High Risk Conditions

*Topics in **bold** are complications of prematurity and at least two must exist.*

Addiction at birth/withdrawal

Adrenogenital Syndrome:

(ah-dre´´no-jen´î-t'l) a group of symptoms associated with alterations of secondary sex characters, due to abnormally increased production of androgens by the adrenal glands. The term most commonly applies to the development of masculine traits in the female or premature puberty in male children. The condition may be congenital, in which case it is due to an inherited defect of the adrenal gland, or acquired, developing as a result of a tumor or hyperplasia of the adrenals.

SYMPTOMS. Females with the congenital form may be reared as boys because of masculinization of the external genitalia. Males may show sexual precocity, with development of the reproductive organs, appearance of pubic hair, and excessive body growth in early childhood. In acquired adrenogenital syndrome there is appearance of masculine secondary sex characters in the female, and precocious puberty in the male.

TREATMENT. When an adrenal tumor is the underlying cause of the disorder, it is removed surgically. Estrogen therapy is successful in some cases.

Agenesis of lung:

(a-jen´ê-sis) absence of an organ due to nonappearance of its primordium in the embryo.

AIDS/HIV (in child):

acquired immune deficiency syndrome; human immunodeficiency virus

Anophthalmia:

(an´´of-thal´me-ah) a developmental defect characterized by complete absence of the eyes or by the presence of rudimentary eyes.

Arthritis:

Juvenile rheumatoid arthritis (JRA) is a disease that affects children (age 16 or younger) and causes inflamed, swollen joints that are often stiff and painful. There are 3 types of juvenile rheumatoid arthritis. Each type is based on the number of joints affected from the start. The 3 types are:

- Pauciarticular JRA. This type of JRA affects 1 to 4 joints at the start of the disease. It is the most common type of JRA.
- Polyarticular JRA. This type of JRA affects more than 4 joints when it first starts. The child with this type of JRA is either RF-positive or RF-negative, depending on whether a certain antibody (called rheumatoid factor or RF) is present in his or her body.
- Systemic JRA. This type of JRA is the most serious but also the least common. The child with systemic JRA usually doesn't have pain in a specific joint at first

but instead has whole-body symptoms, high fever spikes, generalized pain all over the body, and sometimes a rash.

Arthrogyposis:

(ahr´´thro-grî-po´sis) 1. persistent flexion of a joint. 2. tetanoid spasm.

Asphyxiation:

Attention Deficit Disorder:

1. The most common symptom of ADHD is difficulty remaining focused on a task until it is completed (inattention). People with ADHD have a hard time starting and completing tasks that are boring, repetitive, or difficult for them. 2. Many people with ADHD have trouble thinking before acting. Impulsiveness usually continues into adulthood and may interfere with keeping a job and developing personal relationships. 3. Although most people with ADHD (especially as adults) do not appear overactive (hyperactive), they may often feel restless or look fidgety.

Autism Spectrum Disorder:

Blindness:

Bronchopulmary Dysplasia:

chronic lung disease of premature infants with hyaline membrane disease who have needed high concentrations of oxygen and assisted ventilation. Factors related to its development include alveolar damage due to hyaline membrane disease, oxygen toxicity, positive pressure ventilation, and endotracheal intubation. Treatment includes supportive measures and oxygen therapy. Recovery and normal pulmonary function usually occur by the age of 6 months to 1 year; however, some infants may exhibit limited tolerance to exercise.

Central nervous system disorders:

Cerebral Palsy:

CP is the term given to certain disorders of body movement and posture that develop as a result of a disruption in normal brain development. This disruption can occur during fetal growth, at the time of birth, or within the first 2 or 3 years of a child's life. The disruption may be caused by brain injury or by abnormal brain development.

Chromosomal deletions and duplications:

Cleft Lip/Palate:

Cleft palate is a common birth defect of the mouth. Cleft palate occurs when the roof of the mouth (palate) does not develop as expected during the 5th through 10th weeks of fetal growth. This leaves an opening (cleft) in the roof of the mouth. Cleft palate can occur by itself (isolated) or along with other birth defects of the face and skull, such as defects of the nose, inner ear, or lip. Cleft lip is the most common birth defect of the face. Cleft lip develops when the bones and tissues of the upper jaw and nose do not join as expected during the 5th through 10th weeks of fetal growth.

Coloboma of eye:

Communication disorders:

Complex health care needs:

Congenital cataract:

opacity of the lens of the eye or its capsule and present at or before birth

Congenital CMV:

cytomegalovirus (si´´to-meg´ah-lo-vi´´rus) CMV; any of a group of highly host-specific herpesviruses infecting humans, monkeys, or rodents, producing unique large cells with inclusion bodies. Opportunistic infection with cytomegalovirus is extremely common in immunocompromised individuals, causing clinical illnesses such as chorioretinitis, pneumonitis, esophagitis, colitis, adrenalitis, and hepatitis; the most common of these is chorioretinitis. Cytomegalovirus also causes cytomegalic inclusion disease, although a majority of infections are very mild, and it has been associated with a syndrome resembling infectious mononucleosis.

Congenital dislocation of hips:

Congenital malformations/anomalies:

Congenital rubella:

Rubella, also called German measles or three-day measles, is generally a mild illness that causes skin rash, mild fever, and swollen glands, especially behind the ear and at the back of the head. See an illustration of a rash caused by rubella. However, rubella can be passed from a pregnant woman to her fetus. When this happens in the first three months of pregnancy, the fetus may develop serious birth defects, including heart defects, hearing defects, and eye problems.

Cornelia de Lange:

Cornelia de Lange syndrome (CdLS) is a rare genetic disorder that is apparent at birth (congenital). Associated symptoms and findings typically include delays in physical development before and after birth (prenatal and postnatal growth retardation); characteristic abnormalities of the head and facial (craniofacial) area, resulting in a distinctive facial appearance; malformations of the hands and arms (upper limbs); and mild to severe mental retardation. Many infants and children with the disorder have an unusually small, short head (microbrachycephaly); an abnormally long vertical groove between the upper lip and nose (philtrum); a depressed nasal bridge; upturned nostrils (anteverted nares); and a protruding upper jaw (maxillary prognathism). Additional, characteristic facial abnormalities may include thin, downturned lips; low-set ears; arched, well-defined eyebrows that grow together across the base of the nose (synophrys); an unusually low hairline on the forehead and the back of the neck; and abnormally curly, long eyelashes.

Cri-Du-Chat Syndrome:

(kre-du-shah) [Fr.] a hereditary congenital syndrome characterized by a wide space between the eyes, microcephaly, severe mental deficiency, and a plaintive catlike cry

caused by laryngeal abnormalities, due to deletion of part of the short arm of chromosome 5.

Disorders of Attachment:

Down Syndrome:

Down syndrome is a genetic condition caused by abnormal cell division in the sperm or egg before conception of a baby or in the fertilized egg after conception. The abnormal cell division most often occurs before conception and usually occurs in the egg. For some unexplained reason, the cells don't divide in a normal way. This results in an extra copy of chromosome number 21 in the cells of the baby's body. The extra chromosome changes the normal development of the baby's brain and body. Children with Down syndrome are more similar to than different from normal children. Children with Down syndrome have distinct physical features that are usually seen at birth. (Some of these physical features can also be seen in children who do not have Down syndrome. If a baby has one or more of the physical features of Down syndrome, it does not mean that he or she has the condition. It is the total combination of the physical features that indicates Down syndrome. There is much variation in the features among children with Down syndrome. The physical features do not cause any disabilities in a child.)

Dystonia Musculorum Defomans:

ECMO: extracorporeal membrane oxygenation.

Failure to thrive:

Fetal Alcohol Syndrome:

(FAS), or fetal alcohol abuse syndrome (FAAS). FAS is the most severe effect of fetal alcohol exposure. The condition may occur when a woman drinks large amounts of alcohol (4 to 5 drinks a day) throughout pregnancy. Children with FAS have abnormal facial features, one or more signs of growth retardation, and at least one sign of central nervous system abnormality. FAS is estimated to be present in about 1 to 2 of every 1,000 babies. In the United States, at least 1,200 children are born with FAS each year.

- Fetal alcohol effects (FAE), or partial fetal alcohol syndrome (PFAS). Children with FAE have defects in more than one of the FAS areas but not all areas. FAE is estimated to be present in about 3 to 5 of every 1,000 babies.

- Alcohol-related neurodevelopmental disorder (ARND). Children with ARND have central nervous system abnormalities and behavior and cognitive abnormalities. They do not have the facial features and growth retardation that can be caused by fetal alcohol exposure. ARND can occur either alone or in combination with FAS or FAE.

- Alcohol-related birth defects (ARBD). Alcohol may cause one or more birth defects of the eyes, ears, heart, kidneys, and bones. ARBD can occur either alone or in combination with FAS or FAE.

Fragile-X Syndrome:

Fragile X Syndrome is a defect of the X chromosome which causes mild mental retardation. The disorder occurs more frequently and severely among males than females.

This condition is the leading known familial cause of mental retardation in the United States. Language delays, behavioral problems, autism or autistic-like behavior (including poor eye contact and hand-flapping), enlarged external genitalia (macroorchidism), large or prominent ears, hyperactivity, delayed motor development and/or poor sensory skills are among the wide range of symptoms associated with this disorder.

Galactosemia:

(gah-lak´´to-se´me-ah) a genetically determined biochemical disorder in which there is a lack of an enzyme necessary for proper metabolism of galactose. Normally the lactose in milk is initially broken down into its glucose and galactose components. The galactose is then changed by enzymatic action into glucose. When the conversion of galactose to glucose does not take place, the galactose accumulates in the tissues and blood. There are two types: classic galactosemia and "galactokinase deficiency" GALACTOKINASE DEFICIENCY.

Classic galactosemia is due to a deficiency of the enzyme galactose-1-phosphate uridyl transferase, and is transmitted as an autosomal recessive trait. The disorder becomes manifest soon after birth and is characterized by feeding problems, vomiting and diarrhea, abdominal distention, enlargement of the liver, mental retardation, and elevated blood and urine levels of both galactose and galactose-1-phosphate.

Galactosemia is diagnosed by demonstrating that the activity of the enzyme galactose-1-phosphate uridyltransferase is absent. If the disease is detected early, before there is damage to the central nervous system, the symptoms of the disorder can be prevented. Genetic counseling is important for families affected by this disorder.

Treatment consists of exclusion from the diet of milk and all foods containing galactose or lactose. Milk substitutes are used and the diet is planned to substitute necessary nutrients normally obtained from products containing lactose or galactose.

Gangliosidosis:

(gang´´gle-o-si-do´sis) pl. *gangliosido´ses.* a lipid storage disorder marked by accumulation of gangliosides in tissues due to an enzyme defect. In generalized gangliosidosis, a hereditary defect in beta-galactosidase causes accumulation of ganglioside GM_1, resulting in mental retardation, hepatomegaly, skeletal deformities, and, often, a cherry-red spot. In "tay-sachs disease" TAY-SACHS DISEASE, a defect of hexosaminidase A results in accumulation of ganglioside GM_2

Gaucher Disease:

Gaucher disease is the most common of the lipid storage diseases (which include Tay-Sachs, Fabry's, and Neimann-Pick diseases). Lipids are various fats or fat-like substances in the body and are stored by the body to be sources of energy at a later time. There are three forms of Gaucher disease: Type I (non-neuronopathic); Type II (acute neuropathic, or infantile cerebral); Type III (subacute neuropathic). Major symptoms include an enlarged spleen and/or liver, bone deterioration, acute attacks of bone pain, and a low level of iron in the red blood cells (anemia).

Gestational age less than 32 weeks:

Head or spinal cord trauma with residual neurological deficits:

Heart conditions:

History of gestational and early developmental events suggestive of biological insults:

Hunter Syndrome:

Hunter syndrome, also known as mucopolysaccharidosis II, is a rare inborn error of metabolism characterized by deficiency of an enzyme known as iduronate sulfatase. The mucopolysaccharidoses (MPS) are a group of hereditary metabolic diseases known as lysosomal storage disorders. Lysosomes function as the primary digestive units within cells. Enzymes within lysosomes break down or digest particular nutrients, such as certain carbohydrates and fats. In individuals with MPS disorders, including Hunter syndrome, deficiency or improper functioning of lysosomal enzymes leads to an abnormal accumulation of certain complex carbohydrates (glycosaminoglycans [mucopolysaccharides]) in cells within various bodily tissues, such as the skeleton, joints, brain, spinal cord, heart, spleen, or liver.

Initial symptoms and findings associated with Hunter syndrome usually become apparent between age two to four years. Such abnormalities may include progressive growth delays, resulting in short stature; joint stiffness, with associated restriction of movements; and coarsening of facial features, including thickening of the lips, tongue, and nostrils. Affected children may also have an abnormally large head (macrocephaly), a short neck and broad chest, delayed tooth eruption, progressive hearing loss, and enlargement of the liver and spleen (hepatosplenomegaly). Two relatively distinct clinical forms of Hunter syndrome have been recognized. In the mild form of the disease (MPS IIB), intelligence may be normal or only slightly impaired. However, in the more severe form (MPS IIA), profound mental retardation may be apparent by late childhood. In addition, slower disease progression tends to occur in those with the mild form of the disorder.

Hunter syndrome is inherited as an X-linked recessive trait. Mild and severe forms of the disorder result from changes (mutations) of a gene (i.e., IDS gene) that regulates production of the iduronate sulfatase enzyme. The IDS gene is located on the long arm (q) of chromosome X (Xq28).

Hurler-Scheie Syndrome:

Mucopolysaccharidoses (MPS Disorders), are a group of rare genetic disorders caused by the deficiency of one of ten specific lysosomal enzymes, resulting in an inability to metabolize complex carbohydrates (mucopolysaccharides) into simpler molecules. The accumulation of these large, undegraded mucopolysaccharides in the cells of the body causes a number of physical symptoms and abnormalities. Hurler Syndrome is a form of MPS caused by a deficiency of the enzyme alpha-L-iduronidase.

Hydrocephaly:

Hydrocephalus (water on the brain) is a condition that occurs when excess cerebrospinal fluid (CSF) collects within the brain. CSF is constantly being produced and reabsorbed in the membranes that surround the brain and spinal cord. The nervous system of the average child makes and absorbs 0.67 fl oz (19.81 mL) of the cerebrospinal fluid every hour. Hydrocephalus develops when one or several of the following conditions occur:

- Too much fluid is produced by the brain.
- The fluid passageway for CSF is blocked.
- The brain and spinal cord (central nervous system) cannot reabsorb the CSF.

The excess fluid increases pressure in the brain, which may lead to brain damage and loss of mental and physical abilities. However, not all hydrocephalus gets worse. Sometimes the problem corrects itself.
Hydrocephalus can result:

- From a birth defect
- From damage to the brain caused by infection, bleeding, injury, or tumor
- When certain medications (such as tetracycline) have been used.

Hypoplastic Syndrome:

Hypoplastic Left Heart Syndrome is a term used to describe a group of closely related rare heart defects which are present at birth (congenital). The normal heart has four chambers. Two chambers are called atria which are separated from each other by a partition called the atrial septum. The other two chambers, known as ventricles, are also separated by a septum. Valves connect the atria (left and right) to their respective ventricles. Hypoplastic Left Heart Syndrome is characterized by the underdevelopment (hypoplasia) of the chambers on the left side of the heart (i.e., left atrium and ventricle). In addition, the mitral valve, which connects these chambers to each other, is usually abnormally narrow (stenosis) or closed (atresia) and the aortic valve, which connects the heart to the major vessels that lead from the lungs (ascending aorta), may also be narrow or closed. Infants with Hypoplastic Left Heart Syndrome also have an abnormally narrow ascending aorta.

Injury to the middle and inner ear:

Interventricular Hemorrage:

Intrauterine Growth Retardation:

Kernicterus:

(ker-nik´ter-us) a condition in the newborn marked by severe neural symptoms, associated with high levels of bilirubin in the blood; it is commonly a sequela of icterus gravis neonatorum

Kleinfelter's Syndrome:

Lead Poisoning:

Leigh's disease:

Leigh's Disease is a rare inherited neurometabolic disorder. It is characterized by the degeneration of the central nervous system (i.e., brain, spinal cord, and optic nerve). The symptoms of Leigh's Disease usually begin between the ages of three months and two years. Symptoms are associated with progressive neurological deterioration and may include loss of previously acquired motor skills, loss of appetite, vomiting, irritability, and/or seizure activity. As Leigh's Disease progresses, symptoms may also include generalized weakness, lack of muscle tone, and episodes of lactic acidosis, which may lead to impairment of respiratory and kidney function. In most cases, Leigh's Disease is inherited as an autosomal recessive genetic trait. However, autosomal dominant, X-linked

recessive, and mitochondrial inheritance have also been noted. There appear to be several different types of genetically determined enzyme defects that can cause Leigh's Disease.

Lesch-Nyhan Syndrome:

a hereditary disorder of purine metabolism transmitted as an X-linked recessive trait with physical and mental retardation, compulsive self-mutilation of fingers and lips by biting, choreoathetosis, spastic cerebral palsy, and impaired renal function.

Leukemia:

Acute myeloid (myelogenous) leukemia (AML) is a rapidly progressive cancer of the blood that is characterized by the uncontrolled proliferation of immature white blood cells, called blasts. The overproduction of these cells crowds the bone marrow, radically reducing the body's ability to form other normal and necessary blood cells.

Leukodystrophies:

Leukodystrophy is the name given to a group of very rare, progressive, metabolic, genetic diseases that affect the brain, spinal cord and often the peripheral nerves. Each of the leukodystrophies will affect one of the chemicals that make up the myelin sheath or white matter of the brain, causing the various types of leukodystrophy. The myelin sheath, which acts as insulation of the nervous system, is composed of different lipids (fatty substances). Thus defects in production and degradation of these lipids can lead to the many ways in which these diseases can manifest themselves.

Loss of or deformed limbs:

Macrocephaly:

abnormal enlargement of the cranium.

Malignancy or congenital anomaly of brain/spinal cord:

Maroteaux-Lamy Syndrome:

Mucopolysaccharidoses are a group of rare genetic disorders caused by the deficiency of one of ten specific lysosomal enzymes, resulting in an inability to metabolize complex carbohydrates (mucopolysaccharides) into simpler molecules. The accumulation of these large, undegraded mucopolysaccharides in the cells of the body causes a number of physical symptoms and abnormalities.
Maroteaux-Lamy Syndrome (MPS Type VI) occurs in three types: a classic severe type, an intermediate type, and a mild type. The syndrome is characterized by a deficiency in the enzyme arylsulfatase B (also called N- acetylgalactosamine-4-sulfatase), which leads to an excess of dermatan sulfate in the urine.
In general, growth retardation occurs from two to three years of age, with coarsening of facial features and abnormalities in the bones of hands and spine. Joint stiffness also occurs. The intellect is usually normal.

Marquio Syndrome:

Metabolic disorders:

Microcephaly:

small size of the head in relation to the rest of the body.

Multiple Apnea Episodes:

Muscular Dystrophy:

A group of genetically determined, painless, degenerative myopathies that are progressively crippling because muscles are gradually weakened and eventually atrophy. At present there is no specific cure. The disease can sometimes be arrested temporarily; not all forms of it are totally disabling.

The word dystrophy means faulty or imperfect nutrition. In muscular dystrophy the muscles suffer a vital loss of protein, and muscle fibers are replaced gradually by fat and connective tissue until, in the late stages of the disease, the voluntary muscle system becomes virtually useless. In muscular dystrophy all visible damage occurs in the muscles themselves, and thus the disease is markedly different from "multiple sclerosis" MULTIPLE SCLEROSIS, in which the muscles are rendered impotent by damage to the nerves that control them.

Muscular dystrophy is believed to affect almost a quarter of a million Americans and is hereditary, although the way it is inherited is not the same for all types of the disease. The disease (or a propensity for it) seems to be carried mainly by women who, while not suffering from it themselves, may pass it on to their offspring, usually their sons. A woman who has conceived a dystrophic child is probably a carrier, as is a woman who has a dystrophic relative.

CHILDHOOD MUSCULAR DYSTROPHY. Muscular dystrophy cannot be detected at birth; in most cases the symptoms begin to be noticeable about the second or third year. The child gradually finds it more difficult to play and get about. As the weakening process continues, the child relies on a wheelchair. In many cases death comes before the age of 20 from respiratory ailments or heart failure. This childhood type of disease (unfortunately the most common type) is known as the *Duchenne type* or *progressive muscular dystrophy.* It is also called *pseudohypertrophic muscular dystrophy* because at the beginning the muscles, especially those in the calves, appear healthy and bulging when actually they are already weakened and their size is due to an excess of fat.

OTHER TYPES. Another type of the disease sometimes begins in childhood but is much more likely to appear during the teens or twenties. When the first symptom is a failure of the musculature of the pelvic girdle, this type is referred to as *limb-girdle muscular dystrophy.* It usually proceeds more slowly than does the childhood form. This same type may take the form of *facioscapulohumeral muscular dystrophy* (referring to the face, shoulder, and upper arm muscles), which is likely to manifest itself first in an almost imperceptible weakening of the facial muscles. It is also known as *Landouzy-Dejerine muscular dystrophy.* Muscle deterioration starts in childhood or early adulthood but it may proceed very gradually over a number of years, sometimes until late in life. Some patients may be only slightly handicapped.

Other, rarer types of muscular dystrophy have been identified, including a distal type that begins in the peripheral muscles of the extremities and one that affects only muscles of the eye. Sometimes two or more forms are present in the same patient.

Myotonic Dystrophy:

Myotonic Dystrophy (DM) is an inherited disorder involving the muscles, vision, and endocrine glands. It may also cause mental deficiency and loss of hair. The more obvious features of the disorder are muscle rigidity and the inability to relax a muscle or set of muscles after contraction. Onset of this rare disorder usually occurs during early

adulthood. However, it may occur at any age and is extremely variable in degree of severity.
There appear to be at least two forms of this disorder. The more commonly encountered is called Myotonic Dystrophy type 1 (DM1) and results from a fault on chromosome 19. The second and less frequently encountered form is called Myotonic Dystrophy type 2 (DM2). DM2 is the consequence of one or more defects on chromosome 3.
The disorder is brought about by one or more failures or defects in the ³channel² system through which electrolytes (substances that form ions when melted or dissolved in a suitable medium, becoming conductors of electricity) move in and out of muscle cells. DM is one of several ³channelopathies² that may occur.

Neiman-Pick disease:

Neural tube defects:

Neurofibromatosis:

(noor´´o-fi´´bro-mah-to´sis) a genetic disorder characterized by tumor growth along various types of nerves; bone, muscle, and skin may also be affected. There are two types: *Type I* (Recklinghausen's or von Recklinghausen's disease) is characterized by developmental changes in the nervous system, muscles, bones, and skin with formation of neurofibromas over the entire body and patches of pigmentation; scoliosis may also be associated. Half of those with the disorder have some form of learning disability. *Type II* (called also bilateral acoustic neurofibromatosis) is a benign tumor that forms intracranially or intraspinally, usually associated with the eighth cranial nerve (see also acoustic "neuroma" NEUROMA). Information and support for individuals with neurofibromatosis and those caring for them can be obtained from the National Neurofibromatosis Foundation, 95 Pine St., 16th Floor, New York, NY 10005.

Neuromotor/Muscle Disorder:

Nonketotic Hyperglycemia:

a metabolic derangement in which there is an abnormally high serum glucose level without ketoacidosis. It can occur as a complication of borderline and unrecognized "diabetes mellitus" DIABETES MELLITUS, in pancreatic disorders that interfere with the production of insulin, as a complication of extensive burns, and in conditions marked by an excess of steroids, as in steroid therapy, or acute stress conditions, such as infection. It also may develop during total parenteral "nutrition, hemodialysis, " NUTRITION, HEMODIALYSIS, and "peritoneal dialysis" PERITONEAL DIALYSIS.
SYMPTOMS. The hyperglycemia of HHNK is usually extreme, with fasting blood sugar levels ranging from 600 to 3000 mg per 100 ml of blood. In contrast to typical diabetic coma, however, the serum acetone level is normal or only slightly elevated. This occurs because, although there is sufficient insulin available to avoid ketosis, there is not enough to metabolize the glucose and thereby relieve the hyperglycemia.
Hyperosmolality, resulting from the extremely high concentration of sugar in the blood, causes a shift of water from the intracellular fluid (the less concentrated solution) into the blood (the higher concentrated solution). This results in cellular dehydration. Another symptom of HHNK, polyuria, occurs because the high plasma osmolality prevents the normal osmotic return of water to the blood by the renal tubules, and it is excreted in the urine. This leads to a decreased blood volume, which severely hampers the kidney's excretion of glucose and a vicious cycle is begun.

TREATMENT. It is essential that HHNK be recognized early and treatment begun immediately to break the chain of metabolic aberrations that are occurring. It is estimated that the mortality rate of HHNK is 60 per cent to 70 per cent, and the probable reason for this high mortality rate is failure to recognize the condition and institute prompt corrective measures.

Insulin is administered in small doses, the amount and frequency depending on periodic assessment of blood glucose levels. The objective is to avoid the extremes of hyperglycemia and insulin shock. Intravenous fluids are administered cautiously, so that the sodium and water deficits can be corrected without producing extreme shifts of water from the blood into the intracellular compartment and thus failing to correct the hyperosmolar condition of the blood. Electrolytes other than the sodium lost through diuresis also must be replaced as indicated by laboratory findings.

PATIENT CARE. Fluid volume deficit plays a major role in the development of severe HHNK; thus patient care is concerned with careful monitoring of those patients susceptible to its development, especially the elderly, the debilitated, and the mild or unsuspected diabetic. Maintenance of an adequate fluid balance can do much to prevent the hyperosmolar condition and the development of a chain of events that can rapidly lead to coma and death.

Noonan Syndrome:

Noonan syndrome is a rare genetic disorder that is typically evident at birth (congenital). The disorder may be characterized by a wide spectrum of symptoms and physical features that vary greatly in range and severity. In many affected individuals, associated abnormalities include a distinctive facial appearance; a broad or webbed neck; a low hairline in the back of the head; and short stature. Characteristic abnormalities of the head and facial (craniofacial) area may include widely set eyes (ocular hypertelorism); vertical skin folds that may cover the eyes' inner corners (epicanthal folds); drooping of the upper eyelids (ptosis); a small jaw (micrognathia); a low nasal bridge; and low-set, prominent, abnormally rotated ears (pinnae). Distinctive skeletal malformations are also typically present, such as abnormalities of the breastbone (sternum), curvature of the spine (kyphosis and/or scoliosis), and outward deviation of the elbows (cubitus valgus). Many infants with Noonan syndrome also have heart (cardiac) defects, such as obstruction of proper blood flow from the lower right chamber of the heart to the lungs (pulmonary valvular stenosis). Additional abnormalities may include malformations of certain blood and lymph vessels, blood clotting and platelet deficiencies, mild mental retardation, failure of the testes to descend into the scrotum (cryptorchidism) by the first year of life in affected males, and/or other symptoms and findings.

In some affected individuals, Noonan syndrome appears to result from spontaneous (sporadic) genetic changes (mutations). In others, the disorder may be transmitted as an autosomal dominant trait. Genetic analysis of one affected multigenerational family (kindred) suggests that the disorder may result from mutations of a gene located on the long arm (q) of chromosome 12 (12q24). However, many investigators indicate that Noonan syndrome may be caused by mutations of different genes (genetic heterogeneity).

Oppositional Defiant Disorder:

a type of "disruptive behavior disorder" DISRUPTIVE BEHAVIOR DISORDER characterized by a recurrent pattern of defiant, hostile, disobedient, and negativistic behavior directed toward those in authority.

Osteogensis Imperfecta:

Osteogenesis imperfecta (OI) is a group of rare disorders affecting the connective tissue and characterized by extremely fragile bones that break or fracture easily (brittle bones), often without apparent cause. The specific symptoms and physical findings associated with OI vary greatly from case to case. The severity of OI also varies greatly, even among individuals of the same family. OI may be a mild disorder or may result in severe complications. Four main types of OI have been identified. OI type I is the most common and the mildest form of the disorder. OI type II is the most severe. In most cases, the various forms of osteogenesis imperfecta are inherited as autosomal dominant traits.

Paralysis:

Periventricular Leukomalacia:

Pervasive Developmental Disorders:

a group of disorders characterized by impairment of development in multiple areas, including the acquisition of reciprocal social interaction, verbal and nonverbal communication skills, and imaginative activity, and by stereotyped interests and behaviors; included is "autistic disorder" AUTISTIC DISORDER.

Phenylketonuria:

(fen´´il-ke´´to-nu´re-ah) PKU or PKU1, a congenital disease due to a defect in the metabolism of the amino acid phenylalanine. adj., **phenylketonu´ric.** The condition is hereditary and is transmitted recessively through apparently healthy parents who, if tested, will show signs of the disease. It results from lack of an enzyme, phenylalanine hydroxylase, necessary for the conversion of the amino acid phenylalanine into tyrosine. Thus there is accumulation of phenylalanine in the blood with eventual excretion of phenylpyruvic acid in the urine. If untreated, the condition results in mental retardation and other abnormalities.

Persons with phenylketonuria are usually blue-eyed and blond, with defective pigmentation, the skin being excessively sensitive to light and susceptible to eczema. Other manifestations besides mental retardation are tremors, poor muscular coordination, excessive perspiration, a mousy odor, and perhaps convulsions.

DIAGNOSIS. Screening of newborns for PKU entails a simple test using a urine-wet diaper and Phenistix. The screening is required by law in most states in the United States and in all provinces in Canada. It should be pointed out that not all infants exhibiting excess metabolites in the urine have "classic" PKU. The simple screening test must be followed by more extensive clinical laboratory evaluations to distinguish between the variants of PKU. These variants have been named *hyperphenylalaninemia without phenylketonuria* and *atypical PKU.*

The current criteria for establishment of a diagnosis of classic PKU are: (1) a rise in plasma phenylalanine during the first few weeks of life from a level of 1-4 mg/100 ml at birth to 20 mg/100 ml or higher; (2) a normal serum tyrosine level; and (3) urine that contains ortho-hydroxyphenylacetic acid during the newborn period, and later contains phenylketones. Diagnosis of variants of the disease depends in part on values of plasma phenylalanine, family history, clinical course, and the infant's response to ingestion of natural protein.

TREATMENT. Restriction of the infant's diet to control the effects of PKU is prescribed on the basis of the individual child's requirements for phenylalanine, protein,

and calories. Effectiveness of the special diet must be evaluated by frequent determinations of phenylalanine blood levels; otherwise the child may suffer from serious dietary deficiencies. The development of a palatable hydrolysate preparation (Lofenalac) has facilitated implementation of the prescribed treatment. About 90 per cent of the protein requirement is derived from this dietary protein substitute.

Although PKU cannot be cured, its effects can be counteracted or prevented altogether by proper management. Research has shown that the mean intelligence quotient of children treated within the first month of life is about 28 points higher than that of either siblings or matched pairs who were treated after the first month or who were never treated. "FFF" FIGURE

Pierre Robin:

(pyär ro-ban´) micrognathia occurring in association with cleft palate, glossoptosis, and absent gag reflex.

Potter Syndrome:

Prader-Willi Syndrome:

(prah´der vil´e) a congenital syndrome consisting of obesity, short stature, lack of muscle tone, hypogonadism, and central nervous system dysfunction. Information and support for families and individuals affected by this syndrome can be obtained from the Prader-Willi Syndrome Association U.S.A., 6490 Excelsior Blvd., No. E-102, St. Louis Park, MN 55426, telephone (800) 926-4797.

Reduction deformity of limbs:

Renal agenesis/hypoplasia:

Bilateral Renal Agenesis is the absence of both kidneys at birth. It is a genetic disorder characterized by a failure of the kidneys to develop in a fetus. This absence of kidneys causes a deficiency of amniotic fluid (Oligohydramnios) in a pregnant woman. Normally, the amniotic fluid acts as a cushion for the developing fetus. When there is an insufficient amount of this fluid, compression of the fetus may occur resulting in further malformations of the baby.

This disorder is more common in infants born of a parent who has a kidney malformation, particularly the absence of one kidney (unilateral renal agenesis). Studies have proven that unilateral renal agenesis and bilateral renal agenesis are genetically related.

Respiratory Distress Syndrome:

ARDS; a group of symptoms accompanying fulminant pulmonary edema and resulting in acute respiratory failure; see also "acute respiratory distress syndrome" ACUTE RESPIRATORY DISTRESS SYNDROME.

Retinopathy of prematurity:

a disease of the developing retinal vasculature of the premature newborn. Incidence correlates with the degree of maturity; that is, the shorter the gestational period the greater the possibility it will occur. The cause of the disorder is vasoconstriction of retinal capillaries due to the presence of very high concentrations of oxygen in these

blood vessels. This produces development of an overgrowth of blood vessels in the retina. The vascular proliferation and exudation of blood and serum detaches the retina and produces scarring and inevitable blindness. To prevent retinopathy of prematurity it is recommended that oxygen be administered to premature newborns in as low a concentration and for as short a time as feasible. Careful monitoring of the newborn and evaluation of oxygen tension level are essential because no totally safe dosage of oxygen that will prevent the retinal changes has been found. Called also retrolental fibroplasias

Rubenstein-Taybi Syndrome:

Sanfilippo Syndrome:

Mucopolysaccharidoses (MPS Disorders) are a group of rare genetic disorders caused by the deficiency of one of the lysosomal enzymes, resulting in an inability to metabolize complex carbohydrates (mucopolysaccharides) into simpler molecules. The accumulation of these large, undegraded mucopolysaccharides in the cells of the body causes a number of physical symptoms and abnormalities.
Sanfilippo Syndrome (MPS III), an autosomal recessive hereditary disorder, is characterized by severe mental deterioration, mild physical defects and the excretion of heparan sulfate in the urine. There are four types of Sanfilippo Syndrome; types A and B are the most common forms.

Seizure Disorders/Epilepsy:

Epilepsy is a nervous system disorder that produces sudden, intense bursts of electrical activity in the brain. This abnormal electrical activity in the brain causes seizures, which may briefly upset a person's muscle control, movement, speech, vision, or awareness.

People with epilepsy have repeated seizures that usually occur without warning and often for no clear reason. If epilepsy is not treated, seizures may occur throughout a person's life in some cases, becoming more severe and more frequent over time. Treatment most often involves medication. Surgery, a special diet (ketogenic diet), a nerve stimulation device (vagus nerve stimulator), or a combination of these approaches also may be tried when medication alone does not control a person's seizures. Not everyone who has a seizure has epilepsy. Sometimes seizures occur as a result of injury, illness, or another medical condition that is not related to epilepsy. In these cases, the person does not have any more seizures once the condition improves or goes away. This is not epilepsy. Epilepsy is a long-term, ongoing (chronic) disorder that causes repeated seizures if it is not treated (and sometimes despite treatment). Although epilepsy is sometimes the result of another condition, many cases have no known cause. Epilepsy most often begins in childhood or after the age of 60, but it can develop at any age. There are two basic types of seizures caused by epilepsy:

- Partial seizures begin in a specific location in the brain. Partial seizures may affect awareness or only one side or part of the body, but they may also progress to affect the entire body.

- Generalized seizures begin over the entire surface of the brain and may affect the entire body. In people who have generalized seizures, it is impossible to pinpoint a specific location in the brain that is the source of the seizure.

The difference is important, because partial seizures and generalized seizures are often treated differently. The distinction is a key factor in guiding treatment.

Sensorineural Hearing Loss:

that due to a defect in the inner ear or the acoustic nerve.

Sensory disorders/impairments that interfere with ability to respond effectively to environmental stimulus:

Severe Asthma:

Severe Burns:

Sickle Cell Anemia:

any of the diseases associated with the presence of hemoglobin S, including sickle cell anemia, sickle cell-hemoglobin C or D disease, and sickle cell-thalassemia disease. They are found most often in those of black African descent, but they also occur in persons of Mediterranean (Southern European and North African), Middle Eastern, or Asian Indian ancestry.

About 8-10 per cent of all African Americans carry the sickle cell gene. About 90 per cent of these are carriers of the sickle cell trait (are heterozygous for the hemoglobin S gene) and usually are without symptoms. The remainder or about 1 in 500 are homozygous for hemoglobin S and actually have sickle cell disease and suffer from the effects of hemolysis.

Sickle cell disease is a serious, hereditary, chronic disease in which the red blood cells have reduced life span and are rigid, with a crescent or sickle shape. The shape is the result of an abnormality in the hemoglobin, which alters the deformability of the red cells under conditions of low oxygen tension. Because of their distorted shape the red blood cells have difficulty passing through the small arterioles and capillaries and have a tendency to clump together and occlude the blood vessel.

Some scientists believe that sickle cell disease developed as a defense against malaria. Malarial parasites do not grow in erythrocytes containing hemoglobin S. Therefore; carriers (heterozygotes) have an evolutionary advantage in areas where malaria is prevalent.

SYMPTOMS. There are many symptoms of sickle cell disease, all of them related to the defective hemoglobin and its effect on the red blood cells. Some persons with the disease suffer from only a few symptoms, while others are severely affected and have a short life span. Very few severely affected persons live beyond the age of 20, and some die in infancy or early childhood. The major symptoms are anemia, periodic joint and extremity pain and sometimes edema of the joints, chronic ulceration about the ankles, episodes of severe abdominal pain with vomiting, and abdominal distention. The spleen becomes infarcted so that it is essentially absent and predisposes the patient to infection with encapsulated organisms.

Bone changes often can be seen on x-ray and are due to bone infarcts. Headache, paralysis, and convulsions may result from cerebral thrombosis, which can cause stroke, blindness, and other neurological disturbances. There is a tendency toward progressive renal disease and renal failure.

The prognosis for sickle cell disease is not good. Patients have intercurrent infections and multiple emboli or thromboses that can affect a vital organ and cause death, usually before the age of 50.

Sickle cell crisis is a broad term that describes several different conditions, particularly *aplastic crisis*, which is temporary bone marrow aplasia; *hemolytic crisis*, which is acute

red cell destruction, leading to jaundice; and *vaso-occlusive crisis,* which is severe pain due to infarctions located in the bones, joints, lungs, liver, spleen, kidney, eye, or central nervous system. Factors that precipitate a crisis include infection, dehydration, trauma, strenuous physical exertion, emotional stress, and extremes of heat and cold.

TREATMENT. There is no cure for sickle cell disease. Treatment is symptomatic; preventive measures are employed to reduce the incidence of crises and to avoid infections. It is also important that the patient receive all available immunizing agents. Nutritional deficiencies should be corrected when present (folate supplementation is especially important), and then a well-balanced dietary intake should be maintained. When the crisis is due to inflammatory changes, medications such as corticosteroids are sometimes administered to relieve pain in the joints and elsewhere.

PATIENT CARE. Sickle cell disease is a chronic condition with acute episodes related to vaso-occlusion. Virtually every system of the body can be affected by the ischemia resulting from obstruction of the blood vessels by clumps of deformed erythrocytes. Among the more common acute complications are inflammation of fingers and toes, aplastic anemia, splenic sequestration, and stroke. Chronic disorders include leg ulcers, renal complications, aseptic necrosis, and retinopathy. Bacterial infection is one of the major causes of morbidity and mortality in patients with sickle cell disease.

Because of the potential for serious complications due to occlusion of blood vessels, patients with sickle cell disease should have regular physical examinations to detect early changes. Periodic eye examinations are necessary to monitor retinal changes due to vaso-occlusion of retinal vessels.

Measures to improve or maintain the general well-being of patients include increasing the fluid intake to one and a half to two times the usual amount. The additional fluids increase the fluid volume and encourage mobilization of the abnormal red cells. Adequate nutrition is necessary to optimize the patient's resistance to infection and resources for healing and to manage the anemia that is characteristic of sickle cell disease.

Education of patients and their parents and family members is an essential component of care. Parents and grandparents often blame one another for giving the disease to their offspring. Most lay persons do not understand the difference between sickle cell disease and sickle cell trait and how the disease is genetically transmitted. Misinformation and lack of information about this complex disease can lead to unrealistic expectations for treatment and cure and to feelings of guilt and anger on the part of parents whose children have either the trait or an overt manifestation of the disease. Much anxiety and marital discord can be prevented or relieved by adequate genetic counseling and instruction.

A publication called *Sickle Cell Disease: Screening, Diagnosis, Management, and Counseling in Newborns and Infants* (Publication No. 93-0563) is available from the Agency for Health Care Policy and Research, U.S. Department of Health and Human Services, P.O. Box 8547, Silver Spring, MD 20907 (telephone 800-358-9295). Other educational materials can be obtained from the National Association for Sickle Cell Diseases, Inc. (telephone 800-421-8453). "FFF" FIGURE "FFF" FIGURE

Sly Syndrome:

Sly Syndrome (Mucopolysaccharidosis Type VII [MPS VII]) is an extremely rare inherited metabolic disorder characterized by a deficiency of the enzyme beta-glucuronidase, a lysosomal enzyme. Sly Syndrome belongs to a group of disorders known as the Mucopolysaccharidoses, which are lysosomal storage diseases. Lysosomes are particles bound in membranes within cells that break down certain fats and

carbohydrates. In Sly Syndrome, the deficiency of beta-glucuronidase leads to the accumulation of certain complex carbohydrates (mucopolysaccharides) in many tissues and organs of the body. Excessive levels of dermatan and keratan sulfate are also present in the urine of people with this disorder.
The symptoms of Sly Syndrome are similar to those of Hurler Syndrome (MPS I) and the other Mucopolysaccharidoses. Symptoms may include mental retardation, short stature with an unusually short trunk, and/or abnormalities of the intestines, corneas of the eyes, and/or the skeletal system. Sly Syndrome is inherited as an autosomal recessive genetic trait.

Sturge-Weber Syndrome:

Sturge-Weber Syndrome is composed of three major symptoms. Excessive blood vessel growths (leptomeningeal angiomas) are accompanied by accumulations of calcium inside the brain, and seizures. Facial birth marks (nevus flammeus) appear usually on one side of the face. Angiomas similar to those found in the brain can develop inside the eye, often with secondary glaucoma

Syphilis:

(sif´î-lis) a contagious usually "sexually transmitted disease" SEXUALLY TRANSMITTED DISEASE that leads to many structural and cutaneous lesions and is caused by a spirochete, *Treponema pallidum. Congenital syphilis* is a variety acquired by a fetus in utero from the mother. Formerly called also lues.

DIAGNOSIS. The major kinds of tests used for the detection of syphilis are (1) complement fixation tests, which rely on an antigen-antibody reaction and hemolysis to detect the presence of *Treponema pallidum* in the blood, e.g., the Kolmer test; (2) flocculation tests, e.g., the screening test developed by the Venereal Disease Research Laboratories of the U.S. Public Health Service (VDRL) and the rapid plasma reagin (RPR) test; (3) the fluorescent antibody test (FTA-ABS); and (4) hemagglutination tests, e.g., the MHA-TP test. The VDRL and RPR tests are the most commonly used. If these tests are inconclusive, tests for serum antibody may be done.

A positive test for syphilis should be repeated. A false positive result can be due to other diseases such as malaria, leprosy, and advanced pulmonary tuberculosis, and therefore should not be ignored. A false negative serological test can occur when the infection is too recent to have triggered the production of antibodies. A negative result can also occur if the disease is late symptomatic syphilis or if the patient's immune system is not functioning normally. If treatment of syphilis had been started before the test, the patient's blood could be temporarily nonreactive. Since alcohol interferes with and decreases the intensity of a reaction, it should be considered as a possible cause of a negative result. Once treatment has been started, patients with early syphilis should have repeated testing every three months for one full year.

PRIMARY SYPHILIS. Within a few hours after the spirochetes penetrate the skin or a mucous membrane, they enter the bloodstream, and usually in about a week they spread throughout the body. The first sign is a painless sore, called a chancre, that appears 9 days to 3 months (usually about 3 weeks) after infection. Usually firm or hard, the chancre may resemble a blister, pimple, or ulcerated open sore. In men, it appears usually on or near the head of the penis. In women, the chancre is commonly found on the labia, but it may be concealed inside the vagina, where it may not be felt or seen. Chancres sometimes develop elsewhere, such as on the lips of the mouth, a breast, or a finger. They also may appear in the anal region. The nearby lymph nodes become hard and swollen.

Even if no treatment is given, the chancre will disappear in 10 to 40 days, often leading

to the false conclusion that the disease is cured. Occasionally a chancre fails to develop or is too small to be noticed. Primary syphilis can be cured with penicillin in adequate doses and with other antibiotics, such as tetracycline.

SECONDARY SYPHILIS. Two to six months after the primary sore disappears, the secondary stage of syphilis begins; it may last up to 2 years. A rash is usually one of the first symptoms. It may cover any part of the body and often spreads over the entire skin surface, including the palms and soles. It does not itch and may resemble the rash of measles as well as of many other diseases. It can be identified positively as a symptom of syphilis only by a blood test. During secondary syphilis, thin white sores may appear on the mucosa of the mouth and throat and around the genitalia and rectum. Headache, fever, and a general feeling of illness are common. Hair may fall out in patches, bones and joints may be painful, and anemia may develop. Sometimes the eyes are affected. Syphilis is highly contagious in this stage and of great danger to others. If mouth sores are present, the disease may be spread by kissing.

Like primary syphilis, the secondary stage disappears by itself, generally within 3 to 12 weeks, but may return later if the organisms are still present. As in the primary stage, the disease can be cured in the secondary stage by the use of penicillin or other antibiotics. Together, the primary and secondary stages are known as *early syphilis.*

TERTIARY SYPHILIS. The third, or tertiary, stage of the disease is also known as *late syphilis.* Its symptoms may develop soon after the secondary symptoms have vanished or they may lie hidden for 15 or more years. A person may be unaware that the disease is present. Even a blood test may be negative.

Late syphilis is less contagious to others but is extremely dangerous to the person who has it. It may be fatal, particularly if the central nervous system or heart is affected. The spirochete can invade any cell of the body and can damage any organ or structure of the body, including the internal organs, bones, joints, and skin. The characteristic lesion of tertiary syphilis is a soft gummy tumor called a gumma.

If late syphilis attacks the heart, aorta, or aortic valve, death may result from rupture of the weakened aorta or from heart failure. When it attacks the central nervous system, general paresis, a severe disease of the brain, may result; if not treated promptly, it will cause insanity and death. Another serious disorder of the nervous system caused by late syphilis is "tabes dorsalis" TABES DORSALIS, in which there is pain and loss of position sense. Blindness may result if the infection involves the eyes. Other possible effects are deep ulcers on the legs or elsewhere, chronic inflammation of the bones, which is especially painful at night, and perforation of the soft palate.

Cure of late or tertiary syphilis takes longer and is more difficult than that of primary or secondary syphilis. Sometimes the disease cannot be completely cured. As with early syphilis, however, it may be successfully treated with penicillin and other antibiotics.

CONGENITAL SYPHILIS. Congenital syphilis is transmitted from a diseased mother to her unborn child through the placenta. Often this results in spontaneous abortion or stillbirth. Infants with congenital syphilis who are born alive may have snuffles, caused by inflammation of the nose, and may be generally weak and sickly. Syphilitic rashes, especially in the genital area, may occur when the baby is 3 to 8 weeks old. Children with congenital syphilis are often born deformed, and may become blind, deaf, paralyzed, or insane.

To prevent congenital syphilis all pregnant women should have a blood test for syphilis during the early months of pregnancy. Treatment before the fifth month will always prevent infection of the unborn child. A syphilitic mother who is not treated early has only one chance in six of having a healthy child. If a child is born with syphilis, immediate treatment may be effective if the disease has not progressed too far.

PREVENTION. The skin lesions associated with primary and secondary syphilis can be

highly contagious. The Centers for Disease Control and Prevention recommend drainage/secretion precautions and blood/body fluid precautions for 24 hours after the start of effective therapy. No precautions are necessary in latent (tertiary) syphilis or for seropositive persons without lesions.

Tay-Sachs Disease:

(ta´ saks´) the infantile form of "amaurotic familial idiocy" AMAUROTIC FAMILIAL IDIOCY, inherited as an autosomal recessive trait and affecting chiefly Ashkenazic Jews. With each pregnancy couples who are carriers have a one in four chance of having a child with Tay-Sachs; a two in one chance of having a carrier like themselves; and a one in four chance of having a child who neither has the disease nor is a carrier. It is a progressive disorder marked by degeneration of brain tissue and the maculas (with the formation of a cherry-red spot on both retinas) and by dementia, blindness, and death. Tay-Sachs disease is a sphingolipidosis in which the inborn error of metabolism is a deficiency of the enzyme hexosaminidase A that results in accumulation of GM_2 ganglioside in the brain.

It is possible to test for this disease in the unborn fetus at 14 weeks of pregnancy. An absence of the enzyme hexosaminidase A indicates conclusively that the fetus has Tay-Sachs disease. Carriers of the trait have lowered levels of the enzyme in their blood, thus permitting screening of populations most susceptible to transmission of the trait to their offspring and genetic counseling of known carriers. No therapy is currently available.

Most children with Tay-Sachs disease die of bronchopneumonia at 31/2 to 4 years of age.

Technology Dependent:

Thalassemia:

Thalassemia is a blood condition that interferes with the normal production of a substance called hemoglobin. Hemoglobin is found in red blood cells and carries oxygen from the lungs to the body's tissues. Most people with thalassemia do not have any symptoms. However, mild to severe symptoms of anemia can develop with some forms of the condition.

Thalassemia is inherited; it is caused by a defect in one or more of the genes that hold the instructions for making hemoglobin. Most people who inherit thalassemia are Asian, Filipino, Mediterranean, Middle Eastern, or less frequently, of African descent.

Normal hemoglobin is made of two substances:

- Heme, the nonprotein portion of hemoglobin, contains iron and gives the blood its color.
- Globin is the group of 4 protein molecules that bind to the iron in heme molecules to form hemoglobin.

Thalassemia affects the globin portion of hemoglobin. The two main types of thalassemia are further classified according to how specific genes malfunction and interfere with normal hemoglobin production.

Alpha thalassemia is very rare. It occurs when one or more of the four genes that hold the instructions for making alpha-globin are missing or damaged. There are 4 subtypes of alpha thalassemia. Each type represents the loss of or damage to 1, 2, 3, or 4 genes.

Beta thalassemia occurs when one or both of the genes that hold the instructions for producing beta-globin are only partly active or inactive. There are several different subtypes of beta thalassemia. Which type of thalassemia a person has depends upon

whether one or both genes are affected (minor or major respectively) and whether those genes still produce some working (functional) beta globin.

- In B^+, a beta globin gene still produces small amounts of functional beta globin.
- In B^o, a beta globin gene is unable to produce any functional globin.

Very rare forms of thalassemia may cause organ damage that can result in death.[1] Such severe damage can occur when insufficient oxygen reaches the organs. Iron overload caused by treatment with repeated blood transfusions also may damage organs, especially the liver.

Tracheo-esophageal fistula:

Triple X Syndrome:

Triplo X Syndrome is a chromosomal abnormality that affects females. Females normally have two X chromosomes; however, those with Triplo X Syndrome carry three X chromosomes (trisomy X) in the nuclei of body cells. No specific pattern of symptoms and malformations (phenotype) has been found to be associated with this abnormal chromosomal make-up (i.e., 47,XXX karyotype). Many affected females appear to have no or very few associated symptoms, while others may have various abnormalities. However, investigators indicate that Triplo X Syndrome is a relatively common cause of learning difficulties, particularly language-based disabilities (e.g., dyslexia), in females. Evidence suggests that affected females typically have normal intelligence with IQs that tend to be lower than that of their brothers and sisters (siblings). Mental retardation rarely occurs. Infants and children with Triplo X Syndrome may tend to have delayed acquisition of certain motor skills and delayed language and speech development. Affected females often are of tall stature. According to researchers, although sexual development and fertility are usually normal, some may have delayed puberty and/or fertility problems. In addition, in some cases, certain physical abnormalities have been reported, such as a relatively small head, vertical skin folds that may cover the eyes' inner corners (epicanthal folds), and/or other findings. Triplo X Syndrome results from errors during the division of reproductive cells in one of the parents.

Trisomy 13:

Trisomy 13 Syndrome is a rare chromosomal disorder in which all or a portion of chromosome 13 appears three times (trisomy) rather than twice in cells of the body. In some affected individuals, only a percentage of cells may contain the extra 13th chromosome (mosaicism), whereas other cells contain the normal chromosomal pair. In individuals with Trisomy 13 Syndrome, the range and severity of associated symptoms and findings may depend on the specific location of the duplicated (trisomic) portion of chromosome 13--as well as the percentage of cells containing the abnormality. However, in many affected infants and children, such abnormalities may include developmental delays, profound mental retardation, unusually small eyes (microphthalmia), an abnormal groove in the upper lip (cleft lip), incomplete closure of the roof of the mouth (cleft palate), undescended testes (cryptorchidism) in affected males, and extra (supernumerary) fingers and toes (polydactyly). Additional malformations of the head and facial (craniofacial) area may also be present, such as a relatively small head (microcephaly) with a sloping forehead; a broad, flat nose; widely set eyes (ocular hypertelorism); vertical skin folds covering the eyes' inner corners (epicanthal folds); scalp defects; and malformed, low-set ears. Affected infants may also have incomplete development of certain regions of the brain (e.g., the forebrain); kidney (renal)

malformations; and structural heart (cardiac) defects at birth (congenital). For example, characteristic heart defects may include an abnormal opening in the partition dividing the upper or lower chambers of the heart (atrial or ventricular septal defects) or persistence of the fetal opening between the two major arteries (aorta, pulmonary artery) emerging from the heart (patent ductus arteriosus). Many infants with Trisomy 13 Syndrome fail to grow and gain weight at the expected rate (failure to thrive) and have severe feeding difficulties, diminished muscle tone (hypotonia), and episodes in which there is temporary cessation of spontaneous breathing (apnea). Life-threatening complications may develop during infancy or early childhood.

Trisomy 18:

Trisomy 18 Syndrome is a rare chromosomal disorder in which all or a critical region of chromosome 18 appears three times (trisomy) rather than twice in cells of the body. In some cases, the chromosomal abnormality may be present in only a percentage of cells, whereas other cells contain the normal chromosomal pair (mosaicism).
Depending on the specific location of the duplicated (trisomic) portion of chromosome 18--as well as the percentage of cells containing the abnormality--symptoms and findings may be extremely variable from case to case. However, in many affected infants, such abnormalities may include growth deficiency, feeding and breathing difficulties, developmental delays, mental retardation, and, in affected males, undescended testes (cryptorchidism). Individuals with Trisomy 18 Syndrome may also have distinctive malformations of the head and facial (craniofacial) area, such as a prominent back portion of the head; low-set, malformed ears; an abnormally small jaw (micrognathia); a small mouth with an unusually narrow roof (palate); and an upturned nose. Affected infants may also have narrow eyelid folds (palpebral fissures), widely spaced eyes (ocular hypertelorism), and drooping of the upper eyelids (ptosis). Malformations of the hands and feet are also often present, including overlapped, flexed fingers; webbing of the second and third toes; and a deformity in which the heels are turned inward and the soles are flexed (clubfeet [talipes equinovarus]). Infants with Trisomy 18 Syndrome may also have a small pelvis with limited movements of the hips, a short breastbone (sternum), kidney malformations, and structural heart (cardiac) defects at birth (congenital). Such cardiac defects may include an abnormal opening in the partition dividing the lower chambers of the heart (ventricular septal defect) or persistence of the fetal opening between the two major arteries (aorta, pulmonary artery) emerging from the heart (patent ductus arteriosus). Congenital heart defects and respiratory difficulties may lead to potentially life-threatening complications during infancy or childhood.

Treacher-Collins Syndrome:

Treacher Collins Syndrome (aka mandibulofacial "dysostosis") is a rare inherited disorder characterized by distinctive abnormalities of the head and facial (craniofacial) area due to underdevelopment (hypoplasia) of certain portions of the skull (e.g., supraorbital rims and zygomatic arches). Although the symptoms and physical characteristics associated with Treacher Collins Syndrome can vary greatly in severity from patient to patient, craniofacial abnormalities tend to involve the cheekbones, jaws, mouth, ears, and/or eyes.
Craniofacial malformations associated with Treacher Collins Syndrome include underdeveloped (hypoplastic) or absent cheek (malar) bones; an incompletely developed, abnormally small lower jaw (mandibular hypoplasia and micrognathia); an unusually large mouth (macrostomia); malformations of the roof of the mouth (palate); and/or

dental abnormalities such as misaligned teeth (malocclusion). Affected infants may also have underdeveloped (hypoplastic) and/or malformed (dysplastic) ears (pinnae) with blind ending or absent external ear canals (microtia), resulting in hearing impairment (conductive hearing loss). In addition, infants with Treacher Collins Syndrome may exhibit abnormally downwardly slanted upper and lower eyelids (palpebral fissures), a notching (colobomas) from the outer third of the lower eyelids, and/or additional eye (ocular) abnormalities, resulting in varying degrees of visual impairment in some cases. Some individuals with the disorder have additional physical abnormalities. In approximately 40 percent of cases, Treacher Collins Syndrome is inherited as an autosomal dominant genetic trait, passed on by an affected parent. However, in about 60 percent of cases, a positive family history is not found. Such cases represent new genetic changes (mutations) that occur randomly, with no apparent cause (sporadic).

Tuberous Sclerosis:

a congenital heredofamilial disease, transmitted as an autosomal dominant trait, characterized principally by the presence of hamartomas of the brain ("tubers" TUBERS), retina ("phakomas" PHAKOMAS), and viscera, mental retardation, seizures, and adenoma sebaceum, and often associated with other skin lesions.

Turner Syndrome:

Turner Syndrome is a rare chromosomal disorder of females characterized by short stature and the lack of sexual development at puberty. Other physical features may include a webbed neck, heart defects, kidney abnormalities, and/or various other malformations. Normally, females have two X chromosomes. In some cases of Turner Syndrome, however, one X chromosome is missing from the cells (45,X); research studies suggest that approximately 40 percent of these individuals may have some Y chromosomal material in addition to the one X chromosome. In other affected females, both X chromosomes may be present, but one may have genetic defects. In still other cases, some cells may have the normal pair of X chromosomes while other cells do not (45,X/46,XX mosaicism). Although the exact cause of Turner Syndrome is not known, it is believed that the disorder may result from an error during the division (meiosis) of a parent's sex cells.

Urea Cycle Defect:

Very Low Birth Weight:

Less than 1,500 grams

Ventilator dependent for 72 hours or more:

Wardenberg Syndrome:

Werdnig-Hoffman Syndrome:

Wilson’s disease:

Wilson’s disease is a rare genetic disorder characterized by excess copper stored in various body tissues, particularly the liver, brain, and corneas of the eyes. The disease is

progressive and, if left untreated, it may cause liver (hepatic) disease, central nervous system dysfunction, and death. Early diagnosis and treatment may prevent serious long-term disability and life threatening complications. Treatment is aimed at reducing the amount of copper that has accumulated in the body and maintaining normal copper levels thereafter.

Zellweger Syndrome:

Zellweger Syndrome is a rare hereditary disorder affecting infants. It is characterized by reduction or absence of peroxisomes in the cells of the liver, kidneys, and brain. Unusual problems in prenatal development, an enlarged liver, high levels of iron and copper in the blood, and vision disturbances are among the major manifestations of Zellweger Syndrome.