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HEALTH UPDATE

MULTIPLE PERSPECTIVES ON HEALTH EMPOWERMENT

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  HOMOEOPATHY
  NATURE CURE
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Chronic Kidney Failure

ALLOPATHY

Chronic kidney failure is a progressive and irreversible loss of functions of the kidneys. It is a slow process occurring over many years. There are two types of kidney failure: (1) *acute kidney failure*, where kidneys fail due to some recent disease. Many people recover from acute kidney failure after specific treatment for a short time; and (2) *chronic kidney failure*, which needs life long treatment. The term chronic kidney failure is used after more than fifty percent of kidney function is lost due to irreversible damage to the kidneys. At this stage, damage to the kidneys and its adverse impacts are likely to worsen.

If chronic kidney failure is not treated properly, it leads to death. The treatment is very expensive and very few can afford the available treatment options. In India, about one lakh new patients of kidney failure are added every year. It is therefore important to understand the causes and preventive measures of chronic kidney failure.

What are kidneys?

The kidneys are organs of excretion which produce and eliminate urine from our body. Everyone has two kidneys. They are like large beans — about the size of your fist. Kidneys are situated on both sides of the back bone in the abdomen. Kidneys are covered by muscles and ribs which usually protect them from injuries. Blood enters the kidneys by "arteries", called the *renal arteries*. The blood then travels to the "nephrons" which are located in the outer region of the kidneys. Nephrons, which are the filtering units, are like sieves which separate the waste products from the blood. These waste products are excreted as urine. There are about one million nephrons in each kidney. Urine flows down from the kidneys through two tubes called "ureters" to an organ called the urinary "bladder". After the blood is purified, it goes back to the rest of the body through "veins" called the *renal*



Doctor, you must be joking. I have been taking these medicines for so many years. How can they harm my kidneys now?

Definitions of all technical terms used in this issue are given on the last page.

veins. The organs of secretion and the normal mechanism of filtration of blood in the nephrons are illustrated in Figure 6.1.

Urine is the most important route through which the body rids itself of waste products and excess water. It collects in the urinary bladder and is passed out voluntarily. A normal person produces about one to two litres of urine per day. The volume of urine mainly depends on the amount of liquid you drink per day and the amount of sweat. It also depends upon other factors such as alcohol and caffeine intake, presence of certain diseases such as diabetes and some medicines.

What do the kidneys do?

The kidneys have four main functions:

1. Removal of waste products from the body;
2. Control of blood pressure;
3. Production of a hormone called *erythropoietin*. This hormone is necessary for the production of red blood cells. Kidneys therefore maintain normal haemoglobin levels and increase the oxygen carrying capacity of the blood;
4. Maintenance of normal calcium levels in the body. Calcium is essential for bones.

What are the waste products in our body?

Normal waste products in our body are:

- **Urea.** When protein in the food is broken down for normal body maintenance, some waste products are left behind. Urea is one of these waste products. Proteins are the major source of building materials for our muscles, blood, skin, hair, nails, and the internal organs.
- **Creatinine.** This is a waste product from muscles.
- **Minerals.** Most diets contain more minerals than the body needs. These minerals are salt, potassium and phosphates. Canned foods, soups, sauces and fast foods contain large quantities of salt. Chocolate, nuts, citrus fruits, fruit juices and vegetables, particularly potatoes, contain large quantities of *potassium*. Cheese, milk, fish, beans and milk products contain large quantities of *phosphates*. Excess of these minerals is excreted by the kidneys.
- **Water.** We usually take more water or liquids than the body needs. Kidneys excrete most of the excess water.

What happens when the kidneys fail?

As the kidneys begin to fail, the waste products mentioned above start collecting in the body and produce harmful effects. If one kidney fails or is removed, the other kidney takes over the entire work of cleaning the blood. You can therefore lead a normal life

with one normal kidney.

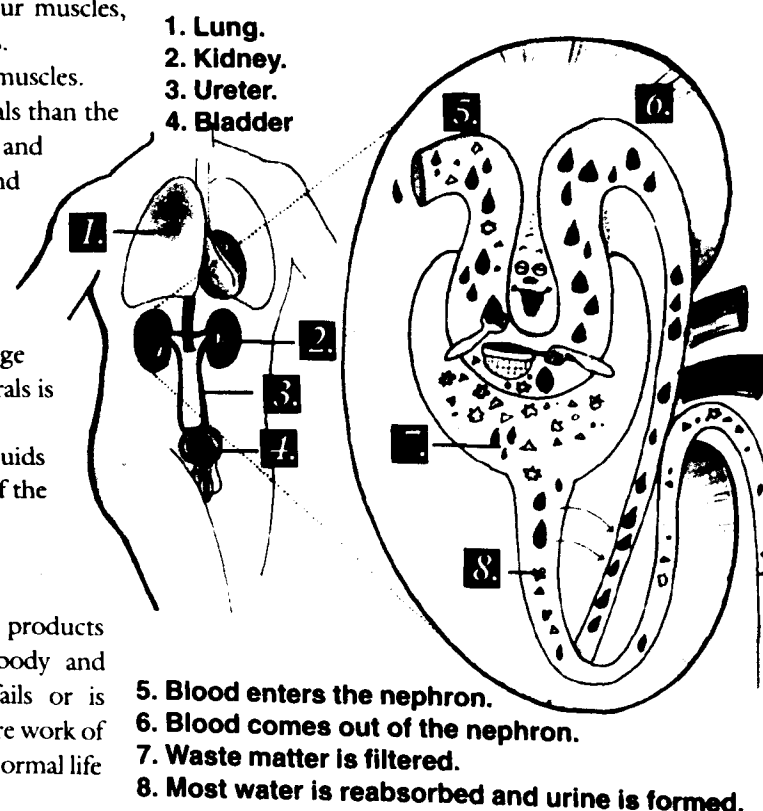
When the kidneys fail, they affect almost every part of the body. Signs and symptoms of kidney failure are seen when more than eighty percent of the kidneys are damaged. Described below are the adverse impacts on various parts and systems of the body. These adverse impacts are summarized in Box 6.1.

- **Cells and tissue.** Kidney failure results in abnormal retention of water and sodium. Excess water leads to weight gain and swelling of the body. This swelling is especially observed around ankles in the evenings and eyelids early in the morning.

- **Skin.** Kidney failure can cause anaemia. Signs of anaemia are pale skin, especially the skin of the palm, tongue and inner part of the eyelids. Sometimes the skin is dull brown. It becomes very itchy because of high calcium levels. The skin also becomes very dry because the sweat glands become smaller. Smaller sweat glands secrete less oil and thus the skin becomes very dry.

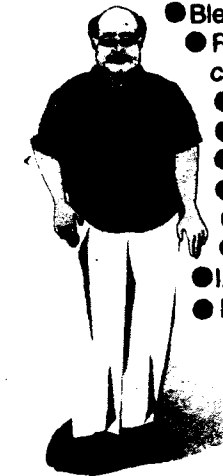
- **Blood.** When the kidneys fail, they secrete less *erythropoietin* — the hormone necessary for formation of red blood cells. Excess urea decreases the life-span of red blood cells. Decreased red blood cells lead to (1) severe anaemia; (2) bleeding tendencies; and (3) decrease ability to fight disease causing germs. Thus kidney failure can lead to more frequent and more severe infections.

Figure 6.1. Organs of excretion and normal mechanism of filtration



Box 6.1. Common signs and symptoms of chronic kidney failure.

- Weight gain, swelling of the body.
- Anaemia.
- Itchy skin.
- Dry skin.
- Bleeding Tendencies.
- Reduced disease fighting capabilities of the body.
- Collection of fluid in the lungs.
- Weakness of the bones.
- Loss of memory, decreased alertness.
- Nausea, vomiting.
- Loss of appetite.
- Absence of menstruation in females.
- Inability to complete pregnancy.
- Impotence in males



- **Lungs.** Kidney failure results in excessive collection of liquid in the lungs. This liquid enters the air sacs and reduces the lungs' ability to absorb oxygen and excrete carbon dioxide. Collection of liquids in the lungs is called *pulmonary oedema*. It can occur suddenly or over a period of many days. Common signs of pulmonary oedema are rapid, shallow and difficult breathing. Restlessness is common and the skin is either pale or blue. Phlegm, if present, is frothy and pink.

- **Heart** Since kidney failure results in increased retention of liquids in the body, the blood volume increases. Increased blood volume causes the heart to work harder to circulate the blood. When the heart is not able to pump the excess load, it leads to heart failure. Excess liquid can also cause high blood pressure.

- **Bones.** Kidney failure results in high phosphorus and low calcium levels in the blood. Low calcium levels cause weakness of the muscles and bone diseases.

- **Brain.** Increased urea in the blood results in abnormalities in the brain function. These include decreased alertness, loss of memory, "pins and needles" sensation in the legs and itchy sensation which is worse at night. Sometimes kidney failure can also cause impotence.

- **Digestive system.** Increased urea in the blood causes nausea, vomiting, lack of appetite, hiccough and poor nutritional status. The glucose and insulin levels in the blood also increase.

- **Reproductive organs.** Kidney failure leads to decreased secretion of sex hormones in both, males and females. Decreased sex hormones in the females can lead to absence of menstruation, inability to conceive and inability to complete the pregnancy. Decreased sex hormones in the males can lead to smaller "testes" and impotence.

What are the causes of chronic kidney failure?

Some diseases of the kidney including chronic infections, long-standing high blood pressure, diabetes, kidney stones and excessive use of some medicines such as pain killers and antibiotics can cause chronic kidney failure. These causes are detailed in Box 6.2.

About twenty to thirty percent people who have had diabetes for more than fifteen to twenty years are at a higher risk of developing kidney failure. This risk is higher if the diabetes is not under control. Diabetic people whose parents have high blood pressure are more likely to develop kidney failure than those whose parents have normal blood pressure. There is no difference in the likelihood of developing kidney failure among diabetics who take insulin and those who take oral medicines. Similarly, males and females have equal chances of developing kidney failure.

Many people take medicines such as pain killers and antibiotics without consulting with a doctor. Excessive and inappropriate use of medicines can lead to kidney failure. *It is therefore important to monitor kidney functions in people, especially the elderly, who have chronic diseases for which they take medicines for a long period of time.*

The percentage of people who have diabetes, high blood pressure and pain-killer induced kidney failure is higher in developed countries than in developing countries. This is perhaps because the proportion of people having diseases such as diabetes and high blood pressure is higher in the developed countries.

What are the laboratory tests for kidney failure?

Mild kidney failure may not have any signs and symptoms. Laboratory tests are therefore necessary to diagnose kidney failure at an early stage. Your doctor is likely to recommend the following laboratory tests:

- **Urine examination.** This is a cheap and reliable test for detecting abnormalities in kidney function even at an early stage. If you have diabetes, urine examination at least once a year is essential to detect kidney functions.

- **X-ray of the abdomen.** Kidney stones can be detected through an x-ray. Your doctor may recommend regular x-rays if either you or any of your family members have kidney stones, or have had them in the past. This is to detect new kidney stones at the earliest.

- **Blood tests.** These include urea and creatinine levels. Normal urea level in the blood is twenty to forty milligram percent and normal creatinine level is 0.5 to 1.5 milligram percent. *It is important to remember that by the time urea*

and creatinine levels are abnormal, the disease is already severe and there is extensive damage to the kidneys.

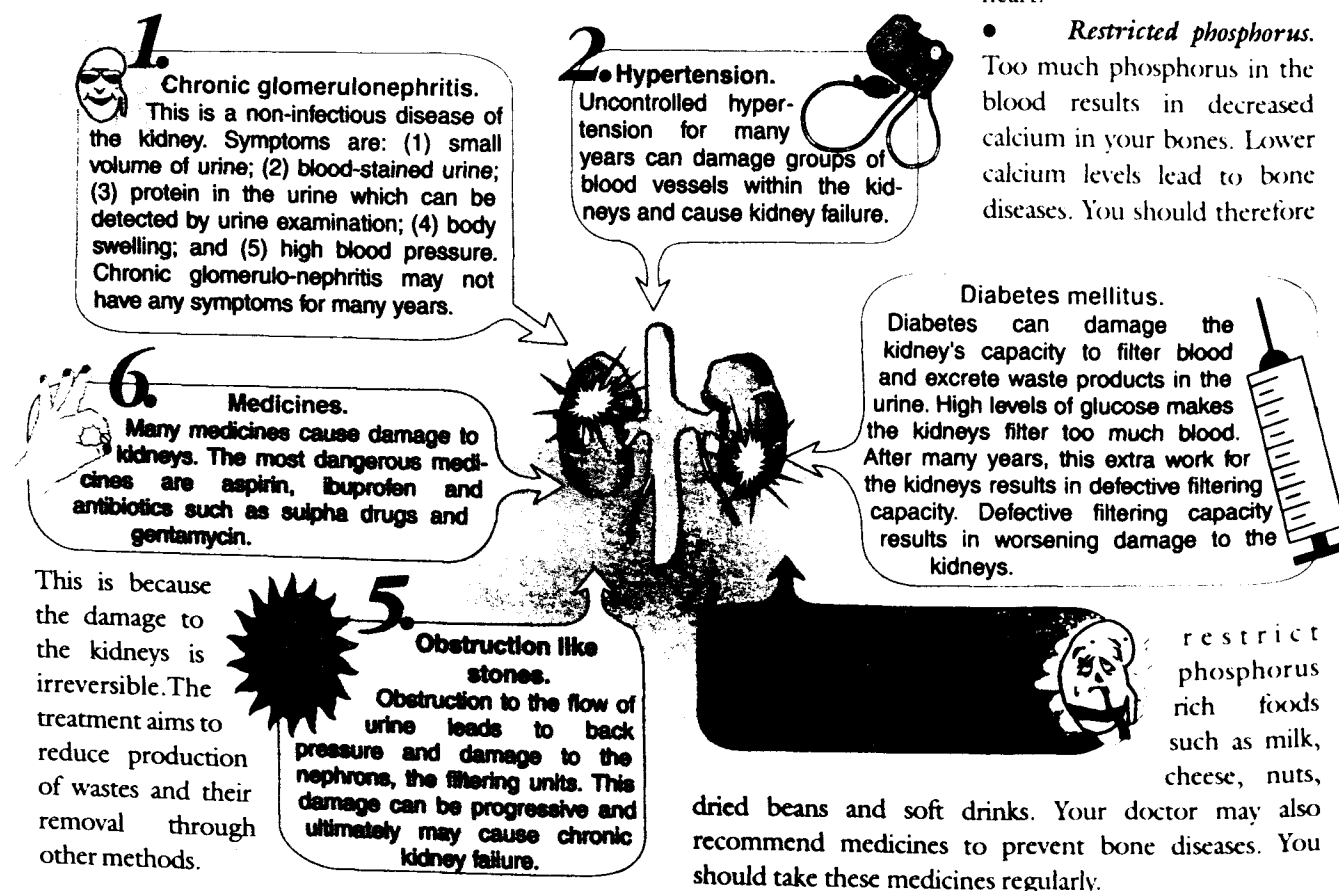
What is the treatment of chronic kidney failure?

The treatment for chronic kidney failure can be broadly divided into three categories:

1. Diet treatment.
2. Dialysis.
3. Kidney transplantation.

It is important to remember that the above treatment options cannot cure chronic kidney failure.

Box 6.2. Common causes of chronic kidney failure



What is the dietary treatment for chronic kidney failure?

Dietary treatment is the mildest form of treatment. It is recommended when the kidneys are still functional, although at a lower level. Common dietary measures are:

- **Restricted protein.** Reduced protein intake will result in less production of waste matter. Thus there will be less burden on the kidneys. Animal protein is used better by the body than protein from vegetables and grains. Your doctor or a qualified dietitian can give detailed information on the quantity and type of protein you can take. Meat, eggs, grams, dals, etc. are rich in protein.
- **Restricted liquid intake.** Damaged kidneys are not

able to remove excess liquids from the body. Thus the liquids build up quickly and the tissues swell. Increased fluid collection in the body can lead to high blood pressure and heart problems.

- **Restricted salt.** Salty foods make you thirsty and you will therefore drink more liquids per day. Since the kidneys are already damaged, this excess liquid will not be excreted. It will therefore accumulate in the body.

- **Restricted potassium.** Potassium is a mineral found in salt substitutes, some fruits, vegetables, milk, chocolates and nuts. Too much or too little potassium can harm your heart.

- **Restricted phosphorus.** Too much phosphorus in the blood results in decreased calcium in your bones. Lower calcium levels lead to bone diseases. You should therefore

Why is diet restriction important?

Diet restriction is important because in chronic kidney failure, the kidneys are unable to get rid of the waste they normally clear. These wastes are excess salt, protein, phosphate and potassium. If you restrict these in your diet, there will be less generation of wastes and therefore less workload on the healthy kidneys. Thus restricted intake of these minerals prevents their accumulation in the body to harmful levels.

Salt restriction is recommended if you have high blood pressure or swelling of the body. **Protein** restriction is necessary to reduce the amount of urea generated. *It is important to remember that protein should not be restricted*

after dialysis is started. **Potassium** restriction is extremely important even after dialysis is started. *This is because the heart can stop functioning if there is excess potassium in the blood.* Your doctor is likely to suggest regular blood tests to see the impact of dietary treatment on sodium, potassium, urea and creatinine levels.

In addition to diet control, your doctor will also prescribe appropriate treatment for high blood pressure and calcium and vitamin D supplementation to retard the progress of kidney failure and its complications.

With time, as the kidney failure becomes more severe, diet alone is not sufficient to maintain the waste products such as urea, creatinine, etc. at safe levels. More active treatment such as dialysis or kidney transplantation is therefore necessary. Both these treatment options take over the functions of your damaged kidneys to filter and clean blood.

What is dialysis?

Dialysis is a medical procedure in which some waste products are removed from the blood through a membrane. This membrane allows wastes to pass through it which collect on its top. There are two types of dialysis: (1) haemodialysis and (2) peritoneal dialysis. A person with chronic kidney failure can live for twenty to thirty years if appropriate and timely treatment is taken. There is no difference in the course of the disease with different methods of dialysis.

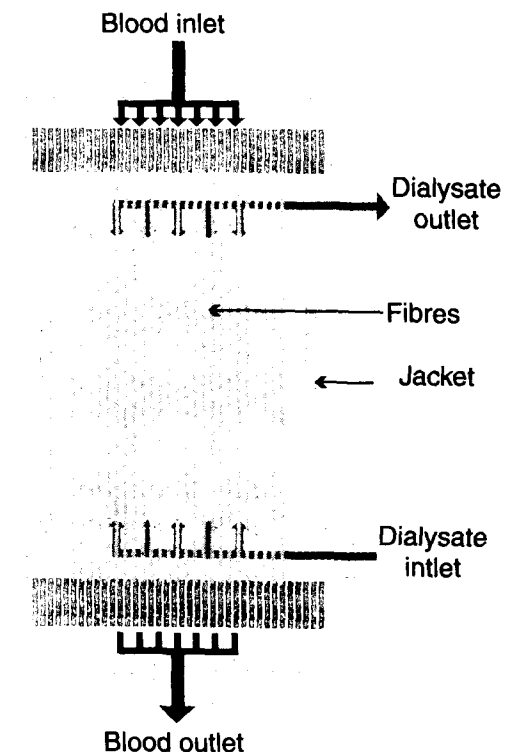
What is haemodialysis?

Haemodialysis is a procedure which cleans and filters the blood with an "artificial kidney". Figure 6.2 shows various components of an artificial kidney. This artificial kidney removes harmful wastes, extra salt and liquids just as your normal kidneys would do. Thus, haemodialysis helps to maintain normal blood pressure and potassium and sodium levels. To carry out haemodialysis, a haemodialysis machine is required.

Haemodialysis uses a special filter called the "dialyser" to clean the blood. These filters are connected to a machine. The pump in the dialysis machine takes about two hundred and fifty millilitres of blood per minute to the artificial kidney. The blood is taken from an artery in your arm which is connected to the dialyser. This blood passes through sterile tubes called "blood lines" before reaching the artificial kidney. After the machine cleans the blood it flows back into your body through a tube attached to the vein in the arm. The liquid used for purifying the blood in dialysis is called "dialysate". Each session of dialysis lasts about four hours. During the procedure, you can read, write, sleep, watch television, or talk to people.

Common side effects of haemodialysis are sudden drop

Figure 6.2. Structure of a typical hollow fibre dialyser.



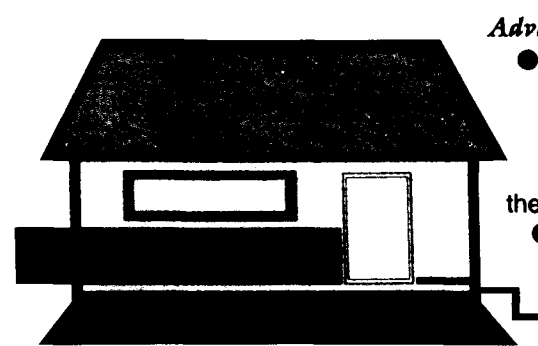
in the blood pressure which leads to dizziness, weakness and muscle cramps. These side effects can be minimized if you follow the dietary restriction. In most cases of chronic kidney failure haemodialysis is necessary at least twice or thrice a week. This is because the effect of one dialysis is temporary. Haemodialysis has to be done regularly throughout life until a successful kidney transplant is done.

Since the dialysis is done only twice a week, you still have to be careful about the diet and liquid intake. You must not take foods containing high potassium and salt. *Protein intake need not be restricted once dialysis is started and performed regularly.*

Haemodialysis costs about ten thousand Rupees every month. You can do the haemodialysis either at home or in the hospital. Box 6.3. lists the advantages and disadvantages of haemodialysis at home and in the hospital.

What is peritoneal dialysis?

Peritoneal dialysis is a type of dialysis in which a membrane inside the abdomen called "peritoneal membrane" is used for the dialysis. Peritoneum is a thin membrane covering the entire wall of the abdomen and the organs inside it. It has many blood vessels. There are three types of peritoneal dialysis: (1) Continuous

Box 6.3. Pros and cons of hemodialysis in the hospital and at home.**Advantages of dialysis at home are:**

- You can do the procedure at a time suitable to you during the day.
- You are likely to be more regular for dialysis because you do not have to travel long distance to the hospital or keep up the appointment.
- You will be able to participate more actively in the management of your health problems.

Disadvantages of dialysis at home are:

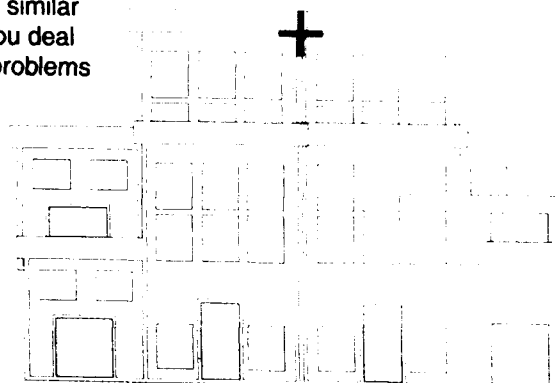
- The dialysis machine is very expensive and you may not have enough place to keep the machine at home.
- You and your family need special training for doing the dialysis. It is not possible to do the procedure unless there are educated family members.
- Family members may find it stressful to take part in the treatment for a long period of time.

Advantages of dialysis in the hospital are:

- The procedure is performed by trained people and the doctors are always available.
- You will meet other patients with similar problems. Talking to them will help you deal with the disease and its associated problems better.

Disadvantages of dialysis in the hospital are:

- The dialysis has to be done at a time suitable to the hospital.
- Traveling to the hospital may be difficult especially if it is located very far from your house.



abdomen at the place where it is first inserted. It does not cause any discomfort. A peritoneal dialysis liquid is introduced into the abdomen through this catheter and allowed to remain inside for some time. Your doctor will tell you the exact volume of the peritoneal liquid which has to be put into the abdomen. After the dialysis, this liquid drains out of the body into a dialysis bag kept below the body by gravity. Liquid remains inside the abdomen for four to six hours during which time the dialysis takes place. A new dialysis bag is connected after the previous bag becomes empty. The process of CAPD is as shown in Figure 6.3.

It is important to remember that you should change the dialysis bags

in a clean surrounding after taking all precautions to prevent infection. This is because the CAPD catheter is a direct route into the body for disease causing germs. These germs can cause an infection called "peritonitis". Peritonitis causes fever and pain in the abdomen.

It is also important to prevent soreness and infection of the skin around the catheter. Your doctor will teach the correct procedure for changing the bags and putting the liquid in the abdomen. You should maintain a chart of the amount of liquid put into the abdomen and the amount collected in the bag below. This chart will help maintain liquid balance in the body.

The process of removing used dialysis bags and introducing more liquid takes about thirty to forty minutes. It is necessary to change the bags about four times a day. Materials for CAPD are costly and are available only at some chemists. CAPD costs about twenty thousand Rupees every month.

Advantages of CAPD are:

- No machines are required.
- You can do it anywhere at a time convenient to you.

Ambulatory Peritoneal Dialysis, also called CAPD; (2) Continuous Cyclic Peritoneal Dialysis, also called CCPD; and (3) Intermittent Peritoneal Dialysis, also called IPD. Of these, Continuous Ambulatory Peritoneal dialysis is the commonest.

What is Continuous Ambulatory Peritoneal Dialysis?

Continuous Ambulatory Peritoneal Dialysis or CAPD was introduced in late 1970s as a treatment of chronic kidney failure. It is called *continuous* because the dialysis goes on within the body throughout the day and night, every day of the year. It is *ambulatory* because you can walk, go to work and continue to do your day to day activities while on dialysis. It is *peritoneal* because the dialysis takes place in the peritoneum.

How does CAPD work?

A small soft plastic tube called "*catheter*" is put into the abdomen through a minor surgical procedure in the operation theatre. This catheter always stays in the

- Support from family members is not necessary for dialysis.

Disadvantage of CAPD is:

- Disruption of daily routine.

What is Continuous Cyclic Peritoneal Dialysis?

The process of Continuous Cyclic Peritoneal Dialysis (CCPD) is like CAPD. The only difference is that a machine is connected to the abdominal catheter. This machine automatically fills and drains the dialysis liquid from the abdomen. The machine does this at night. The treatment lasts for ten to twelve hours every night.

Advantage of CCPD is:

- The dialysis takes place in the night when you are sleeping. Thus there is little disruption of normal life.

Disadvantages of CCPD are:

- A machine is required to do the procedure.
- Support from a family member is necessary to attach the catheter to the abdomen.

What is Intermittent Peritoneal Dialysis?

Intermittent peritoneal dialysis (IPD) uses the same type of machine as CCPD to add and drain the dialysis liquid. IPD is usually done in the hospital. It takes longer time to complete the dialysis than CCPD. This type of dialysis is necessary many times a week. The total duration of dialysis per week is about thirty-six to forty-two hours.

Advantage of IPD is:

- The procedure is done by trained people.

Disadvantages of IPD are:

- Long time of treatment.
- Need to travel to the hospital.
- It requires a machine.

What is kidney transplantation?

Kidney transplantation is a procedure in which a healthy kidney from another person is attached into your body. The original kidneys are usually left in their normal position. This new kidney takes over the function of cleaning the blood. A successful kidney transplantation for most patients of chronic kidney failure is the best solution. *However, not all patients are suitable for kidney transplantation.*

Kidney transplantation is a major surgery. It may take three to six hours for the procedure. You can go home after ten to twelve days. Regular follow-up is however very important. The person who donates the kidney can be discharged from the hospital after a week. A transplanted kidney usually lasts for about five to seven years. In some patients it is rejected within

a year while in others it may last more than twenty years.

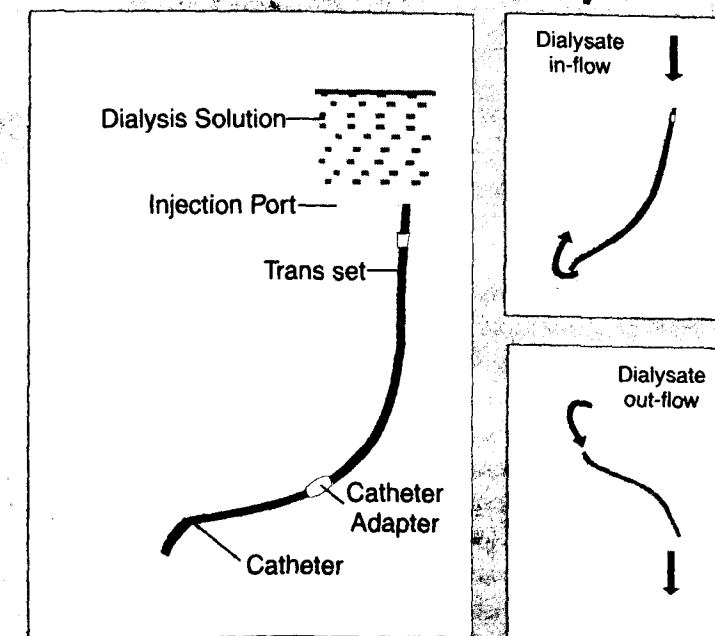
The person who donates kidney is called the "*donor*". There are three types of donors: (1) living related donor; (2) living unrelated donor; and (3) cadaver donor.

Living related donor is the best type of kidney for transplantation as the chances of rejection are less. Father, mother, son, daughter, brother and sister can be donors of this type. Kidney transplantation with living related donor is possible only if you and the donor have the same blood group. In addition, both of you should also have reasonable tissue matching. The donor should not have any other major disease and should have *two normal and equally functioning kidneys*. A kidney donor usually does not have any problem for rest of his/her life after donating the kidney.

Living unrelated donor means kidneys from spouse or some distant relatives such as cousins or uncles. However, this should be the last option as the results of transplantation in these operations are not as good as related donors.

Cadaver donor means a kidney which is taken from a person who is brain dead but has normal functions in all other organs of the body including the kidneys. In India, the Human Organ donation bill was passed by the Parliament in 1994. It is therefore possible to have this type of kidney in some of major hospitals in India. In absence of a family donor, cadaver donor, if available can be used for transplantation.

After kidney transplantation, it is necessary to take "*Immunosuppressive medicines*" throughout life. These medicines prevent rejection of the "foreign kidney" by the

Figure 6.3. Method of Peritoneal Dialysis

Box 6.4. Prevention of chronic kidney failure.

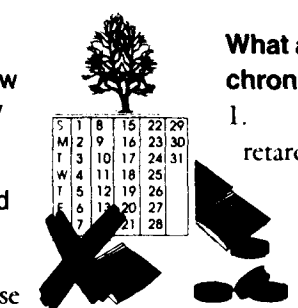
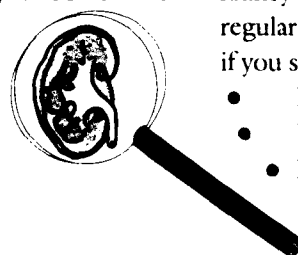
● Do not take medicines such as painkillers and antibiotics without prescription from your doctor. You can thus prevent medicine induced kidney diseases.

● Early detection and removal of kidney stones will prevent kidney stone disease.

● Strict control of diabetes prevents diabetes associated damage to the kidneys.

● Strict control of high blood pressure prevents damage to the kidneys.

● Early diagnosis and surgical correction of obstruction to free flow of urine can prevent chronic kidney damage. Obstruction to urine is especially seen in children and elderly people who have enlarged prostate gland.



chronic kidney failure. Box 6.4. lists some important measures for prevention of chronic kidney failure. It is also important to conduct regular tests to detect kidney damage at the earliest if you suffer from any of the following diseases:

- Diabetes mellitus;
- High blood pressure;
- Family history of kidney disease;
- Kidney stones in a family member;
- Prolonged use of pain killers and antibiotics.

What are the current research areas in chronic kidney failure?

1. Several new medicines are being tried to retard the progression of chronic kidney disease so as to postpone the dialysis and/or kidney transplantation. These medicines include *antibodies* directed against mediators of "inflammation" and excessive growth of "fibrous" tissue in the kidneys. Antibodies are chemical substances secreted by the body in response to a foreign body such as bacteria, virus, dust, etc.
2. Active research is being conducted to improve upon the peritoneal dialysis catheters and techniques. Improved catheters and techniques can minimize the risk of *peritonitis*. Peritonitis is the main cause of failure of CAPD.
3. Newer immunosuppressive medicines are being tried out to prolong the survival of kidney transplant. Some of these medicines are FK506, Mycophenolate, Rapamycin.
4. Transplantation of kidneys from pigs and chimpanzees is being tried out to overcome shortage of human organs. The in-born characteristics of these animals is artificially being manipulated in the laboratory so that the human body accepts these foreign kidneys.

body by suppressing cells which fight disease causing germs and other foreign bodies which enter your body. There are three major immunosuppressive medicines: (1) Cyclosporine; (2) Azathioprine; and (3) Prednisolone. Of these, cyclosporine is most effective and costly. The immunosuppressive medicines increase the risk of developing common as well as uncommon infections. It is therefore important to avoid unhygienic food, water and crowded places. Despite immunosuppressive medicines, rejection is the commonest cause of failure of the transplanted kidney.

How can chronic kidney failure be prevented?

Chronic kidney failure can be prevented by early diagnosis and management of diseases that can lead to

AYURVEDA

Sushruta, the famous surgeon of ancient times, has described the normal functions of kidneys and various kidney disorders in great detail. He calls kidneys "Vrikkau", nephrons as "*mutrashaya*" and outer part of the kidney containing the nephrons as "*ammashaya*". Sushruta has described the nephrons as the seat of formation of urine. His description of the organs of excretion and their function is the same as described in Allopathy. Sushruta's explanation on the mechanism of filtration of blood and formation of the urine is also very accurate. He emphasises that the nephrons are in lakhs and cannot be seen with naked eyes. He further states that during the filtration process, if there are imbalances in the

three *doshas* of the body — *vata*, *pitta*, and *kapha*, chronic kidney failure can occur.

What are the types of kidney disorders?

Ayurveda describes eight types of painful urination (*Mutrakrichha*) and thirteen types of suppression of urine (*Mutraghata*). Painful passing of the urine is also observed in conditions of suppression of urine. Suppression of urine is often due to obstruction. There are thirteen sub-groups of suppression of urine. These include: (1) narrowing of the structures of the kidney; (2) enlarged prostate; (3) inability to pass urine; (4) inability to hold urine; (5) distended bladder; (6) narrowing of the tubes for passing

urine; (7) suppression of urine; (8) tumours of the bladder; (9) abnormal urinary discharges just before or after sexual intercourse; (10) infections of the urinary tract; (11) scanty urination; (12) an abnormal passage connecting the bladder and the *rectum*; and (13) abnormal muscle tone of the bladder.

Out of these sub-groups, retention of urine, suppression of urine and scanty urination are the main factors that indicate chronic kidney failure. According to Ayurveda, people who have chronic kidney failure pass less volume of urine. Even if there is a desire to pass urine, it may not pass, and when it passes, there is pain and burning sensation.

What are the causes of chronic kidney failure?

Suppression of natural urges, improper and imbalances in food, abuse of sexual pleasure and traumatic injuries are the main causes of kidney disorders which can lead to chronic kidney failure. It can be also due to complication of infections of the urinary tract, dysentery, diarrhoea, viral disease, allergic conditions and diabetes.

HOMOEOPATHY

The causes, signs and symptoms of chronic kidney failure as per Homoeopathy are the same as those described in the section on Allopathy.

What is the Homoeopathic approach to treatment of chronic kidney failure?

Homoeopathy, just as Allopathy, cannot repair the damage to the kidneys. This is because chronic kidney failure is a progressive and irreversible disease. The aim of the treatment is therefore to stop the progress of the disease, if possible, or retard the progressive damage to the kidneys. The earlier you start the treatment, the better is the response to Homoeopathic medicines likely to be.

Just as in all chronic diseases, a Homoeopath will ask you several questions in order to determine the treatment which is most effective for you. He/she will particularly inquire about:

- **Present medical history.** Special emphasis is on the onset or precipitatory factors for the symptoms. These factors could be physical or mental shock or excessive and excessive use of some medicines.
- **Past medical history.** A Homoeopath will particularly inquire about past illnesses such as high blood pressure, diabetes, kidney stones, frequent infections and regular and prolonged use of some medicines.
- **Family history.** As always, the family's medical history plays an important role in deciding the plan of

What are the symptoms of chronic kidney failure?

Increased frequency of passing the urine, inability to hold the urine, inability to pass the urine and passing or suppression of large volume of urine can be due to chronic kidney failure. Other symptoms include pale skin, swelling of the body, especially around the eyelids, loss of sleep, thirst, loss of appetite, oedema in the foot, increased pulse rate, dryness of skin, head ache, body ache, pain in upper part of the thighs and decreased watering from the mouth.

What is the treatment of chronic kidney failure?

Ayurveda recommends single and compound medicines for treatment of chronic kidney failure. **Single medicines** include juice of heart-leaved moonseed or whole plant of pig weed. **Compound medicines** commonly used for treatment of chronic kidney failure include *shuddha shilajeet*, *maheswari vata*, *punarnavadi mandoor* and *sarvatobhadra* to be taken with honey.

A simple decoction prepared from fruit of small caltrops, root of *Dakachru* (*Saxifraga ligulata*) and bark of three leaved caper is also used in Ayurveda.

Homoeopathic treatment. Clinical observations of a large number of patients suggests that chronic disorders are more common in people who have family history of some diseases such as diabetes, allergic diseases, tuberculosis, etc. This susceptibility to major diseases is attributed to some inherited traits. Unless specific constitutional treatment with Homoeopathic medicines is given to overcome these traits, suitable treatment for chronic diseases is not possible.

After taking a very detailed history, your doctor will examine you in detail. He/she will also recommend several laboratory tests to decide on the dose of medicine most suitable to you. These tests may need to be repeated in order to monitor your progress and plan further treatment. Tests normally recommended for assessing the action of the medicines and the progress of the disease include: (1) blood urea; (2) serum creatinine; (3) serum protein; (4) urine protein; and (5) serum electrolytes.

What does Homoeopathic treatment do?

The first step in Homoeopathic treatment is to treat the cause of kidney failure. This is because if the cause is not treated, the damage to the kidneys would worsen.

Homoeopathic treatment for chronic kidney failure has five major effects. It (1) gives relief from symptoms; (2) slows down progression of the disease; (3) minimizes the complications; (4) maximizes your kidney functions

and (5) prevents long-term adverse impacts. It also treats side effects of Allopathic treatment. In very advanced cases where the damage to the kidneys is very extensive, Homoeopathy gives relief from symptoms even though it does not cure the disease. You will therefore be more comfortable and will be able to do most of your routine activities without major discomfort.

If the damage to the kidneys is very extensive, dialysis may be essential to remove the waste matter from the body. Homoeopathic treatment can be taken along with dialysis. It can reduce the frequency of dialysis and therefore the cost and discomfort of treatment with dialysis reduces.

Homoeopathic medicines give you the above benefits by (1) increasing your body's natural defence mechanism to fight diseases and (2) improving efficiency of the healthy part of the kidneys. Thus, it also changes the blood levels of waste matter to some extent.

What is the treatment for chronic kidney failure?

There are several Homoeopathic medicines for treatment of chronic kidney failure. Your doctor is the best person to decide on the medicine including its dose. Some of the medicines used more commonly are Cuprum Met, Cuprum Ars, Apis, Eel Serum, Apocynum, Urea and Merc Cor. These medicines improve the kidney functions. In addition to the above, your doctor may also prescribe some other medicines to enhance your body's capabilities to fight diseases, especially infections. Homoeopathic medicines are not immunosuppressive and therefore there are less chances of your contracting other infections. In fact these medicines increase your resistance to various

infectious diseases.

In addition to the medicines, it is important for you to follow a strict diet. Your doctor will give you details about the exact quantity of food and liquids that you can take every day. You should take complete physical and mental rest because any stress can aggravate the disease.

Homoeopathy also strongly recommends prevention of chronic kidney failure. These preventive measures are the same as those detailed in the section on Allopathy.

What are the limitations of Homoeopathic treatment?

If the damage to the kidneys is very extensive, you may not respond to Homoeopathic medicines. In such cases, your doctor will recommend dialysis. Your doctor may also recommend Allopathic medicines if you have uncontrolled high blood pressure or diabetes. This is because Homoeopathic medicines may not be able to control the blood pressure or blood sugar if the disease is at an advanced stage.

Is it necessary to stop Allopathic medicines before starting Homoeopathic medicines?

No. In diseases such as chronic kidney failure, Allopathic medicines are often life saving and they should not be stopped suddenly. You can take Allopathic and Homoeopathic medicines together without any adverse impacts. If your response to Homoeopathic medicines is good, you may be able to reduce the dose of Allopathic medicines gradually. *However, it is important to remember that Homoeopathic medicines have greater effect if you start the treatment at an early stage.*

NATURE CURE

Causes, signs and symptoms of chronic kidney failure as per Nature Cure philosophy are the same as those detailed in the section on Allopathy. The main aim of Nature Cure management of chronic kidney failure is to improve the efficiency of (1) normal part of the kidneys and associated organs such as the ureters and the urinary bladder and (2) other organs of excretions such as bowels, lungs and skin. Nature Cure also recommends that you should reduce the work load of your kidneys by avoiding diets which generate large volume of waste products.

What is the treatment of chronic kidney failure?

Nature Cure also stresses that kidney functions cannot be restored if there is extensive damage to the structure of the kidneys. If there is extensive damage, dialysis is the only way to remove waste products from the body. However, the following treatment options can provide relief from

symptoms if kidneys are still functional. *It is important to remember that you should not adopt any treatment options without direct supervision by a doctor.*

- **Kidney pack.** This pack consists two parts: Hot water bottle and an ice bag. Keep a hot water bottle filled with tolerable hot water on the back in the area of kidneys and at the same time keep an ice bag filled with ice cubes on the "umbilicus" area. Applying a kidney pack for forty five minutes to one hour increases the urine output and improves the filtering capacity of the nephrons. A kidney pack is usually recommended twice a week.

- **Cold hip bath.** Sitting in a sitz bath tub filled with tap water for 10 minutes improves the functions of the kidneys, bladder and the prostate. It is important to remember that you should rub the lower part of your abdomen with a towel during the cold hip bath.

- **Abdominal pack.** Applying a wet bandage to the waist

and covering it with flannel for one hour everyday improves the kidney functions.

- **Enema.** Enema helps remove waste products of the body through bowels. Similarly a sweating bath is often recommended to remove waste products through the skin.
- **Green leaf pack.** A green leaf pack prepared from banana leaves and covered with blanket is recommended once a week to provide relief from symptoms of chronic kidney failure. A full wet sheet pack can also be applied once a week.
- **Onions.** A dressing of grated onions kept on the kidney area improves kidney functions.

The following measures are recommended when there is swelling of the body and difficulty in passing the urine.

- **Hot and cold packs.** Apply hot pack to the kidney area for two minutes followed by cold pack in the same place for half a minute. Alternate hot and cold pack increases urine output by four to five times. It therefore helps to remove the excess liquid from the body.
- **Hot hip bath.** Hot hip bath with bearable hot water for ten to twelve minutes results in passing large volume of urine.

Diet. In addition to the above treatment options, diet plays a very important role in management of chronic kidney failure. You should drink adequate water and reduce intake of salt, protein, non-vegetarian food, milk, greasy and oily food and alcohol.

- **Water and diuretics.** You should drink at least two and a half to three litres of water in order to maintain the chemical balance of the body liquids and maintain the normal consistency and volume of the blood. Water also helps to remove waste products from the body. In addition, you should take natural diuretics (medicines or foods that increase urine production and output). Some of the important natural diuretics are coriander water

decoction, barley water, banana pith, butter milk, parsley juice and tender coconut water. Of these, tender coconut water is the most effective diuretic.

- **Fasting.** Your Nature Cure doctor may recommend a fast for three to four days in order to rid the body of its waste matter. You can have fruit juices, diluted butter milk and tender coconut water during the fast.
- **Reduced salt.** You should not take more than half a tea spoon of salt per day. *It is important to remember that you should not completely stop taking salt.* Natural salt from vegetable sources is better than commercial salt. Do not add salt while cooking. This is because cooked salt is more difficult to digest and remove from the body.

1. **Reduce protein.** Protein is the most difficult food to digest, utilize, collect and remove from the body. You should therefore reduce protein intake.

Protein also requires more energy to go through the process of digestion as compared to other foods. The average time for foods other than fruits to pass through the entire alimentary canal is about twenty five to thirty hours. Non-vegetarian foods require almost twice this time. Thus, if you eat more protein, you will need more energy to digest it. You will therefore have less energy for other functions of the body including removal of waste products. Animal protein such as meat and fish results in higher levels of waste products such as urea.

Milk protein is not recommended in chronic kidney failure. You should instead eat pulses such as red grain, green grain and Soya bean.

- **Parsley.** Add large portions of parsley in salads, soups and vegetables as they improve the kidney functions.
- **Exercise.** It is important to do regular exercises as recommended by your doctor. Exercise helps remove waste products from the body and increase absorption of food. There is thus less generation of waste products.

UNANI

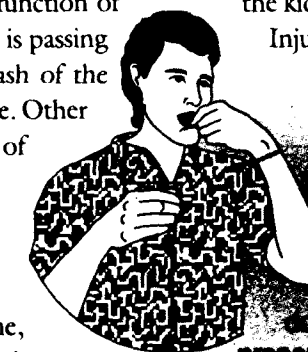
Chronic kidney failure is known as "muzmin suqoot kulliyya" in the Unani system of medicine. It has been described in detail by several ancient hakims. Chronic kidney failure is defined as progressive dysfunction of the kidneys. The most important symptom is passing less urine which has the appearance of wash of the meat. This colour is due to blood in the urine. Other signs and symptoms include headache, loss of appetite, poor digestion and poor eye sight.

What are the causes of chronic kidney failure?

According to Unani system of medicine, chronic kidney failure is due to imbalances in hot,

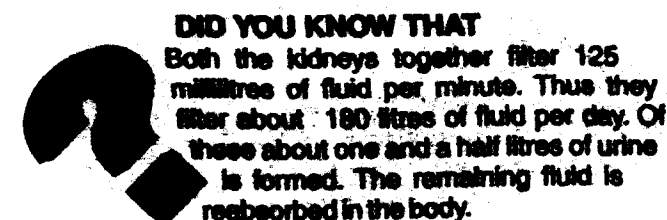
cold or humoral temperament, infections of the kidneys, weakness of the filtering units of the kidneys, weakness in the muscles of the kidneys, widening of the cavity inside the kidneys and kidney stones.

Injury, excessive use of hot or cold foods, continuous



Health tip of the month

Use of medicines for health should be taken as take medicines that your doctor and know further guidance properly.



pressure on the lower abdomen, excessive sexual intercourse and excessive use of medicines to increase volume of urine can lead to kidney failure. These factors result in poor filtration in the nephrons. Chronic kidney failure results when the damage to the kidneys is progressive and the waste products therefore accumulate in the body.

What is the treatment for chronic kidney failure?

The treatment will depend upon the cause of the disease. If there are imbalances in any of the *temperaments*,

suitable medicines are prescribed to correct the imbalances. In addition, specific medicines are also given for improving kidney functions. Kidney tonics are prescribed when there is weakness in the muscles of the kidneys.

Unani medicines which improve kidney function by increasing its retentive power are prepared from the following: (1) Dragons' blood; (2) Pomegranate; (3) Acacia gum; (4) Armenian bole; (5) Plantain tree; (6) Sandal wood; (7) Rose flower; (8) Acacia; (9) Embelic myrobalan; (10) Myrtle and (11) Vinegar.

Kidney tonics are prepared from (1) Pomegranate; (2) Grapes; (3) Dry dates; (4) Armenian bole; (5) Roasted wheat flour; (6) Cottage cheese; (7) Milk of sheep and camel and (8) Goat kidneys.

Diets recommended as kidney tonics include fruits such as pomegranate, grapes and dates, kidneys and fat of goat, wheat porridge; milk and rice; soup of head and legs of the goat and cottage cheese.

DEFINITIONS

Antibodies are chemical substances produced in the body in response to a bacteria, virus or other disease causing agents. Just as each lock has one specific key, one antibody is specific to one disease causing agent. **Arteries** are large blood vessels that carry pure blood from the heart towards other parts of the body.

Bladder is a bag like structure which holds secretions. Urinary bladder holds urine.

Creatinine is a waste product formed by breaking down of muscles.

Dialysate is a solution used in dialysis.

Dialysis is a process by which some elements of blood are removed through a membrane.

Dialyser is a machine used in dialysis.

Erythropoietin is a hormone secreted by the kidneys. It stimulates and regulates the production of red blood cells.

Fibrosis is excessive growth of fibre or fibre containing materials in the body. It occurs normally in the formation of scars to replace normal tissue which is lost through injury or infection.

Inflammation is a protective response of body tissues to irritation of injury. Common signs are redness, heat, swelling and pain.

Nephrons are structural and functional units of kidneys. They filter blood and remove waste products.

Peritoneum is a large membrane which covers the inner lining of the wall of the abdomen and is reflected on the organs inside the abdomen.

Prostate is a gland in men which surrounds the neck of the urinary bladder. It secretes a substance which liquifies semen.

Rectum is a portion of the large intestine just before the outer opening called the anus. It is about twelve centimetres long.

Renal is a medical term pertaining to the kidney.

Testes are male sex organs which produce semen.

Ureters are one pair of tubes, about thirty centimetres long, which carry urine from the kidney to the bladder.

Urethra is a small tube which drains urine from the bladder.

Veins are blood vessels which carry impure blood from various parts of the body to the heart.

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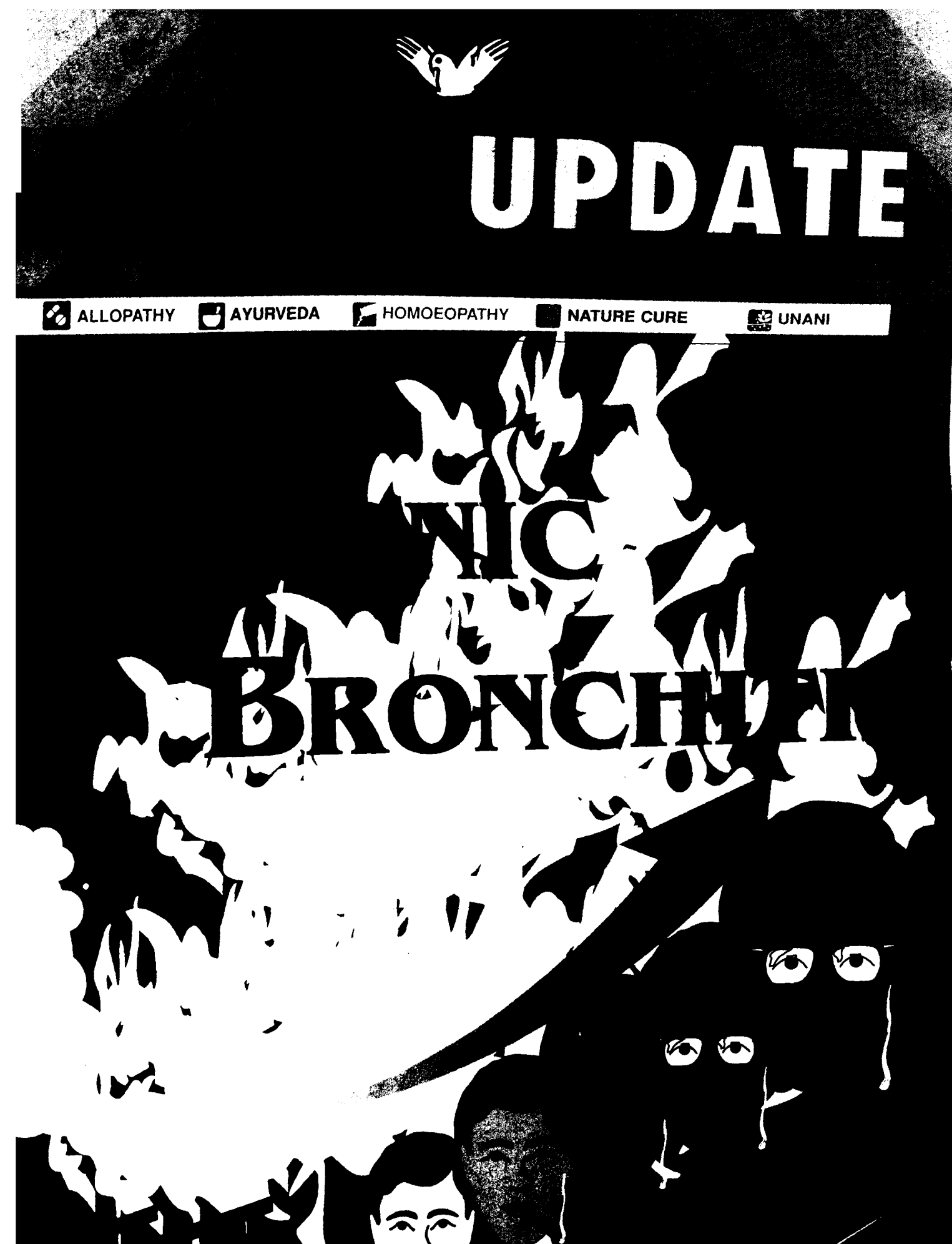
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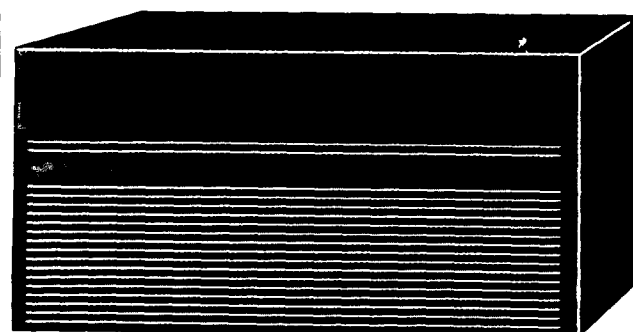
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Chronic Bronchitis

 **ALLOPATHY**

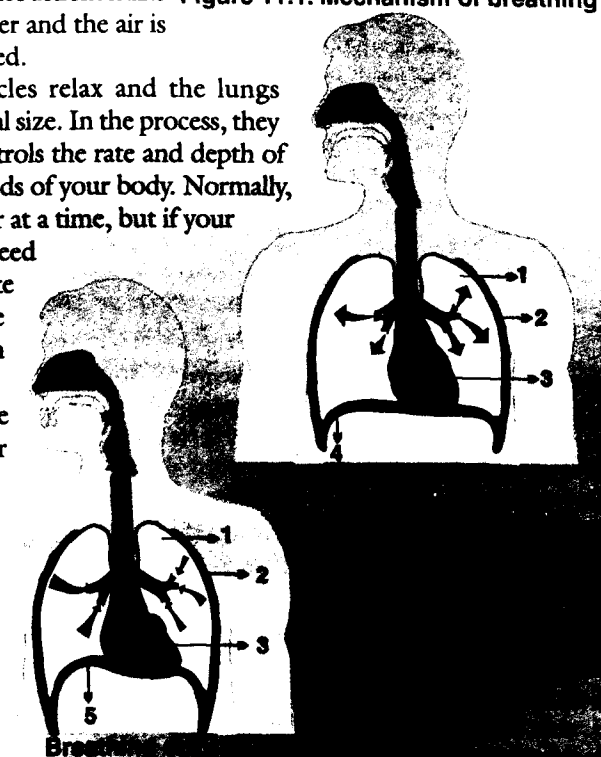
Chronic Bronchitis is a common respiratory disease that usually affects men and women over the age of forty years. It is caused by chronic irritation of the respiratory tract by tobacco smoke and other atmospheric pollutants inhaled over several years or decades. In this condition, you will have chronic cough and expectoration of phlegm, especially during winter months. Chronic Bronchitis is defined as chronic cough with production of phlegm for more than three months for two consecutive years. As the disease progresses, you will have breathlessness. Heart failure is common in the later stages of the illness.

What is the mechanism of breathing?

Breathing is a mechanism where the muscles between the ribs and the *diaphragm*, a sheet of tissue that separates the chest cavity from the abdominal cavity act together as shown in Figure 11.1. When you breathe in (inhale), the muscles outside the ribs pull the ribs upwards and outwards. The diaphragm shortens and is pulled down. These actions make the chest and lungs cavity bigger and the air is sucked in to fill the space created.

To breathe out, the muscles relax and the lungs therefore return to their original size. In the process, they also empty out. The brain controls the rate and depth of breathing according to the needs of your body. Normally, you take about half a litre of air at a time, but if your muscles work harder and you need more oxygen, the breathing rate increases and you may breathe in two or three litres of air at a time.

When you take a breath, the air first passes into the nose or mouth, the throat and then into the wind-pipe. The wind-pipe divides into two branches called the *bronchi* in the lungs and these in turn continue to divide in to smaller and smaller branches. The smallest



Definitions of all technical terms used in this issue are given on the last page.



branches are called *bronchioles* which end in tiny air sacs. Each sac contains a group of air cells of the lungs called the *alveoli*. Both the lungs have almost half a billion alveoli, each of which is less than one millimetre in size. A network of very small blood vessels surrounds the alveoli where the exchange of oxygen and carbon dioxide takes place. Functions of the lungs are as detailed in Box 11.1.

What other diseases are related to Chronic Bronchitis?

Chronic Bronchitis and *Emphysema* are two related disorders that often coexist. Tobacco smoking or exposures to atmospheric pollution are the main causes for both these conditions. Typical feature of Chronic Bronchitis is cough with excessive secretion of mucous in the respiratory tract. This excessive secretion of mucous is brought out as phlegm or sputum. Emphysema is a condition where there is permanent dilatation of the air sacs with destructive changes in their walls. The air sacs become over dilated and therefore the lungs grow larger. Larger lungs are difficult to empty.

Chronic Obstructive Airways Disease is a common term that refers to both, Chronic Bronchitis and Emphysema. *Bronchial Asthma*, however, is a different disease because the narrowing in this condition is completely reversible. Moreover, Asthma often starts in childhood, and the disease has a background of allergy that may run in the family.

What are the causes of Chronic Bronchitis?

Box 11.2 details the risk factors of Chronic Bronchitis that are detailed below.

Tobacco smoking is the single most important cause of Chronic Bronchitis. All forms of smoking, such as, cigarettes, bidis, chillum, cigar, hukka (water-pipe) or chutta (reverse smoking) can cause Chronic Bronchitis. Even passive smokers — persons chronically exposed to environmental tobacco smoke — can suffer from Chronic

Bronchitis, although their risk is lower. The main reason for a ban on tobacco smoking in public places is to protect the health and rights of non-smokers.

Kitchen smoke is one of the common causes of Chronic Bronchitis among middle-aged or elderly women in rural areas. Even if these women do not indulge in tobacco smoking, prolonged exposure to smoke emitted by firewood, coal or animal dung while cooking increases their risk for Chronic Bronchitis. More than sixty percent households in India use fuels without proper ventilation for the smoke.

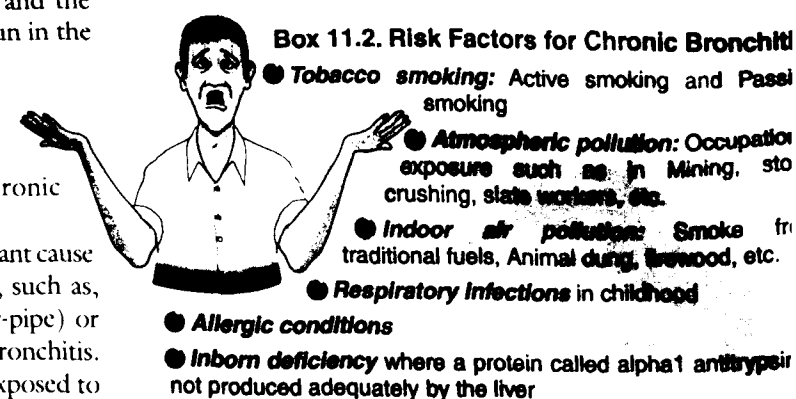
Atmospheric pollution at work place is another major cause of Chronic Bronchitis among people engaged in industries or other dusty occupations. These include crushing, mining, sand blasting and carding and blowing in cotton mills.

How common is Chronic Bronchitis?

About eight percent men and three percent women above the age of forty years suffer from Chronic Bronchitis in urban areas of India. In rural areas, there is no significant difference in the proportion of men and women who suffer from this condition. Twenty five percent of people above forty years of age who smoke have Chronic Bronchitis. Up to forty five percent Indian adults are estimated to smoke tobacco in some form or the other.

How great is the risk if I smoke?

Enormous. Chronic Bronchitis develops after several years or decades of an inactive phase. During this phase, you may continue to smoke and yet have a few symptoms. Thus, if you had started smoking at the age of twenty years, you may live without symptoms till you are about forty or fifty years old. Given time, however, symptoms of cough with phlegm can be observed in all smokers except a lucky few! Moreover, the lung functions start declining rapidly right from the day you start smoking. The only reason why adverse impacts are felt after a few decades is because the lungs have a large reserve of functional capacity. *By the time*



Box 11.2. Risk Factors for Chronic Bronchitis

- **Tobacco smoking:** Active smoking and Passive smoking
- **Atmospheric pollution:** Occupational exposure such as in Mining, stone crushing, slate workers, etc.
- **Indoor air pollution:** Smoke from traditional fuels, Animal dung, firewood, etc.
- **Respiratory Infections** in childhood
- **Allergic conditions**
- **Inborn deficiency** where a protein called alpha1 antitrypsin is not produced adequately by the liver

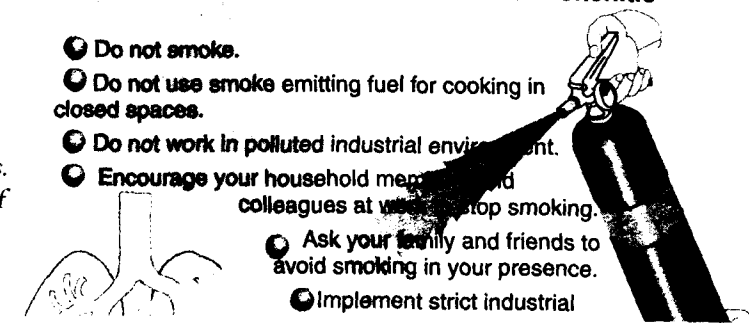
you begin to experience shortness of breath on physical exertion, you would have practically lost function of one lung. Those who participate in competitive sports experience breathlessness much earlier than others.

There are other more serious hazards of smoking. These include lung cancer, heart attack, cancer of the throat and digestive tract and "gangrene" of the limbs. Gangrene means death of a tissue, often due to loss of blood supply.

Would it help to quit smoking now?

Box 11.3. Prevention of Chronic Bronchitis

- Do not smoke.
- Do not use smoke emitting fuel for cooking in closed spaces.
- Do not work in polluted industrial environment.
- Encourage your household members and colleagues at work to stop smoking.
- Ask your family and friends to avoid smoking in your presence.
- Implement strict industrial



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and during winter months. A 'head cold' goes down the chest and seems to stay there for a long time. Initially, the symptoms may occur for three to four months every year. However, as the disease progresses, symptoms may be present throughout the year. You may also have repeated episodes of chest infections. These are the acute attacks of Chronic Bronchitis during which the cough is aggravated and the amount of phlegm increases. The phlegm may also appear yellowish or greenish. Blood is commonly not seen in the phlegm in Chronic Bronchitis. Presence of blood therefore indicates presence of other diseases.

After few years, the lower respiratory passages become permanently narrow, thus making the flow of air in and out of the lungs difficult. Difficulty in airflow results in breathlessness on physical activity that continues to worsen. As the disease progresses, the lungs are unable to provide the required amount of oxygen to blood and body tissues.

in Chronic Bronchitis. However, your doctor may also recommend a x-ray in order to rule out other causes of chronic cough such as tuberculosis or lung cancer.

Lung function tests are important for assessing the severity of (a) obstruction in the respiratory tract and (b) over dilatation of the lungs.

What are lung function tests?

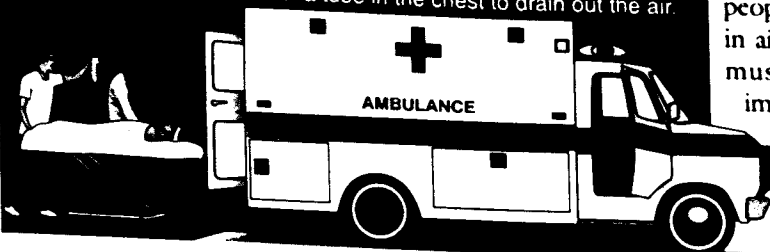
Lung function tests are simple tests that measure the amount of air you can inhale or exhale in a single breath using maximum effort. These tests are done by a simple electronic spirometer. To do the test, you will have to sit on a chair, hold the lips tightly around the mouthpiece of the spirometer and breathe. Your doctor will clamp your nose with a clip so that you will not breathe through the nose. First, you will be asked to inhale fully and then exhale slowly and completely till no more air can be breathed out despite

Box 11.4. Complications of Chronic Bronchitis.

Recurrent respiratory infections as they worsen the signs and symptoms. Pneumonia is an especially serious complication.

Respiratory failure with retention of carbon dioxide. Acute rise in carbon dioxide tension results in confusion, drowsiness or unconsciousness. This condition may require oxygen therapy and in severe cases, machines for assisted respiration.

Pneumothorax, a condition in which the air leak from the surface of the lungs. This is an acute emergency where there is air or gas in the space between the two layers of the membrane that covers the outer part of the lungs and inner part of the chest wall. Symptoms include sudden onset of chest pain and breathlessness. This condition requires insertion of a tube in the chest to drain out the air.



maximal effort. Subsequently, you will need to repeat the breathing but breathe out as fast as possible.

In case of normal lung functions, you should be able to breathe out eighty percent of the total inhaled air in the first second of forced maximal exhalation. In case of significant obstruction to the respiratory passages, you will breathe out less air.

Peak expiratory flow rate is another index of obstruction to the respiratory passages that can be measured using a simple and small device called "Peak flow meter". Sometimes serial measurements of lung function are taken to assess the improvement or deterioration in the lung functions over a period of time. Daily monitoring of peak flow is sometimes recommended for people with asthma.

People with advanced disease who have chronic respiratory failure need monitoring of oxygen and carbon dioxide tension in the blood. Very low concentration of oxygen in the blood would necessitate oxygen therapy. In recent years, measurement of oxygen saturation by "pulse oximetry" has become more common. Pulse oximeter is a portable equipment that can measure and display oxygen saturation continuously without taking blood sample.

Many doctors often evaluate the degree of disability using "twelve minute walking test". It is the maximum distance in meters that you can cover by walking at a tolerable pace for twelve minutes.

What is the treatment for Chronic Bronchitis?

The treatment of Chronic Bronchitis includes breathing exercises, general measures, medicines that dilate the respiratory passages, chest physiotherapy, oxygen therapy and antibiotics in case of infections. Breathing exercises are detailed in Box

11.5 and general measures for management of Chronic Bronchitis are detailed in Box 11.6.

Bronchodilators: These are medicines that relax the muscles lining the respiratory tract and thereby remove narrowing of the airways due to contraction of these muscles. Your doctor may recommend bronchodilators if you have breathlessness on exertion and the lung function tests indicate significant obstruction in the respiratory passages. It is important to remember that more than twenty percent improvement in the lung functions after taking bronchodilators is usually observed in people with asthma. This is because the obstruction in airways in Asthma is due to contraction of the muscles of the respiratory passages. Similar improvement is not common in Chronic Bronchitis because the airways obstruction in Chronic Bronchitis is due to reasons other than contraction of muscles.

Inhaled bronchodilators are preferred because the dose required for inhaling the medicine is much smaller and therefore the side-effects are minimal. These medicines are usually available as *metered dose inhalers*, which you can carry in your shirt pocket. *It is important for you to learn the correct technique of using these inhalers from your doctor.* Otherwise, major portion of the medicine may remain in the throat itself and very little will reach the lower respiratory passages. Inhalers deliver a fixed amount of the medicine when you depress the inhaler can just as a spray from a perfume bottle. You should depress the can — just at the beginning of a deep inhalation and hold the breath for five seconds before exhaling the air. If you find it difficult to coordinate pressing of the inhaler can with inhalation, your doctor is likely to recommend a *spacer* between inhaler and the mouth.

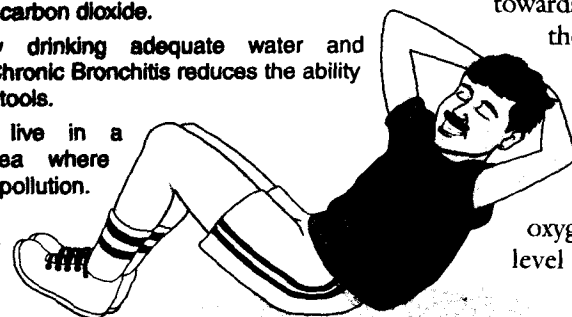
Inhaled bronchodilators commonly recommended for management of Chronic Bronchitis include *salbutamol* or *terbutaline* and *ipratropium bromide*. Sometimes a combination of these medicines is prescribed. Occasionally,

Box 11.5. Breathing exercises Recommended for Chronic Bronchitis

- Take a slow and deep breath, and then exhale it slowly, and as completely as possible, with the lips pursed.
- Towards the end of exhalation, apply gently pressure with your hands over the upper part of the abdomen in order to squeeze out the last bit of air from the lungs.
- Now take a few usual breaths before repeating the above two steps again. You should take twenty deep breaths two to three times a day.
- Alternatively, breath out slowly into a football bladder, or a balloon and attempt to inflate it as much as possible in one breath.
- Incentive spirometers are small, inexpensive devices that encourage you to inhale as fast and as deeply as possible. Inhalation through a resistance placed at the mouth also helps in increasing the strength of the muscles used during inhalation.

Box 11.6. General measures for management of Chronic Bronchitis

- Stop smoking.
- Avoid exposure to environmental pollution.
- If you are obese, reduce weight by a strict low-calorie and low-fat diet.
- In case you are malnourished, improve your calorie intake.
- Have light meals so as not to distend the abdomen and cause further difficulty in breathing.
- Avoid high carbohydrate meals consisting of sugar and starch as they increase production of carbon dioxide.
- Avoid constipation by drinking adequate water and consuming high fibre diet. Chronic Bronchitis reduces the ability to strain while passing the stools.
- If possible, do not live in a congested residential area where there is high environmental pollution.
- Do regular physical activity within the limits of exercise tolerance.



oral theophylline tablets are also recommended. Inhaled bronchodilators provide relief instantly and the effect may last up to four hours. Adverse reactions include increased rate and force of the heart beat. Some people may have temporary side effects such as anxiety, fear, dizziness, restlessness, weakness and headache. Box 11.7 describes the correct use of inhalers.

Antibiotics: These are medicines that either kill the bacteria or prevent them from growing in the body. They are prescribed if you have infections of the respiratory tract. As mentioned earlier, these infections increase the severity of symptoms of Chronic Bronchitis. Commonly prescribed antibiotics are *amoxycillin*, *erythromycin*, *cotrimoxazol* and *cephalosporin*. Culture tests of the sputum are usually not recommended as they often do not give satisfactory results.

Cough mixtures and medicines that make the secretions of the respiratory canal including the phlegm thin in order to bring them out easily have not been proven to be effective.

Chest physiotherapy: Breathing exercises, steam inhalation, and drainage of secretions from the bronchioles

in different postures are important measures to preserve lung functions for a longer time. The main purpose of breathing exercises is to improve the strength and function of the muscles of the respiratory system. Regular exercise will give you a sense of well being and improve exercise capacity. Because of the over-inflation of the lungs in Chronic Bronchitis, the diaphragm is displaced downwards. Gentle pressure on the upper part of the abdomen towards the end of exhalation helps in pushing the diaphragm up and therefore makes exhalation more complete. Complete exhalation increases the amount of air you can inhale in subsequent breath.

Oxygen therapy: In case of severe airway obstruction, there is less oxygen in the blood. Reduced oxygen blood level has adverse effects on several vital functions of the body. If the blood oxygen level is low despite all the measures described above, you may

benefit from inhalation of oxygen on a long-term basis at home. Oxygen is usually administered through nose prongs at the rate of one to two litres per minute, for fifteen to twenty hours per day. It improves the quality of life as well as the survival. Oxygen therapy is a very expensive treatment and is therefore of limited utility. Oxygen can be given either through a cylinder or an oxygen concentrator. Cylinders are heavy and require daily replacement. Oxygen concentrator is an instrument that provides a constant flow of oxygen by absorbing nitrogen from the atmospheric air. It has a high initial cost — approximately seventy thousand rupees — but has no recurring cost except for power consumption. *It is important to remember that oxygen therapy cannot be recommended for those who continue to smoke despite respiratory failure.*

Portable oxygen cylinders enable severely afflicted people to go out of the house for short periods. They are, however, expensive and the need for frequent refilling.

ACUPUNCTURE

Acupuncture describes that Chronic Bronchitis is an example of retention of phlegm in the lungs. This is one of the three main disharmonies in the body as per the Chinese philosophy. Phlegm may have its origin internally (due to chronic deficiencies, irritation or infection) or externally (due to smoking and pollution).

What is the treatment of Chronic Bronchitis?

Acupuncture theory strongly recommends stopping smoking, avoiding infections and regular exercises as supplements to the Acupuncture treatment. Exercises such as walking and deep breathing to improve lung functions are especially recommended.

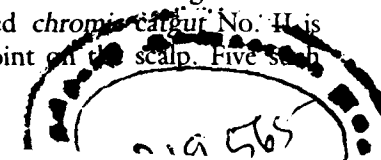
The principle of treatment is to strengthen the

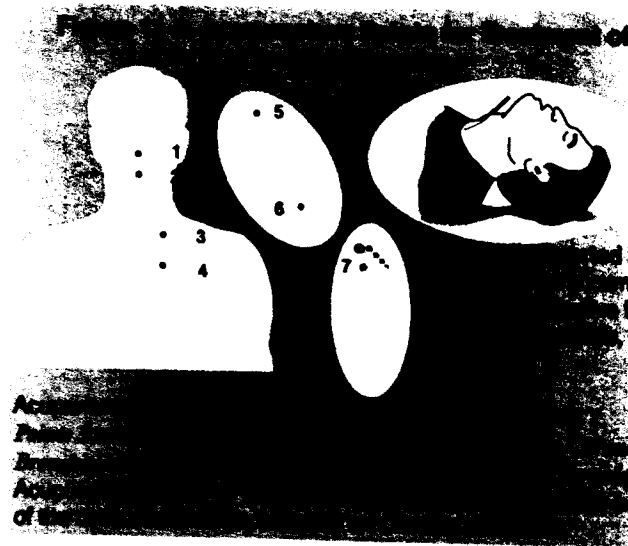
diminishing function of the lungs and remove the phlegm. This can be accomplished through either of the two treatment options:

- **Treatment option 1:** Placing needles in the relevant points and giving low current for thirty minutes each time.
- **Treatment option 2:** Placing needles in the relevant points and giving current for twenty minutes on alternate days.

Acupuncture points for each of the above two treatment options are as shown in Figure 11.2.

● **Depo-Acupuncture:** This is a type of Acupuncture treatment, which is also called suture embedding treatment. A thread like material called *chromic catgut* No. 4 is embedded in a specific point on the scalp. Five such





embedding are done at an interval of thirty days. A major study where this treatment option was tested indicated that the total effective rate was 92.3 percent — 25.8 percent people had complete cure and 27.2 percent cases had significant relief from symptoms.

- **Stop smoking:** Electro-Acupuncture and ear

Acupuncture in the inner layer of the skin is an effective way of helping smokers give up the habit of smoking. Most studies have indicated a success rate of over eighty two percent.

- **Avoid infections:** One single treatment of “Acupuncture” is highly effective in preventing most respiratory infections.

What are the advantages of Acupuncture?

Treatment of Chronic Bronchitis with Acupuncture has several advantages. This is because Acupuncture:

- Makes the structure of the lining of the respiratory tract normal;
- Reduces the number of inflammatory cells in the respiratory tract;
- Reduces the number of eosinophils — one type of white blood cells that increase in a variety of diseases including allergies;
- Increases production of some chemicals in the body that alter the production of antibodies;
- Relieves symptoms without taking any medicines;
- Is cheap, requires no hospitalisation and often limits the need for long-term treatment; and
- Has no known adverse reactions.

AYURVEDA

Chronic Bronchitis is called *Jirnakasain* in Ayurveda and is defined as a respiratory infection that persists for at least three months during two successive years. Its exact cause is not known. However, this condition is observed more frequently among people who are exposed to air pollution and tobacco smoking.

Ayurveda also considers smoke-polluted inhalation as the main cause of Chronic Bronchitis. In this condition, there are abnormalities in *Kapha* and *Pitta* doshas of the body.

There are three types of this disease: (a) *Hikka*, (b) *Swasa* and (c) *Kasa*. Of these, *Hikka* and *Swasa* do not produce any secretions that come out of the body whereas in *Kasa* there is a discharge that may be productive. *Kasa* is considered as clinical presentation of other diseases. It is usually of two types: (a) dry, where very little secretion comes out while coughing; and (b) wet, where there is productive cough.

What are the principles of treatment?

Ayurveda describes three main principles of treatment of Chronic Bronchitis:

- **Nidan-parivarjan:** It is important to find out the actual precipitating factor of the disease and identify preventive measures for these precipitating factors.
- **Dosha-pratyanik:** Each person has a unique constitutional framework and therefore each case should be assessed in detail. It is very important to assess and analyse the dominance of the three doshas: *vata*, *pitta*, and *kapha*.
- **Vyadhi-pratyanik:** Sometimes Chronic Bronchitis may

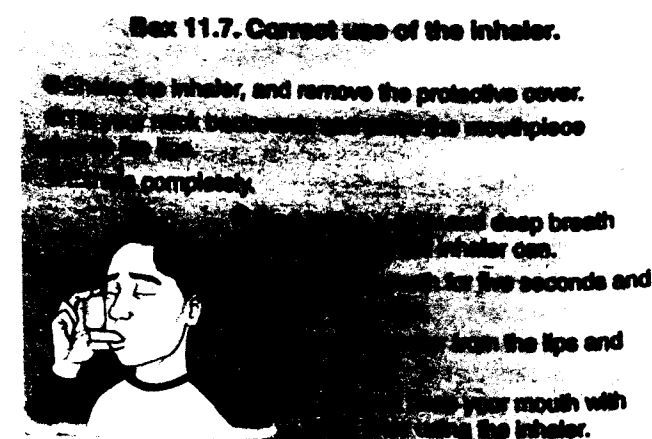
be the result of some other underlying disease of the upper or lower respiratory tract. It is important to detect these diseases and treat them along with treatment of Chronic Bronchitis.

What is the treatment for Chronic Bronchitis?

Ayurveda recommends a wide range of medicines. These include medicines that (a) bring out the phlegm, (b) reduce cough, (c) cure infections, (d) enhance defence mechanism of the body, and (e) modify the antibody production in the body. These can be either single or compound medicines.

Single medicines include:

- **Black basil:** Prepare juice of fresh leaves of black basil. Take twenty-five to fifty millilitres of this juice with four to six grams of honey two to three times a day.



Box 11.7. Correct use of the Inhaler.

- **Eagle-wood:** Powder the wood of Eagle plant. Take one gram of this powder with four to six grams of honey two to three times a day.

- **Sweet flag or Vasa:** Prepare juice of fresh leaves of vasa. Take twenty-five to fifty millilitres of this juice with four to six grams of honey two to three times a day.

Compound medicines include:

- **Dhanwantri gutika**, one gram of which is recommended three times a day.

- **Lovangadi vati or Marichyadi Vati or Eladi Vati** to be taken in the dose of two hundred and fifty milligrams three times a day.

- **Sarvanga Sunder Rasa:** Take one hundred and twenty five milligrams of this medicine three times a day with ginger

juice and honey.

- **Chandramrita rasa or Mahakaleswar rasa or Laxmi Vilas rasa or Vasant Tilak rasa** to be taken in the dose of one hundred and twenty five milligrams three to four times a day.

What are the dietary precautions for Chronic Bronchitis?

Ayurveda recommends that you avoid (a) fried foods and fast foods that either add acidity or induce a sense of dryness in the body; (b) vegetables cooked in mustard oil; (c) foods that take long time to digest; and (d) food cooked the previous day. You should drink boiled and cooled water as far as possible.

HOMOEOPATHY

According to Homoeopathy also, a patient is diagnosed to be suffering from Chronic Bronchitis if he complains of cough with phlegm for at least three months a year for two consecutive years. Homoeopathy also considers Allergic or Asthmatic Bronchitis along with Chronic Bronchitis as the line of treatment is the same for these conditions.

What are the causes of Bronchitis?

Homoeopathy also describes smoking, pollution and occupation in a dusty environment as main causes of Chronic Bronchitis. It also describes the adverse impacts of repeated respiratory infections on the symptoms of Chronic Bronchitis. In addition, it lays special emphasis on family history of health and disease. Homoeopathic practitioners have observed that Chronic Bronchitis has the tendency to run in families. Allergic tendencies are especially known to be hereditary. Members of families where allergic conditions such as common cold, sinusitis, and skin diseases such as urticaria and eczema are more common are at a higher risk of Chronic Bronchitis. Homoeopathic treatment is very effective for such people with family history of allergic diseases because it removes the tendency to diseases and therefore the root cause of the disease.

Homoeopathy emphasizes that emotional stress can precipitate respiratory diseases, especially Allergic Bronchitis.

What is the Homoeopathic approach to management of Chronic Bronchitis?

Homoeopathy aims to treat Chronic Bronchitis in two distinct ways: (a) management of acute exacerbation of the chronic disease and (b) management of chronic disease.

Management of acute disease: Contrary to what many people believe, Homoeopathy offers a wide range of very effective medicines

for controlling acute and severe attacks of respiratory infections in a person suffering from Chronic Bronchitis. These medicines are safe, are not known to cause any significant side effects and do not suppress the disease.

Management of chronic disease: Homoeopathy uses several deep-acting medicines that also remove the body's tendencies to developing diseases. They strengthen your body's natural defence mechanism and enhance the

Box 11.8. Benefits of quitting smoking

When you quit smoking, the body begins to recover within twenty minutes.

- **After twenty minutes:** Your blood pressure drops and pulse rate drops to normal.

- **After eight hours:** Carbon monoxide level in the blood drops to normal. Oxygen level in blood increases to normal.

- **After twenty-four hours:** Chance of a heart attack decreases.

- **After forty-eight hours:** Ability to smell and taste is enhanced.

- **Between two weeks to three weeks:** Blood circulation improves. You can walk more easily. Lung functions increase up to thirty percent.

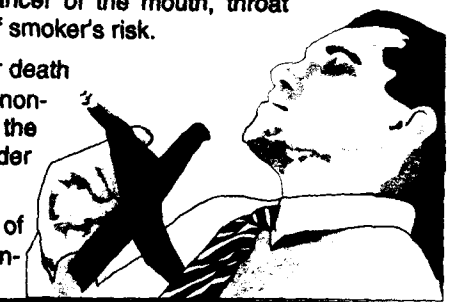
- **Between one to nine months:** Cough, congestion of the nose, fatigue and breathlessness decrease. Hair like projections in the lungs grow and therefore dust, bacteria, etc. are removed more efficiently.

- **After one year:** Excess risk of coronary heart disease is half that of smoker.

- **After five years:** Lung cancer death rate decreases by almost half. Stroke risk is reduced to that of non-smoker five to fifteen years after quitting. Risk of cancer of the mouth, throat and food-pipe reduces to half of smoker's risk.

- **After ten years:** Lung cancer death rate is similar to that of a non-smoker. Risk of cancer of the mouth, throat, food-pipe, bladder and kidneys decreases.

- **After fifteen years:** Risk of heart diseases is that of a non-smoker.



Source: Center for Disease Control and American Cancer Society

functions of vital organs such as lungs. This means that the Homoeopathic medicines can revitalize the lungs to function at their best level. Improved lung functions reduce the frequency of acute attacks of respiratory diseases and increase its resistance to infections. Reduce frequency and intensity of acute diseases improves the lung capacity. Thus, the respiration becomes smoother and more efficient.

Removing the obstructing cause: In addition to prescribing medicines for the immediate symptoms, Homoeopathy aims to cure you completely. To achieve this, the factors that hinder the treatment need to be removed. These factors include smoking, pollution, occupational hazards, emotional stress, etc. Although it may not be always possible to remove these factors that prevent complete cure, Homoeopathic medicines can minimize stress and reduce the urge to smoke. A few Homoeopathic medicines such as Sulphurous acid counteract the effects of pollution. Thus, this medicine is very effective in managing acute attacks of bronchitis caused by exposure to a major pollutant — Sulphur dioxide.

What is the action of Homoeopathic medicines?

Homoeopathic medicines do not act on any one particular organ only. Instead, they act on the whole body. This is because of the Homoeopathic principle that human body is one single entity, which consists of a set of organ systems that function cohesively. If the treatment is aimed at the whole body, the disease can be removed from its roots without suppressing it. This is because as a patient you are suffering from the disease and it is important to cure you rather than one or more of your organs.

Homoeopathy offers similar treatment for Chronic Bronchitis and Allergic Bronchitis as this system of medicine depends upon your symptoms rather than on abnormalities in the structure and function of any one or more organs. Homoeopathic medicines have a wide spectrum. A single, deep acting medicine is as effective in cases of Chronic Bronchitis or any other chronic disease of other organs of the body. The mechanism of action of medicines used for Chronic Bronchitis is therefore the same as for any other chronic disease. These medicines enhance your body's natural defence mechanism that may have been suppressed by various factors mentioned above. They do this by working as antidote to the suppressive action of the harmful disease causing agents. Homoeopathic medicines are compared with fuel and its energy that forces a machine into action. Once the body starts functioning again, the medicines continue to provide energy so that it can work at its optimum level and restore good health.

What is the basis for selecting the medicine for treatment of Chronic Bronchitis?

Your Homoeopath is the best person to select the medicine most suited for you and prescribe its correct dose and strength. He/she will be able to select the most appropriate medicine through detailed case history and laboratory investigations.

Case history: Your doctor will ask questions about:

- Factors present before the onset of the disease or an acute attack of Bronchitis such as emotional stress, exposure to cold, dust, smoke, etc.;
- Symptoms including factors that either worsen or relieve these symptoms;
- Family history of disease;
- General likes, dislikes, eating habits, etc.; and
- Emotional status, personality traits, etc.

Investigations: Your doctor is likely to recommend Chest x-ray and routine blood examination to rule out other associated diseases. Occasionally, he/she may also recommend Lung function tests and spirometry.

What is the treatment for Chronic Bronchitis?

Homoeopathy offers a wide range of medicines for management of Chronic Bronchitis. Of these, the following are used more commonly:

- Sulphurous acid** is recommended when there is an acute exacerbation of the disease due to exposure to pollution, especially Sulphur dioxide. It is also effective around the festival Diwali when the pollution level is high.
- Antim Tart** is recommended for Bronchitis in old people and children, especially if they have loose rattling cough with difficulty in bringing out the phlegm. Associated symptoms for this type of condition include suffocation, blue discolouration of the nails, lips, etc. and vomiting white coloured secretions of the lining of the respiratory tract.
- Arsenic Album** is commonly recommended in case of loose cough, which is worse around midnight and is associated with severe weakness and restlessness.
- Coccus Cacti** is recommended for difficulty in breathing, cough with thick and scanty sputum and pain in the chest that is worse after sleep.
- Drosera** is effective for Bronchitis in old people associated with emphysema, cough that is more at night and family history of tuberculosis.
- Grindelia** is prescribed for Chronic Bronchitis with white sputum that is difficult to bring out.
- Kali Bichromicum and Kali Carb** are recommended for cough that is worse around two to four in the morning and worse during change in weather or exposure to cold.

Other medicines that are equally effective for Chronic Bronchitis include Ipecac, Ars.Iod, Senega, Chelidonium, Lycopodium, Spongia, Blatta, etc. In addition to these medicines, deep-acting medicines such as Thuja, Medorrhinum, Natrum Sulph, and Tuberculinum are also prescribed for removing the disease from its roots.

Homoeopathy strongly recommends simple, healthy diet, meditation to relax the mind, change of occupation, if possible, regular exercises and stopping smoking for management of Chronic Bronchitis. It is important to remember that although Homoeopathy offers very effective medicines for treatment of Chronic Bronchitis, it is necessary to start the treatment as early as possible in order to ensure complete cure. If the disease has progressed a lot, Homoeopathy can only offer relief from symptoms and not cure.

NATURE CURE

In Nature Cure, Chronic Bronchitis is defined as a condition where you have difficulty in breathing, especially while taking the air in due to narrowing of the bronchioles. This narrowing is due to swelling of the lining of the respiratory canal as a result of either infections or allergic reactions to dust, mites, pollen, strong smell, etc. Narrow bronchioles result in shallow breathing and therefore reduced oxygen supply to various parts of the body. In order to meet the oxygen demand, breathing becomes rapid.

What are the causes of Chronic Bronchitis?

Although most acute episodes of Chronic Bronchitis begin with a cold, sneezing, running nose, nose block and headache, the main causes of Chronic Bronchitis are indigestion and excess formation of mucous in the body. Consuming milk or milk products and smoking can precipitate these causes.

Excess formation of mucous in the body is usually due to excessive intake of complex carbohydrates. These carbohydrates ferment in the digestive tract and cause flatulence, increased acid formation and distension of the abdomen. This distension increases the pressure on the lungs in the reverse direction, thereby reducing the lung's capacity to expand. Decreased expansion of the lungs leads to shallow breathing.

Whenever there is increased mucous formation in the body, the mucous forms a thick layer on the lining of the respiratory tract. The mucous lining facilitates the attachment of disease causing germs on the respiratory tract.

Thus, the germs can grow and multiply easily and cause symptoms of respiratory infections. Infection of the respiratory tract results in swelling and narrowing of the respiratory tract. The same mechanism repeats when the allergens such as some foods, mites, dust, pollen, chemicals, etc. enter the respiratory tract.

Why do some people develop allergy?

It is not very clear why only certain people react adversely to some allergens. Some people have allergic reactions to some of these allergens very early in life, while others develop them later in life even though they may have been exposed to the allergens earlier in their life.

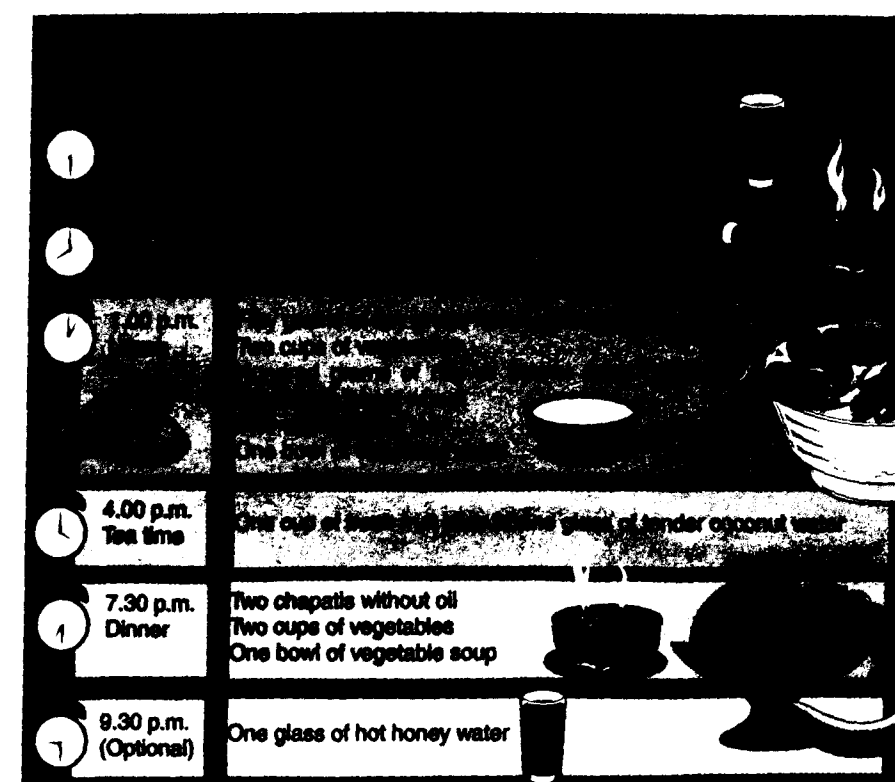
Nature Cure opines that whenever the quality of life fluids including blood and lymph change and are saturated with "poisons", the allergens react adversely with the altered composition of the blood and an "Allergic reaction" sets in. Thus, the toxic blood makes the mucous membrane of the respiratory tract unhealthy and more sensitive to germs and allergens.

Dr. Shelton, leading Naturopath had once said that "He never came across a horse which is allergic to grass". Applying the same logic, human beings are by nature herbivorous and therefore nature has provided vegetables, fruits, leaves and roots for their consumption. An allergic reaction to any of these natural foods is not harmonious with nature. This reaction can set in only when the blood composition alters.

Dairy products are the main source of excessive mucous formation. One of the milk proteins — "Casein" — is difficult to digest, as the human body does not have an effective enzyme for its digestion. The casein therefore decomposes and becomes glue-like. This glue like material forms a coating on the inner lining of the bronchioles. As mentioned before, any abnormal lining on the respiratory tract can lead to infections and therefore bronchitis.

Lactose, present in the milk has similar effect. Since milk has no fibres and is acidic, its derivatives are also acidic and do not have fibres. This is the reason why milk products are not recommended for people suffering from Chronic Bronchitis.

Nature Cure describes smoking as one of the main factors that contributes to developing Chronic Bronchitis. This is because you inhale carbon monoxide while



smoking which interferes with transportation of the oxygen from the lungs to other parts of the body.

Inactivity of the skin: Lungs and skin have an affinity for each other because they are both organs of excretion. Whenever skin diseases are suppressed with medicines, the skin does not remove "poisons" etc. from the body effectively. Thus the lungs have to take up additional load of elimination of "poisons" from the body.

Increased activity of the lungs lead to excessive strain on the respiratory system and it therefore becomes weak. Weak respiratory tract predisposes to several diseases and Chronic Bronchitis is one of them.

What is the treatment of Chronic Bronchitis?

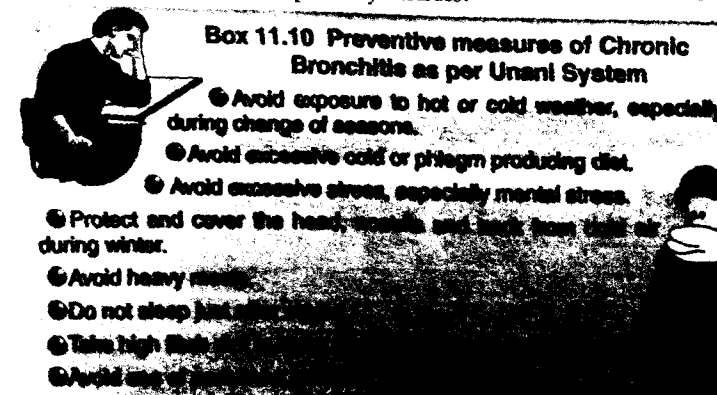
Treatment of Chronic Bronchitis depends upon its cause such as indigestion, excessive secretion of the mucous and inactivity of the skin. It can be broadly divided into two categories:

1. Treatment for immediate relief; and
2. Treatment for permanent relief

Nature Cure recommends diet, hydrotherapy, and exercises supplemented with adequate rest and relaxation for the two categories of treatment.

Treatment for immediate relief: Nature Cure recommends the following measures as soon as you have a feeling of heaviness and tightness of chest:

- **Vomiting:** Drink at least three to four glasses of salt water and vomit it out. This helps in decreasing the abdominal pressure and therefore the lungs are able to expand completely.
- **Hot foot immersion:** Immerse the legs up to calf muscles in a bucket of bearable hot water for twenty minutes. At the end of the immersion, splash large volume of cold water against the feet. This draws the blood to lower legs by dilating the blood vessels and reduces the congestion of the lungs.
- **Fomentation:** Foment the upper and middle portion of the back with a hot water bottle for five to seven minutes till the parts become red and hot. Cover the back with wet towel. This draws blood to the skin surface and therefore decongests the lungs.
- **Enema:** Cleanse the lower part of the digestive tract with a warm water enema. This improves digestion and relieves symptoms of respiratory distress.



- **Chest pack:** Chest pack is one of the most effective measures in Chronic Bronchitis. Dip a cloth in cold water and squeeze it to remove excess water. Wrap it around the chest in such a way that it covers the last rib. Place a dry cloth on the wet cloth and finally cover it with flannel. Keep this chest pack for one hour.

In case of severe symptoms, you can wrap two layers of the wet cloth on the chest. Chest pack also draws blood to the skin surface and reduces lung congestion.

- **Adequate ventilation:** Sleep in a well-ventilated room after wearing warm clothes. Do not cover the head while you sleep so that you can breath fresh air. Keep a hot water bottle in the bed.

- **Steam inhalation:** Inhale steam for three to five minutes at least three times a day. Steam inhalation foment the lining of the respiratory tract and gives quick relief.

- **Diet:** Your Nature Cure practitioner may recommend a fast for three to four days till the congestion subsides. You can take liquids such as vegetable soups, fruit juices, etc. during the fast. You should not take any dairy products during the fast. Other dietary measures include:

- (a) Drinking more than ten to twelve glasses of water per day, especially warm water;
- (b) Avoid soft drinks, tea and coffee. Instead, take a glass of warm honey water;
- (c) Use natural anti-allergens such as ginger, black pepper, aniseed and cinnamon in soups, salads and vegetables. In case you have burning sensation in the stomach, avoid raw vegetables.
- (d) Use radish juice combined with carrot juice everyday in order to maintain normal structure and function of the lining of the respiratory tract. You should prepare radish juice from the leaves and roots.
- (e) Take a mixture prepared from equal proportions of dried ginger powder, pepper and long pepper three times a day. You can either lick it with honey or take it with tea.
- (f) Take one teaspoon of raw onion juice as soon as you get up to liquefy the phlegm and prevent it from forming again.

Treatment for permanent relief: Nature Cure recommends the following measures for prevention of recurrence of acute attacks of Chronic Bronchitis. These measures are more effective if practiced in combination with the measures for temporary relief described above:

- **Abdominal Pack:** Apply a wet towel covered with dry towel on the abdomen for twenty minutes every day. Regular use of towel pack prevents indigestion and constipation.
- **Chest pack:** Take a chest pack as described above for one hour every day between 4-5 p.m.
- **Hot foot immersion:** Take this immersion twice a week as described above.
- **Sun bath:** Take a sun-bath every day for twenty minutes before 9.00 a.m. and after 4.0 p.m.
- **Steam bath:** Take a steam or sauna bath twice a week.
- **Full wet sheet pack:** Take the wet sheet

pack twice a week.

- **Enema:** Take enema with luke warm water whenever you have constipation or once in fifteen days.
- **Deep breathing:** Do regular deep breathing exercises and take brisk walk every day.
- **Yoga and Meditation:** Do regular meditation and yoga, especially *Shavasana* in order to relax your mind and reduce the frequency and severity of acute attacks of Chronic Bronchitis.
- **Diet:** Eat foods that are easily digestible, contain high fibre and low calories and are neutral. Reduce the volume

Have early dinner so that the food is completely digested. You should sleep only after about three hours of having dinner.

- **Fasting:** Occasionally, fasting is recommended for treatment of Chronic Bronchitis. Depending upon your condition, the doctor may suggest an all fruit diet for five to seven days. You should take three full meals with fresh juicy fruits. Subsequently, you need to take a balanced diet of seeds, nuts, grains, vegetables and fruits. You should have large quantities of unsweetened lemon juice or cold or hot plain water.

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lungs, when the airways are inflamed, it is called Bronchitis. Common sign and symptoms include rapid breathing with dry cough, breathlessness, chest pain, dryness of lips and excessive thirst.

What are the causes of Chronic Bronchitis?

According to Unani, Bronchitis is the result of excessive production of phlegm in the body. The body produces large quantities of phlegm in conditions such as (a) recurrent attacks of cold, (b) seasonal changes, especially during spring, (c) excessive use of phlegm producing or temperamentally cold diets, (d) mental exertion, and (e) frequent irritation of

- Try not to inhale when you smoke.

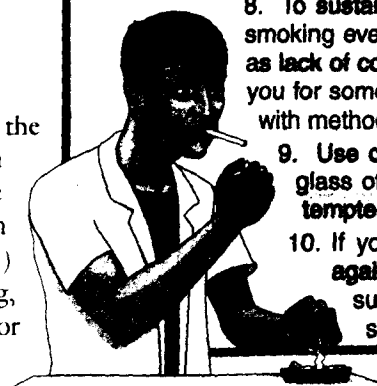
- Change to a brand other than your favourite.

7. After you quit smoking, avoid mixing with smokers, accepting free cigarettes and the temptation of even one smoke.

8. To sustain your efforts, renew your resolve to give up smoking every day. Recognize that some symptoms such as lack of concentration, headache, irritability may trouble you for some time. Learn to deal with stress, tension, etc. with methods other than smoking or drinking.

9. Use chewing gums, toffee, peppermints or drink a glass of your favourite non-alcoholic drink if you are tempted to smoke.

10. If you fail in your effort to give up smoking, try again..... and again..... and again till you succeed. Take advice from those who have quit smoking successfully.



DID YOU KNOW THAT

If you get dust or pollen in your nose, a powerful contraction of the respiratory muscles pushes the air out at around hundred miles an hour so that dust or pollen are removed.

Fenugreek and Indian beach and mix with juice of six grams of garlic. Fry this mixture and add honey. Take ten grams of the finished medicine twice a day on empty stomach.

● **Prescription 2:** Boil ten grams of wheat husk, five pieces of black pepper and two grams of common salt in one hundred and twenty millilitres of water. Strain the liquid and sip it two to three times a day.

● **Prescription 3:** Prepare a decoction of six grams each of Damask, Quince, Jujube berries, Sebestan plum, and khatmi by boiling them in one hundred and eighty millilitres of water. Strain the liquid and add sugar to taste. Sip this medicine twice a day.

● **Prescription 4:** Boil four grams each of Sweetwood and Linseed in one hundred and twenty millilitres of water. Strain the liquid and add ten grams of honey. Sip this preparation twice a day.

● **Prescription 5:** Powder twelve grams each of Mysore Gamboge and Small aloe and six grams of Chian turpentine. Add water and make pills of quarter gram each. Take two of these pills every day.

Unani system also recommends the following compound medicines that are available in the market:

● **Lauq-Nazli**, ten grams of this medicine to be taken twice daily with luke warm water.

● **Lauq Khayarshambar**, ten grams of this medicine to be taken twice a day.

● **Sharbat Banafsha**, twenty five millilitres of this liquid preparation twice everyday.

● **Itrifal Ustokhuddus**, six grams of this compound medicine to be taken twice a day.

Your physician is the best person to prescribe the treatment and you should therefore not take any of the above medicines without consulting with him/her.

DEFINITIONS

Allergen is a substance that produces a hypersensitive reaction in the body.

Alveoli are small grape like and sac like structures at the end of respiratory passages where exchange of gases takes place.

Antibiotics are medicines that either kill the bacteria or prevent them from growing.

Bronchioles are small airways of the respiratory system.

Diaphragm is a dome-shaped partition that separates the chest cavity with the abdominal cavity.

Eosinophils are a type of white blood cells of the body. They increase in number allergies and some infections.

Hereditary means a characteristic, condition or disease that is transmitted from parent to child.

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In the next issue: Hyperthyroidism

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Everyone's Guide to Cancer Therapy

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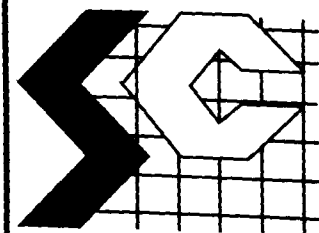
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HYPERTHYROIDISM *(Over activity of the Thyroid gland)*



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HEALTH UPDATE

MULTIPLE PERSPECTIVES ON HEALTH EMPOWERMENT

ALLOPATHY AYURVEDA HOMOEOPATHY NATURE CURE UNANI

August 1997

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Hyperthyroidism

ALLOPATHY

Over-activity of the thyroid gland, called "hyperthyroidism" is a condition where there is excessive amount of hormones secreted by the thyroid gland. Mild hyperthyroidism may not produce any major symptoms but nevertheless is harmful to the body. The symptoms become more obvious as the disease progresses. Hyperthyroidism is a treatable disease. Early diagnosis and treatment can prevent major complications such as irregular heartbeat, worsening heart failure, weakening of the bones and generalized wasting of the body. Untreated disease can lead to a life-threatening condition called "thyroid crisis".

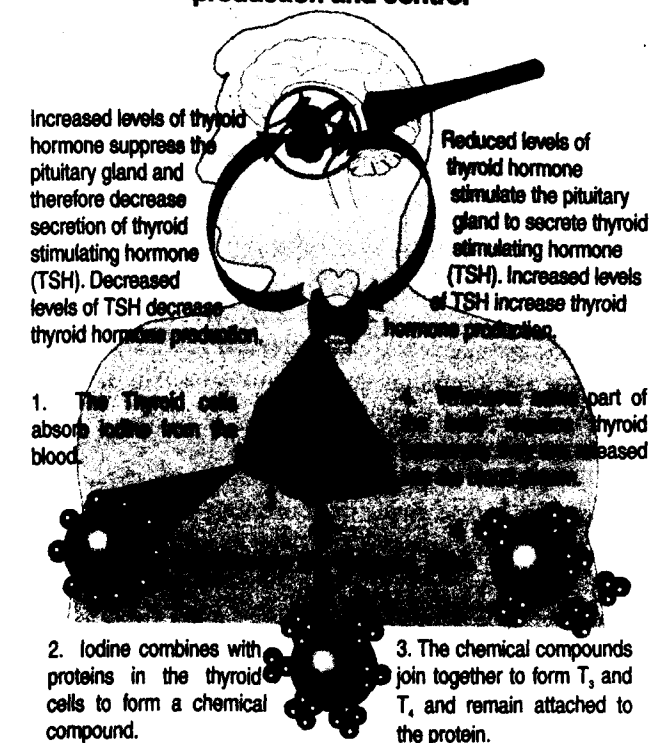
The biological response to the excess of thyroid hormones produces a group of clinical signs and symptoms called thyrotoxicosis. If the cause is over-activity of the thyroid gland, the thyrotoxicosis is said to be due to hyperthyroidism. There are several other diseases that cause thyrotoxicosis without over-activity of the thyroid gland. Irrespective of the cause, thyrotoxicosis is because of excess of thyroid hormone in the blood and the resultant adverse impact on various parts and functions of the body. *In routine practice, hyperthyroidism and thyrotoxicosis are used as interchangeable terms.*

What is a thyroid gland?

The thyroid is a butterfly-shaped endocrine gland situated in front of the neck just below the voice box. Endocrine glands are ductless glands that secrete chemical substances called hormones, which are chemical messengers of your body.

Thyroid gland secretes two hormones: (1) "T₄", also called *thyroxine* and (2) "T₃", also called *tri-iodo-thyronine*. Of these, T₄ is the major hormone and accounts for eighty percent

Figure 12.1 Mechanism thyroid hormone production and control



Definitions of all technical terms used in this issue are given on the last page.



Box 12.1 Functions of the thyroid gland

Growth and development: Thyroid hormones are necessary for:

- Production of growth hormones from the pituitary gland
- Development of the nervous system in young babies
- Growth of developing bones and teeth

Metabolism: The thyroid hormones tell various cells how fast or slowly they should function. Specific actions include:

- Consumption of oxygen and production of heat in all parts of the body except adult brain, testis and uterus.
- Utilization of several other hormones, vitamins and some medicines.
- Amount of calories used by the body for various activities.
- Increased rate or secretion of digestive juices in the stomach and intestines.
- Increased rate of absorption of foods from the intestine.
- Increased utilization of glucose by the cells and increased insulin secretion.
- Utilization of fat for energy production.

Maintenance of:

- Functions of the nervous system in adults.
- Normal heart rate, amount of blood pumped by the blood and blood pressure.

Female reproductive system:

- Regulation of menstruation and production of the egg.
- Production of milk after delivery.

of the hormones produced by the thyroid gland. T_3 is the active form of hormone. T_4 is converted to T_3 before it acts on the body tissues. Thyroid hormones contain iodine. Thus, the functions of the thyroid gland are adversely affected when the body gets inadequate iodine.

Figure 12.1 details mechanism of control of production of thyroid hormones and Box 12.1 lists the functions of the thyroid gland.

What are the signs and symptoms of hyperthyroidism?

The signs and symptoms of hyperthyroidism are due to increased rate of activity in various parts of the body. Detailed below are the symptoms that are summarized in Box 12.2. Signs are detailed in Box 12.3

Symptoms of hyperthyroidism include:

Restlessness, irritability and nervousness: Several diseases including hyperthyroidism cause restlessness, irritability and nervousness. In case of hyperthyroidism, you will be restless, will have difficulty sitting still in one place and will be irritable and therefore lose temper easily. Your moods may swing from happy to sad within short periods. Nervousness and lack of concentration is also common in hyperthyroidism.

Feeling of discomfort in hot climate: As the level of



thyroid hormones increases in your blood, you may prefer to stay in cool room — even during winter. You are likely to feel more comfortable in winters than in summers. The hands may be moist, wet, and shaky and sweating will be more than normal.

Weight loss despite no loss of hunger: Excessive thyroid hormones lead to excessive hunger. Despite increased intake of food, you will lose weight. This is because you are burning calories at a much higher rate.

Frequent urge to pass stools: Although there is increased frequency of passing motions, you may not have loose motions. The urge to pass the stools may come immediately after eating.

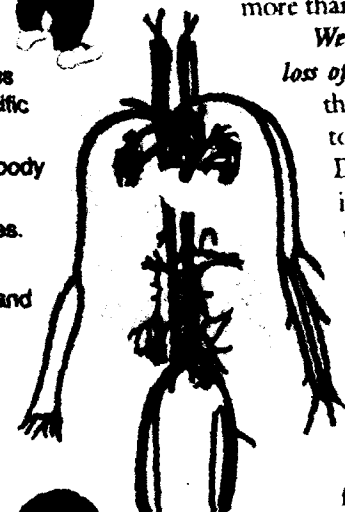
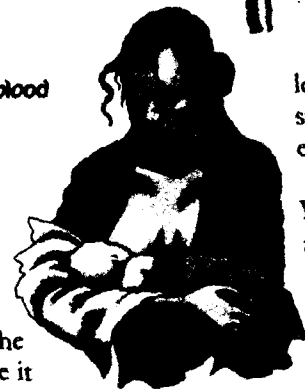
Feeling of strong heart beats: You may have palpitations (increased awareness of the heart beat) or a feeling of thumping in the chest. As the thyroid hormone level increases, your heart beats more rapidly and forcefully. Often, this may be the only complaint you have. It is important to remember that these palpitations are not constant. They may occur from time to time during the day. In severe cases, especially among the elderly who have associated heart diseases, heart failure can occur.

Easy fatigue and breathlessness: You are likely to be exhausted and tired very soon and may become breathless. You may feel weakness in the whole body, especially in the muscles. Thus, there can be difficulty in walking, climbing stairs, combing hair etc.

Bone Pains: Increased thyroid hormones lead to loss of bones and the walls of the bones become very thin. This condition called "osteoporosis" can cause fractures, especially of the backbone.

Sexual Problems: In women, hyperthyroidism can cause reduced flow of blood during menstruation. Some women may not have bleeding for several months. In case of males, there may be increased desire for sex but the performance deteriorates. Sometimes, there may be enlargement of the breasts in males.

Swelling in the neck: Although most people with hyperthyroidism develop enlargement of the thyroid gland, it is not its constant feature.



What are the causes of hyperthyroidism?

Detailed below are the causes of hyperthyroidism that are listed in Box 12.4. Of these, Graves' disease and nodular goitre are the commonest causes.

What is Graves' disease?

Graves disease, also called "toxic diffuse goitre", is one of the autoimmune diseases. Auto immune diseases are a group of diseases where the white blood cells produce antibodies for any part or chemical substance of the body. Normally, antibodies are produced only when a disease causing agent such as bacteria or virus enters the body. In other words, autoimmune diseases are those conditions where the body reacts adversely to its own self.

In Graves' disease, the white blood cells produce antibodies against the proteins on the surface of the thyroid gland. These antibodies stimulate the thyroid gland to secrete more thyroid hormones. Graves' disease usually runs in the families. Although Graves' disease is more common in women, it can affect both men and women. It occurs more frequently at the age of thirty to forty years.

Signs and Symptoms: Graves' disease may not result in any symptoms for a long time. Thus, for several weeks or months you may not be aware that you have developed Graves' disease. The onset is gradual and many people feel that the early symptoms are due to stress or strain. As the disease progresses, and the thyroid hormone levels increase in the blood, the general signs and symptoms described above will be observed.

Graves' disease is the only type of hyperthyroidism where there are changes in the tissues of the eyes and skin. About half the patients with Graves' disease have significant eye signs. The eyes bulge from their sockets, are red and watery and there may be a sensation of something stuck inside the eyes. The eyelids and other muscles of the eye are swollen and therefore eye movements may not be normal. Some people have slight bulging of the eyes due to contraction of the muscles of the eyelids resulting in a staring appearance. These eye changes can increase the risk of injury and drying of the eyes. Rarely, your vision may deteriorate. Graves' disease

may cause skin changes such as uneven reddish thickening of the skin, especially in the front of the leg. This skin condition is usually painless.

It is important to remember that all the signs and symptoms may not occur at the same time and severity of each of them is independent of other signs and symptoms or the severity of the disease.

What is a Toxic nodule?

A thyroid nodule is a localized swelling within the thyroid gland. When the nodule begins to make excess hormone, it is called toxic nodule. As the nodule begins to secrete the hormones, the rest of the thyroid gland gradually shuts down.

Signs and symptoms: Thyroid nodules are usually small and painless. Since nodules tend to grow outwards, they usually do not cause pressure on the underlying wind-pipe. Many people may not even notice these swellings. They may be detected either during routine medical examination or while being examined for other conditions. The thyroid nodules are firm, smooth and easily felt through the skin.

Many people begin to fear that any nodule or swelling in the body is due to cancer. There are many causes of a single nodule in the thyroid gland. Of these, cancer is not common. However, your doctor may still recommend tests

Box 12.2 Symptoms of hyperthyroidism

General:

- ★ Intolerance to heat ★ Fatigue ★ Weight loss
- ★ Sudden increase in height among children
- ★ Decreased attention span ★ Loss of memory

Central nervous system:

- ★ Rapid mood changes ★ Irritability
- ★ Nervousness ★ Depression ★ Changes in emotional responses
- ★ Shivering like movements in hands and other parts of the body
- ★ Periodic loss of function of one or more part

Heart and lung functions:

- ★ Breathlessness ★ High blood pressure ★ Irregular and rapid heart rate
- ★ Palpitation (awareness of heart beats as a thumping sensation in the heart area)

Digestive system:

- ★ Increased frequency of passing the stools
- ★ Increased hunger and therefore increased food intake
- ★ Increased thirst

Muscles:

- ★ Muscle weakness

Reproductive system:

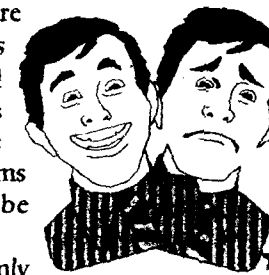
- ★ Decreased menstrual flow in women
- ★ Absence of menstruation
- ★ Reduced performance of men during sexual intercourse

Bones:

- ★ Loss of bone mass

Skin:

- ★ Thinning of the hair
- ★ Loss of hair
- ★ Increased sweating
- ★ Moist skin



Box 12.3. Signs of hyperthyroidism.

- Fast heart beats and pulse rate often more than ninety per minute.
- Heart beats may be irregular
- Flushed skin
- Thinned out hair
- Dirty nails
- Hyperactive and a nervous
- Enlarged thyroid gland that may be visible or may felt on examination
- Blood flow through the enlarged thyroid gland makes a sound that can be hear by a stethoscope.
- Wide eyes with a staring look
- Warm and moist hand-shake
- Trembling and quick movements



to rule out cancer, especially if the nodule is very hard and is associated with other swellings in the neck — the enlarged *lymph nodes*. Lymph nodes are small oval structures that filter one of the body fluids called lymph and fight infections. They become enlarged due to infections or cancer.

What is Multinodular goitre?

When there are several nodules in the thyroid, the condition is called "multinodular goitre". "Goitre" is the general term used for enlargement of the thyroid gland. If these nodules secrete excess thyroid hormone and as a result there are adverse effects on the body functions, the condition is called "toxic multinodular goitre". It occurs more commonly in iodine deficient areas. Due to reasons such as lack of iodine intake, the thyroid gland is stimulated repeatedly. One or more of these stimulated areas develop into nodules and secrete excessive amount of thyroid hormone. The rate of thyroid hormone secretion by these nodules is not dependent on blood levels of thyroid stimulating hormone.

Signs and symptoms: Toxic multinodular goitre is more common in elderly people. The signs and symptoms of this condition vary from person to person. Some people may have typical signs and symptoms of thyrotoxicosis, while other may mainly have heart related symptoms. Sometimes it may only cause weakness, loss of weight, muscle weakness and decreased appetite.

What is Hashimoto's thyroiditis?

Inflammation of the thyroid gland is called thyroiditis. Hashimoto's thyroiditis is a condition where there is excessive release of hormones stored in the thyroid gland. There are several causes of thyroiditis. The most common cause is abnormal antibodies to the thyroid cells. It is important to remember that

Hashimoto's thyroiditis normally causes *hypothyroidism*. This is a condition where there is decreased blood levels of thyroid hormone in the blood. Occasionally, some people have a temporary phase of hyperthyroidism in Hashimoto's disease before it enters the hypothyroid stage.

Signs and symptoms: Hashimoto's thyroiditis is more common in young or middle-aged women but can occur at any age. Often, it only causes vague pressure in the neck and fatigue. In the early stages, there may be enlargement of the thyroid gland that feels firm, irregular and painless.

What are the other causes of thyrotoxicosis?

Subacute thyroiditis is a condition where some types of blood cells infiltrate into the thyroid gland due to a viral infection and damage the normal structure of the thyroid gland. As the damage increases, the hormones that are stored in the thyroid gland leak out into the blood and cause thyrotoxicosis. Soon, the thyroid gland stops functioning. Subacute thyroiditis is usually a self-limiting disease and the hormone production gradually returns to normal.

Signs and symptoms: Subacute thyroiditis is more common in women, especially in the age group of twenty to fifty years. Symptoms include rapid onset of the thyroid swelling which is painful to touch. Some people may complain of sore throat accompanied with pain that radiates to the ears or angle of the jaw. Subacute thyroiditis is more common two or three weeks after respiratory infections.

Postpartum thyroiditis: Thyroiditis may be observed in women soon after delivery, especially among those who have an autoimmune disease, iodine deficiency or autoimmune diseases in other family members. It is usually due to abnormal antibodies to the thyroid gland and may be the result of exacerbation of minor hyperthyroidism during or before pregnancy.

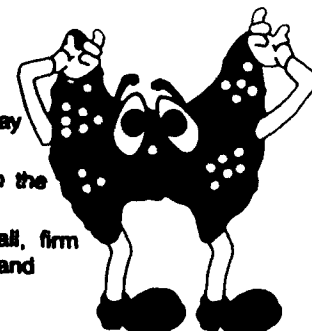
Postpartum thyroiditis is difficult to diagnose, as the symptoms are usually very vague and mild. After three to five months, a phase of decreased level of the functions of the thyroid gland may occur leading to hypothyroidism, which can cause serious complications. Some women may suddenly develop a small, painless goitre about one to four

Box 12.4. Causes of thyrotoxicosis**Related to hyperthyroidism:**

- Graves' disease, a condition that may run in families
- Toxic nodule, a single swelling on the thyroid gland
- Multinodular goitre, several small, firm and knotty swellings on the thyroid gland
- Tumours of the pituitary gland

Not related to hyperthyroidism:

- Painful subacute thyroiditis, inflammation of the thyroid gland
- Thyrotoxic phase of Hashimoto's thyroiditis, which may cause temporary hyperthyroidism
- Iodine induced hyperthyroidism due to excess dose of iodine
- Taking excessive dose of thyroid hormone tablets

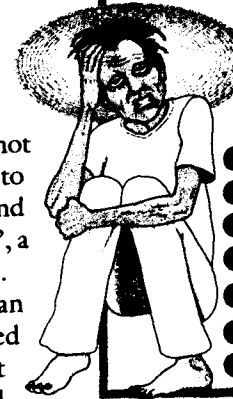


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months after delivery.

Other causes: Another important cause of thyrotoxicosis is taking excess of thyroid hormone tablets (thyroxin). More often than not this medicine is wrongly prescribed to treat obesity. This can be dangerous and cause heart diseases and "osteoporosis", a condition where there is loss of bone.

Untreated hyperthyroidism can cause an emergency situation called thyroid crisis. Box 12.5. and 12.6 list the factors that precipitate thyroid crisis and its signs and symptoms respectively.

**Box 12.6. Signs and symptoms of thyroid crisis**

- Increased heart rate
- Heart failure
- Fever
- Profuse sweating
- Nausea, vomiting and diarrhoea
- Pain in the abdomen
- Disorientation or abnormal mental condition
- Hyperactivity
- Psychiatric symptoms such as depression, hallucination, etc.
- Loss of consciousness if the disease progresses further

**What other diseases may present with signs and symptoms of hyperthyroidism?**

Detailed below are the diseases that may be wrongly diagnosed as hyperthyroidism.

Anxiety: An anxious person can have trembling hands, rapid pulse, sweating, repeated urge to pass stools or loose motions and wide eyes. However, it is important to remember than an anxious person has moist and *cold* hands whereas a person with hyperthyroidism has moist and *warm* hands.

Pregnancy: Normal pregnancy can cause nervousness, irritability and weight loss and can therefore be mistaken for hyperthyroidism. Moreover diagnosis of hyperthyroidism is difficult in a pregnant women.

Tumour of the adrenal gland: Adrenal gland is a small endocrine organ situated just above the two kidneys. Hormones secreted by the adrenal gland have a wide range of actions on the metabolism and mental alertness. It results in the "fight or flight" response of the body to stress. One of the tumours of adrenal gland called "*pheochromocytoma*" secretes excess amount of the hormones that influence the mental alertness and the body's reaction to stress. Typical features of pheochromocytoma include increased *diastolic blood pressure*, occasional palpitation, sweating, headache and anxiety.

Chronic bronchitis: A person who is, or has been a chronic smoker can have respiratory problems such as breathlessness, long-standing cough with a lot of phlegm. He/she may also have flushed appearance, sweating,

rapid pulse and prominent eye balls.

Cancer: Some types of cancer cause weight loss and features of increased metabolism.

Neurological conditions: The muscle weakness of hyperthyroidism may be confused with other disease of the nervous system such as "*polymyositis*" or "*muscular dystrophy*". Polymyositis is the inflammation of several muscles and is usually accompanied by deformity, swelling of the body, sleeplessness, pain, sweating and tension. Muscular dystrophy is a group of *hereditary diseases* that are passed from one generation to the other. All types of muscular dystrophy result in gradual loss of strength of a group of muscles that may ultimately lead to deformity. Also, some diseases of the nervous system such as "*periodic paralysis*" and "*myasthenia gravis*" are more common in people with hyperthyroidism. Periodic paralysis is a condition where there is temporary muscle weakness and/or loss of function of the muscles of the body or a part of it from time to time. Myasthenia gravis is the condition where there is chronic fatigue and weakness of muscles, especially the muscles of the face. It is due to a defect in the transmission of the nerve impulses.

Eye diseases: Wide protruding eyes may occur due to problems of circulation of the eye cage (orbit).

How is hyperthyroidism diagnosed?

Thyrotoxicosis is diagnosed through a combination of history, physical examination and laboratory tests such as:

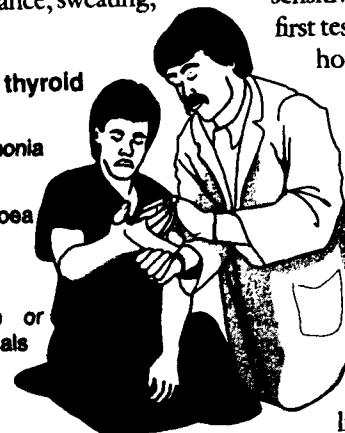
Blood tests for thyroid stimulating hormone: Measurement of thyroid stimulating hormone is one of the sensitive tests to detect thyroid diseases and is usually the first test to be recommended. Reduced thyroid stimulating hormone levels in the blood indicate hyperthyroidism.

Rarely, this hormone level may be lowered due to medicines such as steroids.

Blood tests for thyroid hormones: Measurement of total T₄ and T₃ levels in the blood helps determine the extent of thyroid abnormality. In hyperthyroidism, thyroid hormone levels are higher than normal. High T₄ and T₃ levels in isolation, without clinical features of hyperthyroidism, do not mean a thyroid disease, as it can occur in a number of conditions such as liver diseases, pregnancy, use of contraceptives, etc.

Box 12.5. Factors that precipitate thyroid crisis

- Infections such as sore throat, pneumonia
- Injury
- Dehydration due to vomiting or diarrhoea
- During or just after delivery
- Surgery
- Treatment with radioactive iodine or taking excess of iodine containing materials
- Withdrawal of anti-thyroid medicines
- Uncontrolled diabetes



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In such cases, free T₃ and free T₄ levels are recommended for accurate diagnosis.

Although free hormone levels are affected less frequently by conditions other than abnormal thyroid, their use in diagnosis is limited because of high probability of laboratory errors.

Other blood tests: These include total and differential white blood cells count in order to have a baseline. Thyrotoxicosis lowers blood counts. Since the medicines commonly used for treatment of hyperthyroidism further lower the blood count, a baseline is necessary for comparison.

Radioactive iodine uptake: Excessive production of hormones in the thyroid gland is generally confirmed by a nuclear medicine study using radioactive iodine, called radioactive iodine uptake (RAIU). In this test, radioactive iodine is taken orally and tests done after twenty four hours to measure the amount of iodine absorbed and used by the thyroid gland. This test is safe as the dose of radiation is very small. It is however, usually not recommended for young children and pregnant woman.

Radioactive iodine uptake is especially useful in determining whether the thyrotoxicosis is accompanied with hyperthyroidism or not.

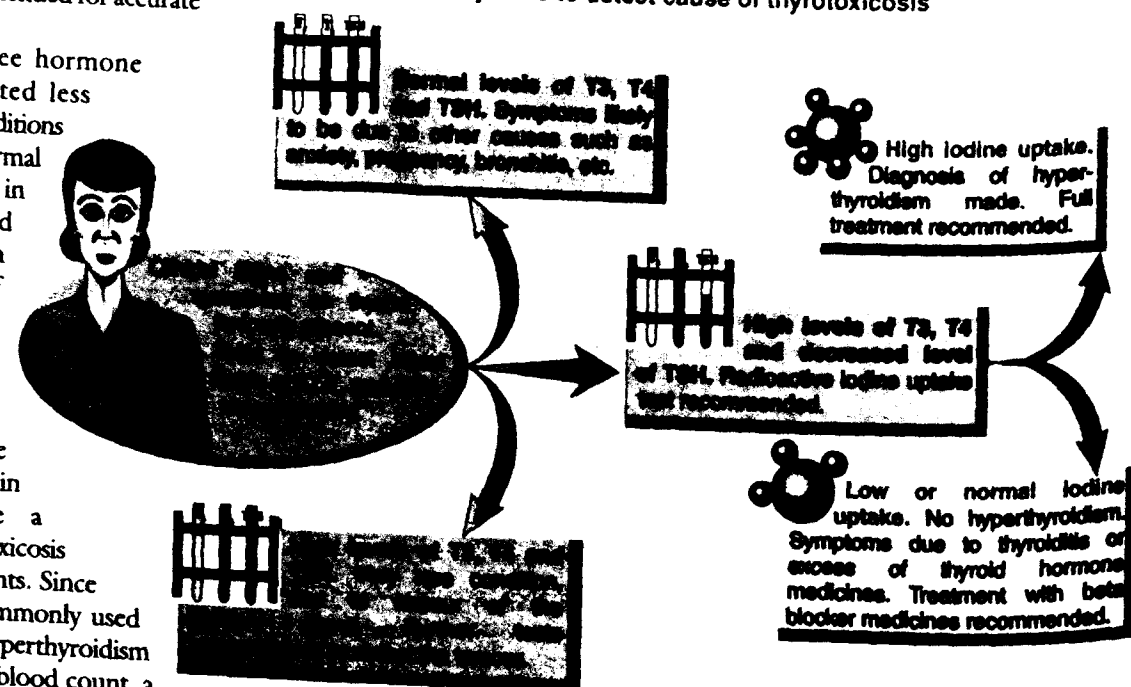
Sometimes, a thyroid scan is recommended after taking an intravenous injection of radioactive technetium (an element just as iodine) to determine the shape and size of the thyroid gland, especially in those with thyroid nodules. Figure 12.2 details the interpretation of the results of the blood tests and radioactive iodine uptake.

Other tests that are recommended occasionally include:

Anti-thyroid antibodies: This is a blood test in which the level of antibodies to the thyroid gland, if present, is measured. It is recommended when autoimmune diseases are suspected. In Graves' disease, the circulating antibodies work like the thyroid stimulating hormone and stimulate the thyroid gland to secrete more hormones. Low levels of antibodies are normally present in elderly women and do not indicate disease.

Thyroid biopsy: A biopsy is a test in which some part of an organ or tissue is taken and studied under a microscope. A thyroid biopsy is normally recommended for a thyroid nodule. In this procedure, a small needle is inserted into the nodule and a small amount of thyroid cells are collected and examined under a microscope. Thyroid biopsy is a

Figure 12.2. Laboratory tests to detect cause of thyrotoxicosis



simple, quick and painless procedure.

What is the treatment for thyrotoxicosis?

There are four main approaches to management of thyrotoxicosis:

1. Medicines that block the synthesis of thyroid hormones;
2. Medicines that reduce the effect of thyroid hormones;
3. Radioactive iodine therapy; and
4. Surgery

Medicines that block the synthesis of thyroid hormones: These medicines, also called anti-thyroid medicines, are recommended for management of thyrotoxicosis associated with hyperthyroidism. *They are not prescribed till radioactive iodine uptake by the thyroid gland has indicated hyperthyroidism.* Anti-thyroid medicines are prescribed either to cure the hyperthyroidism or to prepare for other management options such as surgery and radioactive iodine therapy.

Carbimazole and propylthiouracil are the commonly used anti-thyroid medicines. Of these, carbimazole is available more easily in India. Another medicine called *Methimazole* is used in some countries such as the US. Carbimazole is converted into methimazole in the body. Initially, a large dose of the medicine—about eight to twelve tablets per day—is recommended. If adequate dose of medicine is taken, symptoms subside in about three to six weeks and the blood tests become normal by about six to eight weeks. After the hyperthyroidism is controlled, the dose is reduced to two to four tablets per day. *The main aim of the treatment is to use as little dose as possible to maintain normal thyroid functions.*

If the hyperthyroidism is caused by a self-limiting condition (such as Graves' disease), the medicines are usually continued for about two years. However, if the disease is

not self limiting (such as a thyroid nodule or multinodular goitre with hyperthyroidism), medicines are recommended till you feel better and are healthy enough to undergo a definitive treatment, like surgery or radio-iodine therapy.

Side effects of the anti-thyroid medicines: The most serious side effect of anti-thyroid medicines is a condition called "agranulocytosis". This is a condition where the body does not make a particular type of white blood cells, called "granulocyte". These cells are essential to prevent bacterial infections. Absence of granulocytes results in severe infections where even a minor sore throat can lead to death.

Fortunately, agranulocytosis is a rare complication, but unfortunately the attack of agranulocytosis comes without any precipitating factors. Nor does it give a "warning" with early signs and symptoms. Thus, there is no way to predict or prevent the attack of agranulocytosis. This is why anti-thyroid medicines are not recommended for a long time. Instead, the medicines are stopped and definitive therapy is recommended if spontaneous cure of the disease is not expected. In conditions such as Graves' disease where spontaneous cure is expected, these medicines are prescribed for a maximum period of two years.

Other minor side effects of anti-thyroid medicines include muscle pains, joint pains, abnormality of the liver functions and skin rashes. These adverse effects are more common with carbimazole than with propylthiouracil.

Box 12.7 lists indicators for discontinuation of anti-thyroid medicines and indicators of good response to anti-thyroid medicines.

Medicines that reduce the effect of thyroid hormones: If you have severe symptoms and/or have other associated diseases, your doctor is likely to recommend medicines called beta-blockers (such as propranolol) for about six weeks. This is to reduce the severity of signs and symptoms till the anti-thyroid medicines (such as carbimazole) begin to act.

If thyrotoxicosis is present without hyperthyroidism as indicated by low radioactive iodine uptake, anti-thyroid medicines will not be effective. Your doctor may therefore prescribe medicines such as propranolol only.

Medicines prepared from iodine are prescribed in case of severe thyrotoxicosis. They are also used to prepare for surgery.

Drugs used to treat the eye involvement in Graves' disease: Occasionally, "steroids" are recommended for the treatment of severe eye problems in Graves' disease. It is however important to consult with an ophthalmologist before taking these medicines. In rare cases, the ophthalmologist may recommend a surgery to save the vision.

Radioactive Iodine Therapy: Radioactive iodine emits radiation that

damages the local tissue. After taking the radioactive iodine orally, it is concentrated in the thyroid gland. The total amount of active thyroid tissue is thus reduced. Reduced thyroid tissue secretes fewer hormones. Radioactive iodine therapy has been demonstrated to be safe and effective in all age groups. *It is important to remember that your doctor will not recommend radioactive iodine till your thyroid hormone levels become normal after taking carbimazole.*

Radioactive iodine therapy is useful for people whose thyroid disease is not likely to regress over time. This also includes people with Graves' disease whose thyroid functions do not return to normal even after taking medicines for Graves' disease for two years.

Almost half the people treated with radioactive iodine will develop reduced secretion of thyroid hormone because of excessive damage to the thyroid gland. This damage usually occurs over a period of ten years. Subsequently, it is necessary to take thyroxin tablets for life. It is important to remember that taking thyroxin is definitely less harmful than continuing treatment with anti-thyroid medicines such as carbimazole.

Surgery: Conditions that require surgery for treatment of thyrotoxicosis include:

1. A very large enlargement of the thyroid gland (goitre) that puts pressure on windpipe, food pipe or blood vessels in the neck; and
2. Multi-nodular goitre, especially if the goitre is not likely to respond to radioactive iodine.

Surgery leads to rapid and sure correction of thyrotoxicosis. Complications of surgery include voice defects due to damage to the nerves of the voice-box, scar at the site of operation and reduced calcium levels in the blood. This is due to damage to the four small glands called the "parathyroid gland" that are attached to the thyroid gland. Parathyroid glands secrete a hormone that maintains constant concentration of calcium in the blood.

Box 12.8 details the general measures for management of thyrotoxicosis.

What are the special problems in thyrotoxicosis?

Thyrotoxicosis leads to special problems during pregnancy, childhood, old age and infections.

Box 12.7. Indicators for discontinuation of anti-thyroid medicines

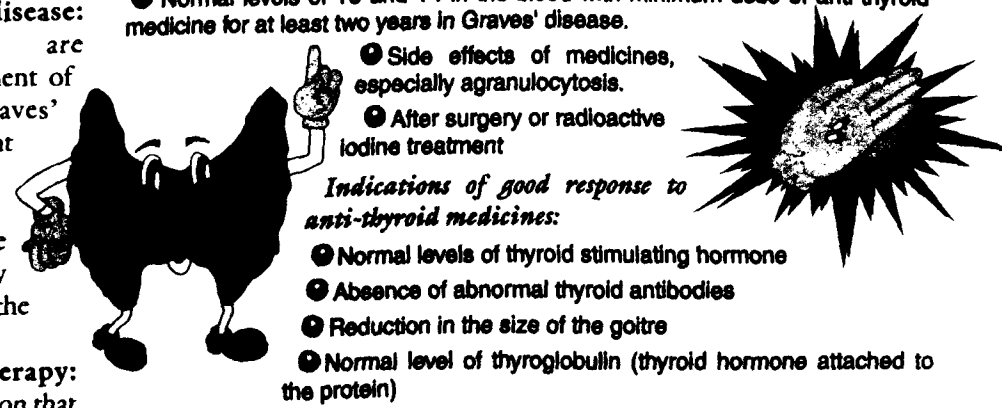
- Normal levels of T₃ and T₄ in the blood with minimum dose of anti-thyroid medicine for at least two years in Graves' disease.

- Side effects of medicines, especially agranulocytosis.

- After surgery or radioactive iodine treatment

Indications of good response to anti-thyroid medicines:

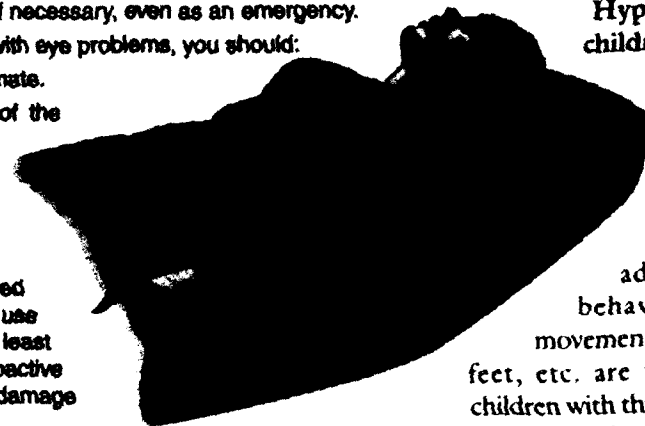
- Normal levels of thyroid stimulating hormone
- Absence of abnormal thyroid antibodies
- Reduction in the size of the goitre
- Normal level of thyroglobulin (thyroid hormone attached to the protein)





Box 12.8 General measures for management of thyrotoxicosis

- Take nutritious diet and adequate rest.
- Avoid physical and psychological stress and hot climate.
- Follow your doctor's advice on the dose of medicines and duration of treatment very accurately.
- If you develop high fever and sore throat while taking anti-thyroid medicines, do the following:
 - Stop the anti-thyroid medicines as soon as symptoms of sore throat appear
 - Get a complete blood count done to determine if there is deficiency of granulocytes.
- Consult your doctor immediately — if necessary, even as an emergency.
- If you have Graves' disease associated with eye problems, you should:
 - Avoid going to hot, dry and dusty climate.
 - Wear glasses that cover the side of the eyes also.
 - If there is excessive swelling of the eye, raise the head-end of the bed by keeping some bricks under the bed.
- Radioactive iodine is not recommended during pregnancy. You should use contraceptives to prevent pregnancy for at least six months after treatment with radioactive iodine as this medicine is likely to cause damage



since these medicines are secreted in breast milk, they can cause hypothyroidism in young babies, which can lead to irreversible and crippling effect on their growth and development. This is why some doctors recommend that breast-feeding be avoided while you are on anti-thyroid medicines. For the same reason, it is advisable that you avoid breast feeding after being treated with radioactive iodine.

Hyperthyroidism in children: Children with thyrotoxicosis may grow rapidly and become very tall. They may not lose weight as much as adult. Abnormal behaviour, dance like movements of the hands and feet, etc. are very common in children with thyrotoxicosis.

Hyperthyroidism in the

elderly: Diagnosis of thyroid diseases in people above sixty-five years of age may be difficult. This is because they do not present with typical signs and symptoms of hyperthyroidism. Common signs and symptoms include depression, confusion, failure to thrive, frequent falling, difficulty in walking, heart failure and bowel disturbances (either constipation or diarrhoea). An elderly person with heart failure without any obvious cause may be suffering from thyrotoxicosis. The suspicion of cancer due to wasting of the body may turn out to be just thyroid abnormality.

Associated illnesses: Illness such as infections associated with hyperthyroidism worsen the signs and symptoms and may lead to an emergency situation with heart problems. You should therefore consult with your doctor as soon as signs and symptoms of other illnesses start. He/she will treat your infections and other diseases more aggressively and may ask you to stop anti-thyroid medicines.

AYURVEDA

Causes, signs and symptoms of thyrotoxicosis as per Ayurveda are the same as those detailed in the section on Allopathy.

The thyroid gland is called *Avastuka-granthi* in Ayurveda and goitre or enlargement of the thyroid gland is called "*galaganda*". It is described as a small and defined swelling that hangs like scrotum in the neck. This swelling is usually painless and does not lead to collection of pus.

Sushruta, the famous surgeon of ancient times describes abnormalities in *vata* and *kapha* as the main causes of thyroid disturbances. Vata and kapha are the two doshas in

the body as per Ayurveda. Another imbalance, called *meda*, reaches the neck and gets localised there. Vijayarakshita, a famous commentator of Ayurvedic literature *Madhava Nidam*, emphasizes that there is no *Paittika galaganda* (or due to pitta dosha) as it is basic nature of the disease. Box 12.9 details the symptoms of three types of hyperthyroidism as per Ayurveda: (a) Vaitika, (b) Medaja and (c) Sleishmika.

What is the treatment for hyperthyroidism?

The principle of treatment for *Vataja* and *Medaja* varieties of thyrotoxicosis is sudation (*swedan*). Sudation

means treatment with medicines that force sweating. *Kaphaja* type of thyrotoxicosis is managed by sudation, application of medicated dressing or poultice (*Upanha*) and Venesection (*Visrayana*). Venesection means letting out the contaminated blood from specific veins of the body. Venesection of the vein for thyroid gland, called *Urumula mata shira* can be done by leaches, Bitter bottle-gourd (*Alabu*) or East Indian Screw tree (*Shringa*). It is not recommended in people above seventy years and below sixteen years of age.

Applications recommended for management of hyperthyroidism include dressings and oils. To prepare a dressing, powder Italian millet, lime, *Mandooru Danti moola*, and *Rasanjana*. Add cow's urine and prepare a pulp and apply as a dressing to the thyroid gland area in the neck.

An external application is prepared from the root of *Clerodendron serratum* in rice washing and applied to the swelling in the neck.

Oil is prepared from equal proportions of *Sendha namaka*, galanga cardamoms, *Bala mula*, *Rasana*, ginger, chilly, Sacred fig and *Daruhaldi* in the form of paste with one and half proportion of mustard oil. *Tailpaka* is made by adding four times the juice of bitter bottle-gourd and is very effective for hyperthyroidism.

Single medicines include (a) fourteen to twenty-eight millilitres of the juice of fresh leaves of Five-leaved Chaste tree and (b) three grams of powdered root of wing leaved clitoria with three to six grams of ghee. Both these medicines are to be taken three times a day.

Simple and compound medicines include:

1. **Five-leaved Chaste tree:** Nasal drops prepared by crushing root of Five-leaved Chaste tree in twelve to twenty-four millilitres of water. These drops are usually recommended twice a day.
2. **Sharp cornered cucumber and long pepper:** Take equal proportions of fruit juice of sharp cornered cucumber and powdered fruit of long pepper, prepare a snuff and use it

Box 12.9 Types of hyperthyroidism as per Ayurveda

Type

Vatika



VATA
Ether

Sleishmika



KAPHA
Water, Earth



MEDAJA
Fat like material

Symptoms

- Pricking sensation or pain.
- Prominent complex of veins on the thyroid gland.
- Colour of skin on the swelling is dark or reddish in appearance.
- Swelling is rough to touch.
- Swelling gradually increases but does not collect pus.
- Taste in the mouth is altered.
- Increased thirst.
- Swelling that does not move, grows slowly and is cold on touch.
- Colour of skin on the swelling is the same that of the skin.
- A feeling of heaviness in the neck.
- Itching on the surface of the thyroid gland.
- Dull pain at the site of swelling.
- Presence of shining like spots on the upper part of the neck (face) and surrounding area.
- Presence of small spots on the skin.
- Pain in the thyroid gland area on stretching the skin.
- The base of the swelling is narrow and its shape is like a cucumber.
- The face looks shining.

twice a day.

3. **White mountain ebony:** Prepare a decoction prepared from the bark of white mountain ebony and take fourteen to twenty eight millilitres of it three times a day.

4. **Three leaved caper:** Prepare a decoction from the root of three leaved caper and take fourteen to twenty eight millilitres of it with four to six grams honey thrice a day.

5. **White mountain ebony:** Prepare a paste from the bark of white mountain ebony. Mix twelve to twenty four grams of this paste with twenty five to hundred millilitres of rice washing. Take this preparation with one gram of dried ginger three times a day.

6. **Kanchanara:** Two to four tablets prepared from *Bauhinia variegata* and gum guggul to be taken with water three times a day.

What is the recommended dietary regimen for thyrotoxicosis?

Ayurveda recommends seeds of oat, phascolus bean and leaf of *patola* (a variety of small cucumber) for hyperthyroidism. You should use sea salt while cooking.

HOMOEOPATHY

The causes, signs and symptoms of hyperthyroidism as per the Homeopathy are the same as detailed in the section on Allopathy. Homeopathic approach for hyperthyroidism revolves around your characteristic features and your response to the disease. Thus, your doctor will ask detailed

history of your illness and recommend laboratory investigations before recommending treatment that is most appropriate for you. This treatment is for enhancing your natural defense mechanism and removing the tendency to develop diseases.

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History: A detailed case study is the foundation of Homoeopathic treatment. Your doctor will therefore ask questions not only about the common signs and symptoms that are typical of hyperthyroidism but also other symptoms that may be unique to you. These include your general likes and dislikes, food and other habits, reaction to temperature, climate etc. He/she will also ask questions about your temperament and reaction to varying circumstances.

Homeopathy lays special emphasis on the factors or circumstances present just before the onset of signs and symptoms. These include (a) *physical factors* such as extraordinary physical strain, prolonged illness, taking excess of medicines, etc. or (b) *mental factors* such as shock, grief, fright, etc. Homeopathy offers a wide range of medicines that are effective for such precipitating factors.

Just as in most diseases, family history plays a very important role in determining the management options. Some diseases in the families often predispose to various chronic disease. These include tuberculosis, diabetes or cancer. Homeopathy offers medicines such as *Tuberculinum*, and *Carcasin* that act on your immune system and remove the tendency to diseases, thereby allow other Homoeopathic medicines to act more effectively.

Investigations: Homeopathy also recommends thyroid function tests at regular intervals in order to monitor the level of thyroid hormones and to assess the efficacy of the treatment being given.

What is the aim of Homoeopathic treatment?

Extensive research has persuasively indicated that medicines that have produced signs and symptoms in healthy people similar to those in people suffering from hyperthyroidism can cure it.

Some medicines if given to healthy people, result in increased metabolism, loss of weight, tremors, increased heart rate, etc. When the medicines that produce these symptoms are given to people with hyperthyroidism, they eradicate the symptoms and cure the disease.

Homoeopathic medicines have three distinct advantages:

1. Enhancement of your defense mechanism to an optimum level so that the functions of the thyroid gland are controlled. Thus, the level of thyroid hormones comes down to normal.

2. Direct action on the thyroid gland to prevent any further damage to it.

If the hormone levels are very high, your Homeopath may recommend continuation of Allopathic medicines along with Homoeopathic medicines. When the thyroid hormone levels returns to normal, the Allopathic medicines can be gradually reduced and Homoeopathic medicines continued so that they act on your body's constitution and control the functions of the thyroid gland.

What is the treatment for thyrotoxicosis?

Homeopathy offers a wide range of medicines that have beneficial effect on the thyroid gland. These are either

medicines that have specific action on the thyroid gland or are deep-acting and wide spectrum medicines. Detailed below are some of these medicines and indications for their use. It is important to remember that the medicines listed below are just a suggestive list and should not be used without prescription from your doctor.

1. **Iodine:** It is the most important medicine used in hyperthyroidism. It is recommended if you have:

- Rapid metabolism as indicated by weight loss despite normal or increased appetite.
- Weakness and increased sweating on minimal exertion.
- Eye changes such as bulging of the eyes.
- Coldness of the hands and feet and trembling.

Iodine is especially effective for thin and dark-complexioned people who are anxious and depressed and have throbbing headaches. Such people usually have a ravenous appetite and intense thirst. They feel much better after eating, are usually intolerant to heat and feel better in open air.

2. **Thyroidinum:** This medicine is prepared from dried thyroid gland of a sheep and is effective for both, hyper and hypothyroidism. The symptoms for which thyroidinum is recommended include weakness, weight loss and palpitations. Most people with these symptoms crave sweets and suffer from flatulence.

3. **Natrum Mur:** The onset of symptoms plays an important role in selection of this medicine for treatment of hyperthyroidism. It is effective in case there is history of grief or emotional disappointment, especially if it is associated with loss of weight despite good appetite.

People who benefit from this medicine are usually reserved and quiet, very sensitive and yet do not express their feelings. They have craving for salty foods and are averse to fatty foods. Young girls who get frequent headaches, especially in the sun or women with irregular monthly periods and infection of the cervix usually respond well to Natrum Mur.

4. **Calcarea Iod:** It is recommended for enlarged thyroid gland at the time of puberty and profuse sweating.

5. **Spongia:** It is effective in cases of bulging and protruding eyes, swollen thyroid gland, dry suffocating cough and palpitations during sleep.

6. **Calcarea Arr:** It is prescribed for palpitations, throbbing headaches and giddiness on moving the head.

7. **Ferrium Iod:** This medicine is used for dullness of mind, giddiness in warm room, scanty or delayed monthly periods in women and restless sleep.

8. **Lycopus V:** This medicine is recommended for irregular, rapid pulse, those who feel worse whenever there is excitement or while thinking of the disease, sighing respiration, tremors in the hands and headaches that improve with pressure.

It is important to remember that the above mentioned medicines are just a few of the wide range of medicines that are recommended for thyroid gland abnormality. The earlier you start treatment, the better will be your response to treatment.

NATURE CURE

Causes, signs and symptoms of hyperthyroidism as per Nature Cure are the same as those detailed in the section Allopathy.

What is the treatment for thyrotoxicosis?

The main aim for the treatment of thyrotoxicosis is to control, and then avoid irritation to the thyroid gland. Irritation is due to:

- Lack of proper blood supply to the gland
- Lack of proper draining of used blood from the thyroid and
- Lack of nerve supply
- Lack of muscular activity

Nature Cure recommends the following measures for management of thyrotoxicosis:

Cold bandage to the throat: Wrap a wet cold towel to the neck so that it covers the thyroid gland area in several layers. Keep the cold bandage for about one to two hours every day. You need to sprinkle cold water on the bandage frequently in order to maintain its moisture. Cold bandage regulates (a) the blood supply and (b) drainage to and from the thyroid gland.

Mud pack: Mud is also very effective in controlling the irritation to the thyroid gland. Instead of cold bandage, apply mud on a piece of cloth and wrap it around the neck. Keep the mud pack for about one to two hours every day.

UNANI

Unani system of medicine describes the thyroid as a gland that produces thyroid hormone, a phlegmatic secretion that controls the body's energy level. An overactive secretion that produces excess of phlegmatic secretions is known as hyperthyroidism or *Kasrat Ghudda Darquia*. Symptoms of hyperthyroidism as per the Unani system are the same as those described in the section on Allopathy.

What are the causes of hyperthyroidism?

The main cause of hyperthyroidism is derangement in the temperament of *Ghudda Darquia*. Predisposing causes that alter or derange this temperament are irregularities in dietary intake, drinking unhealthy water, constant irritation at the site of the thyroid gland, excessive use of dry food, constant exposure to cold, etc.

What is the treatment for hyperthyroidism?

The main principal of treatment of hyperthyroidism is to normalise the deranged temperament of the *Ghudda Darquia* and to detoxicate the blood by prescribing "*Tiryaqat*". In addition, medicines are also prescribed to check the predisposing causes at a primary level. The following medicines

• **Exercises:** Neck and shoulder exercises help improve the muscle tone and thyroid gland activity. Your Naturopath can teach you the correct method of doing these exercises.

• **Yoga:** Yoga and meditation reduce general irritability and stress. They therefore reduce irritability of the thyroid gland also. *Shavasana* or the relaxation pose is especially effective in management of over-active thyroid gland.

• **Spinal bath:** Keep your backbone immersed in cold water in a special spinal bath for thirty minutes every day. Spinal bath helps control over-activity of the thyroid gland through its effect on the pituitary gland.

• **Pranayam:** Pranayam or breathing exercises help reduce irritation of the thyroid gland by regulating the higher centres in the brain.

• **Dietary measures:** Nature Cure recommends a diet rich in calcium for maintaining normal levels of thyroid hormones in the body. Cabbage, turnip, carrot and beet root are effective both as raw vegetables and as juices. Use green leafy vegetables and citrus fruits regularly. Sea plants and iodized salts maintain normal iodine levels in the body and therefore prevent thyroid problems. It is important to remember that you should not consume sea plants or any other form of iodine in excess as it has adverse effects on the thyroid gland, and therefore on all body functions. Water cress, lettuce and green leafy vegetables contain moderate amount of iodine and are therefore safe.

are commonly prescribed to bring the temperament to normal levels and to expel unwanted excessive phlegmatic matter:

• **Kachmar:** One ounce of decoction of the bark of *Kachmar* (*Bauhinia variegata*) is recommended twice a day on empty stomach for fifteen days.

• **Tropical duckweed:** A fine paste prepared by grinding Tropical duckweed (*Jalkhumbi*) is applied at the site of the thyroid gland. You should also drink ten to twenty millilitres of the juice prepared from this plant.

• **Blume:** Leaves of Blume (*Kukronda*) smeared with ghee of sesame oil is warmed and bandaged over the thyroid gland for two to three weeks.

• **Flex seeds:** Prepare a paste by grinding Flex seeds in



DID YOU KNOW THAT

The thyroid gland is the largest endocrine gland in the body and weighs about twenty-five grams. It has the highest rate of blood flow higher than even the heart and the kidneys.

water and apply it to the site of the thyroid gland.

● **Turmeric and Bishop's weed:** Take equal proportion of turmeric (*haldi*) and Bishop's weed (*ajawain*) and finely ground them together. Mix six grams of this powder with twenty grams of the pulp of Aloe, warm it and apply at the site of the thyroid gland.

● **Linseed and mustard:** Grind six grams each of the linseed and mustard in the juice of green Black nightshade and apply it at the site of the thyroid gland while lukewarm.

● **Velvet leaves and black cumin:** Grind six grams each of velvet leaves and black cumin with thirty grams of purging cassia in the juice of Black nightshade. Apply the lukewarm

paste to a leaf of Castro tree and bandage it over the thyroid gland for three to five days.

● **Henbane:** Take three grams of Henbane (*Ajwain khurasani*) for fifteen days.

● **Delphinium root:** Boil four grams of Delphinium root (*Jadwar*) in hundred millilitres of water. Strain the liquid, sweeten with sugar and drink it.

● **Cinnamon:** Boil three grams of cinnamon (*Dalchini*) in hundred millilitres of water. Strain the liquid, add sugar and take it orally.

In addition to the above simple preparations, Unani also recommends compound preparations such as *Khamira Gaozuban Jadwar Ood Salib wala*, *Khamira Abresham*, *Hab-e-Jadwar*, *Hab-e-Jawahar*, *Jawarish Zarooni*, and *Majoon Falasfa*.

What is the dietary regimen for hyperthyroidism?

Unani system recommends that you avoid sour and heavy food. Take larger portions of green gram dal, Bengal gram and wild snake gourd.

DEFINITIONS

Auto immune diseases are a group of diseases where there is alteration in the function of the immune system (defence mechanism) of the body. In this condition, white blood cells recognize some part or tissues as abnormal and secrete chemical substances to destroy them.

Diastolic pressure is the pressure at the time of maximum relaxation of the heart muscles when the blood enters the heart. It is the lower value of blood pressure expressed in millilitres on a mercury column.

Hereditary diseases are those health problems that are passed on from one generation to the other. It is not necessary that all family members should suffer from these diseases.

Metabolism is the aggregate of all chemical processes that take place in the body. These processes result in growth, generation of energy, removal of wastes, distribution of nutrients from the digested foods, etc.

Pituitary gland is located at the base of the skull. It secretes several hormones that control functions of several important functions and other glands of the body.

Testes are male reproductive organs that produce sperms.

Uterus or womb is a female reproductive organ where the unborn baby grows and lives during pregnancy.

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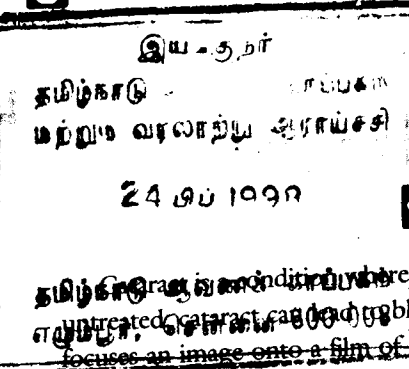
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Cataract

ALLOPATHY

Cataract is a condition where there is opacity or clouding of the eye's natural lens. If untreated, cataract can lead to blindness. The eye is just like a camera. It has a lens that focuses an image onto a film of nerves at the back of the eye. If the lens in a camera is smudged or has scratches, the pictures will be blurred. Similarly, when the lens in the eyes becomes cloudy, you will either see blurred images or not see at all.

Cataract is generally considered a normal part of aging. More than half the people above sixty-five years of age have cataract. Most have it in both the eyes while some may have it in one eye only. However, the vision in one eye may be worse than in the other because cataract in the two eyes tends to develop at different rates. Cataract can also be present in newborns and young adults.

In the absence of any medical cure, surgery remains the mainstay of cataract treatment. Cataract surgery has come a long way over the last twenty years. Today an estimated twenty-five lakh cataract operations are performed in India every year. Several recent advances in the microsurgery of the eyes allow the cataract to be removed very safely and an artificial lens implanted in order to restore vision.

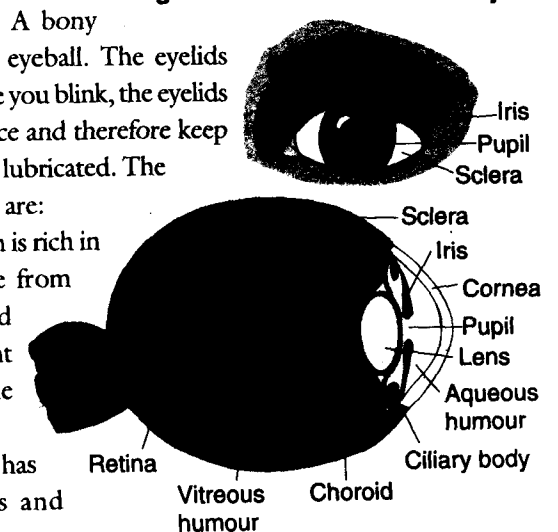
What is the structure of the eye?

The adult human eye is a hollow globe about 2.4 centimetres in diameter. A bony socket inside the skull protects the eyeball. The eyelids provide further protection. Every time you blink, the eyelids spread the tear fluid on the eye surface and therefore keep the outer surface of the eye clean and lubricated. The eyeball consists of three coats. These are:

1. **Sclera**, the outermost layer, which is rich in fibres. These fibres protect the eye from external injury. The sclera is modified in front of the eye into a transparent layer called the **cornea**. It allows the light rays to enter the eyeball.

2. **Choroid**, the middle layer, which has a large number of blood vessels and

Figure 13.1 Structure of an eye

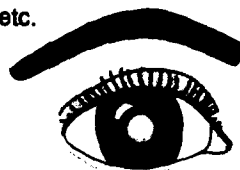


Definitions of all technical terms used in this issue are given on the last page.

CAUSES

Box 13.1. Common causes of cataract

- Old age
- Inborn cataract due to diseases such as rubella and syphilis during pregnancy
- Developmental cataract
- Diseases such as diabetes, rickets, nutritional deficiency, etc.
- Injury to the eye
- Inflammation of the eyes, retinal detachment, etc.
- Medicines such as steroids and iron
- Radiation
- Skin diseases such as atopic dermatitis



pigments. These pigments have two main functions: they prevent (a) internal reflection of the light-rays and (b) extra and unnecessary light into the eyeball. The choroid also provides nutrition to the eyeball. At the junction of sclera and cornea, the choroid is modified into muscles called the *ciliary body* and a contractile diaphragm of the eyeball called the *iris*. The iris contains coloured pigments that give the colour to the eyes. It is perforated in the centre by a circular opening called the pupil.

3. **Retina**, the innermost layer, which consists of photosensitive nerve cells.

The three layers of the eyeball enclose three main structures: (a) the lens, (b) a watery fluid between the cornea and the lens called, the *aqueous humour* and (c) a jelly-like substance between the lens and the retina, called the *vitreous humour*.

The *lens* is completely surrounded by an elastic capsule and does not have any blood supply. It is a biconvex body formed from long, thin and regularly arranged fibres. These fibres contain a gel like material formed from proteins. New fibres are formed on the outer surface of the lens just below the capsule. The older fibres move to the centre of the lens and become more densely packed. The lens measures about nine millimetres in diameter and four millimetres in thickness in young adults. The normal structure of the eye is as shown in Figure 13.1.

How does the normal eye work?

The normal eye works just like a camera. All its parts play an important role in providing a clear vision. The light rays enter the eye through the cornea, which is the main focussing element. It allows the light to pass through it and bends them through the pupil.

The coloured iris opens and closes, just as in a camera, to control the light that enters the pupil. The lens, which is normally soft and pliable, makes the delicate adjustments in the path of the light rays. These adjustments bring the light into focus upon the retina. The photosensitive nerve cells change the light into electrical impulses and send them

to the brain through a nerve called the *optic nerve*. The brain perceives an image on the basis of these electrical impulses.

What are the causes of cataract?

The commonest cause of cataract is old age. Other causes include in-born defects, injuries and some diseases. Detailed below are the main causes of cataract. These are summarized in Box 13.1

1. **Senile cataract**: The most common form of cataract is associated with aging. Most people begin to develop some degree of cataract after the age of fifty years. Reduced vision due to cataract is observed in about five percent people between fifty-two to sixty-four years of age, eighteen percent people between sixty-five to seventy-four years of age and forty-six percent people in the age group of seventy-five years and above.

The type of cataract and the position of the opacities vary from person to person. The commonest site for cataract is in the main body of the lens followed by the opacity in the centre of the lens. Sometimes, the cataract may develop only on the outer surface just below the capsule.

2. **Inborn defects**: About fourteen percent of all childhood blindness is due to hereditary defects. *Rubella*, a viral infection, and *syphilis*, a sexually transmitted disease, during pregnancy and some abnormalities of the *endocrine glands* can also cause cataract in the newborns.

Cataract in newborns is often associated with low birth weight and abnormalities of the central nervous system resulting in mental retardation, convulsions or cerebral palsy. These abnormalities are due to inadequate oxygen or inadequate development of *placenta* in the last three months of pregnancy. Some babies who have deficiency of the enzyme that lead to milk intolerance can develop cataract within the first year of life. However, *it is important to remember that about thirty-five to fifty percent babies who develop cataract before their first birthday may not have any associated illnesses*. Cataract can develop in some children after birth if the newly formed lens fibres are opaque. Most often, these opacities do not interfere with vision.

3. **Cataract following injuries**: Any injury to the eye, irrespective of whether it penetrates the lens or not, can cause cataract. A non-penetrating injury may cause cataract several months or years after the injury. A penetrating injury may result in rapid development of cataract. A small tear in the capsule covering the lens may heal on its own and result only in localized opacity.

4. **Cataract due to some diseases**: Cataracts can be due to some diseases of the endocrine glands and abnormalities of

certain chemical compounds that normally occur in the body. These include:

● **Diabetes**: Young people with diabetes, especially if it is not controlled, can develop sudden vision defects and cataract. The cataract may clear partially after controlling the diabetes but is more likely to progress very rapidly.

● **Enzyme deficiency**: As mentioned earlier, infants who have deficiency of enzymes that digest the carbohydrates in milk can lead to cataract in infants.

● **Decreased calcium**: Cataracts can be associated with reduced calcium in the blood either due to inadequate hormones secreted by *parathyroid gland* or *rickets*. Parathyroid glands are small glands located in the neck just behind the thyroid gland. They secrete hormones that maintain normal calcium levels in the blood. Rickets is a condition caused by deficiency of vitamin D, calcium and sometimes phosphorus. It leads to abnormal bone formation in infants and young children.

● **Poor nutrition**: Cataract can occur in people who have very poor intake of food and in some alcoholics.

● **Complicated cataract**: This is the term used for cataract that follows four main conditions. These include (a) inflammation of the eyes, (b) long-term persistent detachment of the retina, (c) glaucoma or (d) tumours inside the eye. Glaucoma is the condition where the pressure in the eye increases as a result of obstruction to the outward flow of the fluid between the lens and the cornea. Complicated cataract can also occur after surgical treatment for glaucoma or retinal detachment.

● **Toxic cataract**: Some chemical substances such as zinc chloride and medicines can cause cataract. Medicines likely to cause cataract include steroids, long-term use of some medicines for nausea, vomiting and psychiatric disorders and those that contain nitrogen.

● **Radiation cataract**: Radiation, including from x-rays, can lead to cataract. Exposure to x-rays during the first three months of pregnancy increases the risk of inborn cataract. Cataract is also very common due to chronic exposure to infrared radiation by glassblowers and furnace workers.

● **Skin diseases**: Cataract is often associated with skin diseases such as *atopic dermatitis*, which is an allergic disorder that is likely to run in families. These cataracts usually develop in both the eyes and at a younger age.

How does cataract develop?

The cataract can develop through the following six main mechanisms:

1. **Opacity in previously clear lens fibres**: The newly

formed fibres of the lens just below the capsules are very sensitive to physical disturbances such as an injury due to a blow or chemical disturbances such as decreased calcium or increased glucose in the blood. These disturbances can cause opacity of the lens.

In older people, there are irreversible chemical changes in the protein in the older lens fibres at the centre. These chemical changes also cause lens opacity.

2. **Formation of new opaque fibres**: Sometimes, newborn babies and young children may have opacity in the newly formed lens fibres. Either the entire lens or a few fibres may be opaque. If only a few fibres are opaque, the lens can develop normally.

3. **Deposits of powdery material in place of new lens fibres**: Sometimes the lens loses the ability to form new fibres and instead some powdery material may be deposited. This is more common in cataract as a result of radiation but may also be seen in senile, developmental, complicated, toxic cataracts and cataract due to some diseases.

4. **Collection of pigment**: This condition is only seen in adult eyes where there is opacity in the centre of the lens.

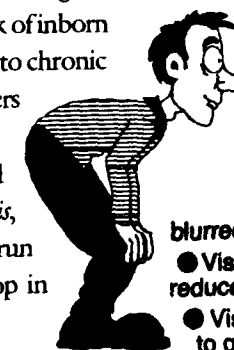
5. **Opacity in the outermost layer of the lens**: This is observed in conditions such as glaucoma and some injuries to the eye.

6. **Deposits of chemical substance**: Copper deposits are observed in a rare form of hereditary disease. Some medicines can also deposit in the lens and therefore cause opacity.

What are the symptoms of cataract?

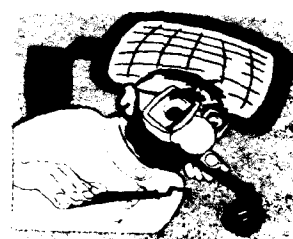
Cataract is a progressive condition in which the lens of the eye becomes cloudy and therefore increasingly opaque. Cataract is usually white in colour but can also be yellow or brown. Thus, the symptoms of cataract depend upon the type and severity of the cataract.

As the cataract progresses, the



Box 13.2. Common symptoms of cataract

- A gradual deterioration of vision over period of time.
- Objects may appear yellow, hazy, blurred or distorted.
- Vision at night or in low light conditions may be dramatically reduced.
- Vision in bright light or in the sunshine may be difficult due to glare.
- Halos may be visible around bright lights at night.
- Double or multiple vision. This symptom disappears after the cataract progresses.
- Frequent changes in the power of the eyeglasses or contact lenses.



Box 13.2 Advantages and disadvantages of intra-capsular cataract surgery

Advantages:

- It is an easy and faster surgery.
- Minimal infrastructure is required.
- There is no risk of developing secondary cataract after surgery.

- It is a low-cost surgery for eradicating blindness due to cataract.

Disadvantages:

- The quality of lens is poor, as the intracapsular lens cannot be implanted after the surgery in the back chamber of the eye.
- Communication between the vitreous and the front chamber of the eye is lost.
- There is a risk of developing retinal detachment, inflammation of vitreous and swelling leading to severe vision loss.



vision becomes blurred and distorted. It is just like seeing through a dirty or steam covered window. As the cataract grows more opaque, the images become less recognizable. Ultimately, the cataract may become so dense that it will block the light entering the eye, thus, leading to blindness.

If the cataract is white, colour vision is usually not affected. However, it gets affected if the cataract is yellow or brown. The vision will be just like you would see through coloured glasses. Box 13.2 summarizes the common symptoms of cataract.

How is cataract diagnosed?

Cataract can be diagnosed by a simple eye examination. You should consult with an ophthalmologist as soon as your vision decreases. He/she will identify the cause of poor vision and suggest appropriate measures. Three tests are normally done to evaluate cataract:

1. **Vision test:** The doctor will ask you to read text of varying sizes on a standard chart kept at a distance. You will need to wear your normal glasses while testing the vision.
2. **Pupil dilation:** Some medicines are instilled into the eyes to dilate the pupils. About two drops of the medicine need to be applied three to four times at the interval of fifteen minutes for the pupils to be completely dilated. After the pupils are dilated, the doctor will use special lights from an instrument, called ophthalmoscope, to view the front and back of the lens along with the opacities, if any.
3. **Tonometry:** This is a common test to measure the

pressure of the fluid inside the eye. As mentioned earlier, increased pressure indicates a condition called glaucoma. It is important to differentiate between cataract and glaucoma through this test because both these conditions may present with the same symptoms and they are also common in the same age group. Also, cataract can lead to glaucoma and vice-versa.

What is the treatment for cataract?

Since the changes in the lens are irreversible, the only treatment for cataract is surgical removal of the lens. In the early stages, different eyeglasses, magnifying lenses or stronger lights may improve vision.

However, after the cataract develops further, these measures may not be effective and therefore surgery is indicated.

Until a few years ago, surgeons preferred to wait till the cataract was "mature" or hard enough to be removed easily during the surgery. Unfortunately, the vision would be greatly diminished at this stage. With recent advances in surgery, it is not necessary to wait till the cataract matures. The doctor will suggest surgery if your vision interferes with your daily activities. He/she will recommend surgery in the eye in which the vision is poorer. Surgery in the second eye is usually avoided till the first eye heals completely. Almost always the doctor will replace the cataract lens with an artificial lens called *intra-ocular lens*. There are several types of artificial lens.

Surgery may be required at an early stage in those with inborn or developmental cataracts. In cataract following an injury in young children, it is important to remove the cataract lens within six months of its development and before squint or cross-eyes develop.

Most adults develop cataract over a period of time and therefore have adequate time to plan the surgery. However, immediate removal of the cataract lens is essential in some conditions such as glaucoma complicating a hyper-mature cataract or those following injury.

Before the surgery, the doctor will take careful measurements of the eyes in order to select the correct size of the lens. He/she may also be able to select a lens power to correct shortsightedness or farsightedness, thus reducing your dependence on corrective eyeglasses after surgery.

You will need to undergo a general examination along with routine blood and urine tests and an Electro-cardiogram (ECG) before the cataract surgery. This is to assess the general condition of your health.

What are the various types of cataract surgery?

There are three main types of surgery to remove the lens that has developed cataract. These include (a) intra-capsular cataract extraction, (b) extra-capsular cataract extraction and (c) phacoemulsification. Your doctor will discuss the options suited to your type of cataract before deciding on the type of surgery.

1. **Intra-capsular cataract extraction:** This is a form of cataract surgery that is still being performed in eye camps. In this procedure, a cut is made in the cornea and the entire lens is removed using an instrument called cryoprobe. The wound is closed with five to seven stitches. Since in this procedure the lens is removed with the capsule, an artificial lens cannot be placed inside. Thick glasses are therefore necessary to restore vision.

This procedure is obsolete in the developed countries and even in India, it has been totally replaced by extra-capsular surgery except in camps. Box 13.3 details the advantages and disadvantages of intra-capsular cataract extraction.

2. **Extra-capsular lens extraction:** In this procedure, the doctor will make a cut about ten to twelve millimetres in

Box 13.4 Advantages and disadvantages of extra-capsular cataract extraction

Advantages:

- The artificial lens can be placed in the position where the natural lens existed.

- The capsule left behind serves as a barrier between the front and back parts of the eye, thus preventing inflammatory substances from causing swelling of the retina.
- The capsule gives stability to the vitreous and retina. It therefore reduces chances of retinal detachment after surgery.

Disadvantages:

- Extra-capsular cataract lens extraction requires the use of a microscope.
- Since the back portion of the capsule is left behind, secondary cataract can develop after surgery.
- In case some portion of the lens is retained, it can lead to chronic inflammation in the eye.



length in the eye at the junction of sclera and cornea. Next, he/she will open the front of the capsule and carefully remove the hard part of the lens. Using a microscopic instrument, the soft part of the lens is removed through suction.

The capsule covering the lens is left behind in the eye. The leftover capsule supports the artificial lens that is placed inside the eye. About five to seven stitches are required to close the cut. Recovery of the vision usually takes about two to three months. Box 13.4 lists the advantages and disadvantages of extra-capsular cataract extraction.

3. **Phacoemulsification:** This is a modification of extra-capsular lens extraction. In this procedure, the doctor will make a small incision about three millimetres in size. The capsule is carefully torn so that a smooth edge is formed and it can stretch without tearing. Next, the doctor will use ultrasound vibrations to break apart the cataract into tiny pieces. These cataract pieces are removed through a suction instrument, leaving behind the back portion of the capsule covering the lens. A foldable artificial lens is inserted into the eye that opens inside to replace the cataract lens.

Some medicines are put in the eyes just before the Phacoemulsification. These medicines will (a) dilate the pupils so that the



Box 13.5 Advantages and disadvantages of phacoemulsification

Advantages:

- The surgery does not require any stitches.
- You can regain the vision within a few days.
- Limited changes in the curvature of the eye after the surgery.
- You can be given the final glasses within two weeks as compared to about ten weeks in conventional surgery.
- The wound is very secure after surgery.
- You can go back home immediately after the surgery, thereby reducing the cost of hospital stay.

Disadvantages:

- The machine required for phacoemulsification is available in only a few hospitals in India as it is very expensive.
- Adequate training and expertise is required for the surgeons to learn the technique correctly.
- It is a relatively more difficult technique to learn.
- The foldable lens to be placed inside the eyes is very expensive.

vitamins, (c) abnormalities in the digestion and utilization of digested food, (d) some abnormalities in the endocrine glands and (e) old age.

Ayurveda also lays special emphasis on old age as the most important cause of cataract. However, it is important to review the general health, habits, working condition, rest, recreation and reaction to stress in all people who have cataract.

What is the management for cataract?

Associated conditions such as diabetes, vitamin deficiency, etc., if present, should be managed through appropriate measures. Ayurveda recommends the following measures to prevent cataract due to old age.

Rasayana therapy: Rasayanas are medicines that are used in various forms to prevent the deterioration of the body due to old age. They provide longevity, improve memory, intelligence and help maintain the normal functions of the body. Rasayanas also improve the colour and texture of the skin, speech functions of the five special senses (sight, touch, taste, hearing and smell), improve the natural defence mechanism of the body. Thus, these medicines improve vitality and agility of the mind and body.



HOMOEOPATHY

Homoeopathy also defines cataract as the opacity of the lens of the eye that affects either its main body or the centre. It describes the various types of cataract as congenital or since birth, degenerative, cataract after injury or operations and cataract associated with diseases such as diabetes, atopic dermatitis, etc.

What is the Homoeopathic approach to cataract?

Homoeopathy offers a number of medicines that are effective in the treatment of cataract. Since it is usually a progressive and degenerative condition, Homoeopathic medicines aim to slow down, and sometimes even halt, the deterioration of the eye. If the progress of development of cataract is prevented, surgery may be postponed or in some cases avoided. *In case the cataract is well advanced and as a result the vision is greatly diminished, surgery is necessary.*

Just as in all other diseases, a detailed history plays a very important role in selecting the Homoeopathic medicines that are most appropriate for you. The main factors that influence the choice of medicines include:

1. **Cause of the cataract:** Homoeopathy offers several medicines that are effective in treating cataract resulting from any injury to the eye. Some of these medicines are

Several types of rasayanas are recommended after preparing the body to derive maximum benefits from them. Of these, Indian gooseberry and Indian Gall nut based rasayanas are especially effective. Ten to twelve grams of *Maha Triphala Ghrit* is recommended once or twice a day with milk.

Herbo-mineral preparation: Five hundred grams of *Saptamrit Lauha*, a medicine prepared from some herbs and minerals is recommended twice a day with honey.

Local treatment: It can only be effective if the general body changes, especially those related to old age, are controlled and arrested. Common local applications recommended for cataract include:

- **Kajal:** Specially medicated *kajal* (kohl) prepared from herbs are recommended from the childhood itself.
- **Palas:** Aqueous extracts of *palas* (Bastard Teak) are used to improve sight.
- **Lotus honey:** Regular use of honey prepared from lotus flowers is recommended at bedtime in both the eyes.
- **Rose water:** Rose water should be applied in the eyes twice or thrice a day.
- **Exercises** of the eyes maintain its normal functions.
- **Surgical removal and replacement of the lens** is necessary if there is irreversible damage to the lens.

Arnica, Conium, Symphytum, Ruta, Calc. Fluor and Causticum. At least one case of cataract after injury has been reported completely cured with Symphytum 10M. Some medicines such as Arnica and Ruta are also effective in for cataract after eye surgery, such as for glaucoma.

2. **Other factors:** Homoeopathy lays special emphasis on your family history, your personal likes and dislikes, digestion, habits, etc. for selecting a medicine that is most suitable for you. These factors help your doctor select deep-acting medicines that act on your body's natural defence mechanism. These medicines act directly on the eye and retard the progression of cataract.

What is the treatment for cataract?

Detailed below are some of the Homoeopathic medicines commonly recommended for treatment of cataract.

- **Arnica, Ruta, Symphytum, Conium:** As mentioned above, these medicines are prescribed for cataract after injury.
- **Phosphorus** is effective for cataract in people who also suffer from arthritis.
- **Causticum** is recommended for cataract in young people and after injury.
- **Sepia** is very effective in cataract in women who also

have disorders as a result of abnormal function of the uterus.

- **Silicea:** There are documented cases of cataract that have developed after suppression of skin eruptions or foot-sweat. Silicea is very effective in treating such cases.
- **Kali Muris** is prescribed when cataract is associated with white discharge from the eyes.
- **Mag. Carb** is effective for cataract associated with inflammation of the eyes with redness and blurring of vision.
- **Calcarea Flour** is effective in various diseases related to the aging process such as cataract, arthritis, etc.
- **Cinereria Martima** eye drops is the most commonly used medicine. Regular use of these eye drops for several months is known to have prevented further progress of the cataract. This medicine is especially effective for early stages of cataract irrespective of its cause. A commercial product called *Cinereria Martima Euphrasia eye drops*,

manufactured by SBL, is easily available at all Homoeopathic pharmacies. It is a combination of several medicines and is observed to be extremely effective in treating cataract. It also provides quick relief from symptoms such as irritation in the eyes, discharge from the eyes, redness of the eye and blurring of the vision. *Cinereria Martima Euphrasia* eye drops is not known to have any side effects or contra-indications.

Cataract is often an aging process that results in degeneration of the lens and hence these changes are irreversible. *It is important to remember that while it cannot be cured, Homoeopathy offers several medicines to prevent further deterioration of the vision.* In case of advanced cases where the vision is greatly diminished, surgery is necessary to restore vision. Thus, it is advisable that you start taking Homoeopathic medicines as soon as the symptoms appear.

NATURE CURE

The definition and signs and symptoms of cataract as per Nature Cure are the same as those detailed in the section on Allopathy. According to Nature Cure, the mechanism of the functions of the eyes is so delicate that it can be adversely affected by minor changes in the activity of the muscles of the eye and some deficiencies in diet. Dr. Henry Lindlahr, a renowned practitioner of Nature Cure states that "there is something wrong with the three primary life requirements: nutrition, drainage and nerve supply". Cataract is nothing but infiltration of the lens with abnormal materials that are waste products of the chemical reactions in the body.

What are the causes of cataract?

According to Nature Cure, four main factors contribute to the development of cataract. These are:

1. Abnormal blood condition, which leads to stagnation of the flow of fluids in the lens;
2. Poor nutrition in the lens, which reduces and vitality and resistance of the transparent fibres of the lens;
3. Deposits of acids and salts between the lens fibres, which irritate the lens; and
4. Increased pressure of the acids and salts on the lens fibres, which lead to clouding of the whole lens.

Whenever you eat food, the carbohydrates, proteins and the fat produce "toxins" after digestion. These toxins are acidic in nature and need to be neutralized by alkaline mineral elements before being eliminated from the body. If these toxins are not removed from the body, they deposit in small blood vessels and therefore cause their obstruction. They also tend to deposit on any available weak spot. Thus,

these toxins deposit on the lens that has become weak from stress, strain, excessive use of the eyes and local irritation. Subsequently, the deposited waste matter decomposes and causes inflammation. When these waste matter deposit on the lens, the lens becomes opaque and does not allow light to pass through, thus resulting in cataract.

Other causes of cataract include excessive intake of alcoholic drinks, sugar, salt, smoking, diseases of the digestive system, diabetes, vitamin deficiencies (especially vitamin C) ageing, radiation and side-effects of medicines used regularly for some other diseases.

What is the treatment for cataract?

Nature Cure aims to restore and maintain normal blood supply to and from the eyes, nutrition and nerve supply to the eyes. This is achieved through eye packs, eye exercises and diet.

● **Eye packs:** Take a small piece of cloth and fold it in several layers till it covers both the eyes. Dip the folded cloth in cold water and apply it on the eyes for twenty to thirty minutes. You can take this eye pack twice a day. Instead of water, you can also use a mud pack for the same duration. To prepare a mud pack, take a small piece of cloth and dip it in cold water. Make a mud pack exactly the size that covers the two eyes, keep it in the soaked cloth and fold the sides of the cloth.

● **Eye bath:** Fill a wash-basin with cold water and immerse the head in the water. Open and close the eyes alternatively in the water for ten to fifteen minutes. You can also take an eye bath through an eye-cup filled with cold water. Place the eye-cup on one of the two eyes and press it on the bony

area around the eye. Bend the head backwards so that the water in the eye-cup covers the eye. With the eye-cup in this position, open and close your eyes alternatively for ten to twenty minutes.

- **Avoid strain:** Nature Cure strongly recommends rest and relaxation for the eyes in order to avoid its strain. One of the easiest and effective methods is palming. Bend both the palms like shallow cups and place them on the eyes. Make sure that the fingers are crossed on the forehead and do not press the eyeball with the palm. You can also avoid stress to the eyes by looking at green grass or trees and relaxing in a dark room. You should avoid reading at night and under bright lights.

- **Eye exercises:** Nature Cure recommends the following exercises for management of cataract:

1. **Stretching of the neck:**

Stretch the neck forward, backward and sideways and rotate the neck in clock-wise and anti-clock wise movements for a few minutes every day.

2. **Shoulder exercises:** Rotate the shoulder joints in clockwise and anti-clockwise direction for a few minutes everyday. You can also swing your hands in the same way to exercise the shoulder joints.

3. **Movements of the eye:** Blink your eye for a few times to exercise the muscles of the eyelids. To exercise the eyeballs, turn your gaze to the two sides, nose, diagonally upwards and downwards and rotate them in clockwise and anti-clockwise directions.

4. **Fixation:** Look at any object at a far distance for a few moments continuously. Next, look at the distant object and then immediately at a nearby object. This will strengthen your eye muscles that help focus rapidly on objects at varying distances.

- **Diet:** Nature Cure recommends uncooked diet consisting of large portions of salads with carrots and greens, fruits and fruit juices for maintaining normal vision of the eyes. This diet should be practiced for at least a few months. You can also have nuts and sprouts. Avoid white sugar and eat as less as salt possible.

Box 10.3 referred to on Page 112 in Volume 1, Issue No. 10 of the Health Update was omitted by mistake. The error is regretted — Editor.

Box 10.3. Preventive measures for Impetigo.

During the infection:

- Remove crusts gently before applying local antibiotic ointment. Soak a soft, clean cloth in warm soapy water and press this wet cloth on the crusts for ten to fifteen minutes three to four times everyday. Subsequently, wipe the crusts gently and apply a little antibiotic ointment.

- Have regular bath and clean the body with a soap.

- Do not allow children to go to school for two to three days after the treatment has begun.

- Use separate towels, napkins, etc.

- Change and wash towel, pillowcases and bed-sheets everyday for the first two days of the treatment.

- Wash the clothes separately for two to three days after the treatment has begun.

- Keep fingernails short.

- Do not scratch the affected skin.

- If Impetigo does not heal within one week, consult your doctor again.

After the infection:

- Have bath everyday with soap and adequate water.

- Keep areas affected by other skin problems such as eczema clean and covered.

Honey is also considered very

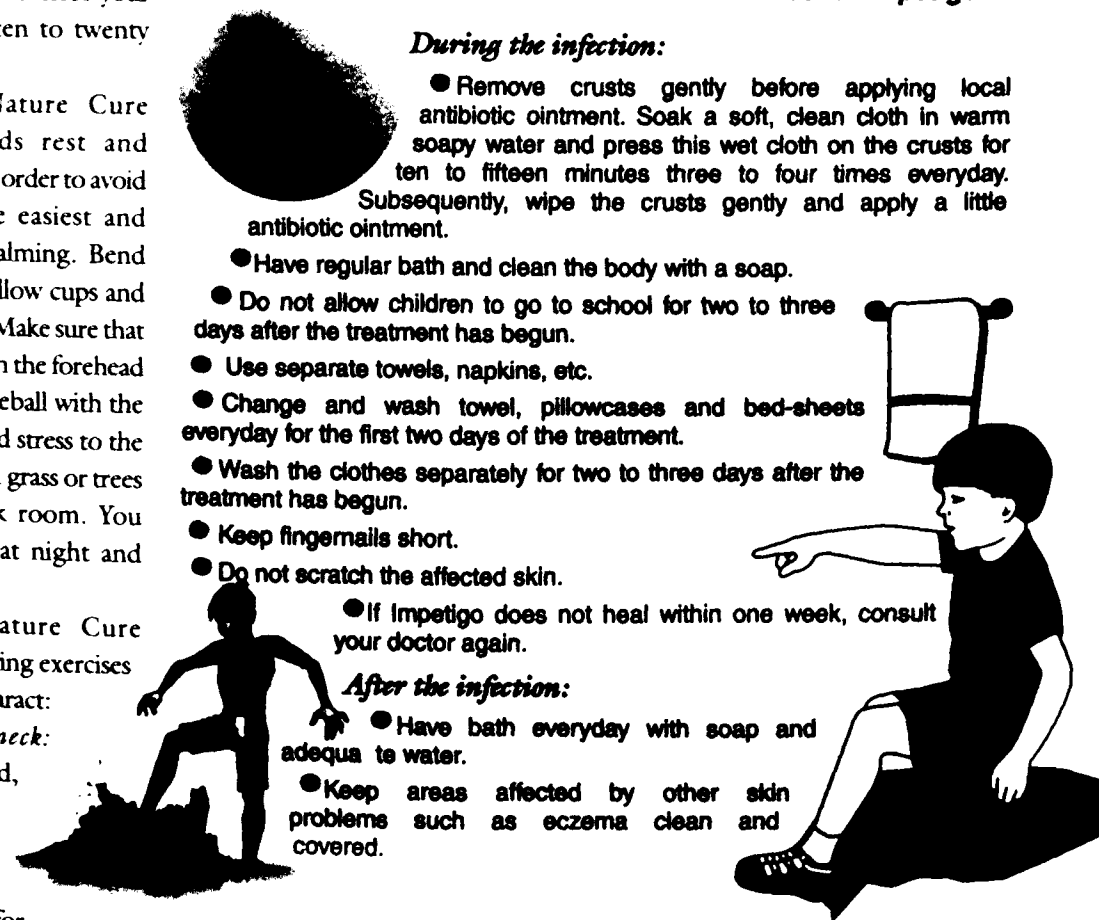
effective for maintaining normal vision of the eyes. According to one school of thought, "pure and neat honey wherein the bees are dead should be dropped into the eyes". An alternative is to instill honey mixed with the ashes of the heads of bees.

Other dietary measures considered effective for management of cataract include:

1. **Aniseed:** Take about six grams of aniseed every day in the morning and evening. You can also take equal proportions of aniseed and coriander powder mixed with brown sugar. Twelve grams of this mixture is recommended twice a day.

2. **Almond:** Grind seven almonds with half gram of pepper in a little water. Strain the liquid, add honey or other sweetening agents and drink the mixture every day.

It is important to remember that you need to practice the above management options for a long time in order to cleanse the blood and maintain its alkalinity. Thus, by adopting appropriate principles of nature with suitable exercises, food and hydro-therapy, you can improve the vision that is lost by leading a negative life.



UNANI

Cataract is called *Muzoolul Ma'a* or *Motia Bindin* Unani system of medicine. It is defined as an eye disease that results in diminished or loss of vision. The deterioration of vision is due to either translucency or opacity of *Ratubat jaleedia* — a type of fluid in the eye. This translucency or opacity is the result of *Ghaliz* (thickened) humoral fluids.

What are the causes of cataract?

The Unani system of medicine describes predisposing and exciting causes of cataract. Predisposing factors are those that are present before the cataract start and are responsible for increasing the chances of development of cataract. Exciting factors are those that either precipitate the development of cataract or increase its progression.

Predisposing factors: Old age, Kidney diseases, injury to the head or eyeball, foreign body in the eye, syphilis (a sexually transmitted disease), epilepsy, diabetes, recurrent cold and cough, reading at night in dim light, excessive reading; and excessive use of some hot temperamental medicines are the predisposing factors for cataract.

In addition to the above factors, hereditary plays a very important role in development of cataract.

Exciting factors: Cataract results when there is accumulation of altered quality and/or quantity of the phlegmatic type of humor. This is one of the four types of humor that are intermixed in blood and all tissues of the body. The phlegmatic humours present in the cavities inside the brain form an obstacle to the eyeball due to injury or some other causes. It collects between the *Tabqa Baizia* (sclera) and *Tabqa Qarnia* (cornea) and makes the *Ratubat Jaleedia* opaque. When the *Ratubat Jaleedia* becomes opaque, light cannot travel through the eyes to the retina.

In case of pain or stress or chronic diseases, the *Tabiat* (natural defence mechanism) diverts its full attention to control the disease and as a result all the systems of the body, including the digestive system, are affected. While controlling the disease, *haijan* (abnormal heat in humoral fluid) is produced in the blood. Since blood contains all the four humors of the body, *haijan* leads to excessive production of humors. These excessive humors evaporate and produce *Bukharat* (vapour) that settle in the eyes and adversely affect them. These *Bukharat* affect the eyes in four main ways: they (a) settle in the eyes, (b) dilate the blood vessels, (c) contaminate the fluids or (d) weaken the functions of the eyes. After some time, these vapours lose their heat, convert into *Ratubat Ghaliz* or thickened *Ratubat* and cause cataract. Sometimes, the cataract is due

to severe recurrent headaches as a result of *Bukharat* or vapour.

What are the signs and symptoms of cataract?

In the initial stages of the disease, you may see small particles like flies and mosquitoes. This is because the *Ratubat Jaleedia* is translucent. The nature and colour of these particles depend upon the type of humor involved. It is not necessary that you see these particles all the time. You are more likely to see them during indigestion or *Imtela* — collection of a type of humor in any one organ of the body. Soon, egg like whiteness appears in the eye. This whiteness usually appears in one eye as the *Tabiat* (natural defence mechanism of the body) protects the other eye. Also, the *Tabiat* directs all the thickened humors to the weak and diseased eye. At this stage, there is diminished vision that is likely to lead to loss of vision.

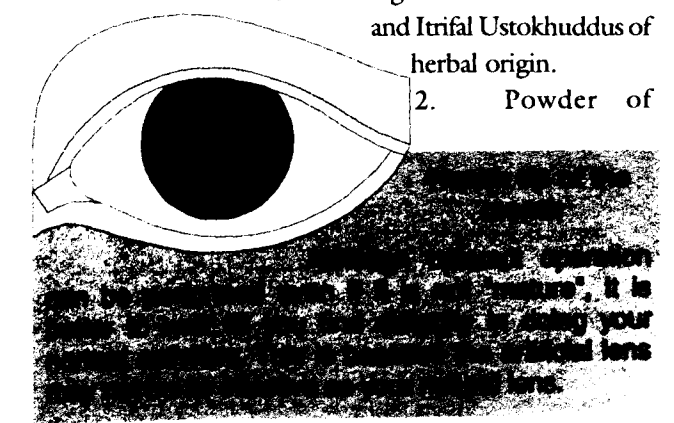
What is the treatment of cataract?

Unani system of medicine recommends *cotives* in the initial stages of the disease. *Cotives* are medicines that normalize the quality and quantity of the humors. These medicines make the *Ratubat Ghaliz* (thickened fluid in the eye) in a condition in which they can be expelled from the cavities in the brain. Subsequently, purgatives — medicines that help excretion — such as *Ayaraj*, a compound medicine are used to excrete the *Ratubat Ghaliz*. In addition, local application of medicines that disintegrate or evaporate the vapour or thickened *Ratubat* are also recommended. These include, among others, *Shiyaf Mirara* and *Shiyaf Basaleequn*.

The prescriptions used to treat cataract are listed below.

1. Two hundred grams each of *Kushta Marjan* and *Kushta Khabsul Hadeed* are mixed in eight grams of *Itrifal Ustokhuddus* are recommended orally twice a day. *Kushta* means ash or calcinated form of medicine. *Marjan* is of mineral origin and *Khabsul Hadeed* and *Itrifal Ustokhuddus* of herbal origin.

2. Powder of



DID YOU KNOW THAT
 You see only a spot in the centre of your vision in detail. There is an area on the retina with a high concentration of light sensitive cells and this is the part of the retina you use when you look at something. Your brain "fills" in the rest from vague details.

Tukhm Neel, a type of herbal seeds is mixed in honey and applied locally.

3. *Dukhan Kundar*, smoke produced by burning kundur (Olibanum), to be applied in the eyes twice a day.

4. Two to three drops of saffron dissolved in rose water to be instilled in the eyes three times a day.
5. Two to three drops of opium dissolved in rose water to be instilled in the eyes three times a day.
6. Alum dissolved in rose water to be instilled in the eyes two to three times a day.
7. Amon chlor dissolved in henna water to be instilled in the eyes two to three times a day.
8. Pearls dissolved in rose water to be instilled in eyes.
9. Zinc oxide dissolved in henna water to be instilled in the eyes.
10. Silver foils dissolved in henna water to be instilled in the eyes.

DEFINITIONS

Choroid is a thin, highly vascular membrane covering the some part of the eye between the retina and sclera.

Ciliary body is the thickened part of the eye that joins the iris with the front of the choroid.

Cornea is the transparent part in the front of the eye.

Endocrine glands are ductless glands that secrete a chemical substance called hormones. Hormones have action on tissues and organs in another part of the body.

Glaucoma is an abnormal condition of increased pressure in the eyes because of obstruction to the outflow of aqueous humour.

Inflammation is the protective response of the tissues of the body to irritation or injury.

Iris is a circular, contractile disc in the eye located between the cornea and the lens. It is perforated with the circular pupil. It gives colour to the eyes.

Kapha is one of the three doshas of the body as per the Ayurvedic system of medicine. Its primary site is stomach.

Pitta is one of the three doshas of the body as per the Ayurvedic system of medicine. Its primary site is small intestine.

Placenta is the highly vascular organ present in the uterus during pregnancy. The unborn child absorbs oxygen and other nutrients and excretes carbon dioxide and other wastes through the placenta.

Pupil is the circular opening in the iris through which the light rays enter the eyes.

Retina is the ten-layered, delicate nervous tissue membrane of the eye. It received images of external objects and transmits visual impulses to the brain through the optic nerve.

Rubella is a contagious viral disease. Common symptoms are fever, cough, sore throat, enlargements of lymph nodes, pain in the joints and fine, red rashes all over the body. If a woman acquires this infection in the first three months of pregnancy, there is a high risk of developing abnormalities in the unborn child.

Sclera is the tough, inelastic, opaque membrane covering the eye. It maintains the size and form of the eyeball and attaches to muscles that move the eye.

Syphilis is a sexually transmitted disease characterized by distinct stages of adverse effects over a period of years. A pregnant woman with syphilis can infect the unborn child and lead to abnormalities.

Vata is one of the three doshas of the body as per the Ayurvedic system of medicine. Its primary site is large intestine.

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In the next issue: Heart Attack and Angina

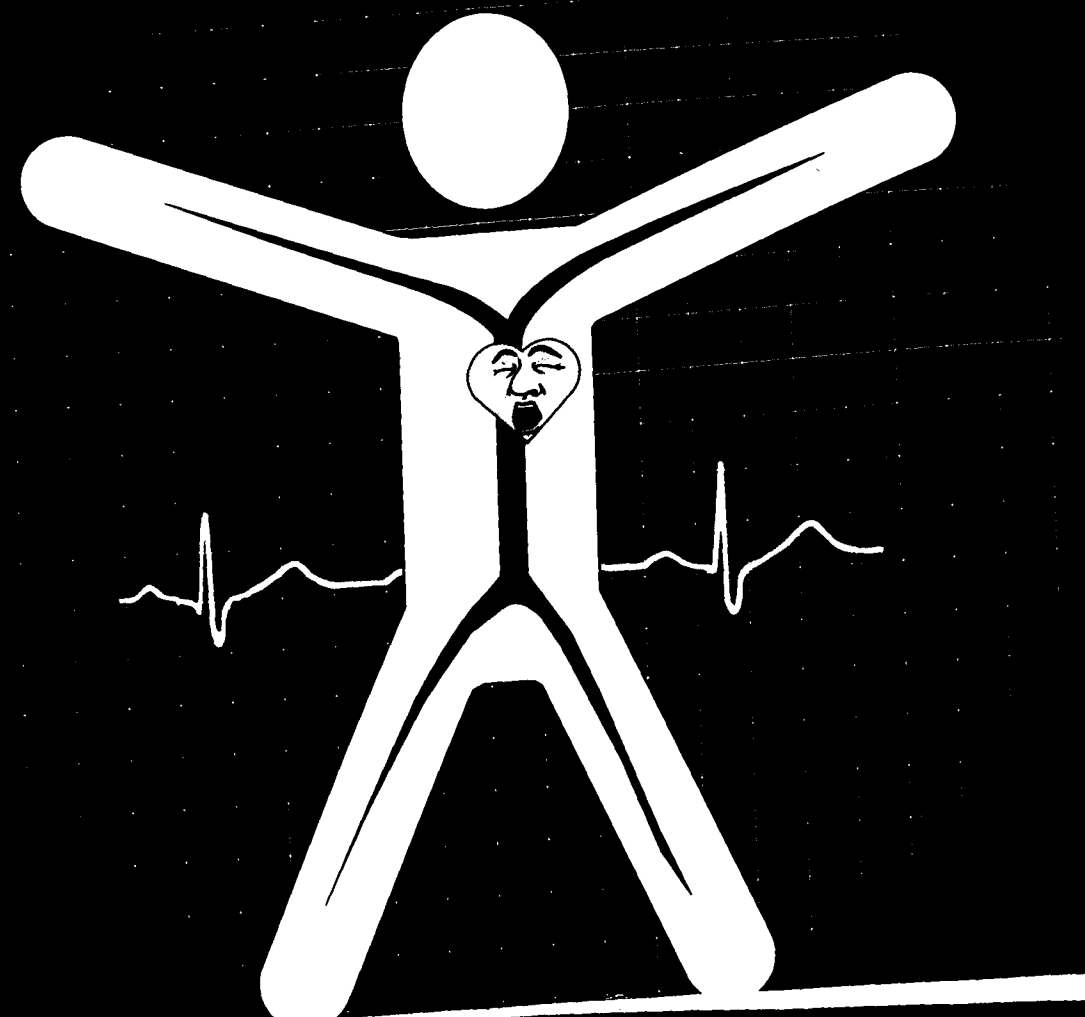
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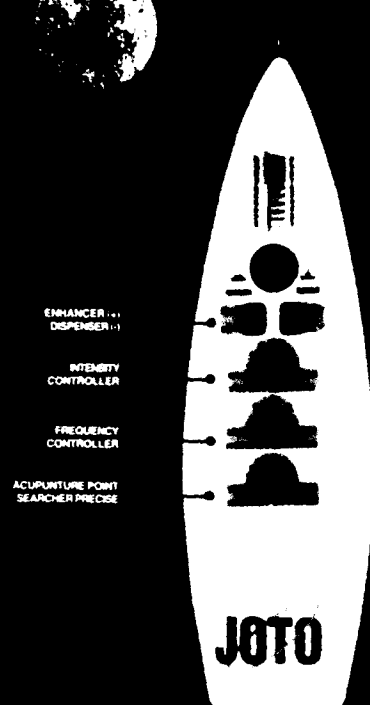
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Heart Attack and Angina

ALLOPATHY

Heart attack is a common health problem among adults. Most fear this condition because of the possibility of sudden, unexpected death or severe disability. One heart attack occurs every twenty seconds in the United States. Although the problem is lesser in India, it is on the increase. You can greatly reduce the risk of a heart attack by adopting a healthy and "heart-friendly" life style at an early age.

What is the normal structure and function of the heart?

The heart has two compartments - the left and the right - that consists of a pair of chambers formed of muscles. These are the upper and the lower chambers. The two lower chambers are called left and right ventricle and the two upper chambers are called the left and right atrium.

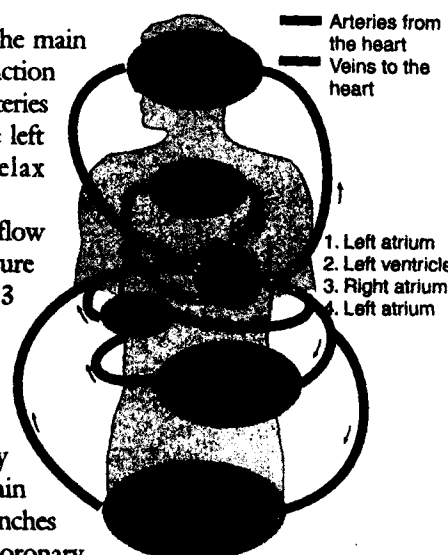
The walls of the heart consist of three main layers. The outer layer, *epicardium*, is a thin layer that covers the middle layer, *myocardium*. The myocardium is the heart muscle itself. The inner layer, *endocardium*, is a thin smooth layer. The entire heart is covered with a protective sac with smooth lining called *pericardium*.

The impure blood carrying carbon dioxide from all parts of the body enters the right atrium. It moves into the right ventricle through a valve called *tricuspid valve*. The right ventricle pumps the impure blood into the lungs where the blood gives up the carbon dioxide from all parts of the body and absorbs oxygen. This purified blood enters the left atrium first and then the left ventricle through a valve called *mitral valve*. It finally enters the main artery, *aorta*, as a result of a very powerful pumping action of the left ventricle. The aorta subdivides into several arteries that supply blood to all parts of the body. Both the left and right sides of the heart contract and relax simultaneously.

Figure 14.1 shows the schematic diagram of the flow of blood between the heart and rest of the body, Figure 14.2 the normal structure of the heart and Figure 14.3 depicts the contraction and relaxation of the ventricles that help pump the blood.

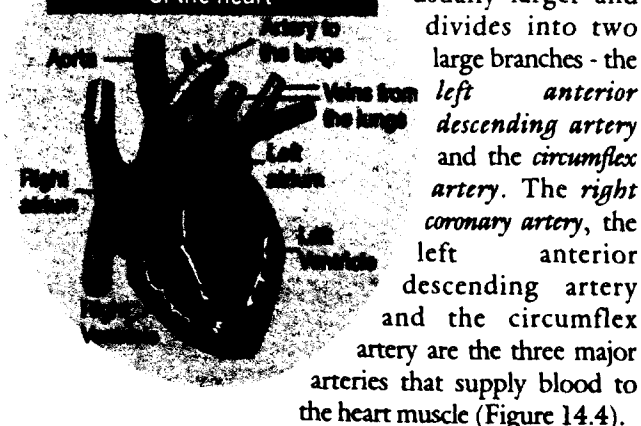
The heart pumps blood to itself through special arteries known as the *coronary arteries*. Normally, there are two coronary arteries - the right coronary artery and the left coronary artery. They arise from the main artery, *aorta*, close to the heart and divide into branches that supply blood to the heart muscle. Of the two coronary

Figure 14.1. Blood flow between heart and other parts of the body



Definitions of all technical terms used in this issue are given on the last page.

Figure 14.2. Internal structure of the heart



arteries, the left is usually larger and divides into two large branches - the left anterior descending artery and the circumflex artery. The right coronary artery, the left anterior descending artery and the circumflex artery are the three major arteries that supply blood to the heart muscle (Figure 14.4).

What is a heart attack?

Heart attack means sudden interruption of blood supply to any portion of the heart muscle (*myocardium*) leading to its death (*infarction*). It is also called '*myocardial infarction*'. A heart attack causes permanent damage to the heart because the dead cells cannot be replaced by multiplication of remaining portion of the healthy heart muscle cells.

How does a heart attack occur?

Heart attack can occur because of two main reasons:

1. **Blood clot** in a damaged portion of one or more coronary arteries results in sudden block in the affected artery. A blood clot is called *thrombus*.
2. **Spasm** or contraction in one or more parts of the coronary arteries. Depending upon the severity of the contraction, the blood supply to the affected part of the heart is either reduced or cut off.

The commonest disease responsible for the formation of a blood clot is known as '*atherosclerosis*'. It is a progressive disease process that results in hardening and thickening of the arteries. It also causes fat deposits called *plaques* in the arteries. When a plaque becomes bigger and bursts, the inner layer of the artery becomes rough. Blood tends to clot at the site of roughness in the artery. If the clot is small, it

Figure 14.4. Major blood vessels of the heart

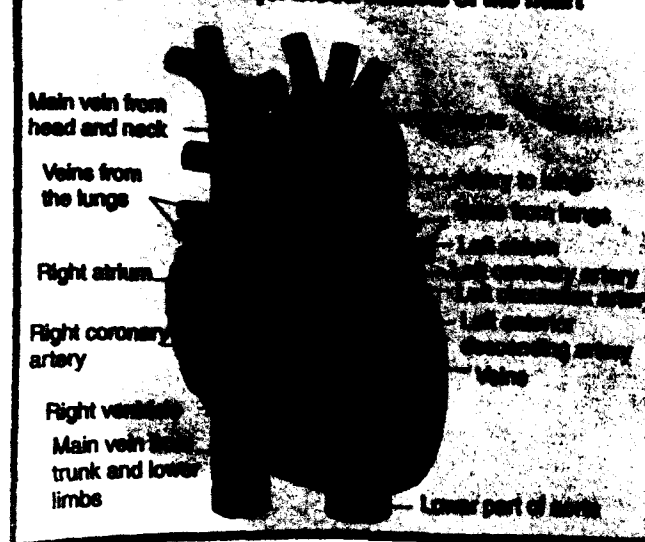
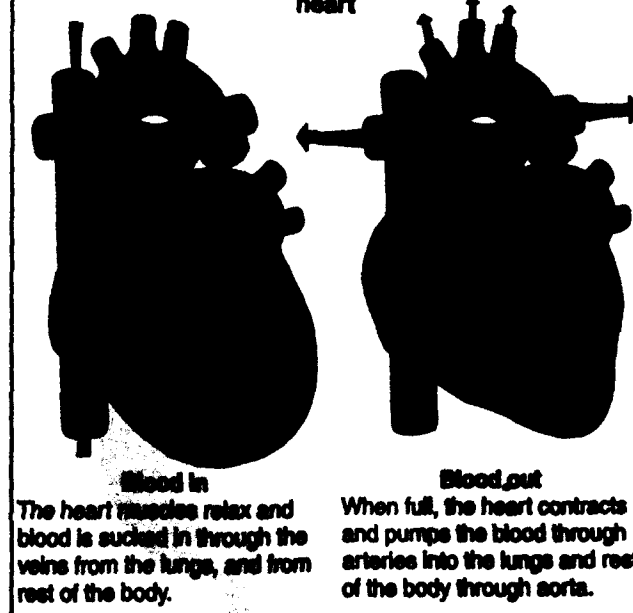


Figure 14.3. Mechanism of pumping action of the heart



breaks down and does not block the artery immediately. The resultant damage however results in progressive narrowing of the artery at the site, usually over a few years. Angina occurs when there is about seventy percent narrowing of the diameter of the artery. Angina and heart attack caused by atherosclerosis are therefore together called '*atherosclerotic coronary artery disease*' or '*coronary artery disease*' or '*ischaemic heart disease*'. Figure 14.5 illustrates the progress of atherosclerosis that ultimately causes blocks in the coronary arteries. Box 14.1 lists the factors that contribute to narrowing of the blood vessels.

Collaterals: There are several small alternative channels of blood circulation called *collaterals* that can, if the block formation is gradual, expand and serve as an alternate route for blood flow to the heart muscle. *It is important to remember that although everyone has collaterals, they do not open and provide alternate blood routes in all people.*

What are the risk factors for a heart attack?

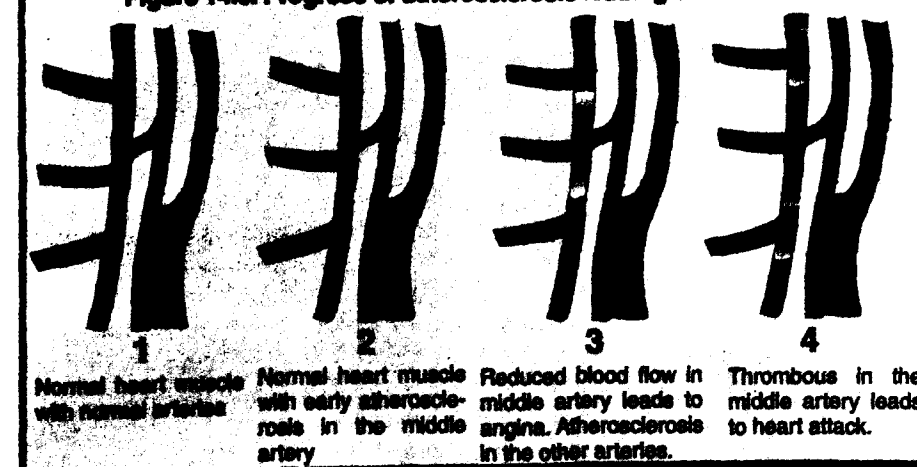
The risk factors for a heart attack may be classified into three groups: modifiable, non-modifiable and less important. These are detailed in Box 14.2.

How is a heart attack recognized?

Box 14.3 details the common signs and symptoms of heart attack. Of these, chest pain is the most common.

The heart attack is generally confirmed by recording an ECG (electro-cardiogram), which is a graphic record of the electrical impulses of your heart. Sometimes *echocardiography* (ultrasound examination of heart) and blood tests to detect death of heart muscle cells are required. Echocardiography is a technique where sound waves sent to the chest rebound from the walls and valves of the heart and are recorded as waves. It indicates the size of the four chambers, shape, texture and movement of the valves in the heart. The doctor therefore can assess if the structure and functions of the heart are normal or not. This test has no risks even for those with severe heart disease.

Figure 14.5. Progress of atherosclerosis leading to heart attack



The dying heart muscles release an enzyme called *creatinine kinase*. Enzymes are proteins produced by living cells that increase the rate of chemical reactions. Measurement of creatine kinase level in the blood may, however, not always be an accurate indicator of heart attack. This is because other muscles can also release this enzyme. Also, the level may remain normal in some people with heart attack. Recently, blood levels of a protein called *Troponin T* are measured as it is found only in those who have had heart attack.

What is a silent heart attack?

A silent heart attack is one that you may not recognize because there are no symptoms. It is usually diagnosed later by an ECG done for some other reason. About one third of heart attacks that do not cause death are silent.

What is the difference between angina and heart attack?

Angina is not a heart attack, though the location and nature of chest pain due to angina is similar to the chest pain due to heart attack. Pain due to angina differs from the heart attack in the following ways:

- It usually appears after physical exertion such as walking, jogging or climbing stairs.
- It is less severe and does not last for more than two to ten minutes.
- The pain is relieved within a few minutes by resting or a nitrate tablet placed beneath the tongue.

Angina is the '*cry of the heart muscle for more oxygen*'. Unlike a heart attack, the affected portion of the heart muscle gets its blood supply from a narrowed but not completely blocked artery. Thus, the narrowed artery may provide adequate blood to the heart at rest but not meet its oxygen demand during physical activities. This imbalance in the oxygen demand and supply or the heart muscle is called '*myocardial ischaemia*'. The ischaemia activates the pain receptors in the heart muscle cells causing chest pain or angina. Box 14.4 lists key points related to heart attack and angina and Box 14.5 describes why heart attack is called a killer.

Sometimes, angina may occur even at rest or may

last for a longer time. If it occurs at rest or last longer than ten minutes, it is called '*unstable angina*'. Serial ECGs, blood tests and sometimes *radioisotope scans* help in differentiating these episodes from a heart attack.

How is angina diagnosed?

Normally a doctor can diagnose angina by listening to your description of chest pain. An ECG recorded during the chest pain is the simplest way to make a definite diagnosis. *It is important to remember that ECG taken after the chest pain subsides may not show any*

changes. Some times, *treadmill test* or *exercise thallium* and rarely *coronary angiography* may be required for a definite diagnosis.

• **Treadmill test** helps the doctor assess how well your heart functions during periods of increased activity. As you walk on a machine, it records your heart rate, blood pressure and ECG during the exercise. The doctor will ask you to stop the exercise after you reach the target heart rate or earlier, if there is reduce blood supply to the heart. He/she will check your heart and blood pressure again after you have rested for sometime.

• **Thallium stress test** is a type of nuclear scanning test that is usually done along with the treadmill test. As you reach the maximum level of exercise, a small amount of radioactive substance called *thallium* is injected into the blood. Next, as you lie down on a special table with a camera, several pictures are taken as the thallium passes through the coronary arteries and enters the heart muscle. The pictures are repeated again after resting for two to three hours in order to assess blood flow to the heart during resting state.

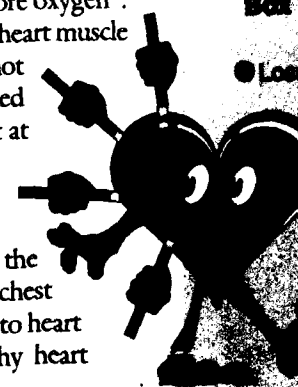
In case you are too sick to perform the thallium stress test, the doctor will give you a medicine called *dipyridamole* or *dobutamine* before injecting thallium. These medicines increase blood flow to the heart just as in the exercise test.

Interpretation of the thallium test: The thallium test is interpreted depending upon the amount of thallium during exercise and rest.

- Normal amount of thallium during exercise and rest

Box 14.1 Factors that influence narrowing of coronary arteries

- **Loss of secretion of protective chemical substances by the inner layer of arteries.**
- **Loss of harmony between the blood and inner layer of arteries.** As a result, the blood is oxidized. The oxidized substances adhere to the inner layer of the arteries.
- **Changes in behaviour of some cells of the blood that makes it thicker and therefore difficult to flow.**
- **Constriction or dilatation of a part of the coronary arteries.**



Box 14.6. Major complications of a heart attack

- Abnormal heart-beats
- Heart failure
- Shock, or abnormally low blood pressure
- A second heart attack within a few days of the first attack
- Rupture of the heart muscle
- Sudden leakage of one of the valves of the heart
- The last three complications require emergency surgery to prevent death.
- Acute pericarditis** — Inflammation of the lining of the heart
- Left ventricular aneurysm** — Undue enlargement of a part of the heart
- Left ventricular thrombus** — Clot in the pumping chamber of the heart
- Stroke** — Paralysis when a part of the clot shifts from the heart to the brain.

testing are the same as those described above. Earlier, exercise tests were generally performed six to eight weeks after a heart attack. Of late, modified exercise testing is carried out three to six weeks after a heart attack. Sometimes it can also be done after one week of a heart attack.

It is important to remember severe angina after a heart attack itself indicates reversible ischaemia. In such a case, the doctor will not recommend exercise testing as it is not only unnecessary but may also be harmful.

• **Holter recordings:** A small machine called Holter monitor is attached to your body to record ECG on a tape continuously for at least twenty-four hours. You can continue to do all your normal activities during the test. Holter recordings can detect arrhythmias.

• **Angiography:** This test involves injection of a radio-opaque chemical into the artery. As the chemical travels through the heart, x-ray images are taken to visualize the structure of the heart and its blood vessels and assess functions of the left ventricle.

If the above tests done after a first uncomplicated heart attack indicate a good left ventricular function, negative exercise test and no arrhythmias, the risk of death is only one to two percent per year.

What is the long-term treatment after a heart attack or a person with angina?

The guidelines for the long-term treatment of angina and after a heart attack are similar. These include:

1. Control of the risk factors of atherosclerosis (as detailed in Box 14.7)
2. Specific treatment of the heart problem. This falls into any one of the following three categories: (a) medicines alone, (b) coronary balloon angioplasty with medicines and (c) bypass surgery with medicines.

Your cardiologist will decide on the treatment

after evaluating factors such as the presence or absence of angina, the result of exercise testing, the efficiency of the pumping function of heart, kidney function, age etc. In most situations, it is possible to definitely decide the best form of treatment. However, sometimes it may be difficult to decide with certainty whether treatment with bypass surgery is better than angioplasty or whether treatment with medicines alone is sufficient. In such cases, different cardiologists may recommend different management options. More research knowledge and studies in the future may resolve some of these controversies.

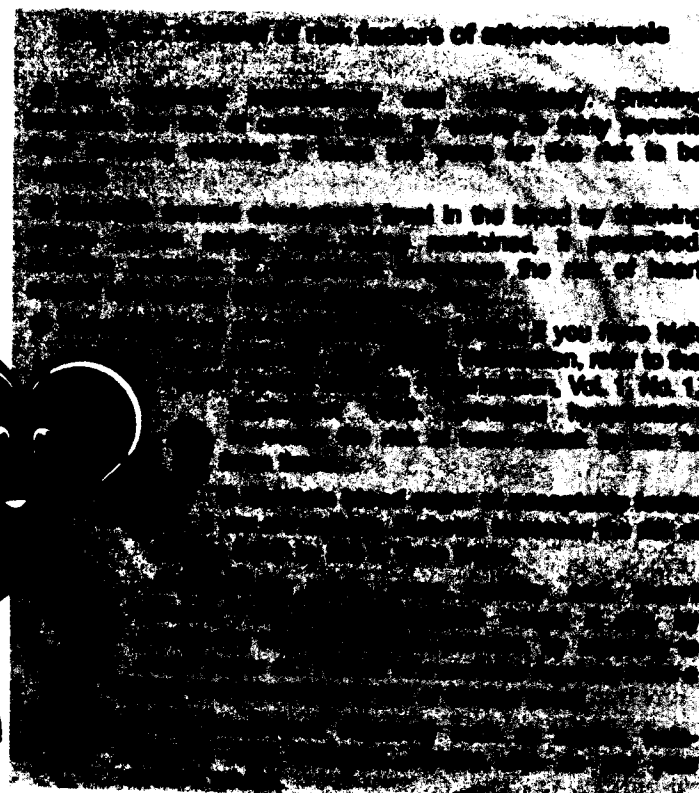
Irrespective of the treatment followed, it is important to control the risk factors of atherosclerosis and take the medicines recommended by your doctor regularly. Some medicines may be necessary for several years or life-long.

How can the later complications after a heart attack be prevented?

Box 14.7 lists the measures for controlling risk factors of atherosclerosis. You need to adopt these measures even after a balloon angioplasty or bypass surgery. Other methods to prevent later complications include medicinal and non-medicinal measures.

Medicines that are normally recommended for preventing later complications of heart attack include:

- **Aspirin:** It maintains normal consistency of the blood and therefore prevents formation of blood clots. As a result, it reduces the risk of a repeat attack, paralytic stroke or death related to these by twenty five percent. Even if a heart attack recurs, the damage to the heart muscle is likely to be less. Aspirin generally has to be taken life long. Common side effects include acidity, indigestion and sometimes headache.
- **Beta-blockers:** This group of medicines is also

**Box 14.8. Methods of use of nitrates**

- Keep a tablet below the tongue as soon as the chest discomfort and pain start.
- Nitrates can cause a fall in the blood pressure and therefore dizziness. Take these pills preferably in a lying down posture. If you cannot lie down, sit comfortably in a chair and then take the tablet.
- The nitrate tablet dissolves within twenty to thirty seconds and is directly absorbed into the blood.
- The chest discomfort and pain is usually relieved within one to five minutes.
- If a single pill dose of nitrate does not relieve chest pain and discomfort within five minutes, take a second tablet. If this does not relieve the pain, take the third tablet and contact your doctor immediately.
- You are likely to have a headache after taking nitrates. This headache is not harmful and is relieved by simple pain-killers such as aspirin or paracetamol.
- If you usually get angina after a certain level of physical activity or exertion, taking a nitrate tablet before you start the activity can prevent angina.
- Nitrates are not habit forming and you can take them as often as is necessary.
- Nitrates lose their effectiveness after a few months when the bottle is opened. Keep the bottle tightly closed and coloured with its lid. If the bottle is broken, do not use it. Replace it with a new one.
- You can use nitrate tablets for

function and eye complications. Side effects of anti-coagulants include allergy, excessive bleeding and interaction with other medicines.

• **Estrogen** treatment in postmenopausal women is currently being intensively studied and may be useful after a heart attack in these women.

Non-medicinal measures for preventing long-term complications of heart attack include coronary balloon angioplasty and coronary bypass surgery. These procedures restore normal blood supply the heart muscles. In specific situations or cases, bypass surgery improves survival and reduces the risk of repeat heart attacks. This benefit may also occur after balloon angioplasty, but further studies are needed to clarify this issue.

What is the treatment for angina?

Two categories of medicines are used for treatment of angina.

These are medicines that (a) relieve the pain and discomfort and (b) prevent heart attack or death in future.

Medicines that relieve pain and discomfort include nitrates, beta-blockers and calcium-channel blockers. In addition, *Trimetazidine* (which is a free oxygen radical scavenger) and *Nicorandil* (a potassium channel activator) have also been demonstrated to be effective for relief of angina.

Nitrate tablet placed beneath the tongue is the quickest way to relieve pain and your doctor will therefore advise you to keep them all the time. Nitrates relieve angina within a few minutes. Box 14.8 lists the method of use and effectiveness of nitrates.

How are the high-risk cases of angina detected?

Some of those who have angina may be at a higher risk of having a heart attack or cardiac death in the future as compared with others. Exercise testing with a treadmill ECG and/or exercise thallium are therefore recommended to assess risks of heart attack or death in a person with angina. Exercise testing is not recommended if you have unstable or severe angina as they can be harmful. The risk of future complications is very high in case of unstable or severe angina.

When is angiography required for someone with angina or after recovery from a heart attack?

Coronary angiography is recommended if your doctor feels that angioplasty or bypass surgery is required either for proper control of angina or to prevent future complications. Such a decision is generally taken if angina is not well controlled with medicines or if the report of exercise testing indicates a high risk for future complications. If your doctor feels that the coronary arteries are not suitable for either angioplasty or bypass surgery, he/she may treat you with medicines only after angiography.

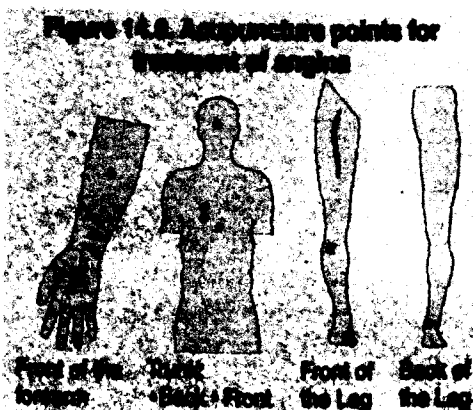
ACUPUNCTURE

Causes, signs and symptoms of angina as per Acupuncture are the same as those detailed in the section on Allopathy. Though medicines such as beta blockers are effective in preventing complications of heart diseases, their use is often limited due to contraindications and side effects. There is thus an acute need to search for new non-medicinal treatments for angina.

Treatment with Acupuncture involves application of fine sterile needles to specific points on the body surface. These points are called "meridian points". Manual or electrical stimulation of these points restores the electrical energy to normal levels.

What is the treatment for angina?

Four to six acupuncture points are pricked with thin needles and are stimulated either manually or with low frequency electric impulses for fifteen to thirty minutes. Initially, fifteen to twenty such treatments are recommended followed by booster treatment at regular intervals. Figure 14.6 details the various acupuncture points for treatment of angina and Box 14.9 lists the conditions that can be treated with Acupuncture.



What is the mechanism of action of Acupuncture treatment?

There are several ways in which Acupuncture benefits a person with heart diseases such as ischaemic heart disease. Acupuncture treatment:

1. Dilates all the blood vessels of the heart and improves its pumping action;
2. Reduces the heart rate and prolongs the period of electrical contraction of the heart muscle;
3. Shortens the time before ejection of blood from the heart; and
4. Reduces the load on the heart muscle before and after contraction.

One of the main objectives of treatment of angina is to increase your tolerance to exercise, to decrease the frequency of angina attacks, risks of heart attack, sudden death and abnormalities of the heart-beats. Recent scientific research has indicated that Acupuncture fulfils all these objectives and therefore can be an uncomplicated, fast, simple and cheap treatment for people with angina. More research is required to substantiate findings of these studies.

AYURVEDA

The ancient Ayurvedic literature describes the shape of the heart like a lotus leaf that expands during the day and reduces in size at night when you are sleeping. It also describes a concept called *Ojas*, which is divided into two types - *Para Ojas* and *Apara Ojas*. *Para Ojas* is quantitatively mentioned as eight drops confined exclusively to the area of the heart where as *Apara Ojas* can fill half the palm of the a person. *Ojas* circulates through the channels of the heart to all the minute and subtle spaces of the body (called *Srotasas*). The *Ojas* has also been attributed as essential to all the body tissues. It is vital for the flowing body fluids, warmth of the body, natural *kapha*, etc. Heart (*Hridaya*) is the site of *Ojas*.

What are signs and symptoms of angina?

Ayurveda, especially *Madhavanakara*, mentions five types of diseases of the heart. Of these, heart disease due to *vata* can be equated with angina or ischaemic heart disease. The symptoms of *vata* type of heart disease include suffocation, heaviness in the chest, congestion, unconsciousness or fainting spells, coma, palpitation, stabbing, cutting, sawing, churning or stretching types of pain and shooting pain.

Angina can also result when *kapha* and *pitta* doshas get accumulated in the heart muscles. As a result, there is obstruction to filling and emptying of the blood vessels of the heart. As the disease progresses, there is decay of the heart muscles and sluggishness in the arteries that supply blood to the heart muscles.

What is the treatment for angina?

Ayurveda recommends simple and compound medicinal preparations in addition to dietary modification for management of angina. Simple medicines include:

1. Powder equal parts of the fruit rind of Chebulic myrobalan (*Haritaki*) and rhizome of sweetflag (*Vaca*). One gram of this powder is recommended with four to five grams of honey twice a day.
2. Powder equal parts of fruit rind of Chebulic myrobalan (*Haritaki*), rhizome of sweetflag (*Vaca*), roots of Indian groundset (*Pushkara*), Zedoary (*Shati*) and Costus (*Pushkara*), fruit of long pepper (*Pippali*) and dried ginger. Take three to six grams of this powder with hundred to two hundred and fifty millilitres of milk twice a day.
3. Powder equal parts of fruit of long pepper (*Pippali*), rhizome of sweetflag (*Vaca*), asafoetida fried in ghee, rock salt, dried ginger, Yavakshara, Sauvarcala lavana and fruit of anise (*Ajmoda*). A paste prepared from one to three grams of this powder fruit juice of lemon, orange or honey is recommended twice a day.
4. Powder equal part of the roots of costus (*Pushkara*), lemon, zedoary (*Sati*), cinnamon bark, dried ginger and fruit of Chebulic myrobalan bruised in water. One to three grams of this preparation is recommended twice a day after adding one gram of *yavakshara*, hundred millilitres of rice water, six to twelve grams of ghee and one gram of salt.
5. Five grams of costus root powder with *Mrita Sanjivani* every half an hour followed by five hundred

grams of the powder with two hundred and fifty grams of *Vatakulantaka rasa* and honey.

6. Two grams of powder prepared from asafoetida, sweetflag and costus root is recommended every two hours till the symptoms subside.

7. Two hundred and fifty milligrams of tablets prepared from *Grewia hirsuta* (*Nagabala*) and costus root can be put below the tongue for immediate relief of symptoms.

Compound medicines commonly recommended for angina include:

1. One hundred and twenty-five grams of *Makardwaja*

HOMOEOPATHY

Causes, signs, symptoms and laboratory investigations for heart attack and angina as per Homoeopathy are the same as those detailed in the section on Allopathy.

What is the Homoeopathic approach to angina?

Homoeopathy offers a wide range of very effective medicines for angina. Many people wrongly believe that Homoeopathic medicines take a long time to act and are therefore not suitable for acute conditions such as angina. This is not true. There are some Homoeopathic medicines that can relieve the pain immediately and also prevent a heart attack if given as soon as the symptoms start. Homoeopathy aims to treat angina in two main ways.

1. To give immediate relief from distressing symptoms with medicines which have specific and direct action on the heart muscle and blood circulation.
2. To give long-term treatment for your entire physical nature with medicines that will allow maximum recovery and reduce the frequency and intensity of future attacks of angina.

What is the immediate treatment for heart attack or angina?

Homoeopathy strongly recommends general management and immediate medical care at a hospital for heart attack and angina. However, there are several medicines that can be given to a person with symptoms suggestive of angina till he/she is taken to a hospital. These include:

- **Aconite**: This medicine is very effective in counteracting the adverse impacts of shock and fright during an acute attack of angina. For best results, it should be given as soon as the symptoms start.
- **Arnica**: This medicine relieves acute chest pain very effectively.
- **Spigelia**: This is also a very effective medicine for chest pain, especially if it is located on the left side of the chest and radiates to the left arm.
- **Kali phos**: This medicine calms the nerves and relaxes the muscles between the ribs, therefore helping you to relax.
- **Cactus, Crataegus**: Both these medicines have specific action on the heart muscles and relieve pain and breathlessness.
- **Carbo veg**: This medicine is given for symptoms such as sinking sensation, difficulty in breathing, desire

and *mukta pisti* with honey thrice a day or the same quantity of *kasturi bhairava rasa* with honey every eight hours.

2. One tablet of *Yakuti* with peppermint juice is very effective in controlling severe palpitation.

3. Five hundred grams of Deer horn ashes with two hundred fifty grams of *Prabhakar vati* or *Hridayarnava vati* is recommended three times a day.

Dietary modifications include increased intake of soup prepared from cereals, banana, pumpkin, pomegranate, dried ginger, aniseed, garlic, Cherubic myrobalan, long pepper and beetle leaves with their petals.

for open air and bluish discoloration of the lips, nails, etc. due to lack of oxygen.

● **Amyl nitrosus**: Inhalation of this medicine gives immediate relief in conditions where the blood vessels are constricted with spasm and you have anxiety and cold and pale skin.

What is the mechanism of action of Homoeopathic medicines?

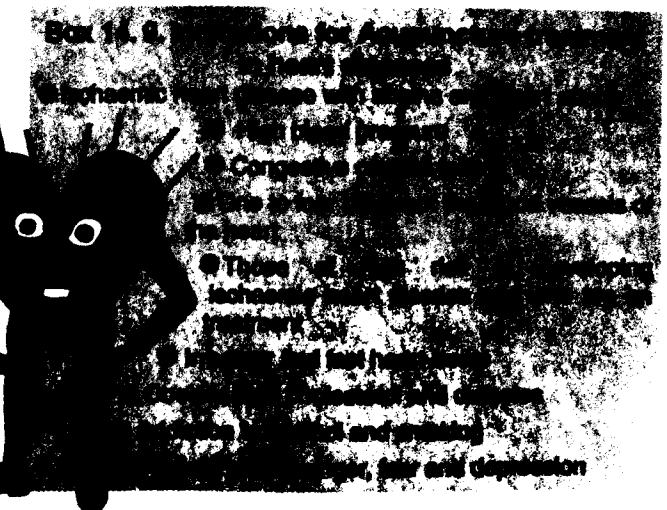
Homoeopathic medicines recommended for angina act in four main ways. They:

1. Improve blood circulation in all the blood vessels, thereby ensuring that the heart muscles get adequate blood and therefore nourishment.
2. Relax the contraction of muscles of the heart and chest.
3. Calm and soothe your nerves.
4. Improve oxygen supply to heart and other parts of the body.

Thus, Homoeopathic medicines ensure optimum recovery and minimum damage to the heart. It is important to remember that the earlier you start the treatment, better will be the effect of medicines.

What is the long-term management of heart attack and angina?

After the acute attack of heart attack or angina is under control, it is necessary that you take appropriate medicines in order to ensure maximum recovery and to avoid future attacks. Long-term management of a person with heart



attack and angina includes detailed case history, general management and medicines.

Case history: Just as in all chronic conditions, your doctor will rely heavily on a detailed case history. He/she will ask specific questions about:

- **Family history:** If other members of your family have had heart diseases, you are at a higher risk of developing heart attack and angina, especially in the presence of other precipitating factors.

- **General habits:** These include smoking, high-fat diet, irregular life-style for meals, sleep, etc.

- **Other diseases:** These include conditions such as high blood pressure and inborn heart diseases.

- **Mental or physical stress:** These can precipitate a heart attack or angina.

General management: Homoeopathy recommends the following general measures for preventing future attacks of heart attack and angina:

- Regulated life style by giving up smoking, excessive consumption of alcohol and eating a balanced diet low in fats and cholesterol.

- Maintenance of an optimum body weight through regular exercises such as walking.

- Effective management of mental stress through yoga, meditation, etc.

Medicines: Commonly used medicines for long-term management of heart attack and angina include:

- **Arsenicum iodatum:** This medicine is very effective for those who are thin, emancipated and suffer from breathlessness, palpitations and a dry cough.

- **Cactus:** This medicine acts specifically on the heart and the arteries. It is recommended if there is constricting pain with difficulty in breathing and spasmodic cough. It is also effective for arteries damaged by atherosclerosis.

- **Crataegus:** It is acts on the heart muscle and is effective for severe weakness, feeble pulse, high blood pressure, pain under the left collar-bone and breathless on minimum exertion.

- **Rauwolfia:** This is a specific medicine for high blood pressure.

- **Digitalis:** This medicine is effective for all types of heart diseases. It is especially recommended for weak, intermittent pulse and a feeling of sinking sensation. Digitalis stimulates the heart muscles and regulates the pulse.

- **Lachesis:** It is very effective on women with heart disease who have attained their menopause. Lachesis is also recommended for constricted feeling with palpitations, anxiety, claustrophobia (abnormal fear of being in narrow or closed places) and irregular pulse.

- **Naja:** This medicine is recommended for those who have dragging pain in the region of the heart extending up to the neck and left arm associated with intense anxiety and fear of death and pain the forehead. People with these symptoms are likely to feel better in open air.

- **Baryta carb and Baryta mur:** Both these medicines are especially recommended in old people who also have degenerative diseases. It is effective for people who have palpitations while lying on the left side, atherosclerosis and high blood pressure.

- **Cholestrinum:** This is a specific medicine for lowering cholesterol levels in your blood.

- **Tabacum:** This medicine is effective for people with severe angina with nausea, giddiness, vomiting and cold-sweating. It is also prescribed for those who are addicted to tobacco and/or cigarette smoking.

- **Veratrum album:** It is recommended for people with heart diseases as a consequence of tobacco chewing and symptoms such as palpitations, breathlessness and feeble pulse.

There are several other medicines that are also recommended for improving your entire physical status and thereby preventing further attacks of heart attack and/or angina. All Homoeopathic medicines help you lead a healthy and active life. *It is important to remember that some conditions may require Allopathic treatment and therefore your Homoeopath may recommend you to a cardiologist.* You can continue Homoeopathic medicines along with allopathic medicines, yoga and Nature Cure practices in order to give you maximum protection from recurrent attacks.

NATURE CURE

The causes, signs and symptoms of angina and heart attack as per Nature Cure are the same as those detailed in the section on Allopathy. Nature Cure practitioners caution that since heart attacks can be serious and fatal, you should seek treatment from a cardiologist as soon as symptoms of heart attack or angina develop. You should also undergo the necessary tests for evaluation of your heart. Nature Cure may have limited effects during the acute phase of the illness but can help prevent future attacks of heart attack and angina.

What is the treatment for angina?

Nature Cure recommends separate treatment for immediate relief of angina and for preventing future attacks of angina. Management options for immediate relief of pain in the acute phase of angina include:

- **Fomentation:** Fomentation of the heart region for about five minutes dilates small blood vessels of the skin in the

heart region.

- **Cold compress:** Keep a cold cloth of ice bag on the heart region for half an hour. Next, rub the same part of the skin with your hands or sponge it with hot water for five minutes. You can repeat hot fomentation followed by cold compress three times a day.

- **Diet:** You should take liquid diet, especially fruit juices and tender coconut water for at least three days in order to remove the "toxins" from the blood. Subsequently, add vegetable salads in the diet for about one week in order to prevent constipation.

Prevention of angina and heart attack: Nature Cure emphasizes that heart diseases and blockage of the blood vessels of the heart are the result of negative thinking and a life-style that is not in harmony with the laws of nature. Detailed below are the main factors that can prevent angina.

- **Deep breathing:** Deep breathing for fifteen minutes

twice a day in open and fresh air will help you to inhale larger volume of oxygen. *It is important to remember that you should do deep breathing using the muscles of your abdomen and not the chest.*

Abdominal breathing helps digestion of food and therefore avoids production of excess "toxins" in the digestive system. If the toxin levels increase in the blood, it becomes thick. Thick blood cannot flow freely through the smaller vessels. It is therefore likely to stagnate and form blood clots.

- **Physical activity:** Physical activities such as walking and other exercises increase activity of most muscles of the body and therefore increase the rate of all the chemical processes in the body. As a result, digestion improves and there is no risk of excessive production of "toxins". Regular exercises also help to eliminate the body wastes through the skin, lungs, intestines and kidneys. They also maintain the normal tone of the walls of the blood vessels.

You should exercise for at least forty minutes every day unless your doctor advises you otherwise.

- **Diet:** Never overeat. Other dietary measures include:

1. Eat simple food, as close to its natural form as possible. It is best to eat raw or steamed vegetables so that there is minimum loss of nutrients.

2. Do not eat more than half a teaspoon of salt per day.

3. Avoid animal foods and dairy products as they are likely to increase cholesterol levels.

4. Eat an early dinner, preferably about two to two-and-a-half hours before sleep.

5. Use unsaturated oils such as from sun-flower, sesame and cotton seeds.

6. Eat fruits, sprouts and curds for breakfast.

7. Eat foods in semi-solid state or chew the food well till it becomes like a liquid before you swallow it.

8. Fast once a week on fruit juices and vegetable soups in order to rejuvenate all the systems of your body.

9. Avoid dinner parties at night. If you have to go, eat some food at home and consume only salads and cereals during the dinner.

10. Drink plenty of water, especially about two glasses as

soon as you get up and just before you go to bed.

11. Eat cereals such as "Ragi" and fruits such as custard apple that are rich in calcium. Jaggery is also a rich source of calcium.

12. Use wheat-germ oil regularly as it helps maintain normal functions of the heart.

- **Smoking:** Stop smoking as it destroys the normal elasticity of the blood vessels.

- **Alcohol:** Alcohol reduces the capacity of the heart to pump the blood.

- **Rest and relaxation:** Hard work is not likely to cause heart attack or angina but the stress associated with any work is likely to lead to these conditions. Practice relaxation methods such as yoga and meditation everyday and maintain regular sleep pattern.

- **Hydrotherapy:** The following treatment measures will help maintain normal functions of the heart:

1. Hot fomentation over the heart for about five minutes.

2. Hot or very cold compress over the entire chest and abdomen for about five to fifteen minutes. A cold compress increases blood supply to the heart. You can also use an ice-bag.

3. Alternative hot and cold applications to the backbone.

4. Drinking hot water.

5. Taking hot water enema.

6. A short application of cold pack to any part of the body, especially the face and the chest helps increase the activity of the heart.

7. Taking a short, hot water bath improves circulation to all parts of the body.

8. Wrap your body with hot blanket for five minutes a day.

9. Take alternate hot and cold immersion baths to improve circulation.

In addition to the above, it is important that other conditions such as diabetes, high blood pressure and obesity that increase the risks of heart attack are managed with appropriate measures.

The above management practices should not be practised without the direct supervision of a Nature Cure practitioner as improper practices may lead to other complications.

UNANI

Sudden and severe pain in the chest due to decreased blood supply to the heart is called *Wajul Qalb* in Unani system of medicine. The deficiency of blood circulation to the heart and therefore nutrition of the heart muscle is due to *Madda muzmin* or *Ghaliz* or psychological factors. *Madda muzmin* or *Ghaliz* are Unani terms for chronic and thickened matter in the body. These factors result in blockage or contractions in the blood vessels of the heart. Angina (Wajal Qalb) may also be due to inflammatory conditions of *sanguine* or *choleric* origin. Sanguine means originated from blood and choleric means originated from bile. Whenever the demand of blood supply by the heart increases, the weak body's *Quwat Haivaniya* is unable to meet this demand. *Quwat Haivaniya* is the quality that controls all activities of the heart. This quality is unable to meet the excessive demand for blood either due to its weakness or hinderance in the passage by *Madda Muzmin* or *Ghaliz*.

What are the causes of angina?

Factors that lead to weakening of *Quwat Haivania* include psychological conditions of fear, anger, excitement, mental tension, shock, heavy physical or mental exertion. Other factors include weakness in *quwat haivania*, blocks in the *Sharnin-e-Qaly* (arteries of the heart) or *Madda Ghaliz* or *Muzmin*.

The signs and symptoms of angina as per the Unani system of medicine are the same as those detailed in the section on Allopathy.

What is the principle of treatment of angina?

The basic principle of treatment of angina is to neutralize the exciting factors by strengthening *Quwat Haivania*. This is done through *Muqarriyat Qalb* (tonics for the heart) and *Muaseat Uroog* (medicines that dilate coronary arteries). Strengthening of *Quawat Haivanai* ensures the necessar

blood supply to the heart muscles. You should also avoid predisposing factors by complete physical and mental rest.

What is the treatment for angina?

Unani recommends the following for treatment of angina: (1) Complete physical and mental rest along with plenty of fresh air. (2). One gram of *Jadwar Sheerin* (sweet variety of *Salvia Plebeia*) mixed with *Arq-e-gulab* (rose water) to be taken orally. (3). Inhalation of the sweet smell of *zafraan* (saffron), rose, *Mushk* (medicine prepared from musk deer), sandal, etc. (4). Half gram of *Jawahar Mohra* (a compound medicine prepared from minerals) dissolved in fifty millilitres of rose water to be taken orally with six grams of *Khamira Gaozuban Ambari* (a compound medicine that reduces cholesterol and increases blood supply to the heart). (5) Local application of chesta paste prepared by mixing powders

of *Darchini* (cinnamon), *Ood*, *Waj Turki*, *Zarambad* (types of wood), *Mastagi* (gum from a medicinal plant) in rose water. (6) Twenty millilitres of either *Arq-e-Bed Mushk* (willow-bark) or rose water twice a day. (7) Ten millilitres of either *Sharbat ward Mukarrar* (rose syrup) or *Sharbat anar* (pomegranate syrup) twice a day. (8) Five drops of *Arq Ajeeb* (compound medicine prepared from omum, mint and camphor) to be taken orally with twenty millilitres of water. (9). One hundred and fifty millilitres of either *Ambar* or *Mushk* with twenty millilitres of rose water twice a day. (10). Two grams of cloves with five grams of sugar to be taken orally at bed time. (11) One tablet of *Qurs Murgang* (a compound medicine) to be taken orally. (12). Two grams of either *Mufarreh Shevanizi* or *Mufarreh Sheikhur Rais* twice a day. both these are compound medicines. *It is also important to eat an easily digestible and suitable diet.*

DEFINITIONS

Amino acids are chemical compounds that form the building blocks of protein.

Angioplasty is an invasive cardiac procedure that removes blocks in the coronary arteries without surgery.

Aorta is the main artery that emerges from the left ventricle.

Arterioles are medium-sized arteries.

Atherosclerosis is a disorder of the large and medium sized arteries where the cholesterol, fatty substances, waste products etc. deposit on the inner layer of the arteries.

Atria are the two low-pressure upper chambers of the heart that receive blood from the lungs and the entire body.

Coronary bypass surgery is a surgical procedure to divert the flow of blood around a block in the coronary artery.

Capillaries are the smallest blood vessels.

Catheter is a flexible rubber tube that is inserted in a blood vessel or

hollow cavity in the body to instill or remove fluids.

Cholesterol is a fat soluble substance that is widely distributed in the body. There are two main types of cholesterol - low density or bad cholesterol and high density or good cholesterol.

Coronary arteries are those that supply blood to the heart.

Enzymes are proteins that increase the rate of chemical reactions in the body.

Oxidation is a process through which the oxygen content of the compound increases.

Spondylitis is a disorder of the backbone characterized by fixation or stiffness of a vertebral joint.

Thrombosis is an abnormal condition where blood clots deposit in the arteries of the body.

Ventricles are the two high-pressured, lower chambers of the heart that pump blood to the lungs and entire body.

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**In the next issue:
Risk factors of heart attack and angina
Healing powers of water**

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Edited by Michael W. Meister and M.A. Dhaky

The aim of the *Encyclopaedia*, sponsored by the American Institute of Indian Studies, is to survey and organise by style, with technical descriptions, the vast body of monuments constructed between c. AD 400 and 18th centuries in India to serve India's symbolic and religious needs.

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Contributors to this Part are: K.R. Srinivasan, K.V. Soundara Rajan, M.A. Dhaky and H. Sarkar.

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MULTIPLE PERSPECTIVES ON HEALTH EMPOWERMENT

ALLOPATHY AYURVEDA HOMOEOPATHY NATURE CURE UNANI

November 1997

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Heart Attack and Angina — II

ALLOPATHY

Heart attack and angina are serious and common health problems among adults. Heart attack (also called "myocardial infarction") and angina (which is the warning sign of a heart attack) occur because of a block or narrowing in one or more arteries that supply blood to the heart muscle. These blood vessels are called *coronary arteries*.

An earlier issue of the Health Update (Vol. 2, Issue 2, October 1997) had focused on the normal functions of the heart, signs and symptoms of heart attack and its non-surgical management. This issue focuses on the risk factors of heart attack and angina and their control. A brief description of surgical procedures for diagnosis and management of blocks or narrowing of the coronary arteries is also included.

The exact reason why a block or narrowing occurs in the blood vessels of some people but not in others is not known. However, some factors are known to increase the risk of developing such blocks or narrowing. These factors, which also increase the risk of heart attack or angina, are called "risk factors". You can control some of these risk factors by life-style changes and/or medicines. Control of risk factors has three main advantages. It can:

1. Reduce the risk of heart attack and angina;
2. Reduce the risk of repeat attacks if you have already suffered from a heart attack or angina earlier; and
3. Prevent further progress of the disease after surgical treatment such as bypass surgery or angioplasty.

Atherosclerosis is one of the main factors that can lead to heart attack and angina. It is the disorder of the large and medium sized arteries where cholesterol, fatty substances, waste products, etc. deposit on the inner layer of the blood vessels. These deposits narrow and subsequently block the blood vessels. Depending upon whether there is narrowing or block in the blood vessel, the blood flow is either reduced or stopped at the site of the damage. Atherosclerosis also hardens the walls of the arteries.

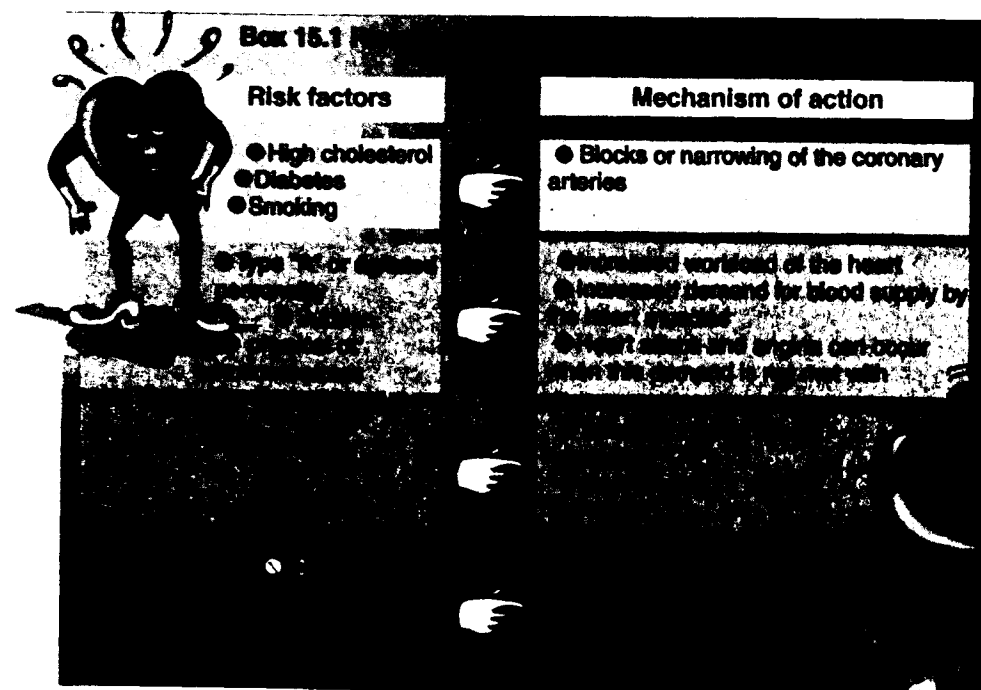
What is the natural defense mechanism against coronary artery blocks?

A clot cannot develop in a healthy artery. This is because of the four main reasons:

a. *Protective layer in the arteries*: The innermost layer of the arteries that comes in direct contact with blood secretes a chemical substance. This chemical substance offers local protection against formation of a *clot*. A clot is a semi-solid substance that results when the blood becomes hard instead of being a free-flowing liquid. The process of clotting of blood normally starts with damage to any part of the body.

When the inner layer of the arteries is damaged by conditions such as atherosclerosis, it loses its natural harmony with the blood. As a result, the cholesterol in the blood gets oxidized. The oxidized cholesterol further damages the inner layer of the arteries and starts depositing on it.

Definitions of all technical terms used in this issue are given on the last page.



chemical compound increases. Amino acids are the building blocks of proteins.

The major risk factors of atherosclerosis and therefore heart attack and angina that can be controlled by life style changes or medicines include:

- High blood pressure (for further information, refer to Health Update Issue No. 1, Vol. 1, September 1996);

- Diabetes (to be discussed in later issues of the Health Update);
- High blood cholesterol; and
- Smoking.

Box 15.1 describes how the risk factors increase the risk of heart attack and angina.

b. Good cholesterol: The high density or "good" cholesterol prevents attachment of low-density or "bad" cholesterol from depositing on the inner layer of the artery. Good and bad cholesterol are discussed in more detail in the section on "What is cholesterol?"

c. Anti-coagulation factors in blood: Natural chemicals in the blood such as *plasmin* prevent clot formation. These chemicals are called anti-coagulants, which are substances that prevent clotting of blood. Plasmin is an enzyme that dissolves *fibrin*, a protein that is responsible for the semi-solid condition of a clot.

d. Elastic wall of the arteries: All arteries in the body, including the coronary arteries have elastic walls. The arteries can therefore expand, if necessary, to transport larger volumes of blood in case the body's requirements increase (such as during exercises).

Narrowing or blocks in the coronary arteries develop when one or more of the above protective mechanisms fail.

What are the risk factors for heart attacks and angina?

As discussed in the earlier issue on Heart attack and angina — I, the risk factors for heart attack and angina can be grouped into three main categories: (a) modifiable risk factors, (b) non-modifiable risk factors and (c) less important risk factors.

Modifiable risk factors include high blood pressure, diabetes, prolonged use of tobacco in any form, high cholesterol, reduced physical activity and obesity. Non-modifiable risk factors include age, male sex and heart diseases in other family members. Other less important risk factors include Type "A" personality, inadequate chemical substances that prevent oxidation of cholesterol and excess of an amino acid called "Homocysteine". Oxidation is the process by which the oxygen content of a

What is cholesterol?

Cholesterol is a type of fat that circulates in the blood stream. It is formed as a result of chemical reactions in the liver and the blood capillaries. Cholesterol accumulates in the body when your normal diet contains excessive amount of three main components of food:

- Cholesterol*, the normal daily diet usually contains about one gram of cholesterol;
- Other types of fat*, especially the saturated fats;
- Carbohydrates*.

Increased production of cholesterol leads to higher levels of cholesterol in the circulating blood and therefore narrowing of all arteries of the body, including the coronary arteries. There are several mechanisms, some of which are not fully understood, through which cholesterol leads to atherosclerosis and are illustrated in Figure 15.1.

What is good and bad cholesterol?

Cholesterol is carried in the blood in the form of complex compounds called "*lipoproteins*". Lipoproteins contain different types of fat and proteins in varying proportions. There are three types of lipoproteins. These include (a) low-density lipoprotein or LDL, (b) high-density lipoprotein or HDL and (c) very-low-density lipoprotein or VLDL.

Low-density lipoprotein or LDL is the term used when:

Your blood cholesterol may be high even with regular exercise and a healthy, low fat diet. This is because you do not consume enough calories from the carbohydrates.

- The major portion of the fat in the lipoproteins is cholesterol;
- This cholesterol carries nearly three-fourths of the total cholesterol in the blood; and
- It supplies cholesterol to all parts of the body.

LDL is partly derived from the breakdown of very-low-density-lipoprotein (VLDL) in the blood vessels. The higher cholesterol content in the low-density lipoprotein or LDL leads to atherosclerosis and therefore ischaemic heart disease. This is why it is called "*bad cholesterol*".

High-density-lipoprotein or HDL is the term used when:

- The cholesterol content of the lipoprotein is about fifty percent;
- This cholesterol helps stabilize the blood levels of very-low-density lipoproteins (or VLDL); and
- It helps transmit cholesterol from the blood to the body tissues.

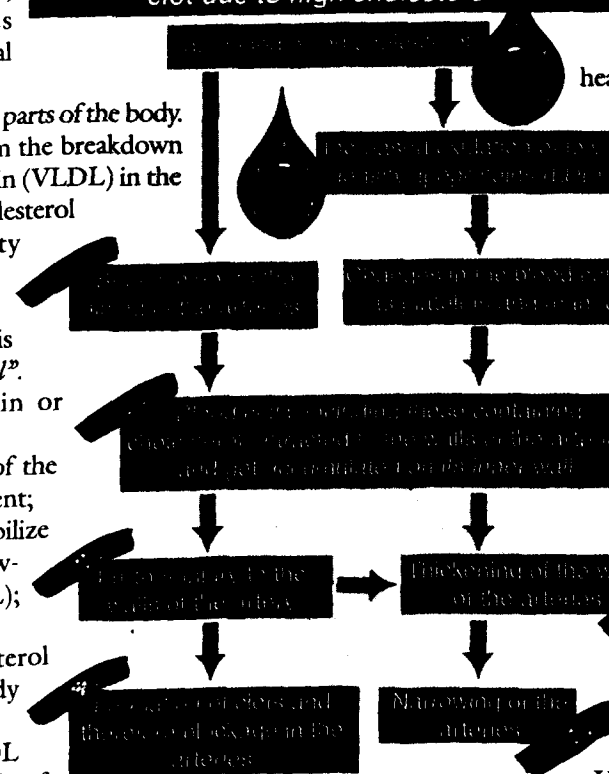
A higher blood level of HDL is known to reduce the risk of developing ischaemic heart disease and is therefore called "*good cholesterol*". The total cholesterol levels in the blood include both, the LDL and HDL. The fat content of very-low-density-lipoprotein or VLDL is mainly in the form of *triglycerides*. Triglycerides are chemical compounds that contain fatty acids. They make up most of the animal and vegetable fat and are the main fats in the blood. Triglycerides are not associated with risk of ischaemic heart disease. However, some recent studies on Indians settled in the Western Countries have indicated that increased blood levels of triglycerides increase the risk of severe ischaemic heart disease. This may not be true for Indians living in India and several studies are currently underway to determine the role of triglycerides on Indians living in India.

Some small studies have identified another risk factor among Indians. This is increased blood levels of *lipoprotein little 'a'*, which is also called as Lp(a). Lp(a) is important for the binding LDL or bad cholesterol to the liver cells. Many medical practitioners opine that "*special risk factors*" such as Lp(a) may be responsible for the increased severity and greater risk of death due to ischaemic heart disease among Indians settled abroad as compared to the native American population. More research is needed to determine if Lp(a) is also an important risk factor for Indians in India.

Can blood cholesterol be high even with regular exercise and a healthy, low fat diet?

Yes. Some people may have defective *genes* that are transmitted from parents to children. Genes are biological units of *genetic* material and inheritance. Genetic means

Figure 15.1. Mechanism of formation of blood clot due to high cholesterol



anything that is related to reproduction, birth or origin. Defective genes is one of the main reasons for higher risk of heart attack or angina in those whose blood relatives have had similar heart problems, especially around the age of forty years.

What are the healthy levels of blood cholesterol?

Total blood cholesterol less than 200 mg%, LDL or bad cholesterol less than 160 mg% and HDL or good cholesterol more than 35 mg% are healthy if you do not have ischaemic heart disease or its risk factors such as smoking, diabetes and high blood pressure. It is desirable that the ratio of total cholesterol to HDL level is less than 4 and the LDL level less than 100 mg% in people with heart diseases.

How can blood cholesterol level be reduced?

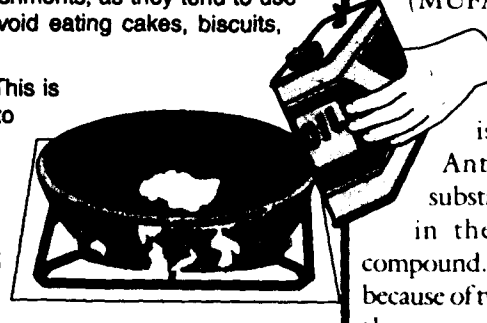
There are two ways by which you can reduce cholesterol levels in the blood: (a) appropriate diet and (b) medicines. Your doctor is likely to recommend that you eat a low-fat diet for two months. If your blood cholesterol levels come down, he/she may not prescribe medicines to reduce them. Sometimes, medicines, especially *statins*, are recommended even if diet therapy is effective. This is to increase effectiveness of the diet therapy. If the cholesterol levels do not return to normal after at least two months of regular dietary modifications, medicines are recommended to reduce cholesterol levels. It is important to continue the diet therapy along with the medicines.

Medicines: There are two main types of medicine that are recommended for reducing blood cholesterol:

- Medicines that reduce the amount of cholesterol made by the liver: These include *clofibrate* and *bezafibrate*. Both these medicines can cause nausea and pain in the abdomen. Occasionally, clofibrate can lead to stones in the *gall bladder*.
- Medicines that increase the excretion of cholesterol from the body: These include medicines such as *cholestyramine* and *colestipol* and are normally in powder form. The main action of these medicines is in the intestines where they prevent the absorption of *bile*. Bile is a bitter, yellow-green secretion of the liver that is stored in the gall bladder. The unabsorbed bile is then excreted in the stools. Bile is made from cholesterol and its loss in the stools makes the body make more bile. Thus, more cholesterol stored in the body

Box 15.2. Cooking oil

- Avoid consuming more than one teaspoon of oil per day.
- Cooking oils contain three types of fatty acids: saturated fatty acids, monounsaturated fatty acids and polyunsaturated fatty acids.
- Different types of cooking oil contain different proportions of the three types of fatty acids.
- Coconut oil, palm oil, butter, ghee, vanaspati and dalda are rich in saturated fatty acids. Their use should therefore be avoided.
- Safflower oil and corn oil are rich in polyunsaturated fatty acids.
- Olive oil, canola (rapeseed oil) and groundnut oil are rich in monounsaturated fatty acids.
- Polyunsaturated fatty acids reduce cholesterol but they also depress the natural defense mechanism of the body and make the platelets (a type of blood cells) stick to each other.
- The best oil to use for reducing cholesterol is olive oil, followed by canola and groundnut oil.
- Avoid eating fried foods from commercial establishments, as they tend to use palm oil, which is rich in saturated fatty acids. Avoid eating cakes, biscuits, pastries, etc.
- Cooking oil once used should be thrown away. This is because when unsaturated fatty acids are heated to high temperatures, they result in a very dangerous substance called trans-fatty acid.
- Production of several brands of cooking oil involves heating them at high temperatures. Thus, trans-fatty acids are formed. This is why cold pressed oil such as virgin olive oil is best for reducing cholesterol.

**What are the common foods rich in cholesterol and saturated fats?**

Foods rich in cholesterol and saturated fats include yellow portion of egg, liver, pork ribs, shrimps, ice-cream, butter, cream, *ghee* (clarified butter) and animal fat. Lean meat, chicken (without fat) and fish are not rich in fats or cholesterol.

Of the oils, coconut oil, groundnut oil, *vanaspati* and *dalda* are rich in saturated fats while safflower oil, corn oil, soya-bean oil and sunflower oil are rich in unsaturated fatty acids.

Recent studies have indicated that monounsaturated fatty acids (MUFA) and antioxidants (such as Vitamins C, E, Flavenoids, etc.) may also offer protection against ischaemic heart disease.

Antioxidants are chemical substances that prevent increase in the oxygen content of a compound. They are probably effective because of two main mechanisms. One, they preventing oxidation of cholesterol and LDL or bad

cholesterol, and therefore prevent atherosclerosis. Two, they prevent oxidation of vital chemical substances present in the heart cells that have the capacity to damage them. This is why although some oils such as coconut and olive oils and nuts such as almonds and walnuts are rich in saturated fatty acids, they *may* not be very harmful to the heart. This is because they are also rich in antioxidants and monounsaturated fatty acids (MUFA). Further research studies are required before definite recommendations can be made on the type of oils that can prevent high cholesterol. Until further research provides persuasive or conclusive evidence, it is desirable that you take antioxidants in the form of green leafy vegetables, sprouted seeds, fresh fruits etc. as they do not contain saturated fats or cholesterol.

A few research studies have indicated that monounsaturated fatty acids (MUFA) may also protect the heart just as polyunsaturated fatty acids (PUFA) do. Oils like groundnut oil and coconut oil that are rich in monounsaturated fatty acids may not be harmful as was thought earlier.

An ideal oil is one that contains both, mono and polyunsaturated fatty acids and smaller quantities of saturated fatty acids. Some doctors therefore recommend taking a mixture of oils such as groundnut or mustard oil and safflower or sunflower oil.

As mentioned earlier, it is desirable that you reduce total oil intake. Box 15.2 lists the key information on the use of cooking oil for reducing blood cholesterol levels.

is used up to make bile.

Common side effects of cholestyramine and colestipol include nausea, increased gas from the bowels, constipation and discomfort in the abdomen. Your doctor may advise small doses of these medicines initially and gradually increase them till the desired dose to minimize the side effects.

What is the recommended diet to lower blood cholesterol levels?

One of the most effective ways to reduce blood cholesterol is to prepare a diet chart and strictly follow it. This diet chart needs to provide the following:

1. The total calories that your body requires. Your doctor or a trained nutritionist can help you determine the amount of calories you need depending on your age, height, sex, weight and physical activity.
2. Twenty to thirty percent of the total calories from fats.
3. Seven to ten percent of the total calories from *saturated* fats.
4. The remaining fat from *polyunsaturated* and *monounsaturated* fats.
5. The cholesterol intake needs to be less than two hundred to three hundred milligrams per day.

It is important to remember that you need to reduce the overall intake of fat and avoid foods rich in fat. In case fat cannot be avoided or reduced, it is desirable to consume unsaturated fats in moderate amounts. This will help reduce the cholesterol levels.

Can alcohol reduce blood cholesterol levels?

In recent times, some specialists have begun to believe that alcohol may prevent ischaemic heart disease. This is because some studies have indicated that regular consumption of less than thirty grams of alcohol per day may increase the blood levels of HDL or the good cholesterol. These studies need to be analyzed with some caution. It is important to consider at least three main factors before you begin to consume regular alcohol.

1. Alcohol provides calories and therefore the total caloric intake can exceed what your body normally requires
2. Regular intake of alcohol can lead to addiction, and therefore excess intake over a period of time. In such cases, in addition to damage to the heart and causing high blood pressure, there may be damage to the liver and stomach; and
3. These findings have been observed only in preliminary studies. Further studies are required to provide persuasive conclusion that alcohol can protect against ischaemic heart disease.

What is the role of diabetes in heart attack and angina?

Diabetes promotes atherosclerosis by (a) reducing the blood levels of good cholesterol, (b) increasing the oxidation of bad cholesterol and (c) other unproven mechanisms. Recent studies have indicated that a *syndrome* called "*Insulin Resistance Syndrome*" is associated with higher risk of ischaemic heart disease. In this condition, there is increased triglycerides, reduced HDL or good cholesterol and abnormal levels of blood sugar. *It is important to remember that blood sugar should not be lowered to below normal levels because low blood sugar can precipitate angina by increasing heart rate and constricting the blood vessels.*

How does smoking cause ischaemic heart disease?

Smoking can cause ischaemic heart disease through three main mechanisms:

1. It reduces blood levels of HDL or the good cholesterol;
2. It promotes narrowing of the arteries; and
3. It causes the *platelets* (a type of blood cell) to stick to one another and block the artery.

Several research studies worldwide have indicated that exposure to people who smoke around you can also increase the risk of ischaemic heart disease. It is therefore desirable that you avoid the company of those who are smoking. Smoking should also be avoided in the presence of children because they are more vulnerable to its adverse effects. Studies have also indicated that tobacco use in any form other than smoking is also a very important risk factor of ischaemic heart disease.

What is coronary angiography?

Coronary angiography or coronary arteriography (CART) is a test and not a treatment. It helps detect the narrowing or blocks in the coronary arteries. After the exact location and the extent of the narrowing and/or block is

detected, your doctor may, if necessary, recommend either coronary angioplasty (also called Post Thrombotic Coronary Angioplasty or PTCA) or coronary artery bypass surgery (also called CABG). Both these procedures restore the normal blood supply to the heart muscle either by removing or by bypassing the narrowing or blocks in the coronary arteries. Thus, coronary angiography is an essential test before planning the management options of blocked or narrowed coronary arteries.

Coronary angiography requires sophisticated and expensive equipment and trained cardiologists. Before starting the procedure, an injection of local *anaesthesia* is given in the right groin. Sometimes it may be given on the left groin or arm. Next, a needle puncture is made into the artery of the groin similar to one that is made for giving glucose drips. Subsequently, a cylindrical plastic tube with a central hole, called *sheath*, is placed in the artery. Through this sheath, a long tube called *catheter* is passed upwards through the various arteries till it reaches the first part of the *aorta* just above the heart. Aorta is the largest artery of the body that emerges from the left side of the heart that supplies purified blood to all parts of the body.

After the catheter reaches the heart, it is moved and rotated to hook the coronary artery that arises from the first part of the aorta. The left and right coronary arteries are hooked separated using specially designed catheters of different shapes. After the coronary artery is hooked, contrast material containing iodine is injected into the artery so that the arteries and their branches are outlined by the contrast medium. The entire procedure is normally filmed by a camera so that it can be reviewed later to detect the presence or severity of the narrowing and/or block. Normally, similar imaging is done to study the structure and functions of the left lower chamber of the heart — the left *ventricle*.

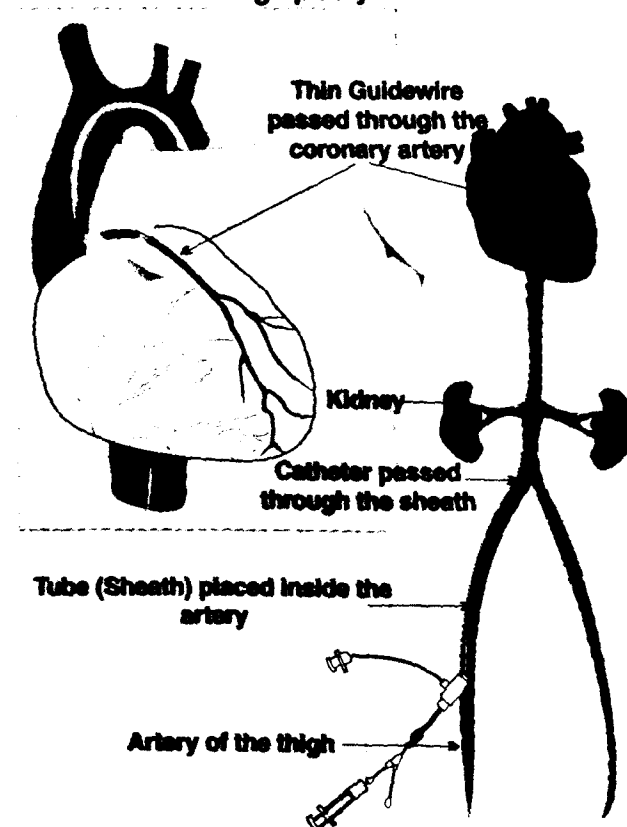
After angiography, the leg through which the artery was punctured needs to be kept straight without any movements for at least six hours. This is to prevent bleeding from the puncture point. You can drink or eat food soon after the procedure is completed.

What are side effects of angiography?

The arteries of the body are not sensitive to pain. This means that when the catheter passes through the arteries, there will be no pain. There may however be some pain at the site of injection in the groin as the skin and the tissues underneath are sensitive to pain. If there is severe narrowing of coronary arteries, angina may occur during the angiography.

Some people may feel a writhing sensation — as if something is moving inside — when the catheter moves up from the groin towards the heart. A sensation of warmth for a few seconds and a mild temporary discomfort is common during angiography of the left ventricle.

The risk to life from angiography is 0 to 0.1%. In case of severe ischaemic heart disease or severely reduced heart function, the risk is higher. Hospitalization is generally

Figure 15.2. Technique of Coronary Balloon Angioplasty

required after the angiography procedure for a day.

What is coronary balloon angioplasty?

Coronary balloon angioplasty is also called Post Thrombotic Coronary Angioplasty or PTCA. It is a procedure through which a narrowed or blocked coronary artery is opened using a balloon.

The initial procedure for coronary balloon angioplasty is similar to angiography until the sheath is placed in the artery of the groin. Subsequently, special catheters, sophisticated thin wires and balloon catheters are used. Since the process of needle puncture and inserting a sheath are common to both angiography and angioplasty, they are often done as two parts of a single procedure. In case of balloon angioplasty, you need to stay in the hospital for upto three days.

The steps for performing coronary balloon angioplasty include:

1. Placing the sheath in the artery of the leg;
2. Hooking the right or left coronary artery with a special catheter and taking pictures of the artery;
3. Passing a thin, long wire through the special catheter and then into the coronary artery by moving and rotating it so that it crosses the narrowing or block in the artery or its branches;
4. Threading a small catheter called a balloon catheter that has a collapsed balloon at its tip over the thin wire placed in Step "3" till the balloon is at the site of the narrowing/

block. This catheter has a thin channel that extends from the balloon at its tip to the other end outside the body;

5. Blowing up the balloon from outside the body by using a syringe like device that is filled with diluted contrast medium; and

6. Taking pictures of the artery again to check if the narrowing and/or the blocks have been removed.

Figure 15.2 illustrates the steps in coronary balloon angioplasty. Figure 15.3 illustrates how a balloon restores normal blood supply to the heart.

What are the other devices used during angioplasty?

In recent times, several new devices have been tried for opening the narrowed and/or blocked coronary arteries. These include (a) *stents*, (b) *atherectomy* devices, which are commonly known as shearing devices, (c) *thrombo-suction* devices to "suck" clots from the coronary artery; (d) *laser* devices such as laser wires and catheter devices, and (e) *ultrasound* energy to dissolve clots. Of these, only *stents* have been documented to be very effective. The others are either not useful, useful only in a few rare cases or need to be tested further.

Stents are specially designed small, cylindrical metal tubes that are commonly made of steel. These are placed within the coronary artery at the site that has been dilated with the balloon. The stents act as structural support to keep the wall of the artery open. Thus, the flow of blood through the damaged part of the artery can be restored to normal.

What are the complications of angioplasty?

In recent times, the complications of angioplasty have been greatly reduced due to refined techniques, sophisticated material used for angioplasty and use of new medicines. As a result, several difficult and complicated cases are also now being managed with angioplasty. The risk to life due to angiography is less than one percent and the need for coronary bypass surgery due to complication following angioplasty is about two to three percent.

What are the long-term results of angioplasty?

If the angioplasty has been successful in removing the narrowing or blocks in the artery and the functions of the left ventricle are normal, you are most likely to be free from heart complaints. You can resume normal activity including sexual activity within a few days. Narrowing can recur in about thirty percent of the cases at the same place where there was narrowing and/or block earlier. This is called *restenosis* and is normally observed within six months. Of the people who have restenosis, about twenty percent may need to be treated with a repeat angioplasty or a coronary bypass surgery. Appropriate use of stents reduces the risk of restenosis by about ten percent. Several research studies are underway with newer medicines such as *statins*, radiation

therapy etc. to try and further reduce the risk of restenosis.

How is coronary artery bypass surgery performed?

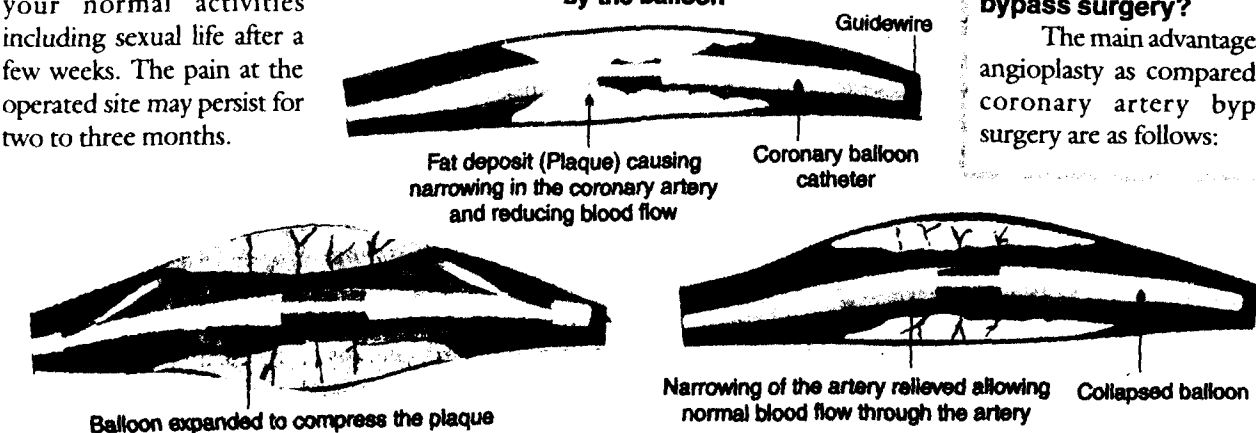
Coronary artery bypass surgery, also called CABG or Coronary Artery Bypass Graft, is a major operation. The term bypass surgery refers to two steps of the operation:

- *Putting the heart on bypass:* Whenever the heart needs to be stopped for performing surgery on its surface (such as for bypass surgery) or inside (such as for replacement of a heart valve), it is attached to a machine. This machine, called the heart-lung machine, takes over the pumping function of the heart and the heart therefore stops beating. Blood from all parts of the body is directed to the heart lung machine by large tubes called *cannulae*, which are placed in the major *veins* that open into the heart. The machine purifies the impure blood from all parts of the body and pumps purified blood through cannulae placed in the aorta.

At the end of the operation, these cannulae are removed. After the heart starts beating on its own, the holes at the site of the cannulae are stitched up.

- *Bypassing the block in the artery:* Bypassing is done after the heart-lung machine begins to pump blood. It is normally done through veins removed from the legs or arteries of the breast, arms and sometimes even the stomach. One end of the vein or the artery used for bypass is stitched to the coronary artery beyond the narrowing or block and the other end is stitched to the first part of the aorta above the place from where the coronary arteries branch out. Thus, the attached vessel carries blood from the aorta directly to the coronary artery after bypassing the block. As a result, the blood supply to the heart becomes normal. Figures 15.4 and 15.5 illustrate the principles of using veins and arteries for bypass grafts respectively.

You need to stay in the hospital for at least a week after a coronary bypass surgery. The risk to life due to this surgery is about one to two percent. The risk is at least five to ten times higher in those who have serious heart disease or are having a repeat bypass surgery. You can resume your normal activities including sexual life after a few weeks. The pain at the operated site may persist for two to three months.

Figure 15.3. Narrowing in the coronary artery relieved by the balloon

Is angioplasty better than bypass surgery?

The main advantages of angioplasty as compared to coronary artery bypass surgery are as follows:

Neither angioplasty nor coronary artery bypass surgery can prevent new blocks/narrowing occurring in other parts of the coronary artery. Therefore even after these two procedures, angina or heart attack may still occur. The best way to reduce the risk of further damage to the coronary arteries is by taking regular and proper medicines and strictly controlling the risk factors.

What are the recent advances in coronary bypass surgery?

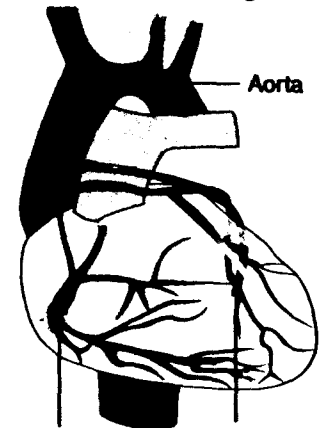
There have been three major advances in coronary bypass surgery. These include:

1. Use of arteries instead of veins to pass the block;
2. Performing coronary artery bypass on a beating heart when there are only one or two blocks; and
3. Minimally invasive coronary bypass surgery. In this surgery, a small cut is made along the ribs instead of cutting the breastbone and opening the entire chest. It is recommended when there are one or two blocks.

The latter two techniques may be possible only in some selected cases and are therefore not recommended as a routine. Your doctor is the best person to decide on the choice of treatment most suited to you.

What are the long-term results of coronary artery bypass surgery?

Blocks may develop in the vessel used for bypass after the surgery. About ten percent of veins used for bypass become blocked within a few days to few weeks after the surgery. Subsequently, about five percent people tend to develop blocks in the vessel used for bypass surgery every year. Thus, about fifty percent people who have had bypass surgery with a vein in the leg can develop new blocks within ten years after surgery. However, about eighty to ninety percent people who have had bypass with artery of the breast have normal blood supply to the heart for at least ten years. The long-term results of using the arteries for the bypass will be known by the turn of the century when those who have had such a procedure have been followed up for at least ten years.

Figure 15.4 Coronary artery bypass graft using veins

Veins connecting aorta and coronary artery beyond the block

- It is non-surgical and a less painful procedure;
- It requires shorter hospital stay;
- It has slightly lower risk to life;
- The risk to life is the same as for the first time even when angioplasty is performed again; and
- It can be done even in those who have had bypass surgery earlier.

The major advantages of bypass surgery as compared to angioplasty include the following:

- Development of blocks in the blood vessels used for bypass is very low if the artery from the breast is used. These arteries can be used to bypass a maximum of two blocked coronary arteries.
- The chances of survival in some people with ischaemic heart diseases are better.

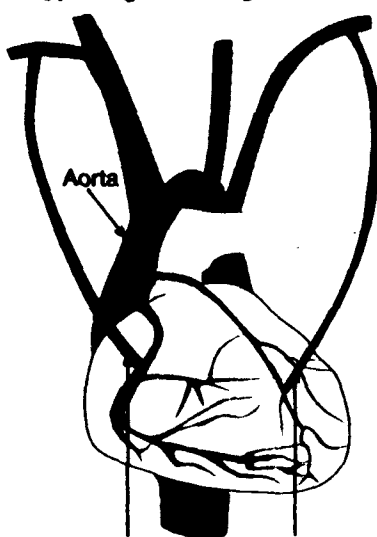
Can all cases of coronary artery blocks be treated with either angioplasty or bypass surgery?

No. Not all people with coronary artery blocks can be treated with either angioplasty or coronary bypass surgery.

In such cases, a new technique called "laser trans-myocardial revascularisation" is often used. This procedure, which can be either surgical or non-surgical, uses laser to remove the blocks or narrowing. The long-term benefits of this technique are not yet known and are being studied.

Occasionally, heart transplantation or "Ventricular Assisted Devices" (VAD) are recommended for management of a few selected cases of ischaemic heart disease. The facilities for such sophisticated procedures are not easily available and are therefore not routinely performed.

It is important to remember that your doctor is the best person to decide on the management option most suited to you. Sometimes it may even be difficult to make an accurate assessment of which is better: angioplasty or bypass surgery.

Figure 15.5. Coronary artery bypass graft using arteries

Arterial graft to coronary arteries from right and left arteries to the chest

AYURVEDA

According to Ayurvedic literature, the main risk factors of heart attack and angina are excessive use of irritants, hot and dry articles, incompatible diet, indigestion, food that is not agreeable, exertion, suppression of natural urges, trauma, stress, worry, fear, terror, faulty treatment, vomiting, excessive cleansing of the intestines through enema, and undernourishment. These can be further grouped into six categories:

1. **Violation of the principles of diet:** Charaka, the ancient Ayurvedic physician, describes eight types of diets where the is mainly on balance of quality and quantity of the food. Normally the food should contain six tastes in specific proportions. It should not be too greasy or dry and overeating should be avoided. The principles of diets are broken by excessive intake of sour foods, salt, pungent foods, alkaline foods, fasting or inadequate intake of food, excessive consumption of alcohol, foods rich in fats and oils and overeating. All these factors can lead to obesity and atherosclerosis of the coronary arteries.
2. **Violation of the principles of exercise:** Exercises should be done in such a way that there is no difficulty in breathing. Strenuous exercises can adversely affect the functions of the heart and lungs.
3. **Violation of the principles of treatment:** The risk of heart diseases increases if the principles of treatment are

broken in applying *vasti*, *virechana* and *yama*. Excessive use of medicines to pass the stools and reduce weight can increase the risk of heart diseases.

4. **Influence of emotional factors:** Anger, anxiety, fear and worry can precipitate a heart attack.

5. **Depletion of vital essence:** The concept of *ojas* or vital essence is unique in Ayurveda. Only eight drops of *ojas*, a reddish or yellowish substance are present in the heart. Reduced *ojas* can lead to three types of diseases: (a) discharge of *ojas* through urine, (b) weakness and loss of body functions, and (c) unconsciousness, reduction in the muscle mass of the body, emotional changes and sometimes even death. The symptoms of loss of *ojas* or vital essence are timidity, weakness, tendency to worry constantly, discomfort of the senses, loss of lustre of the skin, numbness in some parts of the body, dryness and undernourishment. *Ojas* is the first substance created in the body of all living beings. Its colour is like *ghee*, taste is like honey and smell is like roasted paddy.

6. **Concept of Srotovarodha — Agni and Amsrotorodha:** *Srotamsi* are channels of circulation of *doshas*, *dhatu*s and *malas*. There are various procedures, especially the Panchakarma therapy, that cleanse the subtle or microscopic channels through which the *doshas*, *dhatu*s and *malas* circulate. *Srotamsi* transports nutrients to various

parts of the body. Depending upon the type of disorder, there can be hyperactivity, obstruction, dilatation and flow through other pathways in the body. In the presence of risk factors of heart disease, the obstruction reaches the coronary arteries.

Charaka has said that the channels of collection of nutritional juices get contaminated due to eating heavy, cold and oily food and worry. In other words, the risk of heart attack and angina increases with excessive intake of food, especially oily foods and excessive stress and strain.

What factors lead to heart diseases?

According to Sushruta, the famous Ayurvedic surgeon of ancient times, abnormal doshas of the body contaminate the fluids in the body and adversely affect the heart by reducing its blood supply and/or its functions. This adverse effect leads to breathlessness, cough, hiccup, nausea, vomiting, loss of appetite, bad taste in the mouth, thirst, change in the colour of the skin, fainting and pain in the region of the heart.

Other contributory factors are imbalances of *ryan vayu*, *avalambaka kapha* and *sadhaka pitta*.

- *Vyan vayu* moves throughout the body but is present in the heart. It is like a force that helps circulate blood in the body.
- *Sadhaka pitta* helps in removing *kapha* and *tamas* from the heart. It is like a protein that helps in exchange of pure and impure bloods in various tissues of the body. Inadequate *sadhaka pitta* in the heart can reduce its oxygen level.
- *Avalambaka kapha* can be compared to the protein content inside and outside the body cells, especially the heart.

How can the risk factors be reduced?

Ayurveda recommends dietary modification, reducing stress, nutritional supplements, and exercises to reduce the

risk factors of heart attack and angina.

- **Dietary changes:** It is desirable that you avoid processed foods, avoid non-vegetarian food and food that is rich in animal fats and oils. Eat larger portions of green leafy vegetables and raw fruits.

- **Reducing stress:** Stress can increase the damage to the blood vessels due to atherosclerosis. It is therefore desirable that you reduce stress through relaxation techniques such as yoga, meditation, etc.

- **Nutritional supplements:** Ayurveda recommends specific nutrition supplements to prevent excessive oxidation of cholesterol.

- **Exercise:** It is desirable that you develop a regular routine of exercises and yoga. Mudra, pranayam and some specific yogaasanas are very effective in reducing the risk factors.

Medicines: Ayurveda recommends single and herbo-mineral medicines for reducing the risks of heart attack and angina. *Single medicines* include the following:

1. Two to five grams of medicines prepared from any one of the following with honey or water: Guggulu (*Commiphora wightii* (Arn.) Bhand.), Pushkarmula (*Inula racemosa* Hook.f.), Arjuna (*Terminalia arjuna*), Chandan (*Santalum album* Linn.) ginger, haritaki (*Terminalia chebula*) and Devadaru (*Cedrus deodara*).
2. Curd, sugar and milk. Sugarcane, grape, dates and *gulkand* are also recommended.
3. Two to five grams of powdered madhuyashti and katuki are recommended as mild laxatives.

Herbo-mineral preparations include:

1. Two hundred fifty to one hundred twenty-five milligrams of Prabhakar vati, visheshawar rasa or trinetra rasa are recommended twice or thrice a day.
2. Two hundred fifty to five hundred milligrams of rasa sindhur, krihsnabhra bhasma, makaradhwaja, brihada kasturibharava are recommended with honey twice of thrice a day.

HOMOEOPATHY

Homoeopathy lays special emphasis on management of four main risk factors of heart attack and angina. These include (a) mental stress; (b) high cholesterol levels; (c) atherosclerosis and (d) heart disease in other family members. The presence of one or more of these factors predisposes to heart disease. The risk increases manifold when a combination of more than one risk factors is present.

What is the Homoeopathic approach to management of risk factors?

Just as for all diseases, Homoeopathy lays special emphasis on the history. Your doctor will ask detailed questions about the following:

- **Your life-style:** This will include your occupation, diet, schedule of normal activities, addiction (if any), stressful periods either in the past or present, anticipated stress and personality type.
- **Family medical history:** It is important that you inform

your doctor about any heart disease in your family members, especially among the blood relatives. This will help him/her select appropriate medicines.

- **General examination:** A detailed medical examination is done to assess your general health and detect other associated problems, if any.

- **Investigations:** Several laboratory tests are recommended to rule out other underlying diseases.

What is the aim of Homoeopathic treatment?

The main aim of Homoeopathic treatment is to remove the causes of the disease. This is done through medicines, exercises, modifications in the diet and a regulated, disciplined life-style. Detailed below are the common management practices for the major risk factors of heart attack and angina.

Mental stress: The risk of developing heart disease is more if other risk factors are present along with stress.

Homoeopathic medicines normally used for management of mental stress include:

- **Natrum Mur.** It is recommended in case of grief and a tendency to suppress the emotion and/or brood over them. Such people are not likely to gain weight, even if the appetite is normal and may have an abnormal craving for food with excessive salt.
- **Ignatia.** This medicine is recommended when there is recent history of grief or shock, such loss of a loved one. As a result, one may withdraw into a shell, become anti-social and irritable.
- **Nux Vomica.** It is very effective for people with "Type A" personality who are over ambitious, have no regular hours for meals, are addicted to work, sleep late, smoke and drink a lot and who tend to take medicines irrationally.
- **Lycopodium.** This medicine is also recommended for people with "Type A" personality, especially those who are intellectual but physically weak. It is especially effective for those with problems with digestion, who crave sweets and hot drinks, are very dominating and high strung.

Other medicines used to cure stress-related problems include *Staphysagria*, *Argentum Nitricum*, *Arsenic Album* and *Phosphorus*.

Diseases in other members of the family: There are several Homoeopathic medicines that are deep acting and alter the inherited tendency to get diseases. These medicines act on the natural defense mechanism of the body and enhance it to its optimum level. As a result, the defense mechanism of the body can overcome any inherited traits for developing diseases. Medicines commonly prescribed for those in this group include *Thuja*, *Tuberculinum*, *Medorrhinum* etc.

High cholesterol level: Homoeopathy recommends the following main medicines for regulation of the chemical reactions in the body.

- **Cholestrinum.** Several clinical studies have indicated that this medicine acts on the liver and enhances its functions in such a way that the rate of utilization of cholesterol increases.
- **Calcarea Carb.** This is a deep acting medicine and is

recommended for those who are obese, have a sluggish digestion, a slow rate of chemical reactions in the body and are prone to high cholesterol levels.

- **Carduus Marianus.** This medicine is recommended for sluggish functions of the liver and pancreas and altered chemical reactions of fat in various parts of the body.

Other effective medicines are *chelidonium*, *phosphorus*, *chinanthus* etc.

Homoeopathy also emphasizes the need for diet modification, regular exercises, a disciplined and a peaceful life-style.

Atherosclerosis: Medicines normally recommended for management of atherosclerosis include *Baryta Mur*, *Kali 10D*, *Aurum Mur*, *Strophanthus*, *Natrum 10D*, *Crataegus*, *Baryta 10D*, *Amyl Nitrosus*, *Arsenic 10D* and *Adrenaline*.

The above medicines have a specific action on the blood vessels and slow the progress of atherosclerosis. If the choice of medicines and their dosages are correct, they:

- Discourage further deterioration and progress of the disease
- Dissolve the calcium and other deposits on the inner lining of the arteries over a period of time;
- Relieve symptoms of chest pain, high blood pressure, breathlessness etc.
- Provide a general sense of physical and mental well being, thus prolonging and improving the quality of life.

To conclude, the wide spectrum of Homoeopathic medicines have immense scope in minimising the risk factors of heart attack and angina, thereby maximising your quality of life. It is however important to remember that a balanced life style and habits are critical for controlling the risk factors. Homoeopathy recommends regular hours of meals, adequate rest and physical exercise in consultation with a specialist, a controlled, well balanced diet, giving up addictions such as smoking, adequate recreation and regular practice of meditation, yoga etc. You also need to consult with the doctor regularly in order to modify the dose and/or medicines, if necessary.

■ NATURE CURE

Detailed below are the main risk factors of heart attack and angina as per the Nature Cure system of medicine:

- **Diet:** Nature Cure also opines that high blood cholesterol is mainly due to excessive consumption of animal products such as meat, eggs and dairy products such as milk, cheese, butter, *ghee* etc. Also, chlorinated tap water and animal fats in the diet combine in the body through chemical reactions to form a paste like substance. This paste deposits on the inner lining of the arteries and therefore narrows them.
- **Tobacco and alcohol:** Nicotine present in tobacco and regular consumption of alcohol can harm the lining of the arteries.
- **Obesity:** The popular saying that "the longer the belt, the shorter the life" is very true. It can therefore be also said that "the shorter the belt, the longer the life". Obesity

increases the surface area of the body and forces the heart to pump blood to a larger area.

Normally, obesity is defined as body weight above twenty percent of ideal body for the age, sex and height. One of the convenient ways to find out if you are obese or not is to calculate one kilogram of weight for every inch of your height. Thus, if your height is sixty-five inches, your weight should be around sixty-five kilograms. Another way to calculate the ideal weight is to measure your height in centimetres and deduct hundred from it. The remaining number is your recommended weight in kilos. Thus, if your height is one hundred and sixty-five centimetres, your ideal weight is around sixty-five kilograms.

- **High blood cholesterol:** High blood cholesterol is also the result of inadequate exercise and/or excessive intake

of fats or carbohydrates. You can maintain normal weight and cholesterol levels by strictly following a healthy diet.

How are blood cholesterol levels lowered?

Nature Cure recommends the following dietary measures for reducing blood levels of cholesterol.

- **Avoid all animal products:** Animal products are rich in fat, cholesterol and very low in fiber. It is therefore recommended that you avoid flesh foods, eggs, fish, animal organs, and consume larger portions of vegetables, fruits, salads, sprouts, etc. It is also desirable that you avoid full cream milk, butter and ghee.
- **Avoid high protein diet:** In addition to being rich in fat, meat, eggs, and cheese are also rich sources of protein. Animal protein increases the risk of atherosclerosis and since it is difficult to digest, there is increased stress on liver, pancreas and kidneys.
- **Low fat diet:** A diet consisting of brown rice, salads and curds made out of skimmed milk can improve elasticity of the arteries.
- **Vitamin E:** It is desirable that you consume wheat germ oil as it contains Vitamin "E". This oil is more effective if consumed with sea plants.
- **Salt reduction:** Reducing salt intake can help maintain the normal water balance in the body and therefore reduce work load on the heart and kidneys.
- **Eat complex carbohydrates:** It is desirable to eat more complex carbohydrates (starch) as they reduce cholesterol and triglyceride levels in the blood and avoid sugar.
- **Use unsaturated oil:** Consume unsaturated oils such as corn oil, soybean oil, poppy seed oil, sunflower oil, safflower oil, etc. It is desirable to avoid coconut oil for cooking.
- **Avoid large meals:** Some people tend to avoid breakfast. They are therefore more likely to eat larger portions of food during lunch or dinner. Eating larger meals can lead to higher levels of blood cholesterol.
- **Prudent diet:** A prudent diet is one that consists of

saturated fatty acids, monounsaturated and polyunsaturated fatty acids in equal proportions. This type of diet can lower blood cholesterol and therefore reduce the risk of heart attack and angina. The total intake of fat and oil should not exceed more than thirty grams per person per day.

You need to consume larger portions of dark green leafy vegetables, deep yellow vegetables and those that are rich in iodine such as marine plants, water grass etc. Increased iodine content increases the rate of chemical reactions in the body and therefore helps burn more calories. Vegetables are rich in fibres and high fibre diet is necessary to reduce blood cholesterol levels.

- **Fasting:** Fasting helps reduce body weight as the body fat is used to generate calories. It also tones the liver and increases the rate of chemical reactions in the body. A fast for three to five days initially and once a week subsequently is normally recommended to reduce blood cholesterol levels.
- **Exercise:** Aerobic exercises such as walking, jogging, swimming, cycling, etc. use plenty of oxygen to burn the calories and increase rate of all chemical reactions in the body. Deep breathing exercise also provides plenty of oxygen.
- **Enema:** It is important that the movements of the bowels are normal in order to avoid constipation. Irregular bowel movements can lead to accumulation of "poisons" or toxins in the body. These toxins, if in the blood can irritate the lining of arteries.
- **Sweating:** Any method that increases sweating can reduce the risk of heart attack and angina. This is because the skin helps use cholesterol from the body. Nature Cure recommends sweating treatments such as steam bath, sauna bath, sunbath and different types of packs.
- **Herbal remedies:** Iodine plays a critical role in activating the *thyroid gland* and in turn increase the rate of all chemical reactions in the body. Sea plants are rich in iodine. This is why herbs such as water grass, lettuce, horse radish, garlic and mistletoe help reduce cholesterol.



UNANI

Unani physicians include heart among *Aza Raisa* or vital organs. Ancient Unani physicians had detailed information on the various types of heart diseases, their causes and signs and symptoms. They had therefore described management of almost all types of heart diseases. The following ways of controlling the risk factors of angina have been described by various eminent Unani physicians in their classical text.

- **Temperament:** People who have *Damvi* (Sanguine) and *Safravi* (Choleric) temperament are more likely to have diseases of the heart. Such people are usually in a "hurry" and therefore are more likely to have stress. They may also have a hostile temperament and may be involved in the struggle to achieve more and more in life.
- **Sex:** Females are less likely to have heart diseases as compared to men as they predominantly fall under *Damvi* and *Safravi* temperament.

- **Diet:** The risk of ischaemic heart disease is more in people who eat predominantly non-vegetarian diet. Foods of animal origin produce thick and sticky *humours* that circulate in the blood. These sticky or viscid humours sometimes stick to the walls of the arteries and hinder the normal flow of blood. Since vegetarian foods do not produce this kind of sticky humour, vegetarians are less likely to have ischaemic heart disease.

- **Natural foods:** Ancient physicians encouraged use of whole grains such as seeds, cereals, nuts and fresh raw fruits and vegetables in order to prevent heart diseases.

- **Exercise:** Unani system of medicine also emphasizes the importance of regular exercise to prevent heart attack and angina. This is because exercise stimulates circulation, improves the blood stream and clears the blood from unwanted and waste humours.

- **Smoking and tobacco use:** Tobacco chewing and

smoking increase the risk of heart disease. Rhazes, an ancient Unani physician has mentioned in his book "*Al-Hawi*" that chewing tobacco results in production of *Khilt-e-Radi*, which is harmful to all vital organs of the body.

- **Psychological conditions:** Stress and tension contribute to many illnesses. Suppressed anger, aggression, guilt, grief and domestic problems have an effect on the health through the nervous system. These factors decrease *Quwa-Nafsania* in the vital organs.

- **Indigestion:** Recurrent indigestion is a very important but generally neglected factor that can lead to ischaemic heart disease. This is because indigestion results in production of unwanted humours that adversely affect the vital organs. Unani physicians have mentioned that digestion

needs to be paid special attention in those who have heart diseases. This is because indigestion leads to excess production of gases. These gases can disturb the normal functions of the heart through their direct action on a nerve called the *vagus* nerve.

- **Excessive sexual indulgence:** Unani system of medicine opines that excess of sexual play increases the risk of ischaemic heart disease. This is because excessive sexual indulgence activates and adversely affects the functions of the vital organs.

- **Associated diseases:** Unani physicians believed that diseases such as diabetes, hysteria (a psychiatric disorder), cholera, plague, *Damvi* and *Safravi* fevers, epilepsy, etc. increase the risk of heart diseases.

DEFINITIONS

Amino acids are chemical compounds that are building blocks of protein.

Angina is the term used for chest pain that normally occurs during or after exercise or emotional stress and is relieved by rest. Angina is an indication that the heart is not receiving adequate oxygen.

Angiography is a procedure through which the narrowing and blocks of the blood vessels, especially the coronary arteries, are detected. This is done by injecting a contrast medium in the arteries.

Angioplasty is a process of dilating blood vessels, especially the coronary arteries, by inflation of a small balloon catheter.

Aorta is the single largest artery that starts from the left ventricle of the heart. The blood is circulated to the entire body through the aorta.

Atherosclerosis is a disorder of the large and medium sized arteries where the cholesterol, fatty substances, waste products, etc. deposit on the inner layer of the arteries.

Catheter is a flexible rubber tube that is inserted in a blood vessel or any hollow cavity in the body to instill or remove fluids.

Cholesterol is a fat soluble substance widely distributed in the body.

Coronary arteries are those that supply blood to the heart muscle.

Gall bladder is an organ on the lower surface of the liver. It stores bile, a secretion of the liver. During digestion of fats, gall bladder contracts to throw out bile in the first part of the small intestine.

Genes are the biological units of genetic material and inheritance.

Hormones are chemical substances that are secreted in small amounts by some organs of the body. They act on other organs of the body.

Oxidation is a process through which the oxygen content of the compound increases.

Thyroid gland is located in front of the neck. It secretes hormones that increases the rate of chemical reactions in the body, affect body temperature, maintains growth hormone secretion, maturation of bones, functions of the heart, synthesis of several enzymes. It is also important for muscle tone and vigor.

Veins are blood vessels that carry impure blood from all parts of the body to the heart.

Ventricles are the two high-pressure, lower chambers of the heart that pumps blood to the lungs and the entire body.

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In the next issue: Diabetic Retinopathy

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Healing Powers of Water

Most people believe that we feel thirsty whenever our body needs more water. While this is true, recent research studies have indicated that there are several other indicators of inadequate water in some or all parts of the body. Ignoring these indicators can lead to several major diseases that medicines may cure but not treat. Almost everyone knows that drinking adequate water is good for health. But most people do not understand why this is so and what exactly happens when the body does not get adequate water. This issue focuses on the critical role of water in preventing several health problems, some of which can lead to major diseases. It also describes the various techniques of natural healing where water plays an important role.

Up to seventy percent of the total body weight is due to water. Although it is present in all parts of the body, it is more in organs such as lungs and brain and fluids such as blood, lymph, saliva and secretions by the organs of the digestive system.

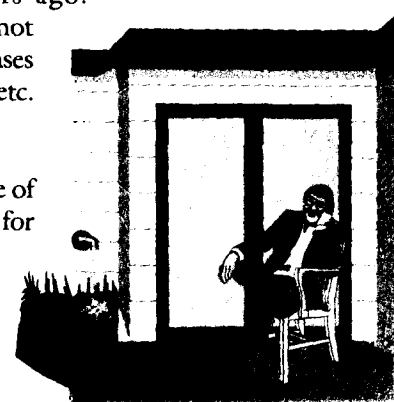
Water is available liberally in most places. There are two main sources of water — underground and surface water (rain-water). Normally, surface water is "soft" and underground water is "hard". This means that the underground water has several minerals and/or compounds mixed in it. Soft water is more effective for therapeutic purposes as compared to hard water. *It is however important to remember that impurities of soft water, if present, can adversely affect the health.* Therefore, it is necessary to purify water to be used for drinking and for therapy.

Water has been an integral part of treatment of several diseases by the ancient Egyptians, Hebrews, Greeks, Persians and Hindus for several centuries. The Chinese used water as a remedy several centuries before Christ. Japanese used cold water for treatment of several diseases almost eight hundred years ago. Hippocrates, father of modern medicine, also used hot and cold water successfully for management of diseases such as fever, ulcers, bleeding in or outside the body, etc.

How is the body water regulated?

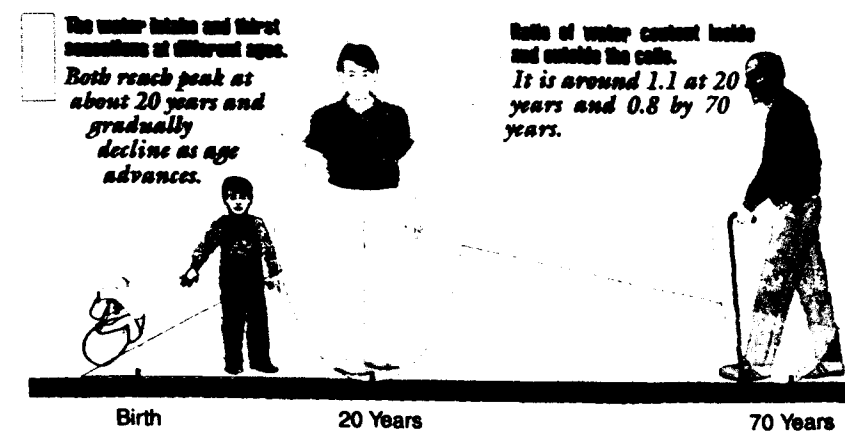
Whenever there is water shortage in your house, you would prioritize the use of water for essential purposes. For example, you would use the necessary water for drinking and cooking but reduce the amount of water used for bathing, washing, etc. Similarly, when the body receives less water, *histamine*, a chemical compound present in all cells, initiates a system of water regulation. This system prioritizes the distribution of water to more important organs of the body such as brain, heart, lungs, etc.

Histamine directs and operates a system of chemicals called *neurotransmitters*. These chemicals either modify or transmit impulses in the nerves. Histamine directs some neurotransmitters to operate sub-systems to regulate water intake.



It is just water. I do not need it to remain healthy.

Definitions of all technical terms used in this issue are given on the last page.

Figure 16.1 Water regulation at different ages

These sub-systems use chemical substances such as "vasopressin" and "renin-angiotensin" for regulating water intake and distribution.

Vasopressin is a hormone that increases re-absorption of water by the kidneys and therefore decreases the production of urine. Renin is an enzyme produced and stored in kidneys. Whenever the volume of blood decreases, renin initiates a series of chemical reactions that produce a chemical compound, *angiotensin*. Angiotensin results in contraction of the blood vessels of the kidneys and therefore reduces the rate of filtration of blood by the kidneys. Reduced filtration helps the body to retain more water.

There are three stages of water regulation of body at different stages of life. These include (a) before birth, (b) between birth and adolescence and (c) in adulthood. Before birth, the unborn baby sends signals to the mother if more water is required for its growth and development. Thus, although the unborn baby sends the response, the mother experiences the effect. It is believed that morning sickness in a pregnant woman is the first indicator that the unborn baby needs more water.

Water regulation efficiency of the body reaches the peak by the age of twenty years. Subsequently, it gradually declines through life. Thus, the thirst sensation gradually decreases as age advances. This is perhaps why chronic diseases such as arthritis, high blood pressure, etc. that are also attributed to inadequate intake of water are more common in the older age group. The amount of tea, coffee, alcohol, aerated drinks etc. you consume regularly may also adversely affect the water regulation in later life.

The ratio of the water content in and outside the cells of the various organs is very important. As age advances, water content in the cells decreases. Since the water content in each cell plays a vital role in maintaining

its normal function, inadequate water can lead to loss of some functions. Loss of functions results in specific signs and symptoms. Figure 16.1 illustrates the water intake and thirst sensations and the ratio of water inside and outside the cells at different ages.

Why is water important for maintaining normal health?

The water content in various parts of the body regulates their functions. They also help regulate the functions of the solids such as minerals, vitamins, etc. dissolved in the water. In

other words, every function of the body is influenced by the flow of water in the various organs. Adequate distribution of water in all parts of the body ensures that water and the chemical substances that it transports (such as hormones, nutrients, etc.) first reach the more important organs such as the brain, heart, kidneys and lungs. Several organs secrete chemical substances that act on distant parts of the body. These chemicals regulate their own production and release in to the "water" around them.

Box 16.1 describes main features of water in the body. In addition to these, Nature Cure describes the following roles of water in our body:

1. Water helps maintain the moisture of the lining of the internal organs of the body;
2. It maintains normal volume and consistency of fluids such as blood and lymph;
3. It regulates body temperature;
4. It removes "poisons" or "toxins" from the body through urine, sweat and breathing; and
5. Water is essential for regulating the normal structure and functions of the skin.

The body loses about four litres of water every day. It is therefore necessary to replenish this volume by drinking at least the equivalent amount of water every day. Inadequate

Box 16.1 Main features of water in the body

- Necessary for all chemical reactions in the body. Just as water helps a seed grow into a tree, it also helps our body grow from birth to adulthood.
- The flow of water inside and outside the cells generates energy. This energy is stored in the body along with other chemical sources of energy in the body.
- The energy generated by the water in the cells helps transmit impulses in the nerves.
- Helps formation of a glue-like material that helps the solid substances in the walls of the cells to be "stuck" to each other.
- Helps transport the chemical substances produced by the brain that carry its messages to different parts of the body. Just as there are lanes on a main road for different types of vehicles, chemical substances of the brain are transported in the "water lanes" along the length of the nerves.
- Water content in the body influences the function of the various proteins and enzymes that are dissolved in it.

intake of water can lead to dehydration.

What is dehydration?

Dehydration is excessive loss of water from the body. It results in imbalance in sodium, potassium and chlorides levels. Normally, dehydration is the term used when there is inadequate water in all parts of the body. This is often the result of rapid loss of water due to conditions such as fever, diarrhoea, vomiting, or etc.

The common symptoms of dehydration of the entire body include increased thirst, loss of skin elasticity, dry skin, decreased urine production, irritability and confusion. This is the stage when the body's natural compensatory mechanism of water regulation is not able to meet the minimum requirement for the vital organs. As mentioned earlier, dehydration may be present in some specific cells or organs of the body without resulting in these acute symptoms.

What are the indications of dehydration?

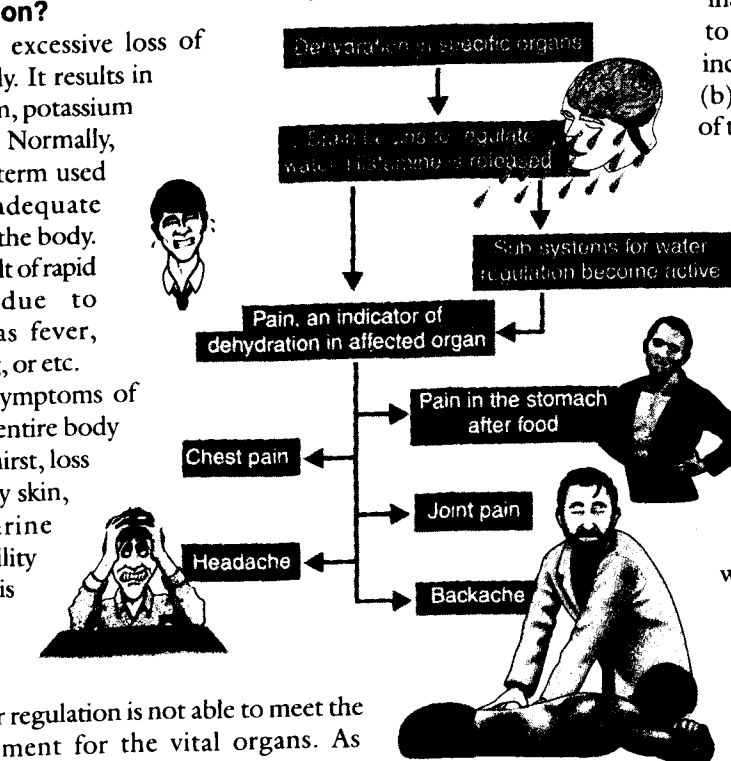
Thirst is an early indicator of inadequate water in the entire body. However, there can be inadequate water supply to some parts of the body without resulting in thirst. Inadequate water in the body cells can adversely affect their functioning. Depending upon the organ affected by inadequate water supply, there are specific signs and symptoms. *Chronic pains and allergies are the most common symptoms indicating limited functions of an organ due to chronic dehydration of the affected organs.* Figure 16.2 illustrates the common types of pain due to dehydration of specific organs.

What are the common health problems due to chronic dehydration?

Detailed below are some of the health hazards due to chronic deprivation of water to specific organs of the body.

DYSPEPSIA

Dyspepsia is the term used for a vague feeling of discomfort in the stomach region soon after eating food. This discomfort can be in the form of a feeling of fullness, heartburn, bloating and nausea. Dyspepsia is not a disease but a symptom indicating that there is an underlying disease such as ulcer in the stomach, diseases of the *gall bladder* or *chronic appendicitis*.

Figure 16.2 Common types of pain due to dehydration in specific organs

Why does inadequate water intake lead to dyspepsia?

There are two main reasons why inadequate water intake can lead to dyspepsia. These include (a) increased acid in the stomach and (b) changes in the normal functions of the pancreas.

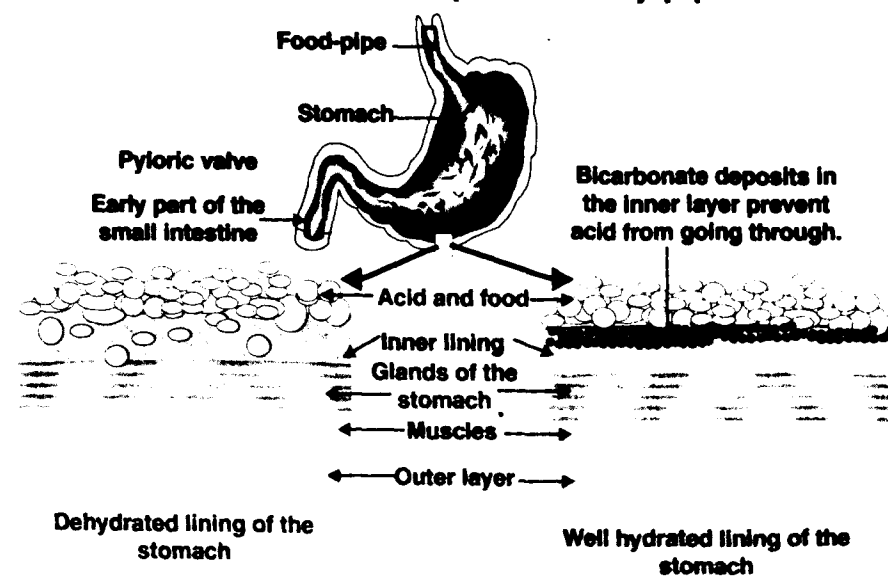
Increased acid in the stomach:

The secretions that line the inner layer of the stomach consist of ninety eight percent water and two percent support like structure that "traps" water. This trapped water forms a protective layer on the inner lining of the stomach. The cells below this protective layer secrete a chemical compound, *sodium bicarbonate*, which in turn is trapped by the inner water layer. Acid is secreted in the stomach for breakdown of complex food particles. When this acid, which contains chloride, tries to enter the protective layer of water in the stomach, the sodium bicarbonate neutralizes

it. As a result, sodium from the bicarbonate and chlorine from the acid combine form salt. Excess salt reduces the amount of water trapped on the inner layer of the stomach. When the water content in the protective layer decreases, the acid comes in contact with the inner layer of the stomach and causes pain.

Changes in the functions of the pancreas: Pancreas is an organ of the digestive system that is situated behind the stomach. Although its main function is to secrete insulin for regulation of blood sugar, it also secretes some important digestive enzymes into the intestine. In addition, it secretes a watery bicarbonate solution that makes the intestines alkaline. Thus, when the acid from the stomach reaches the intestines, the bicarbonate solution neutralizes it.

At the end of breakdown of solid foods that are hard to digest by the acids in the stomach, the food becomes liquefied. This liquefied but slightly acidic food enters the first part of the small intestine through a valve called the *pyloric valve*. This valve normally does not allow the contents of the intestine to enter the stomach. It is regulated by messages from both the sides. This means that the valve can function effectively when it receives message that the stomach is ready to send food to the intestine and the intestine is ready to receive it. The intestine sends the message to the pyloric valve to open when there is adequate watery bicarbonate. When the pancreas does not get adequate water from the blood circulation, there is

Figure 16.3 Role of water in prevention of dyspepsia

inadequate secretion of watery bicarbonate solution. As a result, the intestine is not able to send effective messages to the pyloric valve to allow food to enter. Figure 16.3 illustrates how decreased water in the stomach can lead to dyspepsia or pain.

How does drinking more water prevent dyspepsia?

When you drink a glass of water, especially on empty stomach, it passes into the intestines immediately and is absorbed into the body. After about one to one-and-a-half-hours, the absorbed water is secreted into the stomach through its inner layer and as a result removes the excess salt deposits on it. Thus, the protective layer of water remains intact. The acids therefore cannot penetrate the layer and cause dyspepsia. This is why Nature Cure recommends drinking water at least an hour before meals.

You can cure gastritis and heartburn just by increasing the intake of water to about two and a half liters of water per day. Normally, the discomfort and pain subside within a few days. However, if the symptoms have been present for a long time, the benefits may be observed after a few weeks. In case of ulcers in the stomach or diseases of the gall bladder, your doctor is likely to suggest dietary modification such as eating larger portions of fresh vegetables and fruits and avoiding foods rich in fats.

What is the role of medicines in dyspepsia?

Medicines such as *Ranitidine* or *Cimetidine* that are extensively prescribed for control of dyspepsia are very effective for short-term therapy. However, it is likely that prolonged use of these medicines may actually be harmful. This is because they block the action of histamine on specific "receptors" in the body. Some cells in the stomach that produce acid are sensitive to the blocking action on histamine and therefore secrete less acid. However, many cells in other parts of the body that do not produce acid are also sensitive to the blocking action on histamine. As

mentioned earlier, one of the important functions of histamine is to control water regulation in different cells of the body. If its action is blocked in some cells, it can cause chronic dehydration in these cells.

JOINT PAIN

Some medical practitioners opine that pain in the joints is one of the early indicators of water deficiency in the affected joints. All the ends of the bone in a joint have a protective structure called *cartilage*. Cartilages have more water content as compared to the bones, which are harder. The water in the cartilage helps provide lubrication and therefore enables the two ends of the bone to glide one over another very freely. During this

gliding motion, some cells die and are peeled away. These dead cells are replaced by new cells. When there is less water in the cartilage, the lubrication is less. Thus, the number of dead cells increases. Joint pains result when the number of dead cells is more than the number of new cells being produced. Figure 16.4 illustrates the role of water in the normal functioning of the joints.

Low backache: Water shortage in the backbone can also lead to low back pain. Joints in the backbone contain more water in two areas: (a) in the surface of the cartilage near the backbones and (b) in the centre of the discs between the two backbones. The water near the cartilage surface provides lubrication just as in the joints of the hands and legs. The water in the disc supports almost seventy-five percent of the weight of the upper part of the body that tends to compress the discs. The tissues around the discs support the remaining twenty-five percent of the upper body weight.

Water in the joints of the backbones is circulated through periodic creation of a vacuum. Specific exercises are normally recommended to strengthen the muscles of the backbone and therefore reduce pain. This is because these exercises increase the water circulation by drawing it in the vacuum area. Drinking more water will not only maintain normal content of the water in these joints but also increase the efficiency of the exercise related water regulation in the discs.

It is important to remember that appropriate and regular exercises and posture are necessary for preventing backache. Water mainly contributes to the positive effects of exercises and correct posture.

STRESS AND DEPRESSION

Stress is the term used for any emotional, physical, social or other factors that requires a response or change. Dehydration is also a type of stress and therefore this stress mobilizes body reserves to deal with the stress. As a result,

some of the body reserves of water are also used up. Thus, dehydration causes stress and stress can cause further dehydration.

Depression is the term used to describe an abnormal emotional state that results in exaggerated feelings of sadness, dejection, worthlessness, emptiness and hopelessness. These feelings are not inappropriate and out of proportion with the reality. Inadequate water in the brain can precipitate depression. The brain generates electrical energy from the water present in it. Decreased water in the brain leads to inadequate production of the electrical energy. Thus, the functions of the brain that depend on this type of energy become inefficient. When the normal functions of the brain are affected, depression can set in.

What are the effects of stress on water regulation?

Any type of stress results in secretion of several hormones. These hormones continue to be in higher concentration till the stress is relieved. Since the body is not able to distinguish between different types of stress, dehydration also results in secretion of higher amount of these hormones. Detailed below are some of the hormones secreted in large amounts during any type of stress.

- **Endorphins:** These hormones are secreted by a small gland in the brain called *pituitary gland*. They act on the nervous system to reduce pain. Excessive secretion of endorphins may affect the normal pain reaction in the body.
- **Cortisone:** It is a chemical compound produced by liver and also made synthetically. During emergencies, the cortisone begins the process of breakdown of fats and proteins for releasing energy and formation of new proteins and chemical substances for use by the muscles respectively. Thus, cortisone promotes utilization of some of the body reserves. Prolonged action of cortisone may therefore reduce specific body reserves.
- **Prolactin:** Prolactin is a hormone secreted by the pituitary gland. It ensures that a woman continues to produce milk after child-birth even when there is dehydration or stress that can cause dehydration. Thus prolactin secretion increases during stress or dehydration in order to maintain the normal water content of the breast milk.

Research studies have indicated that long-term increased prolactin secretion can lead to breast tumours in mice. Some medical practitioners therefore believe that the risk of breast tumour may be higher in women who have increased prolactin secretion due to chronic dehydration.

- **Vasopressin:** Vasopressin, a hormone secreted by the pituitary gland, is one of the hormones that is involved in the rationing and distribution of water as per the priority of the vital organs. In case of dehydration, the nerve cells produce more vasopressin as compared to other cells of the body.

What is the effect of alcohol on water regulation?

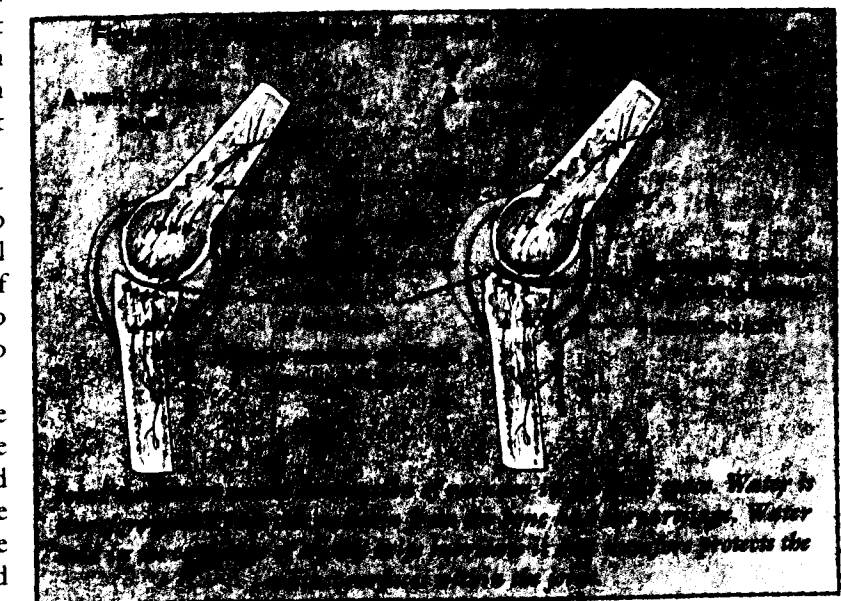
Alcohol adversely affects water regulation because of two main reasons: (a) it suppresses the secretion of vasopressin and (b) it leads to chronic dehydration in some parts of the body.

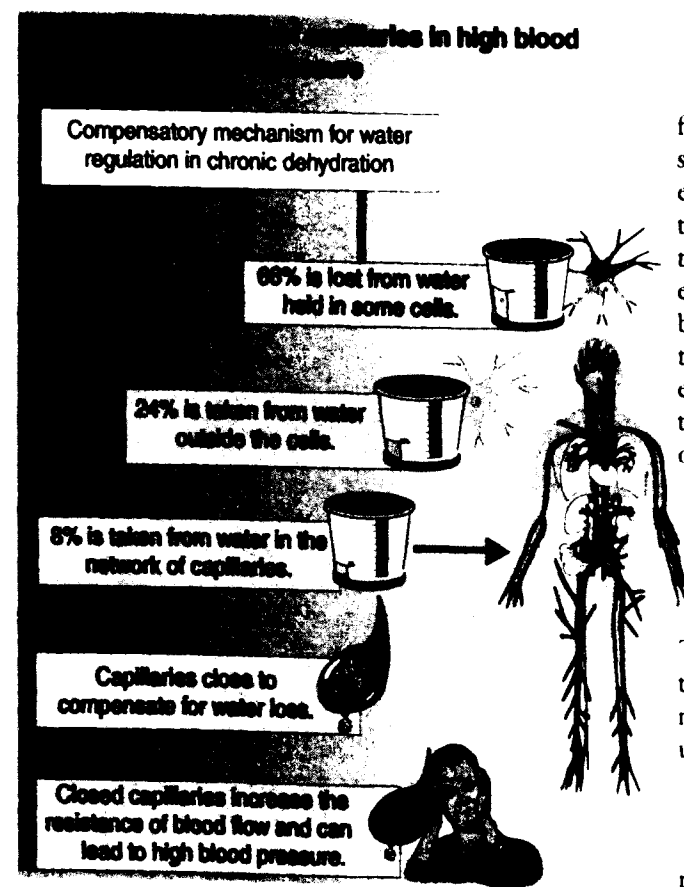
Alcohol suppresses the secretion of vasopressin from the pituitary gland. Decreased vasopressin can adversely affect the body's natural compensatory mechanisms of water regulation. This adds to the stress and results in excessive secretion of other hormones such as endorphins, which are naturally addictive.

Regular intake of alcohol and caffeine (in coffee, cola drinks, etc.) can lead to chronic dehydration in some organs of the body. In such situations, whenever the nerve requires more water, the blood circulation along the nerve increases. Increased blood circulation results in increased release of histamine from the cells lining the nerves. Persistently high histamine can cause inflammation like reaction that may damage the lining of the nerves over a period of time. When the rate of damage exceeds the rate of repair, nerve disorders can set in.

HIGH BLOOD PRESSURE

Whenever there is water shortage in some parts of the body, the compensatory mechanism takes sixty-six percent of the additional requirement from the water normally present in the cells, twenty-six percent from the water outside the cells and eight percent from the blood volume. In order to maintain the normal blood volume, some capillaries close down and pour their water content in the blood. Thus, the extent of activity in the capillaries in different parts of the body ultimately determines the volume of the circulating blood. Closed capillaries increase the resistance to blood flow around them. Increased resistance to blood flow leads to high blood pressure. (For further information on high blood pressure, refer to the Health





Update issues on Hypertension, Volume I, Issue No. 1, September 1996)

It is important to remember that drinking more water alone cannot prevent or control high blood pressure. This is because there are several other important factors that contribute to it. Adequate water intake can delay the onset of high blood pressure or reduce its severity. The role of capillaries in high blood pressure is as shown in Figure 16.5.

HIGH BLOOD CHOLESTEROL

High blood cholesterol indicates that the cells of the body have lost the ability to allow adequate water to travel through the cell wall. This is because cholesterol is like natural cement that fills the gaps of the cell walls and prevents water from passing through it. Some medical practitioners opine that excessive deposition of cholesterol in the cell walls is a natural protective mechanism against dehydration of the cells. This is because during dehydration, the normal quality of water to form an adhesive lining to bind the cell walls together is lost.

Figure 16.6 illustrates the role of vital organs in concentration of blood and the reason for cholesterol adaptation of the body to dehydration. Several weeks after increasing the daily water intake, the water content in the cells will become normal. Thus the flow of water through the cell walls will also become normal. As a result, the need for cholesterol defense mechanism against passage of water across the cell walls will be gradually decrease. Hence, the body will produce less cholesterol.

OBESITY

The brain is very sensitive to low energy levels available for its functions. Low energy levels cause thirst and hunger sensations. Normally, hormones are necessary to mobilize energy from the stored fat. Since this process takes some time and the brain requires energy urgently, it depends on the blood sugar for the energy. It also uses water to produce electricity and transport its messages to various parts of the body. Thus, the sensation of thirst and hunger are felt together to indicate the brain's needs for more instant energy. Drinking adequate water before the meal will reduce the intensity of the thirst and therefore help prevent overeating. In case the water intake is inadequate, you are likely to feel more "hungry" and eat larger portions of food at more frequent intervals in order to supply necessary sugar to the brain.

It is important to note that only twenty percent of the energy from the food reaches the brain. The energy from food that is not used by any other part of the body is stored. On the other hand, if the brain derives more energy from water, the unused water is excreted as urine. Thus, the risk of weight gain is greatly reduced.

ASTHMA AND ALLERGIES

Asthma is a disease of the respiratory system that causes repeated attacks of difficulty in breathing, wheezing because of constriction of the air passages, coughing and thick secretions of the air passages. It is often due to allergy. People with asthma have increased histamine in the lung, which results in contraction of the air passages. Since lungs help losses of water, contraction of the air passages will lead to decreased loss of water. This is also one of the defense mechanisms of the water in case of dehydration.

Histamine also plays an important role in the body's natural defense mechanism against disease causing agents. When the histamine level increases, the defense mechanism becomes exaggerated. Some studies on animals have indicated that increased water intake reduces histamine production after one to four weeks of appropriate water regulation. They therefore are less prone for allergic reactions. This is why some medical practitioners opine that drinking adequate water may help control asthma.

It is important to remember that drinking excess water will not control asthma immediately. Drinking about ten glasses of water per day for a few weeks can lead to adequate water in all cells of the body. This is when the healing powers of water can be experienced.

What is the normal daily requirement of water?

It is very difficult to quantify the exact amount of water each person requires to maintain normal functioning of all the organs of the body. This is because the quantity of water required for the body functions depends on several factors such as age, climate, season, physical activity, type of food consumed, amount of condiments and spices used for cooking, the water content in the food, salt intake etc.

Normally, our daily diet provides about two-third of the body's requirement of water. Some health practitioners suggest that you drink about eight to ten glasses of water everyday to meet the remaining one-third of the body's requirement. You also need to drink a lot of water when you are tired and/or are sweating profusely.

It is also important to learn when not to drink water. It is desirable that you avoid drinking water while eating food, as it will adversely affect chewing of the food and secretion of the saliva. The water leaves the stomach within five to ten minutes of drinking it, and therefore some of the food is also likely to leave the stomach along with the water. Thus, digestion of the food is likely to be adversely affected. Water also dilutes the digestive juices in the stomach, thus leading to indigestion. It is desirable that you drink water on empty stomach or three hours after food or one to one and a half hours before food.

One of the ways to ensure that you are drinking adequate water is to observe the colour of your urine. If it is almost white, it means that all parts of your body are hydrated. Yellowish tint in the urine indicates that the kidneys have to work harder to remove the waste products because of inadequate water in the blood.

How should you drink water?

Most people tend to drink water in large gulps. Nature Cure recommends that you need to "eat liquids and drink solids". This means that you need to take water sip by sip, and "chew" it in the mouth in order to mix it with the saliva. Avoid regular use of straws for drinking water and/or fluids.

What is the best type of water for drinking?

Nature Cure recommends drinking pure water to which no minerals are added. This is because the minerals may either be rejected or deposited in some parts of the body, thus causing health problems. However, water from natural sources may contain minerals that can be beneficial to the body in specific conditions due to their reaction and affinity towards the mineral content in the food.

Does temperature of the drinking water affect health?

Yes, the temperature of the water you drink is also important for maintaining normal health. Cold water from natural sources (which is not cooled in a refrigerator or with ice) is fit for drinking because of six main reasons.

- Cold water:
1. Lowers the body temperature;
 2. Dilutes the blood to the required

consistency;

3. Promotes excretion of poisons from the skin in the form of "evaporation";
4. Stimulates the normal functions of the kidneys and therefore increases the rate of removal of "poisons" from the body through the urine;
5. Increases movements of the intestines, thus facilitating formation and passing of soft stools.

Sipping hot water has several benefits too. For example, as soon as you drink hot water, there is instant stimulation of the inner lining of the stomach and contraction of its blood vessels. As a result, there is less blood circulation in the lining of the stomach. This leads to reduced activity of the glands that secrete acids in the stomach. Thus, you are less likely to suffer from increased acid secretions in the stomach.

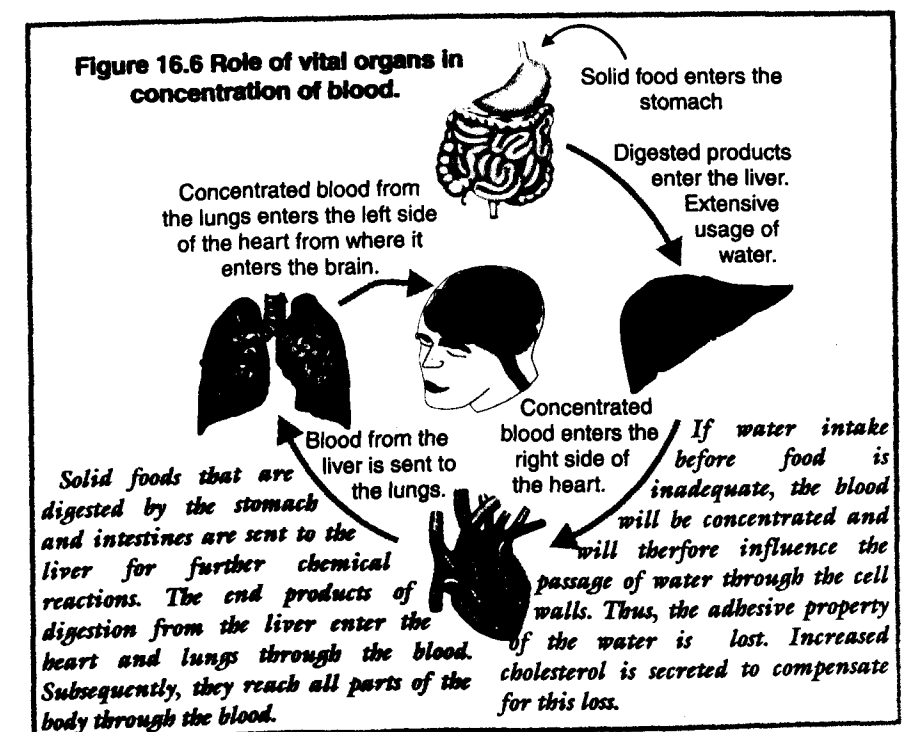
Hot water cleans the stomach, relieves heartburn, belching, flatulence, acute indigestion, vomiting and cramps in the abdomen. *Drinking hot water is not recommended for those who suffer from ulcers in the stomach.* It is important to remember that hot water should be sipped and not gulped.

What is hydrotherapy?

Hydrotherapy is a branch of healing systems that deals with the management of diseases such as headache, constipation, high blood pressure, etc. by using water, either as an external application or taken internally or both.

Water is used for hydrotherapy because of three main reasons:

1. It has immense power for absorbing and communicating heat;
2. Water is an universal solvent. This means that majority of the substances can dissolve in water; and



3. Water can be easily frozen to a solid state as ice or heated to a gaseous form as vapour.

How is water used in management of diseases?

Water is used in various forms for maintaining health and management of several diseases. These include:

- **Temperature:** Different temperatures of water are used for different health problems. For example, cold water, warm or neutral water and hot water.

- **Packs:** Water is used as cold packs, hot packs, whole body packs and partial body packs.

- **Baths:** Nature Cure treatment normally includes four main types of baths. These include:

- i. Immersion bath in which the entire body is immersed in water;
- ii. Sitz bath, in which only the buttocks or hips are immersed in water or salt solution;
- iii. Sweating baths such as vapour bath or hot air bath;
- iv. Medicated baths such as brine bath, sulphur bath, foam bath, etc.

- **Douches:** Water is also used as jet sprays and douches. Douche is a procedure in which medicine or cleansing agent mixed with warm water is introduced into the *vagina* under low pressure.

- **Drinking:** Drinking water also plays an important role in management of health and disease. Drinking naturally cold water has tonic effect while application of ice cold water on the body is used to reduce fever. Drinking water is like having a bath for the internal organs of the body. It helps purify and dilute the blood. As mentioned earlier, it also increases the output of urine by activating the kidneys to remove waste products from the body. Drinking large quantities of water helps the blood to carry the energy-giving and nutritive parts of the digested food to the relevant parts of the body. It also increases the blood and *lymph* circulation and helps maintain normal functions of most glands of the body.

When should you drink more than normal water per day?

In addition to the health problems detailed above, it is desirable that you drink large

Box 16.2 Can water be substituted with other drinks?

- No. Drinking tea, coffee, aerated drinks or alcohol are not desirable substitutes for water.

- Although these fluids contain water, they also contain substances that cause dehydration.

- As a result, the body not only excretes the water in these beverages but also some water that is reserved in the body.

- Regular intake of aerated drinks and juices automatically reduces the urge to drink plain water when these drinks are not available.



quantities of water in the following conditions:

- **Hydrops:** Drinking about two to three litres of water at a time in the morning and evening is recommended for those who have *hydrops*. This is a condition in which there is abnormal collection of clear and watery fluid in some parts of the body. Hydrops was earlier called *dropsy*. Drinking very large volume of water increases the volume of urine and therefore helps reduce the volume of accumulated fluid also. It is important to remember that in case of dropsy, water is not recommended during the day, irrespective of the food you eat. This is to increase the *specific gravity* of the blood. Increased specific gravity helps to remove water from the kidneys and skin very rapidly.

- **To increase volume of blood:** You need to drink large quantities of water to increase the blood volume. It is desirable that you drink a maximum of three-fourth to one cup of water at a time as often as possible during the day. This amounts to about one hundred and thirty to one hundred and eighty millilitres of water at a time.

- **Fever:** You need to drink at least one glass of water every hour during fever in order to compensate for the water lost from the skin during *evaporation*. Evaporation promotes loss of heat from the body and therefore keeps it cool. It also reduces the metabolic rate in the body and therefore decreases the production of heat and increases the rate of elimination of waste products from the body.

- **Urinary tract infection:** Drinking more water during urinary tract infection increases urine production. It therefore helps "flush" out the infection faster.

- **Rheumatism:** This is a general term used for a large number of conditions with inflammation of joints, muscles, lining of the joints, etc. that result in pain, limited movements and degeneration in the structure of the affected muscles and/or joints. Drinking large quantity of water in rheumatism dilutes the blood and therefore decreases the *uric acid* level in it. Uric acid is a by-product of the metabolism of the proteins present in the blood. It is excreted in the urine.

What are the effects of cold water?

Cold water can be applied on the skin either directly or as compress (cloth dipped in cold water) or ice.

Application of cold water on the skin has tonic and stimulating effects on it. The effect of cold water is in two phases: (a) action, which takes place immediately after cold water application. It results in temporary changes and (b) reaction, which sets in after cold water application is removed. It results in long-term effects, often till the cold pack is applied again. Cold application has seven main effects. These include:

1. Dilatation of blood vessels of the skin;
2. Redness of the skin;
3. Feeling of warmth;
4. Decreased metabolic rate;
5. Decreased pulse rate;
6. Decreased respiratory rate; and

7. Decreased blood pressure.

What are the effects of hot water?

Heat or hot water can be applied either by fomentation, hot compress, hot water, vapour or hot air. It is sedative and relieves pains, cramps and spasms. This is because of its influence on the *sensory* and *motor* nerves. Sensory nerves conduct impulses from the outer parts of the body to the brain or *spinal cord*. Motor nerves carry impulses from the brain or spinal cord to muscles or various tissues in the body.

The other effects of hot water application are rise in local temperature, metabolic rate, oxygen consumption, increased blood volume and pulse rate.

Many people believe that drinking hot water helps reduce body weight. This is not true because drinking hot water does not burn calories. You can either reduce weight by eating less than calories that your body requires or burning more calories than what you consume through exercises.

What are water packs?

Water packs are prepared by soaking several layers of cotton cloth or muslin in either hot or cold water. The size of the pack depends upon the part of the body to which it is applied. The effects of cold and hot packs are similar. Hot packs are used to avoid the cold feeling at the beginning of the pack.

Water packs relieve congestion of the internal organs, pain, swelling and spasms. There are several types of packs. These include:

- **Throat pack:** It is effective in hoarseness of voice, laryngitis (infection of the voice-box), pharyngitis (infection of the throat), tonsillitis (infection of the *tonsils*), irritation of throat, hypothyroidism (decreased activity of the *thyroid gland*) and hyperthyroidism (over activity of the thyroid gland).

- **Chest pack:** A chest pack is recommended for all types of lung disorders such as emphysema (an abnormal condition of the respiratory system that results in loss of elasticity of the lungs tissue and decreased gases), pleurisy (inflammation of the lining of the lungs that results in difficulty in breathing and stabbing pain), pneumonia, bronchitis, asthma and productive cough. It is desirable that you use a chest pack for at least an hour everyday.

- **Abdominal pack:** This pack is recommended for the abdominal complaints such as flatulence (gas in the stomach), indigestion, acidity, ulcers in the stomach or duodenum (first part of the small intestine), liver disorders like jaundice, hepatitis, infection of the *pancreas* and diabetes mellitus. Pancreas is an organ situated in the upper part of the abdomen. It secretes various substances such as digestive juices and insulin. An abdominal pack is recommended for one hour at least once a day.

- **Girdle pack:** A wet girdle pack is recommended for diseases of the urinary bladder and uterus such as abnormal menstruation, retention of urine and inactivity of the urinary

tract.

- **Trunk pack:** This is a combination of chest pack, abdominal pack and girdle pack.

- **Joint packs:** Joint Packs are recommended for diseases of the joints such as arthritis, gout, rheumatism and any pain of long duration. These packs are also effective in muscle-pain.

- **Full wet sheet pack:** In this pack, the entire body is wrapped in a wet cloth immersed or soaked in cold water. This cold water pack is covered with a blanket. A full wet sheet pack is usually recommended for one hour. At the end of the hour, the skin needs to be wiped with a towel dipped in cold water. Sometimes the full wet sheet pack followed by cold towel scrub is repeated again and again till the sweating is completed. At the end of full wet sheet pack, a cold shower is desirable.

Full wet sheet pack is recommended for any type of congestion in the internal organs of the body and increasing the blood circulation to the surface of the skin and sweating. It is very effective in management of diseases of the skin and respiratory system. This pack is recommended for almost all chronic diseases except in those who are physically very weak and/or are sensitive to cold. It is a very powerful method to remove "poisons" from the body and/or blood.

- **Cooling packs:** Cooling packs are prepared by wrapping ice cubes in a towel or filling a rubber bag with ice and applied to the affected parts. Immersing a part of the body in ice cold water for ten to twelve minutes or rubbing the affected part with an ice cube for five to seven minutes can also be used for cooling the affected part.

Cooling packs are recommended to reduce the extra blood circulation to any part of the body that has inflammation due to sprain, sport injuries, accidents etc.

What are water baths?

Application of water to a part or whole of the body for therapeutic purposes is called water bath. There are several types of water baths. These include hip bath, immersion bath, sweating or vapour bath and hot air bath.

- **Immersion baths:** Immersion bath is the term used when the entire body is immersed in water. It affects all parts of the body. There are three main types of immersion baths:

1. **Cold immersion bath:** This bath is given at a temperature of 10-18°C for a few seconds only. In case the cold immersion bath is desirable for a slightly longer period, the body is rubbed vigorously while giving the bath. Cold immersion bath energizes the body and has tonic effects on it. It also increases metabolic rate and circulation of body fluids such as blood and lymph. It is important to have a warm water application after the cold immersion.

2. **Neutral immersion bath:** This bath is given at body temperature in between 32-36°C for a period of fifteen to twenty minutes. It is sedative and is recommended for sleeplessness, general irritability and to reduce irritability of the nervous system. Neutral immersion bath has a limited role in reducing fever.

3. **Hot immersion baths:** This bath is given at a temperature

of about 40-45°C for a maximum duration of twenty minutes. Water above 45°C is not effective for management of diseases. In fact it can be destructive.

Hot bath is tonic, and the results are temporary. It is recommended for instant relief from pains such as colic pains and muscle and joint pains. Hot immersion baths often cause irritation and exhaustion and therefore their use is limited to minimum.

4. **Deep immersion bath:** This bath is effective if combined with massage, exercises or a douche. Although the main benefits are due to exercise and buoyancy, the upward thrust of water makes the body light and the weight bearing affect is minimised. Deep immersion bath is recommended for arthritis, poliomyelitis and wasting of the muscles. Wasting of the muscles is the term used when the size and the normal functions of the muscles are reduced due to disease.

● **Sitz bath:** This bath is also called Hip bath. Sitz can be cold, neutral or hot. In this bath, the hip region is immersed in water filled in a hollow, oval shape tub. Sitz bath activates the internal organs of the abdomen and the pelvis by (a) increasing the blood circulation to the surface, (b) reducing the congestion of abdominal organs and (c) reducing the inflammation. It is recommended for piles or haemorrhoids, constipation and all chronic digestive disorders.

Neutral sitz bath is recommended whenever a cooling effect is required, such as for burning sensation and excessive gas in the stomach. Hot Sitz bath is recommended in conditions such as difficulty in passing the urine, cramp like pain, low-back pain. Alternative hot and cold sitz bath, stimulates circulation on the skin and in the lower limbs. It is also effective in treatment of chronic disease of the internal organs of the abdomen such as inflammation of the *fallopian tubes*, *ovaries*, etc.

● **Douche:** This is the term used when one or more water streams of controlled temperature and controlled pressure is applied against the surface of entire body or any part of it. Douches can either be given with cold, neutral or hot water or liquids. They act as general tonic to the affected part and have a massage like effect. Although the effects of douches are similar to immersion baths, they are more effective because of the pressure with which the water is applied. This pressure has a more stimulating effect.

Douches can also be applied under the water surface in immersion bath tub or water pool for relief of pain and spasms in the muscles. Contrast douche with alternate hot and cold water is also used as a general tonic and stimulant.

● **Partial baths:** Partial bath may be given to one or more limbs at different temperatures by immersing them in a tub or tank filled with water. Partial bath can be give either with cold, neutral or hot water.

A hot foot bath relieves sprains of the foot and ankle. It also reduces congestion of the upper part of the body and is therefore recommended for headache, cold, difficulty in breathing, etc. A prolonged cold foot bath is recommended for refreshing effects. Cold foot bath for a shorter duration is effective in controlling abnormal menstruation. Contrast foot bath with alternate hot and cold water is recommended

for management of chronic swelling of the feet. It is also a very effective in relaxing strained calf muscles after a long walk.

● **Whirlpool baths:** This bath is given in a tub or tank filled with artificially "agitated" water to the limbs individually or the whole body. Whirlpool bath has beneficial effects due to the temperature of the water and the mechanical effect of agitation. The movement of the water provides gentle friction to part of the body immersed in water. The combination of heat and friction is more effective in relieving pains and spasms of muscles.

Whirlpool baths are also used for management of open wounds of the hands or legs, especially for infected or painful stumps after *amputation*. It is important to remember that cleaning of open wounds and appropriate dressing on them are essential for their effective management. Whirlpool bath given to the entire body results in relaxation and a feeling of freshness.

● **Hot air bath:** It is also called Turkish bath and results in profuse sweating. Hot air bath contains three or four successive chambers through which the hot air is passed. The temperature of the hot air increases with each chamber and in the last chamber, the temperature is usually 200-220°F.

The sweat evaporated in this bath is more than in any other form of hot water treatment. It however does not increase the body temperature. A cold shower is necessary at the end of hot air bath. Rest for at least thirty minutes is desirable at the end of this bath as it may be tiring.

The hot air bath is effective in improving circulation of the body fluids and is a popular remedy for arthritis. It can also lower blood pressure as relaxes the blood vessels of the skin.

Hot air bath and vapour baths have, in recent times, become popular as a weight reducing treatment. It is important to remember that the reduction in weight is temporary because of loss of fluid from the body. Real weight loss can result only by burning calories.

● **Vapour bath:** In this bath, vapour generated by boiling the water is passed into a chamber or box. The effects of vapour bath are the same as for hot air bath except for the increase of body temperature. This is because the sweat produced in vapour bath cannot be evaporated.

Vapour bath is recommended for arthritis and mild high blood pressure. *It is important to remember that this bath should always be taken under direct supervision of a trained person.*

● **Irrigations:** This is the term used when running water is used for cleaning different parts of the body. These include:

1. **Enema:** In this procedure, water is introduced in the lower part of the large intestine. Since the large intestine is also called colon, this procedure is called "colon irrigation". It can be given with either hot, neutral and cold water in an enema can. The main purpose of enema is to cleanse the lower part of the large intestine.

In order to take enema, you need to lie down on your

left side while bending the right leg slightly and keeping the left leg straight. The narrow front part of the enema can is first lubricated with vaseline or oil and is then inserted into the rectum, the last part of the large intestine that opens outside as anus. The can is then raised slowly so that the water can enter the rectum. Normally, about one to two litres of water is injected into the rectum. After a few minutes of holding the water in your bowels, you can pass it out along with the stools.

Warm water enema is recommended for four main conditions. These include (a) chronic constipation, (b) inflammation of the *prostate gland*, difficulty in passing the urine, and painful conditions of the large intestine that are not associated with swelling and bleeding.

Neutral enema is recommended to soothe the irritated bowels and in all types of chronic diseases. It removes the waste products from the large intestine completely. Thus the "poisons" in the body are not accumulated. Neutral enema also improves the normal forward movements of the intestines.

Cold enema reduces irritation in the intestines, especially when the nerves are inflamed, such as in irritable bowel syndrome. It also helps absorb water whenever there is dehydration. Small quantity of cold water is given as an enema at night in case of severe constipation. This water is retained in the lower part of the large intestine and softens the hard stools.

● **Nasal irrigation:** Irrigation of the nose with warm water is usually recommended for *sinusitis* and infection of the upper respiratory tract. Nasal irrigation with cold water is recommended for *epilepsy* and bleeding from the nose.

● **Irrigation of the ears:** Warm water is normally used to irrigate an infected ear, especially if there is discharge of pus or other liquids.

● **Vaginal irrigation:** Vaginal irrigation is recommended in case of white discharge or after menstruation. Irrigation after menstruation helps remove the remaining blood clots from the vagina. A cold water douche is recommended for diseases that result in irritation and swelling of the vagina.

What is cryotherapy?

Any treatment that uses cold as a destructive medium is called cryotherapy. In Nature Cure, cryotherapy is given either by dipping Turkish towels in cracked ice and water for eight minutes or ice bags filled with ice and covered with cold or large size of ice cubes.

Cryotherapy is very effective for management of several painful conditions, especially after surgery and to reduce sensations in any part of the body.

Some recent studies have indicated that using ice packs after any *orthopaedic* procedures improves recovery. This recovery is indicated by lesser need to use pain killers and maintenance of normal blood pressure, temperature, heart rate, respiratory rate and number of white blood cells in the blood. Massaging the low back with ice relieves its pain.

Some doctors use cryotherapy for a wide range of disorders of the bones and the muscles attached to them. These include (a) acute sprain, (b) collection of fluid in the knee joint, (c) acute pain in the back or the shoulder joint, (d) inflammation of the *bursa*, (e) arthritis, (f) injury to the brain, and (g) cervical spondylosis. Bursa is a lining of a sac like structure below the end of the muscles where it joins the bones.

Whenever movements of some part of the body, especially the limbs, are limited due to abnormal functions of the brain, cryotherapy is often recommended for several weeks before starting an exercise program.

What is pool therapy?

Doing certain exercises after immersing the body in deep water is called pool therapy. It is very effective for management of painful conditions such as arthritis and contraction of the muscles. Pool therapy is often used for management of poliomyelitis and spastic muscles at a rehabilitation centre. In these pools, you can walk a few steps and perform various movements of hips, back, upper back, hands, shoulders and the legs. The main advantage of doing exercises in water is due to the buoyancy and you can therefore do movements of the affected part more easily than on the ground.

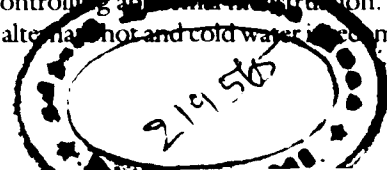
What are medicated baths?

Having bath in water to which medicinal substances are added is called medical bath. These substances include, among others, common salt, sulphur, mustard powder, foam forming extracts, pine extracts, alkaline bath, sea weed and some antiseptics.

Medicated baths are effective because they act as counter irritant and antiseptics. They also increase buoyancy of the immersed body. There are several types of medicated baths. These include:

● **Brine bath:** Artificial brine bath is prepared by adding two and a half to three kilograms of common salt to a bath tub filled with warm water. The temperature of the water is maintained between 90-105°F or as much as you can tolerate.

Brine bath stimulates the skin and therefore results in profuse sweating. After having the brine bath, a blanket is often wrapped around the body to continue sweating. Brine bath is normally recommended for management of some skin diseases and rheumatism. Having bath in sea water has effects similar to a brine bath.



- **Sulphur bath:** In this bath, one hundred fifty to two hundred grams of potash with sulphur is added to a bath tub filled with water. The temperature of the water ranges from 90-102°F. A sulphur bath is usually recommended for ten to twenty minutes to manage skin infections, pimples, skin infestations and some skin eruptions.
- **Mustard bath:** This bath is given by adding eight hundred and fifty to nine hundred grams of mustard to a bath tub filled with water at a temperature of 96-100°F. Mustard bath is recommended for ten to fifteen minutes. The oil in the mustard results in irritation of skin and therefore enhances the effect of a plain immersion bath. This irritation increases blood circulation of the skin.
- **SPA treatment:** A spa is a resort that has a natural spring with some chemicals that have medicinal properties. A

mineral spring used for spa treatment has a higher mineral content as compared to normal drinking water and/or its temperature is above 20°C.

The type of diseases that can be managed by spa treatment depends on the mineral content of the water in it. In recent times, the use of spa has become less as most of these spas have either become tourist attractions or are used for relaxation purposes.

It is important to remember that the use of water for management of various diseases in its various forms has several advantages and contraindication. It is therefore important that you avoid using water treatment without direct supervision of a trained Nature Cure practitioner. Some of these treatments can result in severe adverse effects if not used properly.

DEFINITIONS

Amputation is the surgical removal of a part of the body or limb.

Appendicitis is the inflammation of appendix, a small attached to the intestine. It is often an acute condition and leads to constant pain in the right lower part of the abdomen.

Belching is the act of bringing out gas from the stomach with a characteristic sound.

Dehydration is excessive loss of water from the body tissues.

Enzymes are proteins produced by living cells that increase the rate of some chemical reactions.

Epilepsy is a disorder of the nervous system that leads to convulsions or seizures.

Evaporation is the change of a substance from a solid or liquid state to a gas.

Fallopian tubes are a pair of tubes, one end of which open into the uterus and another over the ovary in the abdomen.

Flatulence is the presence of an excessive amount of air or gas in the stomach and intestines. It causes distension of the organs and mild to moderate pain.

Gall bladder is an organ attached to the surface of the liver. During digestion of fats, it secretes bile into the first part of the intestines.

Lymph is one of the body fluids that flows through special channels. It contains some red and some white blood cells.

Motor nerves are those that transmit messages from the brain or spinal cord to various parts of the body.

Orthopaedics is the branch of medicine that is devoted to the study and treatment of joints, muscles, bones and its associated structures.

Ovaries are female reproductive organs, one situated on each side of the uterus. They produce eggs.

Prostate gland is an organ in males that secretes a substance which liquefies the semen.

Sensory nerves are those that carry messages from various parts of the body to the brain.

Sinusitis is inflammation in one or more of the bony spaces around the nose.

Solvent is a liquid in which other substances can dissolve.

Specific gravity is the ratio of the density of a substance as compared to the density of another substance considered as standard.

Spinal cord is a long cylindrical organ that originates from the brain and is located inside the backbone.

Thyroid gland is situated in the front of the neck. It secretes hormones that are especially essential for normal growth and development.

Tonsils are a small rounded mass of lymph tissues present at the end of the palate in the mouth.

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In the next issue: Anxiety

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