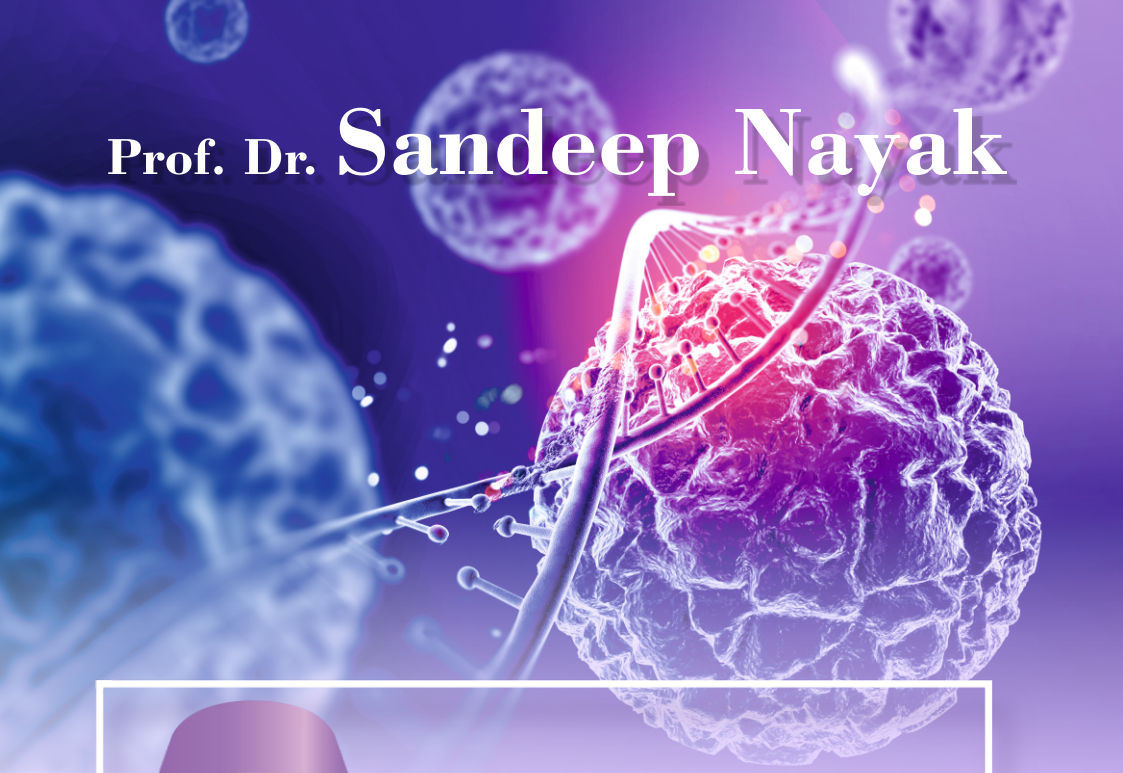
Prof. Dr. **Sandeep Nayak**



Armed to Beat CANCER - Know & Prevent

2nd EDITION

The Power You Need to Prevent Cancer

CONTENT

CANCER AND CONCERNS

We all know that the number of cancer patients are increasing. In this session we discuss the number as they appear today and understand why we are seeing an increase in the number of cancer cases.

a. INTRODUCTION

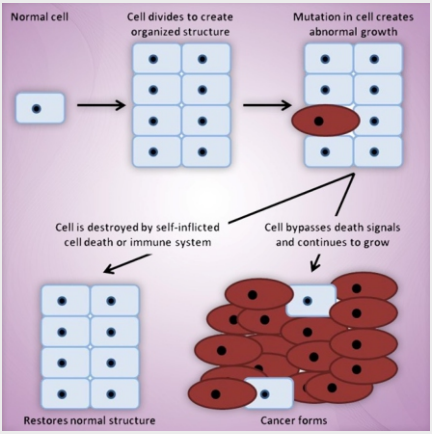
b. THE CANCER NUMBERS

c. IS CANCER INCREASING?

d. THE REASON FOR INCREASE

INTRODUCTION

Cancer is the name given to a group of diseases that behave similarly. A wide range of cancers are characterized by an uncontrolled division of the body's cells without halting and thereby, spreading to surrounding tissues pushing normal cells & destroying them.



The cells in the body are controlled by their immunity. From time to time a few cells do get out of control which is taken care of by the immune system. Cancer grows when the immune system fails to control this uncontrolled multiplication. These are the cells that refuse to follow the rules of our body. They multiply with no control and have a tendency to spread and destroy other organs.

Cancer can begin at any place in the human body, which comprises trillions of cells. Regularly, human cells divide and shape into new cells as the body needs them. At the point when cells get senile or get harmed, they bite the dust, and new cells assume their position. When the organised procedure of cell growth fails, cancer begins. Cells become increasingly irregular in shape and size and continue to survive even when they ought to die, and the formation of new cells occurs even when they are not required. These cells can multiply without any reason and may form what are called tumours.

Cancerous tumours are harmful as they can spread into, or attack, adjacent tissues. Moreover, as cancers grow, some cancer cells can escape and travel to far-off spots in the body through the blood or the lymph network, forming new tumours far way from the first tumour.

WHAT ARE THE NUMBERS TODAY?

Cancer figures are among the main causes of illness and death worldwide. Every year, there are roughly **1.4 crore new cases and 82 lakh cancer-related deaths**. In India, approximately 13 lakh new cancer cases are diagnosed annually, and 8.5 lakh die due to cancer. In the next two decades, estimates state that cancer incidence will increase by 60% worldwide.

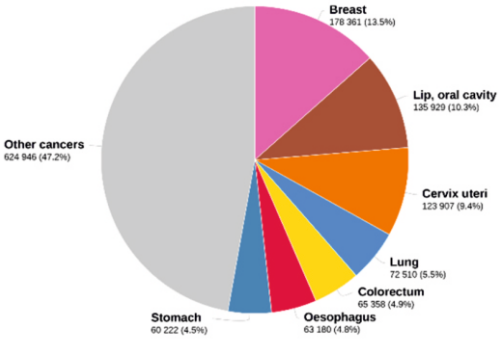
The pie chart from World Health Organisation shows the most common cancer in India and the difference between the cancers among men and women.

As of the year 2020

- The leading cancers are breast, lung, mouth, cervical and colo-rectal (large intestine) cancer.
- Among men, the five most common cancers were mouth, lung, stomach, colo-rectal & esophageal cancers.
- In women, the five most common cancers are breast cancer, followed by cervical cancer, ovary cancer, mouth cancer and colorectal cancer.

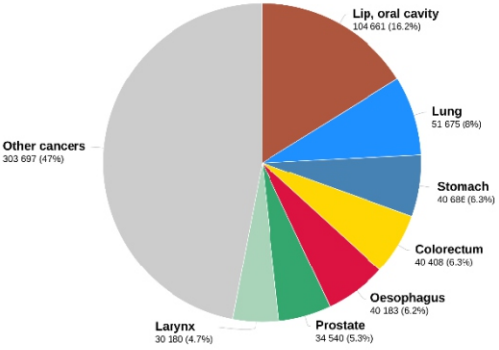
The risks include high body mass index (obesity), low fruit and vegetable intake, lack of physical activity, tobacco use, and alcohol use. Also, behavioral and dietary changes can prevent around 33% of cancer deaths.

Estimated number of new cases in 2020, India, both sexes, all ages



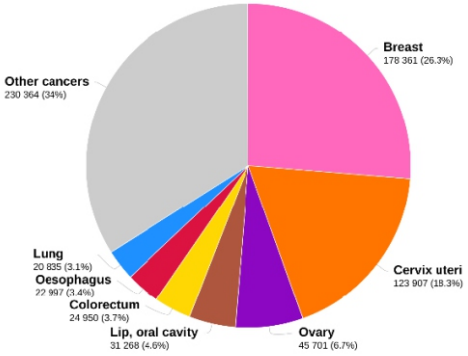
Total : 1 324 413

Estimated number of new cases in 2020, India, males, all ages



Total : 646 030

Estimated number of new cases in 2020, India, females, all ages



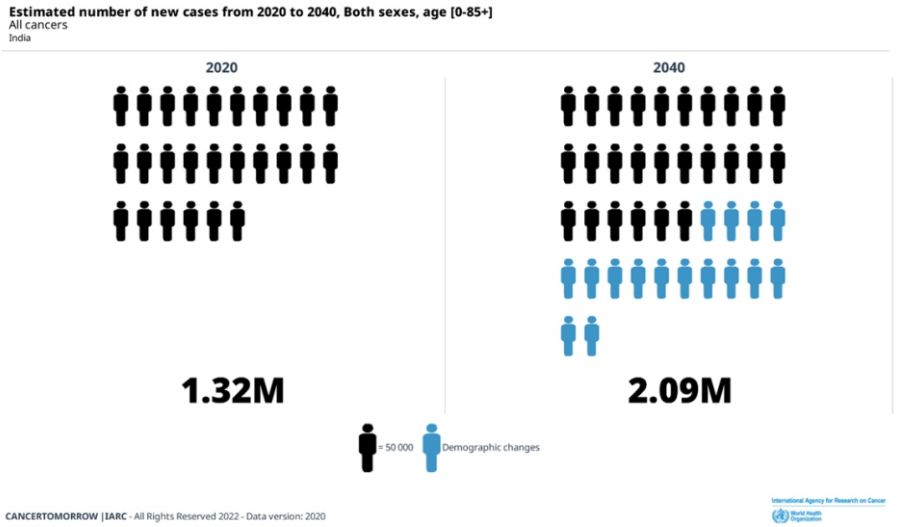
Total : 678 383

IS CANCER INCREASING?

Cancer was once considered a rare disease, but, today it is not. Cancer is the third most common cause of death worldwide (WHO data) and its incidence is increasing. It is calculated that 25% of people living today will develop cancer sometime in their life.

It is estimated that more than 1.4 crore persons are diagnosed with cancer each year (not counting skin cancer). Over half of the cancer cases occur in developing countries, where its incidence is increasing dramatically (see image). This is a staggering number, and we need to act now if we have to make an impact.

The best part is that we can do many things to prevent cancer from killing us. There are many measures that can prevent cancer (primary prevention) and detect it early (secondary prevention), i.e., at a stage when it can often be cured.

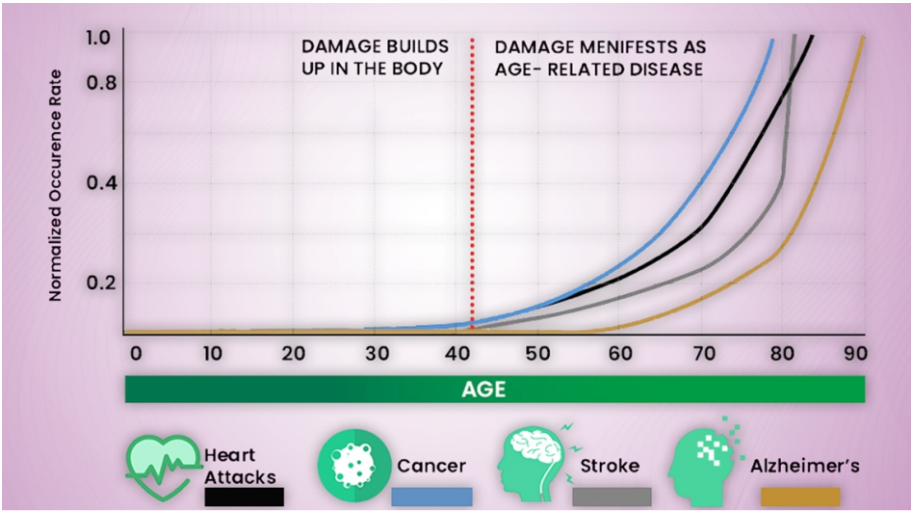


What are the key Risk reduction strategies?

There are 2 main things we all need to understand. We need to reduce the risk of cancer and we need to diagnose cancer early to get cure. Both are very important strategies.

WHY IS CANCER INCREASING?

There was a time when life expectancy at birth in India was about 40 years. This has changed over the years. Today life expectancy in India is reaching 70 years. This change has happened because of holistic better healthcare.



The deaths from infections like typhoid, malaria, cholera, etc. have been almost eliminated. This has led to an ageing population that is prone to age-related diseases as shown in the graph below.

Age is the single unavoidable risk factor for cancer. This is the reason why screening tests have to start when you are above the age of 40. This applies to all age-related diseases like heart ailments, hypertension, diabetes, etc.

CAUSES OF CANCER

What we do could make us prone to cancer. There are five major well-known risk factors for cancer. These are almost the same risk factors that are involved in causing diabetes, hypertension, and other chronic illnesses. These are:

a. TOBACCO ABUSE
b. ALCOHOL ABUSE
c. INFECTIONS
d. EXERCISE AND DIETARY HABITS
e. POLLUTION

TOBACCO, THE GREAT KILLER

History of Tobacco:

Tobacco has an interesting history. In October, 1492, Christopher Columbus was offered dried tobacco leaves as a gift from the American Indians that he encountered. Soon after, sailors brought tobacco back to Europe, and the plant was being grown all over Europe. Probably mixed with lime or chalk, tobacco appears to have been used in these Native American populations as toothpaste to whiten teeth. The notion of tobacco as a panacea became prevalent perhaps in the year 1500

Tobacco was also used as a medicinal plant during this time. It was used for treating ulcerated abscesses, fistulas, sores, inveterate polyps and many other ailments. Breathing the odour of the fresh green leaves of the plant relieved persistent headaches. For colds and catarrh, green or powdered leaves should be rubbed around inside the mouth. Diseases of glands in the neck could be cured by cutting out the root of the lesion and placing on it crushed tobacco plant hot and mixed with salt, on the same spot. Well, to tell the truth, tobacco was the solution for every ailment during those days! Yet, those were the days when the evidence was scarce.

Till the beginning of the 20th century, the ill effects of tobacco abuse were unknown to the public. The tobacco giants ran advertisements claiming the benefits of tobacco. They advised that regular smoking would improve one's health. It took enormous effort by the activists and scientific community to discover the ill effects of tobacco. Today we know that tobacco use is the single greatest avoidable risk factor for cancer mortality worldwide. Tobacco causes an estimated 22% of cancer deaths per year. In 2004, 16 lakh of the 74 lakh cancer deaths were due to tobacco use.

Damage Due to Tobacco:

Tobacco smoking causes many types of cancer, including cancers of the lung, esophagus, larynx (voice box), mouth, throat, kidney, bladder, pancreas, stomach and cervix. About 70% of the oral & lung cancer burden can be attributed to tobacco alone.

Second-hand smoke, also known as environmental tobacco smoke, has been proven to cause lung cancer in non-smoking adults. Smokeless tobacco (also called oral tobacco, chewing tobacco or snuff) causes oral, esophageal and pancreatic cancer.

Cigarettes, cigars, and pipe tobacco are made from dried tobacco leaves. Other substances are added for flavour and to make smoking more pleasant. The smoke from these products is a complex mixture of chemicals produced by burning tobacco and its additives. Tobacco smoke comprises over 7,000 chemicals, including over 70 known to cause cancer (carcinogens).

Secondhand Smoke is also Dangerous.

What is it?

Second-hand smoke (also known as environmental tobacco smoke) is the smoke a smoker breathes out and that which comes from the tip of burning cigarettes, pipes, and cigars. It contains about 4,000 chemicals. Many of these chemicals are dangerous; more than 50 of them are known to cause cancer. Children are exposed to these chemicals anytime they breathe in second-hand smoke.

What are the dangers?

Inhaling second-hand smoke can cause lung cancer in non-smoking adults. The data from the United States says approximately 3,000 adults die each year from lung cancer from second-hand smoke exposure. Also, living with a smoker increases a non-smoker's chances of developing lung cancer by 20% to 30%.

Exposure to second-hand smoke can also cause heart disease and negatively affect your blood and blood vessels, increasing your risk of a heart attack. Heart disease caused by second-hand smoke kills approximately 46,000 non-smokers every year.

People who already have heart disease are at an especially elevated risk of suffering negative effects from breathing second-hand smoke and should avoid even its briefest exposure.

The dangerous particles in second-hand smoke can linger in the air for hours or even longer. It is not just the smoke that's a concern, though. The residue that clings to a smoker's hair and clothing, as well as cushions, carpeting and other goods — sometimes referred to as thirdhand smoke — also can pose risks, especially for children.

Children are at the highest risk. Children who grow up with parents who smoke are more likely to smoke themselves. Children and teens who smoke are affected by the same health problems that affect adults.

Second-hand smoke may cause problems for children later in life including poor lung development (meaning that their lungs never grow to their full potential), lung cancer, heart disease & cataracts (an eye disease).

What is the treatment available for tobacco cessation?

Stopping the use of tobacco is difficult for most people. It is advisable to take professional help from trained counselors. Medications also might help. Several cessation methods are available to help you quit, including nicotine replacement products such as nicotine gum, patches or lollipops.

Nicotine replacement therapy may also help ease withdrawal symptoms and reduce the desire for tobacco. Other medications are designed to block the effects of nicotine and reduce withdrawal symptoms. Group therapies help by providing support to each other. App-based support is also available for tobacco cessation.

Contact your doctor for help.

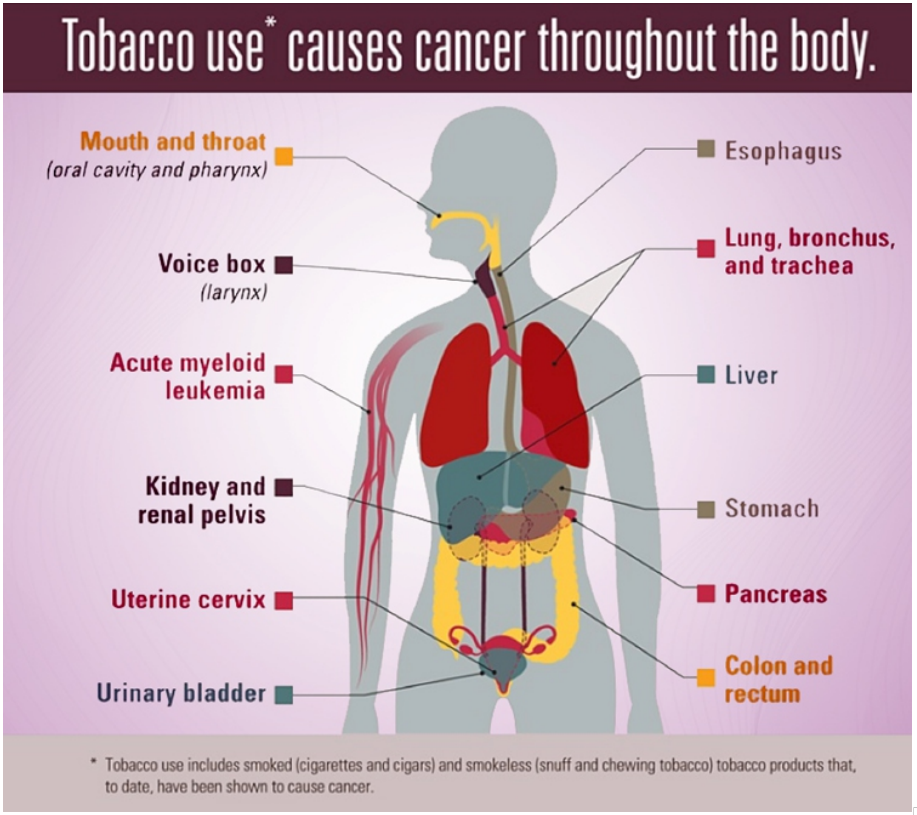
Smoking during or after cancer treatment

- May make treatment less effective. Smoking may cause a lack of

oxygen in the body or part of the body resulting in poorer outcomes from radiation therapy and immunotherapy. Toxins in tobacco smoke may cause cellular changes that affect how chemotherapy drugs are processed; potentially making them more toxic or less effective. Smokers may have fewer immune cells called natural killer cells which are needed to kill cancer cells. It also slows healing.

- May worsen cancer symptoms: On the overall, smokers have a lower quality of life during treatment compared to non-smokers due to increased side effects.

- Increases the risk of recurrence: You can always get second cancer or same cancer can come back.



ALCOHOL & CANCER

All alcoholic drinks, including red and white wine, beer, and liquor, are linked with cancer. The more you drink, the higher your risk. Not everyone who drinks alcohol will develop cancer. But scientists have found that some cancers are more common in people who drink more alcohol than others.

Drinking & Cancer Risk

It is likely that different cancers are caused in diverse ways. Regular drinking of alcohol can increase the risk of at least seven different cancers. Cancers linked to alcohol include:

- Mouth cancer
- Pharyngeal cancer (upper throat)
- Oesophageal cancer (food pipe)
- Laryngeal cancer (voice box)
- Breast cancer
- Bowel cancer
- Liver cancer

No single type of alcohol is better or worse than another. Alcohol itself leads to damage, regardless of whether it is in wine, beer or spirits. And drinking and smoking together are even worse for you.

Why does alcohol cause cancer?

When you drink alcohol, the liver breaks it down into a chemical called acetaldehyde. Acetaldehyde damages your DNA and prevents your body from repairing the damage. DNA is the cell's instruction manual that controls a cell's normal growth and function. When DNA is damaged, a cell can begin to grow out of control and create a cancer tumour.

Smoking & Alcohol

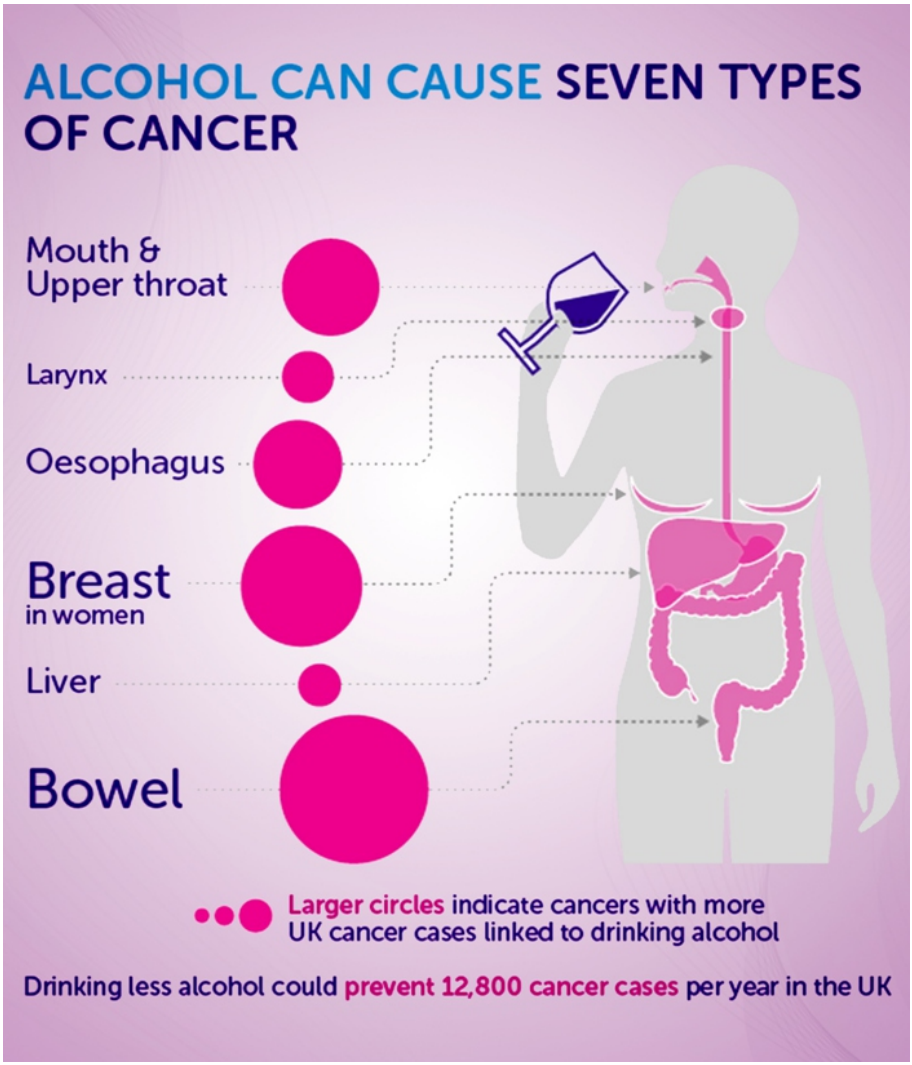
Together, smoking and alcohol seem to synergistically affect cancer risk, meaning the combined effects of use are significantly greater than the sum of individual risks. As alcohol is a good solvent, it is possible that alcohol dissolves the cancer-causing chemicals in the smoke and makes it easily available to the body.

Alcohol is an Empty Calorie.

Alcohol is considered an empty calorie as it only provides calories with no nutrition. Also, alcohol use may contribute to weight (fat) gain, and greater body fatness is a convincing cause of cancers of the oesophagus, pancreas, gallbladder, stomach, bowel, endometrium, ovary, kidney, liver, breast (in post-menopausal women) and prostate (advanced).

Drinking during Cancer treatment

There are some cases during cancer treatment in which alcohol should definitely be avoided. For example, alcohol - even in very small amounts – can irritate mouth sores caused by some cancer treatments, and can even make them worse. Alcohol can also interact with some drugs used during cancer treatment, which might increase the risk of harmful side effects. It is important to talk to your doctor about this if **you are being treated for cancer.**


ALCOHOL CAN CAUSE SEVEN TYPES OF CANCER
Mouth & Upper throat
Larynx
Oesophagus
Breast in women
Liver
Bowel
Larger circles indicate cancers with more UK cancer cases linked to drinking alcohol
Drinking less alcohol could prevent 12,800 cancer cases per year in the UK

Infections with certain **viruses and bacteria** have been recognized as risk factors for several types of cancer in humans.

Worldwide, infections are linked to about 15% to 20% of cancers. This percentage is even higher in developing countries, while it is lower in the developed countries. This is partly because certain infections are more common in developing countries, and partly because some other risk factors for cancer, such as obesity, are more common in developed countries.

Hepatitis Causing Liver Cancer

We are talking about the hepatitis B virus (HBV) & hepatitis C (HCV) virus. These viruses cause jaundice in the beginning and in some patients, they may remain in the liver causing chronic damage, cirrhosis, and cancer. Infected people may develop a chronic infection that can lead to cirrhosis. The damage that results increases the risk of liver cancer (hepatocellular carcinoma). The risk of liver cancer is greater for people with chronic HBV or HCV infection than for the general population. These viruses are transmitted through unsafe sex or unsafe blood products.

Presently, It is possible to prevent HBV infection through vaccination. Currently, the HBV vaccine is included in the routine immunization schedule from 2007-08 in most states in India. There is no vaccine for HCV.

HPV Infection

Human papillomavirus (HPV) is the most common sexually transmitted infection. Most sexually active men and women are exposed to the virus at some point during their lifetime. HPV can also spread through unhygienic toilets, etc.

HPV can cause cervical and other cancers including cancer of the vulva, vagina, penis, or anus. It can also cause cancer in the back of the throat, including the base of the tongue and tonsils (called

oropharyngeal cancer).

HPV infection is preventable. The HPV vaccine is available and recommended especially to young women and men to reduce the risk of HPV-associated cancer.

More than 90% of cervical cancer is caused by HPV. For this reason HPV vaccine is indicated as a preventive measure. The best way to prevent cervical cancer is to have the HPV vaccine at the age of 12 or 13. The vaccine can be taken up to the age of 35. Moreover, they should maintain better vaginal and menstrual hygiene to prevent infection.

Stomach Cancer

Helicobacter pylori (H pylori) bacteria which infect the stomach causing gastritis can damage the inner layer of the stomach. This damage can lead to cancer over the years. H. pylori infection is spread by unhygienic food and is common in developing countries. There are tests to diagnose this and treatment is available to cure the infection. Prevention is by maintaining food hygiene and quality.

HIV

Infection with the human immunodeficiency virus (HIV) is associated with cancer. HIV itself plays a role in how cancer grows in HIV-positive people. HIV attacks the immune system, which protects the body from infections and diseases. A weaker immune system is less able to fight diseases like cancer. People with HIV often have weakened immune systems, which means they will have a greater chance of getting cancer.

- AIDS-related Cancers: There are three types of cancer: Kaposi's Sarcoma (type of skin cancer), non-Hodgkin's lymphoma (cancer of lymph glands), and cervical cancer (in women).

- Non-AIDS-related Cancers: People with HIV are getting more non-AIDS-related cancers as they are living longer due to better

HIV treatment and so may not have full blown immunodeficiency. These cancers include:Lung Cancer, Hodgkin's Lymphoma (cancer of lymph glands), anal cancer, liver cancer and other skin cancers.

Spread of these Infections:

Many of the infections that influence cancer risk can be passed from person to person, but cancer itself cannot. A healthy person can't "catch" cancer from someone who has it.

To conclude, developing countries have an unequal burden of infection-related cancers. This is particularly true for cervical cancer caused by certain genital papilloma viruses, liver cancer caused by the hepatitis B and C viruses, and stomach cancer caused by H. pylori.

Even though the infections described here can raise a person's risk of certain types of cancer, most people with these infections never develop cancer. The risk of developing cancer is also influenced by other factors. For example, infection with Helicobacter pylori (H pylori) bacteria might increase your risk of stomach cancer, but what you eat, whether you smoke or don't, and other factors also affect your risk.

EXERCISE, WEIGHT & CANCER

According to independent estimates, up to one-third of cancer-related deaths are due to **obesity and a sedentary lifestyle**, including two of the most common cancers - breast and colon cancer. Many people exercise to prevent heart disease, but exercise can also play a key role in preventing cancer.

Exercise is one of the most important actions you can take to help guard against many types of cancer. Up to one-third of cancer-related deaths are due to obesity and a sedentary lifestyle, including two of the most common cancers, breast and colon cancer.

Most cancers are caused by lifestyle factors - not genes.

A good goal is to **exercise at least 30 minutes a day on most days of the week**. To get the most benefit, though, aim for about an hour a day. Moderate-intensity activities such as brisk walking may be sufficient, although there is more benefit with increased intensity.

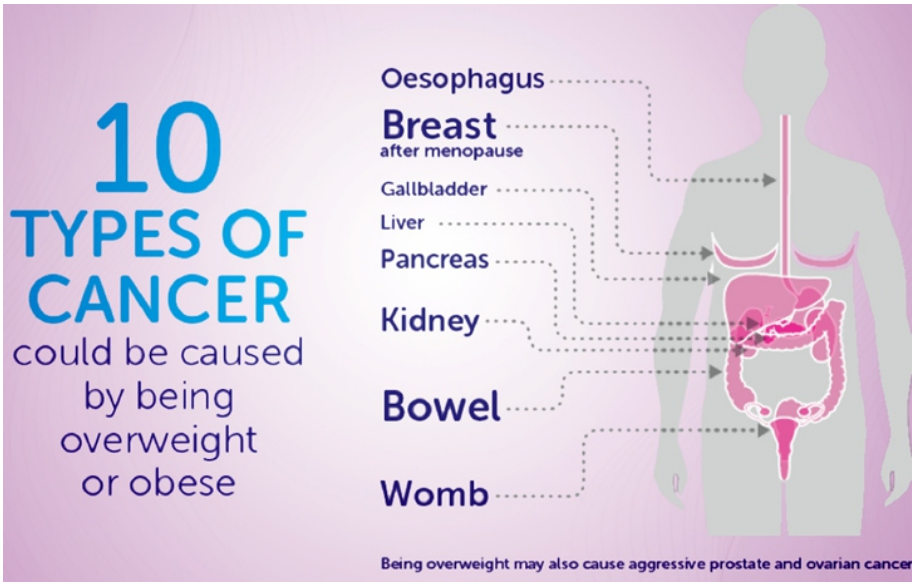
It's easier than you think! A half hour of physical activity daily such as walking, slow swimming, leisurely bike riding or golfing without a cart will get you started. Here are some other ways to be more active:

- Use stairs rather than an elevator.
- Walk or bike to your destination, and walk around the block after dinner.
- Exercise at lunch with your family or friends.
- Go dancing.
- Use a stationary bike or do sit-ups, leg lifts and push-ups while watching TV.
- When the weather is too poor to be outside, grab a partner and "walk the mall."
- Vary your type of exercise so you won't get bored or think it's a chore.

Often people view exercise narrowly as a way to lose weight or to look better. These incentives can be effective, but exercise is really about a person taking charge of his or her health, preventing chronic diseases like cancer, living healthier & longer.

Body Mass Index (BMI):

A good way to understand if you are within healthy range of body wait is to measure your BMI. Your BMI = weight in kg/height in metre^2. Though worldwide normal BMI is between 18.5 to 24.9, however for Indians the upper limit is set to 23. This is because Indians tend to develop truncal obesity (fat around the belly) which is unhealthier than overall obesity.



FOOD TIPS TO AVOID CANCER

Did you know that simple dietary changes can help raise immunity, resistance and longevity levels and help prevent and fight cancer? Well, to begin with, here are seven of them:

- Choose whole grains over refined flour. Whole grains are more nutritious than polished.
- Fresh fruits help repair damaged cells, thereby assisting in fighting cancer. Four servings a day is highly recommended.
- Vegetables contain nutrients that help detoxify dangerous elements. Have a healthy serving with every meal.
- Keep the red meat at bay. Choose fish over meat. Red meat is known to increase the risk of bowel cancer.
- Consume less fat: Some cancers are linked to a high intake of fatty food.
- Sugary Items: Refined sugars have a high glycaemic index. They are bad for your health and cause cancer. Soft drinks and sweets have a high amount of sugar and are dangerous for health.
- Processed meat: Processed meat is meat that has been preserved by curing, salting, smoking, drying or canning, including sausages and pickles.
- Alcohol: Say no to booze. It not only inebriates but also can increase cancer risk.

Developing a taste for the right foods, too, will go a long way in reducing the risks of many diseases and ailments!

POLLUTION & CANCER

Air pollution's role as a cause of cancer has slowly been shifting to the centre stage over the past few years. Exposure to air pollution, second-hand smoke, radon, ultraviolet radiation, asbestos, certain chemicals and other pollutants cause over 10% of all cancer cases.

Over the past decades, evidence has been mounting that air pollution is linked to various cancers. In 2013, a group of international experts, working on behalf of the World Health Organisation's International Agency for Research on Cancer (IARC), looked at the results of all of the research and concluded that air pollution causes cancer in humans – in particular, lung cancer.

Outdoor pollution

But what do these experts mean by air pollution? The term is very broad and covers a host of 'nasties' including minuscule particles, tiny fragments of metals and gases. But regarding cancer risk, research so far shows that tiny dust-like particles just millionths of a metre wide – so-called 'particulate matter, or PM – are the main culprits. In particular, the smallest particles – less than 2.5 millionths of a metre across, known as PM2.5 – appear to be behind lung cancers caused by pollution. These are chiefly found in emissions from diesel engines – something IARC has also ruled causes cancer in humans.

Indoor pollution

Quite often, we all wonder why when a non-smoker homemaker gets cancer! There are severe indoor pollutants as well. Though the use of coal and wood for cooking has come down, we still use cooking gas. But there is no evidence at present that cooking gas can cause cancer, it is a fossil fuel. Burning any fossil fuel releases fine particulate matter that is harmful. Cooking in a well-ventilated kitchen is what is recommended.

This emphasises the need for a better understanding of the actual risk of cancer posed by environmental factors and the effect of measurements aimed at controlling exposure to environmental carcinogens.

HEREDITY & CANCER

Yes, cancer is a genetic disease and is caused by changes in the genes that control the way cells grow and multiply. Cancer itself can't be passed down from parents to children. Also, genetic changes in tumor cells can't be passed down. But a genetic change that increases cancer risk can be passed down (inherited) if it is present in a parent's egg or sperm cells. This is like a manufacturing defect that makes you prone to develop cancer. Less than 10% of cancers are hereditary. Others are due to environmental and lifestyle factors.

Who should test for Family Cancer Syndrome?

We suspect hereditary or genetic causes of cancer when the patient is young, or multiple cases of cancer in one family. Genetic counselling and testing are done to know cancer risk for those people. Knowing the risk helps in preventing the cancer by surgery or other methods. The most popular example of this would be Hollywood actress Angelina Jolie who underwent double mastectomy (surgical removal of the breasts) to prevent breast cancer.

How do hereditary genetic changes cause cancer?

All cancers occur due to a series of genetic damage that go unrepaired. When a person is born with a genetic defect that hampers the repair of DNA damage, such a person accumulates those damages much faster than a normal individual. These accumulated damages lead to cancer.

How to Prevent Hereditary Cancers?

You must undergo specific screening tests, if you have a higher risk of cancer due to the genetic makeup you carry. These tests depend on the cancer type that you are at risk, e.g. for colon cancer, a colonoscopy is advisable yearly.

There are cancers for which preventive surgery would be a better option. E.g. for ovarian cancer, it is simpler to perform surgical removal of the ovary and tubes. There are many other surgeries that are offered based on the type of risk an individual has. These can only be decided after counseling.

JUST BAD LUCK

A research paper published in January 2015 in a reputed journal called Science raised many eyebrows! The global media quoted this paper to call cancer only to be a matter of 'bad luck in a way conveying that what one does (lifestyle) does not matter. Every cancer patient need not have a clear cause.

The paper in concern was designed to understand why some tissues in the body were more prone to cancer (e.g. colon) than others (e.g. brain).

The final interpretation of the study was that the chance of developing cancer depended on the normal rate of multiplication of the cells. For example, the cells in the colon need to multiply at a very high rate when compared to brain cells, which may hardly ever multiply. This makes colon cancer much more common.

This study was not based on a population study but based on cells in tissue culture in laboratories. They compared about 31 research papers to conclude that cancer is more common in cells multiplying at a high rate, when a mutation (error in DNA copying) can occur as a matter of luck.

These mutations, if not corrected, can lead to cancer. Error in copying does occur every day, however, they are corrected immediately. But these changes may be missed in cells that are multiplying very fast.

All the factors that we have discussed above contribute to cancer causation by increasing the multiplication of cells. It is proven beyond reasonable doubt that environmental factors have a great role to play in causing cancer. The elements that increase the rate of cell multiplication in various tissues include environmental factors (pollution, tobacco, etc.), infections (hepatitis), and others.

Anything that increases the rate of stem cell multiplication can cause cancer. However, cancer can also occur in the absence of these stimuli, and in those cases, it is due to bad luck. The reason is an error in DNA copying. For this reason, the strategies of cancer prevention still hold good.

SELF EXAMINATION

The key to successful cancer treatment is the awareness of changes in one's body leading to early cancer detection. It is important not to ignore these changes. It is important to know some symptoms and tips to self-examine your body, so you do not miss any abnormalities.

a. BENEFITS OF EARLY DIAGNOSIS
b. 12 CANCER SYMPTOMS
c. CANCER IS PAINLESS.
d. BREAST SELF-EXAMINATION
e. MOUTH SELF EXAMINATION.
f. TESTIS SELF EXAMINATION

BENEFITS OF EARLY DIAGNOSIS OF CANCER

It goes without saying that early detection of cancer increases the chances for successful treatment. Also, early cancer treatment is much simpler than advanced cancer treatment. As early treatment is simpler, it leads to fewer deformities and complications. It is important to know that there are two major components of early detection of cancer: education to promote early diagnosis and screening.

Identifying possible warning signs of cancer and taking quick action leads to early diagnosis. Increased awareness of possible warning signs of cancer can have a great impact on the disease.

Almost every test or procedure has benefits and risks. But, it is to find cancer early so that the benefits of having regular screening tests for breast, cervical and colorectal cancer outweigh the risks. Early detection may also mean less treatment and less time spent recovering.

The survival rate for people with eight of the most common cancers is more than three times higher when the disease is diagnosed early. Ten-year survival is more than 90% for people whose cancer is diagnosed at stage one, compared with 5% for those whose disease is found at stage four.

ROBOTIC AND LAPAROSCOPIC SURGERY FOR EARLY CANCER

The people who get the maximum benefit from early detection can opt for less invasive surgeries like robotic & laparoscopic surgery. Many of these may attain cure with just surgery. This means that these patients complete their cancer treatment without any scars or deformities.

The advantages of robotic and laparoscopic surgery include the following:

- Least **PAIN** & **DISCOMFORT**
- Less **BLOOD LOSS**
- **COSMETICALLYSUPERIOR** (Smallest wound & scar)
- **NO PROLONGED STARVATION**: Bowel movements recover much quicker
- Short hospital **STAY**
- Quicker return to **NORMAL LIFE & WORK**
- Least wound **COMPLICATIONS.**
- **AVOID** unnecessary major surgery
- Get all the advantages of **ROBOTIC** surgery.
- Best possible **CURE RATE.**
- No loss of **IMMUNITY**.

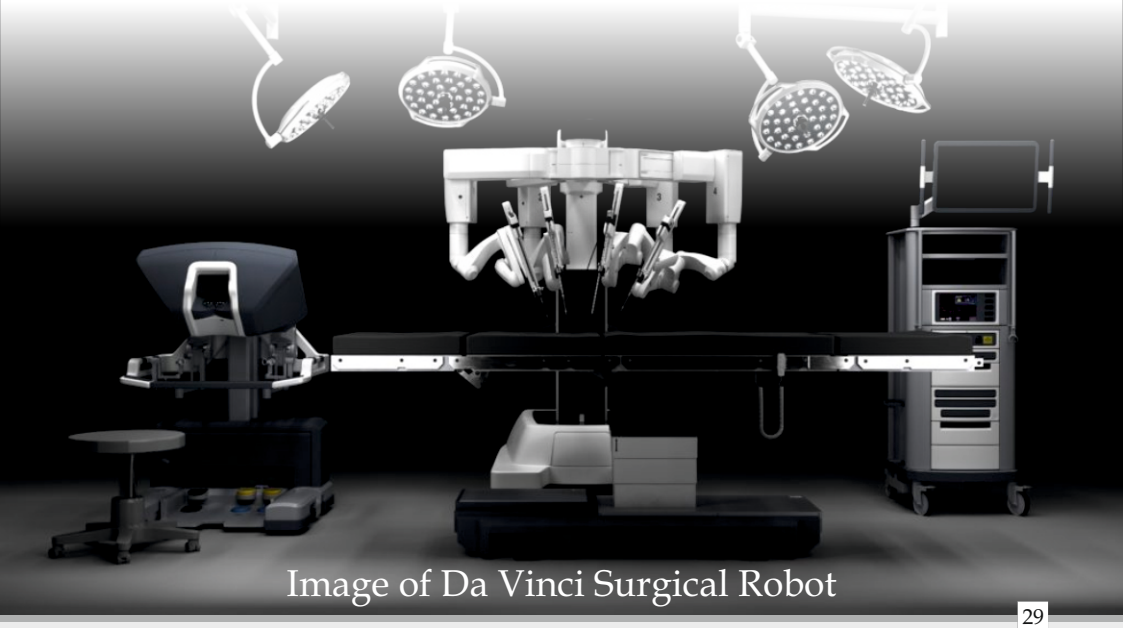


Image of Da Vinci Surgical Robot

TWELVE CANCER SYMPTOMS

Cancer is an unwanted growth of cells that destroys the healthy environment of the body. The fear associated with it is not because of the disease itself, but, because of the delayed diagnosis due to a lack of clear symptoms. Here is a list of commonly ignored symptoms that could be cancer's warning signs.

Cancer is PAINLESS when it starts, and so it gets ignored by the patient and doctors alike. It is your awareness that saves you.

1. **Lump or swelling:** Cancers of the breast and limb begin as painless lumps or swellings and progress over months. Any newly appearing lumps or swellings should be thoroughly investigated.

2. **A new patch, wound, or sore:** Oral or mouth cancers are common in India. These cancers start as a patch, wound, or sore and progress over months. Many other cancers in other parts of body start like this. If diagnosed early, they can be treated effectively.

3. **Anaemia:** Tiredness in cancer is usually due anaemia (lack of blood) and deficiency of nutrition. Cancer eats up most of the nutrients in its race to grow quickly. Also, bleeding from cancer tissue makes one anaemic. Very often, these patients are treated with iron without investigation for cancer. Cancer of the colon and stomach can come with anaemia.

4. **Blood while passing stool:** In most cases, it is due to piles or similar causes. However, cancer of the colon and rectum also causes this. When anyone has blood in stool, it is advisable to do a colonoscopy to look inside the colon. Cancer of the colon can cause changes in bowel habits (like alternating constipation and diarrhoea).

5. **Blood in urine:** This always requires further tests. Cancer of the kidney or urinary bladder, or prostate (among men) can cause blood in the urine. The bad part is this bleeding can be infrequent. This infrequency makes patients ignore this symptom. Even one episode of blood in urine needs thorough examination.

6. **Bleeding in between periods (women) or after intercourse or even a drop of blood after menopause:** Any bleeding that does not follow the usual pattern of the menstrual period is a warning sign. Cancer of the uterus or cervix can present with this kind of symptom. Patients with cervical cancer also have bleeding after having sexual intercourse. A drop of blood after menopause needs investigation.

7. **Loss of weight without trying:** A sudden weight loss when you are not dieting needs investigation. As cancer consumes most of your nutrition, you tend to lose weight.

8. **Loss of appetite and bloating after eating:** This could be because of bowel obstruction or cancer secreting its toxic substances. A thorough examination is needed to reach a diagnosis. Persistent indigestion is a feature of many intestinal & stomach cancers.

9. **Lymph node enlargement:** Lymph nodes are present everywhere in the body and function as filters. Most of the time, they enlarge due to infections. The cancer cells also get filtered in these nodes and are trapped. They grow in these nodes and the nodes enlarge because of this growth. There are cancers of lymph nodes themselves called lymphomas.

10. **Trouble swallowing or vomiting after taking food** are both warning signs of a cancer in the digestive tract. These need to be evaluated with endoscopic tests to identify the cause. Some patients have only persistent heartburns which are misdiagnosed as gastritis and treated only for months before the correct diagnosis reveals itself.

11. **Mole that is itchy, bleeding, irregular and increasing in size.**

12. **Hoarseness or loss of voice** is mostly due to causes other than cancer. Yet, a thorough investigation is warranted if it persists or worsens over weeks.

CANCER IS A PAINLESS DISEASE WHEN IT STARTS

In the beginning, the uncontrolled growth of cancer cells causes no pain. Pain starts only when the growth affects nearby tissues with pain sensors (receptors). Also, in some cases, cancers secrete certain substances or trigger immune reactions that cause symptoms in other parts of the body that are not near to the cancer-affected area.

The pain sensors are present abundantly only over some organs of the body. Most sensitive pain sensors are present in the skin and bones. The other organs, especially the bowel and soft tissues, do not have many sensors for pain.

When a tumour grows, it can compress, irritate, block, or destroy any tissue, tubes, ducts or blood vessels in the vicinity. Pain starts only when cancer reaches the organs rich in these pain sensors and/or stimulates them by other means. When this happens, nerves are stimulated and a flow of information travels along nerve pathways up to the brain where pain is perceived.

Cancer pain may correspond directly to the spot where the tumour is located, or to a distance from the original source, what is called referred pain. But pain is noteworthy, whether it is slight or strong and needs to be investigated thoroughly.

The quality and quantity of cancer pain also depend on how much room is available for the tumour to expand. So if a tumour is hemmed in the brain, the pain might be experienced sooner than tumours in the belly, where it has more space to grow and spread.

When any lump or swelling grows painlessly, the absence of pain should make you consider cancer. Consult your doctor as soon as symptoms start.

BREAST SELF-EXAMINATION

According to recent studies, increasing prosperity and "Westernisation" of our traditional lifestyles; in addition to a richer diet, smaller families, delayed childbearing, and reduced breastfeeding has driven breast cancer cases onto a higher trajectory.

And for the same reason, now more than ever, breast cancer symptoms and signs should be made known to every woman. At any point of time if one notices anything unusual, it should be investigated by a healthcare professional. By performing monthly breast self-exams, a woman herself will be able to identify any changes more easily in her breasts that can be a cause of concern.

Most people who have breast cancer symptoms and signs will initially be able to notice only one or two. These symptoms and signs do not automatically mean that one has breast cancer.

Be on the lookout for the following symptoms of Breast Cancer:

A Change in the Breast or Nipple Appearance

- Any unexplained change in the size or shape of the breast
- Dimpling anywhere on the breast
- Unexplained swelling of the breast (especially if on one side only)
- Unexplained shrinkage of the breast (especially if on one side only)
- Recent asymmetry of the breasts (Although it is common for women to have one breast that is slightly larger than the other, if the onset of asymmetry is recent, it should be checked)
- A nipple that is turned slightly inward or inverted, if it is of recent onset
- The skin of the breast, areola, or nipple that becomes scaly, red, or swollen or may have ridges or pitting resembling the skin of an orange

A Change in How the Breast or Nipple Feels

- Nipple tenderness or a lump or thickening in or near the breast or under arm area
- A change in the skin texture or an enlargement of pores in the skin of the breast (some describe this as like an orange peel's texture)
- A lump in the breast (It's important to remember that all lumps should be investigated by a healthcare professional, but not all lumps are cancerous)

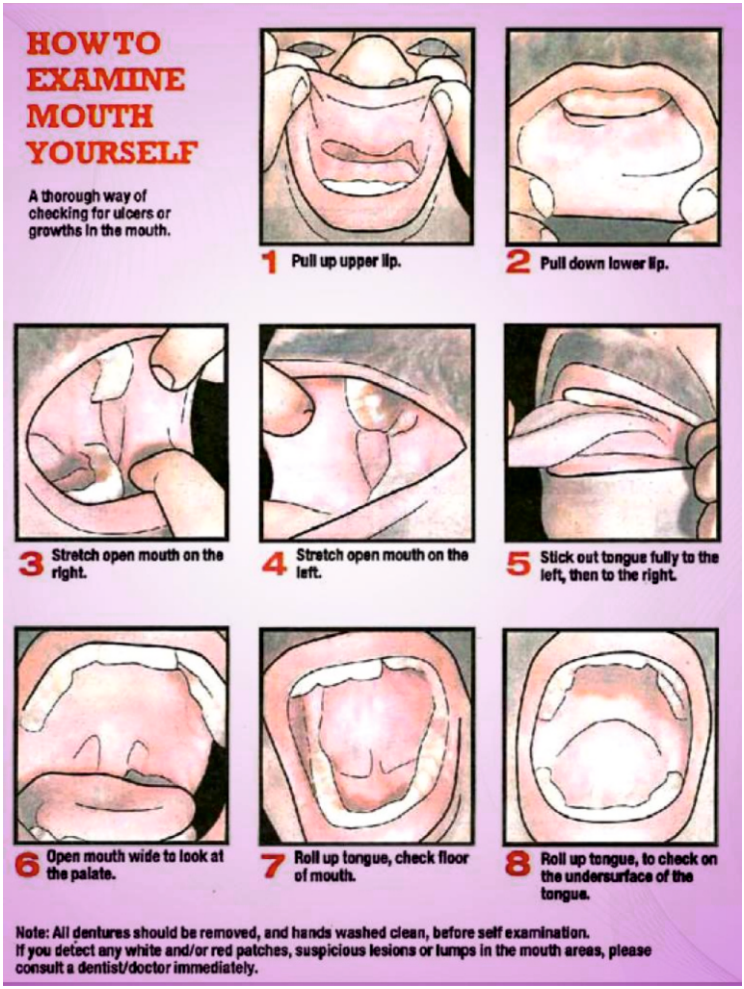
Any Nipple Discharge - Particularly Clear Discharge or Bloody Discharge

It is also important to note that a milky discharge that is present when a woman is not breast-feeding should be checked by her doctor, even though it is not always linked with breast cancer. Bloody discharge should always be treated with a high degree of suspicion

Pain is the last feature of cancer. Do not wait for it.

MOUTH SELF EXAMINATION

The mouth or oral cavity is one of the most accessible areas of the body. Yet mouth cancer kills more patients in India than other cancers. Many lives can be saved if people start examining their mouths themselves. Though everyone should examine, people who use tobacco should do this diligently. Examine your mouth once a month.



What should one look for in the mouth ?

1. Patches, if any: White patch (leukoplakia), red patch (erythroplakia) or black patch (melanoplakia) could be early signs of cancer. These patches are called Potentially Malignant Lesions (PML),
2. Ulcers or sores: The ulcers that do not heal or keep increasing in size are of great concern.
3. Mouth cancers can be painful, unlike other cancers.

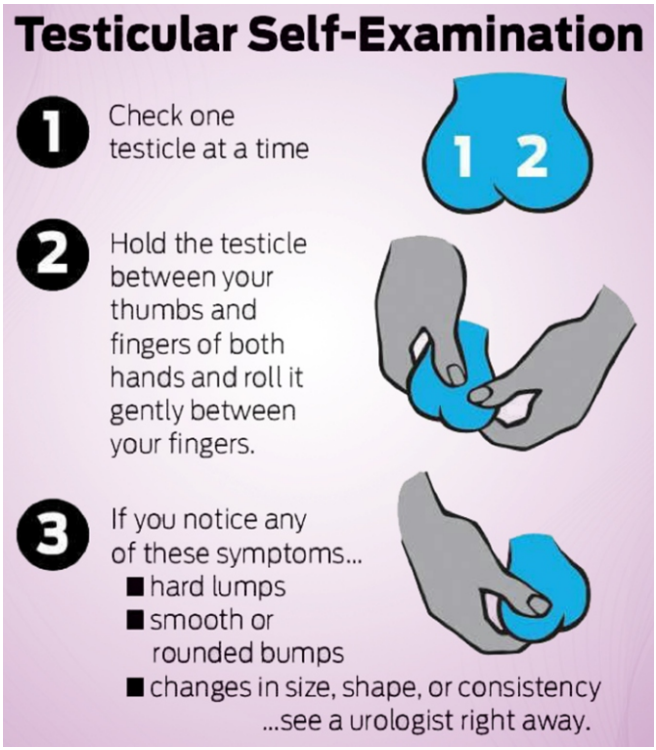
If, you notice any of these, please show them to your doctor.

TESTIS SELF EXAMINATION

Testicular cancer most commonly occurs in the age group of 18-to 50-year-old males. Young adult men are unaware of their risk for testicular cancer, which is the most common cancer in this age group.

Testicular Self-Examination (TSE) only takes a minute. One should aim to perform TSE about once every four weeks or so. Choose a day that's easy to remember, like the first day of every calendar month.

Additionally, healthcare providers seldom teach TSE techniques to people, thus potentially missing opportunities for early detection. It's important to remember that testicular cancer is relatively uncommon, so don't panic if you find a lump or anything else that seems unusual. It is better to see a doctor for a prompt diagnosis.



TESTS FOR CANCER DETECTION

Screening tests are meant to detect cancer before symptoms start. and are available for a few of the common cancers. They are a part of many of the master health check-ups. These recommendations are what we advise our patients. However, none of these tests are 100% accurate. These are meant for people with a normal risk of cancer. Please contact your doctor for a personalized screening protocol if you have a strong family history of cancer or any reason for increased cancer risk. It is important to follow the awareness and self-examination tips given above along with these tests.

a. BREAST CANCER SCREENING
b. LUNG CANCER SCREENING
c. COLO-RECTAL CANCER SCREENING
d. CERVICAL CANCER SCREENING
e. THYROID SCREENING
f. PROSTATE CANCER SCREENING
g. HARMS OF SCREENING TESTS

BREAST CANCER SCREENING

Breast cancer screening means checking a woman's breasts for cancer before there are signs or symptoms of the disease. Every woman should be aware of the best tests for themselves. An informed and shared decision-making is needed to decide the test for everyone based on their age, family history, personal history, etc.

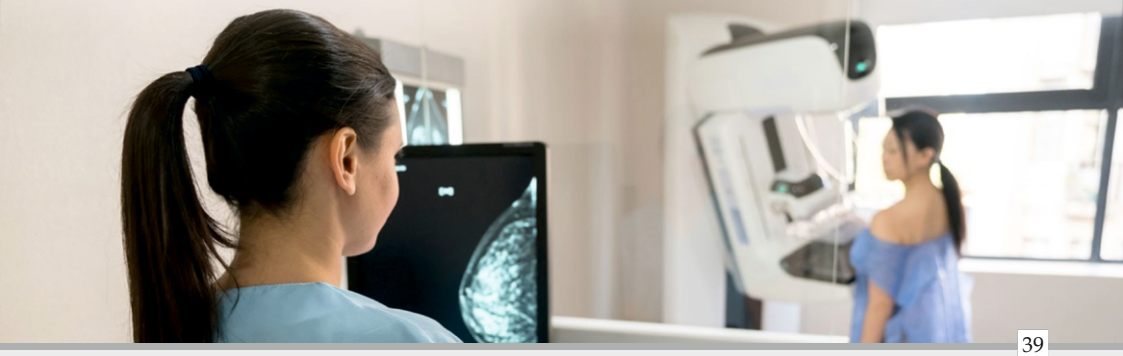
Breast cancer screening cannot prevent breast cancer, it can help find breast cancer early when it is easier to treat.

Breast Cancer Screening Tests

Mammogram: A mammogram is a breast X-ray that can detect suspected cancer. For many women, mammograms are the best way to find breast cancer early before it is big enough to feel or cause symptoms. Early cancers are easier to treat.

Breast Magnetic Resonance Imaging (MRI): A breast MRI uses magnets and radio waves to take pictures of the breast. Breast MRI is used along with mammograms to screen women at high risk for breast cancer. Breast MRIs may appear abnormal even when there is no cancer, they are not used for women at average risk.

Non-Invasive Risk Assessment with Machine Intelligence (NIRAMAI) is a method that uses thermalytix or heat-based imaging to detect breast abnormalities that need further tests. This does not involve radiation or compression of the breast and is portable. It is ideal for use in less-equipped areas to screen for breast cancer.



Frequency of Tests:

There are different guidelines offered by different organisations across the world. There are no specific guidelines for Indian women. However, it is well known that Asians get breast cancer a decade earlier than their western counterparts.

Women aged 40 to 44 years should have the choice to start breast cancer screening once a year with mammography if they wish to do so.

Women aged 45 to 54 years should be annually screened with mammography.

For women aged 55 to 74 years and older, screening with mammography is recommended once every two years or once a year.

Women over 75 should continue screening with mammography as long as their overall health is good and they have a life expectancy of 10 years or more.

Women with dense breasts - insufficient evidence to recommend for or against yearly MRI screening.

LUNG CANCER SCREENING

Lung cancer is the second most common cancer. It is also the leading cause of death from cancer. Usually, symptoms of lung cancer don't appear until the disease is already at an advanced stage.

Currently, a**low-dose CT scan** is the only recommended test for early detection of lung cancer. During this scan, you lie on a table, and an X-ray machine uses a low radiation dose to make detailed images of your lungs. The scan only takes a few minutes and is not painful.

Who should undergo this test?

Low-dose CT (LDCT) scan is not recommended for everyone. The following 3 criteria are to be fulfilled for performing the test:

- Have a 20 pack-year or more smoking history, and
- Smoke now or have quit within the past 15 years, and
- Are between 50 and 80 years of age (in good health)

A pack-year is smoking an average of one pack of cigarettes per day for one year. For example, a person could have a 20-pack-year history of smoking one pack a day for 20 years or two packs a day for 10 years.

LDCTs also expose people to a small amount of radiation with each test. It is less than the dose from a standard CT, but it is more than the dose from a chest x-ray.

Sometimes screening tests may show something abnormal in the lungs or nearby areas that might be cancer. Most of these abnormal findings will turn out not to be cancer, but more CT scans or other tests will be needed to be sure.

COLON & RECTAL CANCER SCREENING

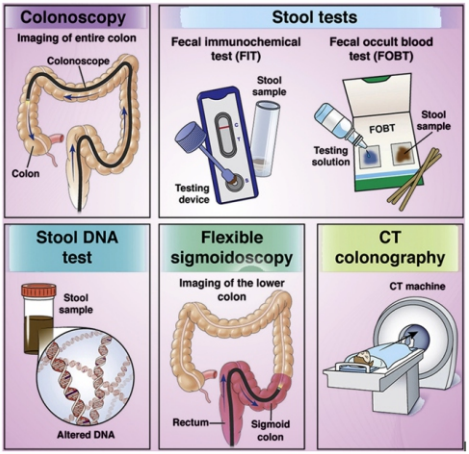
Large intestine or colorectal cancer can often be prevented through regular screening, which can find polyps before they become cancerous. Talk with your doctor about when screening should begin based on your age, personal history and family history of the disease.

Due to the rising incidence of colorectal cancer in younger people, we recommend that ordinary individuals should start regular screening at age 45. But, people with higher risk (like strong family history, previous history of colon cancer, etc.) must be screened differently.

What are the options available?

Though many organizations have recommended different tests, we find the following are the most practical options:

- Flexible sigmoidoscopy every 5 years
- Every 10 years with Stool or **Fecal occult blood test (FOBT)** and **Fecal Immunochemical Test (FIT)** every year
- Colonoscopy, every 10 years
- CT colonoscopy where a CT scan is used instead of colonoscopy.



It is important to note that, regardless of which screening test used, if any test indicates an abnormality, it should be followed up with a colonoscopy.

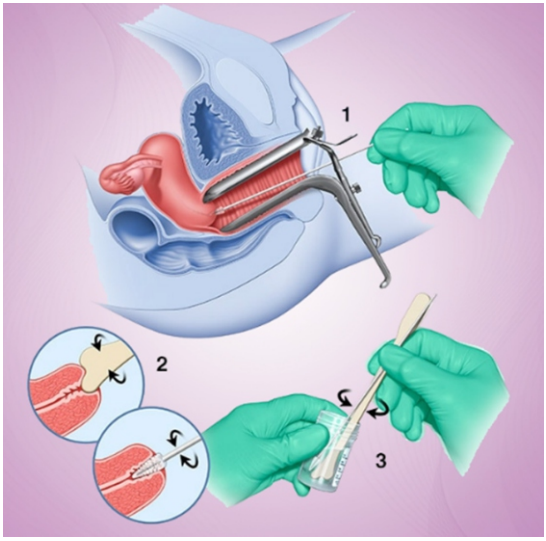
CERVICAL CANCER SCREENING

Cervical cancer was once one of the most common causes of cancer death for Indian women. **Pap test and HPV test are the two tests** that are available for screening. Screening tests offer the best chance of detecting cervical cancer early when treatment can be most successful. Screening can also prevent most cervical cancers by finding abnormal cervical cell changes (pre-cancers) so that they can be treated before they can turn into cervical cancer.

Despite the benefits of cervical cancer screening, not all women get screened. Most cervical cancers are found in women who have never had a Pap test or who have not had one recently.

Who should undergo this test?

- Cervical cancer testing should begin at age 30.
- Those aged 30 to 65 should have a primary HPV DNA PCR test every 5 years or a Pap test alone every 3 years.
- People who have been vaccinated against HPV should still follow these guidelines for their age groups.



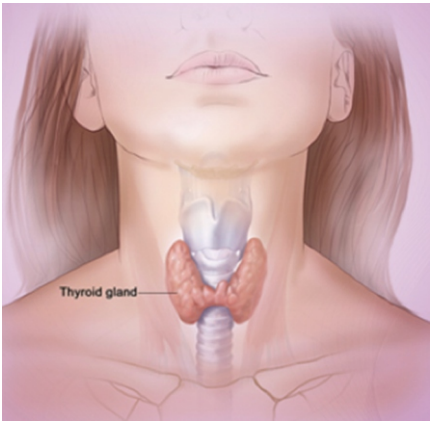
THYROID SCREENING

Thyroid cancers are on the rise. Most of the thyroid cancers are curable. Yet, it mostly occurs in young adults and tends to grow slowly. Except for a slow growing nodule, there won't be any symptoms. Most likely, it is detected or picked on an ultrasound scan of the neck.

It is a good idea to feel your thyroid gland from time to time. The thyroid gland is butterfly-shaped gland located in the centre of your neck, between your Adam's apple and the notch of your breastbone. It is spread across the windpipe.

Below are steps for examining your thyroid:

- Face a mirror
- Notice any asymmetrical swellings in the neck
- Take a sip of water
- Tilt your head slightly back, while still being able to see the mirror
- When you swallow the water, look for any lumps or areas that are not the same on both sides of the thyroid
- Thyroid nodules move while you swallow



Thyroid nodules are usually round in shape and move up and down when you swallow. You may feel the nodule rolling underneath your fingertips or see it move when you swallow.

Talk to your doctor if you find any lumps or swelling in this area. As noted earlier, lumps or nodules on the thyroid gland do not necessarily mean that you have a thyroid hormone disorder or cancer. Thyroid nodules are very common and often do not cause any other issues.

Another way to keep ahead of the disease is to do an **ultrasound scan of the neck once in 2 years** to pick up any suspicious nodules. This would allow cancer to be picked for treatment before any symptoms are caused.

PROSTATE CANCER SCREENING

Prostate cancer is **one of the top ten leading cancers in India**. It usually affects men in the age group of 65+ years. However, recently there has been an increase in cancer reports in younger men aged 35-44 and 55-64 residing in metropolitan cities. It is recommended to start screening for prostate cancer above the age of 40 or 45.

Prostate Specific Antigen (PSA) Test

A simple blood test called a prostate-specific antigen (PSA) test measures the level of PSA in the blood. PSA is a substance secreted by the prostate. The levels of PSA in the blood can be higher in men with prostate cancer.

The higher the PSA level in the blood, the more likely a prostate problem is present. But many factors can affect PSA levels. Some prostate glands make more PSA than others.

PSA levels also can be affected by

- Certain medical procedures like catheterization.
- Certain medications.
- Benign enlarged prostate (BPH)
- Prostate or urinary infection

If the PSA test is abnormal, your doctor may recommend an MRI scan and a TRUS-guided biopsy to determine if you have prostate cancer.

HARMS OF SCREENING TESTS

Prevention of diseases require proper planning. There are many laboratories offering some blood tests as screening test. Most often these are very basic tests which do not detect serious illnesses like cancer. They offer these tests at very low costs to attract people. These kind of tests can **misguide people** into thinking that they are free from diseases. These type tests are a danger to the idea of disease prevention.

Harms can include **false positive test results** when a doctor sees something that looks like cancer but is not. This can lead to more tests, which can be expensive, invasive, time-consuming, and may cause anxiety.

Tests also can lead to **over-diagnosis**, when doctors find cancer or pre-cancer that would not have gone on to cause problems or even may go away on its own. Treatment of these cancers is called **over-treatment**. However, it is not possible to detect what will progress to cancer and what will not.

Tests may also miss some cancers, called **false negative test results**, which may delay finding cancer and getting treatment.

THE REGULAR TESTS ACCORDING TO AGE

Screening tests are meant to detect cancer before symptoms start. These are available for a few of the common cancers. They are part of many of the master health check-ups, usually advised yearly. These recommendations are what we tell our patients. Yet, none of these tests is 100% accurate. These tests are meant for people with a normal risk for cancer. If you have a strong family history of cancer or any reason for increased cancer risk, please contact your doctor for personalised screening protocol. It is important to follow the awareness and self-examination tips given above along with these tests.

WOMEN

Women between **20 to 40 years**

- **HPV DNA testing every 5 years**: Only once women is sexually active (Strongly recommended)
- **Ultrasound Scan of Neck**: for thyroid tumours (may consider)
- Complete Blood Counts (CBC) (may consider)

Women between **40 to 50 years**

- **Mammography**: For breast both X-ray and Ultrasound. (Strongly recommended)
- **HPV DNA testing every 5 years**(Strongly recommended)
- Ultra-sound of abdomen (Strongly recommended)
- **Ultrasound Scan of Neck** (may consider)
- Blood tests: complete blood count (CBC), kidney (RFT) and liver function tests (LFT), Thyroid function test (TFT). (Strongly recommended)
- **Low Dose CT scan**of chest for lung cancer (smokers)

Women from **50 and above years**

- **Stool occult blood** (to detect colon and rectum cancer)
- **Mammography**: For breast both X-ray and Ultrasound. (Strongly recommended)
- **HPV DNA testing every 5 years**(Strongly recommended)
- **Ultra-sound of abdomen** (Strongly recommended)
- **Ultrasound Scan of Neck** (may consider)
- **Blood tests:** complete blood count (CBC), kidney (RFT) and liver function tests (LFT), Thyroid function test (TFT). (Strongly recommended)
- **Low Dose CT scan** of chest for lung cancer (smokers)

MEN

Men bellow **50 years**

- **Ultrasound Scan of Neck**(may consider)
- Complete Blood Counts (CBC) (may consider)

Men above **50 years**

- **PSA** blood test for prostate cancer.
- **Stool occult blood** (to detect colon and rectum cancer)
- **Ultra-sound of abdomen** (Strongly recommended)
- **Ultrasound Scan of Neck** (may consider)
- **Blood tests:** complete blood count (CBC), kidney (RFT) and liver function tests (LFT), Thyroid function test (TFT). (Strongly recommended)
- **Low Dose CT scan**of chest for lung cancer (smokers)

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Dr Nayak is specialized in Minimal Access Cancer Surgeries (MACS) – Laparoscopic and Robotic surgery that minimizes patient trauma and ensure a speedy recovery. He has pioneered the robotic thyroid surgery (RABIT) and Robotic head Dissection (RIA-MIND) for oral, head & neck cancer surgery. He is also known for rectal cancer surgery (ISR) & other highly specialized cancer surgeries. He has authored several medical publications and performed many live demonstrations of surgeries. His surgeries have won several national & international awards.

Samrohana Cancer Foundation:

Samrohana is a non-governmental cancer foundation started by Dr Sandeep Nayak with an intention of helping the cause by our **CAP** strategy- **Connection (pear group support), Awareness& Prevention.**

Samrohona is involved in financially supporting the needy patients to cover the last mile cost of treatment, especially for potentially curable patients. Samrohana survives on donations to support all the activities. The readers are also welcome to donate by using the QR code.

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