

# Caring for Your Health



Basic Facts

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# Preventive Health

## *Eye Care*

Eyes are the windows to the outside world. They are nature's priceless gift. We can realize just a bit of the plight of a blind person if we close our eyes and try to move around.

Our eyes take care of us throughout our life. Likewise, we must take care of them. Eye problems can occur at any stage of human life. Certain eye diseases occur while the baby is still in the mother's womb. Others present themselves when the child is born. There are eye conditions that are predominantly encountered during a child's growing years (pre-school and school-going age). People are faced with a variety of eye problems during young adulthood, middle age, elderly years and extreme old age.



One important fact to be remembered is that many eye problems, if not recognized and treated in time, can lead to blindness. A second important fact is that many of these blinding conditions are preventable. Preventing a disease is more effective, convenient, cheaper and much easier than getting a disease and having to treat it.

Now let us see how care of the eyes is required right from the beginning of life in the mother's womb, and should be continued till the end of your life and even thereafter (for eye donation).

### **Care of the baby's eyes in the mother's womb**

During pregnancy (the antenatal period) poor nutrition, anaemia, medications containing steroids, x-ray examination of the abdomen and rubella (German Measles) infection can harm the eyes of an unborn baby by causing blindness due to conditions such as congenital cataract, glaucoma and retinopathy. To prevent such complications, you should:

- Vaccinate girls against rubella (MMR) before puberty
- Avoid unnecessary abdominal x-rays and steroid intake
- Ensure proper nutrition
- Avoid unnecessary drugs during the first three months of pregnancy

## Care of the newborn's eyes



A baby's face, especially the area around the eyes, should be cleaned with a sterile lint before opening them. Thereafter antibiotic drops need to be instilled into the eyes of the baby. If there is any watering or discharge from the baby's eyes during the first month of life, you must consult your eye doctor without delay. Such a condition may be simple conjunctivitis (eye flu), but it may be one of the following serious conditions:

- Ophthalmia neonatorum (eye infection of the newborn)
- Congenital glaucoma (baby has high pressure in the eyes)
- Nasolacrimal-duct block (blockage of tear outflow channels)

In such conditions, follow the treatment advised, and you will save the child from vision loss and other eye complications. If the pupil of the baby's eye has a white discoloration, it may be due to a congenital cataract or cancer of the eye (retinoblastoma) or another serious eye condition. Consult your eye doctor.

## Eye problems in growing children

As the baby grows, the following eye problems may be encountered:

### Nutritional blindness

Vitamin A deficiency in children can cause night blindness, dryness of the eye (xerosis), keratomalacia (ulcerations and dissolution of cornea, which is the front transparent covering of eye) leading to total blindness and even loss of an eye. This condition is known as nutritional blindness. It commonly affects children below five years of age especially if they suffer from protein-calorie-malnutrition. Additional factors include URI (upper respiratory tract infection), measles, diarrhoea and worm infestation.

*Prevent nutritional blindness by eating carrots, mangoes, papayas, dark green leafy vegetables (like palak and bathua), and milk-based foods. Give breast milk to newborns and infants.*

If you cannot get these foods, then give children (between the age of six months and six years) doses of vitamin A every six months.

## Eye problems in school-going children from 6 to 14 years

There should be a check-up for refractive errors (near-sightedness, far-sightedness, and astigmatism), amblyopia (lazy eye), squint and colour vision defects.

### Refractive errors (problems needing spectacles)

In this group there are three main conditions that cause poor vision and sometimes blindness. These are:

- Short-sightedness or near-sightedness (myopia)
- Far-sightedness (hypermetropia)
- Astigmatism (uneven curvature of the surface of the eye)



All the three problems happen to people of all ages and they can usually be helped by wearing spectacles. Short- and far-sightedness are caused by a change in the shape of the eyeball. In children, these problems are congenital. If children have one of these problems, they will:

- Blink frequently and rub their eyes
- Squeeze or narrow their eyes to see a distant or close object
- Hold a book close to the eye
- Not be able to read a clock at a distance
- Often stumble, particularly in dim light
- Lose interest in activities around them

Children usually don't say they have poor vision. They may not even notice their problem and may adjust to their poor eyesight by sitting near the television or blackboard or by squeezing their eyes.

*Check your children's eyesight before they start school and later also at least once or twice during their school years (between 6–14 years) for early diagnosis and treatment of problems.*

## **Squint (deviated eye or lazy eye)**

Deviated eye (squint) is not only a cosmetic problem but it can also cause blindness (amblyopia). Get it corrected as soon as possible.

## **Colour vision defects**

These defects are often detected at the time of selection of a child for a particular career. At this stage, the child may be rejected because of defective colour vision and feels very much disheartened. If the colour vision defect is detected early, this may help the child and the parent to make up their mind for a career where colour vision is not really important.

## **Injuries**

Injuries to the eyes may cause blindness. Children are prone to injuries. Eye injuries are commonly caused by:

- A direct hit on the eye (e.g., by a ball or a blunt object)
- Sharp objects entering the eye
- Chemicals entering the eye
- Heat injuries (burns)
- Gunshot and landmine injuries
- Head injuries (a serious hit on the head)
- Road accidents

### **To prevent eye injuries:**



- Take care when children play games like gullidanda and bows and arrows.
- Do not let children play with sharp-edged toys, knives, scissors, needles or any other sharp objects.
- Do not let children play with firecrackers
- Do not look at the sun directly with or without dark glasses, particularly during a solar eclipse.

The sun can burn the retina, which is very delicate. This can damage the eyesight or cause blindness.

- If you are a bus driver, truck driver or you drive any type of vehicle, have your eyes tested every year. Never drink alcohol before or while driving.
- Wear protective (safety) glasses when working with chisels, saws or other machinery, and particularly when welding.

## Trachoma (kukre or rohe)



Trachoma is an infection of the eye caused by a germ called *Chlamydia trachomatis*. Left untreated, it can lead to blindness. It is common in India, especially in villages among people living in unhygienic conditions. Trachoma occurs when:

- Too many people are living together.
- There is no clean water.
- There is an increased number of eye-seeking flies. (In India this happens in April–May and during July–September when high temperature and rainfall favour the increase in fly population.)
- You share towels, handkerchiefs and pillows, etc.
- You apply *kajal* or *surma* with a shared rod.
- You live in a dry and dusty environment.
- There are conditions of poverty, ignorance, poor personal hygiene, and lack of knowledge about spread of contagious disease. As living conditions improve, the disease tends to regress.

## Blindness in trachoma

Trachoma infection by itself (“pure” trachoma) is a relatively mild condition, so mild and symptomless indeed as to excite little or no attention. However, in the absence of treatment, the disease runs a persistent course (subacute trachoma) and ultimately leads to opacity of the transparent covering of the eye (cornea) leading to blindness. The cornea becomes opaque in the following ways:

1. There is roughening and scarring of the undersurfaces of the eyelids (hallmark of trachoma) with inturning of eyelashes (trichiasis). The uneven undersurface of the eyelids and misdirected eyelashes rub the cornea with every blink and damage it, finally making it opaque due to scarring.
2. Trachoma germs can cause an ulcer on the cornea directly which, when healed, leads to opacity.
3. Eyes with trachoma are vulnerable to secondary infection with other types of germs (previously known as “acute” trachoma) resulting in an acute and severe ulcerative condition of the cornea. These are liable to relapse and lead to more scarring, more opacity and blindness.



*TO PREVENT TRACHOMA:  
Wash your eyes with clean water.  
Keep yourself and your surroundings clean.  
IF YOU HAVE AN EYE INFECTION:  
Show it to a qualified doctor.  
Use the right medicines (antibiotics) early.*

Follow the SAFE strategy as recommended by WHO (the World Health Organization). The components of the **SAFE** strategy are:

- S** – Surgery to correct trichiasis (inturned eye lashes), the immediate precursor to blindness
- A** – Antibiotics to treat an active disease (as advised by an eye specialist)
- F** – Facial cleanliness to reduce transmission of infection
- E** – Environmental improvement (clean latrines, fly control, clean water supply, proper garbage disposal, etc.)

### **Corneal ulcer**

A corneal ulcer is a discontinuity in the surface cells of the cornea (the cornea is the frontmost clear layer of the eye that allows light to enter). A corneal ulcer is a sight-threatening condition. It usually occurs due to abrasions or scratches on the corneal surface that get infected with bacteria, fungus, or virus. These scratches or abrasions result from trivial injuries and foreign bodies. Certain eye conditions like misdirected eyelashes (trichiasis) and granular deposits (concretions) on the under-surface of the eyelids can also scratch the cornea with every blink.



The following eye conditions predispose the eye to a corneal ulcer:

- Dryness of the eye (xerosis/xerophthalmia—commonly due to vitamin A deficiency)
- Inability to close the eye due to facial palsy
- Decrease/loss of normal sensations of the cornea (e.g., due to herpes or neuroparalytic keratitis)
- Waterlogging of the cornea (corneal oedema)
- Virulent bacteria like gonococcus or diphtheria bacilli invading the intact surface cells of the cornea

- Use of steroid eye drops
- Intake of immunosuppressant/steroid drugs
- Obstruction to the tear outflow channels (chronic dacryocystitis)

A corneal ulcer is an emergency situation. If you develop severe pain, redness, inability to tolerate light (photophobia), or watering/discharge, consult your eye specialist urgently for immediate and effective treatment. Serious complications such as scarring and corneal opacity can occur, which can cause partial or total blindness.

## How to prevent corneal ulcers



1. Avoid scratches and abrasions in the eye. Do not let dirt or dust into the eye and, if it gets into the eyes, do not rub. Wash the eyes with plenty of clean water. If irritation persists, consult your eye doctor immediately.
2. If you wear contact lenses, follow your doctor's instructions. If pain and redness occur while wearing contact lenses, see your doctor to rule out a corneal ulcer.
3. If you are a farmer, avoid getting vegetative foreign bodies into your eyes (leaves of sugar cane, maize, etc.). Such foreign bodies may be harbouring fungus. Fungal ulcers are difficult to heal. Whenever possible, wear protective (safety) glasses in windy or dusty conditions.
4. If you have dry eyes (xerosis, etc.), use lubricant eye drops and oral Vitamin A as advised by your doctor.
5. If you have facial palsy, the affected eye should be closed with tape at night as instructed by a doctor. People with facial palsy are prone to getting ulcers as the cornea becomes dry due to the inability of the eye to close (exposure keratitis).
6. Correct misdirected lashes by surgery or get them pulled out by a doctor to avoid injury to the cornea.
7. Treat the underlying diseases of the eye.
8. If you have an ulcer, do not use steroid eye drops. Also try to avoid the intake of steroid and immunosuppressant drugs.

## Television and our eyes

Watching television can strain the eyes. If you like to watch television, remember the following:

- Sit at least three meters (eight to ten feet) away from the television set.
- Have some extra light in the viewing room, so the room is not pitch dark.
- Make sure light is not reflected off the screen into your eyes.
- Avoid watching a television screen that is blurred, flecked or vibrating (shaking).
- Rest your eyes from time to time while watching television programmes. For example, get up and walk out of the room and do something else, like make a cup of tea.

## Computer vision syndrome (CVS)

The human vision system is not designed for long hours of computer viewing. The use of computers is growing exponentially. The amount of time one spends looking at a computer screen is also increasing. While computers enable us to be more efficient and more productive, this comes at a price—computer vision syndrome (CVS). CVS is a complex of eye and vision problems that are experienced during, and related to, computer use, and is a repetitive strain disorder. All computer-related eye problems are preventable and correctable.

## Typical symptoms of CVS

- Eye strain
- Blurred vision
- Dizziness or nausea
- Headaches
- Red, dry or burning eyes
- Increase in nearsightedness
- Change in colour perception
- Slow refocusing
- Excessive fatigue
- Neck, shoulder and back pain
- Occasional double vision



## 10 Commandments to Avoid Computer Vision Syndrome (CVS)



**Screen distance:** At least 25 inches.



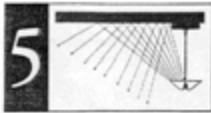
**Monitor tilt:** Keep monitor top slightly farther from eyes than its bottom.



**Screen:** Dark letters on a light background.



**Vertical location:** Viewing area of monitor 15°- 50° below horizontal eye level.



**Lighting:** Ceiling suspended indirect lighting. Use blinds, shades and curtains to avoid outside light and reflection.



**Neck posture:** Use chair with arms. Flexion (head-tilt pose) causes less fatigue.



**AC airflow:** Avoid direct flow / draft of air on your eyes.



**Break:** Short visual break every 20 minutes.



**Exercise:** Blink eyes a few times. Close eyelids; roll eyes behind closed eyelids clockwise, then anti-clockwise. Take a deep breath; open eyes while releasing breath.



**Lubricate eyes:** As advised by your doctor.

## Eye problems of middle age

### Diabetes and high blood pressure

Diabetes is a disease in which the amount of sugar in the blood is not properly controlled. It is caused by too little insulin, the hormone that is made by the pancreas and controls sugar levels in the blood. Diabetes affects all organs of the body including the eyes.

**Warning!** Diabetes can lead to blindness, most commonly because of damage to the blood vessels in the retina (the membrane lining the inside of the eye). In diabetic patients, additional risk factors to the eyes are pregnancy, smoking, obesity and high cholesterol levels in the blood.



Get your blood pressure checked yearly. There are usually no warning signs for high blood pressure, although the risk increases if you gain weight as you get older.

**Warning!** If you have diabetes and high blood pressure, you are at a much higher risk of eye disease than people with just one of these problems. Work hard to keep them under control with your doctor's help. This will help you keep your eyesight in good condition.

In addition to the control of blood pressure and diabetes, fundus examination (internal examination of the dilated pupil after appropriate eyedrops) by an eye specialist is essential. See pages 92-107 for more information about diabetes.

### Glaucoma (kala motia)

Glaucoma, commonly known as kala motia, is a blinding disorder. The vision loss that occurs in this condition is irreversible. Glaucoma includes a group of eye conditions which lead to gradual damage of the nerve that takes visual impulses to the brain (optic nerve). The condition usually affects both eyes.

The nerve damage is responsible for causing blindness in such people due either to high pressure inside the eye or to impaired blood circulation to the nerve. This may happen even in eyes with normal pressure. The nerve damage causes a reduction in the field of vision, and may eventually result in complete blindness.

Glaucoma is mostly a silent killer of vision. Most often the condition is painless and, by the time one is aware of it, harm to the vision may have already occurred. Vision, once lost, cannot be regained by any medical/surgical or laser treatment. However, once detected, the progress can be halted or slowed by any of the above-mentioned treatments and further loss of vision can often be prevented.

Disciplined and regular treatment as advised by the eye physician is required so that the existing vision can be preserved. The treatment required may have to be continued for the rest of one's life because glaucoma cannot be cured. It can only be kept in check.

Some people are at high risk of glaucoma, such as those:

- Having a relative with glaucoma
- Wearing high minus-numbered glasses (near-sightedness)
- Suffering from diabetes, hypertension or thyroid diseases
- Using steroids (eye drops, ointment or tablets)
- Who need frequent changes of eyeglass prescriptions
- Having poor night vision
- Who are detected to have high pressure in the eye

The risk increases with age. All adults should have regular eye check-ups to rule out glaucoma. Early detection of glaucoma and regular treatment will help to prevent blindness.

There is a kind of glaucoma that can happen quickly (acute angle closure glaucoma). Since it is a sight-threatening and emergency situation, seek medical help as soon as possible if you have one of the following. Note that both eyes will require treatment:

- Very bad pain in one eye
- A red or bloodshot eye
- Visions of coloured rings around lights (bulbs or candles)
- Sudden diminution of vision
- Nausea or vomiting
- High plus-numbered glasses (far-sightedness)

Glaucoma usually affects older people but can also affect newborn babies and infants. This is called ‘congenital glaucoma’ and must be treated as early as possible to prevent blindness. If your child has unusually large eyes, beware: it may be congenital glaucoma. Take him/her to an eye specialist.

Remember that you must play your part in maintaining your vision.

*The hallmark of early glaucoma management:  
Ensure early detection!  
That means having regular eye exams.*

## Eye problems of old age

### Cataract (safed motia)

‘Cataract’ means any cloudiness in the lens of the eye. This cloudiness gets in the way of light entering into the eye and so it makes vision worse. It usually occurs above the age of fifty years and is commonly seen in older people when it is also called ‘senile cataract’. The causes of senile cataract are not entirely clear. A cataract can also be present at birth (congenital cataract). It can also grow at a very young age (developmental cataract).

Causes commonly linked to cataracts are:



- Age (senile cataract)
- Eye injuries
- Not enough green vegetables
- Bright sunlight (ultra-violet rays)
- Certain eye diseases
- General diseases (like diabetes, thyroid and parathyroid disorders)
- Steroids

The following symptoms may indicate the presence of a cataract:

- Gradual painless reduction of vision
- More light is required to see clearly
- Frequent change of prescriptions
- Coloured rings around light

- Improvement in near vision, i.e., one starts seeing clearly without near glasses
- Objects visible as two or more than two, e.g., one moon may be visible as many moons
- Difficulty in driving at night
- Greyish or white pupils

### **Treatment of a cataract**

There is no medical cure for cataract. Cataracts can only be cured by surgically removing the clouded lens and replacing it with a small artificial lens (intra-ocular lens or IOL) to restore vision.

- You do not have to wait for the cataract to be fully mature (i.e., to wait for complete loss of vision). Rather if your quality of life is being hampered due to a decrease in vision, the surgery can be performed in the early stages of development.
- Waiting for a cataract to mature may be harmful as the chances of developing glaucoma (kala motia) are greater.
- You do not need to stay in the hospital for long. You may be sent home on the same day.
- You do not have to wait for a particular season.
- There is no laser cataract cure. Instead, a new technique of cataract removal called phacoemulsification allows cataract removal in an emulsified form through a very small cut, where a stitch is usually not required. The advantage of this technique is early rehabilitation, however, it is more expensive.
- There are less expensive techniques. Commonly used are ECCE/ IOL or MSICS/IOL (manual small incision cataract surgery with IOL). They give equally good final visual recovery.

### **Age-related macular degeneration (ARMD)**

Age-related macular degeneration is a slowly progressing, blinding disease, due to progressive damage to the macula. The macula is the central part of the retina (the innermost light sensitive layer of the eyeball) that allows us to see the fine details and appropriate colours of an object. It affects both eyes. It is a leading cause of blindness in developed countries in the population above the age of sixty-five years. In India, blindness due to ARMD has also become significant due to the increase in life span and thus an increase in the number of the aged population.



**ARMD** is of two types:

1. **Dry ARMD:** This is more common than the wet form of the disease and accounts for 90% of all ARMD cases. It is caused by the aging and thinning of the tissues of the macula. Vision loss is usually gradual and may take years. There is no effective treatment available. Low vision aids may help the patient to do reading and near vision work.
2. **Wet ARMD:** This is less common but more severe than the dry form. It accounts for approximately 10% of all ARMD cases but causes 90% of the cases of profound blindness with ARMD. There is abnormal development of new blood vessels (choroidal neovascularisation, CNV) beneath the retinal pigment layer of the retina (RPE). The vessels can bleed and eventually cause macular scarring, which can result in a profound loss of central vision (disciform scar). It is therefore associated with comparatively rapidly progressive marked loss of vision. Fundus fluorescein angiography (FFA) helps in detecting CNV.

### **The risk factors**

- Age: If you are above the age of sixty-five years, the risk of having ARMD greatly increases.
- Family history: It may run in families.
- Sex: It affects women more than men.
- Demography: It is more common in northern Europe.
- Smoking: The only environmental exposure clearly associated with macular degeneration is tobacco smoking. It is more common in smokers.
- Hypertension, heart problems, high cholesterol in blood, obesity, and high fat intake are among other possible risk factors.

## **Consult your eye specialist if:**

- You develop difficulty in reading and close work. Words on a page look blurred.
- Colours look dim.
- Straight lines look distorted, especially at the centre of vision.
- There is alteration in the size of an object.
- A dark or empty area appears in the centre of vision.

## **Treatment**

**Antioxidants:** In early stages of ARMD, some specific antioxidants may help to slow down the progression of degeneration, so eat green leafy vegetables throughout your life.

**Laser:** May help in selected cases of wet ARMD. The vision lost cannot be regained with a laser. Low vision devices may be helpful in advanced stages of ARMD.

Photodynamic therapy (PDT) and transpupillary thermo-therapy (TTT) are other newer techniques.

The aim of the treatment is to stabilize the existing vision.

## ***Do's of eye care***

- Use clean water when washing your face and eyes.
- Use protective (safety) glasses when drilling, welding, using cutting machinery, or working in dusty environments.
- Eat green vegetables, carrots, and fruits like papaya and mangoes.
- Read in proper light and in a proper sitting posture. While reading, the book should be on the table and light should:
- Come from the left and front for a right-handed person.
- Come from the right and front for a left-handed person.
- Take your child to see an eye doctor if he or she child has a squint (crossed eyes) or lazy eyes.
- Breastfeed infants if possible to avoid nutritional blindness.
- Protect your eyes when playing sports like cricket and boxing.
- Get your eyes checked every year if you are over 35 years or if you drive for a living.
- Get your children's eyes checked before they start school and at least once or twice during their school years.

- Always see a doctor if you have blurred vision, see coloured rings around lights, have problems seeing in the dark, or have recurring pain in one or both eyes.
- Get glasses prescribed by an eye specialist and not by an optician. If you are nearing forty years of age and have difficulty reading, you may need glasses to help with far-sightedness.

### ***Don'ts of eye care***

- Don't use towels and handkerchiefs used by others.
- Don't apply *kajal* or *surma* to children with the same rod.
- Don't let your children play with sharp objects, air guns, firecrackers, etc. Avoid games like bows and arrows and gullidanda.
- Don't look at the sun directly, particularly during a solar eclipse.
- Don't rub the eye if something falls into it. Rather, rinse the eye with clean water. Get medical help if the dirt or object is not washed out.
- Don't go to quacks (people who say they know cures, but have no medical training), as their medicines may be harmful and injurious.
- Don't decide on your own about eye-drops or medicines.
- Don't read in dim light.
- Don't delay the treatment of squint, red eye, any problem needing spectacles, glaucoma, cataract and injury to the eye.
- Don't use another person's spectacles.

*Pledge eye donations during your lifetime.  
Contact your local eye bank for more information.  
For more information, see pages 145–147 of this booklet.*

# Dental Health

Oral and dental hygiene is an integral part of total body health. Oral (mouth) health problems like dental caries (cavities), periodontal (gum) diseases, malocclusion (crooked teeth) and oral cancer are highly prevalent in India. It is well known that the treatment of dental disease is quite costly. Therefore it is important that an alternative strategy be developed to combat these problems at the level of primary prevention.



## The teeth

Teeth are a living part of the body. The outermost hard white cover is known as the **enamel**. The inner, relatively less hard part is **dentine**, which surrounds the **pulp** containing the blood vessels and nerves of the teeth. The teeth remain embedded in the jaw bone, which is covered on the outside by the **gum**. There are two sets of teeth:

- **Primary teeth**

These are twenty in number and start erupting in the oral cavity around the age of six months and by the age of two years all twenty teeth have erupted. Primary teeth start falling out at the age of six years and are shed by the age of twelve years and replaced by permanent teeth. First teeth are also called *milk teeth*.

- **Permanent teeth**

These are thirty-two in number. They start appearing at the age of six years and by the age of twelve to thirteen years, twenty-eight teeth have erupted. The remaining four wisdom teeth erupt only between eighteen and twenty-four years of age.

*Be it salty, be it sweet,  
rinse your mouth after you eat.*

## Four Common dental diseases and their prevention:

### 1. Dental caries

Dental caries or tooth decay is a common disease in children as well as adults. It commonly occurs on the chewing surface or below the contact area of two adjacent teeth.



The cause of this disease is the interaction between the bacteria present in the food and food remnants and the tooth surface. Every person has bacteria in his or her mouth. These bacteria live in a slimy transparent layer covering the tooth. This slimy layer is called plaque. When food remnants come in contact with the bacteria, fermentation starts. The bacteria produce acid as a result of the fermentation, which in turn causes dissolution of the tooth surface leading to dental caries.

### 2. Gum diseases or gingivitis

Gum diseases (gingivitis) are also caused by plaque formation. The bacteria present in the plaque form toxic substances that cause inflammation of the gums. If plaque is not removed regularly it may harden to form calculus (tartar).

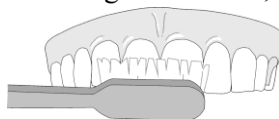
*Teeth are friendly pearly white,  
Brush them daily not once but twice.*

### Prevention of dental caries and gum disease

The major cause of dental caries as well as gum diseases is dental plaque, so control of dental plaque is the main factor in the prevention of these diseases. Dental plaque can be controlled by:

#### Mechanical methods

This method is the most important in plaque control. It involves the use of toothpaste and a toothbrush. For proper cleaning of the teeth, the teeth should be cleaned in such a way that the upper teeth are cleaned in a downward motion and the lower teeth in an upward motion both from the outside as well as the inside. On the chewing surfaces, circular brushing motions help to clean the pits and fissures. At the end of brushing one should not forget to rinse the mouth thoroughly, clean the tongue and massage the gums with a finger.



*A stitch in time saves nine.  
This holds true for dental ailments also.*

### **Chemical methods**

There are certain chemicals such as chlorhexidine and fluoride that help in reducing bacterial plaque. They are available as mouth rinses but should be used only on the advice of a doctor.

### **Role of the diet in caries prevention**

Sugars have a major role in caries causation; therefore, it is very important to reduce sugar intake. Consumption of sweets, especially toffees, chocolates, cookies, cake, pastries, cold drinks, and ice creams, should be avoided, especially in between meals. The golden rule is to use sweets only during major meals. In between meals, one can have fruits, salads, nuts, corns, vegetables and sandwiches.



After eating sweets, rinse the mouth thoroughly. Vitamins and minerals are very important for normal growth and teeth development; therefore, during childhood, a diet rich in calcium and vitamins should be given. The same holds true during pregnancy and lactation. Bottle feeding of young children at night should be totally avoided.

*Decay! Decay! Decay!  
Go another way!  
I brush my teeth  
after I eat.  
That protects my teeth  
night and day!!*

## Role of fluoride in caries prevention

Fluorides make the teeth stronger and more resistant to caries. The simplest method of use of fluoride is by using toothpaste that contains fluoride. Fluoride toothpaste is recommended for all people above six years of age.

## Specific control and prevention of gum disease

We know that brushing properly reduces plaque and bacteria and therefore it is beneficial for the gums too. Steps to keep the gums healthy include:

- Don't smoke as smoking is a common cause of unhealthy gums as people age.
- Use oral rinses or plain water after each meal.
- Finger massage your gums and teeth.
- Use dental floss and other inter-dental cleaning devices such as a single tuft toothbrush or rubber tip.
- Have teeth cleaned and polished by dental professionals at regular intervals.
- Visit the dentist regularly, at least once in six months.

*I brush my teeth twice a day.  
In my life plaque has no say,  
I smile all the way and I never smoke.*

## 3. Malocclusion of teeth



In this disorder, there is excessive crowding or spacing between the teeth or the teeth may be placed abnormally forwards or backwards or abnormally rotated.

Malocclusion or crooked teeth affect almost 30–40% of the children of our country. Many cases are caused by faulty oral habits like thumb sucking, tongue thrusting and mouth breathing in children. The most common cause of irregularity or crowding of the teeth is premature loss of 'milk teeth' due to dental caries or other reasons. The 'milk teeth' help space the new permanent teeth properly as they come in. Malocclusion may also lead to increased caries or gum disease and

temporal-mandibular joint (these two joints, one on each side, are the hinges of the lower jaw) problems.

### **Prevention of malocclusion**

To prevent malocclusion, it is important to keep the milk teeth free from dental caries and to discontinue bad oral habits as soon as possible. Apart from this, planned extractions of over-retained milk teeth can in some cases be options. Always seek advice from a qualified dentist.

## **4. Oral cancer**

In India, this is the third most common cancer. It is common where betel-quid chewing, bidi smoking, alcohol, and tobacco consumption are high. Other risk factors are:

- Poor oral hygiene
- Chronic irritation (e.g., rough teeth, dentures, fillings, etc.)

Cancer of the mouth may remain undetected because initially the symptoms may be mild. Alertness and prompt attention are needed in the following situations:

- Persistent non-healing ulcer in the mouth for more than two weeks
- A white or red raised patch in the mouth
- Restriction in mouth opening
- A lump or growth in the mouth
- Abnormal loosening of teeth or unexplained bleeding
- Soreness or feeling that some object is caught in the throat
- Difficulty in chewing or swallowing
- Numbness of the tongue or other areas of the mouth
- Hoarseness of the voice



*Order! Order!! Order!!!  
Pan masala, gutka chewer,  
and you, Mr Cigarette Smoker,  
may be inviting the curse of cancer.*



## **Prevention of oral cancer**

1. Stop various tobacco-related habits immediately and avoid alcohol
2. Perform self examination for early detection and treatment of precancerous lesions:
  - The oral cavity can be examined easily in two minutes by standing in front of a mirror in good light.
  - Both lips, both cheeks, the tongue from the upper side, lower sides and margins, the floor and roof of the mouth, and the throat should be examined.
  - On each surface, look for changes in colour or consistency, the presence of swelling or growths or ulcers.

If you find any such feature, please contact the nearest doctor or qualified dentist.

## **Infant dental care**

Children are the future of any country. Keeping our young ones free from disease will give us a healthy, progressive generation in the future. Expectant females and mothers should be informed and educated regarding the following:

- Nutrition is important. A well-balanced diet for expectant mothers is a must for proper development and growth of the baby as well as healthy teeth and gums.
- Expectant mothers should not take any medicine without consulting a qualified doctor. They must always inform the health care provider about the pregnancy, so that any medicine like tetracycline (an antibiotic that discolours the baby's teeth) may not be prescribed. Other drugs may cause discoloration of teeth.
- At birth, a baby's mouth is free from bacteria. The germs are transferred into the baby's mouth from parents during cuddling and kissing. It is important for parents to keep their own mouths clean and avoid kissing on the baby's mouth. Also sharing of spoons and utensils, etc. should be avoided as far as possible.
- It has been observed that use of a milk bottle is the major cause of early childhood caries. Therefore, mothers should breastfeed the baby for the first year and then to go directly to cup or spoon feeding rather than using a nursing bottle.

- After every feeding the child should be given a sip of water to clear residual milk from the mouth. Also the child should be held upright thereafter from five to ten minutes.
- Mothers should clean the gum pads and the tongue of the infants with a clean, wet, soft cotton cloth after every feed. A clean/boiled soft cotton cloth is wrapped around the index finger and then the upper and lower gum pads should be cleaned in a single sweeping motion each time. After this, the position of the cloth on the finger should be changed and the tongue should be cleaned in a sweeping motion.
- When the first teeth erupt in the mouth of the child, the use of a soft baby toothbrush must be started.
- At the time of tooth eruption, children get an itching sensation in their gums and tend to put different objects such as toys into their mouth. These habits lead to various infections and frequently result in diarrhoea. The mother should keep a close watch on the child's activities. Fruits and rusks, etc. can be given to help reduce irritation and develop chewing habits.
- It is very important to take care of milk teeth since decay-free milk teeth create a healthy environment for the permanent teeth and guide their eruption into the proper position.

### **Prevention of dental diseases in infants**

1. Brushing two times everyday = healthy teeth
2. Healthy diet = healthy teeth
3. Healthy teeth = healthy body

Food minus sweets = 32 teeth intact

## Prevention of oro-facial trauma in children



Children are quite prone to trauma of the oral and facial region, the most common being a fall, getting hit during playing, and cycling and roadside accidents. Sometimes, a small act of negligence can lead to a serious accident, hampering the quality of life of the child and family. Taking care of a few small things can avoid many major and minor mishaps:

- A child should always be helped when learning to walk up to 3 years of age.
- When a child is learning cycling, the cycle should be supported.
- Instruct children not to keep their hands in their pockets while climbing or coming down stairs.
- Road rules should be taught and followed strictly by children.
- Excessively protruding teeth should be corrected by orthodontic treatment.
- Special mouth guards can be fabricated for children or young adults who participate in athletic/sports events to reduce impact injuries to the teeth and face.

*Life is a hit if the teeth are fit.*

# Maternal and Child Health

Maternal and infant mortality in India remains unacceptably high. This part of the booklet aims to allay the anxiety and fears of young mothers who are worried about pregnancy, delivery, and the subsequent care of their newborn. Most of these fears arise due to ignorance about some basic aspects of care during pregnancy and care of the infant. We can avoid many maternal and infant deaths if we take just a few basic precautions in the care of mothers and children.

## Antenatal care (care during pregnancy)

To ensure the good health of a mother and her child, it must be understood that the care of a newborn starts even before the child is born. This means that every pregnant woman must take good care of herself by following certain simple rules:



- ✓ As soon as you know that you are pregnant, get yourself registered at the earliest in an antenatal clinic (ANC) in a nearby hospital, dispensary, health centre, or sub-centre.
- ✓ Attend this clinic as advised by your health professional. You must go for at least 3 checkups in this ANC: first at the time of registration, second at 24–28 weeks, and third at 3–4 weeks before the expected date of delivery. During these visits you will be examined for your height and weight, your blood pressure will be taken, and certain necessary investigations, e.g., a haemoglobin test and urine examination, will also be carried out.
- ✓ High-risk mothers need to visit the ANC more frequently, as chances of problems arising during pregnancy are greater. You are a ‘high-risk mother’ if you have even one of the following:
  - Age less than 18 years or more than 35 years
  - Height 140 cm or less
  - Bleeding through vagina or pain in abdomen during pregnancy (indicating threatened miscarriage)
  - Anaemia (lack of iron), swelling of feet, high blood pressure (BP) and protein in urine during pregnancy (pre-eclampsia), or convulsions (eclampsia)

- Are pregnant with twins
- Have a history of caesarean operation or forceps delivery
- Malpresentation (the fetus is not in the head-down position by the last month of the pregnancy)
- Have a disease, e.g., heart disease, high BP, kidney disease, diabetes, tuberculosis or liver disease
- Are over 30 years old and are pregnant for the first time



- ✓ You must take injections of tetanus toxoid (TT) during pregnancy. If this is your first pregnancy, take 2 injections of TT with a gap of 4–6 weeks between them. These injections can be taken any time during pregnancy and are essential to protect you and your child against a deadly disease called **tetanus**.
- ✓ If this is your second pregnancy and it has occurred within 3 years of your first pregnancy, you need to take only 1 injection of TT provided you have taken 2 injections of TT during the first pregnancy. If not, you need to take 2 injections.
- ✓ Take folic acid tablets for the first three months and iron, folic acid and calcium tablets thereafter to prevent anaemia during pregnancy. (Remember, if you already suffer from anaemia, you will require two tablets of iron and folic acid.)
- ✓ Take rest, sleep eight hours at night and, if possible, two hours in the afternoon.
- ✓ Do not smoke or drink. Also make sure that others do not smoke in your vicinity.
- ✓ Do not take any medicine unless prescribed by a qualified doctor. Similarly do not get investigations like x-rays and ultrasound done on your own. Both of these can be harmful.
- ✓ Keep yourself neat and clean.

- ✓ Keep your breasts clean; wash them daily. If the nipples of your breasts are inverted (pointing inwards), this is the time to deal with this problem. Try to gently pull them out and hold them in this position for a few minutes. This can be repeated 5–6 times daily.
- ✓ If possible, sexual intercourse is better avoided in the first three months and last six weeks of pregnancy.
- ✓ Look out for any of these symptoms. These are danger signals and need immediate attention from a health professional:
  1. Persistent headache
  2. Reduction/blurring of vision
  3. Swelling around your ankles
  4. Pain in your abdomen
  5. Bleeding, spotting, or excessive and watery vaginal discharge
- ✓ Make plans for the delivery of your child a few weeks before the expected date of birth. It is important that your delivery is conducted by a trained health professional in a clean and safe environment.
- ✓ It is also important to find out about the nearest hospital, where you can be taken in case there is a problem during delivery. Also do not forget to arrange for a vehicle to be available in advance.
- ✓ Eat a balanced and nutritious diet. Compared to your pre-pregnancy state, you require at least 50% more food during your pregnancy. Remember, if you eat well, the baby inside ‘eats’ well and will be born with a good birth weight. Include lots of green leafy vegetables for iron, fresh seasonal fruits for vitamins, jaggery for energy, and gram (chana), peas and pulses for proteins—the body-building nutrients in your diet. If possible, take at least two glasses (total 500 mL) of milk everyday.

## Iron Content in Food

<b>High: More than 5 mg/100g</b>	
Whole wheat flour	Turnip leaves
Wheat germ	Onion stocks
Dalia	Plantain green
Rice flakes	Lotus stem
Bajra	Watermelon
Peas dry	Almonds
Soyabean	Raisins
Rajmah	Gingelly seeds
Lobhia	Nigella seeds
Lentil	Tamarind pulp
Bengal Gram Dal	Coriander seeds
Bengal Gram, whole	Zeera
Bengal Gram, roasted	Ajwain
Bengal Gram leaves	Mango Powder
Colacasia leaves	Turmeric powder
Cauliflower leaves	Munakka
Mustard leaves	Jaggery
Table Radish Leaves	

<b>Low: Less than 5 mg/100g</b>	
Jowar	Peas, green
Maize	Bathua leaves
Barley	Sem beans
Rice	Apple
Ragi	Amla
Spinach	Cashew Nuts
Methi	Sapota
Amaranth	

## Natal care (during childbirth)

### Place of delivery



- If possible the first delivery should take place at a hospital.
- In case of home delivery, it should be by a trained birth attendant/health professional. The room should be warm, clean and well ventilated, with adequate light. Put the bed or mat and blankets in the hot sun before use.

### The five cleans during delivery

1. To maintain **clean hands**, the birth attendant should cut her nails and wash her hands well with soap and water before conducting the delivery. She should not wipe her hands or touch anything.
2. Perform the delivery on a **clean surface** or clean bed sheet.
3. Use **clean thread** for tying the umbilical cord.
4. Use a new, **clean blade** for cutting the cord.
5. Do not apply anything on the cord. Keep the **cord clean**.

### Delivery Do's and Don'ts

<b><i>Do's</i></b>	<b><i>Don'ts</i></b>
<ol style="list-style-type: none"><li>1. Inform the dai, auxiliary nurse midwife (ANM), or nurse as the case may be.</li><li>2. Keep ready a new blade, soap, thread or cord tie and gloves (the disposable dai kit), and a clean cloth for wrapping the baby, sanitary napkins for the mother, cotton gauze, and boiled water.</li><li>3. Take plenty of liquids during labour pain.</li><li>4. Walk in early stages of labour.</li><li>5. Lie down on a bed and take deep breaths after the bag of water breaks.</li></ol>	<ol style="list-style-type: none"><li>1. Do not press the abdomen from the outside and do not lie on your stomach.</li><li>2. Do not break the water bag with a nail or blade.</li><li>3. Do not take any injections to speed up the delivery.</li><li>4. Do not push the baby down in between pains.</li><li>5. Do not pull the baby out by force.</li><li>6. Do not do frequent vaginal examinations.</li></ol>



## **After the delivery**

1. Wipe the baby clean with a soft, clean cloth at birth.
2. Wrap the baby in two layers of clothes. Keep the baby by the side of the mother as her body temperature will keep the baby warm.
3. Start breastfeeding within a half hour after delivery. Ensure that the baby is not exposed to a direct draught of air. Do not give a low-birth-weight baby (less than 2.5 kg) a bath for one week after birth.
4. Ensure the baby is handled by only one or two persons.

## **Danger signs during delivery**

The mother and/or baby should be shifted to a hospital immediately if any of these danger signs appear:

1. There is excessive vaginal bleeding before or after the baby is delivered.
2. The mother is in labour for 24 hours without delivering the baby.
3. The baby's hand or foot comes out first.
4. There is dirty-looking discharge.
5. The mother has fits during delivery.
6. The mother has severe pains in the abdomen or severe paleness or breathlessness.
7. The baby appears pale, blue or does not cry.

## **Care during the postnatal period (after the birth)**

- Nutritious food is a must for the mother after childbirth.
- Continue taking iron, calcium and a high protein diet.
- Drink plenty of liquids, including milk.
- Vaccinate the child as required.
- Exclusively breastfeed till 6 months. Clean your nipples and areola before breastfeeding the child.
- Take a daily bath and change pads every 6–8 hours.
- A minimum of three postnatal visits by a dai or nurse or in a hospital within six weeks after delivery are a must.



## **Danger signs in the mother**

- High-grade fever or foul-smelling vaginal discharge after delivery or up to 40 days after childbirth
- Excessive vaginal bleeding within 40 days after delivery
- Headache and vomiting or fits
- Severe pain in the abdomen within 40 days

## **Care of the newborn**

Care of the newborn starts with good antenatal care, safe delivery at a hospital or by a trained birth attendant at home, and includes:

- Resuscitation at birth if necessary
- Management of hypothermia (below normal temperature)
- Prevention of infections
- Care of low-birth-weight (less than 2.5 kg) babies
- Identification of high-risk newborns

## **Birth asphyxia (breathing problems at birth)**

- 95% of newborns cry immediately after birth. The colour of their skin is pink and they breathe easily. Their heart rate is approximately 120–160 per minute. Such newborns should be wiped with a soft clean cotton cloth and wrapped in warm clothes and kept near their mother for breastfeeding.
- Some newborns do not cry at birth and breathe irregularly. Their skin colour is blue or pale, and their heart rate is also less than 100 per minute or is not at all audible. These are signs of birth asphyxia.

## In case of birth asphyxia:

<i><b>Do's</b></i>	<i><b>Don'ts</b></i>
<ol style="list-style-type: none"><li>1. Put the child under a warmer or bulb if possible.</li><li>2. Place the child on its side so that fluid can come out easily.</li><li>3. Suck out aspirated fluids with a mucus extractor if possible. Clean the baby's mouth, nose and throat so that airways are not blocked.</li><li>4. Respiration is stimulated with cleaning of airways and most newborns start crying thereafter. If not, stimulate the soles of the feet with your fingers, or the baby's back can be rubbed softly.</li><li>5. Mouth-to-mouth respiration should be given. Blow with the cheeks rather than full breaths as a baby's lungs are very small and delicate.</li><li>6. Take the newborn to the hospital immediately if the above measures fail.</li></ol>	<ol style="list-style-type: none"><li>1. Don't keep the child upside down.</li><li>2. Don't place the baby face down.</li><li>3. Don't pat the baby hard on the back.</li><li>4. Don't press the baby's abdomen.</li><li>5. Don't sprinkle hot or cold water on the baby.</li></ol>

## **Hypothermia (low body temperature)**



In hypothermia, a newborn loses heat from all parts of his body and is unable to generate heat to maintain its body temperature. Temperature falls very quickly if not properly maintained, which can be fatal. Low temperature can be assessed by recording axillary (under the arm) temperature. (Normal is 98.4° F.)

### **Cold stress**

If palms and soles are cold, but chest and abdomen are warm.

### **Hypothermia**

If all parts are cold. A normal newborn is warm to the touch and its colour is pink.

### **Prevention of hypothermia**

1. Wipe the newborn with a clean warm towel immediately after birth.
2. Then wrap the baby in another warm dry towel or with cotton from head to foot.
3. The newborn should be kept next to the mother's skin.
4. The room should be warm; fans should be switched off.

### **Treatment of hypothermia**

1. Put the newborn under a warmer if one is available, or 1½ feet away from a 200-watt bulb. Keep the room warm with a heater or a hot water bottle.
2. Put the child between the mother's breasts (kangaroo method).

## Prevention of infections

A newborn is prone to infections, which are a major cause of death.

<i>Do's</i>	<i>Don'ts</i>
<ol style="list-style-type: none"><li>1. Take two injections of tetanus toxoid during each pregnancy.</li><li>2. Choose a delivery place that is clean, airy and well-lit.</li><li>3. Make sure the birth attendant should washes her hands thoroughly with soap and water before conducting the delivery.</li><li>4. Cut with a clean new blade, tied with sterilized cord ties and left dry and clean. The care of the cord is important.</li><li>5. Ensure that any person who has to hold the newborn washes his/her hands thoroughly for one minute before touching the baby.</li><li>6. Cut the baby's nails clean.</li><li>7. Continue Breastfeeding for six months.</li><li>8. Use clean clothes for the newborn.</li><li>9. Get the child immunized.</li></ol>	<ol style="list-style-type: none"><li>1. Don't give the child honey, tea, gur, water or ghutti or bottlefeed.</li><li>2. Don't let a sick person hold or attend to the newborn.</li><li>3. Don't take a newborn to a crowded place.</li><li>4. Don't allow many persons to enter the room where the newborn is lying.</li></ol>

## Low birth weight babies

The normal birth weight of a newborn is 2.5 kg. If a newborn weighs less than 2½ kg, it is known as a low-birth-weight baby. Newborn babies whose weight is between 2.0 and 2.5 kg can be managed at home. Babies who weigh less than 2 kg may have to be kept at a hospital.

## **Home management of babies with low birth weight**

1. During the first week, sponge-bathe the newborn daily. At the end of the first week, bathe the newborn.
2. Managing hypothermia is important. Keep the newborn wrapped in woolens or next to the mother's skin. 'Kangarooing' should be done by keeping the child between the mother's breasts.
3. Keep the baby in a clean and airy room; the room should be kept cosy.
4. Exclusive breastfeeding should be practiced. Feed the baby frequently, every two hours at least, as it gets tired easily and may feed only for a short time.
5. If a baby is unable to suck, express breast milk into the baby's mouth or into a bowl and feed with a spoon.
6. Watch for diarrhoea and acute respiratory infections. If there is diarrhoea, give ORS (oral rehydration solution) and take the baby immediately to a doctor.
7. Immunization is very important as a weak child is prone to infections.
8. The child should be handled by as few people as possible. Sick persons should not go near the child.

## **Prevention of low birth weight**

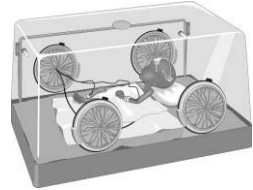
The future mother should:

1. Start taking iron tablets after 12 years of age.
2. Avoid pregnancy before 21 years of age.
3. Take one extra meal and avoid very hard work during pregnancy.
4. Avoid smoking and alcohol completely.
5. Rest for at least 2 hours in a lying down position during the day and get adequate sleep of 8 hours at night during pregnancy.
6. Take folic acid tablets for the first three months and iron, folic acid and calcium tablets thereafter during pregnancy.
7. Get at least three antenatal checkups by doctors.
8. Detect any anaemia, high blood pressure and bleeding early for referral to hospital.
9. Space births at least 3 years apart.

## Identification of the high-risk newborn

Arrange to take the newborn to a hospital if:

- Birth weight is less than 1800 g or there was a premature delivery (baby was born before the due date).
- Breathing is difficult or laboured.
- Child is unable to suck or breastfeed.
- Child is having fits or convulsions.
- Child is sleepy or cries a lot.
- Child is pale.
- Child has fever or is cold.
- Child is bleeding from any site.
- Abdomen is distended (swollen) or child is vomiting.
- There is pus from the cord.
- Child has any birth defects.



## Breastfeeding

- Breast milk is a balanced meal for the first six months of life. First milk (colostrum) should always be given to the newborn. This acts to boost the immune system and to protect the newborn from infection. It acts as its first immunization.
- Breastfeeding should be started between half an hour and two hours after delivery or as early as possible.
- Feeding should be every two hours or feed on demand.
- Exclusive breastfeeding should be done for the first six months.
- Don't give water, ghutti, or bottle feed.
- When the infant is six months old, start weaning with liquid foods like daal ka paani, rice water, and lassi. Then give semi-solid foods like dalia, khichdi, suji ki kheer, boiled and mashed potatoes, mashed banana, and homemade cerelac. Continue breastfeeding.
- Give the above three to four times a day initially.
- Then increase the quantity and give food more frequently.
- At nine months give everything that is cooked for adults.
- At 1½ years of age, the child should eat half of what an adult eats.

## **Pneumonia and respiratory problems**

Look for the following signs in the newborn:

- The child is cold or has high fever with chills.
- Breathing is fast and laboured.
- The child is unable to suck or eat food.
- The child is abnormally sleepy or difficult to awaken.
- There is indrawing of the chest when the child is calm. (A deep groove appears between the chest and tummy when the child breathes in.)
- When the child is calm, there are wheezing noises in the chest.

## **Do's and Don'ts of Treating a Newborn with Respiratory Problems:**

<i><b>Do's</b></i>	<i><b>Don'ts</b></i>
<ol style="list-style-type: none"><li>1. Give plenty of liquids.</li><li>2. Continue breastfeeding.</li><li>3. Keep child warm.</li><li>4. Keep the child in clean, non-smoky air.</li><li>5. Immediately take the child to the doctor or hospital if you see any of the above problems.</li></ol>	<ol style="list-style-type: none"><li>1. Do not give home remedies if any of the above problems are present.</li><li>2. Do not go to 'roadside doctors' (quacks) for treatment.</li></ol>



## Immunization



It is absolutely essential to protect the child against deadly diseases like tuberculosis, diphtheria, whooping cough, tetanus, polio, measles and hepatitis B. A child who is not immunized is likely to become disabled or undernourished and may die.

### Immunization schedule

- |                   |   |
|-------------------|---|
| 1. At birth       | BCG/OPV zero dose   |
| 2. 1½ months      | DPT and OPV 1 <sup>st</sup> dose + Hepatitis B 1 <sup>st</sup> dose |
| 3. 2½ months      | DPT and OPV 2 <sup>nd</sup> dose + Hepatitis B 2 <sup>nd</sup> dose |
| 4. 3½ months      | Hepatitis B 3 <sup>rd</sup> dose                                    |
| 5. 9 months       | Measles and Vit A 1 <sup>st</sup> dose                              |
| 6. 16–24 months   | DPT and OPV booster + Vit A 2 <sup>nd</sup> dose                    |
| 7. 2 years        | Vit A 3 <sup>rd</sup> dose  |
| 8. 2½ years       | Vit A 4 <sup>th</sup> dose  |
| 9. 3 years        | Vit A 5 <sup>th</sup> dose  |
| 10. 4½ to 5 years | DT and OPV booster + Hepatitis B booster                            |
| 11. 10 & 16 years | T-T + Hepatitis B booster   |

- All children 0–5 years of age should be given 2 drops of OPV during pulse polio program.
- Immunization is urgent and has to be done in the first year of life.

### Diarrhoea

- Diarrhoea can kill a child quickly by loss of liquid from the body.
- Give plenty of liquids to the child, like coconut water, shikanji (lemon water), light tea, lassi (buttermilk), soup, khichdi, light daal, dalia, good cooked rice, and boiled and mashed potato (if the child is not still breastfeeding).
- Give ORS (oral rehydration solution) or jeevan rak-shak ghol.
- Continue breastfeeding.
- Consult a doctor if diarrhoea is present for several days or there is blood in the baby's stools.
- Give a child who has recovered from diarrhoea at least one extra meal each day for at least two weeks.

## **Consult a doctor immediately if:**

1. The child has uncontrolled vomiting and diarrhoea.
2. There is blood in the stool.
3. The child is not taking fluid or food orally.
4. The child is sleepy and difficult to awaken.
5. The child faints due to dehydration.



## **Signs of severe dehydration**

1. Weak crying, no tears from the eyes, dry mouth and lips
2. Loss of skin elasticity
3. Sunken eyes and sunken fontanel (soft areas in the child's skull)
4. Decrease in amount of urine

## **Prevention of diarrhoea**

1. Breastfeed exclusively: no ghutti or bottle for the first six months of life.
2. Keep food and water for drinking covered and away from flies.
3. Keep child clean, cutting nails regularly.
4. Wash hands with soap and water before taking food and after using the toilet.

## **Malnutrition**

### **Causes of malnutrition**

- Weaning done early, not at proper age (seventh month)
- Poor hygiene/poor diet
- Worm infestation
- Repeated episodes of diarrhoea/chest infection

## **Symptoms of malnutrition**

- Child not gaining weight and attaining required height
- Weight for age in growth chart is low
- Generalized swelling of the body or very thin body
- Repeated skin infections like boils
- History of eating inedible things like soil, chalk, paper, pencils, hair, etc.

## **Management of malnutrition**

- Diet rich in proteins
- Treatment for worm infestations
- Nutritional recipes like homemade cerelac:
  1. Use 250 gms roasted channa + 100 gms of murmura.
  2. Grind separately and sieve.
  3. Mix and keep in airtight container.
  4. Mix 4 spoons in a bowl of milk with sugar for each feeding.

## **The adolescent girl**

- Age at marriage should be more than 18 years.
- Bearing a child before 21 years can be dangerous for the life of both mother and child.
- All adolescent girls (10–14 years) should take one tablet of iron every alternate day for prevention of anaemia.
- Iron prevents anaemia and thus helps prevent the problem of low birth weight if it is given till the girl gets married and conceives. Iron should be given as per the same schedule (three times a week) to newlywed women also, till they miss their menstrual period and pregnancy is confirmed.
- Anaemia can be prevented by a diet rich in iron. Eat saag, palak, chaulai, methi, mooli, sprouted daals, and gur.
- Cooking in iron utensils is also useful.
- Maintenance of hygiene is important during menstruation; use of sanitary napkins is a must for the prevention of reproductive tract infections.

# *Health and Hygiene*

The World Health Organization (WHO) tells us that **health** is a state of complete physical, mental, and social well-being, and not merely an absence of disease or infirmity. It enables enabling one to lead a socially and economically productive life.

## **Health goals for life**

- Fit and growing as a child
- Fit and attractive as a youth
- Fit and productive as an adult
- Fit and functioning as an elder



*You can get the best out of life by keeping fit.  
Health information is part of your success kit.*

## **A healthy way of living**

How you live, what you eat and drink, which physical activities you perform, and your good and bad habits is called all contribute to our lifestyle. If you follow a good lifestyle, you will fall ill less often and be full of energy. With a bad lifestyle, life will be cut short and made difficult by disease and disability.

You can choose to live healthily by eating healthy food, exercising regularly and not using tobacco or alcohol in any form. You can also motivate others in your family to do the same. You can help society grow healthier by beginning with yourself and your family.

*Let us all live healthy!  
Your health is your responsibility too.  
No one else can take better care of you than you.*

## Ask yourself how you feel about your present way of living?

- Do I eat a diet that meets my body's needs?
- Does my body get enough physical activity?
- Does tobacco harm my body?

To get answers to these questions read on.

### With a healthy way of living you are going toward:

**Look good** You will have a good build, strong muscles, bright eyes, and healthy skin and hair.

**Feel good** You will have more energy, sleep better and be more relaxed.

**Be happy** You will be able to perform better in your work or studies, and you will enjoy life much more with your family and friends.

You have it in you to do it yourself—enjoy life to the fullest.

*Learn health! Earn health!  
Health today and health tomorrow  
are yours to earn, not to borrow.*

### What is a healthy way of living? It means:

- Not picking up harmful habits
- Giving up harmful habits
- Picking up more good habits

In our country, diseases like heart attacks, high blood pressure, diabetes, cancer, breathing problems, and mental illness are increasing in frequency. A lot can be done to prevent these diseases by picking up good habits and giving up harmful ones. Developing good habits is easier when you are young. This will help to prevent lifestyle-related illnesses during the later years of your life. If you want to achieve success for yourself and for the country in the 21<sup>st</sup> century, you must ensure that you have good health to support your efforts throughout life. By taking care of yourself (eating well, being active, and not smoking), you will also feel good and grow strong, with energy for work and play.

## What to do to move towards a healthy lifestyle?

Avoid heart disease, diabetes and high blood pressure,  
and remain fully fit to enjoy life with pleasure  
**by having ideal weight for your height**  
and not becoming roly-poly.  
Be specially careful about that unhealthy pot-belly.

### How to keep healthy: Eat right.

Key Words are **regularity, balance, moderation, and variety.**

- **Eat in moderate amounts at regular intervals.**



Do you know that people who eat only one or two large meals every day are more prone to heart attacks and diabetes? It's good to have small meals more frequently, e.g., one should never skip breakfast or an evening snack. Have healthy snacks like fruits or vegetable sandwiches to supplement regular food at the main meals.

- **Eat right for your age.**

Children cannot eat the same amount of food in one meal as adults. They also expend a lot of energy throughout the day. They should sustain their energy requirement by eating small meals and snacks spread over the day. At the same time, overeating must be avoided at each meal.

- **Eat right for your level of activity.**

Food is the body's fuel. The more active people are, the more fuel they need, whereas less active people will need less fuel. For example, a carpenter and a postman who do more physical work have higher food requirements than as compared to a clerk and or an executive who are sitting most of the time and do not have to move around much.

- **Eat out less frequently.**

Eating in dhabas or restaurants should not become a habit because this increases the intake of junk food and foods prepared with large amounts of fat, salt, and masala. These foods may not be prepared under hygienic conditions and there are chances of adulteration (harmful items added to the food, such as chemicals or colours added to food items like mithai).

- **Eat a variety of foods.**

Eating enough does not mean eating too much of one thing. There is no food which alone can give you all the strength and nutrition that you need. You therefore need variety in the foods you eat. Rigidly sticking to the same few food items every time limits the availability of nutrients in your diet. For a balanced diet, choose some foods daily from all basic food groups:

- Cereals (rice, roti, bread) are ‘**go foods**’ as they provide energy for work and play.
- Pulses (dals, rajmah), milk and milk products such as curd and cheese (preferably made from low-fat or skimmed milk), and nuts and seeds are ‘**grow foods**’ as they give us proteins.
- Fruits and vegetables are ‘**glow foods**’ as they provide vitamins, minerals, and fibre.

**For a healthy diet, eat more:**

➤ **Fresh fruits and vegetables**  
For vitamins, minerals and fibre.

➤ **Fibre**

In addition to fruits and vegetables, whole grain cereals (atta, dalia, etc.) also provide vegetable fibre. This vegetable fibre (roughage) helps in the movement of food through our digestive system and helps to prevent diabetes, heart attacks, and some cancers. It also keeps the blood cholesterol level in check.



## **And eat less:**

### ➤ **Fat**

Fat is essential for growing well and staying healthy. However, too much fat in the diet can lead to obesity, heart attacks, and certain types of cancers. So keep the intake of deep-fried oily food, processed cheese, butter, cream, ice-cream, and chocolate as low and infrequent as possible.

### ➤ **Sugar, syrups**

Too many sweets can damage your teeth and cause cavities. They also make you grow fat and inactive. While Although you need energy for growth and activity, it is better to get it from complex carbohydrates like chapati, rice, potatoes, and arbi than from simple sugars. It is good to take less of sweet desserts and reduce or avoid sugar in milk, tea or coffee.

### ➤ **Salt (sodium)**

Excess salt increases the risk of high blood pressure. High blood pressure is a major cause of heart attacks and paralytic strokes. Reduce the amount of salt you take since we do not really need the amount we usually consume. Add less salt while cooking and avoid adding extra salt while eating. Some foods like pickles, sauces, papad, chips, and namkeen have too much salt, so take less of these.

## **How food is prepared affects its quality!**

Points to keep in mind while preparing food:

- Fruits and vegetables should be washed properly before cutting, eating or preparing.
- Fruits and vegetables should never be washed after they have been cut as there would be loss of vitamins and minerals.
- Whenever possible, eat raw vegetables to get maximum fibre, vitamins, and minerals. Other ways you can get high fibre in your diet are by eating:
  - Unsieved atta (flour) rather than sieved atta
  - Fruits with edible skin such as apple, chickoo, guava
  - Tandoori roti or chapati rather than white bread or naan, since naan is made of refined flour (maida) and has less fibre
  - Fresh whole fruits rather than juice



### **Please Remember:**

- Fruit juice is a better option than a soft drink like cola.
- Whole fruit is a better option than fruit juice.
- Cooking methods like steaming, pressure cooking, baking, or roasting should be preferred to boiling as these help prevent loss of nutrients while cooking.
- Frying adds fats to food items, which may lead to many diseases like obesity, heart disease, and diabetes. Frying also destroys nutrients. (For example, eating an idli is preferable to vada because vada, which is fried, has more fat content, and or idli, which is steamed, has no fat added during preparation.)
- Similarly, one should opt for roasted peanuts rather than french fried potatoes to avoid excess fat. Make sure, however, that only a little fat is used while roasting.
- Some vegetables like spinach and torai naturally have salt (sodium) in them. Therefore, we should add less salt to such vegetables while cooking.
- In order to cut down on salt intake, one should avoid sprinkling extra salt after the food is served.

### **You need energy but you need nutrients too**



You need energy to work and enjoy life. The body uses food as fuel (calories, food energy) to get this energy. However, if we eat more food than our bodies can use, the extra will be stored in the body as fat. In order to grow and do things like work, study, exercise, and recover from illness, we need not only fuel, but also nutrition.

Some foods give you lots of energy to **GO** but not many nutrients for you to **GROW** and **GLOW**. Foods that don't give us many nutrients may cause us to get fat and sometimes will make us tired and less fit! Healthy foods like cereal, milk, dals, fruits and vegetables give nutrients and energy to help you **GO**, **GROW**, and **GLOW**. Reserve high calorie foods—rich foods, soft drinks, and chocolates—for special occasions, and restrict their intake.

## Major Vegetarian Food Sources of Nutrients

Nutrients	Food
Energy	Cereals, pulses, roots and tubers, fats and oils, sugar and jaggery
Protein	Milk and milk products, pulses, nuts and oil seeds
Fat	Butter, ghee, vegetable oils, hydrogenated fats, nuts and oil seeds
Carbohydrate	Cereals, pulses, sugar and jaggery, roots, tubers
Fiber	Green leafy vegetables, fruits, unrefined cereals, pulses and legumes
Calcium	Milk and milk products, ragi, green leafy vegetables
Iron	Green leafy vegetables, rice flakes, whole wheat flour, ragi, pulses
Vitamin A, Beta Carotene, and Vitamin B	Butter, ghee, milk, carrots, green leafy vegetables, papaya, mango
B Complex	Milk, hand-pounded rice, whole wheat, whole grams, pulses, green leafy vegetables, nuts and oil seeds
Vitamin C	Amla, lime, orange, guava, tomato, lettuce, sprouted grams
Vitamin D	Milk, sunlight

### Iodine and Health Conditions

**The best source of iodine** is iodized salt and kelp (dried seaweed). Other good food sources are yogurt, cow's milk, and strawberries.

**An iodine deficiency can create:** fibrocystic breast disease, goiter, hyperthyroidism, hypothyroidism, and multiple miscarriages.

### Avoid overeating

- Eat regular meals to ensure you do not eat too much at one time.
- Take small bites, chew well, and eat slowly to avoid eating too much. It takes about twenty minutes for food to satisfy your hunger.
- Eat fruits and raw or cooked vegetables to get fibre that makes your stomach feel full and contented.
- Keep busy. Boredom encourages nibbling.

### Nutrition Who's Who

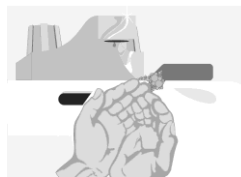
**Energy-dense foods** give you lots of calories but do not give the nutrients that you require to grow and keep well. Some of these foods are chocolates, ice-cream, potato chips, and soft drinks.

**Nutrient-dense foods** give you calories as well as nutrients in the right amounts to make you **go, grow, and glow**. Some nutrient-dense foods are chappati, rice, dals, rajmah, vegetables, fruits, milk, and milk products.

## Hygienic Habits

### Washing hands keeps us healthy

Harmful bacteria and viruses can stick to our hands. Washing your hands is the single best way to reduce the spread of infection. It should be an essential habit for everyone. Ensure that servants also wash their hands before handling food or dishes.



Here's how	When
<ul style="list-style-type: none"><li>• Wet your hands under warm running water.</li><li>• Put soap on your wet hands.</li><li>• Rub soap all over the front and back of your hands and between your fingers for 5 to 10 seconds</li><li>• Use a nail brush.</li><li>• Rinse your hands well under running water.</li><li>• Dry your hands with a clean towel.</li></ul>	<ul style="list-style-type: none"><li>• After going to the toilet.</li><li>• After taking a child to the toilet.</li><li>• After changing diapers.</li><li>• After wiping your nose.</li><li>• Before and after caring for a sick person.</li><li>• Before eating.</li></ul>

### Covering your mouth and nose while coughing or sneezing prevents disease

Use a handkerchief to cover your mouth when you cough or sneeze. If you don't have a handkerchief, it is better to cough or sneeze into the crook of your elbow, rather than into your hands, which are always later touching people or food. This will prevent the spread of airborne infections such as flu, colds, and tuberculosis.

### Spitting in public places spreads disease

Spitting is a bad habit, as it makes the environment unclean. It also contains viruses and bacteria which can spread disease.

## **Your health is in your hands**

### **Do Not:**

- Dump garbage in:
  - Open spaces
  - Vacant plots
  - Parks/green belts
- Create unauthorised garbage points for your convenience as it endangers your health.
- Litter around the garbage container.
- Throw garbage around the walls of educational institutions.
- Create unhygienic conditions by throwing rubbish over the back wall of your houses.
- Throw garbage over hedge cuttings/malba collection or vice versa.

## **Sanitation ensures health**

### **Do:**

- Train your domestic servant/maid servant to throw garbage only at an authorised refuse point.
- Keep your surroundings clean.
- Keep a dustbin in your house/shop, etc.
- Empty your kitchen bins before going to bed.
- Teach your school children about personal hygiene and keeping their locality clean.
- Ensure that rubbish/garbage is dumped in the garbage container and not around it.
- Help the area safaiwala, sanitary jamadar, and sanitary inspector by extending your cooperation.

## Tobacco

### Keep away from tobacco in any form



- Being a non-smoker is one of the best ways to stay healthy.
- Tobacco smoke has over 4000 harmful or poisonous chemicals like nicotine, tar, carbon-monoxide and many others. Cigarettes, bidis, hookahs, chillums and pipes are all harmful.
- Nicotine is an addictive substance like cocaine, heroin, and other addictive drugs. Once nicotine captures a person, the person is dependent on it and cannot give up the habit easily. That is why many smokers find it difficult to stop smoking. Tobacco smoke damages your body and causes lung, throat, and other cancers, heart disease and chronic lung diseases like bronchitis, asthma, etc. It causes loss of stamina. It may also lead to infertility and to still-births in pregnancy. If you wish to stay fit and healthy, say 'NO' to smoking. Do not get influenced by your friends or advertisements for cigarettes. Do not give in to the curiosity to smoke. It is just not worth it.
- A smoker harms the health of others around him too. The burning tip of a cigarette or bidi releases smoke into the air. Moreover, when a smoker exhales the smoke he has inhaled, he increases the smoke level of the room. The persons sitting in the same room also end up inhaling this smoke. They become 'passive smokers'. This means that although the others are not smoking themselves, they may have their lungs and heart damaged by cigarette smoke. This way a smoker harms his family members, friends and others around him.

#### **Of 1000 teenagers who smoke today:**

- 500 will eventually die due to tobacco-related diseases.
- 250 of these will die in their middle age. Compared to non-smokers, they lose 22 years of life on average.
- 250 will die in old age but will have suffered ill health due to tobacco-related diseases in middle age.

## **If someone is already a smoker**

A person who smokes can quit smoking if they make up their mind to do so; it requires will power and determination. The addiction makes it difficult sometimes, but with individual effort and support from family and friends, it can be overcome.

## **If you are not a smoker**

- Stay smart! Do not be tempted.
- Stop others from smoking near you. “Passive smoking” is harmful too!
- Persuade your family members and friends who are smokers to give up the habit. Talk to them about the benefits of stopping.
- Encourage your boss to make your workplace smoke-free.
- Encourage governments to make all workplaces smoke-free.

Here are a few points you could use to persuade the smokers you know to give up smoking:

- Your risk of getting lung cancer and heart attack will go steadily down.
- Your smoker’s cough will disappear.
- You will breathe more easily.
- You will feel more fit.
- You will no longer harm the health of your loved ones.
- You will save money.
- Your clothes will smell fresher.
- Your breath will be more pleasant.
- Your home will stay clean.

## **Tobacco related cancers**

Tobacco was introduced in India in the 17<sup>th</sup> century. Beginning in the 20<sup>th</sup> century, it became common. It is used in various ways; i.e., smoking, chewing, and snuff. Smoking is common worldwide. Harmful contents of smoke are hydrocarbons, benzene, and cadmium. Harmful substances in chewing tobacco include nicotine and nitrosamines. When tobacco in the form of Gutka is kept in oral cavity for long time, it plays a major role in development of oral cancers.

### **Oral cancer causes are:**

- Early age of starting to use pan (betel leaf) and tobacco.
- Poor dental and oral hygiene.
- Non-healing ulcer of oral cavity.
- Eating very hot food.

### **Warning signals**

- Development of white patches of mouth, lip, gums, and tongue.
- Pain during eating and drinking, foul smell from mouth.
- Lump in the tongue causing difficulty in swallowing.
- Nasal voice and ear pain.

**Treatment** is usually by surgery, chemotherapy, and radiotherapy.

### **Lung cancer causes are:**

- Smoking
- Exposure to asbestos fibers

### **Signs and symptoms**

Early stage is usually without symptoms. Later stage symptoms include:

- Persisting cough
- Difficulty in breathing
- Harsh wheezing sound
- Coughing blood
- Pain in chest

### **Diagnostic Tests**

- Sputum examination
- Chest x-ray
- Examination of airways by bronchoscopy (tube through the mouth into the chest under anaesthesia) and biopsy

**Treatment** is by surgery, chemotherapy and radiotherapy.



*Once you stop smoking,  
your body starts to repair the damage!*

**Please Remember:**

- Tobacco in all forms is dangerous. Chewing tobacco causes cancers of the mouth, stomach, and urinary bladder.
- Lots of trees are cut every year for making cigarettes (wood fuel is burnt for ‘curing’ tobacco). For every 300 cigarettes smoked, someone, somewhere, has killed a tree.
- You are responsible for your own health. Do not listen to others who encourage you to smoke.

**Physical Activity**

**What is physical activity?**

Physical activity involves any body movement that results in our body expending energy (burning calories). Any movement, therefore, involves physical activity. When we walk briskly, climb stairs, cycle, play sports, dance, or even clean the house, we are being physically active! Depending on the energy required for these activities, physical activity can be of different levels of intensity: light, moderate, vigorous, or strenuous.



**Type and Amount of Activity**

Active living	Activity for health	Exercise for fitness	Training for sports
Light to moderate activity	Moderate activity	Moderate to vigorous activity	Strenuous activity
Ten minutes or more, a few times a day	Twenty minutes or more, three times a week	Thirty minutes or more, daily	Duration and frequency according to individual fitness level

## How is physical activity different from ‘exercise’?

Moderate levels of physical activity are adequate to provide many health benefits, especially in preventing several diseases. Although higher levels of physical activity (vigorous or strenuous activity) serve to increase fitness by increasing the efficiency and endurance levels of the heart, lungs and muscles, they are not essential for gaining other health benefits. Being fit enables you to undertake higher levels of exercise more efficiently, while moderate physical activity provides adequate health benefits. Vigorous exercise is also more beneficial for weight control, as it burns more calories.

Regular moderate physical activity	=	Health benefits (reduced risk of disease)
Frequent vigorous physical activity	=	Increased fitness plus health benefits

## What are the benefits of physical activity?

### Regular physical activity

- Reduces the risk of dying prematurely.
- Reduces the risk of dying from heart disease or stroke, which are responsible for one-third of all deaths.
- Reduces the risk of developing heart disease or colon cancer by up to 50%.
- Reduces the risk of developing type II diabetes by 50%.
- Helps to prevent or reduce hypertension, which affects one-fifth of the world’s adult population.
- Helps prevent osteoporosis, reducing the risk of hip fracture by up to 50% in women.
- Reduces the risk of developing lower-back pain.
- Promotes psychological well-being and reduces stress, anxiety and feelings of depression and loneliness.



- Helps prevent or control risky behaviour (especially among children and young people) like smoking, drinking or other substance abuse, and the ill effects of an unhealthy diet or violence.
- Helps control weight and lower the risk of becoming obese by 50% compared to people with sedentary lifestyles.
- Helps build and maintain healthy bones, muscles, and joints and improves stamina for people with chronic, disabling conditions.
- Improves the functioning of the body's immune system and thereby protects against infections.
- Can help manage painful conditions like back pain or knee pain.
- Improves productivity by protecting health and promoting fitness.
- Enhances performance in sports.
- Promotes social networks and family bonding through group activities or sports.
- Serves as a stimulus for better urban planning and improved environments by creating a demand for pedestrian and cycling paths, parks, clean outdoor air, etc.

*The benefits will extend across your entire life!*

A **child** will:

- Have better bone and body growth.
- Build better capacity for the functioning of heart and lungs.
- Gain greater reserves for meeting the challenges of strenuous physical activity and stress in later life.
- Develop properly set body mechanisms that regulate blood pressure, pulse rate, blood cholesterol, blood glucose, and body weight.

An ***adolescent*** will:

- Build better muscle mass and gain bone strength.
- Be more attractive to others through appealing body shape, gait, and confidence.
- Cope better with mental stress.
- Perform better in sports.
- Avoid unhealthy weight gain.
- Improve the immune system and avoid infections.
- Increase appetite and improve nutrition.

A ***young adult*** will:

- Avoid high blood pressure.
- Prevent diabetes.
- Keep blood fats healthy.
- Maintain ideal body weight and body fat distribution.
- Adopt to challenges of daily life with less stress.

An ***older adult*** will:

- Reduce the risk of a heart attack.
- Reduce the risk of colon cancer.
- Keep blood pressure in the normal range (130/85) or help control blood pressure, if elevated.
- Improve blood fats, if abnormal.
- Keep blood glucose in the normal range or help control diabetes, if present.
- Avoid anxiety and depression.
- Keep better body balance.
- Minimize risk of joint problems.
- Reduce the risk of falls and fractures.
- Have regular bowel movements and avoid constipation.
- Gain protection from leg cramps.
- Ensure a good quality of life.

## **Regular physical activity prevents deadly diseases**

### **Heart attack**



The risk of heart attack is greatly reduced by regular physical activity, which keeps blood pressure and heart rate at relatively lower levels. It raises the HDL (good) cholesterol, which protects against fat deposits in the arteries. Lowering of blood pressure also protects against stroke.

### **Cancer**

Gut cancer is less likely to occur in persons who are physically active. Breast cancer may also be prevented by regular physical activity. Several other cancers are also less frequent in those who exercise regularly.

### **Diabetes**

Risk is greatly reduced by regular physical activity, especially if combined with appropriate diet.

### **Osteoporosis**

- Physical activity stimulates bone formation and renewal; it preserves bone strength, even in elderly people.
- Physical activity counteracts the tendency of bones to lose calcium and become weak in later life.
- Bone pains and fractures are much less frequent.
- Joints remain more supple, reducing joint aches even in the elderly. Muscles retain good tone and balance is improved, thus falls are avoided.

### **Excess weight and obesity**

Excess weight and obesity are risk factors for heart attacks, high blood pressure, diabetes, high blood fat levels, joint problems, lung disorders, etc. Regular physical activity helps to keep the body weight in check and prevents health problems. Those who are physically active and who do not gain weight as they grow older live longer and better lives.

## Mental health

Mental health is often adversely affected by poor physical fitness. Physical activity helps to avoid anxiety and depression.

### If you choose routine physical activity:

- Take a brisk walk for ten minutes three times a day
- Climb stairs (stay away from the lift up to the third floor)
- Walk/cycle to the nearby market (instead of taking the scooter/car)
- Do household work (cleaning, mopping, washing clothes)
- Do gardening, digging, cleaning, watering
- Dance—even at home—it is not as mad as you think!
- Play with children and friends
- Do aerobic exercises
- Skip rope
- Learn and practice yoga



## Calories Burned during Exercise

Basic factors influencing the number of calories burned during exercise are the:

- Type of workout
- Duration and intensity of the workout
- Body weight of the person working out — the heavier the person, the more calories burned during exercise.

To a lesser degree, certain individual factors such as *age*, *gender*, and *muscle versus fat ratio* may also affect the numbers of calories burned during exercise.

## Calories Burned by Exercise Type

For the sake of this discussion, we will consider a workout time of *30 minutes* and a person weighing *180 pounds*.

Here's how many calories are burned during various exercises:

<b>Aerobic Activities (30 minutes, 180 pounds body weight)</b>	<b>Calories Burned</b>
General aerobics, low impact	215
General aerobics, high impact	300
Bicycling, stationary, moderate intensity	300
Bicycling, stationary, vigorous effort	450
Rowing, stationary, moderate effort	300
Rowing, stationery, vigorous effort	360
Running 6 mph (10 min/mile)	330
Running 8 mph (7.5 min/mile)	450
Running 10 mph (6 min/mile)	533
Rope jumping, moderate speed	430
Rope jumping, fast speed	510
Stair climber treadmill, moderate effort	380
Swimming freestyle moderate effort	300
Swimming freestyle vigorous effort	430
Walking 3 mph (moderate pace), on level ground	140
Walking 4 mph (brisk pace), on level ground	215
Walking 3.5 mph, uphill	260

<b>Strength Training</b>	<b>Calories Burned</b>
Calisthenics, moderate effort (pushups, setups, jumping jacks)	200
Calisthenics, vigorous effort	340
Weight lifting, free weights, moderate effort	200
Weight lifting, free weights, vigorous effort	260

<b>Sports Activities</b>	<b>Calories Burned</b>
Badminton	200
Basketball, game	340
Basketball, non-game	260
Basketball, shooting baskets	200
Baseball/Softball	230
Billiards	110
Bowling	130
Boxing, in ring	510
Boxing, punching bag	260
Boxing, sparring	390
Fencing	260
Football	350
Golf, walking and carrying clubs	200
Golf, using power cart	150
Golf, miniature	130
Gymnastics, general	170
Handball, team	350
Hockey, ice or field	350
Horseback riding, walking	110
Horseback riding, trotting	280
Juggling	170
Kickball	300
Martial Arts (judo, jujitsu, karate, kick boxing, tae kwon do)	430
Polo	340
Roller skating	300
Skate boarding	215
Soccer	370
Table tennis	170
Tai chi	170
Tennis	300
Volleyball, game	340
Volleyball, general	300



***Please Note:***

- The numbers shown apply to a someone who weighs 180 pounds and exercises for 30 minutes.
- If the person weighs less than 180 pounds, the number of calories burned during exercise will be less than shown above.
- If the person weighs more than 180 pounds, the number of calories burned during exercise will be more than shown above.

To determine the numbers for your own particular case, see the Exercise Calorie Calculator.

**Tips for Picking the Most Time-Efficient Exercises**

The lists provide a comparative guide to the number of calories burned by various exercises. Of course, exercises that burn more calories over the same amount of time are more time-efficient.

You can see that among the exercises listed, the most time-efficient are:

- Running (at 8–10 mph)
- Ring-boxing
- Fast rope jumping
- Martial arts
- Vigorous stationary bicycling
- Vigorous swimming

To pick a time efficient exercise:

- Scan the list for exercises that burn more than 250 calories per half hour, then
- Choose the type of exercise you find most appealing and feel capable of doing.

## **Interval training**

Regardless of the type of exercise you choose, you may increase efficiency by varying effort intensity during your workout. Alternating intervals of high intensity with intervals of low intensity is more efficient than exercising at constant moderate intensity. This method is called interval training, and is widely used by athletes in their training programs.

### **Advantages of interval training:**

- It allows some recovery time during the low intensity intervals of the workout.
- It creates muscle confusion, which is a good thing because it results in more calories being burned for the same amount of effort.

If, for example, you choose running as your exercise, run at a moderate pace (about 6 mph) for a few minutes and then increase your speed as tolerated for 1–2 minutes (aiming to achieve 8–10 mph). Return to a moderate pace and repeat. As you become better conditioned, you may extend the duration of high-effort intervals versus low-effort intervals. The same applies for activities such as swimming, walking, bicycling, general aerobics, stationary rowing, and weight lifting.

## **Circuit training**


The number of calories burned during exercise can also be increased by combining aerobic activity and strength training in the same workout. This particular type of exercise is called circuit training. It has the advantage of allowing you to sustain a higher intensity throughout your workout: As you shift from an aerobic segment to a strength training segment and vice versa, your body gets a chance to recover from the previous effort.

## Exercise Calorie Calculator

(per minute)

Estimated calories burned are based on activities *per minute*. Actual calories burned vary with your individual body weight; the more you weigh, the more you burn.

Activity	Your Body Weight (in pounds)			
	105-115	127-137	160-170	180-200
Aerobic dancing	5.8	6.6	7.8	8.6
Basketball	9.8	11.2	13.2	14.5
Bicycling, stationary (10 mph)	5.5	6.3	7.8	8.3
Bicycling, stationary (20 mph)	11.7	13.3	15.6	17.8
Golf	3.3	3.8	4.4	4.9
Hiking (backpack)	5.9	6.7	7.9	8.8
Jogging (5 mph)	8.6	9.2	11.5	12.7
Running (8 mph)	10.4	11.9	14.2	17.3
Skiing, downhill	7.8	10.4	12.3	13.3
Skiing, cross country	13.1	15	17.8	19.4
Snow shovel, light	9	9.1	10.8	12.5
Snow shovel, heavy	13.8	15.7	18.5	20.5
Stair climbing	5.9	6.7	7.9	8.8
Swimming (20 yds/min)	3.9	4.5	5.3	6.8
Swimming (60 yds/min)	11	12.5	14.8	17.9
Tennis (singles)	7.8	8.9	10.5	11.6
Volleyball	7.8	8.9	10.5	11.6
Walking (4 mph)	4.5	5.2	6.1	6.8

<b>Examples of physical activity</b>		
Washing and waxing a car or motorcycle	45–60 minutes	
Cleaning/washing windows or floors	45–60 minutes	
Playing volleyball or badminton	45 minutes	
Gardening/digging	30–45 minutes	
Walking 1¾ miles	35 minutes (20 minutes/mile)	
Basketball (shooting baskets)	30 minutes	
Bicycling 5 miles	30 minutes (10 miles/hour)	
Dancing fast	30 minutes	
Walking 2 miles	30 minutes (4 miles/hour)	
Water aerobics	30 minutes	
Swimming laps	20 minutes	
Basketball game	15–20 minutes	
Bicycling 4 miles	15 minutes	
Jumping rope	15 minutes	
Running 1½ miles	15 minutes (10 minutes/mile)	
Stair-walking	15 minutes	

# Getting Well Without Antibiotics

## What are antibiotics?

Strong medicines used to treat infections caused by bacteria. Viruses are not killed by antibiotics.

## Should antibiotics be used for common ailments like coughs, colds and ‘flu’?

No! These common ailments are usually caused by viruses (not bacteria). Instead, use over-the-counter medicines for colds, as needed; drink lots of water and rest.



## What happens if we use antibiotics too often?

By over-using antibiotics for minor illnesses, some bacteria will no longer be killed by antibiotics. This is called *antibiotic resistance*.

## Could we then use other antibiotics?

Yes, but they may not be as effective, and may have more side-effects. Eventually bacteria may become resistant to these antibiotics too. Humans may run out of antibiotics faster than new ones are discovered. If everyone abuses antibiotics, there will be an ever-increasing number of antibiotic-resistant bacteria in the world. This is already a serious problem.

## How can antibiotic resistance be avoided?

By using antibiotics correctly for bacterial infections only.

## When are antibiotics needed?

Sometimes, simple colds become complicated by bacterial growth along with the original viruses. Also, serious infections like meningitis, pneumonia, and kidney infections require antibiotics. Your doctor will decide when you need them.

## How can I help?

Only use antibiotics when necessary and make sure to take the full dosage prescribed by your doctor. Antibiotics may be life-saving and they are more likely to work if they are used carefully. Antibiotic resistance is a global public health issue in which we all have a part to play. Bacteria will always try to survive by evolving and developing resistance to antibiotics, so we must stay one step ahead of the game. That means using fewer antibiotics, not more.

## *Early Detection of Cancer*

Cancer is an abnormal and unrestricted growth of cells of any organ or tissue and at any age into a mass called a tumor. Cancer is dangerous mostly when it spreads to other parts of the body. If it is detected early, it can often be cured. This is why it is so important to seek help early if you have a lump or sore that will not heal.

**Warning signals of cancer are:**

- A discharge that is not part of your usual menstrual flow or occurs after menopause. Also seek help if you have an unusual discharge that smells bad.
- A lump or thickening in the breast or elsewhere in both men and women.
- Change of breast skin so that it looks like the skin of an orange, or red, brown, or even clear discharge from the nipple.
- A sore that does not heal, even with treatment.
- A change in bowel habits such as repeated constipation or diarrhoea or alternating bouts of both.
- Difficulty with urination.
- Blood in stool or urine.
- A persistent cough or hoarseness of voice, blood in sputum.
- Difficulty in swallowing of food or liquid, continual indigestion, blood in vomit.
- Change in a wart or a mole, such as increasing size, change in colour, itching, or bloody discharge.
- Unexplained loss of weight, loss of appetite, or extreme fatigue.
- Any lump or growth found in your armpit, neck, or groin.
- A lump found on bony surface, joint, or muscle.

If you have any of these symptoms or signs or other unexplained symptoms, make an appointment to see your doctor immediately. Early detection of cancer and early treatment give better chance of overall survival. Treatment can involve surgery, chemotherapy, or radiation therapy.

Equally importantly, cancer can be prevented so you need to think about all aspects of your lifestyle such as eating, drinking, exercise, and body weight. You can protect yourself from cancer by eliminating the known causative factors from your life. You can be a victor and not a victim.

# Health Care for Women

Early detection of cancer is done by screening. Common cancers found in women are breast cancer and cervical cancer.

## Breast Cancer Screening

The most important step is breast self examination (BSE). It should be done every month before your period or, in menopausal women, on a fixed date of every month. Your physician should examine you every six months to one year. There are four methods for screening for breast cancer:

1. **Breast Self Examination (BSE)** It is important that your doctor teach you how to do BSE. A general description follows. BSE involves two parts: looking at the breast and feeling the breast.

**Looking at the breast** should be done either sitting or standing in front of a mirror in good light.

**Step 1:** Keep both arms by the side of your chest and look for:



- Any change in contour or shape of the breast
- Dimpling or pulling of skin
- Dryness or rash around nipple
- Retraction of nipple
- Swelling, puckering or redness over breast
- Fluid leaking from the nipple.

**Step 2:** Raise both arms above or behind your head with locked hands.

- Look for changes in breast contour/shape on both sides
- Nipple line should be horizontal. If there is any change, there may be an abnormality.



**Step 3:** Press both hands on your hips to make your breast prominent and look again for any change in size, shape or movement.

**Step 4:** Lean forward and see that both breasts are falling equally on both sides with prominent nipple.

### Feeling the breast:

#### Lying position

First lie on your back and put a pillow or folded towel under the shoulder to raise your breast. Use the pads of your fingers of the opposite hand.



Gently rotate your fingers in circular pattern and press them gently to feel any lump, tenderness or irregularity in your breast.

Squeeze your nipple for any discharge. Clear, red, or dark brown discharge is abnormal.

Feel your breast towards the armpit. Feel in your armpit as well as your neck for any lump or swollen gland.

Repeat for the other breast.

#### Standing position

The same examination can be done while you are taking your shower as soapy and wet hands can more easily be moved over the breast and to feel deeper into the breast tissue. Try to make a habit of examining yourself during bathing.



2. **Mammography** In case of any abnormality, mammography should be done at 30 to 35 yrs of age, then every 3 year interval between 40 to 50 yrs of age and after that every year.
3. **Sonomammography** A non-invasive method for detection of fluid-filled lumps. It is safe during pregnancy.
4. **Fine-needle aspiration (FNAC) and core biopsy** are methods used to further examine suspicious lumps.



**Please Remember:**

- Many breast lumps are not cancerous (especially in women who have lumpy painful breasts before their periods.)
- Any hard or irregular lump, retracted nipple, bloody discharge from nipple, or puckering of breast skin should be shown to your physician immediately. If you notice any abnormalities in one or both breasts, visit your doctor or local hospital.
- Risk factors for breast cancer include: older age at first pregnancy, older age at last pregnancy, no childbirth, no breast feeding, and gaining weight as you age.
- A healthy lifestyle without stress, maintaining a steady weight, regular exercise, eating lots of high fiber green, yellow, orange, and red coloured vegetables and fruits can help in preventing cancer.
- If a close family member has had breast cancer, you may be more likely to get it. So, be vigilant.

**Cervical cancer screening**

Cervical cancer occurs mainly in women who are or have been sexually active.

The following may increase the risk of cervical cancer:

- Early sexual life, i.e., sex before 20 years of age.
- Multiple sexual partners—or partners who, themselves, have had multiple partners.
- Human Papilloma Virus (HPV) infection.
- Smoking & other tobacco consumption.
- Repeated pregnancies, abortions & deliveries.
- Penile cancers in husbands or partners.
- Poverty, low socioeconomic status, and poor personal hygiene.
- Immunosuppression such as is caused by HIV infection.

Clinically, cervical cancers initially do not cause symptoms, but can be detected by having a regular Pap smear test and examination.

With grateful thanks to [www.breastcancer.org](http://www.breastcancer.org); this has been adapted for local women.

A **Pap smear** is taken from the neck of the womb with the help of a wooden spatula or brush. The watery smear is then spread evenly on a glass slide which is then stained (Papanicolaou stain) to make the cells easier to see. The slide is viewed under the microscope by a doctor or expert technician to detect any abnormal cancer cells.

- A Pap smear should be done yearly in all sexually active women.
- First Pap smear should be at 21 years of age.
- From the ages of 20–30, repeat every two years.
- For those 30 and above, repeat every 3 years
- Screening can be stopped after 65 years of age if three consecutive smears are normal.
- Women who have had a complete hysterectomy for reasons other than cancer do not need further Pap tests.

**Colposcopy.** All smears that show evidence of HPV infection should be followed up by colposcopy—direct visual examination of the cervix. A biopsy will be taken from any suspicious-looking area and examined for cancer.

**Please Remember:**

If you have any of the following symptoms or signs, you should contact your doctor immediately.

- Bleeding after sexual intercourse, bleeding between periods, bleeding after menopause.
- Offensive vaginal discharge.
- Unexplained vulval lumps or thickening.
- Vulval itching, white patch, or ulcer.

## *Colorectal (Bowel) Cancer*

Both men and women are at risk for colorectal cancers.

**Causes and risk factors** include:

- Diet high in meat and low in vegetables
- Smoking
- Alcohol
- Lack of exercise
- Gaining weight
- Family history
- Ulcerative colitis

**Main symptoms** are:

- Changes in bowel habits; for example, alternating constipation and diarrhoea
- Pain during defecation
- Fatigue, anaemia
- Bleeding from your rear end.

**Tests required for early detection**

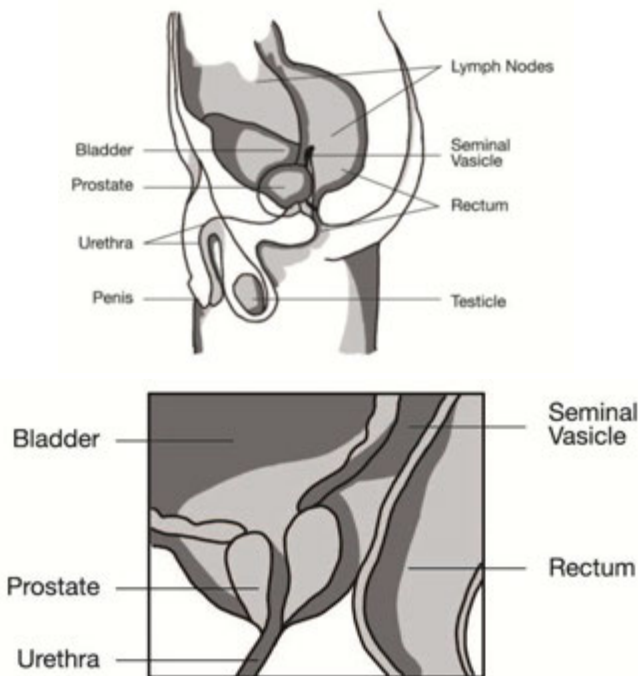
- Stool examination for occult blood every year
- Proctoscopy and rectal examination every year
- Other diagnostic tests are used if there is a suspicion of cancer, including x-rays and colonoscopy (examination of the bowel with a long tube inserted into your rear end)

**The best prevention** involves:

- A vegetarian, high vegetable diet
- Exercise
- Not gaining weight
- No tobacco or alcohol

## *Healthcare for Men: Prostate Cancer*

The prostate is a small gland the size of a walnut that is near the bladder. Often, the prostate grows larger in older men, but it's not usually cancer. This is called benign prostatic hyperplasia (BPH). It can cause a variety of urination problems, including waking up to urinate several times at night and a slowing down of the flow. BPH is often treated effectively with medicines; if not, a simple operation is done to relieve the symptoms—like cleaning out a blocked drainpipe.



Some men develop prostate cancer. It takes years to develop and usually does not cause symptoms, especially in the early stages. If your doctor finds prostate cancer early, it can be cured.

Advanced prostate cancer can cause pain if it spreads to the bones, such as the back and ribs.

**Who is at risk?**

Men after the age of 40 are at risk, after which time the likelihood of getting this cancer increases progressively.

Men who have been exposed to cadmium, or too many x-rays, as well as farmers are at higher risk.

**What can I do to ensure that, if I were to develop prostate cancer, it is detected early?**

Request a prostate exam from your doctor, at least once a year, after the age of 40.

Your doctor may also recommend a blood test (if available) called PSA, which can also help to find it early.

If there is any suspicion, a biopsy (taking needle samples of the prostate) may be recommended.

**What are the treatments for prostate cancer?**

If caught early and curable, different forms of radiation as well as surgery are all effective treatment options.

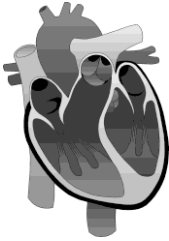
Late cancer is initially treated by lowering blood levels of male hormones (called androgens).

# Some Common Diseases

## *Heart Disease*

Indians around the world have the highest rates of sickness and death from coronary artery disease (CAD). CAD affects about 10% of the urban population of India. When compared to Europeans and other Asians, CAD rates are two to four times higher in Indians overall and five to ten times higher in those who are younger than 40 years of age. The prevalence of CAD in urban adults is estimated to be 7–10% in North India and as high as 14% in South India.

CAD is the commonest variety of heart disease, which manifests as angina pectoris (acute heart-related chest pain), acute myocardial infarction (heart attack) or sudden death.



The heart pumps blood through blood vessels to supply oxygen and nutrients to all parts of the body. Oxygen is the fuel for the energy needs of the body. The heart also needs blood to function, which is supplied by blood vessels known as coronary arteries. When an artery supplying blood to the heart gets clogged, then formation of a blood clot in it can lead to a heart attack. The artery gets blocked by the progressive deposition of cholesterol in the vessel wall leading to plaque formation.

### **Heart attack warning signs:**

#### **Chest discomfort**

Feeling uncomfortable with pressure, squeezing, pain, and heaviness in the centre of the chest, which lasts more than a few minutes, goes and comes back (especially if it lasts beyond thirty minutes or is not responding to a nitrate tablet) is strongly suggestive of a heart attack.

## **Discomfort in other parts of the body besides the chest**

Discomfort (pain or heaviness) may be present in the arms, back, neck or jaw. Chest discomfort may spread to the arms, shoulders, jaw or neck or may travel to the chest from these areas. Less common is upper abdominal pain with a feeling of fullness, acidity or indigestion which does not respond to antacids. Any of these pains should not be ignored but should be checked for a possible heart attack.

## **Shortness of breath**

Shortness of breath or breathlessness may be present before, during, or after chest pain (or discomfort). In addition, nausea, sweating, or light-headedness (giddiness) may be present. Sometimes breathlessness without pain or choking without a feeling of pain may be the only symptom.

## **What are the known coronary risk factors?**

These can be put under two headings.



### **1. Factors which cannot be modified:**

- Age >55 years in men, >65 years in women
- Male sex (males are more prone to atherosclerosis)
- Family history of CAD before 55 years of age (occurrence of CAD in a parent or grandparent before 55 years of age)

### **2. Factors which may be modified:**

- High blood cholesterol
- Smoking or tobacco chewing (present/past)
- High blood pressure (BP)
- Physical inactivity (sedentary lifestyle)
- Diabetes mellitus
- Mental stress
- Obesity, especially abdominal fat deposit (waist to hip ratio >0.95 in males, >0.85 in females)

## Reasons for high risk of heart attack in young Indians



The prevalence of hypertension (high blood pressure) in Indians is not extraordinarily high; smoking is more prevalent among westerners. The average level of cholesterol in Indians is also lower. Still Indians are prone to CAD at a young age. This so-called ‘Asian

paradox’ is probably due to many factors such as:

- The high prevalence of diabetes mellitus.
- Raised blood triglycerides or low HDL (good cholesterol) levels.
- Abdominal obesity: This is an important risk factor for CAD. It results from an excess of insulin in the blood and resistance to its action. Insulin resistance leads to a high blood triglyceride level, low HDL levels, abdominal obesity, and an increased risk of hypertension and diabetes mellitus, all of which increase the risk of CAD. This is sometimes referred to as ‘Syndrome X’ or ‘Metabolic Syndrome’.
- Physical inactivity.
- Excessive consumption of desi ghee and coconut oil.
- Consumption of hydrogenated fats like vanaspati.
- Lipoprotein A: This is a special variety of cholesterol and is an important CAD risk factor. Its levels have been found to be three times higher in Indians, than in European and Chinese populations.
- A genetic tendency to both high triglycerides and low HDL levels.

## At what time of day do most heart attacks occur?

Heart attacks most commonly occur between 4:00 a.m. and 10:00 a.m. The possible reasons are that blood pressure increases abruptly in the morning, the anti-clotting mechanism of blood is least efficient at this time, and coronary arteries are also in a state of constriction during morning hours.



## **What should be done if an acute heart attack is suspected?**

- Get to the nearest hospital at once.
- Sit upright on the way unless you feel light-headed.
- Keep a nitroglycerin tablet under your tongue if it has already been prescribed for angina (chest pain).
- Take a tablet of aspirin with water; this may control the damage to the heart.

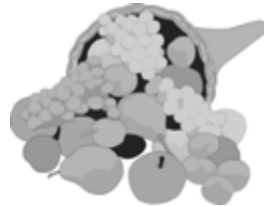
## **Prevention of CAD**

### **Role of diet in CAD prevention**

Healthy eating and desirable lifestyles are the most important strategies. Medicines are required in some cases.

### **Basic principles of healthy eating**

- Eat a variety of foods.
- Eat in moderation.
- Restrict total fat intake.
- Minimise saturated fat intake.
- Avoid hydrogenated fats.
- Reduce cholesterol intake.
- Ensure adequate fibre intake.
- Restrict intake of simple sugars, refined carbohydrates, caffeine and salt.



### **To achieve these goals**

- Eat plenty of cereals, pulses, vegetables and fruits.
- Eat a moderate amount of low-fat dairy products.
- Restrict the amount of fat, especially in fried foods and sweets.

## **Standard advice for reducing cholesterol and fat intake**

- Consume skimmed milk and skimmed-milk products.
- Eat plenty of fresh fruits and vegetables.
- Use low-fat sweets and snacks.
- Use low-fat cooking methods to reduce the overall fat content in your diet.
- When cooking, desirable methods are steaming, grilling, boiling, baking, and microwaving.

### **Which oils are more desirable?**

Unsaturated fatty acids (PUFA—polyunsaturated fatty acids, and MUFA—monounsaturated fatty acids) are preferred over saturated fatty acids. Saturated fatty acids increase LDL (bad cholesterol) production, thereby increasing the risk of CAD, while unsaturated fatty acids (PUFA and MUFA) reduce LDL cholesterol; hence they are preferred.

However, unsaturated fatty acids containing excessive PUFA can be detrimental because they may reduce HDL cholesterol also, which is a good cholesterol. There is no single oil available that contains both PUFA and MUFA in balanced amounts. Therefore, it is better to use a combination of oils having an appropriate balance between PUFA and MUFA and to minimize saturated fatty acid intake.

For example, one can use sunflower oil, having a high PUFA, combined with mustard oil, which has a high MUFA. Similarly, the following are examples of some oils that can be used together to achieve a balance between PUFA and MUFA:

- Ground nut oil + mustard oil
- Til oil + mustard oil
- Rice bran oil + soybean oil

Saturated fatty acids are normally solid or semi-solid at room temperature. Examples are coconut oil, vanaspati, and desi ghee. Unsaturated fatty acids are normally in a liquid state at room temperature. Examples are: safflower, sunflower, til, rice bran, mustard, ground nut, and soybean oils.

## **Role of dietary fibre in prevention of CAD**

Dietary fibre is that part of food that is not digested in the stomach and small intestine. Soluble fibre prevents constipation and bowel cancer.

### **Sources of soluble fibre**

Oats, legumes, gur, barley, apples, citrus fruit, carrots, etc.



### **Sources of insoluble fibre**

Whole wheat, bran, green vegetables, fruits, etc.

## **Benefits of fibre**

- Reduces weight.
- Reduces blood sugar and serum lipids.
- Prevents several benign gut disorders and colon cancer.
- Relieves constipation.
- Satisfies hunger and provides a feeling of comfortable fullness.
- Is a good source of vitamins and minerals.

## **Healthy options**

- Do not peel the skin of fruits like apples and pears.
- Eat sprouts, whole legumes (rajmah, kala chana), soybeans, husked dals (moong chilka, urad chilka) rather than dhuli (washed) dals.
- Don't sieve wheat flour.
- Use brown bread rather than white bread.
- Eat green leafy vegetables and salads regularly.
- Add lots of vegetables to idli, poha, upma, rice, dalia, noodles, macaroni, and pastas to make dishes rich in fibre.
- Use methi (seed/powder) in your diet.
- Use white oats rather than corn flakes for your breakfast.
- Eat whole-wheat roti, or stuffed roti (palak, gobi, mooli) rather than naan, rumali roti and parathas.

## **Why is it important to avoid excessive sugar intake even if a person is not a diabetic?**

Too much sugar promotes undesirable weight gain and tends to increase the triglyceride levels.

## **When is drug treatment for high cholesterol called for?**

Medication may be required in addition to dietary measures when:

- There is a strong genetic predisposition (family history) for an abnormal lipid profile. (A lipid profile is the term given to the estimation of total cholesterol: HDL, LDL, lipoprotein cholesterol, and triglycerides).
- Blood cholesterol or the triglyceride level is severely elevated (blood cholesterol >250 mg/dl, triglycerides >200 mg/dl).
- Dietary and other lifestyle measures do not control levels.

Safety and effectiveness of drug therapy should be reviewed by periodic lipid profile and liver function tests. Drug therapy should be considered a lifetime commitment. Generally, if medication is stopped, cholesterol returns to previously high levels. Diet control and medication stabilise heart disease, stops further cholesterol deposition in arteries and may even result in some regression of established deposits.

## Food Guide for a Healthy Heart

<b>Foods</b>	<b>Prefer</b>	<b>Limit</b>	<b>Avoid</b>
<b>Cereals</b>	Wheat, rice, ragi, bajra, maize, jowar	Foods prepared with maida (white bread, biscuits)	Cakes, pastries, naan roti, rumali roti, noodles
<b>Pulses</b>	Whole and sprouted, dals	–	–
<b>Vegetables</b>	Green leafy vegetables and other vegetables	Roots and tubers	Fried vegetables, banana chips, canned vegetables
<b>Fruits</b>	Fresh fruit	–	Dried fruit, canned fruit in syrup
<b>Dairy products</b>	Low fat milk, buttermilk, skimmed milk	Whole milk, milk powder	Cheese, butter, khoa, cream, condensed milk
<b>Fat</b>	Vegetable oil combinations	Total fat intake, coconut oil, ghee	Oily dishes, vanaspati, deep fried foods, butter
<b>Sugar and sugar products</b>	Sugar, jaggery	Sugar in any homemade beverages, all nuts and oil seeds	Sweets such as chocolates, ice creams, gulab jamun, jalebi
<b>Nuts and oil seeds</b>	–	All nuts and oil seeds	–
<b>Beverages</b>	Water, fresh fruit juice (no added sugar), light tea	Coffee, soft drinks	Alcohol
<b>Salt</b>	Foods in natural state without salt	Too much salt in preparations	Pickles, salt, papad, sauces, biscuits, fried crispies

## Sodium Content of Food

Vegetables	Mg
Bitter gourd	2.4
Parwal	2.6
Brinjal	3.0
Onion	4.0
French beans	4.3
Pumpkin	5.6
Lady's finger	6.9
Peas, green	7.8
ColocasiaArbi	9.0
Sweet potato	9.0
Yam	9.0
Cucumber	10.2
Potato	11.0
Tomato ripe	12.9
Radish, white	33.0
Tinda	35.0
Carrot	35.6
Cauliflower	53.0
Lettuce	58.0
Spinach	58.2
Coriander leaves	58.3
Beet root	59.8
Jack fruit	63.2
Radish, pink	63.5
Fenugreek leaves	76.1
Lotus stem	438.0

Other	Mg
Buffalo milk	19.0
Coriander seeds	32.0
Cow milk curd	32.0
Neem leaves	72.0
Cow milk	73.0
Cumin seeds	126.0

Fruits	Mg
Plum	0.8
Anar	0.9
Peaches	2.0
Phalsa	4.4
Orange	4.5
Guava	5.5
Chikoo	5.9
Papaya, ripe	6.0
Pears	6.1
Papaya green	23.0
Mango, ripe	26.0
Watermelon	27.3
Apple	28.0
Pineapple	34.7
Banana	36.6
Mango, green	43.0
Melon	104.6
Lichi	124.9

Grains	Mg
Jowar	7.3
Wheat vermicelli	7.9
Wheat flour refined	9.3
Maize, dry	15.9
Wheat flour	20.0
Semolina	21.0
Green dram dal	27.2
Red gram dal	28.5
Bengal gram whole	37.3
Black gram dal	38.8
Lentil whole	41.1
Bengal gram	73.2
Amaranth	230.0

## Who should have a lipid profile?



Ideally, everybody should have a lipid profile at the age of twenty years. This is to assess the future risk of CAD. It also helps detect genetic abnormalities of cholesterol and TG levels. If the lipid profile is normal at twenty years, it may be repeated after five years.

### Normal levels of lipids

Lipid	Desirable range
Cholesterol	<200 mg%
LDL cholesterol	<100 mg%
HDL cholesterol	>40 mg/dl for men >60 mg/dl for women
Triglycerides (TGS)	<150 mg/dl

Lipid profile at a young age is especially indicated in the following situations:

- Family history of CAD or stroke especially before the age of fifty-five years
- Family history of high blood cholesterol
- Lipid deposits appear as cream-coloured elevated patches over eyelids
- Obesity, hypertension, diabetes or thyroid problems
- History of excessive drinking of alcoholic beverages
- Continuous use of oral contraceptives over many years.

## **How does regular exercise help?**

Regular exercise prevents CAD and premature death and is one of the most important parts of a healthy lifestyle. The risk of heart attack is greatly reduced by regular exercise, which keeps blood pressure and heart rate at relatively lower levels.

Regular physical activity also raises the blood levels of HDL cholesterol, which protects against fat deposits in blood vessels and prevents heart attacks. Persons suffering from high blood pressure can avoid or reduce drug intake through regular physical activity. Exercise improves blood circulation to the legs and reduces leg cramps.

Modest exercise of thirty minutes, three to five times a week, is enough. The level of physical effort may always be increased gradually. Brisk walking, swimming, cycling or light games (badminton and table tennis) are good. Weight lifting does not help with fitness although it improves strength.

## **Safety rules for exercise**

- Exercise either before, or two hours after, major meals.
- Avoid exercise when unwell.
- Do not discontinue exercise for more than two weeks at a stretch.
- Avoid exercise that is too vigorous if it is not usually what you do.
- Avoid holding your breath.
- Avoid difficult and unenjoyable exercises.
- Overweight people should select low-intensity exercises such as brisk walking and gradually increase activity over time.
- Slow down your pace during extremely hot weather.
- Protect yourself from extremely cold weather by wearing sufficient clothing.
- Drink plenty of water.



## **Strategies to control stress in preventing CAD**

Stress activates the sympathetic nervous system, resulting in a faster heartbeat, high blood pressure and constriction of the coronary arteries, all of which increase the oxygen requirement of the heart muscles. Stress also promotes clot formation within these vessels.

Although easier said than done, one should learn to cope with stress by:

- Relaxation exercises
- Meditation
- Hobbies
- Physical activity
- Positive thinking
- Yoga

## **Role of tobacco/smoking in CAD**

Smoking is a major risk factor for CAD. Smoking is in fact the major (often the only) risk factor for CAD in people below forty years of age. The prevalence of CAD in smokers is three to five times greater than that in non-smokers. The nicotine present in tobacco leads to an increase in heart rate and blood pressure and narrowing of the blood vessels.

## **Does giving up smoking help?**

The risk of CAD begins to decrease within one year of quitting smoking even in lifelong smokers. The risk continues to fall further with abstinence from smoking. See also pages 54-57.

## Managing stress



Stress management is a learning process. First, identify the particular cause of your stress. Second, take steps to change those circumstances that are stressful, whenever possible. Third, relearn ways to cope with stress in your everyday life.

The following are a few suggestions for coping with stress:

- Do not waste energy being upset over little things. Remember that stress is our reaction to situations, not the situation itself. Often it helps to talk it out and get a different perspective on the situation while at the same time venting your concerns; venting does not mean angry shouting.
- Escape from the stress for a period of time. Exercise—taking a walk before lunch to get rid of the morning’s frustrations or taking a walk after work to help unwind—can be very helpful to reduce your stress.
- Beware of the urge to do and be the best at everything. Set priorities, establish realistic goals and stop trying to do too much.
- Take time to relax daily whether you learn relaxation techniques or just take time out for a favourite hobby.
- Take it easy with criticism or arguments. Stand your ground on what you believe is right, but make allowances for the other party. Search for the positives in an argument, and in a critical person, as well as your own positive qualities.
- Finally, if stress seems out of control, discuss it further with your doctor or other health-care professional.

## Obesity and CAD

Obesity increases the risk of fatal heart attacks because:

- Obesity is associated with a higher risk of nearly all risk factors except smoking.
- Blood cholesterol, triglycerides, and glucose levels, as well as blood pressure tend to rise with weight gain.
- HDL (good) cholesterol falls with weight gain.

A good measure of obesity is the body mass index (BMI). This is calculated as weight in kilograms divided by the square of height in meters.

$\frac{\text{Weight}}{\text{Height}^2}$	
Normal BMI	19–24.9
Overweight	25–29.9
Obese	30–40
Morbid Obesity	> 40

### Does weight control help?

Yes, weight reduction often reduces blood pressure to normal levels. It improves glucose levels and control of diabetes. It also reduces the frequency and severity of angina and the risk of heart attack and improves the pumping efficiency of the heart.

*Do not ignore signals of a heart attack.  
Do not hesitate to seek medical help.*

# *Diabetes*

Diabetes mellitus has become a major menace in India. Every fourth or fifth household in urban areas has a diabetic patient. The incidence of diabetes has increased dramatically over the years. A few decades ago, approximately 2% of the adult population suffered from diabetes. In the last two to three decades there has been a sharp rise to approximately 8–10%. According to the World Health Organization (WHO), India will have 57 million diabetic patients by 2025. Although there is no known cure for diabetes, with modern treatment one can hope to lead as normal, as active, and as useful a life as any other person.

## **What is diabetes?**

Diabetes is a condition in which there is too much glucose (sugar) in the blood due to defective insulin action or deficiency in its secretion. Insulin is required for glucose to enter the cells of the body, where it is utilised. It is as if insulin is a key which opens the doors of the cells to allow glucose to enter. When insulin is absent or is less efficient, glucose in the blood cannot enter the cells and remains in the blood in high amounts.

## **What happens in diabetes?**

When glucose does not enter the body cells due to lack of insulin, it accumulates in the blood. After it reaches a certain limit, it starts appearing in the urine. Normal urine does not contain glucose. When glucose appears in the urine, it draws out more water with it and hence there is **excessive urination**. Because of excess urination (loss of water) there is **excessive thirst**. Although there is excess glucose in the blood, there is not enough in the cells due to lack of insulin. The cells are starved of glucose. This causes an **increase in appetite**. Hence a diabetic eats more, but the body's cells do not get enough glucose. In a desperate effort to get energy, the "starved cells" begin using body fat and protein. This can eventually cause **loss of weight and tiredness**, but usually only in Type I diabetes. Because of high levels of glucose in the blood, some people become irritable. Sometimes very high blood glucose can lead to **coma**. Also there is a greater risk of developing infections. Symptoms may not be present.

## Common symptoms of diabetes



Excessive Urination



Excessive Thirst



Excessive Hunger



Loss of Weight



Tiredness



Irritability

## What causes diabetes?

Two main factors are responsible for causing diabetes:



- 1. Inherited factors:** Some genetic factors are inherited from parents. That is why it is more common in some families. If one parent has diabetes, there is a 20% chance of diabetes in the children, whereas if both parents are diabetics, chances increase to 20–50%.

- 2. Environmental factors** such as:

- Obesity
- Physical inactivity
- Lack of exercise
- Poor food choices, especially high-sugar, high-fat, low-fibre fast foods.

These factors precipitate diabetes in those who have inherited the trait.

## Are all diabetics alike?

No, all diabetics are not alike. Diabetics can be classified into two main groups.

### Type I

- Develops at an early age--usually in childhood
- Patients are young, lean and thin
- Illness develops rapidly
- Patients are dependent on insulin for life

### Type II

- Develops later in life (40+)
- Patients are often overweight or have a potbelly
- Illness progresses slowly
- Patients are not necessarily dependent on insulin, but often require it for good control

## Preventing Type II diabetes is possible

1. **Primary prevention** of diabetes is targeted in individuals who are at a high risk of developing diabetes. You are at high risk if you:
  - Have a blood relative who is a diabetic
  - Are overweight (BMI >25)
  - Delivered a big baby (birth weight was 4 kg or more)
  - Had diabetes or even a mild elevation of blood sugar during pregnancy
  - Are physically inactive, meaning you exercise less than three times a week
  - Have high blood pressure
  - Are pre-diabetic: fasting blood glucose of 110–126mg<sup>0</sup>%, postprandial (after eating) glucose of 140–200mg<sup>0</sup>%
  - Have triglycerides or cholesterol levels higher than normal

Success in preventing diabetes depends upon:

- Maintaining an ideal body weight or losing about 5–7% of your body weight (if your body weight is more than desired). Even 2–3 kg of weight loss can make a difference.
  - Diet should be of foods which have a low glycemic index, such as whole wheat, whole grains, beans, fruits, vegetables, etc. Fats should be only of an unsaturated type like liquid vegetable oils.
  - Undertaking a brisk walk or other forms of physical activity for 30 minutes, 5 times a week.
2. **Secondary Prevention:** If you keep good control of your diabetic state (blood sugar, lipid profile, blood pressure) and take other measures such as a small daily dose of aspirin, statins and ACE inhibitors (if needed and under the guidance of your doctor), you can prevent the complications of diabetes.
  3. **Tertiary Prevention:** Even when complications such as eye, kidney, heart, vascular, or nerve problems have started, it is possible too prevent further damage and preserve the function of these organs if these problems are detected in the earlier stages.

## **Responsibility of a diabetic in preventing diabetes among blood relations**

You know that if you are a diabetic, other members of the family may have diabetes. Try to convince your brothers and sisters to undergo screening for diabetes, particularly if they:

- Are over the age of 25 years
- Are overweight
- Don't exercise
- Suffer from repeated infections
- Have high blood pressure
- Have a history of angina or heart attack
- Have high blood cholesterol
- Have a bad obstetric (childbirth) history

### **Screening is simple**

Get blood sugar tested two hours after a meal (postprandial). If blood sugar is greater than 140 mg%, re-check while fasting and two hours after 75 gms of glucose have been taken orally.

	<b>Fasting</b>	<b>2 hrs after a meal</b>
Normal	<110 mg%	<140 mg%
Pre-diabetic	110–125 mg%	140–200mg%
Diabetic		>200 mg%

Even if your fasting blood sugar is normal but, after the Impaired Glucose Tolerance (IGT) test your blood sugar levels are above normal, you should repeat the IGT every year. The IGT should not be ignored. Lifestyle modification can help in preventing diabetes.

### **Preventing diabetic complications**

Diabetes, if not well controlled, affects other organs of the body and can lead to serious acute and long-term complications. It is possible to delay or prevent some of these complications if diabetes is controlled properly.



## Acute complications

Patients with diabetes who neglect to control high blood sugar may lose excessive amounts of water and salt in their urine. This can lead to dehydration, which can sometimes be fatal.

*The diabetic who knows the most  
will live the longest.*

## Hyperglycaemia (high blood sugar/ketoacidosis and coma)

Burning of fats can be inefficient as a way of producing energy and the process results in products called ketone bodies which make the blood acidic. This condition, called ketoacidosis, is more common



among patients who require insulin to control the diabetes. It occurs if the patient stops taking insulin or the insulin requirement increases (due to illness or fever). The patient suffers vomiting, abdominal pain, dehydration (excessive loss of salt and water),

breathlessness, and a characteristic fruity smell like acetone on the breath. Unconsciousness and even death may occur.

## Hypoglycaemia (low blood sugar)

Hypoglycaemia means abnormal lowering of blood sugar below the acceptable range, which leads to a variety of symptoms.

Hypoglycaemia may also occur without any warning signals, or even during sleep. It may occur due to:

- Excess dose or inappropriate timing of insulin or glucose-lowering tablets
- Inadequate amount of food after taking insulin
- Increased exercise
- Excessive alcohol consumption

## What are the symptoms of hypoglycaemia?

Minor	Moderate	Severe
Sweating	Weakness	Poor cognitive function; impaired capacity to solve problems, including loss of awareness of the need to respond to the hypoglycaemia itself
Palpitations	Hunger pains	Confusion
Nervousness	Drowsiness	Reduced ability to concentrate
Trembling		Slowed reactions

### How to avoid hypoglycaemia

Mild hypoglycaemia is self-limiting and is corrected by the body's natural mechanism, whereas severe hypoglycaemia, if not treated properly, may result in coma.

Proper care about diet, exercise and medication can help to avoid hypoglycemia. Always carry something sweet and eat it the moment you observe the symptoms. Keep your relatives informed about hypoglycemia. Always carry your identity card showing that you are a diabetic. Contact a doctor immediately if you are in severe hypoglycaemia.

## 2. Long-term complications

The common long-term complications are as follows:

### **Diabetes and blindness**

Many diabetics complain of not being able to get proper glasses due to fluctuating vision. It is because of fluctuating blood sugar levels. To obtain new glasses while the blood sugar is uncontrolled serves no purpose. Therefore, it is advisable to control blood sugar for at least two to three weeks before obtaining new glasses and then maintain good control.

A change in the number of glasses prescriptions may be a sign of diabetic retinopathy, a condition which leads to blindness if due care is not exercised.

### **What is diabetic retinopathy?**

Diabetic retinopathy is the most frequent cause of blindness in diabetics. Early detection and appropriate therapy may prevent blindness due to diabetic retinopathy. Diabetic retinopathy occurs when vessels in the retina are ruptured or produce a new growth (neo-vascularization), which leads to impaired vision and blindness.

*The diabetic who knows the most  
will live the longest.*

## What can be done to prevent blindness?

- Eye check-up by an eye specialist twice a year or whenever you think there is even a slight loss of vision.



- Optimal control of glucose and blood pressure.
- If the condition continues to develop, photocoagulation can be undergone, which seals the blood vessels leaking into the retina.
- In some cases when loss of vision is great, a surgical procedure called vitrectomy may be considered.

## Diabetes and heart attack

Heart attacks are about three times more common in persons with diabetes, and diabetics are prone to develop high blood pressure.

### Preventing heart attack and stroke in diabetics

Diabetic patients have two to four times more chance of getting a heart attack or stroke as compared to the non-diabetic population.

There are certain peculiarities of heart attacks in diabetic patients:

- They occur in a comparatively younger age group, at least a decade earlier.
- Classical chest pain may not be felt.
- The coronary arteries are blocked at multiple places; hence bypass surgery becomes more difficult.
- Recurrence is more common.

### Factors responsible for heart attack in diabetics

- Heredity
- Aging
- Physical inactivity
- Uncontrolled blood sugar
- High blood pressure
- Microalbuminuria – loss of protein in the urine because of damage to the blood vessels in the kidneys
- High circulating fats (cholesterol, LDL, triglycerides)
- Altered coagulation factors (in blood)

If the above factors are taken care of, heart attacks are reduced by almost 50%. Try to achieve the following target values:

- Normal weight
- Regular exercise
- Blood pressure <130/85
- Blood sugar:
- Fasting 110–120 mg%
- Postprandial up to 140 mgs
- Glycated Haemoglobin (HbA<sub>1c</sub>) <7%
- Cholesterol <150 mg%
- HDL > 50 mg%
- LDL < 70 mg%
- TGS < 130 mg%
- Urine albumin < 30 mg% per day

### **Preventing kidney failure and damage in diabetics**

Uncontrolled diabetes damages the kidneys, often leading to kidney failure. One third of all new cases of renal (kidney) failure seen today are the result of uncontrolled diabetes.

### **Kidneys can be protected by:**

- Keeping blood pressure (BP) within the normal range (130/85) through diet, exercise and drugs
- Controlling the blood glucose level
- Restricting protein intake to about 40 g/day
- Monitoring of albumin in urine periodically

### **Blood vessels and circulation**

The arteries may develop fat deposits, hindering the flow of blood. This can lead to stroke and gangrene of limbs at times.

*Your attitude decides your success  
in looking after your diabetes.*

## **Diabetes and the nervous system**

Uncontrolled diabetes affects the nerves, which can lead to loss of sensation. Because of loss of sensation, minor cuts and wounds go unnoticed. The wound can get infected, and when this happens in association with poor circulation, it can lead to gangrene or a need for amputation.

*Show your doctor your feet at each visit  
and ask your doctor if your feet are at risk.*

## **Care for your feet (prevent gangrene and amputation)**

- Control your blood sugar, blood pressure and lipids.
- Check your feet every day for cuts, sores, red spots, swellings and infected toe nails. Find time to do this.
- Wear shoes at all times of the day especially when you are out. Wear socks at night if your feet are cold.
- Wash your feet daily, dry them properly; use warm, not hot water.
- Dry your feet well, especially between your toes.

## **Diabetes monitoring schedule to achieve good control**

Each and every test has some significance and offers important but limited information. Some parameters like blood sugar change minute to minute, others like cholesterol may not change for months. Hence, the tests are repeated according to this pattern of change and stability so that monitoring becomes effective and economical.

## Which tests are to be done and when?

### At the time of initial diagnosis of diabetes

- Weight
- Height
- BMI – weight in kilograms/[height in metres]<sup>2</sup>  
(Underweight <19, Normal 19–25, Overweight 25–30, Obese >30)
- Blood sugar – fasting and postprandial (after eating); repeat more frequently till it becomes normal.
- Blood pressure (BP)
- Haemoglobin, and other blood tests
- Lipid profile (cholesterol, HDL-cholesterol, LDL-cholesterol, triglycerides)
- Serum creatinine, blood urea, and uric acid
- Urine for routine test including microalbumin
- Liver function test—repeat after one year
- Fundus examination (internal examination of the dilated pupil of the eye)—repeat after one year
- ECG
- X-ray chest—repeat after 5 years

Once treatment has stabilized the diabetic state, the tests are meant to confirm:

- State of control of diabetes
- Early detection of complications
- Reversal of complications
- Further deterioration

*Self care is more effective and practical with best results.*

### ***Quarterly check-up for a diabetic***

- Weight
- Blood sugar
- HbA<sub>1c</sub> (Glycated haemoglobin—this is a measure of how well controlled your blood glucose is over a span of time)
- BP assessment
- Urine for albumin
- Reassessment of treatment

### ***Half yearly check-up for a diabetic***

- Lipid profile
- Cardiovascular system—ECG
- Modification of treatment if required

### ***Yearly check-up for a diabetic***

1. Comprehensive check-up of all systems
2. Fundus (eye) examination
3. Complete heart check-up
4. Renal function test, liver function test

*Merely having the knowledge is not enough,  
you have to achieve its implementation.*



## **Management of diabetes**

### **What is diabetic control?**

Diabetic control can mean different things to different people:

- Control of the symptoms of diabetes
- Control of blood sugar level
- Control of Hb A<sub>1</sub>C (Glycated haemoglobin)
- Control of the complications of diabetes. While to the patient with diabetes, control of symptoms and blood sugar may seem adequate, the doctor may want to ensure that associated problems (blood fats, blood pressure, etc.) are also kept in check.

To achieve good control, you must understand your disease. The doctor can help you to attain the goals that you wish to set, but remember, you are the key person in the management of the disease. The chief tools in the management of diabetes are:

- Diet
- Exercise
- Medication

When we eat any food, whether consisting of carbohydrates, proteins, fats or mixed in different ratios, the blood sugar rises. The blood sugar rise depends on the glycemic index (GI) of the particular food.

The GI is the ratio of blood sugar level after taking any food item to that after taking equal calories of glucose. The GI of glucose is very high. If we do not want our blood sugar to rise very quickly, our food should be of low GI.

### **Significance of the glycemic index**

- Low GI means a smaller rise in blood glucose levels after meals.
- Low GI diets can help people lose weight.
- Low GI diets can improve the body's sensitivity to insulin.
- Low GI can improve diabetes control.
- Low GI foods keep you full for longer.
- Low GI can prolong physical endurance.

## Glycemic Index of Some Food Items

Curd	14	Green peas	47
Cherries	22	Oatmeal	48
Kidney beans	29	Carrots	49
Lentils (green, brown)	30	Sweet potatoes	52
Whole milk	32	Mangoes	55
Skimmed milk	30	Bananas	56
Tomato soup	38	Potatoes	59
Apples	38	Wheat	66
Oranges	43	Watermelon	72
Grapes	46	Corn flakes	83

A mixed diet of different nutrients has a lower GI. If we eat roti with dal, the GI will be lower than that of roti if taken alone.

- The GI of whole-wheat atta or whole dal is lower than an equal amount of maida, suji, or washed dal.
- Coarse cereals, green vegetables, and some fruits have a lower GI because of greater fibre content.
- Fibre slows the digestion, hence blood sugar rises slowly.
- Some low GI snacks are dhokla, sprouts, atta biscuits, roasted channa, popcorn, besan, chila or baked items.
- The GI of starchy vegetables can be reduced by adding curd.
- Reduce the GI of dal (sambar) by adding green vegetables.
- Split major meals into small, frequent meals to reduce the GI.

### General guidelines on diet

- In a typical day, a normal-weight diabetic should have 1500 calories from meals and snacks although this will vary by age, gender, and amount of physical activity.
- Eat a variety of items of food every day. Do not skip meals.
- Increase the amount of dietary fibre in your diet.
- Use less oil in cooking.
- Avoid fried foods, milk-cream, or food cooked in coconut oil.
- Avoid ready-to-eat foods, sweets, and sugary drinks.
- Restrict protein consumption if you have kidney damage.
- Keep a regular check on your weight and try to maintain it.
- Match your meal time to the insulin injection schedule.

## **What are the main adjustments in a diabetic diet?**

### **Diabetic diet instructions**

1. Weight should not exceed your expected ideal weight.
2. Do not starve yourself. Take the free foods from the list below.
3. Divide your whole day's ration into 5 to 6 meals of equal quantity and nutrients, rather than eating 2 to 3 major meals.
4. Exercise is good and should be a part of the daily routine.
5. Feasts and fasts should be avoided.
6. Cereals are the principal source of carbohydrates and should be consumed in prescribed amounts; use of mixed or whole grain cereals is desirable.

### **Free foods**

Plain tea and coffee, nimbu pani, clear soup, plain aerated soda, vinegar, diluted khatti lassi, kheera, kakkri, tomato, muli, karela, sag, and leafy vegetables.

### **Foods to be avoided**

Ice cream, pudding, mango, banana, sitaphal, kishmish, grapes, chikoo, khajur, dry fruits, nuts, alu, shakarkandi, kachalu, chukander, fried foods, pickles in oil, cakes, pastry, maida articles, and pineapple.

## Meals by Caloric Content

<b>Calories</b>	<b>800</b>
Protein	40 g
Carbohydrates	14 g
Fat	130 g

<b>Breakfast</b>	
Vegetable enriched dalia	1 cup
Curd or milk	1 katori or 1 cup
Missi or stuffed chappati or	1 small
Curd or	1 katori
Skimmed milk	1 cup
<b>Mid morning</b>	
Vegetable soup or lemon water	1 cup
<b>Lunch</b>	
Chappati without ghee	1 small
Dal	½ katori
Curd	½ katori
Seasonal boiled vegetable	1 katori¼ plate
Salad	
<b>Evening Tea</b>	
Skimmed milk (reduce curd in lunch) or	1 cup
Tea	1 cup
Marie biscuit	1 biscuit
<b>Dinner</b>	
Vegetable soup	1 cup
Chappati without ghee	½ small chappati
Dal	¼ katori
Seasonal boiled vegetable	1 katori
Salad	¼ plate

Note:

1. 1 katori of dal is 150 mL or 25 g
2. 1 cup of milk is 150 mL
3. Use only skimmed milk for drinking and for preparation of tea and curd
4. 1 katori of curd is 25 g

## Meals (continued)

<b>Calories</b>	<b>1300</b>	<b>1600</b>	<b>1900</b>
Protein	50 g	60 g	70 g
Carbohydrates	30 g	36 g	43 g
Fat	210 g	260 g	310 g

<b>Breakfast</b>			
Milk	1 cup	1 cup	1 cup
Dalia	1 katori	1 katori	1 katori
Stuffed/missi roti	1 roti	1 roti	1 roti
Curd	100g	100g	100g
<b>Mid-morning</b>			
Tea, lassi or nimbu pani	Tea, lassi or nimbu pani	Tea, lassi or nimbu pani	Tea, lassi or nimbu pani
Sprouts or fruits	Sprouts or fruits	Sprouts or fruits	Sprouts or fruits
<b>Lunch</b>			
Chappati	2 small	3 small	2 medium
Dal	1 katori	1 katori	1 katori
Vegetable	1 katori	1 katori	1 katori
Curd	100 g	100 g	100 g
Salad	¼ plate	¼ plate	¼ plate
<b>Evening Tea</b>			
Tea	1 cup	1 cup	1 cup
Biscuit	2–3biscuits	2–3 biscuits	2–3biscuits
Poha or upma	1 katori	1 katori	1 katori
<b>Dinner</b>			
Chappati	1 small	1 small	2 medium
Dal or cheese curry	½ katori	1 katori	1 katori
Vegetable	1 katori	1 katori	1 katori
Curd	100 g	100 g	100 g
Salad	¼ plate	¼ plate	¼ plate

<b>Vegetable Exchange</b>		
<b>Negligible carbohydrates and calories – use as desired</b>	<b>Contains 10 g of carbohydrates and 50 calories</b>	
<b>Leafy Vegetables</b>	<b>Root Vegetables</b>	<b>Quantity (g)</b>
Amaranth (Chawli)	Beet root	75
Bathua	Carrot	105
Cabbage	Colocasia	45
Coriander leaves	Onion (medium)	90
Fenugreek leaves	Potato	45
Curry leaves	Sweet Potato	30
Lettuce	Yam	45
Mint		
Spinach		
Soya leaves		
<b>Other Vegetables</b>	<b>Other vegetables</b>	
Ash gourd	Broad beans	90
Bitter gourd	Cluster beans	90
Brinjal	Double beans	50
Calabash cucumber	Jack tender	105
Cauliflower	Jack fruit seeds	30
Cucumber	Peas	45
Drumstick	Plantain green	75
French beans	Singhara	45
Mango green		
Lady's fingers		
Onion stalks		
Parwal		
Plantain flower		
Pumpkin		
Radish		
Snake gourd		
Ridge ground		
Tinda		
Tomato green		
Turnip		

<b>Fruit Exchange</b>			
<b>Carbohydrates 10 g, Calories 50</b>			
<b>Fruits</b>	<b>Quantity (g)</b>	<b>Approximate Quantity</b>	
Amla	90	20	Medium
Apple	75	1	Small
Banana	30	¼	Medium
Cape gooseberry	150	40	Small
Cashew fruit	90	2	Medium
Custard apple	50	¼	
Dates	30	3	
Figs	135	6	Medium
Grapes	105	20	
Guava	100	1	Medium
Jambu fruit	50	10	Big
Lemon	90	1	Medium
Loquat	105	6	Big
Mango	90	1	Small
Melon	270	¼	Medium
Orange	90	1	Small
Papaya	120	2	Medium
Peach	135	1	Medium
Pear	90	1	Medium
Pineapple	90	1 ½	Slice (round)
Plum	120	4	Medium
Pomegranate	75	1	Small
Sweet lime	150	1	Medium
Strawberry	105	40	
Tomato	240	4	Medium
Watermelon	175	¼	Small

<b>Legume and Pulse Exchange</b>	
<b>30 g = 100 Calories, Carbohydrates 15 g, Protein 6 g</b>	
Bengal gram	Kabuli channa
Bengal gram, roasted	Lentils
Besan	Moth beans
Lobhia	Rajmah
Green gram	Peas, dry
Red gram (Arhar)	

<b>Cereal Exchange</b>	
<b>30 g = 100 Calories, Carbohydrates 20 g, Protein 2 g</b>	
Bajra	Rice flakes
Barley	Rice puffed
Bread (to meet carbohydrates and calories with 5 g sugar)	
Jowar	Samai (vermicelli)
Cornflakes	Suji
Maize, dry	Wheat flour
Oatmeal	Maida
Rice	Dalia
Ragi	Sago (requires supplementation with other high protein foods, when used)



<b>Milk Exchange</b>		<b>Fat Exchange</b>	
<b>Calories 100, Protein 5 g</b>		<b>Calories 100, Fat 11g</b>	
<b>Food</b>	<b>Quantity</b>	<b>Food</b>	<b>Quantity (g)</b>
Butter milk	750 mL	Almonds	15
Cheese	30 g	Butter	15
Curd	210 g	Cashew nuts	20
Khoa	30 g	Coconut	30
Milk buffalo	90 mL	Ghee	11
Milk Cow	180 mL	Groundnuts roasted	20
Milk skimmed*	260 mL	Vanaspati ghee	11
Milk skimmed powder*	30 g	Oil	11
		Walnuts	15
		Pista	15

\* provides 10 g of protein

## Nutritive Value of Commonly Used Portions of Indian Foods

Food	Units	Household Measure	Protein (g)	Calories (kcal)
<b>Milk and Milk Products</b>				
Milk, cow's	250 mL	1 glass	8.00	167.50
Milk, buffalo's	250 mL	1 glass	10.75	292.50
Milk, skimmed	250 mL	1 glass	6.25	72.50
Curd	125 g	1 katori	3.87	75.00
Paneer	25 g	½"x ½" x 2"	6.00	87.00
Buttermilk	250 mL	1 glass	2.00	37.50
Skimmed milk powder (cow's)	100 g	-	38.00	357.00
<b>Cereals and Pulses</b>				
Wheat flour chapatti, thin	25 g	1 chapatti	3.03	85.25
Chapatti, medium	30 g	1 chapatti	3.63	102.30
Chapatti, large	40 g	1 chapatti	4.84	136.40
Wheat porridge	25 g	1 katori	2.95	86.50
Suji	15 g	1 Tbsp	1.56	52.20
Rice	30 g	1 katori	1.92	103.80
Dal Moong wash	30 g	1 katori	7.35	104.40
Dal Malka Masur	30 g	1 katori	7.53	102.90
Dal Arhar	30 g	1 katori	6.69	100.50
Bengal Gram Whole (Black Channa)	40 g	1 katori	6.84	144.00
Channa Dal	30 g	1 katori	7.20	104.10
<b>Vegetables</b>				
Palak	100 g	1 katori	2.00	26.00
Methi	100 g	1 katori	4.40	49.00
Patta gobhi	100 g	1 katori	1.80	27.00
Brinjal (Baingan)	100 g	1 katori	1.40	24.00
Ghea	100 g	1 katori	0.20	12.00
Pumpkin (Halwa kadhu)	100 g	1 katori	0.10	25.00
Cauliflower (Phool gobhi)	100 g	1 katori	2.60	30.00
Potato	100 g	1 katori	1.60	97.00
French Beans	100 g	1 katori	1.70	26.00
Mushrooms	100 g	1 katori	3.10	43.00

<b>Food</b>	<b>Units</b>	<b>Household Measure</b>	<b>Protein (g)</b>	<b>Calories (kcal)</b>
<b>Fruits</b>				
Orange	100 g	1 piece	0.70	48.00
Banana	100 g	1 piece	1.20	116.00
Papaya	100 g	1 piece	0.60	32.00
Apple	100 g	1 piece	0.20	59.00
Guava	100 g	1 piece	0.90	51.00
<b>Nuts and Oil Seeds</b>				
Almonds	15 g	1 Tbsp	3.12	98.25
Cashew nuts	15 g	1 Tbsp	3.18	89.40
Coconut, dry	15 g	1 Tbsp	1.02	99.30
Walnuts	15 g	1 Tbsp	2.34	103.05
Raisins	20 g	1 Tbsp	0.36	61.60
Ground nuts	15 g	1 Tbsp	3.80	85.05
<b>Fats and Oil</b>				
Ghee and oil	15 g	1 Tbsp		135.00
Butter	20 g	1 Tbsp		145.80
<b>Misc. Food Stuffs</b>				
Honey	15 g	1 Tbsp		47.85
Sugar	15 g	1 Tbsp		59.70
Jaggary	20 g	1 Tbsp		76.60
Sago (Sabudana)	20 g	1 Tbsp		70.20
Bread Brown	25 g	1 slice	2.20	61.00
Bread White	25 g	1 slice	1.95	61.25
Corn flakes Kellogg's	30 g	1 cup	2.40	114.00
Nutrinuggets	5 g	5-6 pieces	4.11	43.10
Threptin Biscuits	5 g	1 biscuit	1.50	22.00
Jam	20 g	1 Tbsp		55.00
Jelly	18 g	1 Tbsp		50.00

*Merely having the knowledge is not enough,  
you have to achieve its implementation.*

### **Adjustment of diet should take into account:**

#### **1. Composition of food:**

Carbohydrates	65% of total calories
Proteins	15–30% of total calories
Fat	20% of total calories

#### **2. Distribution of meals:**

Bed tea	5–10% of total calories
Breakfast	20% of total calories
Lunch	30% of total calories
Evening tea	10% of total calories
Dinner	30% of total calories

### **Low-GI Recipes**

<b>For 1 chapati, mix:</b>	<b>For bran biscuits (20 g each), mix:</b>
15 g Wheat atta	100 g Wheat atta
10 g Channa atta	100 g Wheat bran
5 g Barley atta	10 g Oil
	5 g Salt
	1 g Ajwain
	½ g Baking powder

## Exercise

- Exercise is an essential component of diabetes management. It is useful for everyone, whether or not you have diabetes. Regular exercise, even walking just 3–4 km a day, has a tremendous benefit. Exercise: Keeps weight within the normal range
- Improves sense of well-being
- Preserves insulin sensitivity
- Keeps the blood sugar within the normal range, even if there is no weight loss
- Corrects lipid (fat) disorders
- Helps prevent blood clots
- Offers better digestion of food
- Keeps mobility of the joints intact
- Decreases the risk to the heart by reducing blood pressure and correcting the lipids
- Improves bone and muscle strength

*Exercise helps to reduce the long term complications of diabetes.*

If there are so many advantages of regular exercise, what makes you go against it—sheer laziness? The common excuses are:

- Shortage of time
- Over-busy schedule
- Bad weather
- Pollution outside
- More important engagements to keep
- Risk of getting exposed to allergens
- Better to enjoy good sleep rather than walk in a park

## When not to exercise

- If you have excessive blood glucose—particularly if glucose level is  $> 400$  mg%
- If you have ketones in your urine
- When you have an illness or infection
- On the first sign of pain or vision change
- On the first sign of feeling dizzy or shortness of breath—it could be the sign of a heart problem
- In extreme weather



## Watch your prescription

Many of you have felt that you are taking too many tablets; it may be inconvenient and expensive, and may be having some side effects too. You may not be convinced about the usefulness of these drugs, as there are no immediate results. The doctors, on the other hand, are responsible not only for immediate benefit but also for prevention of long-term complications.

Both are right, the patients and the doctors. The doctors ought to explain, and patients have to understand, why a particular drug is given and for how long. Always ask if you do not understand what has been said or advised.

## We can classify medication approaches as follows:

1. Drugs which are essential for normalizing blood sugar levels for:
  - Type I diabetes: Insulin is essential and has to be taken lifelong.
  - Type II diabetes: One can take tablets which:
    - a) Reduce insulin resistance, like biguanides and thiazolidinediones
    - b) Increase insulin secretion, like sulphonylureas
    - c) Reduce digestion of carbohydrates, like alpha-glucosidase inhibitors

One may need only one or two of these drugs, or sometimes three, and insulin as well.

2. Drugs to keep the blood pressure below 130/85. The first choice is an ACE inhibitor. It also prevents kidney and heart damage.
3. Drugs that correct the lipid profile—like statins.
4. A small dose of aspirin, 75–150 mg. a day, is effective in preventing blood-clotting disorders responsible for heart attack and cerebral stroke.

These drugs are important and most diabetics need them.

*Discuss with your doctor  
before taking any medicine.*

### **Calorie requirement**

Determining the basic calorie requirement for your weight and height is an essential component of treatment strategy. Follow these steps to determine the basic calorie requirement that is right for you.

1. Determine the ideal body weight for your height:

	<b>Men</b>	<b>Women</b>
Height	152 cm	152 cm
Weight	48 kg	45 kg
<b>Add</b> for each additional cm	1.1 kg	0.9 kg

2. **Multiply** your ideal weight by 22 Kcal per kg to get the daily basic calorie requirement.
3. **Add:** For a sedentary life style: 25% of basic calories  
                   For moderate exercise: 50% of basic calories  
                   For strenuous exercise: 75% of basic calories
4. **Add or subtract** 500 Kcal if you are underweight or overweight respectively.

**Example:** 170 cm male adult weighing 80 kg with sedentary lifestyle

1. **Determine ideal body weight:** For 152 cm, the ideal body weight is 48 kg. To add 1.1 kg for each additional cm, subtract 152 from 170, which equals 18. Then multiply by 1.1, which equals 19.8. The ideal weight is  $48 + 19.8 = 67.8$  rounded to **68 kg**.
2. **Determine basic calorie requirement for a weight of 68 kg:** 22 Kcal/kg is the formula. For a 68 kg person, the basic calorie requirement is  $68 \times 22 = 1496$  (approximately **1500**) Kcal.
3. **Add calories for lifestyle:** Add 25% of basic calories for a sedentary lifestyle.  $25\% \text{ of } 1500 = 375$  Kcal;  $375 + 1500 = 1875$ .
4. **Add or subtract calories for weight:** Since the man is **over-weight** (his ideal weight is 68 kg, but he is 80 kg), **subtract** 500 from 1875 Kcal, for a calorie requirement of 1375 Kcal per day.

Therefore, a male adult weighing 80 kg with a height of 170 cm with a sedentary lifestyle requires 1375 Kcal per day.

*A walk a day keeps diabetes away.*



## *HIV and AIDS*

**AIDS** is a serious and often fatal disease for which there is no cure or vaccine to date. Each one of us is at risk for this deadly disease; we are each responsible for protecting ourselves from it. That is why everyone should know about AIDS.



*AIDS can happen to anyone...  
but everyone can avoid it.*

*Information is the only prevention*

*No complete cure for AIDS has been established at present,  
so prevention is the single most important factor.*

### **What is AIDS?**

AIDS stands for:

- A** → Acquired (something that you get)
- I** → Immune (related to the capacity of the human body to fight diseases)
- D** → Deficiency (shortage/reduction)
- S** → Syndrome (a group of symptoms and signs)

AIDS is a communicable disease, meaning it can spread from an HIV-positive person or AIDS patient to other uninfected persons through some specific means. However, it is not a contagious disease; that is, it does not spread by usual casual social contact.

## What is HIV?

HIV stands for Human **I**mmunodeficiency Virus. It is this virus that causes AIDS.

## How does HIV cause AIDS?

The human body has a way of fighting disease and protecting itself. This defence mechanism can be compared to a country's army. When a virus or 'enemy' enters the body, the body's defence mechanism or 'army' attacks and kills the enemy.



Simply put, the army is the body's immune system, which fights against infections and diseases. One of the most important components of this immune system is a cell called the 'CD<sub>4</sub> cell'. Usually the number of CD<sub>4</sub> cells in a healthy body ranges from 500 to 1800 per millilitre (mL) of blood.

The HIV virus starts attacking CD<sub>4</sub> cells by multiplying within them and destroying them. The virus is particularly problematic because it hijacks part of the very system (the immune system) that normally protects us against disease-causing micro-organisms such as fungi, bacteria, and viruses. Over a period of several years, the number of CD<sub>4</sub> cells starts declining. The immune system becomes weak, with the result that the body can't fight infections and diseases very well. This leads to development of certain illnesses that typically affect people with HIV infection. When this happens, it is called AIDS.

Some of the typical illnesses affecting people with AIDS are tuberculosis (TB), diarrhoea, fever, weight loss, pneumonia, fungal infections, herpes, and certain cancers. Many of the germs that cause these illnesses are quite harmless to people who have a normal immune system. But, if the body's immune system has been weakened by HIV, they can cause severe life threatening illnesses and even death.

## **What is the difference between being HIV-positive and having AIDS?**

Being HIV-positive means that you have been infected with the virus. It is within your body and this can be established by a blood test. However, when various diseases begin to appear or when the number of CD<sub>4</sub> cells falls to less than 200 per mL, it is called AIDS. From the time you have been infected with the virus, it may take anywhere from 5 to 10 years for AIDS to develop.

Ultimately, HIV-positive persons develop the AIDS disease and then die, so the sequence of events is as follows:



HIV status can be determined by testing.

## **Where is HIV found in the body?**

HIV can be found in body fluids such as the **semen, vaginal secretions** and **blood** of an infected person.

Though there is evidence that HIV is present in tears, saliva, sweat and mother's milk, the concentration of HIV in tears, sweat and saliva is so low that it usually does not infect others.

## **How does HIV enter the body and cause AIDS?**

**HIV spreads from one person to another mainly in three ways:**

1. Entry into the body via semen or vaginal secretions as a result of sexual intercourse with a person infected with HIV (unsafe sexual practices).
2. Entry into the body via infected blood or blood products such as by blood transfusion or sharing syringes and needles used by HIV-infected persons (usually drug addicts).
3. From an infected mother to her baby through birth fluids or breast milk.

Sex is the most common cause for the spread of AIDS. When a man or woman has sex with another man or woman who is HIV-positive or is a patient with AIDS, the uninfected person is at risk of getting the HIV infection and AIDS if a condom is not used. The disease can spread through unprotected sex or unsafe sexual practices (i.e., sex without using condoms).

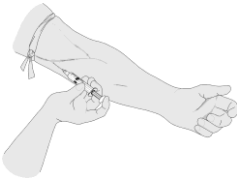
## HIV/AIDS ...



**Can** spread through unprotected sex



**Can** spread by receiving HIV-infected blood



**Can** spread by using unsterilized syringes or needles used on HIV persons



**Can** spread from an HIV-positive mother to her baby

## **AIDS also spreads through the following:**

- Syringes and needles if they carry HIV and are not sterilized properly.
- Instruments used for piercing the ears, or nose and tattooing the body—if these instruments are not sterile (germ-free).
- Drug addicts sharing syringes and needles amongst themselves for injecting drugs. If one is HIV-positive, they are all at risk.
- From an HIV-positive mother to her baby. If an HIV-positive mother becomes pregnant, the virus can be spread to her newborn baby either in pregnancy, during delivery, or, sometimes, during breast feeding. The possibility of such an occurrence is about 35%.
- Blood transfusions from an HIV-infected donor.

## **AIDS does NOT spread by:**

- Working with HIV-positive persons or AIDS patients at the office, factory, etc.
- Sitting, standing, shaking hands, hugging, or touching HIV-positive or AIDS patients.
- Common use of telephones, pens, typewriters, computers, machines, and books, etc. with an HIV-positive person.
- Donating blood at a reputable blood-donation centre
- Soft or gentle kissing of cheeks and lips, etc., if there are no cuts or wounds in the mouth.
- Travelling together in a bus, train, or an airplane.
- Insect bites.
- Sharing food, clothes, toilets, etc.

## HIV/AIDS...



**Cannot** spread through touch



**Cannot** spread through mosquito bites



**Cannot** spread by working together



**Cannot** spread by sharing food, clothes and toilets

## **Preventing HIV/AIDS is very easy**

### **Observe restraint and faithfulness in sexual relations.**

- Have sexual relations only with your partner
- If due to any reason sexual relations are established with strangers, always use a condom in a proper manner.

### **Use clean syringes and instruments.**

- Always use disposable syringes and needles
- Destroy them after single use only
- Use a new syringe/needle for each person
- Do not get ears or nose pierced or tattooing done on your body by ‘roadside doctors’ (quacks) because most of the time their instruments are contaminated and may be infected with HIV or other germs.

### **Make sure blood transfusions are safe.**

- If ever you or any of your dear ones require a blood transfusion, make sure that the blood or blood products intended for use have been tested for HIV. Demand to know this from your doctor.
- Demand blood that has been tested for HIV—this is your right.

### **What are the blood tests for HIV/AIDS?**



If you suspect that you may have AIDS, contact a doctor immediately. The doctor will clear your doubts and, if needed, after counselling he may order a blood test. HIV/AIDS can be diagnosed by blood tests, which are:

- The spot test for instant diagnosis of HIV. It is not the most reliable.
- Elisa test.
- Western blot test.

The Elisa test should be done only three months after the last possible exposure to HIV/AIDS because of the window period — it can take some time after coming into contact before HIV-positivity is detectable. Before that, the Elisa test is not useful. It may give false negative results.



## **Window period**

Once the HIV enters the body of a human being, the blood tests (e.g. Elisa) cannot identify the HIV immediately. About three months have to pass before these blood tests can identify the presence of HIV antibodies in the body. During this period the blood tests may be reported as negative even if the HIV infection is present in the body. A person infected with HIV who tests negative during these three months is fully capable of spreading HIV infection to others. This period is called the ‘window period’, i.e. the period between getting the HIV infection and the appearance of HIV antibodies in the infected person which will test HIV-positive.

## **Where are the tests done?**

Under the National Aids Control Programme being run by the National AIDS Control Organization (NACO), Elisa tests are done at a nominal cost by the voluntary counselling and testing centres in most District Hospitals.

## **What symptoms should an HIV-positive person watch for?**

As mentioned earlier, people who are infected with HIV have a higher chance of getting other infections and diseases. However, this is not common if the HIV-positive person is taking their medicines regularly as advised by their doctor and if their CD<sub>4</sub> cell count remains above 200. Watch out for the following symptoms:

- Fever of more than three weeks duration
- Cough or diarrhoea of more than three weeks duration that is not cured with routine treatment
- Weight loss, despite taking good food
- Extreme weakness
- Night sweats
- Breathing problems
- Mouth problems such as white spots, sores, change in taste, loose teeth or skin rashes
- Difficulty in swallowing
- Swellings or lumps that appear in the neck, armpits, or groin

As the disease progresses, these symptoms become more obvious or more frequent and the patient becomes weaker and weaker. Some infection or disease is then almost always present. Life may be prolonged with treatment, but AIDS cannot be cured.



### **What should an HIV-positive person do to stay healthy?**

There are many things that an HIV-positive person can do in order to stay healthy. Maintaining a positive attitude and attention to one's general health is extremely important, as it helps the immune system to fight HIV/AIDS. Do not fall prey to any addictions, whether to legal or illegal drugs.

#### **Follow the golden rules:**

- Eat a nutritious diet. This is extremely important. Eat a well-balanced diet and maintain your usual weight.
- Quit smoking and chewing tobacco or betel as these can cause cancer. This will certainly be of help in the long run.
- Exercise: Along with good nutrition, exercise helps you to maintain your muscle mass, relax and sleep better, besides giving you a sense of well-being. Walking, jogging, swimming, and cycling are all good. Exercise regularly to stay strong and fit.
- Relax: Practice yoga and meditation. These will help a lot in keeping you calm and quiet.
- Practice good hygiene. Maintain good personal hygiene to prevent minor infections from setting in and to avoid infecting others.
- Avoid alcohol and addictive drugs and narcotics as these can weaken your resistance to infections.
- An HIV-positive person should always use a condom while having sex.
- Such a person should also ensure that no one else uses his personal items, e.g., blades, shaving razor and shaving machine, toothbrush, etc.
- An HIV-positive person should keep away from people who have a cold or sore throat, etc. and seek early treatment for all infections.

HIV-positive persons can lead almost normal lives. This is important as they may have many years of productive healthy life in front of them.



Once the diagnosis of HIV has been confirmed, your doctor will talk to you and send you for some additional blood tests. These tests may include the CD<sub>4</sub> cell count and viral load. Both these tests will help your doctor to decide when to start giving you

antiretroviral therapy (ART). These medicines do not cure the disease; they hold it in check.

Over the years, many people have claimed to have discovered a treatment for AIDS, but no such claim has been found to be true by scientists or doctors. To date there is no cure for AIDS.

### **Antiretroviral drugs / therapy (ART or HAART – Highly Active Antiretroviral Therapy)**

HIV/AIDS patients can live normally for a long time after regularly taking antiretroviral therapy (ART or HAART). These medicines are available free of cost at specific government hospitals for certain categories of persons such as:

- Children aged one to fifteen years infected with HIV
- Mothers enrolled in the PPTCT (Prevention of Parent to Child Transmission) Programme
- Full-blown AIDS cases

### **ART is not a cure for HIV!**

- ART has to be taken daily for your whole life.
- Discontinuing ART can render the HIV infection more dangerous.
- HIV can develop resistance to ART.
- ART involves taking many pills at the right time and with proper relation to meals. Please remember that they are expensive and not without side effects.

**Please remember:**

- It is true that carelessness in sexual relations is the most common cause (in about 75–80% of cases) of AIDS.
- But apart from sex, there are other routes of infection for AIDS (in about 20–25% of cases).
- So please don't look at any HIV-positive or AIDS patient with contempt — we are all at risk.

Please behave normally and affectionately with such a person just like you behave with patients with other diseases. All sick people need our care and support.

# Donation

## *Blood Donation: A Great Humanitarian Act*

Blood is an essential part of life and primarily consists of 55% plasma and 45% of cellular contents—red cells, white cells and platelets. Plasma is mainly composed of three types of proteins—albumin, globulin, and fibrinogen along with some coagulation factors.

Each millilitre (mL) of blood contains:

- 5 million red blood cells (RBCs)
- 4,000 to 11,000 white blood cells (WBCs)
- 1.5–4 lakhs platelets

These cells and platelets float in a pale yellow fluid called plasma.

- Blood has no substitute.
- Blood cannot be manufactured in any laboratory.
- Blood can only be donated by human beings.
- The sick and wounded can be saved if every healthy person considers it a responsibility to donate blood.
- The donor's blood volume begins to be restored immediately after the blood donation and complete restoration of body fluids comes within twenty-four hours. Full replacement of the components of blood takes place in three weeks.

### **Indications for transfusion**

Blood transfusion is important in the treatment of:

Accidents	Haemolytic disease of the newborn
Anaemia	Haemorrhages
Bleeding after childbirth	Leukaemia
Bleeding diathesis	Major operations
Burns (plasma only)	Thalassaemias

## What is the role of the different components of blood?

- Red blood cells carry oxygen from the lungs to all parts of the body and have a life of about 120 days.
- White blood cells destroy germs which invade the body and have a life of 7 hours to a few days.
- Platelets assist the blood to clot in a wound and have a life of 5 days.
- The plasma, as it circulates in blood vessels, carries the cells as well as many other chemical substances and nutrients to all parts of the body.

*Become a life saver—donate blood*

## ABO blood groups

A person's blood group never changes throughout his or her life. It is classified according to the proteins (antigens) present in the red blood cell membrane.

<b>Blood group</b>	<b>Red blood cells that have...</b>
AB	both A- and B-proteins (antigens)
A	the A-protein (antigen) only
B	the B-protein (antigen) only
O	none of these proteins (antigens)

## Rhesus blood group (Rh factor)

The Rh group is named after the macacus rhesus monkey, as it resembles the protein in the red blood cells of rhesus monkeys.

- If this Rh protein (antigen) is present in the red blood cells of human beings, it is called Rh positive.
- If this Rh protein (antigen) is absent in the red blood cells of human beings, it is called Rh negative.
- 95–98% of Indians are Rh positive and 2–5% are Rh negative.

## Who can donate blood?

- Any healthy person of either sex between the ages of 18–60 years can donate blood.



- Men can donate once in 3 months and women once in 4 months.
- Donors should have a body weight of more than 45 kgs.
- The haemoglobin content should be above 12.5 gms/dl.
- The systolic blood pressure should be between 120–140 mm of mercury and the diastolic blood pressure should be between 70–90 mm of mercury.
- A person who has about 65–80 ml of blood per kg of body weight can safely donate 6–8 mL of blood per kg.
- It will not hurt more than the prick of an injection needle.
- It will take only about 20 minutes for registration and medical check-up and another 20 minutes for the blood donation and recuperation period.

## Postpone blood donation if you have:

- Had a cold or fever of unknown cause during the last 7 days.
- Been vaccinated within the last 24 hours.
- Had a miscarriage in the last 6 months or have been pregnant or breastfeeding in the past 12 months.

## You may not be able to donate blood if you have:

- Severe heart disease.
- Tuberculosis (TB).
- An overactive thyroid (thyrotoxicosis).
- A history of cancer, kidney disease, bleeding tendencies, anaemia, or sexually transmitted disease (STD).
- AIDS or are infected with HIV.
- A history of alcoholism or drug addiction.
- Fainted during your last 2 blood donations.
- Hepatitis B or C

## Helpful and healthful tips for blood donors

### *Before donating blood:*

- Drink water.
- Avoid excessive amounts of caffeine such as coffee and tea.
- Eat a snack before donating.

### *After donating blood:*

- Drink extra water and other fluids for 2 hours.
- Continue your daily routine but avoid strenuous exercise for 24 hours.
- Avoid drinking alcohol for half an hour.
- Avoid smoking for about 2 hours.
- Leave the band-aid in place for a few hours.

## What will happen when you donate blood?

- Donating blood is quick and almost painless.
- Your name details are registered.
- You will receive a medical check-up by a medical officer to ensure that your blood will be safe for people receiving it. This includes measurement of your blood pressure, pulse, temperature, and a test for anaemia.
  - You will proceed to the donor area where your arm will be cleaned with an antiseptic.
  - A needle is inserted into your arm and about 350 mL of blood is collected using a sterile disposable needle and plastic bag.
- The donation process will take about 5–8 minutes.
- Following your donation, you will receive refreshments.



Remember, body fluids lost due to the donation are completely replenished within 24 hours.

*That's all except when you leave,  
you feel so good!*



## What happens to the blood you have donated?

After collection of blood in a plastic bag containing an anticoagulant solution to prevent the blood from clotting, it is processed for ABO, Rh grouping and screening for all transmissible infections like HIV, hepatitis B, hepatitis C, syphilis and malaria, and stored in a refrigerator operating at 4–6°C.

The blood collected for preparation or separation of platelets is stored at room temperature in a platelet incubator or shaker. Platelets can be preserved for five to seven days, while fresh frozen plasma can be stored at –30°C for a period of one year. Before blood is issued for transfusion it is cross-matched with that of the patient to ensure that the donor and the recipient have compatible blood groups.



It is important to note that blood has different components that can be prepared in a blood centre. The usual components include packed red cells, platelets, cryoprecipitate, plasma, etc. The shelf life for each component varies, but the real advantage is that one unit of blood can be used for four or five patients depending upon the specific requirement of the patient. For instance, a case of anaemia will require red blood cells, a case of bleeding or leukaemia will require platelets, and a burn case will require plasma. Cryoprecipitate will be utilized specifically for a case of haemophilia or allied bleeding disorder.

*I don't know your name...  
...but thanks for your gift of life.  
Donate blood!*

*Become a life saver –  
Donate blood!*

## **Blood—the Elixir of Life**

### **Information from the Voluntary Blood Bank**

- There is a high demand for blood and blood components and demand is ever on the increase. On average, for every eight patients who need a transfusion, only one gets it. So every drop matters. Every donation matters. Never forget just how much you are doing. When you give blood, you are literally '*giving a gift of Life*'.
- You can donate at work or you can just go to any public donor session. The registration, medical check-up and donation will last about forty-five minutes in all. When you arrive, we will ask you a few routine questions about your health. Answer these questions fully and honestly for your own well-being and that of the patient who will receive your blood. We will then take a drop of blood from your finger to ensure you're not anaemic. If all is well we will accept your donation. This only takes ten minutes. And after a rest, a refreshing drink and a snack, you will be ready to go. Refreshments will be available at the donation site.
- We understand that there may be some apprehension. That is a very natural reaction until you actually make your first donation. If need be, we will use a local anaesthetic for your ease. Either way you will see how painless, simple and effortless it is – and more importantly – IT SAVES LIVES.
- The Voluntary Blood Bank has different blood insurance policies for different blood donors to make sure that their demand should be fulfilled if they need blood. Be a regular blood donor by donating blood at least two times a year.
- Up to six precious lives can be saved by each donation you make. Don't you think this is enough motivation itself? And all this is so simple. All it takes is a few minutes. All you need is a healthy body and a heart of gold. Do you have it in you? Go ahead and take the initiative today. Someone somewhere must be counting on you to save his or her life.
- Any healthy person between the ages of eighteen and sixty years can donate blood safely. So if you fall into this category, you are the right person to be the saviour of another human being. Go ahead and save a life today.

- Remember! It's all sorts of blood we as a society need – not just rare ones. In fact, the commoner the blood type, the more we need it. So even if your blood is one of the most common types – group O, for instance – you can be sure that by donating blood regularly, two or three times a year, you could be saving more lives. Perhaps even your own one day. Donate regularly! You really are doing something AMAZING.
- When you give blood, you can enable someone to receive a desperately needed transfusion. This is a unique service rendered to humanity. By donating blood you feel proud. It is a feeling of supreme satisfaction that no words can describe. You have to experience it at least once to know it. Go ahead and find out for yourself.
- Why not check out your health status for sure. We have a qualified medical team who will ensure that giving blood doesn't affect your health at all. A confidential health interview helps us to be sure that you are fit to give blood and that your blood will be safe for transfusion. However even if there are health reasons that prevent you from donating, you can still encourage your family and friends to donate blood and save a life.
- There is no risk of getting an infection. The needle and bag that we use are used only ONCE, and then INCINERATED. You can never get any transmissible disease by donating blood.
- The body starts replacing the blood immediately after donating and in about twenty-four hours the donated amount is made up. To ensure that you are never rendered anaemic due to blood donation, a period of three to four months is required between donations.
- Be a regular blood donor by donating blood three or four times a year. Many have donated blood over a hundred times in their lifetime – so can you! Our society needs people like you.
- The Voluntary Blood Bank is a social, not-for-profit charitable trust that works on a self-sustaining basis. We have the goal of helping society save as many human lives as possible and for that your blood is required. Every unit you donate will be rigorously tested for any virus or any pathogen. It will be separated into its components so that more patients can benefit from it.

## Plasma Donations

In addition to donation whole blood, you can donate plasma.

### Plasma – the most versatile component of your blood

Blood is composed of red blood cells, white blood cells, and platelets suspended in a fluid called plasma.



- Your plasma also contains very important proteins, nutrients and clotting factors which help to prevent or stop bleeding.
- An average adult has approximately five litres of blood, three litres of which is plasma.

### Why donate plasma?

Thirteen different products can be made from plasma donations. Some of the most needed products are:

- Biostatic or factor VIII concentrate – This is used to stop bleeding in people with haemophilia A. Haemophilia A is an inherited lack of factor VIII, which is a protein necessary for normal blood clotting.
- Immunoglobulin – This is a special preparation containing antibodies and is used to protect a person against some infectious diseases such as tetanus, chicken pox and hepatitis B.
- Albumin – This may be used to restore blood volume in the treatment of shock or burns, or to assist in the treatment of liver and kidney diseases.
- Intragam P – This is another preparation containing antibodies and is used to boost the immune system, for example, following a bone marrow transplant and for immune deficiency disorders.

*Help people put up a good fight –  
donate blood!*

## **What is involved in donating plasma?**

- Plasma donations are made through a process called apheresis.
- The collection of plasma takes approximately 40 minutes.
- 650 mL of plasma can be collected in one single plasma donation.

## **What happens during the donation?**

During plasma donation, whole blood is drawn from one arm into a sterile collection kit inside a cell separating machine. The machine separates the blood so that only plasma is collected. The other blood components (red and white blood cells, and platelets) are returned to the donor through the same line.

## **Is the plasma donation process safe?**

- The plasma donation process is extremely safe and carried out by expert trained staff.

## **How often can a plasma donation be given?**

- Because your red blood cells are returned to you when you give a plasma donation, you can donate every two to three weeks.
- You are under no obligation to continue as a plasma donor and can return to donating whole blood at any time.

## **How do I become a plasma donor?**

- First-time plasma donors should have given at least one whole blood donation in the last twelve months without complication.
- Your selection is dependent on your availability, the suitability of your veins, haemoglobin level and blood group.
- You should be aged between 18 and 60 years for your first donation. You can continue to donate up to 70 years of age.
- You should weigh 50 kg or more.
- Drink plenty of water in the twenty-four hours prior to donating, and eat a meal prior to donating.

*Give someone the gift of life – donate blood!*

## Frequently asked questions

### **How much blood will I lose?**

The human body contains about 5–6 litres of blood. Each full donation is 350 mL. Your body naturally replaces the lost fluid in a very short time (within 24 hours) and you do not even feel anything from it. That is why some people going for planned surgery donate their own blood, 3–4 weeks in advance, and this can be used for them during their surgery (operation). This procedure is well accepted and is called autologous blood donation.

### **Why are voluntary donors preferable to professional ones?**

Professional sellers are motivated only by the desire to earn money. They may conceal their ailments and some types of infections or use of drugs which cannot be readily detected by any tests. Blood from professional sellers exposes the patient to serious risk, whereas voluntary donors freely disclose any ailments they may have, and their donations are safe and reliable.

### **How will giving blood affect my health?**

Your donation will be accepted only if you are fit and well. Only about 5% of your blood volume is taken and there is usually no weakness or other ill effect noted. The volume of liquid lost is replaced within 24 hours and the blood cells will take a few weeks to replace themselves.

### **What if I need blood?**

If you need blood urgently, the hospital will provide it. Most hospitals like to replace blood given to patients with donations from relatives or friends of patients.

### **Can I smoke after giving blood?**

It is best that you do not smoke for two hours after the donation, as this can cause dizziness or even make you faint. Better still, don't smoke at all!

## **Can I bring a friend?**

Yes. Your friend may be interested when he or she sees how painless and simple it is to give blood.

## **Can I go back to work?**



Yes, as long as you have the full rest and some refreshment before you leave the blood donation session. On rare occasions, people can faint some time after donating blood. So, if you are in an occupation where this could endanger yourself or others, you should not go on duty after giving blood that day.

If you drive a lorry or train, for instance, or work in an emergency service, or your work involves heights (e.g., climbing ladders), you should not go back to work on the day that you donate blood. You should come and give blood at the end of your shift.

## **Where can I go to donate blood?**

You can donate blood at a blood donation camp near your home, work place or school, or you can go to a recognized blood bank in your area. Please call the local Indian Red Cross Blood Bank for information.

## **A Healthy Habit**

Donation of blood from time to time has certain personal benefits:

- Each time you donate blood, a history is taken and you are given a limited physical examination. A new health condition such as high blood pressure, anaemia, or irregular heartbeat is sometimes found during this process. So early diagnosis and treatment of a new condition may result from donating blood regularly.
- Two studies found that heart disease was less common in men and post-menopausal women who donated blood.
- More importantly, giving blood is a “healthy habit” because of the satisfaction you get from helping to save lives.

**Please Remember:**

Blood cannot be manufactured. It has to be donated by human beings. If every eligible person made blood donation a way of life, there would be no shortage and no one would have to go without it.

*Let us work together to save more lives –  
Donate blood today!  
Be responsible. Be a blood donor.  
Help save a life.*



# *Eye Donation*

## **From Darkness To Light**

*One million blind in our  
country can get back their  
sight if you help them;  
they need corneal transplantation.*

*It can make a difference if you –  
pledge your eyes today  
donate your dear one's eyes.  
Do not close their eyes,  
keep them open even after death.*

*Eye donation is a priceless gift  
which only you can give.*

You can help make this happen. Let eye donation be your family tradition. Donate the eyes of your dearest. Age doesn't matter.

- People wearing spectacles or people who have previously undergone eye surgery and people with diabetes, hypertension and other systemic disorders like asthma, tuberculosis or heart disease can also donate eyes.
- Exceptions are patients with AIDS, blood cancer, rabies, septicemia, viral hepatitis, etc.
- Anyone with a clear cornea, even if he or she has a damaged retina or optic nerve, can be an eye donor.
- Donate the eyes of your dearest. Eye donation gives sight to two corneally blind persons. Contact the nearest Eye Bank.
- All religions endorse the practice of eye donation.
- Eyes have to be removed within six hours after death; it takes less than thirty minutes to remove the eyes, and the earlier the better. So lose no time in informing the nearest Eye Bank. You could be instrumental in ensuring an eye donation in time. If someone dies in your family or circle of friends, remember to

call the nearest Eye Bank. This can be done whether the deceased had or had not pledged his or her eyes.

- While waiting for the Eye Bank team to arrive, please: switch off fans, keep the air conditioner or cooler running and place wet cotton with ice over the closed eyelids. It will help keep the tissue moist. Raise the head with a pillow.



- The Eye Bank personnel with a doctor or trained technician visits the donor's home. This is done free of cost. A blood sample is collected from the donor for testing.
- The eyes are removed using a sterile procedure. It leaves no scar or disfigurement of the face. Eye donation gives sight to two blind persons as one blind person receives the cornea from one donated eye.
- On reaching the Eye Bank, tissues are examined, processed and used for a corneal transplant operation as early as possible.
- Needy patients are contacted in accordance with the waiting list at the Eye Bank.
- The donated eyes are never bought or sold. A request for an eye donation is always attended to.
- The donor and recipient of the cornea will remain anonymous.

## What is corneal blindness?



The cornea is the clear window covering the front of the eye. It transmits and focuses light. Vision is dramatically reduced or lost if the cornea becomes cloudy from infection, injury or any other disease.

## Common causes of corneal blindness are:

- Infections
- Injuries
- Chemical burns
- Malnutrition
- Congenital disorders
- Post-operative complications or infections

Fortunately, in most cases lost sight can be restored through the medical intervention of corneal transplantation from a donated eye.

### **Which patients benefit from eye donations?**

- Only patients suffering from corneal blindness

### **Which part of the eye is used?**

Mostly the transparent part of the eye (cornea) is used. Sometimes the white portion (sclera), conjunctiva and stem cells at the corneal periphery are used.

### **How can I pledge my eyes?**

Fill an eye pledge form available at any eye bank and get it signed by a relative.

- The eye bank will give a donor card which you can carry in your pocket.
- Share your wish to donate your eyes with your relations.

### **What else can I do for eye donation?**

- Motivate and convince others to donate eyes in case of any death in your family or neighbourhood.
- If relations agree, inform the nearest Eye Bank to send their team.

### **Join the EYE DONATION MOVEMENT**

- Become a 'Sight Ambassador'.
- Make yourself a friend of the Eye Donation Movement.
- Spread information about eye donation. Your message will help the movement.
- Motivate the family members of a person who has died in your area to donate their loved one's eyes.
- Consent to donate the eyes of your close relative or friend.
- Dial the nearest Eye Bank soon after the unfortunate death of your near and dear one.

## *Organ Donation: A Gift of Life*

*There are stars whose radiance is visible on earth though they have long been extinct. There are people whose brilliance continues to light the world though they are no longer among the living. These lights are particularly bright when the night is dark.*

Hannah Senesh

### **Life is precious**

Death is a fact of life! We are born to live and die. In the words of Tagore, “Death belongs to life as birth does. The walk is in the raising of the foot as the laying of it down.” Some might assume that death is the end of life. But a person can live on even after death. And death can be made as meaningful as life by giving the precious gift of life to many terminally ill patients by donating your organs.

Life is too precious to be lost to an organ failure. But millions have lost their lives when a vital organ ceased to function properly. The fact is that medical advances in the field of transplant immunology, surgical management, and organ preservation have made the transplantation of vital organs possible. This provides a viable approach to the management of diseases that cause irreversible organ failure. So all you need to do is pledge to donate an organ and help precious lives from being lost before their time.

Transplantation has meant a significant improvement in quality of life, offering the opportunity for many organ recipients to resume healthy and productive lives. For renal patients, kidney transplantation offers the opportunity to resume a normal life, no

longer subjected to the need for regular dialysis treatment. For some heart and liver patients, for whom there is no equivalent of dialysis, trans-plantation is their only chance of survival.

Many patients are dying and families are grieving because of the critical shortage of donor organs. The cruel irony, however, is that an organ shortage need not exist, if even a fraction of our population pledge to serve the living by donating organs after death.

*Ask yourself whether the dream of heaven and greatness  
should be waiting for us in our graves  
or whether it should be ours  
here and now and on this earth.*

Ayn Rand

## **What is organ donation?**



Organ donation means gifting someone a life. When people donate organs, it means they are donating more than just an organ. It means they are gifting a life. In simple terms it means that they pledge during their lifetime that, after their death, organs from their bodies can be used for transplantation to help terminally ill patients, giving them a new lease on life.

*We make a living by what we get,  
but we make a life by what we give.*

Norman MacEwan

## Two ways you can donate organs:

1. **Living donors:** As per the Transplantation of Human Organs Act 1994, only immediate blood relations (brothers, sisters, parents and children) can donate while living. A living donor can donate only a few organs. For instance, one kidney (as one kidney is capable of maintaining the body functions), a portion of the pancreas (as half of the pancreas is adequate for sustaining pancreatic functions), and part of the liver (as the few segments that are donated will regenerate after a period of time) can be donated.
2. **Cadaver organ donors:** All organs and tissues can be donated after brain death.

## When exactly can you donate your organs?

Organ donation can take place after one is declared 'brain dead'. Now what do we mean by 'brain dead'? It is the irreversible and permanent cessation of all brain functions, when the brain can no longer send messages to the body to perform vital functions like breathing, sensation, obeying commands, etc. Such persons are kept on artificial support (ventilation) to maintain oxygenation of organs so that the organs are in healthy condition until they are removed. Most cases of brain death are the end result of head injuries or the death of brain tumour patients from intensive care units. The organs of such patients can be transplanted into patients whose organs have failed to provide them with a new lease on life.

After death at home, only corneas (eyes) can be removed, whereas for removal of other tissues such as heart valves, bones, middle ear, ligaments and skin, the body needs to be brought to the hospital, preferably within a few hours after death.

*Take me from falsehood to truth.  
Take me from darkness to light.  
Take me from death to immortality.  
Support Life.*

### **How is brain death diagnosed?**

This is done by the independent advice of a team of doctors whose qualifications and experience are accepted by the hospital for such purposes. Doctors carry out a set of tests to confirm brain death.

The two sets of tests are carried out at an interval of at least six to twelve hours. Legal time of death is the time at which the second set of tests is carried out. Once a person is declared brain dead, further artificial support is futile and causes emotional and financial trauma. *At this time a decision to donate the organs of the deceased can be made.*

### **How quickly should the organs be donated?**

Healthy organs should be transplanted from the donor to the recipient as soon as possible after brain death.

### **Who can be a donor?**

Anyone, regardless of age, race or gender, can become an organ and tissue donor. If you are under the age of eighteen, you must have the consent of your parent or legal guardian to pledge your organs. Medical suitability for donation is determined at the time of death. People suffering from some diseases like HIV, hepatitis B, hepatitis C, etc. are unsuitable donors.

### **Who can give consent for organ donation after brain death?**

Donors who, during their lifetime, have given consent for organ donation in writing in the presence of two witnesses (at least one of whom is a near relative) should carry their donor cards with them and also express their wish to their near and dear ones. In case no such consent or donor pledge form was filled before death, then the authority to give consent for organ donation lies with the person lawfully in possession of the dead body.

## Which terminal diseases can be cured by transplant?

Here are some terminal diseases which can be cured by a transplant:

Organ/Tissue	Disease
Heart	Heart failure
Lungs	Terminal lung illnesses
Kidneys	Kidney failure
Liver	Liver failure
Pancreas	Diabetes
Eyes	Blindness
Heart valve	Valvular disease
Skin	Bums
Bones	Birth defects, injuries, cancer, etc.

## What organs and tissues can be donated?

The major donor organs and tissues are heart, lungs, liver, pancreas, kidneys, eyes, heart valves, skin, bones, bone marrow, connective tissue, middle ear, and blood vessels. *Therefore, one donor can possibly give the gift of life to many terminally ill or other patients in need who would not otherwise survive.*

*What lies behind us and what lies before us  
are tiny matters compared to what lies within us.*

Ralph Waldo Emerson



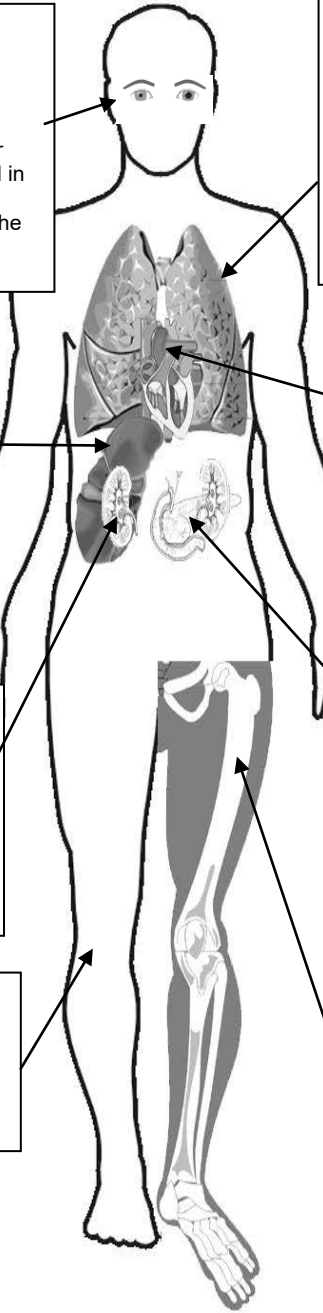
## Organs and Tissues that can be Donated

**Eyes** are the organs of vision. They are roughly spherical in shape. Light enters them through the corneas, and passes through the pupil (circular opening) which is located in the iris. Eye/corneal transplantation restores the vision of the patient.

**Liver** transplantation is required for people with advanced liver failure, and also children born with biliary atresia. The liver receives the products of digestion, converts glucose to glycogen and breaks down fats. It removes excess amino acids from the blood.

**Kidneys** are responsible for fluid regulation and excretion of waste products. Kidney transplantation is required when kidneys cannot perform renal functions, e.g., renal failure.

**Skin:** The exterior surface of the body is covered with **skin**. The skin contains nerve receptors for sensations of touch, pain, heat and cold.



The **lungs** are the organs of the breathing system, which bring inhaled air into close contact with the blood so that oxygen can pass into the body and waste carbon dioxide can be passed out. Lung transplantation is required when illness, injury or infection reduces the breathing capacity of the patient, e.g., cystic fibrosis.

The **heart** is the central organ of circulation, which forces blood around the body through a circulatory system. Heart transplantation is required when the pumping of the heart decreases and blood cannot be circulated effectively throughout the body, e.g., cardiomyopathy.

The **pancreas** helps digest starches, proteins, and fats. It contains cells which secrete hormones like insulin that regulate the blood sugar level.

**Bones** form the rigid or semi-rigid framework that supports and gives form to the body. Donated bones can be used for helping people with fractures that do not heal, bone cancer, knee reconstruction due to torn ligaments and spinal fusion surgery.

## **Who will receive your organs?**

Your vital organs will be transplanted into those individuals who need them most urgently. Gifts of life (organs) are matched to recipients on the basis of medical suitability, urgency of transplant, duration on the waiting list and geographical location.

## **Is there any charge to my family for organ donation?**

No. There is no charge or payment for organs/tissues used in transplantation. Organ donation is a true gift.

## **Does organ/tissue removal affect cremation/burial arrangements or disfigure the body?**

No. The removal of organs or tissues will not interfere with customary funeral or burial arrangements. The appearance of the body is not altered. A highly skilled surgical transplant team removes the organs and tissues that can be transplanted to other patients. Surgeons stitch up the body carefully, hence no disfigurement occurs. The body can be viewed as in any case of death, and funeral arrangements need not be delayed.

*Life's unfairness is not irrevocable;  
we can help balance the scales for others,  
if not always for ourselves.*

Hubert Humphrey

## **Will the doctor ask permission for donation from my family, once the signed donor card is found?**



Yes. Doctors will always ask permission for organ donation from the family if your signed card is sighted. Therefore, it is important that you discuss your decision with family members and loved ones so that it will be easier for them to follow through with your wishes.

## **What is the legal position on organ donations?**

It is legal. The Govt. of India enacted the “Transplantation of Human Organs Act 1994” in Feb. 1995, which has allowed organ donation and legalized brain death.

## **Is it permissible to sell human organs?**

No. The “Transplantation of Human Organs Act 1994” prohibits the sale of human organs and tissues. Violators are subject to fines and imprisonment.

## **Can organs be removed after death at home?**

No. Organs can only be removed when a person is brain dead in the hospital and immediately put on a ventilator and other life support systems. After death at home, only eyes and tissues can be removed.

*In the face of uncertainty,  
there is nothing wrong with hope.*  
O. Carl Simonton

## **Where to donate?**

Organ transplantation has become a reality with the establishment of the **Organ Retrieval Banking Organisation (ORBO)**, which has been set up at All India Institute of Medical Sciences (AIIMS), New Delhi. This is the nodal centre for the nation with the objective of encouraging organ donations, and the fair and equitable distribution and optimum utilization of human organs.

ORBO maintains a waiting list of terminally ill patients requiring transplants and donor registers. It provides matching of recipients with donors, coordination from procurement of organs to transplantation, dissemination of information to concerned hospitals and individuals, awareness activities, promotion of organ donation and transplantation activities. It has networking with most of the hospitals located in Delhi and is further expanding.

**Pledge an organ donation!**  
**For further information, contact:**

**ORBO**

**Organ Retrieval Banking Organisation**

All India Institute of Medical Sciences,  
Ansari Nagar, New Delhi 110029

**Phone: 1060 (Special 24 hrs. helpline),**  
2659 -3444/2658 8360

**Fax: 011 -2658 -8402**

**Email Addresses**

**Stem Cells:** stemcellinfo@orbo.org

**ORBO:** info@orbo.org / orboindia@yahoo.com

**Web site:** www.aiims.edu/aiims/orbowww.orbo.org

Facilities for organ transplantation have also been set up in other parts of the country such as Chennai, Bangalore, Mumbai, Hyderabad and Chandigarh and are expanding throughout the country.