APPENDIX A

HEALTH CONDITIONS

This appendix contains an explanation of symptoms and medications prescribed for common health conditions, diseases and disorders.

Appendix A -- Health Conditions

ALLERGIES

A collection of disease symptoms that develop in certain people after exposure to agents that produce no symptoms in the majority of people. Allergies are inappropriate or exaggerated reactions of the **immune system**. They occur only on second or subsequent exposures to the offending agent, after the first contact has sensitized the body. Many common illnesses, such as **asthma** and allergic **rhinitis** *(hay fever)*, are caused by allergic reactions.

CAUSES

Allergies may be caused by exposure of the skin to a chemical, of the respiratory system to particles of dust or pollen, or of the stomach and intestines to a particular food. The function of the immune system is to recognize **antigens** *(foreign proteins)* contained on the surfaces of microorganisms *(such as viruses and bacteria)* and to form **antibodies** *(also called immunoglobins)* and sensitized white blood cells *(called **lymphocytes**)* that will interact with these antigens when next encountered, leading to destruction of the microorganisms.

In allergies, a similar process occurs, except that the immune system forms antibodies or sensitized lymphocytes against harmless substances because it mistakenly identifies these allergens (as these substances are called) as potentially harmful antigens.

The inappropriate or exaggerated reactions seen in allergies, termed **hypersensitivity** reactions, are the result of any of four different mechanisms *(termed Types I through IV hypersensitivity reactions)*. Most allergies are of the Type I variety *(also known as anaphylactic or immediate hypersensitivity)*.

Common allergens that can cause Type I reactions include flowers, grasses, tree pollens, animal dander *(tiny particles of skin and hair)*, house dust, house-dust mites, yeasts, certain drugs and foods, and constituents of bee and wasp venom. Of the food allergens, the most common are milk, eggs, shellfish, dried fruits, nuts, and certain food dyes. These allergens provoke the immune system to produce specific antibodies, belonging to a type called **immunoglobulin E** *(IgE)*, which coat cells present in the skin and the lining of the stomach, lungs, and upper respiratory airways. When the allergen is encountered for the second time, it binds to the IgE antibodies and causes granules in the cells to release several different chemicals, which are responsible for the symptoms of the allergy.

It is not known why certain individuals and not others get allergies, although about one person in eight seems to have an inherited predisposition to have allergies. Certain mild deficiencies of the immune system are associated with allergy. Environmental conditions are sometimes involved; a child living in a house with a cat or dog may slowly become sensitized to the pet, and an allergic reaction such as hives or asthma may develop. Exposure to some viruses may precipitate or

increase allergic responses. Emotional factors are also thought to contribute to allergic diseases such as asthma.

SYMPTOMS

Symptoms may be restricted to the skin (itchy swelling or rash), upper airways (inflammation or mucus secretion, sneezing in hay fever, and spasm and narrowing of the airways in asthma), eyes (inflammation), or stomach and intestines (vomiting and diarrhea). Or the symptoms may affect several organs, especially when the allergies are to injected drugs, insect venom, or certain foods.

Particular illnesses associated with Type I reactions include asthma, hay fever, **urticaria** *(hives)*, **angioedema, anaphylactic shock** *(a severe, generalized allergic reaction)*, possible atopic **eczema**, and many types of food allergy producing immediate symptoms.

TREATMENT

Immunotherapy can be valuable for people who suffer allergic reactions to insect venom, house-dust mites, and some pollens. Gradually increasing doses of the allergen are given to promote the formation of antibodies that will then block future adverse reactions. The therapy is effective in about two-thirds of the cases, but usually requires two to three years of treatment.

Drug treatment for allergic reactions includes the use of **antihistamine drugs**, which relieve the symptoms *(the itching produced by an insect bite, for example)*. Most available antihistamine drugs are sedative, which is particularly useful in treating the itching due to eczema because they permit the sufferer to sleep more soundly. Several of the newer antihistamines do not cause drowsiness.

Other drugs, such as cromolyn sodium and **corticosteroid drugs**, can be taken regularly to prevent symptoms from developing. Corticosteroid creams are useful for treating eczema, but prolonged use on the same area can damage the skin. In severe allergic diseases, such as asthma, the use of oral corticosteroids may be necessary.

PREVENTION

Whenever possible, the most effective prevention for an allergy attack is avoidance of the relevant allergen. For example, anyone with an allergy to eggs should avoid eating eggs or any dishes containing eggs as an ingredient. If pollen is the allergen, it may be harder to avoid; measures such as keeping car windows closed while driving and closing bedroom windows at night afford some protection.

AMPUTATION

Surgical removal of part or all of a limb, usually to prevent **gangrene** *(death and decay of tissue)* or infection. Amputation may be performed to prevent the spread of bone cancer or malignant **melanoma** *(a skin cancer)*.

CAUSES

Until the introduction of antibiotics in the early 1940's, amputation was a common operation, especially in wartime. It was the only means of preventing gangrene when an open fracture *(one in which the broken bone is exposed)* became infected.

TREATMENT

Today, the use of antibiotics to treat infected wounds means amputation is restricted mainly to severe cases or arterial disease. Eighty-five percent of the 25,000 amputations performed in the US each year are carried out on patients with **peripheral vascular disease**, in which a combination of **atherosclerosis** and **thrombosis** may completely block the blood supply to a limb, causing gangrene.

ANEMIA

A condition in which the concentration of the oxygen-carrying pigment **hemoglobin** in the blood is below normal. Hemoglobin molecules are carried inside red **blood cells** and function to transport oxygen from the lungs to the tissues. Under normal circumstances, stable hemoglobin concentrations in the blood are maintained by strict balance between red-cell production in the bone marrow and red-cell destruction in the spleen. Anemia may result if this balance is lost.

CAUSES

By far the most common form of anemia worldwide is due to a deficiency of iron, an essential component of hemoglobin. However, there are numerous other causes of anemia, which is not a disease itself but a feature of many different diseases and disorders.

Red blood cells are formed in the bone marrow over a period of about five days from less specialized cells called stem cells. During this time, the cells change their appearance and accumulate hemoglobin. The red cells released from the bone marrow into the blood are called reticulocytes. Over a few days, reticulocytes mature into adult red blood cells. The adult cells circulate in the bloodstream for about 120 days; they age and are eventually trapped in small blood vessels *(mainly in the spleen)* and destroyed.

Anemia can be classified into two categories: those caused by decreased or defective production of red cells by the bone marrow and those caused by decreased survival of the red cells in the blood.

SYMPTOMS

Symptoms common to all forms of anemia result from the reduced oxygen-carrying capacity of the blood. The severity of the symptoms depends on how low the hemoglobin concentration in the blood is. A concentration below 10g/100ml can cause headaches, tiredness, and lethargy. Concentrations below 8 g/100ml can cause breathing difficulty during exercise, dizziness (due to a reduced oxygen supply reaching the brain), **angina pectoris** (due to a reduced oxygen supply to

the heart muscle), and palpitations (as the heart works harder to compensate). General signs include pallor, although this is not a reliable indicator of the severity of the anemia.

TREATMENT

Aplastic anemia- Occurs when failed formation and division of stem cells in the marrow causes a drop in the number of red and other blood cells. For this type of anemia, transfusions of red cells and platelets are given until the marrow returns to its normal state.

Iron-deficiency anemia- Occurs when a ack of iron prevents the bone marrow from making sufficient hemoglobin for the red cells. The cells produced are small and pale-centered and have a reduced oxygen-carrying capacity. The treatment is a course of iron tablets or injections to build up the depleted iron stores.

Hemolytic anemia- Includes all anemias in which the rate of red-cell production is normal or high but in which the cells are destroyed at a much faster rate than normal. Treatment depends on the cause of this anemia; if inherited, this type is treated by removal of the main site of destruction of the red cells (the spleen). If caused by immune or autoimmune processes, this type of anemia can be controlled through the use of *immunosuppresant drugs*.

Megaloblastic anemia- Occurs when a deficient supply of certain vitamins causes the bone marrow to produce red cells that are larger than normal and have a reduced oxygen-carrying capacity. When due to poor diet, this type of anemia can be treated with a normal diet and a course of vitamin B12 injections.

ARTHRITIS

Inflammation of a joint, characterized by pain, swelling, stiffness, and redness. Arthritis is not a single disorder but the name of joint diseases that can develop from a number of causes. Arthritis may involve one joint or many and can vary from a mild ache and stiffness to severe pain and, later, joint deformity.

CAUSES

Osteoarthritis, also known as degenerative arthritis, is the most common type of arthritis. Caused by wear and tear on the joints, it develops in middle age and most commonly troubles older people.

Rheumatoid arthritis, the most severe type of inflammatory joint disease, is an **autoimmune disorder** in which the body's **immune system** acts against and damages joints and surrounding soft tissue. Joints (most commonly in the hands, feet, and arms) become painful, stiff, and deformed.

TREATMENT

There are specific treatments for the different types of arthritis. For example, **antibiotic drugs**

are given for septic arthritis, **anti-inflammatory drugs** are used for treating rheumatoid arthritis and osteoarthritis, and allopurinol is prescribed for gout. Other drugs are used for treating the different forms of arthritis, but none seems able to effect a cure.

In a severe attack of arthritis affecting several joints, bed rest will help settle the inflammation. Individual joints can be splinted to reduce the pain, and heat and supervised exercises help keep the deformity in the joints to a minimum. Obese people with arthritis in weight-bearing joints should lose weight. Diseased joints that have become extremely painful, unstable, or deformed may require **arthroplasty** *(replacement of the joint with an artificial substitute)* or **arthrodesis** *(fusion of the bones in the joint)*.

ASTHMA

Recurrent attacks of breathlessness, characteristically accompanied by wheezing when breathing is exhaled and varying in severity from day to day and from hour to hour. The illness frequently starts in childhood and tends to clear up or become less severe in early adulthood.

The familiar form of asthma is more correctly called bronchial asthma; this use of the full name distinguishes it from a condition associated with wheezing caused by heart failure.

CAUSES

Asthma is of two main types: extrinsic, in which an allergy *(usually to something inhaled)* triggers an attack, and intrinsic, in which there is no apparent external cause.

The most common allergens responsible for asthma are pollens, which often also cause allergic **rhinitis** *(hay fever)*. Other common allergens include household dust, house-dust mites, animal fur, dander, or feathers. Extrinsic asthma may also be triggered by a respiratory infection *(such as a cough, cold, or bronchitis)*, by exercise *(especially in cold air)*, by tobacco smoke or other air pollutants, and by allergy to a particular food or drug.

Intrinsic asthma tends to develop later in life than extrinsic asthma, with the first attack often following a respiratory-tract infection. Emotional factors, such as stress or anxiety, may precipitate attacks.

About 1 in 20 of the overall population is asthmatic. The prevalence among children is much greater- about 1 in 10. Heredity is a major factor in the development of extrinsic asthma. Asthma seems to be becoming more common in the US and other developed countries.

SYMPTOMS

Asthmatic attacks vary greatly in their severity, ranging from a slight breathlessness to respiratory failure. The main symptoms are breathlessness, wheezing, a dry cough, sometimes brought on by

exercise, and a feeling of tightness in the chest. Attacks may be most frequent in the early morning.

TREATMENT
Once an attack has started, a prophylactic (preventative) drug, has limited effects and a **bronchodilator** *(a drug that relaxes and widens the airways)*, such as albutrol, must be used. Most asthmatic people learn to administer the drug themselves with a hand-held plastic inhaler.

An inhaler loses its effectiveness after a certain period *(the date is marked on the container)*, so it is essential for the asthmatic person to renew his or her supply regularly.

Oral theophylline preparations are also used preventively for their bronchodilating properties.

PREVENTION
Although there is no cure for asthma, attacks can be prevented to a large extent. For sufferers of extrinsic asthma, tests are available to discover whether any of the common allergens is responsible for triggering attacks. If a specific cause is discovered, steps can be taken to avoid it. For example, if pollen is the cause, the person will need to avoid gardens, parks, and the countryside during pollen season.

Immunotherapy *(a course of injections of the allergen)* can be performed, but it has a limited success rate. Much more successful in preventing attacks are prophylactic *(preventative)* drugs, such as cromolyn sodium and inhaled **corticosteroid drugs**. To be effective, they must be taken several times daily, usually through an inhaler.

BEDSORES

Ulcers that develop on the skin of patients who are bedridden, unconscious, or immobile. Also known as decubitus ulcers or pressure sores, they commonly affect victims of stroke or spinal cord injuries that result in a loss of sensation. Constantly wet skin, caused by incontinence, may also be a factor.

Bedsores start as red, painful areas that become purple before the skin breaks down, developing into open sores. Once the skin is broken, they often become infected, enlarge, deepen, and are very slow to heal.

Six Stages:

- 1st - skin redness
- 2nd - redness, edema, some blistering
- 3rd - necrotic with exposure of fat
- 4th - necrosis through skin and fat to muscle
- 5th - further fat and muscle necrosis (larger)
- 6th - bone destruction osteomyelitis, pathologic Fx septicema

TREATMENT
Once a bedsore has developed, it will heal only if pressure on it is minimized. Deep, chronic ulcers may require treatment with antibiotics, packing with plastic foam, and possibly **plastic surgery**. New medications for topical application to the skin are constantly being evaluated.

PREVENTION
Good nursing care of a bedridden, immobile patient is crucial. The patient's position should be changed at least every two hours, and it is important to wash and dry pressure areas carefully, especially if there is incontinence. Barrier creams can be used for additional protection.

CANCER

Any group of diseases in which symptoms are due to the unrestrained growth of cells in one of the body organs or tissues. Most commonly, malignant tumors develop in major organs, such as the lungs, breasts, intestines, skin, stomach or pancreas, but they may also develop in the nasal sinuses, the testes or ovaries, or the lips or tongue. Cancers may also develop in the blood-cell-forming tissues of the bone marrow *(the **leukemias**)* and in the lymphatic system, muscles, or bones. Cancer is the second most common cause of death in the US, accounting for about one-fifth of total deaths.

Cancers are not the only type of abnormal growth, or **neoplasm**, that occur in the body. However, a cancer differs from a **benign** tumor, such as a **wart** or a **lipoma**, in two important ways. As it grows, it spreads and infiltrates the tissues around it and may block passageways, destroy nerves, and erode bone. Cells from the cancer may spread via the blood vessels and lymphatic channels to other parts of the body, where these (**metastases**) form new, satellite tumors that grow independently.

Years may pass before the growth of cells becomes large enough to cause symptoms, although the rate of growth varies according to the tissue of origin. Current estimates suggest that some cancers of the lung and breast have been present for more than five years before they cause symptoms. During this "occult" phase, metastases may be seeded in the liver, lungs, bones, or brain, and, in these circumstances, surgical cure is impossible because the cancer has already spread far beyond the primary site of the organ.

CAUSES
The growth of a cancer begins when the **oncogenes** *(genes controlling cell growth and multiplication)* in a cell or cells are transformed by agents known as **carcinogens.**

Once a cell is transformed into a tumor-forming type *(malignant transformation)*, the change in its oncogenes is passed on to all offspring cells. A small group of abnormal cells is thus established, and they divide more rapidly than the normal surrounding cells. Usually the abnormal cells show a lack of **differentiation**, that is, they no longer perform the specialized task of the

cells of the host issue and may escape the normal control of hormones and nerves. Thus they are in effect parasites, contributing nothing to their host tissue but continuing to consume nutrients.

Smoking is particularly implicated in lung and bladder cancers, alcohol in cancers of the tongue, pharynx, and esophagus. Sexual and reproductive behavior affects the risk of cervical cancer *(the more sexual partners a woman has, the higher the risk)* and of breast cancer *(having children while relatively young protects against this cancer)*. Note the importance of dietary factors:

35%	Natural constituants of food (estimate)
30%	Tobacco
7%	Sexual and reproductive history
4%	Occupational hazards
3%	Alcohol
1%	Food additives
20%	Unknown

SYMPTOMS

The range of symptoms that may be produced by cancers is vast, depending on the site of the growth, the tissue of origin, and the extent of the growth. Symptoms may be a direct feature of the growth *(e.g., lumps or skin changes)*. They may be or derived from obstruction or bleeding into passageways, such as the lung airways, gastrointestinal tract, or urinary tract, or from disruption of the function of a vital organ.

Tumors pressing on or disturbing nerve tracts can cause nervous system disorders and pain. Some tumors lead to the overproduction of hormones, with complications and effects far distant from the site of the growth. Unexplained weight loss is a feature of many types of cancer.

TREATMENT

The treatment of many cancers is still primarily surgical; excision of an early tumor will often give a complete cure. Because there may be small, undetectable metastases at the time of operation, surgery is commonly combined with **radiation therapy** and **anti-cancer drugs**. The aim of these treatments is to suppress, or arrest, the rate of cell division in any tumor cells left after surgery. Anticancer drugs often have unpleasant side effects because targeting specific drugs effectively is sometimes difficult, and normal cells and tissues may be disrupted along with the tumor cells.

CATARACT

Loss of transparency of the lens of the eye. The name arose many centuries ago from the fanciful idea that the whiteness behind the pupil was a kind of waterfall descending from the brain. In fact, the white appearance is due to changes in the delicate protein fibers within the lens, in a manner similar to those occurring in eggs when they are boiled.

A cataract never causes complete blindness, because even a densely opalescent lens will still transmit light. However, with increasing loss of transparency, the clarity and detail of the image is progressively lost. Even at a fairly advanced stage, a cataract may not be apparent to an external observer, and it is only when the front part of the crystalline lens becomes densely opaque that whiteness is visible in the pupil. Cataracts usually occur in both eyes, but in most cases one eye is more severely affected than the other.

Almost everyone over the age of 65 has some degree of cataract, but usually the opacification is minor and often confined to the edge of the lens, where it does not interfere with vision. Opacification tends to progress with age, so that the majority of people over 75 have minor visual deterioration from cataract. Cataract in the elderly is so common that it is considered almost normal.

CAUSES

The majority of cataracts occur in old age; the cause in these cases is unknown. Progressive hardening of the center of the lens and increased permeability to water of the lens capsule *(shell)* occur in the natural aging process. Both lead to protein changes. Severe **diabetes mellitus**, with high blood sugar levels, can be associated with cataracts in young people. Finally, almost any form of radiation *(other than light)*, including infrared, microwave, and X rays, can cause cataracts to develop.

SYMPTOMS

The main symptom is a progressive loss of visual acuity with increased blurring of vision. Often the opacities in the lenses cause scattering of light rays and, even at a
fairly early stage, this may seriously affect night driving. Many patients, however, are barely aware of these effects and notice only that they cannot see as well as before.

TREATMENT

Once a lens has developed a cataract, there is no possible way of reversing the change and restoring transparency and vision by means of medication. If normal clear images are to be perceived, the lens must be removed and the refracting power of the eye restored either by means of a substitute *(implant)* lens or with a special type of contact lens. Cataract extraction is one of the less complex and most successful operations in all surgery. The expectation of an excellent result, provided the eye is otherwise healthy, is well over 90 percent.

CHRONIC OBSTRUCTIVE LUNG DISEASE

This lung disease is a combination of **chronic bronchitis** and **emphysema**, in which the airflow into or out of the lungs is persistently interrupted. This disease is also referred to as chronic obstuctive pulmonary disease. (See emphysema)

CIRRHOSIS

A disease of the liver caused by chronic damage to its cells. Bands of **fibrosis** *(internal scarring)* break up the normal structure of the liver. The surviving cells multiply to form regeneration nodules *(islands of living cells separated by scar tissue)*. Because these nodules are inadequately supplied with blood, liver function is gradually impaired ; for example, the liver no longer effectively removes toxic substances from the blood. The distortion and fibrosis of the liver leads to **portal hypertension** *(high blood pressure in the veins from the intestines and spleen to the liver)*, which can cause serious complications.

In the US, about one in 70 people dies as a direct result of chronic liver disease and cirrhosis, for a total of about 30,000 deaths each year.

CAUSES

Heavy alcohol consumption is the most common cause of cirrhosis both in Europe and the US; it is an increasing problem in most developed countries. The risk relates to the amount of alcohol consumed rather than the type, and women are more susceptible than men. Another cause of cirrhosis is **hepatitis** *(inflammation of the liver)*. Chronic viral hepatitis *(particularly that due to hepatitis B virus)* is the most common cause of cirrhosis in the Middle and Far East and Africa.

SYMPTOMS

There may be no early symptoms of cirrhosis; the disease may be discovered initially during a routine medical examination or blood test because of some abnormality. The most common symptoms are mild **jaundice, edema** *(fluid collection in the tissues)*, mental confusion, and **hematemesis** *(vomiting of blood)*. In men, enlargement of the breasts and loss of body hair are thought to be due to an abnormality in the sex hormone balance caused by liver failure and associated with cirrhosis.

TREATMENT

The cirrhotic process itself can be treated by slowing the process causing liver-cell damage. Abstinence from alcohol can lead to substantial improvement, and in some cases specific treatment for the underlying cause may be available. Diuretics *(drugs that increase the production of urine)* are used to control such complications as **ascites** *(collections of fluid in the abdominal cavity)*. In extreme cases, a *liver transplant*, if available, may offer the only chance for a long-term cure.

DEHYDRATION

A condition in which a person's water content has fallen to a dangerously low level. Water accounts for about 60 percent of a man's weight and 50 percent of a woman's weight, and the total water content must be kept within fairly narrow limits for healthy functioning of cells and tissues.

The concentration in the body's fluids of mineral salts and other dissolved substances also must be kept within a narrow range. In many cases of dehydration, salt will have been lost as well as water.

CAUSES

Normally, dehydration is prevented by the sensation of thirst, which encourages a person to drink when the body is short of water. This mechanism may fail because water is not available or because the body has sustained high losses of water.

Even in a temperate climate, a minimum of three pints of water continues to be lost every 24 hours through the skin via perspiration, from the lungs into the air, and in the urine to rid the body of waste products. Severe dehydration is likely to develop within a few days if no water is taken. Large amounts of water may be lost in vomit or diarrhea, particularly if the diarrhea is profuse and watery *(as in cholera)* or in the urine of anyone with uncontrolled **diabetes mellitus, diabetes insipidus,** and some types of **renal failure**. In all these cases, the thirst sensation may not encourage sufficient water intake to balance the losses.

SYMPTOMS

Symptoms and signs of water depletion include severe thirst, dry lips and tongue, an increase in heart rate and breathing rate, dizziness, confusion, and eventual coma. The skin looks dry and loses its elasticity. Any urine passed is small in amount and dark-colored. If there is salt depletion *(usually as a result of heavy sweating, vomiting, or diarrhea)*, there may be lethargy, headaches, cramps, and pallor.

TREATMENT

Once dehydration has developed, fluid and salt replacement may be required at a far faster rate than that required to simply prevent dehydration. Sometimes, fluids must be given intravenously, and the water/salt balance requires careful monitoring with blood tests and adjustment.

PREVENTION

For those living in a hot climate or suffering from a fever, vomiting, or diarrhea, the simplest rule is to drink enough water to produce urine that is consistently pale. This often means drinking well beyond the point of thirst (possibly a pint of water every hour during the heat of the day).

Salt losses from heavy sweating need to be replaced either in the diet or by the addition of a quarter teaspoon of table salt to each pint of drinking water. Bottled mineral water can help maintain the intake of salts. For vomiting and diarrhea, special salt and glucose rehydration mixtures to be added to water may be purchased from drugstores.

DEMENTIA

Usually due to brain disease, dementia is progressive. The most obvious feature of dementia is increasing intellectual impairment, and a general decline in all areas of mental ability. It is the

great health problem of modern developed societies, since long life is creating an increasingly large proportion of elderly citizens. Ten percent of those over the age of 65 and 20 percent of those over the age of 75 are affected to some degree.

CAUSES

Traditionally, dementing illnesses were divided into presenile *(under 65 years of age at onset)* and senile *(over 65 years)*. This is now regarded as an artificial division, although treatable causes are more common in the younger age group. Treatable causes include head injury, pernicious anemia, encephalitis, myxedema, syphilis, brain tumor, and alcoholism.

Such "reversible" illnesses account for only about ten percent of dementias. The great majority of them result from **cerebrovascular disease** *(including strokes)* and from **Alzheimer's disease**. While the former can sometimes be helped by treatment of hypertension *(high blood pressure)* or heart disease, the recurrent loss of blood supply to the brain is often due to narrowed or blocked arteries within the brain, and a gradual deterioration occurs. Alzheimer's disease is at present completely irreversible, consisting as it does of a gradual loss of brain cells and shrinkage of the brain substance.

SYMPTOMS

The person with dementia may not remember recent events, may become easily lost in a familiar neighborhood, may fail to grasp what is going on, and may become confused over days and dates. These symptoms tend to come on gradually and may not be noticed right away. People also tend to cover up their problems by **confabulation** *(making up stories to fill the gaps in their memories)*. Sudden emotional outbursts or embarrassing behavior *(such as urinating in public)* may be the first obvious signs of the illness.

Commonly the person's failures in judgment result in the magnification of his or her unpleasant personality traits. Family members may have to endure unreasonable demands, accusations, pilfering, and even physical assault. Paranoid and depressive illnesses with psychotic **delusions** may occur as dementia worsens. Irritability or anxiety, with the patient retaining some awareness of his or her emotional state, alters to a shallow indifference toward all feelings.

Personal habits deteriorate, clothes and possessions become soiled and dirty, and speech becomes incoherent. Demented individuals lapse into "second childhood" and require total nursing care of their feeding, toilet, and physical activities.

TREATMENT

While appropriate treatment of certain illnesses is effective in arresting decline *(such as surgery for a brain tumor or thyroid replacement for myxedema)*, management of the most common, Alzheimer-type illness is based mostly on the treatment of symptoms. The patient should be kept clean and well nourished in comfortable surroundings with good nursing care, and sedatives should be given for obvious restlessness or paranoid beliefs.

These measures can help ease the distress of both patient and family. A transfer to suitable hospital or custodial care must be sensitively timed and organized. Research into medication to alleviate memory loss and intellectual decline has shown some promise, but no truly effective treatment is yet commercially available.

DIABETES INSIPIDUS

A rare condition characterized by the passing of enormous quantities of dilute urine *(polyuria)* and excessive thirst *(polydipsia)*. These symptoms also occur, in a milder form, early in **diabetes mellitus**, a much more common disease that in all other respects is different from diabetes insipidus.

CAUSES

Diabetes insipidus usually results from a failure of the **pituitary gland** to secrete the antidiuretic hormone *(ADH)*. Normally, this hormone diminishes the amount of water passed by the kidneys into the urine to maintain a constant dilution of the blood. Diseases of the pituitary, including damage from injury or a tumor, can cause a failure of secretion.

SYMPTOMS

A person with diabetes insipidus may pass between 10 and 40 pints of urine every 24 hours-provided this output is matched by a similar intake of water. If water is unobtainable or withheld, the signs and symptoms of **dehydration** will appear, followed by confusion, stupor, and coma.

TREATMENT

A patient is treated with a synthetic variety of antidiuretic hormone, such as *Vasoppressin*.

DIABETES MELLITUS

A disorder in which the pancreas produces insufficient or no **insulin**, the hormone responsible for the absorption of glucose into cells for their energy needs and into the liver and fat cells for storage. As a result, the level of glucose in the blood becomes abnormally high, causing excessive urination and constant thirst and hunger. Diabetes mellitus also results in disordered **lipid** metabolism and accelerated degeneration of small blood vessels.

Apart from the symptoms of thirst and excessive urination, the disease has nothing in common with **diabetes insipidus**. There are two main types of diabetes mellitus. Insulin-dependent *(type I)* diabetes, the more severe form, usually first appears in people under the age of 35 and most commonly in people between the ages of 10 and 16. It develops rapidly. The insulin-secreting cells in the pancreas are destroyed, probably as a result of an **immune response** after a virus

infection, and insulin production ceases almost completely. Without regular injections of insulin, the sufferer lapses into a coma and dies.

The other main type, non-insulin-dependent *(type II)* diabetes, usually has a gradual onset and occurs mainly in people over 40. In many cases it is discovered during a routine medical examination. Insulin is produced, but not enough to meet the body's needs, especially if the person is overweight. Often the body is resistant to the effects of insulin. In most cases, insulin-replacement injections are not required; the combination of dietary measures, weight reduction, and oral medication controls the condition.

In the US about two persons per 1,000 have insulin-dependent diabetes by the age of 20; overall, the insulin-dependent form affects about 150 to 200 persons per 100,000. Non-insulin-dependent diabetes is more common, with as many as 2,000 persons per 100,000 affected.

CAUSES

Diabetes mellitus tends to run in families. However, of those who inherit the genes responsible for the insulin-dependent form, only a small proportion eventually develop the disease. In these cases the disorder possibly occurs as the delayed result of a viral infection that had damaged the pancreas years earlier.

In the case of non-insulin-dependent diabetes, the greater proportion of people predisposed to the disease by heredity *(primarily those who are overweight)* go on to acquire it. Although obesity is the primary cause of unmasking latent diabetes, other causes that can unmask or aggravate diabetes are certain illnesses *(among them **pancreatitis and thyrotoxicosis**)*, certain drugs *(including some corticosteroids and some diuretics)*, infections, and pregnancy.

TREATMENT

In people with insulin-dependent diabetes, treatment consists of regular self-injections, one to four times a day, with insulin *(either obtained from animals or of a human type synthesized by **genetic engineering**)*. In addition, the person must follow a diet in which carbohydrate intake is regulated and spread out over the day according to a consistent timetable. In this way, marked fluctuations in the glucose levels in the blood can be avoided. Also, overexertion should be avoided, and new exercise programs must be carefully regulated, because exercise can change glucose levels.

In people with non-insulin-dependent diabetes, treatment may consist of oral medications such as *Tolinase, Orinase, and Diabinese.*

Disturbances in the careful balance between insulin and glucose intake can result in **hyperglycemia** *(too much glucose in the blood)*, which causes the symptoms of the untreated disease, or **hypoglycemia** *(too little glucose)*, which can lead to weakness, confusion, dizziness, sweating, and even unconsciousness and seizures. To help prevent this, diabetics *(of both types)* are advised to regularly monitor their blood and urine glucose levels with do-it-yourself testing kits.

DIALYSIS

A technique used to remove waste products from the blood and excess fluid from the body as a treatment for **renal failure** *(kidney failure)*. Dialysis takes over the function of the kidneys until they start working normally again. In acute, chronic cases, dialysis can function for the kidneys for the rest of a person's life.

The main function of the kidneys is the maintenance of **electrolyte** and water balance and the excretion of waste products. Fully one-fifth of the blood pumped by the heart goes to the kidneys; the kidneys filter approximately 150 liters of blood daily. From this volume of blood, the kidneys reabsorb important elements, such as sodium, potassium, calcium, amino acids, glucose, and water. The kidneys excrete, as urine, the protein breakdown product nitrogen in the form of urea, as well as other excess minerals, toxins, and drugs.

In people whose kidneys have been damaged, this process may fail-either suddenly *(in acute renal failure)* or gradually *(in the chronic form of the disease)*. Wastes start to accumulate in the blood, with harmful, sometimes life-threatening effects. In severe cases, the function of the kidneys must be taken over by the artificial means of dialysis.

In cases of acute kidney failure, dialysis continues until the kidneys recover and start functioning normally again. However, in chronic kidney failure, patients may need to undergo dialysis for the rest of their lives or until they can be given a **kidney transplant**. Dialysis therapy may not always be chosen by the patient and physician when kidney failure is simply a part of an otherwise rapidly fatal disorder.

TREATMENT

Two methods of dialysis are used to treat renal failure. Hemodialysis, which was pioneered in the 1940's, removes wastes by passing blood through an artificial kidney machine. In most cases, hemodialysis is performed in hospitals or outpatient dialysis centers.

Peritoneal dialysis, which was developed in the early 1970's, makes use of a natural filtering membrane within the body's abdomen. Peritoneal dialysis may be performed in a hospital, but an increasing number of patients are now able, once the catheter has been inserted into the abdomen, to carry out the dialysis themselves at home, a procedure known as *continuous ambulatory peritoneal dialysis*.

Long-term dialysis enables people who would once have died from chronic kidney failure to live relatively normal lives. Their diet and fluid intake must be restricted somewhat and they may not feel completely well. Since the patient's health is invariably affected in the long run, many physicians feel that dialysis should be replaced with a kidney transplant, which, if successful, can bring about a dramatic restoration of general health.

DIZZINESS

A sensation of unsteadiness and lightheadedness. It may be a mild, brief symptom that occurs by itself, or it may be part of a more severe, prolonged attack of **vertigo** *(which is characterized by a sensation of spinning, either of oneself or of the surroundings)*, and is accompanied by nausea, vomiting, sweating or fainting.

CAUSES

Most attacks of dizziness are harmless and are caused by a momentary fall in the pressure of blood to the brain, as can occur, for example, when a person gets up quickly from a sitting or lying position *(a phenomenon called **postural hypotension**)*.

Postural hypotension is more common in the elderly and in people taking drugs to treat **hypertension** *(high blood pressure)*. Similar symptoms may result from a temporary, partial blockage in the arteries that supply the brain-a **transient ischemic attack**.

Other common causes of dizziness include tiredness, stress, fever, **anemia, heart block** *(impairment of the conduction of excitatory impulses through the heart muscle, causing slow, uncoordinated beating of the individual chambers)*, **hypoglycemia**, *(low blood sugar level)*, and **subdural hemorrhage** and **hematoma** *(bleeding between the outer two membranes that cover the brain)*.

Dizziness that is associated with vertigo is usually due to a disorder of the inner ear, **acoustic nerve**, or **brain stem**. The principal disorders of the inner ear that can cause dizziness and vertigo are **labyrinthitis** and **Meniere's disease**.

In labyrinthitis, the labyrinth *(the fluid-filled canals within the inner ear that play a vital role in balance)* becomes inflamed, usually as a result of a viral infection. In severe cases, any movement of the head can cause vomiting and fainting. In Meniere's disease, a degenerative disease of the ear, the dizziness and vertigo are often associated with hearing loss and **tinnitus**.

Disorders of the acoustic nerve are relatively rare causes of dizziness and vertigo. They include *acoustic neuroma* and cases of *meningitis* in which the acoustic nerve is affected. Disorders of the brain stem (specifically the part of the brain stem that connects with the acoustic nerve) that can cause dizziness and vertigo include narrowing of the blood vessels that supply this part of the brain stem *(a condition called vertebrobasilar insufficiency)*; cases of migraine that involve blood vessels in the brain stem; and brain tumors that press on the brain stem.

TREATMENT

Brief episodes of mild dizziness usually clear up after a few deep breaths, or, if this fails, after a brief rest. Severe, prolonged, or recurrent dizziness should be investigated by a physician, who will try to determine the cause from a description of symptoms, examination of the ears, and, in some cases, further diagnostic tests.

In certain cases of dizziness and vertigo caused by a disorder of the inner ear, the physician may treat the patient by prescribing **antiemetic** or **antihistamine drugs** *such as Dimetab, Dramamine, and Benadryl.*

ELECTROLYTE

A substance whose molecules dissociate *(split)* into its constituent **ions** *(electrically charged particles)* when dissolved or melted. For example, sodium chloride *(table salt)* dissociates into positive sodium ions and negative chloride ions when dissolved in water. Ions that play an important role in regulating body processes include sodium, potassium, hydrogen, magnesium,

calcium, bicarbonate, phosphate, and chloride. An **electrolyte imbalance** can occur if the equilibrium of these ions is disturbed.

EMPHYSEMA

A disease in which the alveoli *(tiny air sacs)* in the lungs become damaged. The disorder is characterized by shortness of breath and in severe cases can lead to respiratory and/or heart failure.

Several hundred people per 100,000 in the US suffer from some degree of emphysema. About 30 people per 100,000 in the US each year die from chronic obstructive lung disease; of these, about six deaths are ascribed to emphysema alone.

CAUSES
In almost all cases, emphysema is caused by cigarette smoking. Atmospheric pollution is sometimes a predisposing factor. In rare cases, an inherited predisposition to emphysema is due to a deficiency of a chemical called alpha-antitrypsin in the lungs; the disease appears early in life, but its development is hastened and intensified by smoking.

The alveoli, of which there are many millions in each lung, are groups of air sacs at the end of the bronchioles *(tiny air passages)*. Through their thin walls, inhaled oxygen is passed into the bloodstream and carbon dioxide is removed from the capillaries to be breathed out.

Tobacco smoke and other air pollutants are believed to cause emphysema by provoking the release of chemicals within the alveoli that damage the alveolar walls. Alpha-antitrypsin is thought to protect against this chemical damage; hence, the effect on people with a deficiency of this substance is particularly severe. The damage is slight at first, but in heavy smokers it becomes progressively worse, the alveoli bursting and bleeding to form fewer, larger sacs with less surface area, and with consequent impairment of oxygen and carbon dioxide exchange. Over the years, as the lungs become less and less elastic, their efficiency is further reduced.

Emphysema is often accompanied by **chronic bronchitis**, also brought on by air pollutants and

smoking. Emphysema and chronic bronchitis together are sometimes called chronic obstructive lung *(or airways)* disease.

SYMPTOMS

Initially, and for a considerable time in mild cases, there may be no symptoms, but as the disease progresses it results in increasing shortness of breath. At first this may be noticed only when climbing stairs or steep inclines, but gradually it becomes more severe until eventually it occurs after only mild exercise or is present even at rest.

A sign of emphysema is a barrel-shaped chest, associated with air being trapped in the outer part of the lungs. There may also be a chronic cough (caused by accompanying bronchitis) and a slight wheeze.

TREATMENT

Because emphysema is incurable-lung tissue that has been damaged cannot be replaced-treatment can only control the disease. This means preventing more damage to the lungs by a total and lifelong ban on smoking, and improving the efficiency of remaining lung tissue, which is done in various ways. **Bronchodilator drugs** are given to widen the bronchi *(the airways linking the windpipe to the lungs)* and the bronchioles. These drugs can be taken by means of a hand-held aerosol inhaler or an electric operated **nebulizer** that produces a fine spray.

Occasionally, **corticosteroid drugs**, taken by inhaler to reduce inflammation in the lungs are also beneficial. *Theophylline* is a common bronchodilator and *Cortone* is a cortiocosteroid drug used in treatment.

GALLSTONES

Round or oval, smooth or faceted lumps of solid matter found in the gallbladder (the sac under the liver where the bile is stored and concentrated). Gallstones are sometimes found in the bile ducts (which connect the gallbladder and liver to the duodenum). In these cases, the symptoms can be severe.

There may be between 1 and 10, or sometimes more, stones varying in size from 0.05 inch to 1 inch across. Gallstones composed principally of cholesterol are the most common type, but some contain a high content of bile pigments and other substances such as chalk.

Gallstones are rare in childhood and become progressively more common with age. Two to three times more women than men are affected *(autopsies show that 20 percent of all women have gallstones when they die)*. Risk groups include overweight people and women who have had many children. Use of the birth-control pill may cause gallstones to form earlier than they would have otherwise.

CAUSES
Gallstones develop when an upset occurs in the chemical composition of bile. When the liver makes bile, it can put too much cholesterol into it *(which occurs in obesity)*, or it may fail to put in enough of the detergent substances that normally keep cholesterol, a fatty substance, in solution.

Once the bile is overloaded with cholesterol, a tiny particle can form that gradually grows as more material solidifies around it, eventually forming a stone. Something else in the bile *(its nature is unknown)* actually triggers this process. Fasting for long periods may help gallstones develop by causing bile to stagnate in the gallbladder.

SYMPTOMS
Only about 20 percent of gallstones cause symptoms or complications. Symptoms commonly begin only when a gallstone gets stuck in the duct leading from the gallbladder. This causes **biliary colic** *(intense pain in the upper right side of the abdomen or between the shoulder blades)*. The sufferer may feel sick and possibly vomit. Indigestion made worse by fatty foods often seems to be associated with gallstones. Other potential complications include **cholecystitis** *(inflammation of the gallbladder)* and **bile duct obstruction** leading to jaundice.

TREATMENT
Stones that do not cause symptoms can safely be left alone, as they are unlikely to cause trouble. In some cases drug treatment may be used, especially if the stones are small and noncalcified. Tablets containing *chenodiol* can dissolve stones over a period of several months. When symptoms are more severe, a **cholecystectomy** *(surgical removal of the gallbladder)* is carried out; this cures the problem in 95 percent of the cases.

New treatments are being developed. Extracorpeal shock wave **lithotripsy** uses shock waves to shatter the stones. In another technique a tube is inserted into the gallbladder, and a strong solution that dissolves cholesterol is flushed through. The safety and long-term value of these treatments are still being investigated.

PREVENTION
People should avoid becoming overweight and should eat as little sugar and fat as possible. Some experts believe that a high intake of fiber helps prevent gallstones and that drinking one alcoholic drink a day has protective value.

GLAUCOMA

A condition in which the pressure of the fluid in the eye is so abnormally high that it causes damage. A minimal pressure is required to maintain the shape of the eyeball, but excessive pressure may result in the compression and obstruction of the small internal blood vessels and/or the fibers of the optic nerve. The result is nerve-fiber destruction and partial or complete loss of vision.

CAUSES

There are three kinds of glaucoma: chronic open-angle glaucoma, the most common form; acute closed angle glaucoma; and subacute angle-closure glaucoma. In chronic open-angle glaucoma, which rarely occurs before the age of 40, a gradual blockage of the outflow of aqueous humor *(fluid in the front compartment of the eye)* over a period of years causes a slow rise in pressure. This type tends to run in families.

In acute closed-angle glaucoma, a sudden obstruction to the outflow of aqueous humor from the eye causes a sudden rise in pressure. Subacute angle-closure glaucoma is similar to acute glaucoma, but develops more slowly or occurs intermittently.

Glaucoma is one of the most common major eye disorders in people over the age of 60; it is responsible for 15 percent of the blindness in adults in the US. Nearly 2 percent of people over the age of 40 have chronic glaucoma. The incidence rises with age, and about 10 percent of people over 70 have abnormally raised pressure within the eye.

SYMPTOMS

Chronic glaucoma often causes no symptoms until the condition is advanced because the gradual loss of peripheral vision is not apparent to the affected person. Only late in the disease, after severe, irreversible damage has occurred, may the person be aware of some visual loss. The symptoms of acute glaucoma include a dull, severe, aching pain in and above the eye, some fogginess of vision, and the perception of rainbow rings around lights at night *(halos)*. Nausea and vomiting can occur, and the eye can become red and have a partly dilated pupil and a hazy cornea. Subacute glaucoma can cause similar mild, brief episodes.

TREATMENT

Chronic open-angle glaucoma can usually be controlled with eye drops, which reduce the pressure in the eye. Repeated tonometry and visual field testing may be carried out to ensure that the pressure is being controlled; if necessary, other eye drops will be given. If drops fail to control the pressure, tablets or long-acting capsules may also be prescribed. The medications for treatment of chronic glaucoma usually are prescribed for life since, if stopped, the pressure generally rises. If medications fail to reduce the pressure in chronic glaucoma, and if a continuing loss of visual field or vision occurs, laser surgery may be necessary to open up the drainage channel or to create an artificial channel for the aqueous humor.

Acute closed-angle glaucoma is a medical emergency calling for urgent treatment.

Various treatments *(i.e., eye drops, pills, liquids, and/or intravenous fluids)* are given to try to reduce the high eye pressure. Usually, after the pressure is controlled, laser surgery or cutting surgery is necessary for the treatment of both acute glaucoma and subacute glaucoma. Surgery may prevent a recurrent attack. Usually a peripheral **iridectomy** is done. A small opening is made in the periphery of the iris so that aqueous humor can drain more easily. The iridectomy is often curative but, if the drainage angle was damaged by the attack, medications may be needed to

control the pressure after surgery. If the iris is scarred at the drainage angle, other types of surgery, such as that performed to create an artificial drainage channel, may be necessary.

PREVENTION
The pressure rise of glaucoma can be prevented by treatment, but early diagnosis and treatment are needed to prevent any impairment of vision. Regular eye examinations are an important tool for early detection of glaucoma.

HEPATITIS

An inflammation of the liver, with accompanying liver-cell damage or death, caused most frequently by viral infection, but also by certain drugs, chemicals, or poisons. Hepatitis may be either acute *(of limited duration)* or chronic *(continuing)*. A number of viruses may secondarily infect the liver, but for certain viruses, the liver is a primary target. These viruses include viral hepatitis type A *(infectious hepatitis)* and viral hepatitis type B *(serum hepatitis)*.

Viral hepatitis type A- Incidence is worldwide. In the US, about 40 percent of young adults have been exposed to the virus. In parts of the world where hygiene is poor, almost everyone has been exposed to this type of hepatitis.

Groups at particular risk include travelers to areas where hygiene standards are poor and prevalence of the virus is high *(i.e., parts of Asia, Africa, or South America)*. The incubation period for this disease lasts for three to six weeks after the virus has entered the body. In many cases there is no illness. If there is an illness, it is typical acute hepatitis *(flu-like illness with jaundice)*, usually mild, and never progresses to chronic hepatitis.

CAUSES
The virus is present in the feces of infected people and transmitted to others by fecal contamination of food *(e.g., when infected people handle food)*. Feces are infective from two to three weeks before and until eight days after the onset of jaundice. Local epidemics can occur.

PREVENTION
For nonimmune travelers at risk, passive immunization with immunoglobulin plus good hygiene and care in selection of food and drink is necessary. A vaccine has also recently been developed as a treatment for this condition.

Viral hepatitis type B- Incidence is worldwide. In parts of Africa and Asia, up to 20 percent of the population has been carrying the virus without symptoms for years. In the US, the carrier rate is much lower *(less than 1 percent)*.

Groups at particular risk include homosexuals, people with multiple sex partners, intravenous drug abusers, health care personnel, or children born to carrier mothers. The incubation period lasts for a few weeks to several months after infection. The illness is typical acute hepatitis, often

more severe than with type A virus. Progression to chronic hepatitis and other liver disease may occur. Sometimes, no illness is present.

CAUSES
The virus is present in blood and other body fluids of infected people. In the US, the virus is spread mainly through sexual contact and by needle sharing among drug abusers. Health workers are at risk from infected blood. In Africa and Asia, spread from mother to baby is common.

PREVENTION
Observance of "safe" sex with sexual partners who are at risk of being infected and avoidance of blood exchange are necessary. Other measures of prevention include vaccination and/or passive immunization for groups at high risk.

HIV/AIDS

A deficiency of the **immune system** due to infection with the HIV *(human immunodeficiency virus)*. In its present form, AIDS *(acquired immune deficiency syndrome)* appears to be new to the human population. As yet, there is no curative treatment and no vaccine for AIDS, but the symptoms and complications respond variably to antibiotics, antiviral agents, radiation therapy and anticancer drugs.

AIDS is not present in all individuals who are infected with HIV. The proportion of those infected whose condition progresses to AIDS has varied widely in different countries and in different risk groups. Every year, AIDS will develop in between 1 and 5 percent of people infected with HIV, but some evidence indicates that in a few infected people *(less than 1 percent)* both the viruses and the antibodies eventually disappear fro the blood, suggesting that the body has fought off the infection.

Once AIDS has been diagnosed, the condition is considered fatal. By the end of the 1980s approximately 100,000 men, women and children in the US had been diagnosed as having AIDS and about half of them had died. The main risk groups are homosexual or bisexual men and people who inject themselves with drugs using unsterile needles and syringes. Many hemophiliacs also became infected in the early 1980s as a result of receiving infected blood products, but this route of infection is now closed by better screening of blood products. Other risk groups include heterosexual contacts of infected individuals, children of infected women, and people who have received infected transfusions.

60% **Male homosexual activity**
This has accounted for the most cases.

16% **Needle sharing by drug abusers**
The number of cases is increasing in this second largest group of AIDS victims.

3% **Infected blood or blood-product transfusions**

This is no longer a significant mechanism of transmission in the US.

2% **Male-to-female sexual transmission**
In the US,this has accounted for relatively few AIDS cases, but the percentage from this cause is rising.

2% **Female-to-male sexual transmission**
Again, in the US, this has accounted for relatively few AIDS cases, but the percentage from this cause is rising.

1% **Mother-to-child via placenta**
A baby born to a woman who has AIDS or who has tested positive for HIV antibodies has a high risk of being infected.

13% **Multiple risk factors**
This group consists of victims with more than one risk factor - mainly homosexual males who have also shared needles.

3% **Other/unknown**
This group, many of them hospital workers, contracted AIDS by other means (e.g., needle injury) or by unknown means.

CAUSES

HIV has been isolated from blood, semen, saliva, tears, nervous system tissue, breast milk, and female genital tract secretions. However, only semen and blood have been proven to transmit infection.

The major methods of transmission are sexual contact *(penis to anus, vagina or mouth)*, blood to blood *(through transfusions or needle sharing in addicts)*, and from women to fetus. Other rare methods are through accidental needle injury, artificial insemination by donated semen, and kidney transplantation.

"Casual" or household spread does not occur. The infection is not spread by touching or hugging, by breathing the same air, or by sharing cutlery or crockery. Heterosexual transmission does occur. By the late 1980s, this mode of transmission accounted for approximately 4 percent of all known cases in the US. In Africa, AIDS affects men and women equally; heterosexual transmission plays a more important role for unknown reasons.

HOW HIV (THE AIDS VIRUS) AFFECTS THE IMMUNE SYSTEM:

In a person with a healthy immune system, various types of lymphocytes combat disease organisms:

1. Disease organisms entering the body alert T4-lymphocytes and other immune system components.
2. The T4-lymphocytes help regulate the response of other lymphocytes (cells of the immune system).
3. These lymphocytes then counterattack and destroy the disease organisms by various mechanisms.

In a person infected with HIV, the immune system is weakened; in some cases, this may lead to AIDS:

1. HIV (the AIDS virus) multiplies within, and ultimately may destroy, the body's T4-lymphocytes.
2. When disease organisms invade, immune responses may fail because of the absence of the vital T-4 lymphocytes.
3. The disease organisms may then overwhelm the immune system and lead to the features of AIDS.

SYMPTOMS

Individuals infected with the virus may have no symptoms; others experience a brief illness, sometimes resembling infectious **mononucleosis**, when they first became infected. Medical examination of patients without symptoms may reveal abnormalities, most commonly lymph-gland enlargement.

Minor features of HIV infection include skin disorders such as seborrheic **dermatitis** *(skin inflammation particularly affecting the face)*. More severe features include marked weight loss, diarrhea, fever, and or **candidiasis** *(thrush)*.

Other infections that are more common or more severe in HIV-infected patients include **herpes simplex** infections, **shingles, tuberculosis,** salmonellosis, and shigellosis. HIV may also affect the brain, causing a variety of neurological disorders including dementia.

The features of full-blown AIDS include cancers, such as Kaposi's sarcoma and lymphoma of the brain, and infections, such as **pneumocystis pneumonia.** Diagnosis of bull-blown AIDS is based on positive results for the HIV antibody test and Western blot (a confirmatory test), along with observation of the characteristic infections and tumors.

TREATMENT

There is no cure for AIDS. Supportive treatment is available only for its complications. Pneumocystis pneumnia is treated with antibiotics. Treatment of Kaposi's sarcoma by radiation therapy or anticancer drugs is rarely curative.

Several antiviral drugs, such as zidovudine *(AZT)* and acyclovir, are being used to treat patients with AIDS and those with HIV infection. Zidovudine has serious side effects, but it does slow the progress of HIV infection. Full assessment will come only after more patients have been treated for long periods of time.

PREVENTION

Medical prevention will be possible as soon as a vaccine against HIV is developed. A successful vaccine has been developed against feline leukemia virus, which bears similarities to the HIV virus, so the technology is available and progress is being made in the development of a vaccine against the HIV virus. Currently prevention is only by avoidance of high-risk behavior.

HYPERTENSION

Abnormally high **blood pressure** *(the pressure of blood in the main arteries)*. Blood pressure goes up as a normal response to stress and physical activity. However, a person with hypertension has a high blood pressure at rest.

Hypertension is usually defined as a resting blood pressure greater than 140 mm Hg *(systolic)*/90 mm Hg *(diastolic)*. However, an elderly person normally has blood pressure readings above these values because blood pressure increases with age. Children usually have blood pressure readings well below these values.

CAUSES

The majority of people have no obvious cause for their elevated blood pressure; in such cases it is called essential hypertension. However, in about 10 percent of patients, a definite cause can be found, including various disorders of the **kidney**, certain disorders of the **adrenal glands**, and **coarctation of the aorta**.

Tobacco smoking and obesity significantly increase the risk of hypertension. Hypertension sometimes develops in women who are taking the birth-control pill.

SYMPTOMS

Hypertension usually causes no symptoms and generally goes undiscovered until detected by a physician during the course of a routine physical examination.

Possible complications of untreated hypertension include **stroke, heart failure, kidney damage**, and **retinopathy** *(damage to the retina at the back of the eye)*. Severe hypertension may cause confusion and seizures.

TREATMENT

Mild hypertension may respond to weight reduction and a reduction in personal stress. Smokers should stop smoking and heavy drinkers should drastically reduce their consumption of alcohol. Restriction of salt intake is sometimes recommended.

If these measures have no effect, **antihypertensive drugs** may be prescribed. Occasionally, in severe cases, admission to the hospital for investigation of the cause, emergency treatment, and bed rest are required. Some drugs used to treat hypertension are *Reserpine, Clonidine, Minoxidil, Hydralazine, Capoten and Catapres.*

MYOCARDIAL INFARCTION

Commonly known as a heart attack, sudden death of part of the heart muscle characterized , in most cases, by severe unremitting chest pain. Each year in the US about one million people have a

heart attack. These attacks are fatal in about one-third of cases and are the single most common cause of death in developed countries.

Men are more likely to suffer heart attacks than women and smokers more than nonsmokers. Children of someone who has died of a heart attack are more likely to die from this cause. Other risk factors include increased age, unhealthy diet, stress, obesity, and disorders such as **hypertension** *(high blood pressure)*, **diabetes mellitus**, and **hyperlipidemia**.

SYMPTOMS
The characteristic symptom is sudden pain in the center of the chest. The victim may also be short of breath, restless, and apprehensive, have cold, clammy skin, feel nauseated or vomit, or lose consciousness.

Most people who die of a myocardial infarction do so within the first few hours as a result of a type of arrhythmia called ventricular fibrillation, which seriously interferes with the pumping action. If the person can be brought to a hospital, however, arrhythmias can be controlled with drugs or electrical **defibrillation**.

TREATMENT
If someone is thought to be having a heart attack, a physician or ambulance should be called immediately. Initial treatment may include strong pain killers and **oxygen therapy**. **Diuretic drugs** may be given to treat heart failure, which can lead to accumulation of fluids in the lungs. Intravenous fluids may need to be given for shock, and **antiarrhythmic drugs** may be given to control arrhythmias. **Beta-blocker** drugs are given in some cases to reduce the risk of further muscle damage. Some common drugs used in treatment are *Inderal, Quinidine and Procan.*

In many hospitals, patients who arrive within three to six hours of a heart attack are now treated with **thrombolytic drugs** to dissolve any blood clot. Other new methods of treatment include **angioplasty** *(widening of narrowed coronary arteries)*, which may follow thrombolytic treatment. **Coronary artery bypass** surgery may be considered.

PREVENTION
People should avoid becoming overweight and smoking cigarettes. Other preventive measures include regulating high blood pressure and remaining physically active.

OSTEOPOROSIS

Loss of protein matrix tissue from bone, causing it to become brittle and easily fractured. Many physicians do not discriminate between osteoporosis and **osteomalacia**, diagnosing any decreased density of the bone *(thinning)* as osteoporosis. In fact, decreased bone density may cause osteoporosis or osteomalacia. Osteoporosis is a natural part of aging. By age 70, the density of the skeleton has diminished by about one third. However, for hormonal reasons, the condition is

much more common in women than in men. Also, for reasons that are unknown, osteoporosis is more common in whites than in blacks.

CAUSES

Bone naturally becomes thinner as a person ages, but women are especially vulnerable to osteoporosis after **menopause** because their ovaries no longer produce the **estrogen hormone**, which maintains bone mass. Other causes of the disorder include removal of the ovaries, and a diet deficient in calcium, which is essential for bone health. Osteoporosis is more common in smokers, and for unknown reasons is associated with chronic obstructive lung disorders, such as **bronchitis** and **emphysema**.

SYMPTOMS

In many cases, osteoporosis produces no obvious symptoms; the first sign is often a fracture after a fall that would not cause a fracture in a young adult. Typical sites for such fractures are just above the wrist and the top of the femur *(thigh bone)*. Another type of fracture that occurs in osteoporosis is a spontaneous fracture of one or several vertebrae, which causes the bones to be compressed and leads to a progressive loss of height or to pain due to compression of a spinal nerve.

TREATMENT

Hormone replacement therapy to compensate for reduced estrogen production after menopause has been shown to prevent osteoporosis in women; in the US, it has halved the rate of fractures caused by osteoporosis in menopausal women.

PREVENTION

Lost bone tissue cannot easily be replaced, but bone loss can be minimized by ensuring that both men and women get enough **calcium** in their diet. The richest dietary sources of this mineral are milk and milk products, green leafy vegetables, citrus fruits, sardines, and shellfish. Calcium tablets may be needed. Exercise also helps to build bones, but anything less than three brisk three-mile walks a week *(or the equivalent)* is unlikely to be of much benefit in preventing osteoporosis.

PARALYSIS

Complete or partial loss of controlled movement caused by the inability to contract one or more muscles. Weakness, rather than complete loss of movement, is often referred to as **paresis**. Paralysis may be temporary or permanent, and can affect a range of muscles, from a small facial muscle to many of the major muscles in the body. Loss of feeling in the affected parts may accompany the inability to move them.

Paralysis of one half of the body is called **hemiplegia**; paralysis of all four limbs and the trunk is called **quadriplegia**. **Paraplegia** is paralysis of both legs and sometimes part of the trunk. **Palsy**

is an outdated general term for paralysis; it is still used in the names of certain disorders *(such as cerebral palsy)*.

Paralysis may be flaccid, which gives the limbs a floppy appearance, or spastic, in which case the affected parts of the body are rigid.

CAUSES
Muscles that control movement of the body are stimulated to contract by impulses originating in the motor cortex of the brain; they travel via the spinal cord and peripheral nerves to reach the muscle. Paralysis may be caused by any form of injury or disorder anywhere along this nerve pathway, or by a muscle disorder. Some possible causes are brain disorders, spinal-cord disorders, peripheral-nerve disorders, and muscle disorders.

TREATMENT
The underlying cause is treated if possible. **Physical therapy** is used to prevent joints from becoming locked into useless positions, which is important in both temporary and permanent paralysis. When the paralysis is temporary *(such as in a mild stroke)*, physical therapy is used to retrain and strengthen the muscles and joints so that some degree of mobility is possible after recovery.

For paralyzed people confined to a bed or a wheelchair, nursing care is essential to avoid complications *(such as bedsores, deep vein thrombosis, urinary-tract infections, constipation, and limb deformities)* of prolonged **immobility**. In addition, various aids are available to help the totally or partially paralyzed person.

PARKINSONISM

A neurologic disorder characterized by a masklike face, rigidity, and slowness of movement. The most common type is **Parkinson's disease**. Known causes of parkinsonism include **antipsychotic drugs, carbon monoxide poisoning, cerebrovascular disease**, and the use of certain **designer drugs**.

PARKINSON'S DISEASE

A brain disorder that causes muscle tremor, joint stiffness or rigidity, and weakness. The characteristic signs of Parkinson's disease are trembling, a rigid posture, slow movements, and a shuffling, unbalanced walk. About one person in 200 *(mostly elderly)* is affected by the disease. In the US, 50,000 new cases are reported each year. Men are more likely to be affected than women. The incidence of Parkinson's disease is lower among smokers.

CAUSES
Parkinson's disease is caused by degeneration of or damage to nerve cells within the **basal**

ganglia in the brain. The basal ganglia are thus prevented from modifying the nerve pathways that control muscle contraction. As a result, the muscles become overly tense.

SYMPTOMS
Symptoms of this disease include tremor, joint rigidity, and slow movement. The disease usually begins as a slight tremor of one hand, arm, or leg. In the early stages, the tremor is worse when the hand or limb is at rest; when it is used, the shaking virtually stops.

Later, the disease affects both sides of the body and causes stiffness and weakness, as well as trembling, of the muscles. Symptoms include a stiff, shuffling, overbalancing walk that may break into tiny, uncontrollable, running steps; a constant trembling of the hands, more marked at rest and sometimes accompanied by a shaking of the head; a permanent rigid stoop; and an unblinking, fixed expression. Eating, washing, dressing, and other everyday activities gradually become very difficult to manage.

The intellect is unaffected until late in the disease, although speech may become slow and hesitant; handwriting usually becomes very small. Depression is common.

TREATMENT
Although there is no cure for Parkinson's disease, much can be done for sufferers to improve their morale and mobility through exercise, special aids in the home, and encouragement. Organizations exist to provide help and advice for sufferers and their families. This is often all that is needed in the early stages of the disease.

Later, treatment is with drugs, which minimize symptoms but cannot halt the degeneration of brain cells. Such treatment is often complex because several different types of drugs may need to be administered in various combinations.

Levodopa, which the body converts into *dopamine*, is usually the most effective drug and is often the first drug tried. The beneficial effects of *Levodopa* often wear off suddenly: then another drug may be given. Levodopa usually can be successfully reintroduced some weeks later. Drugs used in conjunction with or as substitutes for levodopa include *Bromocriptine* and *Amantadine*. Other drugs that provide effective relief for specific symptoms, such as tremor, include **anticholinergic drugs** such as *Cogentin* and *Scopolamine*.

Occasionally, an operation on the brain may be performed to reduce the tremor or rigidity. This operation is reserved for relatively young, active sufferers who are otherwise in good health and who are in the early stages of the illness.

PNEUMONIA

Inflammation of the lungs due to infection. Pneumonia is the sixth most common cause of death in the US, primarily because it is a common complication of any serious illness. It is more common

in males, during infancy and old age, and in those who have reduced immunity to infection *(such as alcoholics)*.

There are two main types of pneumonia: **lobar pneumonia** and **bronchopneumonia**. In lobar pneumonia, one lobe of the lung initially is affected. In bronchopneumonia, inflammation starts in the bronchi and bronchioles *(airways)* and then spreads to affected patches of tissue in one or both lungs.

CAUSES

Most cases of pneumonia are caused by viruses or bacteria.

SYMPTOMS

Symptoms and signs typically include fever, chills, shortness of breath, and a cough that produces yellow-green sputum and occasionally blood. Chest pain that is worse when breathing in may occur because of **pleurisy** *(inflammation of the membrane lining the lungs and chest cavity)*. Potential complications include **pleural effusion** *(fluid around the lung)*, **empyema** *(pus in the pleural cavity)*, and, rarely, an **abscess** in the lung.

TREATMENT

Patients with mild pneumonia can usually be treated at home, but hospitalization is necessary in severe cases. The drugs prescribed depend on the causative microorganism; they may include *antibiotic drugs* or *antifungal drugs*. Aspirin or acetaminophen may be given to reduce fever. In severe cases, *oxygen therapy* and *artificial ventilation* may be required.

SEIZURE

A sudden episode of uncontrolled electrical activity in the brain.

CAUSES

Seizures may be caused by many different neurological or medical problems, including **head injury**, infection, cerebrovascular accident (**stroke**), brain tumor, metabolic disturbances, or **alcohol** *(withdrawal or hereditary intolerance of alcohol)*.

SYMPTOMS

If the abnormal activity remains confined to one area, the person may experience tingling or twitching of only a small area of the body, such as the face or an extremity. Other symptoms include hallucinations or intense feelings of fear or familiarity (**deja vu**). If the abnormal electrical activity spreads throughout the brain, consciousness is lost and a **grand mal** seizure results. Recurrent seizures are called **epilepsy**.

TREATMENT

Anticonvulsant drugs are the first line of treatment for epilepsy, and in almost all cases, they lessen the frequency of seizures. The drugs may have unpleasant side effects, including

drowsiness and impaired concentration. The physician will attempt to find the one drug that works best, but with very severe epilepsy, a combination may be needed to control seizures. If no seizures occur for two to three years (*depending on their cause*), the physician may suggest reducing or stopping drug treatment. Some common drugs used in treatment are *Dilantin* and *Phenobarbital.*

Rarely, surgery may be considered if it is thought that a single area of brain damage *(usually in the temporal lobe)* is causing the seizures and if medication is ineffective.

SHINGLES

An infection of the nerves that supply certain areas of the skin. The medical term for shingles is **Herpes zoster**. It is characterized by a painful rash of small, crusting blisters. After the rash heals, pain may persist for months or in rare cases, years.

Herpes zoster is a common disease. Every year in the US, a few hundred people per 100,000 suffer an attack. It affects mainly people over 50 and the incidence rises with age. The disease is very common in people whose immune systems have been weakened by diseases such as **lymphoma** or **Hodgkin's disease**, or by treatment with *immunosuppressant or anticancer drugs.* Herpes zoster often affects a strip of skin over the ribs on one side or, less commonly, a strip on one side of the neck and arm or the lower part of the body. Sometimes it involves the upper half of the face on one side; in this case, the eyes may also be affected. Shingles in this area is known as **Herpes zoster ophthalmicus**.

CAUSES

Herpes zoster is caused by the *varicella-zoster virus*, which also causes **chickenpox**. During an attack of chickenpox, most of the viral organisms are destroyed, but some survive and lie dormant in certain sensory nerves, remaining there for many years. In some people, a decline in the efficiency of the **immune system** *(the body's defense against infection)* allows the viruses to reemerge and cause shingles. The competence of the immune system declines with age; this decline is probably accelerated by stress and the use of **corticosteroid drugs**. Herpes zoster commonly follows a stressful episode.

SYMPTOMS

The first indication is excessive sensitivity in the area of the skin to be affected; this is soon followed by pain, which is sometimes severe and which may, until the rash appears, be mistaken for pleurisy or appendicitis.

After about five days, the rash appears, starting as small, slightly raised, red spots that quickly turn to tense blisters, teeming with viruses. Within three days, the blisters turn yellowish and soon dry, flatten, and crust over. During the next two weeks or so, these crusts can drop off, often leaving small pitted scars.

The most serious feature of herpes zoster is the pain that follows an attack. The pain is a consequence of damage to the nerves, causing strong nerve impulses to be constantly produced and passed upward to the brain. The pain, which affects about one-third of sufferers, may be severe and may last for months or years. The older the patient and the more pronounced the rash, the more likely the pain will be severe and persistent.

TREATMENT
Once the rash is fully established, little can be done to influence the course of the disease or the likelihood of postherpetic pain. Only **palliative** *(comforting)* measures and **analgesics** *(painkillers)* are of value. It is, however, possible to reduce the severity of the active stage and to minimize nerve damage by the prompt use of **antiviral drugs** *(such as acyclovir)*.

SLEEP DISORDERS

More than 100 disorders of sleeping and waking have been identified. They are divided into four main categories-problems with falling or staying asleep *(**the insomnias**)*, problems with staying awake, problems with adhering to a consistent sleep/wake schedule, and problems with sleep-disruptive behaviors.

Problems with falling or staying asleep trouble one in three adults in the US. Insomnias are classified as transient-lasting up to several nights, usually resulting from excitement or minor stress; short-term- lasting up to two or three weeks, related to major stress or illness; and chronic-frequent or continued poor sleep, a complex disorder with many causes, including physical illnesses, psychological factors, a poor sleeping environment, and life-style. Insomnia is not a disease; it is a symptom warranting medical attention.

Problems with staying awake are the prime reason people seek help at sleep disorder centers, of which more than 200 now exist in the US. The primary causes of this symptom are **sleep apnea**, a potentially life-threatening disorder in which breathing intermittently stops during sleep, and **narcolepsy**, a disorder in which REM sleep intrudes into wakefulness, causing sudden daytime "attacks."

Problems with a consistent sleep/wake schedule involve difficulty staying awake as a result of disruptions of the internal clocks that regulate sleeping and waking. A common example is **jet lag**, in which body clocks are desynchronized by rapid travel across several time zones. Shift workers on rotating schedules, who frequently change their hours for work and sleep, commonly suffer "occupational jet lag." Shift workers, particularly those working at night, complain more about poor sleep and daytime drowsiness than do day workers.

Behaviors that interfere with sleep include **sleepwalking, night terrors** *(partial awakening from sleep in a terrified state)*, and **enuresis** *(bed-wetting)*.

Another sleep disorder is **sleep deprivation**, which is an insufficient amount of **sleep**. Studies of sleep-deprived volunteers have shown that irritability and a shortened attention span may occur after a night in which there was less than three hours' sleep.

After longer periods without sleep, individuals become increasingly unable to concentrate and their performance of tasks deteriorates as they continually slip into short periods of "microsleep." People with epilepsy are more prone to **seizures** after sleep deprivation. Three days or more without sleep may lead to visual and auditory **hallucinations** and, in some cases, **paranoia**. Sleep deprivation has been employed in torture to extract confessions, and as a brainwashing technique.

TREATMENT

A certain group of drugs are used in the treatment of **insomnia**. Prescription sleeping drugs include **benzodiazepine drugs, barbiturate drugs, antihistamine drugs, antidepressant drugs, and chloralhydrate**. Certain antihistamines are sold as nonprescription sleep aids.

STROKE

Damage to part of the brain caused by interruption of its blood supply or leakage of blood outside of vessel walls. Sensation, movement, or function controlled by the damaged area is impaired. Strokes are fatal in about one third of cases and are a leading cause of death in developed countries.

In the US, the overall incidence of stroke is about 200 people per 100,000 population annually. The incidence of stroke rises steeply with age and is higher in men than in women.

CAUSES

A stroke may be caused by any of three mechanisms. Thrombosis and embolism both lead to cessation of the blood supply to part of the brain and thus to infarction *(tissue death)*. Rupture of a blood vessel in or near the brain may cause an **intracerebral hemorrhage** or a **subarachnoid hemorrhage**.

Certain factors increase the risk of having a stroke. The two most important are **hypertension** *(high blood pressure)*, which weakens the walls of arteries, and **atherosclerosis** *(thickening of the lining of arterial walls)*, which narrows arteries.

Other factors that increase the risk of a stroke include **atrial fibrillation** *(a type of irregular heart beat)*, a damaged **heart valve**, and a recent **myocardial infarction** *(heart attack)*. All of these conditions can cause blood clots in the heart that may break off and migrate to the brain. **Polycythemia** *(a raised level of red cells in the blood)*, **hyperlipidemia** *(a high level of fatty substances in the blood)*, **diabetes mellitus**, and smoking also increase the risk of stroke by increasing the risk of hypertension and/or atherosclerosis. Oral contraceptives increase the risk of stroke in women under 50.

SYMPTOMS

Any part of the brain may be affected by a stroke; accordingly, the symptoms vary considerably. Damage to a specific area of the brain impairs the bodily sensation, movement, or function controlled by that part of the brain. A stroke that affects the dominant of the two cerebral hemispheres in the brain *(usually the left hemisphere)* may cause disturbance of language and speech.

Movement on one side of the body is controlled by the cerebral hemisphere on the opposite side. Thus, damage to areas controlling movement in the right cerebral hemisphere results in weakness

or paralysis on the left side of the body. Such one-sided weakness or paralysis, known as **hemiplegia**, is one of the most common effects of a serious stroke.

When symptoms last for less than 24 hours and are followed by full recovery, the episode is known as a **transient ischemic attack**. Such an attack, which usually lasts for only a few minutes, is a warning signal that a sufficient supply of blood is not reaching part of the brain. About a third of major strokes are fatal, a third result in a permanent handicap, and a third result in no lasting ill effects.

Possible complications of a major stroke include **pneumonia** and the formation of blood clots in the veins of the leg *(deep vein thrombosis)*, which may travel to the artery supplying the lung to cause a potentially fatal **pulmonary embolism**.

TREATMENT

In the hospital, patients who are unconscious or semiconscious require a clear airway, feeding by means of **intravenous infusion** or a **nasogastric tube**, and regular changing of position to prevent bedsores or pneumonia. Any **edema** *(accumulation of fluid)* within the brain caused by the stroke may be treated with **corticosteroid drugs or diuretic drugs**.

When a stroke has been caused by an embolism, **anticoagulant drugs** may be prescribed *(in many cases for the rest of the patient's life)* to help prevent recurrences. In other instances, aspirin is prescribed or vascular surgery is performed to reduce the risk of subsequent stroke. Every effort is made to restore any lost movements or sensations with **physical therapy** and to remedy any speech disturbances with **speech therapy**. Some common anticoagulant drugs are *Heparin* and *Warfarin*.

THYROID GLAND DISORDERS

Disorders, chiefly hypothyroidism and hyperthyroidism, of an important organ of the **endocrine system**. The thyroid gland is situated in the front of the neck, just below the larynx *(voice box)*. It consists of two lobes, one on each side of the trachea *(windpipe)*, joined by a narrower portion of tissue called the isthmus.

Thyroid tissue is composed of two type of secretory cells that secrete thyroxine *(T4)* and triiodothronine *(T3)*. T4 and T3 play an important role in controlling body **metabolism**. Calcitonin acts in conjunction with parathryroid hormone to regulate calcium balance in the body.

Hypothyroidism-Insufficient production of thyroid hormones, caused by an underactive thyroid gland. Symptoms include tiredness, dry skin, hair loss, weight gain, constipation, and sensitivity to cold. In childhood, deficiency may cause severe growth retardation.

Hypothyroidism may be associated with Hashimoto's thyroiditis or atrophy of the thyroid, or it may be a consequence of treatment for hyperthyroidism. A possible result is **myxedema**, wherein the skin becomes dry and thickened and facial features become coarse. Constipation, cold intolerance, and fatigue are other common symptoms. In many cases, the cause of myxedema is not known.

Hyperthyroidism-Overproduction of thyroid hormones, caused by an overactive thyroid gland. Symptoms include fatigue, anxiety, heart palpitations, sweating, diarrhea, swelling of tissues around the eyes, and intolerance of heat. Despite increased appetite, there is often weight loss.

Graves' disease, an autoimmune disorder, is a form of thyroid overactivity whose chief feature is hyperthyroidism. The disease is thought to be due to the body producing an "autoantibody" that stimulates the thyroid to secrete excessive amounts of hormones. Autoantibodies are also believed to be associated with certain other thyroid disorders, notably Hashimoto's thyroiditis, in which the antibodies damage glandular cells.

TREATMENT
The most commonly used thyroid hormone drugs are the synthetic thyroid hormone preparations *levothyroxine* and *liothyonine*.

TUBERCULOSIS

An infectious disease, commonly called **TB**, caused in humans by the bacterium **Mycobacterium Tuberculosis**. Tuberculosis, once common worldwide, was a major cause of death in childhood and early adult life.

The incidence of tuberculosis in the US is about 8 to 10 new cases per 100,000 people annually and is falling. However, this represents more than 20,000 new cases in the US per year. The incidence is much higher in certain racial or social groups, such as Hispanics, Haitians, and immigrants from Southeast Asia. The disease is also more common in deprived city areas, in the elderly, in patients with **immunodeficiency disorders**, in diabetics, in alcoholics, and in people who are in close contact with an infected person.

CAUSES
Infection is passed from person to person in airborne droplets *(produced by coughing or*

sneezing). The bacteria breathed into the lungs then multiply to form an infected "focus." In a high proportion of cases, the body's **immune system** then checks the infection and healing occurs, leaving a scar. In about 5 percent of cases, however, the primary infection does not resolve.

SYMPTOMS

Because tuberculosis usually affects the lungs, the main symptoms include coughing *(sometimes bringing up blood)*, chest pain, shortness of breath, fever and sweating *(especially at night)*, poor appetite, and weight loss.

The main complications of tuberculosis of the lungs are **pleural effusion** *(collection of fluid between the lung and the chest wall)*, **pneumothorax** *(air between the lungs and chest wall)*, and in some cases, progression of the disease to death.

TREATMENT

Modern drugs are very effective against tuberculosis, although at least two different antibiotic drugs must be taken to avoid bacterial **resistance** to the drugs. In the US, a common treatment is daily therapy for 9 to 12 months with *isoniazid* and *rifampin*.

ULCER

An open sore on the skin or on a mucous membrane that results from the destruction of surface tissue. An ulcer may be shallow or deep and crater shaped and usually inflamed and painful.

Skin ulcers most commonly occur on the leg, usually as the result of inadequate blood supply to or drainage from the limb. Among the rarer forms of skin ulcers are those that develop on **basal cell carcinomas**, which are a form of skin cancer.

Ulcers on mucous membranes most commonly develop within the digestive tract, occurring in the mouth *(mouth ulcer)*, in the small or large intestine *(ulcerative colitis)*, or in the stomach or the duodenum *(peptic ulcer)*. An ulcer may also develop on the cornea, the transparent covering at the front of the eyeball, *(corneal ulcer)*.

A **peptic ulcer** is a raw area that occurs in the gastrointestinal tract, where it is bathed by acid gastric juice. A peptic ulcer may occur in the esophagus, stomach or duodenum. In rare cases, it occurs in the jejunum *(as it does in **Zolliger-Ellison syndrome**)* or ileum *(as in **Meckel's diverticula**)*. Usually about 0.33 inch to 1 inch *(10 to 25 mm)* across and about 0.01 inch deep, an ulcer may occur singly or in several places. The typical symptom is a gnawing pain in the abdomen when the stomach is empty.

In the US, a duodenal ulcer develops in about one in 10 people at some time in their lives, and a gastric ulcer develops in about one in 30 people. The incidence of gastric ulcers is about equal in men and women, but more males than females suffer from duodenal ulcers. Middle age is the

most likely time for either type of ulcer to develop, although the peak age for duodenal ulcers to develop is somewhat earlier than the peak age for gastric ulcers.

CAUSES
The lining of the stomach and duodenum are constantly at risk of erosion from acid produced by the stomach wall. The lower esophagus is at risk only when reflux of acid juice from the stomach occurs. Ulcers in the jejunum occur only with a massive outpouring of gastric acid. In some people, there is a strong family history of peptic ulceration. Psychological stress may play a part in making an existing ulcer worse.

SYMPTOMS
Many people found to have a peptic ulcer have no symptoms, but a greater number complain of a burning or gnawing pain in the abdomen, which sometimes wakes them at night. The pain of a duodenal ulcer is often relieved by eating, but usually recurs a few hours later.

Other symptoms accompanying both types of ulcer include loss of appetite *(though sometimes a duodenal ulcer increases appetite)*, belching, feeling bloated, weight loss, nausea, and vomiting *(which usually relieves the pain)*.

TREATMENT
Drug treatment includes the administration of antacids, which neutralize acid in the stomach, and drugs such as *sucralfate*, which work by forming a protective coat over the ulcer crater. H2-blockers, such as *ranitidine, cimetidine*, and *famotidine* reduce acid secretion by blocking nerve receptors on acid-producing cells.

Self-help methods include avoiding smoking *(the most important step in self-help)*, as well as alcohol, coffee, and tea. Those affected should also avoid using aspirin and nonsteroidal anti-inflammatory drugs. Eating several small meals a day, at regular intervals, rather than two or three large ones will also help.

URINARY TRACT INFECTION

An infection anywhere in the urinary tract. Infection is diagnosed by a **culture** of a few drops of urine. The urine specimen is taken midstream to avoid contamination of the specimen by organisms that normally live in the last part of the urethra. Further investigation is usually needed for men who have any urinary tract infection or for women suffering from recurrent cystitis or an infection above the level of the bladder. Such investigation is performed by **pyelography** *(introduction of a radiopaque dye into the urinary tract, followed by X rays)* or by ultrasound scanning.

CAUSES
Urethritis *(inflammation of the urethra)* may be caused by mechanisms other than infection, but

cystitis *(inflammation of the bladder)* and **pyelonephritis** *(inflammation of the kidneys)* are nearly always caused by bacterial infection.

When urethritis is due to infection, the cause is usually a sexually transmitted disease, such as **gonorrhea** or nonspecific urethritis, often caused by *chlamydia* organisms. Otherwise, urinary tract infection is usually caused by organisms that have spread from the rectum, via the urethra, to the bladder or kidneys. Infections can also be bloodborne.

Because of the shortness of the urethra in women, infections above the urethra are more common in women. In many women, they occur without any identifiable underlying cause. In most men

and some women, however, there is an identifiable cause, usually some factor that impairs the drainage of urine. In men, this may be an enlarged prostate gland or a **urethral stricture**.

In either sex, urinary tract infection may be caused by a urinary tract **calculus** *(stone)* , a **bladder tumor**, or a congenital abnormality of the urinary tract, such as a double kidney on one side. Defective bladder emptying as a result of **spina bifida** or spinal cord injury leads almost inevitably to urinary tract infection. Urinary tract infection is also more common during pregnancy.

Urethritis can lead to scarring of the urethra and formation of a urethral stricture. Cystitis, provided there is no upward spread to the kidneys, does not usually produce complications. Without proper treatment, kidney infection can lead to permanent kidney damage, **septicemia** *(spread of infectious organisms to the blood)*, and **septic shock**. If a calculus in a kidney is the underlying cause of infection, it may grow rapidly during the course of the infection.

SYMPTOMS

Urethritis causes a burning sensation when urine is passed. Cystitis causes a frequent urge to pass urine, lower abdominal pain, **hematuria** *(blood in the urine)*, and often general malaise with a mild fever. An infection in the kidneys leads to pain in the loins and high fever.

TREATMENT

Most urinary tract infections are treated with **antibiotic drugs**. The drug that is administered depends on the type of infection involved.

PREVENTION

The risks of a urinary tract infection can be reduced by careful personal hygiene, drinking plenty of fluids, and regular emptying of the bladder.