysis (hī'pō-dēr-mōk'lē-sīs) [Gr. *hypo*, under, beneath, below, + *derma*, skin, + *klysis*, a washing out] The treatment of dehydration by injecting fluids into the subcutaneous tissues (e.g., of the thighs, buttocks, or below the breasts or scapulae). This practice is used, rarely, as a palliative measure to treat dehydration or cachexia when other methods of rehydration (oral or intravenous) are not available. Common complications include fluid overload, electrolyte disturbances, and wound infections, among others.

hypodontia (hī'pō-dōn'shē-ā) The developmental absence of one or more teeth.

hypodynamia (hī'pō-dī-nā'mē-ā) [+ *dynamis*, power] Diminished muscular power or energy. SEE: *adynamia*.

hypoeccrisia (hī'pō-ēk-kris'ē-ā) [+ *ek*, out, + *krisis*, separation] Diminished excretion of waste material.

hypoeccritic (hī'pō-ēk-krit'ik) 1. Retarding normal excretion. 2. Pert. to insufficient or defective excretion.

hypochoic (hī'pō-ē-kō'ik) In ultrasonography, pertaining to body structures

that either reflect sound waves weakly or less strongly than expected.

hypoeosinophilia (hī'pō-ē'ō-sin'ō-fil'ē-ā) [Gr. *hypo*, under, beneath, below, + *eos*, dawn, + *philein*, to love] A diminished number of eosinophils in the blood.

hypoergasia (hī'pō-ēr-gā'sē-ā) [+ *er-gon*, work] Decreased functional activity.

hypoergia (hī'pō-ēr'jē-ā) A diminished response to any stimulus. **hypoergic** (-ēr'jik), *adj.*

hypoesophoria (hī'pō-ēs'ō-fō'rē-ā) [+ *eso*, inward, + *phorein*, to bear] A downward and inward deviation of the eye.

hypoesthesia (hī'pō-ēs-thē'zē-ā) [+ *aisthesis*, sensation] A dulled sensitivity to touch.

hyporexophoria (hī'pō-ēks-ō-fō'rē-ā) [+ *exo*, outward, + *phorein*, to bear] A downward and outward deviation of the eye.

hypoferremia (hī'pō-fē-rē'mē-ā) Iron deficiency as indicated by diminished iron in the blood.

hypofibrinogenemia (hī'pō-fī-brīn'ō-jē-nē'mē-ā) Decreased fibrinogen in the blood.

hypofunction (hī'pō-fūnk'shūn) Decreased function.

hypogalactia (hī'pō-gā-lāk'shē-ā) [+ *gala*, milk] Deficient milk production.

hypogammaglobulinemia (hī'pō-gām'ā-glōb'ū-lī-nē'mē-ā) A deficiency of one or more of the five classes of immunoglobulins. It is caused by defective functioning of B lymphocytes. People who manufacture insufficient quantities of immunoglobulins become susceptible to infections from pyogenic organisms (e.g., staphylococci, streptococci, and pseudomonas species).

acquired h. A form of hypogammaglobulinemia that usually appears between 15 and 35 years of age. Patients have total immunoglobulin levels of less than 300 mg/dl, IgG levels of less than 250 mg/dl, a propensity to infection, lymphadenopathy, and splenomegaly. The cause is unknown. Patients should not be vaccinated with live attenuated (weakened) vaccines because of the risk of infection from the injection. Treatment includes intravenous immune globulin (200–400 mg/kg) each month and administration of specific antibiotics when needed for specific infections. Although patients often live normal life spans, chronic lung disease is a common complication and may cause an earlier than expected death.

congenital h. Total immunoglobulin levels that are below 250 mg/dl. Chronic bacterial infections are common. Administration of intravenous immune globulin (beginning at 200 mg/kg per month) is usually effective.

hypogastric (hī'pō-gās'trīk) [h + *gaster*, belly] Pert. to the lower middle of the abdomen or to the hypogastrium.

h. plexus Sympathetic nerve plexus in the pelvis.

h. region The hypogastrium. SEE: *abdominal regions*.

hypogastrium (hī'pō-gās'trē-ūm) The region below the umbilicus or navel, between the right and left inguinal regions.

hypogenesis (hī'pō-jěn'ě-sīs) [Gr. *hypo*, under, beneath, below, + *genesis*, generation, birth] Cessation of growth or development at an early stage, causing defective structure. SEE: *ateliosis*.

hypogenitalism (hī'pō-jěn'ī-tāl-izm) [h + *L. genitalis*, a genital, + Gr. *-ismos*, condition] A condition in which the genital organs are underdeveloped. It is characterized by reduced size of genital organs, failure of testes to descend in some cases, and incomplete development of secondary sex characteristics. SEE: *hypogonadism*.

hypogeusia (hī'pō-gū'sē-ā) [h + *geusis*, taste] A blunting of the sense of taste.

idiopathic h. A syndrome of unknown cause, consisting of decreased taste and olfactory acuity, with or without perverted taste (*dysgeusia*) and smell. Certain trace elements (such as zinc added to the diet) appear to correct some of the symptoms.

hypoglossal (hī'pō-glōs'āl) [h + *glossa*, tongue] 1. Situated under the tongue.

2. The hypoglossal nerve.

hypoglottis (hī'pō-glōt'īs) The undersurface of the tongue.

hypoglycemia (hī'pō-gli-sē'mē-ā) [h + *glykys*, sweet, + *haima*, blood] An abnormally low level of glucose in the blood, often associated with neurological side effects and arousal of the sympathetic nervous system. Medication-induced hypoglycemia is a common occurrence during the treatment of diabetes mellitus. SYN: *glucopenia*. SEE: *brittle diabetes*; *hypoglycemic coma*; *diabetes mellitus* for table; *hyperglycemia*; *neuroglycopenia*; **Nursing Diagnoses Appendix**. **hypoglycemic** (-sē'mik), *adj.*

ETIOLOGY: Hypoglycemia may be caused by insulin or oral antidiabetic drug overdoses; failure to eat an adequate number of calories despite diabetic treatments; unusual levels of exercise (again, usually among treated diabetics); extreme starvation (fasting hypoglycemia); alcoholic depletion of carbohydrate reserves from the liver; salicylate overdoses; and, rarely, by an insulin-secreting tumor of the pancreas.

SYMPTOMS: A patient with moderately low blood sugar may feel fatigued, dizzy, restless, hungry, or unusually irritable; have difficulty concentrating; or have spontaneous episodes of sweating, palpitations, tremor, or nausea. Se-

verely low blood sugar produces delirium, violent behaviors, obtundation, seizures, coma, and occasionally death. Some patients who have treated their diabetes mellitus with insulin for many years may lose the normal ability to recognize symptoms of low blood sugar. Hypoglycemia awareness may be partially restored by easing insulin regimens slightly to avoid severely low blood sugars for several months.

DIAGNOSIS: The condition is demonstrated when a symptomatic patient has a capillary blood glucose or plasma glucose level that is less than 3.0 mmol/L (40 mg/dl).

TREATMENT: The acute treatment for hypoglycemia is glucose by mouth or per rectum, dextrose (D50) intravenously, or glucagon intramuscularly or subcutaneously. Treated patients who remain relatively hypoglycemic may require continuous infusions of dextrose during in-hospital observation.



Oral glucose supplements (e.g., juice or candy) should never be given to patients with a severely impaired level of consciousness because of the risk of aspiration. In the emergency setting, all comatose patients are routinely assumed to be hypoglycemic and are treated immediately with dextrose infusions.

After a hypoglycemic episode resolves, diabetic management regimens often need adjustment. Patients should be educated to recognize the symptoms that low blood sugar causes and to intervene quickly to reverse it in the future. Patients who follow strenuously restricted diets often are encouraged to increase their calorie intake. They may need to reduce doses of insulin or antidiabetic drugs. A patient who suffers repeated hypoglycemic episodes should perform self-monitoring of blood glucose before meals, at bedtime, in the middle of the night, and whenever dietary, exercise, or work routines change.

PATIENT CARE: Hypoglycemic episodes need to be prevented or treated promptly if they do occur to avoid severe complications. The caregiver ensures that the patient understands the signs and symptoms and key dangers of hypoglycemia and urges the patient to note signs and symptoms typically experienced. Once it occurs, the patient may quickly lose the ability to think clearly. If this should happen while the patient drives a car or operates machinery, a serious accident could result. The patient taking beta blockers may experience only CNS-related symptoms, and many patients who have long used insulin to control blood sugar may be-

come unaware of hypoglycemic episodes. Patient teaching is vital to managing hypoglycemia unawareness. Patients should not skip meals or scheduled snacks. Patients should be made aware that exercise or vigorous activity increases the risk for hypoglycemia, which remains high for at least the following 4 to 6 hours. Patients at risk should measure blood glucose and treat low levels before driving and stop hourly on long trips to treat the problem if necessary. The caregiver reviews with the patient and family treatment measures they should follow if the patient experiences a hypoglycemic episode. If the patient is conscious and has an intact gag reflex, he or she should consume a readily available source of glucose, such as five to six pieces of hard candy; 4 to 6 oz of apple juice, orange juice, cola, or other soft drink; or 1 tbsp of honey or grape jelly. Commercially prepared sugar cake icing may be placed in the buccal cavity for absorption via mucous membranes (1 tbsp). If the patient is unconscious, EMS should be alerted immediately and then the patient should receive a subcutaneous injection of glucagon; the patient's family should also be taught how to administer glucagon injections. If hypoglycemic episodes do not respond to treatment or if they occur frequently, either the patient or family should notify their health care professional. The patient should follow the prescribed diet to prevent a rapid drop in blood glucose levels. A dietitian can help the patient to understand the necessary diet and to develop a dietary plan that includes foods that the patient enjoys while avoiding simple carbohydrates. The patient should wear or carry a medical identification device describing the condition and emergency treatment measures. For the patient with pharmacological hypoglycemia from insulin or antidiabetic agents, the caregiver reviews the essentials of managing diabetes mellitus. As warranted, the patient is taught about prescribed drug therapy or surgery; when surgery becomes necessary, the patient is prepared physically and emotionally for the procedure and postoperative care provided (as for a patient undergoing other intra-abdominal surgery, with added blood glucose level concerns).

POSTPRANDIAL "HYPOGLYCEMIA": Many people mistakenly believe that they are hypoglycemic if they become drowsy or fatigued after meals. There is no evidence to support this belief.

idiopathic h. 1. Hypoglycemia of unclear origin. 2. Reactive hypoglycemia.

newborn h. Blood glucose levels less than 40 mg/dl in infants during the first hours of life.

ETIOLOGY: A high metabolic rate,

low glycogen and fat reserves, and limited capacity for gluconeogenesis contribute to the normal newborn's postbirth risk of hypoglycemia. Approximately 8% of normal term infants who were born vaginally and nearly 16% of those born by cesarean delivery experience one or more episodes of hypoglycemia, usually within the 24 to 72 hr period following birth. Premature and small for gestational age infants experience an earlier onset (6 hrs or so after birth) because of reduced glycogen production by their smaller, immature livers. Infants of diabetic mothers and those who are small for gestational age exhibit a higher incidence of low blood sugar. Other maternal risk factors for newborn hypoglycemia include erythroblastosis fetalis, glycogen storage diseases, and toxemia. Newborn risk factors include postmaturity, macrosomia, cold stress, perinatal asphyxia, sepsis, and respiratory distress syndrome.

PATIENT CARE: Newborns are monitored closely for muscle twitching, tremors, seizures, lethargy, poor feeding, vomiting, sweating, limpness, weak or high-pitched cry, apnea, and cyanosis. For high-risk infants, glucose levels are assessed every 2 hr for 6 hr, then at 12, 24, and 48 hr after delivery. Prompt treatment is provided with oral breast milk or a 5% to 10% glucose solution or intravenous glucose as necessary. IV infusions must be closely monitored to avoid hyperglycemia, circulatory overload, and cellular dehydration. Solutions should be terminated gradually to prevent hypoglycemia due to hyperinsulinemia.

persistent infant hyperinsulinemic h. ABBR: PHHI. The most common cause of recurring low blood glucose levels in newborns. PHHI is typically caused either by diffuse overgrowth of insulin-secreting cells (beta cells) throughout the pancreas or by a single beta cell adenoma. It is characterized by the abnormal secretion of insulin despite low blood glucose levels. Neonates affected by PHHI may suffer brain injury caused by low blood glucose levels. SYN: *congenital hyperinsulinism*.

reactive h. A postprandial blood glucose reading less than 70 mg/dl in a patient who is not being treated for diabetes mellitus. It sometimes can occur in patients who have undergone gastric bypass surgery and in a few other conditions.

hypoglycemic agents, oral ABBR: OHA. Any drug taken by mouth that lowers or maintains blood sugar (as opposed to insulin, a drug taken parenterally to control blood sugar). OHAs are typically used, in addition to diet and exercise, to control blood glucose levels in type 2 diabetes mellitus. Commonly used oral

agents for diabetes include metformin (a biguanide), sulfonylureas (e.g., glyburide), alpha glucosidase inhibitors (acarbose), and thiazolidinediones (pioglitazone). Used appropriately, OHAs lower hemoglobin A1c levels by about 0.5 to 1.5%. SEE: table.

hypoglycogenolysis (hī'pō-glī'kō-jěn-ōl'ī-sis) [Gr. *hypo*, under, beneath, below, + *glykys*, sweet, + *gennan*, to produce, + *lysis*, dissolution] Defective hydrolysis of glycogen (glycogenolysis).

hypoglycorrhachia (hī'pō-glī'kō-rā'kē-ā) [" + " + *rhachis*, spine] A decreased concentration of glucose in the cerebrospinal fluid, such as is found in meningitis.

hypognathous (hī'pōg'nā-thūs) [" + *gnathos*, jaw] Having a lower jaw smaller than the upper jaw.

hypogonadism (hī'pō-gō'nād-īzm) [" + *gone*, semen, + *-ismos*, condition] Inadequate production of sex hormones.

hypogonadotropism (hī'pō-gō'n'ā-dō-trōp'izm) Low serum levels of gonadotropins. **hypogonadotropic**, *adj.*

hypohepatia (hī'pō-hē-pā'tē-ā) [" + *hepar*, liver] Deficient liver function.

hypohidrosis (hī'pō-hī-drō'sis) [" + *hidros*, sweat, + *osis*, condition] Diminished perspiration.

hypohydration (hī'pō-hī-drā'shūn) [" + "'] The provision of less than the normal amount of water to the body to meet its

metabolic demands. SEE: *hyperhydration*; *euhydration*; *dehydration*.

hypohyloma (hī'pō-hī-lō'mā) [" + *hyle*, matter, + *oma*, tumor] A tumor formed by embryonic tissue. It is derived from hypoblastic tissue.

hypoinsulinism (hī'pō-in'sū-lin-izm) [" + *L. insula*, island, + Gr. *-ismos*, condition] 1. Type 1 diabetes mellitus. 2. Relative deficiency in insulin secretion or insulin dosing.

hypoisotonic (hī'pō-ī'sō-tōn'ik) [" + *isos*, equal, + *tonos*, tension] Hypotonic. SEE: *hypotonia*.

hypokalemia (hī'pō-kā-lē'mē-ā) [" + Mod. L. *kalium*, potash, + Gr. *haima*, blood] An abnormally low concentration of potassium in the blood. SYN: *hypopotassemia*. SEE: *hyperkalemia*. **hypokalemic** (-lē'mik), *adj.*

ETIOLOGY: Causes include deficient potassium intake or excess loss of potassium due to vomiting, diarrhea, or fistulas; metabolic acidosis; diuretic therapy; aldosteronism; excess adrenocortical secretion; renal tubule disease; and alkalosis.

SYMPTOMS: Common manifestations of mild to moderate potassium depletion include muscle aches, fatigue, or mild weakness. As potassium concentrations drop significantly below 3.0 mmol/L, ileus, paralysis, or cardiac conduction and rhythm disturbances may arise. Arrhythmias are particularly

Oral Agents That Lower Blood Glucose*

Class of Drug	Activity	Adverse Features	Approximate Cost
Alpha-glucosidase inhibitors (e.g., acarbose)	Delay absorption of glucose from intestinal tract	Flatulence and other abdominal side effects	Expensive
Biguanides (e.g., metformin)	Improve sensitivity to insulin; decrease glucose production by the liver	Less weight gain than with other agents; avoid in patients with renal failure	Very expensive
Sulfonylureas, 1st generation (e.g., tolazamide)	Cause beta cells to release insulin	Resistance to drug may develop over time	Inexpensive
Sulfonylureas, 2nd generation (e.g., glipizide, glyburide, others)	Same as 1st generation; also increase sensitivity to insulin	Same as 1st generation	Moderately expensive
Thiazolidinediones (e.g., pioglitazone)	Improve sensitivity to insulin; improve lipid profile	Monthly monitoring of liver functions needed for some drugs in this class due to risk of toxicity. Heart failure and other heart diseases.	Very expensive

* Combinations of these drugs, either with each other or with insulin, may be used in patients with poorly controlled diabetes mellitus.

likely to affect those patients taking digoxin who become hypokalemic.

PREVENTION: To prevent hypokalemia, patients taking cardiac glycosides or potassium-wasting diuretics are instructed to include potassium supplements in their medical regimens. Potassium-rich foods (such as oranges, bananas, and tomatoes) are not an adequate source of the potassium that is lost by diuresis.

TREATMENT: Therapy consists of oral, intravenous, or combined potassium replacement.



Severely hypokalemic patients may require close electrocardiographic monitoring and frequent assessment of plasma potassium levels.

PATIENT CARE: Potassium and other electrolyte levels are monitored frequently during replacement therapy to avoid overcorrection leading to hyperkalemia. Fluid balance is monitored. A physician must be notified if the patient's urine output is less than 600 ml/day because 80% to 90% of potassium is excreted through the kidneys. Cardiac rhythm is monitored, and arrhythmias are reported immediately. Additional care is taken if the patient takes a cardiac glycoside because hypokalemia enhances its action. The patient is assessed for indications of digitalis toxicity (anorexia, nausea, vomiting, blurred vision, arrhythmias). Other signs to watch for include decreased bowel sounds, abdominal distention, and constipation.

Prescribed IV potassium replacement is administered slowly with a volumetric device if the concentration exceeds 40 mEq/L. The rate should not exceed 200-250 mEq/24 hr, and the drug should never be given as a bolus because it may precipitate cardiac arrest. If the patient is prescribed a liquid oral potassium supplement, he or she is advised to dilute it in a full glass of water or fruit juice and to sip it slowly to prevent gastric irritation. Safety measures are implemented for the patient experiencing muscle weakness due to postural hypotension. The importance of taking potassium supplements as prescribed is emphasized, particularly if the patient also is prescribed a diuretic or digitalis preparation. The patient is taught signs of potassium imbalance to report, including weakness and pulse irregularities.

hypokinesia (hī'pō-kī-nē'zē-ā) [ʹ + *kinēsis*, movement] Decreased motor reaction to stimulus. **hypokinetic** (-nēt'ik), *adj.*

hypokinetic movement disorder A brain-based motor system disorder

characterized by difficulty initiating movements and a decreased amount and speed of voluntary movements. Hypokinetic disorders usually also have muscle tremors at rest and general muscular rigidity. The classic hypokinetic disorder is Parkinson's disease.

hypolactasia (hī'pō-lāk-tāz'ē-ā) Lactase deficiency. The absence of enzymes that break down dietary lactose is common in adults, esp. those of Northern European heritage, in whom it is a common cause of abdominal gas or indigestion.

hypoleydigism (hī'pō-lī'dig-izm) Decreased secretion of androgen by the interstitial (Leydig) cells of the testicles.

hypolipidemic (hī'pō-lip'i-dē'mik) Decreasing the lipid concentration of the blood.

hypoliposis (hī'pō-lī-pō'sis) [ʹ + *lipos*, fat, + *osis*, condition] A deficiency of fat in the tissues.

hypologia (hī-pō-lō'jē-ā) [ʹ + *logos*, word, reason] Sparse verbal output; diminished speech.

hypomagnesemia (hī'pō-māg'nē-sē'mē-ā) Decreased magnesium in the blood. Clinically, it is accompanied by increased neuromuscular irritability.

hypomania (hī'pō-mā-nē-ā) [ʹ + *mania*, madness] Mild mania and excitement, with a moderate change in behavior.

hypomastia (hī-pō-mās'tē-ā) [ʹ + *mastos*, breast] A condition of having abnormally small breasts.

hypomelanosis (hī'pō-mēl-ān-ō'sis) One of several disorders of melanin pigmentation in which melanin in the epidermis is decreased or absent. It may be caused by albinism, chronic protein deficiency, burns, trauma, or vitiligo. SEE: *hypermelanosis*.

hypomenorrhea (hī'pō-mēn-ō-rē-ā) [ʹ + *men*, month, + *rhoia*, flow] A deficient amount of menstrual flow, but with regular periods. SEE: *oligomenorrhea*.

hypometabolism (hī'pō-mē-tāb'ō-lizm) [ʹ + *metabole*, change, + *-ismos*, condition] A lowered metabolism.

hypometria (hī'pō-mē'trē-ā) [ʹ + *metron*, measure] A shortened range of movement. SEE: *dysmetria*.

hypometropia (hī'pō-mē-trōp'ē-ā) [ʹ + *ops*, eye] Myopia or nearsightedness.

hypomimia (hī'pō-mīm'ē-ā) A reduction in the expressiveness of the face, as occurs in patients with Parkinson's disease. It is marked by diminished animation and movement of the facial muscles.

hypomnesia, hypomnesis (hī'pōm-nē'zē-ā, -nē'sis) [ʹ + *mnesis*, memory] Impaired memory.

hypomobility (hī'pō-mō-bil'ī-tē) Restricted joint movement (play) that lim-

its normal range of motion; the opposite of hypermobility.

hypomorph (hī'pō-mōrf) [" + *morphe*, form] **1.** A person with disproportionately short limbs with respect to the length of the trunk; the opposite of hypermorph. **2.** A mutant gene that has a loss of function or expresses much less gene product than the wild type. SEE: *somatotype*.

hypomotility (hī'pō-mō-tīl'ī-tē) [" + L. *motus*, moved] Hypokinesia.

hypomyotonia (hī'pō-mī'ō-tō'nē-ā) [" + *mys*, muscle, + *tonos*, tension] Lacking in muscular tone.

hypomyxia (hī'pō-mīks'ē-ā) [" + *myxa*, mucus] A diminished secretion of mucus.

hyponatremia (hī'pō-nā-trē'mē-ā) [" + L. *natron*, sodium, + Gr. *haima*, blood] A decreased concentration of sodium in the blood.

hyponeocytosis (hī'pō-nē'ō-sī-tō'sīs) [" + *neos*, new, + *kytos*, cell, + *osis*, condition] A decreased number of leukocytes (leukopenia) with immature cells in the blood.

hypoноia (hī'pō-noy'ā) [" + *nous*, mind] Diminished or sluggish mental activity.

hyponychon (hī-pōn'ī-kōn) [" + *onyx*, nail] An extravasation of blood beneath the nail.

hypo-orthocytosis (hī'pō-or'thō-sī-tō'sīs) [" + *orthos*, regular, + *kytos*, cell, + *osis*, condition] Leukopenia with normal proportions of white blood cells.

hypopallesthesia (hī'pō-pāl'ēs-thē'zē-ā) [" + *pallein*, to shake, + *aisthesis*, sensation] A decreased ability to perceive vibration.

hypopancreatism (hī'pō-pān'krē-ā-tīzm) [" + *pankreas*, pancreas, + *-ismos*, condition] Pancreatic insufficiency.

hypoparathyroidism (hī'pō-pār-ā-thī'royd-īzm) [" + " + *eidōs*, form, shape, + *-ismos*, condition] A condition caused by an insufficient or absent secretion of the parathyroid glands. SEE: *Nursing Diagnoses Appendix*.

hypopepsia (hī'pō-pēp'sē-ā) [" + *pepsis*, digestion] Impaired digestion owing to lack of pepsin.

hypopepsinia (hī'pō-pēp-sīn'ē-ā) Deficient pepsin in the gastric juice.

hypoperfusion (hī'pō-pēr-fū'shūn) Inadequate blood flow, for example, to a single organ or through the entire circulatory system.

hypoperistalsis (hī'pō-pēr'ī-stāl'sīs) Diminished peristalsis. SEE: *paralytic ileus*.

hypophalangism (hī'pō-fā-lān'jīzm) The state of having fewer than the normal number of fingers or toes.

hypopharynx (hī'pō-fār'īnks) [" + *pharynx*, throat] The lower portion of the pharynx that opens into the larynx

anteriorly and the esophagus posteriorly. SYN: *laryngopharynx*.

hypophonesis (hī'pō-fō-nē'sīs) [" + *phone*, voice] A diminished or fainter sound in auscultation or percussion.

hypophonia (hī'pō-fō'nē-ā) An abnormally weak voice resulting from incoordination of speech muscles, including weakness of muscles of respiration.

hypophoria (hī'pō-fō-rē-ā) [" + *phorēin*, to bear] A type of strabismus in which one visual axis lies below the other.

hypophosphatasia (hī'pō-fōs'fā-tā'zē-ā) A rare inherited disorder of bony mineralization with a deficiency of alkaline phosphatase. There are four forms of this condition: lethal perinatal, infantile, childhood, and adult. The perinatal and infantile forms are inherited as autosomal recessive traits. The inheritance pattern of the childhood and adult forms is unknown. In the adult form, signs and symptoms may not become apparent until middle age, but there may be a history of early loss of either deciduous or permanent teeth and short stature.

hypophosphatemia (hī'pō-fōs'fā-tē'mē-ā) [" + L. *phosphas*, phosphate, + Gr. *haima*, blood] Abnormally decreased amount of phosphates circulating in the blood.

hypophosphatemic (hī'pō-fōs'fā-tē'mīk) [Gr. *hypo-*, less than, deficient, + L. *phosphas*, phosphate, + Gr. *haima*, blood] **1.** Having an abnormally low blood phosphate concentration. **2.** An agent that lowers the blood phosphate concentration, e.g., in renal failure.

hypophosphaturia (hī'pō-fōs'fā-tū'rē-ā) [" + " + Gr. *ouron*, urine] Decreased excretion of phosphate in the urine.

hypophrenia (hī'pō-frē'nē-ā) [" + *phren*, mind] Mental retardation.

hypophrenic (hī'pō-frēn'īk) [" + *phren*, diaphragm, mind] **1.** Mentally retarded. **2.** Below the diaphragm.

hypophyseal (hī'pō-fīz'ē-āl) [" + *physis*, growth] Pert. to the hypophysis or pituitary.

hypophysectomy (hī-pōf'ī-sēk'tō-mē) [" + " + *ektome*, excision] Excision of the hypophysis cerebri.

hypophyseoportal (hī'pō-fīz'ē-ō-por'tāl) Concerning the portal system of the pituitary gland. SEE: *hypophyseoportal system*.

hypophyseoportal system The series of vessels that lead from the hypothalamus to the anterior lobe of the pituitary. The releasing hormones are carried to the pituitary through this system.

hypophysis (hī-pōf'ī-sīs) *pl.* **hypophyses** [Gr., an undergrowth] **1.** An undergrowth. **2.** The pituitary gland. An endocrine gland lying in the sella turcica of the sphenoid bone. It consists of two portions, the adenohypophysis (anterior

lobe) and the neurohypophysis (posterior lobe), which are attached to the hypothalamus of the brain by the infundibulum. SEE: *pituitary gland*.

h. cerebri Pituitary gland.

pharyngeal h. A small structure anterior to the pharyngeal bursa. It is derived from the lower portion of Rathke's pouch and occasionally gives rise to a cyst or tumor.

hypophysitis (hī'pōf'ī-sī'tīs) [Gr. *hypo*, under, beneath, below, + *physis*, growth, + *itis*, inflammation] An inflammation of the pituitary gland. Lymphocytic or *autoimmune* hypophysitis is the most common type of pituitary gland inflammation. A typical patient is a woman, who, after delivering a child, develops excess prolactin secretion ("hyperprolactinemia") and an enlarged pituitary gland.

hypopigmentation (hī'pō-pīg'mēn-tā'shūn) Diminished pigment in a tissue.

hypopinealism (hī'pō-pīn'ē-āl'īzm) [ʹ + L. *pineus*, pert. to pine cone, + Gr. *-ismos*, condition] Diminished secretion of the pineal gland.

hypopituitarism (hī'pō-pī-tū'ī-tā-rīzm) [ʹ + L. *pituita*, mucus, + Gr. *-ismos*, condition] A condition resulting from diminished secretion of pituitary hormones, esp. those of the anterior lobe. SEE: *Sheehan's syndrome*.

hypoplasia (hī'pō-plā'zē-ā) [ʹ + *plasis*, formation] Underdevelopment of a tissue organ or body. SEE: *tissue*.

hypopnea (hī'pō-nē-ā) [ʹ + *pnoia*, breath] Decreased rate and depth of breathing. SEE: *apnea*.

hypoporosis (hī'pō-pō-rō'sīs) [ʹ + *poros*, callus, + *osis*, condition] Deficient development of a callus at the site of a bone fracture.

hypoposia (hī'pō-pō-zē-ā) [ʹ + *posis*, drinking] A decreased intake of fluids.

hypopotassemia (hī'pō-pō'tās-sē'mē-ā) [ʹ + *potassium* + Gr. *haima*, blood] Hypokalemia.

hypoproteinemia (hī'pō-prō'tē-īn-ē'mē-ā) [ʹ + *protos*, first, + *haima*, blood] An abnormally decreased concentration of protein in the blood. It is one of many causes of edema, esp. in the lower extremities.

hypoprotrombinemia (hī'pō-prō-thrōm'bin-ē'mē-ā) [ʹ + L. *pro*, for, + Gr. *thrombos*, clot, + *haima*, blood] A deficiency of blood clotting factor II (prothrombin) in the blood.

hypopselaphesia (hī'pōp-sēl-ā-fē'zē-ā) [ʹ + *pselaphesis*, touch] Blunted tactile sense.

hypoptyalism (hī'pō-tī'āl'īzm) [ʹ + *ptyalon*, saliva, + *-ismos*, condition] Decreased salivary secretion.

hypopyon (hī-pō'pē-ōn) [ʹ + *pyon*, pus] Pus in the anterior chamber of the eye consisting of layered white blood cells;

may be infectious or inflammatory (sterile).

hyporeactive (hī'pō-rē-āk'tīv) A decreased response to stimuli.

hyporeflexia (hī'pō-rē-flēk'sē-ā) [ʹ + L. *reflexus*, bent back] A diminished function of the reflexes.

hyposalivation (hī'pō-sāl'ī-vā'shūn) An abnormal decrease in flow of saliva.

hyposcleral (hī'pō-sklē'rāl) Beneath the sclera of the eye.

hyposecretion (hī'pō-sē-krē'shūn) Lowered amount of secretion.

hyposensitive (hī'pō-sēn'sī-tīv) [ʹ + L. *sentire*, to feel] Having a reduced ability to respond to stimuli.

hyposensitization (hī'pō-sēn'sī-tī-zā'shūn) Desensitization.

hyposialadenitis (hī'pō-sī'āl-ād-ē-nī'tīs) [Gr. *hypo*, under, beneath, below, + *sialon*, saliva, + *aden*, gland, + *itis*, inflammation] Inflammation of the submandibular salivary gland.

hyposmia (hī-pōz'mē-ā) [ʹ + *osme*, smell] Decreased sensitivity to odors.

hyposmolarity (hī-pōz'mō-lār'ī-tē) Decreased osmolar concentration, esp. of the blood or urine.

hyposomnia (hī'pō-sōm'nē-ā) A decreased ability to sleep.

hypospadias, hypospadias (hī'pō-spā'dē-ā, -ās) [ʹ + *span*, to draw] **1.** An abnormal congenital opening of the male urethra upon the undersurface of the penis. **2.** A urethral opening into the vagina.

hypostasis (hī'pōs'tā-sīs) [ʹ + *stasis*, a standing] **1.** A diminished blood flow or circulation. **2.** A deposit of sediment owing to decreased flow of a body fluid such as blood or urine.

hypostatic (hī'pō-stāt'īk) [ʹ + *statikos*, standing] **1.** Of or pert. to hypostasis. **2.** In genetics, hidden or suppressed; said of a gene whose effect is suppressed by the presence of another gene.

hyposteatolysis (hī'pō-stē-ā-tōl'ī-sīs) [ʹ + *stear*, fat, + *lysis*, dissolution] Diminished emulsification of fats during digestion.

hyposthenic (hī-pōs-thēn'īk) **1.** Debilitant. **2.** A body habitus characterized by a long, shallow thorax, a long thoracic cavity, a long, narrow abdominal cavity, and a slender build.

hyposthenuria (hī'pōs-thēn-ū'rē-ā) [ʹ + *sthenos*, strength, + *ouron*, urine] The secretion of urine of low specific gravity, chiefly in chronic nephritis.

tubular h. Hyposthenuria resulting from disease of the renal tubule epithelial cells.

hypostomia (hī'pō-stō'mē-ā) [ʹ + *stoma*, mouth] A congenital defect in which the mouth is abnormally small and appears as a vertical opening.

hypostosis (hīp'ōs-tō'sīs) [ʹ + *osteon*, bone, + *osis*, condition] Deficient bone development.

hyposynergia (hī'pō-sīn-ēr'jē-ā) [ʼ + *syn*, together, + *ergon*, work] Poor coordination.

hypotelorism (hī'pō-tēl'ō-rīzm) [ʼ + *telouros*, distant] Abnormally decreased distance between paired organs, esp. the eyes.

hypotension (hī'pō-tēn'shūn) [ʼ + *L. tensio*, tension] **1.** A deficiency in tone or tension. **2.** A decrease of the systolic and diastolic blood pressure to below normal. This occurs, for example, in shock, hemorrhage, dehydration, sepsis, Addison's disease, and in many other diseases and conditions. SEE: *blood pressure, chronic low*.

orthostatic h. Hypotension occurring when a person assumes an upright position after getting up from a bed or chair. SEE: *orthostatic vital signs determination*.

postprandial h. A decrease in systolic blood pressure of 20 mm Hg or more within 2 hr of the start of a meal. This may cause syncope, falls, dizziness, weakness, angina pectoris, or stroke. This condition occurs most often in older adults and in persons with autonomic failure. Although postural changes may increase the severity of the condition, postprandial hypotension is a different entity from postural hypotension.

supine h. syndrome A drop in blood pressure that occurs when a person, esp. a pregnant woman in the last trimester, lies on her back.

ETIOLOGY: Compression of the vena cava or the abdominal aorta by the developing fetus results in decreased return of blood to the heart.

PATIENT CARE: Most pregnant women regain a normal blood pressure if they shift to their left side.

hypotensive (hī'pō-tēn'siv) **1.** Characterized by or causing low blood pressure. **2.** An agent that lowers blood pressure.

hypothalamus (hī'pō-thāl'ā-mūs) [ʼ + *thalamos*, chamber] The bottom (ventral) half of the diencephalon of the brain. It is the regulator of the essential homeostatic balance of body fluids, salt concentrations, temperature, and energy metabolism as well as the governor of reproductive cycles and certain emotional responses. The hypothalamus is a single structure, but it comprises two mirror-image walls of neural tissue on the left and the right sides of the ventral half of the third ventricle. In the embryo, these walls are at the front end of the neural tube; in the adult, the hypothalamus begins at the lamina terminalis (at the base of the frontal lobes) and just below the lamina terminalis; the optic chiasm lies in front of the hypothalamus. The base of the hypothalamus ends in a stalk (the infundibulum) from which hangs the pituitary gland

(the hypophysis); farther caudally, two mammillary bodies bulge from the bottom of the hypothalamus. At the top of the hypothalamus, the lateral ventricles empty into the third ventricle via a left and a right interventricular foramen, and behind (caudal to) the foramina are the right and left thalami. The hypothalamus is the central controller of the preganglionic sympathetic and parasympathetic nervous systems; it is also the central regulator of the pituitary gland. The hypothalamus is a collecting zone for input from the cerebral cortex, the hippocampus, the amygdala, the retina, and the brainstem; it sends output to the cerebral cortex, the thalamus, the brainstem, and the pituitary gland. Besides the pituitary gland and the mammillary bodies, the hypothalamus contains many discrete CNS nuclei in its walls, and these nuclei are categorized according to their regional locations. The anterior region (which is subdivided into the preoptic and supraoptic areas) contains nuclei involved in the regulation of gonadal hormones, body fluid levels, body temperature, and circadian rhythm; the middle (infundibular or tuberal) region contains nuclei involved in regulating levels of adrenocortical, thyroid, growth, and gonadal hormones; and the posterior (mammillary) region is a central part of the mid-brain-mammillary-thalamic-midbrain circuit of the limbic system.

SEE: *hormone, releasing*.

temperature regulation in the h. Control of body temperature, locally in the periphery and centrally in the hypothalamus. Neurons in the preoptic area of the hypothalamus respond to the temperature of the blood in that region. The same or adjacent neurons also react to pyrogens (e.g., from bacteria).

hypothernar (hī-pōth-ē-nār) [ʼ + *thēnar*, palm] The fleshy prominence on the inner side of the palm next to the little finger. SYN: *hypothernar eminence*.

hypothermal (hī'pō-thēr'māl) [ʼ + *therme*, heat] **1.** Tepid. **2.** Subnormal temperature.

hypothermia (hī'pō-thēr'mē-ā) A core body temperature below 35°C (95°F). It may be further classified as mild (93.2°–96.8°F [34°–36°C]); moderate (86°–93°F [30°–34°C]); or severe (<86°F [30°C]). It should be confirmed by temperature readings at two separate core locations (e.g., esophagus and rectum). Low body temperatures are most likely to affect newborns, older adults, demented individuals, individuals exposed to wet and cold conditions outdoors, alcoholics, septic patients, trauma patients, and patients with endocrine disorders such as severe hypothyroidism. Phenothiazines and benzodiazepines may contribute to hy-

pothermia by decreasing centrally mediated vasoconstriction; anesthetics by blocking shivering. Hypothermia can be life-threatening, impairing neurological, cardiovascular, respiratory, and gastrointestinal systems. SYN: *cold stress*.

PREVENTION: To help prevent hypothermia, patients with multiple traumas receiving treatment in emergency facilities should be maintained under radiant warmers. Individuals who anticipate prolonged exposure to cold should be advised not to smoke or drink alcohol. They should wear layered clothing, two pairs of socks, mittens (not gloves), and a scarf or hat that covers ears and head (to avoid loss of heat through the head). They also need adequate food and rest. If caught in severe cold weather, the individual should find warmth and shelter as soon as possible and increase physical activity to maintain body warmth.

PATIENT CARE: Emergency care of the hypothermic patient: Emergency department personnel first assess airway, breathing, and circulation. If breathing or pulse is not detected, cardiopulmonary resuscitation (CPR) begins immediately and continues until the patient's core body temperature reaches at least 89.6°F (32°C). Wet clothing should be removed and the patient protected against further heat loss. The patient is treated gently to avoid triggering cardiac dysrhythmias. If the patient has a core temperature of 93.2° to 96.8° F (34°–36° C) (mild hypothermia) and is breathing spontaneously, passive warming and active external warming are initiated. Passive warming involves covering the patient in dry insulating materials. Active external rewarming uses forced warm air, radiant heat sources, a fluid-circulating heat blanket, or heating pads to rewarm the body. If the patient's core temperature is 86° to 93° F (30°–34° C) (moderate hyperthermia), the patient is dried and covered and external rewarming is begun immediately. If the patient's core temperature is less than 86° F (30° C) (severe hypothermia), invasive core rewarming is initiated, e.g., with infusions of warmed IV, gastric, and/or peritoneal fluids, warmed humidified oxygen, esophageal warming tubes, and extracorporeal hemodialysis. SEE: *Nursing Diagnoses Appendix*.



Oral thermometers are likely to be inaccurate outdoors.

Hypothermia in newborns is prevented by maintaining the dry but unclothed infant under a radiant warmer with thermistor probe until tempera-

ture is stabilized. The initial bath is postponed until skin temperature stabilizes between 97.6° and 99°F (36.5°–37.2°C). Once stabilized, the infant's temperature is maintained by keeping him or her dry and wrapped in warm blankets, with the head covered, in a nursery unit with an ambient temperature of 75°F (24°C). If the infant has become hypothermic (cold delivery room, birth in a car on the way to the birth center, inadequate drying and wrapping after birth), rewarming is accomplished with great care over a period of 2 to 4 hr, as rapid warming or cooling may result in apneic spells or acidosis.

accidental h. Hypothermia due to exposure to wet and cold conditions (e.g., in skiers, hunters, sailors, swimmers, climbers, the indigent, homeless persons in winter, and alcoholics) rather than diseases (e.g., sepsis or hypothyroidism).

h. blanket A specially designed blanket for cooling patients with hyperthermia. It has flexible tubing between the layers of cloth through which cold water is circulated.

induced h. Therapeutic h.
therapeutic h. Any technique in which body temperature is lowered to reduce metabolic rates, oxygen demand, or organ damage. Therapeutic hypothermia has been used to manage stroke and traumatic brain injury, to alleviate fever or pain, and to improve outcomes in surgery or after cardiac arrest. SYN: *induced hypothermia*.



Potential complications include cardiac dysrhythmias, disorders of blood coagulation, infections, and injuries to or burns of the skin.

hypothesis (hī-pōth'ē-sis) *pl. hypotheses* [" + *thesis*, a placing] **1.** An empirically testable assertion about one or more concepts. It is assumed in order to test its soundness or to facilitate investigation of a class of phenomena. **2.** A conclusion drawn before all the facts are established and tentatively accepted as a basis for further investigation.

null h. SEE: *null hypothesis*.

hypothrombinemia (hī'pō-thrōm-bīn-ē'mē-ā) [" + *thrombos*, clot, + *haima*, blood] A deficiency of thrombin in the blood.

hypothymia (hī'pō-thī'mē-ā) [" + *thymos*, mind] A decreased emotional response to stimuli.

hypothymism (hī'pō-thī'mīzəm) [" + " + *-ismos*, condition] Decreased activity of the thymus.

hypothyroid (hī'pō-thī'royd) [" + *thyreos*, shield, + *eidōs*, form, shape]

Marked by insufficient thyroid secretion.

hypothyroidism (hī'pō-thī'royd-izm) The clinical consequences of inadequate levels of thyroid hormone in the body. When thyroid deficiency is long-standing or severe, it results in diminished basal metabolism, intolerance of the cold temperatures, fatigue, mental apathy, physical sluggishness, constipation, muscle aches, dry skin and hair, and coarsening of features. Collectively, these symptoms are called *myxedema*. In infancy, inadequate levels of thyroid hormone cause *cretinism*. SEE: *thyroid function test*; *Nursing Diagnoses Appendix*.

ETIOLOGY: Most patients with hypothyroidism have either Hashimoto's (autoimmune) thyroiditis or have undergone treatment for hyperthyroidism with thyroidectomy or radioactive iodine. Occasionally, hypothyroidism is drug-induced, e.g., in patients treated with antithyroid drugs (propylthiouracil) or the antiarrhythmic agent amiodarone. In nations where salt is not iodized, hypothyroidism may result from dietary iodine deficiency. Rarely, hypothyroidism results from inadequate stimulation of the thyroid gland by the anterior pituitary or inadequate release of thyrotropin-releasing hormone by the hypothalamus.

DIAGNOSIS: Long before the symptoms of hypothyroidism become obvious, the condition can be diagnosed with thyroid function tests. The plasma TSH test is used to screen for the disease; if it is high, hypothyroidism is likely to be present. Other tests, including a low free T₄ index, confirm the diagnosis.

TREATMENT: For most patients, the lifelong administration of thyroid hormone at a dose of approx. 1.6 mcg/kg/day of oral levothyroxine restores normal metabolism and well-being. Failure to treat hypothyroidism inevitably results in myxedema, eventual coma, or death. Drug-induced hypothyroidism sometimes requires no treatment other than discontinuation of the offending agent or adjustment of its dose.

PATIENT CARE: The patient is assessed for indications of decreased metabolic rate; easy fatigability; cool, dry, and scaly skin; hypercarotenemia; hair and eyebrow loss; brittle nails, facial puffiness, and periorbital edema; paresthesias; ataxias; cold intolerance; bradycardia; reduced cardiac output; slow pulse rate, poor peripheral circulation, aching muscles and joint stiffness; changes in bowel habits; irregular menses; and decreased libido. Reflexes (esp. in the Achilles tendon) show delayed relaxation time. In acute hypothyroid crisis (myxedema coma) vital

signs, fluid intake, urine output, weight, and neurological status are monitored.

Chronic management includes the prescription of long-term hormone replacement. The patient's activity level is increased gradually as treatment proceeds, while adequate rest is a continual priority to limit fatigue and to decrease myocardial oxygen demand. The patient should wear or carry a medical identification device describing the condition and its treatment and carry medications at all times. Desired outcomes include understanding of and cooperation with treatment regimen, restoration of normal activity level, absence of complications, and restoration of psychological well-being.

subclinical h. A mild elevation of serum thyrotropin level without overt symptoms or signs of thyroid insufficiency. It occurs in 5% to 20% of women over age 60 and about the same percentage of men over age 75.

hypotonia (hī'pō-tō'nē-ā) [" + *tonos*, tone] **1.** In physiology, an abnormally low intrinsic resting tension (i.e., low tone in muscles or arteries). **2.** In chemistry, an osmotic pressure lower than a reference or isotonic solution. **hypotonic, adj.**

hypotrichosis (hī'pō-trī-kō'sīs) [" + *thrix*, hair, + *osis*, condition] An abnormal deficiency of hair.

hypotrophy (hī-pōt'rō-fē) [" + *trophe*, nourishment] Atrophy.

hypotropia (hī'pō-trō'pē-ā) [" + *trope*, a turning] Vertical strabismus downward.

hypotympanotomy (hī'pō-tīm'pā-nōt'ō-mē) Surgical incision of the hypotympanum.

hypotympanum (hī'pō-tīm'pā-nūm) The part of the middle ear beneath the level of the tympanic membrane.

hypouricuria (hī'pō-ū-rī-kū-rē-ā) [" + *ouron*, urine, + *ouron*, urine] Less than normal amount of uric acid in the urine.

hypovenosity (hī'pō-vēn-ōs'ī-tē) [" + *L. venosus*, pert. to a vein] Incomplete development of the venous system in an area, resulting in atrophy or degeneration.

hypoventilation (hī'pō-vēn'tī-lā'shūn) [" + *L. ventilatio*, ventilation] Reduced rate and depth of breathing that causes an increase in carbon dioxide.

hypovitaminosis (hī'pō-vī'tā-mīn-ō'sīs) [" + *L. vita*, life, + *amine* + *Gr. osis*, condition] A condition caused by a lack of vitamins in or inadequate uptake of vitamins from the diet.

hypovolemia (hī'pō-vō-lē-mē-ā) [" + *L. volumen*, volume] A decreased blood volume that may be caused by internal or external bleeding, fluid losses, or inadequate fluid intake.

hypovolia (hī'pō-vō'lē-ä) Decreased water content.

hypoxanthine (hī'pō-zän'thīn, -thēn) [*h* + *xanthos*, yellow] A purine derivative, C₅H₄N₄O, in muscles and tissues in a stage of uric acid formation. It is formed during protein decomposition. Hypoxanthine is normal in urine in small amounts.

hypoxemia (hī-pōks-ē'mē-ä) [*h* + *oxygen* + *haima*, blood] Decreased oxygen tension (oxygen concentration) of arterial blood, measured by arterial oxygen partial pressures (PaO₂) values. It is sometimes associated with decreased oxygen content. SEE: *hypoxia*; *respiration*.

hypoxia (hī'pōks'ē-ä) 1. An oxygen deficiency in body tissues. 2. A decreased concentration of oxygen in inspired air. SEE: *anoxia*; *hypoxemia*; *posthypoxia syndrome*.

altitude h. Hypoxia due to insufficient oxygen content of inspired air at high altitudes.

anemic h. Hypoxia due to a decrease in hemoglobin concentration or in the number of erythrocytes in the blood.

anoxic h. Hypoxia due to disordered pulmonary mechanisms of oxygenation; may be due to reduced oxygen supply, respiratory obstruction, reduced pulmonary function, or inadequate ventilation.

autoerotic h. Cerebral oxygen deprivation that a person self-induces (e.g., by hanging oneself or by tying a constricting device around the neck) during masturbation. The practice of limiting cerebral blood flow during masturbation has been thought to intensify pleasure during orgasm. It has occasionally resulted in brain damage or death from hypoxia. SYN: *autoerotic asphyxia*; *sexual asphyxia*. SEE: *asphyxiophilia*.

cerebral h. Lack of oxygen supply to the brain, usually as a result of either diminished blood flow (e.g., in traumatic childbirth or cardiopulmonary arrest) or diminished oxygenation of the blood (e.g., in high-altitude exposures or patients with advanced cardiopulmonary disease). If nothing is done to treat this condition, irreversible anoxic damage to the brain begins after 4 to 6 minutes and sooner in some cases. If basic resuscitation measures are begun before the end of this period, the onset of cerebral death may be postponed. SEE: *cardiopulmonary resuscitation*.

fetal h. Low oxygen levels in the fetus, commonly as a result of diminished placental perfusion, uteroplacental insufficiency, or umbilical cord compression. The condition often is accompanied by acidosis and is life-threatening unless prompt interventions are undertaken to restore well-oxygenated blood to the fetus. Signs of early fetal hypoxia

include tachycardia and increased fetal heart rate variability; profound fetal hypoxia is characterized by bradycardia and a sinusoidal fetal heart rate pattern.

histotoxic h. Hypoxia due to inability of the tissues to use oxygen. SEE: *cyanide*.

hypokinetic h. Stagnant h.

post-traumatic h. Secondary hypoxic injury.

stagnant h. Hypoxia due to insufficient peripheral circulation, as occurs in cardiac failure, shock, arterial spasm, and thrombosis. SYN: *hypokinetic hypoxia*.

hypoxic lap swimming (hī'pōk'sīk) A practice by competitive swimmers of holding their breath for a number of laps in order to increase the tolerance to oxygen debt during races. The practice is potentially dangerous and may lead to drowning.

hypsarhythmia (hīp'sār-īth'mē-ä) [Gr. *hysī*, high, + *a-*, not, + *rhythmos*, rhythm] An abnormal electroencephalographic pattern of persistent generalized slow waves and very high voltage. Clinically it is often associated with infantile spasm and progressive mental deterioration.

hypsi brachycephalic (hīp'sē-brāk'ē-sē-fäl'īk) [Gr. *hysī*, high, + *brachys*, broad, + *kephale*, head] Having a broad and high skull.

hypsiccephalic (hīp'sē-sē-fäl'īk) [*h* + *kephale*, head] Having a skull with a cranial index greater than 75.1 degrees. SYN: *hypsistenocephalic*; *hypocephalous*.

hypsiccephaly (hīp-sē-sēf'ä-lē) The condition of having a skull with a cranial index greater than 75.1 degrees.

hypsicnchous (hīp'sē-kōng'kü) [*h* + *konche*, shell] Having an orbital index of about 85 degrees.

hypsiloid (hīp'sī-loyd) [Gr. *upsilon*, U or Y, + *eidōs*, form] Hyoid.

hypsistenocephalic (hīp'sē-stēn'ō-sē-fäl'īk) [*h* + *stenos*, narrow, + *kephale*, head] Hypsiccephalic.

hypocephalous (hīp'sō-sēf'ä-lūs) [Gr. *hypsos*, height, + *kephale*, head] Hypsiccephalic.

hypsokinesis (hīp'sō-kī-nē'sīs) [*h* + *kinēsis*, movement] A tendency to fall backward when standing or walking; seen in neurodegenerative disorders such as Parkinson's disease.

Hyrtil's anastomosis (hürt'älz) An occasional looplike anastomosis between the right and left hypoglossal nerves in geniohyoid muscle.

hyster- SEE: *hystero-*.

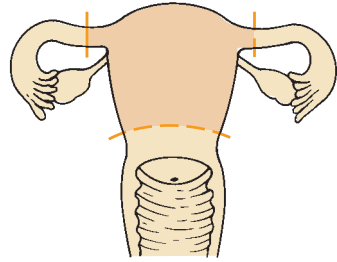
hysteralgia (hīs-tēr-äl'jē-ä) [Gr. *hystera*, womb, + *algos*, pain] Uterine pain. SYN: *hysterodynia*.

hysterectomy (hīs-tēr-ēk'tō-mē) [*h* + *ektome*, excision] Surgical removal of

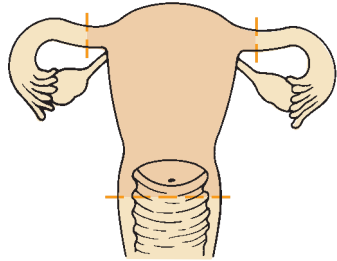
the uterus. Each year, about 500,000 women undergo hysterectomies. Indications for the surgery include benign or malignant changes in the uterine wall or cavity and cervical abnormalities (including endometrial cancer, cervical cancer, severe dysfunctional bleeding, large or bleeding fibroid tumors (leiomyomas), prolapse of the uterus, intractable postpartum hemorrhage due to placenta accreta or uterine rupture, or severe endometriosis). The approach to excision may be either abdominal or vaginal. The abdominal approach is used most commonly to remove large tumors; when the ovaries and fallopian tubes also will be removed; and when there is need to examine adjacent pelvic structures, such as the regional lymph nodes. Vaginal hysterectomy is appropriate when uterine size is less than that in 12 week gestation; no other abdominal pathology is suspected; and when surgical plans include cystocele, enterocele, or rectocele repair. **SEE: *illus.; Nursing Diagnoses Appendix.***

In preparation for abdominal hysterectomy, the patient is placed in the dorsal position. The table is ready to be tipped into the Trendelenburg position. As soon as the incision is made through the peritoneum, the table should be put into the Trendelenburg position. This procedure is the same for all abdominopelvic surgery, as the Trendelenburg position allows the abdominal organs to fall away from the pelvis so that they may be easily packed off and isolated from the surgical field with large pads or a large roll of packing.

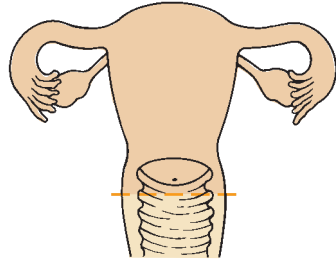
PATIENT CARE: *Preoperative:* In general, preparations for an abdominal hysterectomy are similar to protocols for any abdominopelvic surgery (e.g., abdominal skin preparation, insertion of an intravenous line and, depending on surgical protocol, an indwelling urinary catheter). Vaginal irrigation with antibacterial solution also may be ordered. All procedures are explained to the patient, who is provided with anticipatory guidance for the postoperative period. Misconceptions are clarified, informed consent is validated, and the signing of the operative permit is witnessed. The patient may be encouraged to discuss the personal meaning and implications of the procedure, such as permanent inability to bear children; emotional support is given. The gynecologist and nurses should make available opportunities for the patient to ask questions and receive information about sexual concerns and be provided with resources (or a way to access resources), or specialist referrals for further information as desired. Controlled trials that have studied large numbers of women have not shown, in aggregate, any ad-



SUBTOTAL HYSTERECTOMY,
CERVIX NOT REMOVED



TOTAL HYSTERECTOMY,
CERVIX IS REMOVED



TOTAL HYSTERECTOMY,
PLUS BILATERAL SALPINGO-
OOPHORECTOMY

HYSTERECTOMY

verse effect of hysterectomy on sexuality (good sexual function is retained or regained; however the nature and quality of sexual response may change) or women's perceptions of their femininity.

Postoperative: Initial status assessments include color; vital signs; airway patency and breath sounds; level of consciousness and discomfort; intravenous intake; and nasogastric and indwelling catheter drainage. During the first few hours, assessments usually are made over lengthening intervals, from every 10 to 15 minutes during the first hour

to every 30 minutes to hourly. Intervals and assessment priorities may be altered on the basis of current findings, such as bleeding. Color; vital signs; airway patency and lung sounds; level of consciousness and discomfort; intake and output (including intravenous fluids, nasogastric and indwelling catheter drainage); and abdominal dressings (intact, amount and character of any drainage) are monitored. Additional later assessments include bowel sounds; lower extremity circulation (pedal pulses, leg pain); and wound status (redness, edema, ecchymosis, discharge, and approximation). The patient is encouraged to splint the incision, turn from side to side, use incentive spirometry, deep breathe and cough every 2 hr, and use incentive spirometry. Prescribed intravenous fluids and analgesics are administered. The woman is assisted in self-administering patient-controlled analgesia. Anti-thromboembolic devices (pneumatic dressings or elastic stockings) are applied as needed. The patient is encouraged and assisted with early ambulation.

As appropriate, the rationale for hormone replacement therapy is explained. Effective coping strategies related to anticipated radiation and/or chemotherapy are targeted. Desired outcomes include evidence of incisional healing; absence of complications; return of normal GI and bladder function; and understanding of and compliance with the prescribed treatment regimen.

abdominal h. The removal of the uterus through an abdominal incision. SYN: *abdominohysterectomy*.

cesarean h. The surgical removal of the uterus at the time of cesarean section.

pan h. Removal of the uterus, fallopian tubes, and ovaries.

Porro h. SEE: *Porro's operation*.

radical h. The surgical removal of the uterus, tubes, ovaries, adjacent lymph nodes, and part of the vagina.

subtotal h. The surgical removal of the uterus, leaving the cervix in place. SYN: *supracervical hysterectomy*; *supravaginal hysterectomy*.

supracervical h. Subtotal h.

supravaginal h. Subtotal h.

total abdominal h. Removal of the uterus, including the cervix, through an abdominal incision.

vaginal h. The surgical removal of the uterus through the vagina.

hysteresis (hīs'tēr-ē'sis) [Gr., a coming too late] 1. The failure of related phenomena to keep pace with each other. 2. The failure of the manifestation of an effect to keep up with its cause. 3. The difference between inflation and defla-

tion of the lung, shown as a pressure volume difference.

hysteria (hīs-tē'rē-ā) [Gr. *hystera*, uterus] A pejorative term used in popular speech to mean a conversion reaction or a widely fluctuating expression of emotions.

NOTE: Currently accepted nomenclature for mental disorders does not include the term *hysteria*; it is included here for historical reasons. SEE: *mass psychogenic illness*; *somatization disorder*.

SYMPTOMS: Symptoms include emotional instability, sensory disturbances, loss of motor function, or other disorders.

ETIOLOGY: It may be related to emotional or physical stress.

TREATMENT: Rest and reassurance are cornerstones of management.

anxiety h. Hysteria combined with an anxiety neurosis.

conversion h. Conversion disorder.

epidemic h. Mass sociogenic illness.

major h. Agitated behavior, sometimes accompanied by pseudoepilepsies.

mass h. Mass sociogenic illness.

hysteriac (hīs-tēr'ē-āk) [Gr. *hystera*, womb] An hysterical person.

hysterical, hysterical (hī-stēr'ik) Pert. to hysteria.

hystero-, hyster- [Gr. *hystera*, womb] Combining forms meaning *uterus* or *hysteria*. SEE: *metro-*; *utero-*.

hysterocele (hīs'tēr-ō-sēl) [" + *kele*, tumor, swelling] A hernia of the uterus, esp. when gravid.

hysterodynia (hīs'tēr-ō-dīn'ē-ā) [" + *odyne*, pain] Hysteralgia.

hysterogenic (hīs'tēr-ō-jēn'ik) [" + *gennan*, to produce] Causing hysteria.

hysteroqram (hīs'tēr-ō-grām) A radiograph of the uterus after injection of a contrast medium. It has been replaced by ultrasound.

hysteroqrphy (hīs'tēr-ōgr'fā) [" + *graphein*, to write] A recording of the frequency and intensity of contractions of the uterus.

hysteroid (hīs'tēr-ōyd) [" + *eidōs*, form, shape] Resembling or pert. to hysteria.

hysterolaparotomy (hīs'tēr-ō-lāp'ā-rōt'ō-mē) [" + *lapara*, flank, + *tōme*, incision] A uterine incision through the abdominal wall; abdominal hysterectomy.

hysterolith (hīs'tēr-ō-lith) [" + *lithos*, stone] A calculus in the uterus.

hysterolysis (hīs'tēr-ōl'ī-sīs) [" + *lysis*, dissolution] An operation to loosen the uterus from its adhesions.

hystrometer (hīs'tēr-ōm'ē-tēr) [" + *metron*, measure] A device for measuring the size of the uterus.

hysterometry (hīs'tēr-ōm'ē-trē) Measurement of the size of the uterus.

hysteromyoma (hīs'tēr-ō-mī-ō-mā) [Gr. *hystera*, womb, + *mys*, muscle, +

- oma*, tumor] A myoma or fibromyoma of the uterus.
- hysteromyomectomy** (hīs'tēr-ō-mī'ō-mēk'tō-mē) [" + " + *ektome*, excision] Excision of a uterine fibroid.
- hysteromyotomy** (hīs'tēr-ō-mī-ōt'ō-mē) [" + " + *tome*, incision] Uterine incision for removal of a solid tumor.
- hystero-oophorectomy** (hīs'tēr-ō-ō'ō-for-ēk'tō-mē) [" + *oon*, egg, + *phoros*, bearing, + *ektome*, excision] Removal of the uterus and of one or both ovaries.
- hysteropathy** (hīs'tēr-ōp'ā-thē) [" + *pathos*, disease, suffering] Any uterine disorder.
- hysteroptosis, hysteroptosis** (hīs'tēr-ōp-tō'sē-ā, -sīs) [" + *ptosis*, a dropping] Prolapse of the uterus.
- hysterorrhaphy** (hīs-tēr-or'ā-fē) [" + *rhaphe*, seam, ridge] Suture of the uterus.
- hysterorrhexis** (hīs'tēr-ō-rēk'sīs) [" + *rhexis*, rupture] Rupture of the uterus, esp. when pregnant.
- hysterosalpingectomy** (hīs'tēr-ō-sāl'pīn-jēk'tō-mē) [" + *salpinx*, tube, + *ektome*, excision] Surgical removal of the uterus and fallopian tubes.
- hysterosalpingography** (hīs'tēr-ō-sāl'pīng-ōg'rā-fē) [" + " + *graphein*, to write] Radiography of the uterus and oviducts after injection of a contrast medium. This procedure, although sometimes therapeutic in clearing the fallopian tubes, is seldom performed due to the superior imaging possible via ultrasound. SYN: *metrosalpingography*.
- hysterosalpingo-oophorectomy** (hīs'tēr-

ō-sāl-pīng'gō-ō'ō-for-ēk'tō-mē) [" + " + *oon*, egg, + *phoros*, bearing, + *ektome*, excision] The surgical removal of the uterus, oviducts, and ovaries.

- hysterosalpingostomy** (hīs'tēr-ō-sāl'pīng-ōs'tō-mē) [" + " + *stoma*, mouth] Anastomosis of the uterus with the distal end of the fallopian tube after excision of a strictured portion of the tube.
- hysteroscope** (hīs'tēr-ō-skōp) [" + *sko-pein*, to examine] An instrument for examining the uterine cavity.
- hysteroscopy** (hīs'tēr-ōs'kō-pē) Inspection of the uterus by use of a special endoscope. SEE: *hysteroscope*.
- hysterospasm** (hīs'tēr-ō-spāzm) [Gr. *hystera*, womb, + *spasmos*, a convulsion] A uterine spasm.
- hysterotomy** (hīs-tēr-ōt'ō-mē) **1.** Incision of the uterus. **2.** Cesarean section. **abdominal h.** Incision of the uterus through a surgical opening in the abdomen. SYN: *abdominohysterotomy*.
- hysterotracheloplasty** (hīs'tēr-ō-trā'kēl-lō-plās'tē) [" + " + *plassein*, to form] Plastic surgery or repair of the cervix.
- hysterotrachelorrhaphy** (hīs'tēr-ō-trā'kēl-or'ā-fē) [" + " + *rhaphe*, seam, ridge] Plastic surgery of a lacerated cervix by paring the edges and suturing them together.
- hysterotrachelotomy** (hīs'tēr-ō-trā'kēl-ōt'ō-mē) [" + " + *tome*, incision] A surgical incision of the neck of the uterus.
- H_z** *hertz*.
- HZV** *herpes zoster virus*.