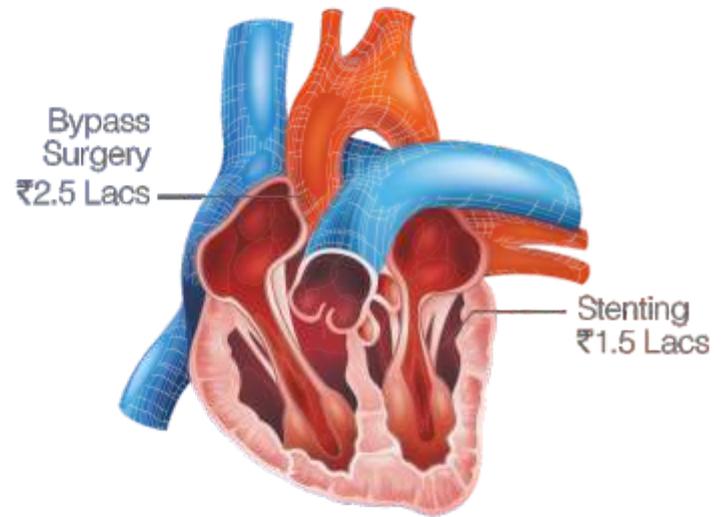


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The Health Insurance Specialist



Printed Matter

## The Best tool in the fight against Cancer Awareness



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## Message from CMD



My dear policyholder,

Yet another issue of the health magazine from your company has been brought out to bring awareness and information on Oncology for your benefit.

I am sure that you will immensely benefit from the articles contributed by eminent Oncologists.

At Star, we believe in rendering services to customers at times of need and there is scope for continuous improvement. I am sure that with your assured patronage, your company will reach greater heights in times to come.

V. Jagannathan  
Chairman-cum-Managing Director

OUR NEXT ISSUE WILL FOCUS ON "ORGAN TRANSPLANTATION"



## Foreword



Cancer awareness has made its way in today's world, as against its status about 20 years ago.

Patients are now getting their check up done on a regular basis in order to detect cancer at the right time and receive the right treatment and cure and hence proceed to live a healthy life ahead.

But, the issue that an individual faces after being detected of cancer is where to go and whom to consult. It is very important to be aware of centres that offer a holistic treatment approach, with all the required diagnostic aids, technology and management facilities under one roof.

A genuine centre would comprise a team of medical oncologist, surgical oncologist, radiation oncologist, clinical pathologist, radiologist and a rehabilitation specialist, all together constituting a "TUMOUR BOARD".

The opinion of Tumour Board will help one to take the right decision. In this regard, I am confident that the information provided in this issue will help you to offer the best guidance to those in need!

At Star Health Insurance, we always care for our valuable customers.

**Dr. S. Prakash**  
M.S., FRCS (Glasg), FAIS  
Executive Director  
Star Health and Allied Insurance Co. Ltd.



**Dr.K.S.Sekar,**  
MD., DMRT  
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### Introduction

**W**orldwide Non-communicable diseases (NCD) kill 36 million lives. Major contributors: Cardio Vascular diseases and Chronic Respiratory diseases. Of these deaths approximately 20 % were due to cancer which is presently 13.3 million and would rise to 21.4 millions in just < 20 years (2030). Half of these will occur in countries that are medium on the Human Development Index (HDI) – China & India.

In the year 2012 alone we have lost 8.3 million people due to cancer across the World. This figure is certainly more than deaths due to AIDS, but there is no such awareness on cancer prevention, as it exists for AIDS.

### Trends Impacting Cancer Burden

- ▶ Ageing Population
- ▶ Growing adoption of unhealthy lifestyle
- ▶ Increased consumption of tobacco
- ▶ Change in dietary patterns
- ▶ Late pregnancies

### Ageing population: Age Pyramid

Cancers are age-related, much more frequent in the old than in the young. - the accumulation of cancer-causing mutations, drives cancer rates higher as we grow older. Our average life expectancy has crossed 65 years.

**Obesity:** There are over 300 million obese adults worldwide. It is increasing globally.

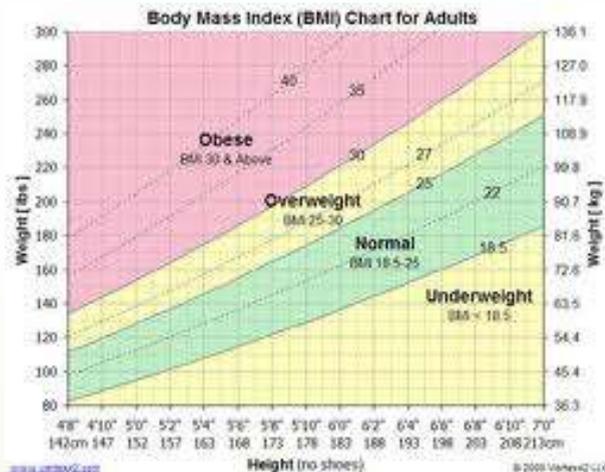
More than half of U.S. adults are overweight and nearly 1/3 is obese

It is the second leading cause of preventable death after smoking

It results in at least 300,000 deaths in the U.S. each year.

Some individuals have a genetic tendency to gain weight

How is obesity measured? BMI (Body Mass Index) =  $\frac{\text{weight (kg)}}{(\text{height(m)})^2}$



### Growing adoption of unhealthy lifestyle Smoking:

- ▶ Primary carcinoma of the lung is the leading cause of cancer deaths in both men and women.
- ▶ It accounts for approximately 32% of cancer deaths in men and 25% in women.
- ▶ Current or former cigarette smokers make up approximately 90% of patients with the disease.
- ▶ Men who smoke one pack a day increase their risk 10 times compared with non smokers.
- ▶ Men who smoke two packs a day increase their risk more than 25 times compared with non-smokers.
- ▶ The more you smoke and the longer you smoke, the greater your risk.
- ▶ Of the 180,000 people diagnosed in the United States alone each year, 86% will die within 5 years of diagnosis.
- ▶ Chemicals and compounds in tobacco smoke make it cancerous

Fortunately the smoking population is decreasing in the last two decades with resultant fall in lung cancer incidence

### Alcohol is a known cause of cancers of the:

- ▶ Mouth
- ▶ Throat (pharynx)
- ▶ Voice box (larynx)
- ▶ Esophagus
- ▶ Liver
- ▶ Colon and rectum
- ▶ Breast

Alcohol may also increase the risk of cancer of the pancreas.

For each of these cancers, the risk increases with the amount of alcohol consumed.

## WHAT DOES THE RESEARCH SHOW?

### Recommendations to Decrease Your Cancer Risk

Cancer risk reduction benefit	Avoid tobacco	Be physically active	Maintain a healthy weight	Eat a healthy diet	Limit alcohol	Avoid excess sun exposure
Bladder	✓			✓		
Breast		✓	✓	✓	✓	
Cervix	✓					
Colorectal	✓	✓	✓	✓	✓	
Esophagus	✓		✓	✓	✓	
Kidney	✓		✓			
Larynx	✓			✓	✓	
Lung	✓			✓		
Oral	✓			✓	✓	✓
Pancreas	✓			✓		
Prostate						
Skin						✓
Stomach	✓			✓		
Uterus (excluding cervix)			✓			

Source:  
World Cancer Research Fund/American Cancer Institute for Cancer Research, Food, Nutrition, Physical Activity, and the Prevention of Cancer: A Global Perspective. Washington DC: AICR, 2007  
\* Probable increased risk from arsenic in drinking water (AICR Second Expert Report Summary, 2007)  
\*\* Connecting increased risk from arsenic in drinking water (AICR Second Expert Report Summary, 2007)  
† Cancer Care Ontario

### Conclusion

Cancer survival tends to be poorer in developing countries, most likely because of a combination of a late stage at diagnosis and limited access to timely and standard treatment. A substantial proportion of the worldwide burden of cancer could be prevented through the application of existing cancer control knowledge and by implementing programs for tobacco control, vaccination (for liver and cervical cancers), and early detection and treatment, as well as public health campaigns promoting physical activity and a healthier dietary intake. Clinicians, public health professionals, and policy makers can play an active role in accelerating the application of such interventions globally. (CA Cancer J Clin 2011).

**TUMOUR BOARD**  
Once you make the decision, the universe conspires to make it happen

**Dr. George M.Chandy**  
MD, DM (Gastro), PGDHA, FRCP, FIHS  
Director, Professor of Gastroenterology & Hepatology,  
MIOT International, Chennai



Mrs X, a 62 year old lady living in Chennai, despite her diabetes and hypertension, was in reasonable health. She enjoyed the time with her grandchildren and her ladies meetings were great fun. One day, she suddenly developed severe abdominal pain. She had to be rushed to a hospital near her house. She was told that problem was with her pancreas and was referred to MIOT International.

After initial blood tests, it was evident that she had developed Pancreatitis, but there was also a suspicion of a tumor in the pancreas. The doctors did a special investigation called Endoscopic Ultrasound (EUS) by passing a pipe through her mouth into her intestine and looking at the Pancreas from close range. They then passed a needle through this pipe and took out some tissue from the mass and sent it for biopsy. When the report came, her worst fears came true. She was diagnosed to have Cancer of the Pancreas.

She developed very high fever and her eyes became very yellow and she was very scared. But the doctor's team took up the challenge, encouraged her, consoled her and did an Endoscopic Retrograde Cholangio Pancreatography (ERCP), wherein they passed a tube through the stomach and into her bile duct and placed a stent to drain the bile which was stagnant – the cause for her fever and yellowing of eyes. This procedure which was done by experienced experts and appropriate antibiotics saved her and she began to feel better.

Once she improved, an excellent team of Tumour Board members comprising of Gastroenterologists, GI Surgeons, Medical, Surgical and Radiation Oncologists set about evaluating her in an attempt to restore her to perfect health. After a detailed discussion, they came to a conclusion. The Surgical Oncologist did an excellent job while performing a 5 hour long surgery and removed the tumor. Just when she was feeling better and trying to get back to her normal routine, she noticed that she was passing black colored stools and her hemoglobin was dropping. The Gastro team again worked together and detected some erosions in her digestive tract. She was started on medications and was given three bottles of blood. Her hemoglobin returned to normal and it was soon time for her to go home.

Now she is back having a great time at home with her grandchildren and friends. We even feel that she looks younger and more fit than before. She says and we know that this has been made possible by a dedicated team at our hospital which provide holistic, world class care backed by cutting edge technology.

Currently, the treatment of cancer in our country is fragmented. Hence the need for Tumour Board. Tumour Board is a multispeciality group of committed, full time cancer specialists, nurses and allied health professionals, who are trained to provide the most appropriate care. The Medical, Surgical and Radiation Oncologists along with the Radiologists, Histopathologists and Superspecialists in the appropriate specialities form a formidable team of world class experts. Specialists in the management of cancers of Head and Neck, Lung, Breast, Gastro Intestinal system (oesophagus, stomach and colon), Prostate and Skin form an integral part of the team.

The Tumour Board has been constituted to meet regularly to discuss the details of patients with cancer. The permanent members of the Tumour Board are the Medical Oncologist, Surgical Oncologist, Radiation Oncologist, Radiologist and Pathologist. The Specialists from the concerned departments are invited to the Tumour Board when their patients are being discussed. This helps in effective decision making and in providing each patient with personalized, appropriate, holistic care.



## Does cancer cure start in laboratory?

It's not the load,  
It's the way you carry it

**DR CN Srinivas**

MD(Path), DipNB, FCAP, PGDHRM, CLLMC  
Fellowship in Immunodiagnosics and  
Molecular Pathology, USA Head-Clinical Lab,  
Transplantation Immunology and Molecular Diagnostics,  
MIOT International, Chennai



“Cancer” is a disease where the cells are immortal, parasitic and destroy the adjacent tissue and also spread to kill a patient. Diagnosis of the cancer can be primary, secondary and tertiary. In India, still cancer is detected in secondary or tertiary stage. Detection of the cancer can be early to provide the best cure and survival rate. For detection of early stage evidence is needed and this is provided by Laboratory performing various testing from routine to complex.

Research in Basic Sciences has an impact on the diagnosis, prognosis and treatment. The strong association of the technology and academicians help to bring in hope to our patients. The laboratories thus are true “Friends to detect Foe”.

The Technologies available today are-

Automated Extended Differential Hematology analyzer, Automated Immunoassay analyzer, Automated Clinical chemistry analyzer, Electrophoresis and added to this are Histopathology and Molecular diagnostics.

### Role of Clinical laboratory-

The Clinical laboratories include hematology, microbiology, immunology, serology, Clinical chemistry and toxicology. In these areas, the pathologist acts as a consultant to the clinician, defining appropriate tests and interpreting their results. Many of these tests solidify a clinical diagnosis. After diagnosis, many tests are performed repeatedly to assess progress of the disease and response to treatment.

In clinical hematology, pathologists review all abnormal histograms and blood smears. They may also obtain bone marrow samples from patients. In examining the smears and microscopic sections from these sources, the pathologist may encounter problems such as, investigation of causes of anemia, detection of disorders of coagulation, and definitive diagnosis of malignant diseases such as leukemia.

Automation in clinical laboratory has revolutionized the diagnostic arena. The early detection of the cancer can be picked up sign of Iron Deficiency Anemia which is easily picked up by hematology analyzer which gives –value of MCV, Reticulocyte hemoglobin (Ret-He) and Reticulocyte count. In case of Leukemia, a Haemogram is characteristic along with the count of Immature cells and Blast Cells (Cancer cells). These “Clues” are later confirmed by the Pathologist for the morphological classification. The machine is also a boon for Body Fluid count, especially in detection of cancer cells in body fluids. The machine gives exact number of cells in the submitted fluid and flags our abnormal cells which need to be confirmed further by microscopy.

Tumour markers	Probable source of Cancer
PSA	Prostate
CA 125	Ovary, Colon and sometimes Peritoneum
CEA	GastroIntestinal System
AFP	Liver, Testis and Ovary
CA 99	Pancreas
Beta HCG	Testis and Ovary
Thyroglobulin	Thyroid

The Immunoassay analyzer is needed to screen, detect, diagnose and prognosticate a cancer (Tumor Marker).PSA is a well-known cancer marker for Prostate cancer in men. Similarly we have 6-10 markers for detection of cancer of liver, pancreas, GI, breast and ovary (see table) The values generated by these machines have to be quality assured and hence the laboratory performs quality control practices.

Whenever tissue is removed from the body, it must be examined to determine the precise cause of the illness that prompted its removal. Microscopic analysis of tissue changes is the focus of histopathology. The pathologist plays a central role in the diagnosis of surgically removed tissues, particularly when tumor is suspected, and works closely with surgeons and other physicians in such cases.

Often during surgery for suspected cancer, a pathologist is asked to prepare a frozen section. A piece of tissue is removed during the operation, frozen, thinly sliced, and prepared for rapid microscopic examination by the pathologist while the patient is still on the operating table. The preliminary diagnosis based on the frozen section guides the surgeon as to the next steps to take during surgery.

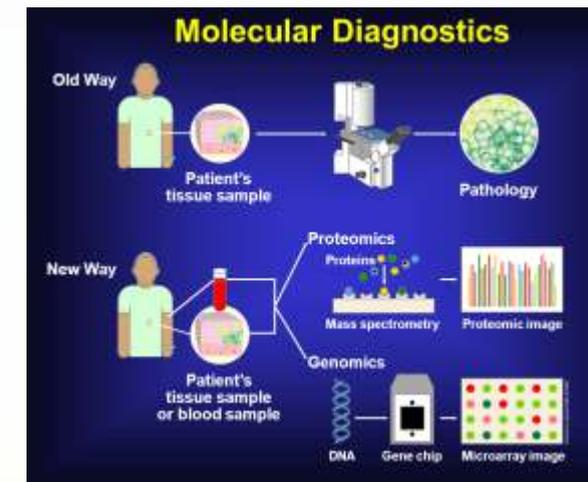
### Molecular Diagnostics and Personalized Medicine

The Era of Personalized medicine has dawned in medicine. Simply stated it means “customized solution”. The basic science has helped to move to a platform to detect etiological agent, mutated gene and chromosome on the tissue. This means that we can study tumor at molecular level and check whether the standard protocol gives apt remission or should the consultant adopt a different protocol.

At this point it is important to realize the value of pathologist and role of Molecular Diagnostics.

The pathologist has long been considered the "doctor's doctor," consulted for interpretation of laboratory results, selection of diagnostic tests, monitoring the accuracy of surgical judgments, and introduction of new diagnostic modalities. They serve on many committees important in hospital and medical management, continuing medical education, and quality assessment. More recently,

because of the range and complexity of diagnostic services, a role for the pathologist in explaining tests and their results directly to the patient has evolved. In addition, a very different new role has emerged for pathologists in this era of Managed Care. They are accustomed to thinking diagnostically across a broad spectrum of human disease.



The tools of molecular biology are contributing to the recent rapid growth of new tests with both greater accuracy and precision in many of the above areas of laboratory medicine. Infectious agents can be identified by virtue of unique DNA sequences. Molecular identification of chromosomal rearrangements is used not only in diagnosis, but also in monitoring for the effectiveness of therapy and detection of residual disease. Genetic alterations underlying heart diseases, iron metabolism defects, and congenital abnormalities, to name a few, are appreciated to be far more common than was previously recognized. Prenatal screening is now available to detect hemoglobin disorders and many metabolic diseases, such as cystic fibrosis. Genetic susceptibility to inherited cancer is another dynamic new testing area. For example, the advent of new treatments for certain breast cancers depends on identification of a gene that is amplified and over-expressed in those cancers; the gene amplification can be identified by molecular testing (eg. HER<sub>2</sub>). The metabolism of many important medications can also be predicted by molecular techniques.

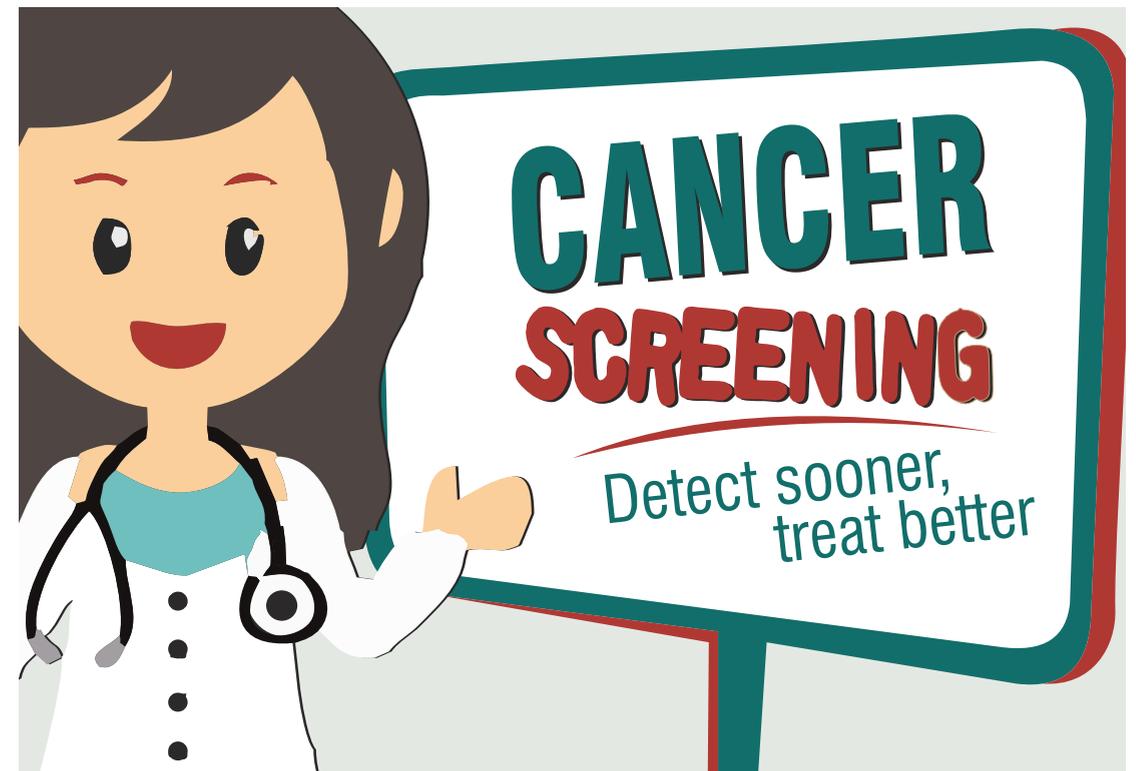
The basic technology in Molecular Diagnostics involve Denaturation, hybridization, annealing and amplification. After amplification we can detect abnormal cells. The detection can be on various platforms like PCR (Polymerase Chain Reaction), FISH (Fluorescence In Situ Hybridization) and Micro-array.

Sometime we also take help of Flow Cytometry to detect abnormal expression of proteins especially in Blood cancers and Lymphomas.

The utility of Molecular Diagnostics are-

1. Basic abnormality to confirm the diagnosis
2. Identifying the tumors which have potential to spread (Metastasis)
3. Subtyping of the certain tumors
4. Response to Chemotherapy and Radiotherapy
5. Prediction of survival
6. Detection and screening of Family Cancers-Eg: Breast, Colon cancers
7. Protocol for Therapy
8. Using the molecular information to modify treatment plan
9. To understand Drug Metabolism in an individual

To conclude, modern laboratory can run blood to give quantity and quality of our protein-DNA., direct to a "Path-Engineer" who can customize the treatment modality for cancer.



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### What is Cancer Screening?

Some types of cancer can be found before they cause symptoms. Checking for cancer (or for conditions that may lead to cancer) in people who have no symptoms is called cancer screening. Generally, cancer treatment is more effective when the disease is found early. By the time symptoms appear, the cancer may have grown and spread. This can make the cancer harder to treat or

cure. However, not all types of cancer have screening tests and some tests are only for people with specific genetic risks.

**There are different kinds of screening tests:**

Screening tests include the following:

**Physical exam and history:** An exam of the body to check general signs of health, including checking for signs of disease, such as lumps or anything else that seems unusual. A history of the patient's health habits and past illnesses and treatments & also family history of any diseases including cancer will also be taken.

**Laboratory tests:** Medical procedures that test samples of tissue, blood, urine, or other substances in the body.

**Imaging procedures:** Procedures that make pictures of areas inside the body .eg; Ultrasound, Mammogram and X-rays .

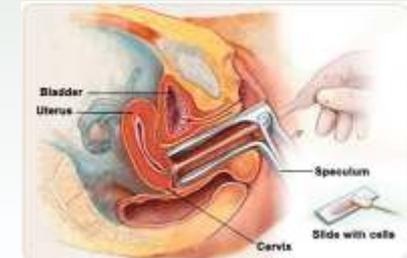
**Genetic tests:** Tests that look for certain gene mutations (changes) that are linked to some types of cancer. This field will develop enormously in the future as more cancer associated genes are found, and tests for mutations become simpler.

- ▶ Cancer screening is looking for cancer before a person has any symptoms.
- ▶ It is important to remember that when doctor suggests a cancer screening test, it does not always mean he or she thinks you have cancer.
- ▶ Screening tests usually do not diagnose cancer. If a screening test result is abnormal, more tests may be done to check for cancer.
- ▶ People who have a high risk of cancer may need to be screened more often or at an earlier age than other people.
- ▶ Certain screening tests may be suggested only for people who have a high risk for certain cancers.
- ▶ The three areas where the greatest advancements have been made are cervical, breast, and colorectal cancer screening.
- ▶ Other areas with promising outcome include prostate, stomach, ovary, & lungs.

Little similarity exists between the specific screening modalities for the different cancer sites, and a meaningful discussion requires that we examine the approaches for each type of cancer separately.

**Cervical cancer**

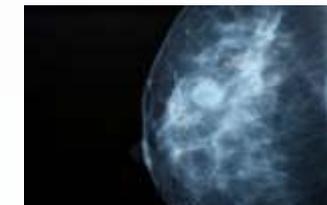
The universally accepted screening method for preventing cervical cancer is cytological examination of cervical scrapes which have been smeared onto slides and stained by Papanicolou's smear method. Successful as it has been, screening by cytology is not without its problems. New technologies are being developed which, although initially expensive, may ultimately make it possible to undertake screening at a much lower cost and with less technical expertise. Liquid based sample collection provides better material for a range of tests and will facilitate automation. New markers, especially adding HPV hr testing to primary screening, offer great potential within the cervical screening program. They offer the possibility of greater sensitivity, reduced follow-up of low grade cytological abnormalities, increased screening intervals, and overall cost reductions.



Picture showing how the Pap smear is taken from cervix or mouth of the uterus.

**Breast cancer**

The most fully investigated modality for early detection of breast cancer is mammography. This method is aimed at early detection of invasive cancer and so is limited by the fact that this may still be too late to affect survival. As a result, only moderate benefits of the order of 20%–30% mortality reduction can be expected from this approach. However, because breast cancer is so common, even modest benefits can be worth having and would amount to a larger reduction in the death toll from cancer. There is a consensus that mammography is effective in women aged over 50 years and the studies overall suggest that 2–3 yearly screening can reduce breast cancer mortality by approximately 30% in this age group. However, there is considerable controversy about the value of mammography at ages 40–49 and, to date; studies indicate a much smaller benefit in the order of 10%–15%.



Mammogram showing the malignant lesion in the breast



Mammography machine

Screening mammography has resulted in a shift in both the incidence and stage of patients presenting with breast cancer. In a simplified model described, for every 1,000 screening mammograms, 80 women (8%) will be recalled for additional diagnostic imaging, 10 (1%) will require tissue diagnosis, and of those undergoing biopsy only three (0.3%) will have a malignancy.

#### ► Digital versus Screen Film Mammography

There has been increased utilization of digital mammography for screening. This technology utilizes a special detector capable of transforming x-ray images into electronic digital image. Advantages include no film processing, faster image acquisition, and less call-backs due to the ability to manipulate the image digitally. Given the potential efficiencies and advantages of digital mammography, even with equivalent sensitivities many centers are moving in this direction.

#### ► Magnetic Resonance Imaging Screening

The role of MRI screening is rapidly evolving. Although MRI is unlikely to replace mammography for screening of the general population, its use in screening high-risk populations has recently been supported in several studies.

#### ► Screening by Physical Examination

Clinical breast examination and breast self examination may be complementary to mammography, perhaps detecting interval cancers not visualized by mammography. Although it is evident that clinical screening is not as sensitive as mammography, the combination of clinical examination and mammography appears to yield optimal results in early detection.

### Colorectal cancer

The screening method that has received the most attention for colorectal cancer is the **faecal occult blood test**, which uses a guaiac impregnated slide to test for small amounts of blood in a stool sample. The guaiac test detects blood from any lesion in the bowel and also reacts to a number of foods (red meat, fresh fruits and vegetables with peroxidase activity, e.g. tomatoes) and aspirin-induced gastrointestinal bleeding. Dietary restriction before testing or retesting has been used to try to minimize false-positives.

Another approach to colorectal cancer screening is based on the pre-existing adenomas. Adenomas are pre-cancerous growths which occur throughout the bowel and have the same sub-site distribution as cancers, but occur at a younger age. Thus, a better strategy to control colon cancer



**Flexible sigmoidoscopy can detect precancerous lesions.**

might be to detect and remove adenomas, since the transition time from a small adenoma to a carcinoma is thought to be very long (of the order of 10–25 years), implying that screening need only be carried out very infrequently.

An approach, based specifically on this idea is to use **flexible 60 cm sigmoidoscopy as a screening tool**. This is far less expensive or traumatic than complete colonoscopy and approximately 60% of colorectal cancers occur in the region accessible by this instrument.

### Prostate cancer

The disease is exceedingly common, but many cancers are indolent and remain asymptomatic. As yet, the problem of how to discriminate aggressive disease from indolent cancers which are likely to remain asymptomatic for the remainder of the patient's lifetime remains unsolved, and this is a key issue.

Nevertheless, prostate cancer is a significant public health problem and an obvious target for screening. **Digital rectal examinations** have been used for many years and still have a role in screening, but are subjective and lack sensitivity. **Prostate specific antigen (PSA)** testing has good sensitivity, especially when used at a **4 µg/ml** cut-off. However, specificity is less good, and the test measures tumor volume but not aggressiveness. **Transrectal ultrasound** is probably too invasive and expensive to use as a primary screening test. Further markers of tumor aggressiveness, either measured in serum or needle biopsy specimens, are needed to determine which patients are in need of curative treatment.

### Ovarian cancer

Screening for ovarian cancer is still at a research stage. Two methods—**trans abdominal/trans vaginal ultrasonography** and a blood test for the tumor marker **CA-125** have been most actively studied.

Ultrasound screening involves looking for enlarged ovaries. To improve the specificity, **transvaginal color doppler ultrasound** has been used to image blood flow. Blood vessel formation is thought to be a good discriminator between cancer and benign cysts and early reports indicate that the test can substantially reduce the false-positive rate.

Another approach is to measure serum **CA-125**. Using a cut-off of 30 U/ml for serum CA-125, better specificity can be obtained by combining both ultrasound and CA-125 so that the false-positive rate has been reduced.

### Stomach cancer

With its high incidence and mortality, screening for gastric cancer by **barium X-ray** is already a national program in Japan. Another approach to stomach cancer prevention is **screening for Helicobacter pylori infection** and eradication by antibiotic therapy.

# Surgical Oncology

*Why less is more in cancer surgery*



**Dr Ajit Pai**

MRCS, MS, MCh [Surgical Oncology]  
Director and Head of Oncology  
MIOT International, Chennai



**S**urgical oncology is the branch of cancer medicine, which deals with the treatment of solid organ cancers by surgery. Solid organ implies organs such as pancreas, breast, lung, intestine etc as distinct from cancers affecting the blood and blood elements or lymphatic tissues called leukemias and lymphomas respectively. Common cancers treated by surgery include breast cancer, cancers of the gastrointestinal tract and gynaecological cancers. Surgery is an important part of the treatment for most cancers, and cure is rarely possible without the involvement of the surgeon.

Traditionally surgery was a major undertaking feared by patients, for the loss of function and form which used to occur. Cancer operations used to be associated with mutilation and loss of body image. Keeping the patient alive was given a priority over all else, and quality of life was not considered relevant in the quest for the holy grail of cure.

With availability of more effective chemotherapy and advanced radiation delivery systems, it is possible to avoid removal of the entire organ for several cancers, referred to as conservation; or in some cases to avoid surgery altogether, known as organ preservation.

The addition of treatments such as chemotherapy or radiation before the surgery shrinks the tumour to a size, which allows a less mutilating surgery to be performed.

## These concepts are best understood with 3 illustrative situations:

1. We would counsel a 30-year-old lady with a large breast cancer, who traditionally would undergo a mastectomy or removal of the entire breast, for chemotherapy before surgery, which allows her cancer to shrink to a very small size. Then a breast conservation surgery, which involves removal of only the tumour bearing portion of the breast with some surrounding breast tissue and the lymph glands in the armpit would be done, followed by radiotherapy to the breast. This would ensure a result as good as that with mastectomy. At MIOT hospitals over 60% of the women who present with breast cancer, are offered breast conservation.
2. A 50-year-old singer with a cancer in his voice box would conventionally lose his voice box and his voice to treatment. With modern treatment modalities of chemotherapy given concurrently with radiation, there is a high likelihood of cure and him having a near normal voice.
3. Cancer of the rectum, the last part of the intestine would normally lead to complete removal and formation of a permanent opening for stool passage, called a colostomy on the abdomen; with chemo radiotherapy this can be avoided in many patients and a curative surgery can be performed after tumour shrinkage, without the need for a colostomy.

Minimally invasive surgery or keyhole or laparoscopic surgery has traditionally not been used much in the treatment of cancers. Earlier concerns regarding the ability of the surgeon to remove the entire cancer through tiny incisions, without touching the tumour have been dispelled, and keyhole techniques are finding an increasing place in the oncosurgeon's armamentarium. Laparoscopic surgery is also used as a diagnostic procedure to obtain a biopsy without the need for a large incision and to stage the disease, i.e. to determine whether a tumour, which appears removable on the scans, is actually so before opening the abdomen. The major benefits of the minimally invasive approach lie in a better operation, because the surgeon sees objects magnified 3-5 times by the endoscope and less postoperative pain, smaller scars and an earlier return to normal life for the patient. The predominant cancers suitable for this type of surgery are esophageal [food pipe] cancers, colon cancers and cancers of the uterus and cervix, and we are increasingly using this modality in practice.

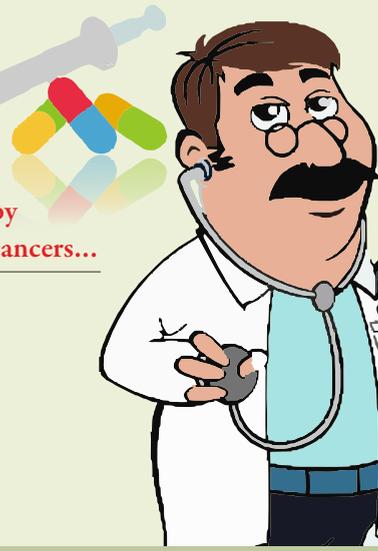
We believe that it is not sufficient to simply offer the patient treatment; rather the treatment must improve or at least maintain the quality of life of the patient. This concept is easily understood as 'adding life to years and not just years to life'. The efficacy of two treatments, which offer similar cure rates, would also involve measurement and comparison of how they affect the quality of life of the patient. Cancer should no longer be considered a dreaded disease. Cure is possible in many instances and a meaningful prolongation of life with an acceptable quality in most others.

# ADVANCES IN CHEMOTHERAPY: THE WAR ON CANCER

Revolutionary new drugs in Chemotherapy effectively target and cure certain deadly cancers...



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Until the year 2000, a diagnosis of Chronic Myeloid Leukemia meant certain death. A patient diagnosed with this disease would live only for an average of 5 years. Today, the leukemia patients not only live for 9-10 years with diseased under complete control but also lead normal lives! The difference is a leap in medical oncology.

## The role of chemo

Medical oncology is the treatment of cancer using chemotherapeutic drugs. Today the management of cancer calls for a multidisciplinary approach combining surgery, radiotherapy and chemotherapy. When cancer is diagnosed at an early stage, chemotherapy supplements the benefits provided by surgery and radiotherapy. In advanced stages, it offers good palliation with less side effects, improved quality of life and a prolonged survival. In some cancers, chemotherapy plays a major role and is curative - these include such varied cancers; lymphomas, leukemia and germ cell tumors.

## A mini-revolution

However Chemotherapy drugs do not discriminate between cancer cells and normal cells that have a higher growth rate – such as hair, skin, epithelium of the gut and bone marrow. As a result, hair loss, peeling of skin, sores in the mouth and gut and drop in blood counts occur.

However, new research into the molecular biology of tumor growth has resulted in

sophisticated drugs which discriminate between cancer cells and normal cells of the body. These drugs, known as targeted agents, target specific cancer cells while sparing normal cells thus offering potential relief from toxic side effects.

## Zeroing in on cancers

The last decade has seen the development of atleast a dozen such “targeted” drugs. A classical example being the introduction of the drug Imatinib for Chronic Myeloid Leukemia. These targeted drugs - oral and injectable - are currently available for limited number of cancers – lymphomas, breast cancer, lung cancer, colorectal and head and neck cancers. However, as the understanding of the biology of other cancer increases, it is only a matter of time before more emerge in the market.



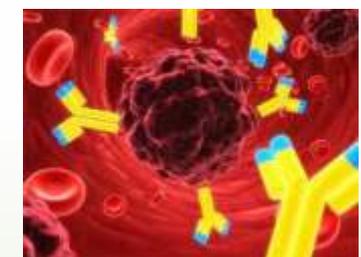
## Managing side effects

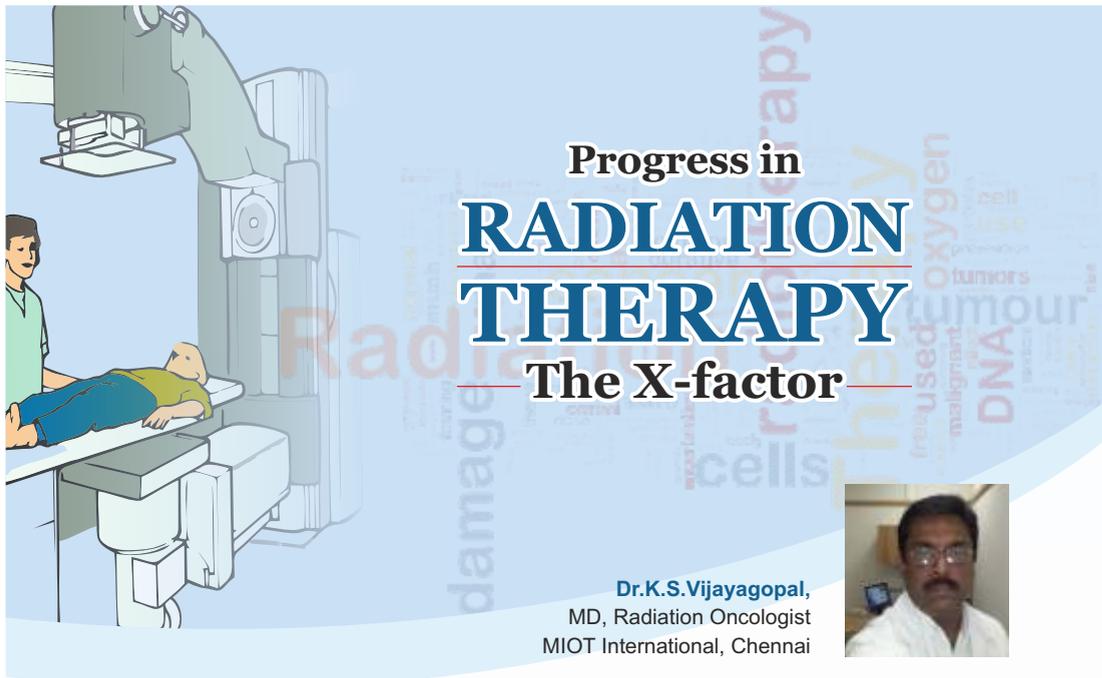
It was often said of chemotherapy that the treatment is worse than the cure. But the new approach is more considerate, using premedications to control the side-effects. For instance, vomiting which used to be a major cause of concern two decades ago has near completely been controlled with powerful anti-emetic drugs.

Another side effect was the drop in the blood count for white blood cells. To counter this growth factors are used. Powerful broad spectrum antibiotics ensure safe delivery of chemo drugs by helping to manage fever during chemotherapy.

## A positive tomorrow

In some cancers, older more toxic drugs have been replaced by less toxic modern drugs. Some drugs are available in oral form eliminating the need for prolonged intravenous infusions, and hospital admission. With improved version of chemo drugs, improved safety, toxicity, tolerability, improved methods of delivery and targeted agents, modern chemotherapy has leapt ahead and is progressing ambitiously against cancer.





## Progress in RADIATION THERAPY The X-factor

**Dr.K.S.Vijayagopal,**  
MD, Radiation Oncologist  
MIOT International, Chennai



**W**ilhelm Conrad Röntgen discovered X-rays in november 1895 and soon the medical community were enthusiastic to use the potential of these rays for treatment of cancerous as well as benign ailments. Over the period the serious side effects of radiation were evident enough to limit its use in treatment of tumours only. In the early oncology practice more emphasis was given on control of tumour and the long term side effects and decline in quality of life in the cancer survivors were not of a much concern. The attention was changed at improvement of quality of life as more and more patients being cured of cancer by early detection, better understanding of disease and newer modalities of treatment and became long survivors with significant morbidities of treatment.

In the early days of conventional Radio Therapy (RT) the tumour is treated with radiation beams from two or three angles where large amounts of normal tissues recives high doses of radiation resulting in undue toxicity. Advances in modern radiation therapy have been focused on delivering a therapeutic dose of radiation in a highly conformal fashion. In doing so, the goal is to diminish unnecessary radiation to normal adjacent and critical structures while maintaining excellent local control rates. This effect is made possible by improvement and integration of imaging modalities like CT, MRI, PET scan, computer based radiation planning and the development of modern linear accelerators, the most widely used treatment machine in radiation oncology. At present approximately 2/3 of cancer patients receives radiotherapy during the course of treatment either with an intent of cure or palliation.

### Types of radiation therapy:

**External beam radiotherapy EBRT:** Here the tumors are treated with rays delivered from machines like linear accelerators. The beams have to pass through the normal tissues to reach the tumour.

**Brachytherapy:** Here the tubes, needles or pellets containing radioactive materials are inserted inside the tumour or kept in direct contact with the target.

### Radiotherapy planning.

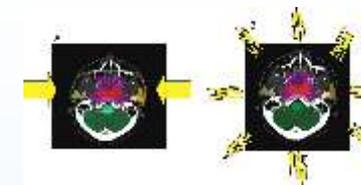
In EBRT we know that the radiation beam has to pass through the normal tissues to reach the tumour and destroy it. During this passage significant amount of energy is deposited to cause damage to the critical tissues. Hence lot of efforts are being done at integrating imaging like CT, MRI, PET CT etc and use of complicated computer planning to conform the radiation to the target and to reduce normal tissue doses within its tolerance limits. This has improved the quality of life of the patient as well control of the disease.

**Conventional radiotherapy :** Here the treatment is planned with anatomical dimensions of tumor with or without X-ray verification. The entire tissue whether it is tumor or normal tissue will get full dose of radiation.

**3D Conformal radiotherapy - 3DCRT -** A CT scan of the tumour area is taken in the radiotherapy treatment position with necessary immobilization devices. This CT is exported to the planning computer and the tumour and normal organs were delineated. Beam angles are chosen such a way that least amount of normal tissues receives high dose.

**Intensity Modulated radiotherapy - IMRT.** This is the advanced mode of 3DCRT. Here the tumour is treated for 7 - 9 angles and each beam is divided into smaller segments called beamlets. The intensity of radiation in each beamlet decreases or increases whether it encounters a critical organ in its path or not with the help of small moving leaves called Multileaf collimators. Most of the modern treatment is based on IMRT delivered in a static, dynamic or arc methods.

Multileaf collimators



Picture : 3DCRT v/s IMRT

### Image Guided radiation Therapy IGRT

IGRT involves conformal radiation treatment guided by imaging, such as CT, ultrasound or X-rays, taken in the treatment room just before the patient is given the radiation treatment on a daily basis. Modern machines are fitted with an onboard CT scanner to do imaging prior and during treatment. During IGRT, doctors compare the images to see if the treatment needs to be adjusted. In some cases, doctors will implant a tiny marker in or near the tumor to pinpoint it for IGRT. This helps to account for organ/tumor motion even if the body is immobilized by a casting device.

All of the above treatments are delivered by single per day sittings over few weeks depending up on the tumour type and location.

**Stereotactic radiosurgery - SRS** - Here deep seated Brain tumours, were treated with reference to a frame fixed to the head by screws. This is a single high dose treatment for tumours which cannot be operated. This can be done with a specific machine called Gamma-knife or by linear accelerators. In frameless radiosurgery there is no need for a head frame and makes it painless.

Taking care of movement during treatment:

Some tumours (E.g: Lung, Liver ) moves during respiration and possess a challenge for day to day treatment. There are methods to track these movements by optical guidance and deliver radiation only when the tumour comes to particular position. This called gated radiotherapy.

Being done so much improvement in radiation planning we need precise machines to deliver this treatment accurately and comfortably.

#### Types of Machines.

1. Ortho-voltage units. These are the machines with low energies which was mainly used to treat skin and superficial tumors, not used in current era.
2. Tele Cobalt machines uses naturally occurring radio-isotope called Cobalt-60 which produce an average beam energy of 1.25 MeV. These machines are still in widespread use worldwide, since the machinery is relatively reliable and simple to maintain compared to the modern linear accelerator. The role of the cobalt unit has partly been replaced by the linear accelerator, which can generate higher energy radiation. Compared to Linear accelerators the side effects are more and modern techniques like IMRT cannot be executed through these machines



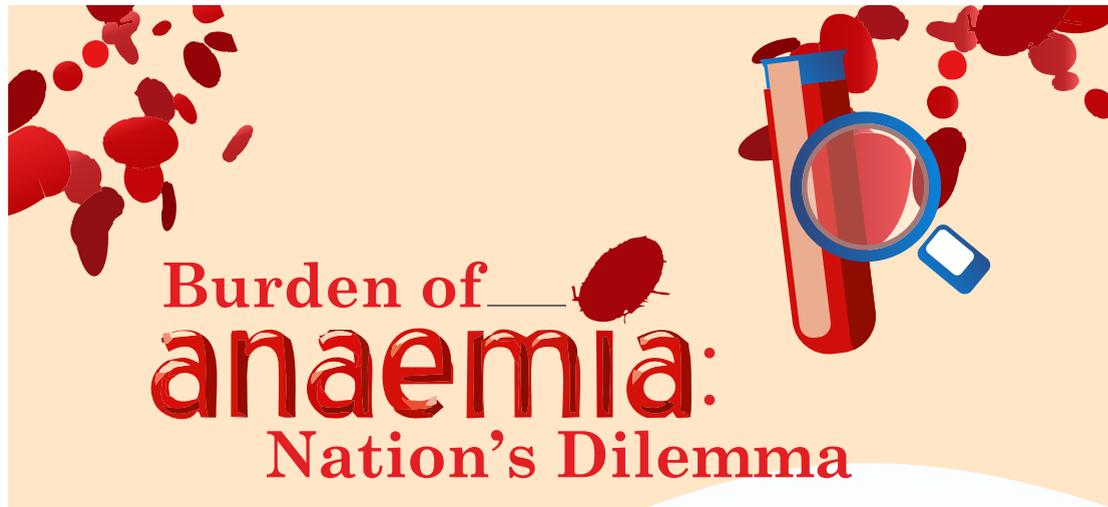
Cobalt 60 Machine

3. Linear accelerator which produces mega voltage X-rays. The first use of a linac for medical radiotherapy was in 195. Modern medlicalinacs can produce high energy X-rays ranging from 6 - 15 MV and electrons with an energy range from 4 MeV up to around 25 MeV. These high energy beams can be used to treat deep seated tumours with less toxicities. The modern linacs are built in with small multi leaf collimeters which can conform to the shape of tumour and intensity of the beam can be modified by complex computer planning. Thus, conventional, conformal, intensity-modulated, tomographic, and stereotactic radiotherapy all can be executed by specially-modified linear accelerators



**THE TRUEBEAM STX IN USE AT THE MIOT INSTITUTE OF CANCER CURE**

TRUEBEAM STX	CYBERKNIFE
All treatments possible (IMRT/IGRT/SRS/SRT/SBRT/TSET/Electron therapy/ Gating)	Predominantly a radio surgery device
Able to treat large volume tumours	Difficulty in treating large volume tumours as it is time consuming
Short treatment time (2 to 10 minutes)	Long treatment time (45 to 90 minutes)
Possibility of total body radiation	Is not possible
Skin and superficial lesions can be treated	Is not possible
Different available energies like 6MV, 10MV and 15MV make it possible to treat deep-seated tumours as well as electrons of energy 6 to 18MV	Only 6MV available
Ability to treat more number of patients	Owing to long treatment time, reduction in total number of treatable patients per day
Lower maintenance cost	Higher maintenance cost



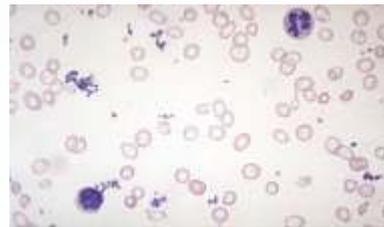
# Burden of anaemia: Nation's Dilemma

**Dr. Chezian Subash**

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Transplant Physician & Clinical Haematologist  
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**N**early half the population of India is anaemic. Even though we have made great strides in tertiary health care, India has done badly in Human Developmental Index even when compared to our neighbours. Nearly 75-90% of children, 50-60% of pregnant women & 60-70% of non pregnant women are anaemic. This affects the health of a nation as a whole as evidenced by our dismal maternal and infant mortality rate.



The predominant cause of anaemia in India is nutritional. Anaemia in pregnant women contributed to low birth weight, leading to further morbidity setting up a vicious cycle.

### Causes of anaemia:

- |                    |  |
|--------------------|--|
| Nutritional        | – Iron, B12 & Folate deficiency<br>Inadequate food with vitamins, vegetarian food, Phytates in most Indian food, etc |
| Chronic blood loss | – Menorrhagia, hook worm infection, NSAID use  |
| Chronic infections |  |

- |                        |  |
|------------------------|--|
| Chronic illness        | – Renal failure is a common cause  |
| Inherited from parents | – Thalassemia 4-5% (1 in 25) are carriers<br>Enzyme deficiencies<br>Hereditary Spherocytosis |
| Others                 | – Bone marrow failure, blood cancers like leukemia   |

### Symptoms:

How does anaemia present? Many symptoms of anaemia are non-specific.

- Tiredness
- Lethargy
- Exertional shortness of breath
- Severe cases can have chest pain
- Others like hair loss

Some symptoms can indicate serious underlying problems – symptoms like bleeding, recurrent infections and weight loss.

### Diagnosing anaemia:

If there are any of the above symptoms – consult a doctor immediately. Depending on what symptoms you have or after examining the patient, the doctor will ask for appropriate blood test. Some of the basic tests are

- Complete blood count
- Ferritin, B12, Folate levels
- Renal function test
- Complex investigation like bone marrow biopsy, haemoglobin electrophoresis, etc may be needed

### Treatment:

- |               |   |
|---------------|---|
| Balanced diet | – Vegetarian diet- spinach, beans, chick peas, pumpkin<br>Non-vegetarian – Fish, liver, lamb, egg |
|---------------|---|

Vitamin supplements

Treat infections

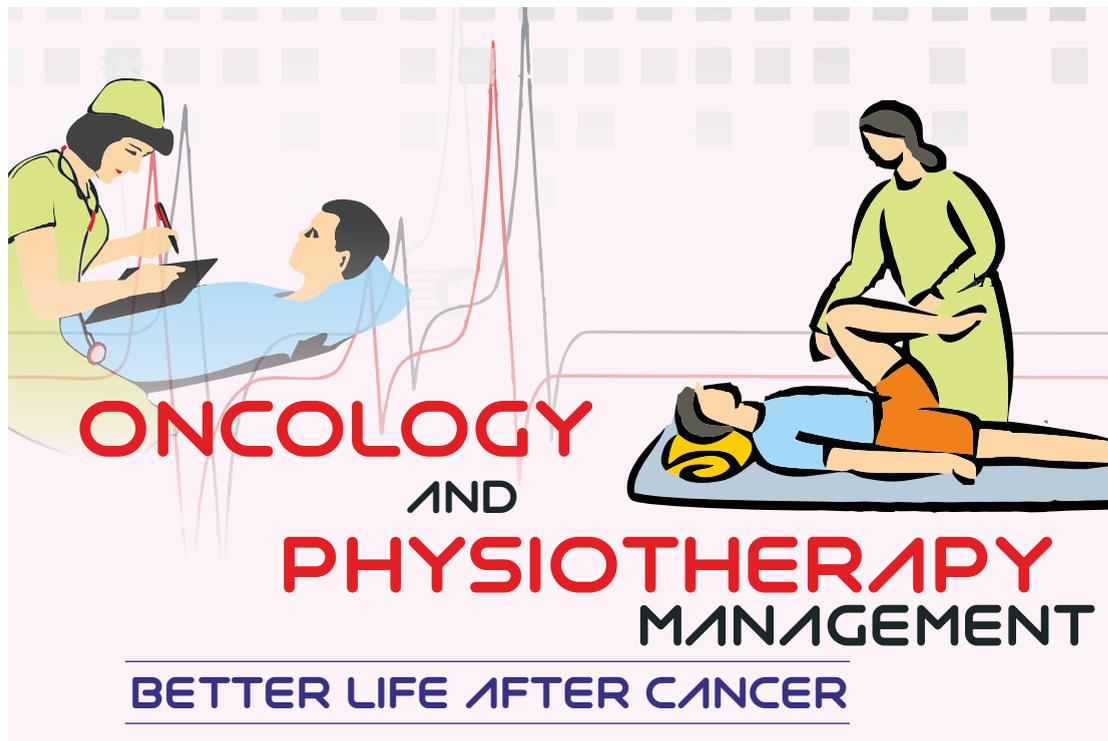
Treat underlying problems

Blood transfusion

Erythropoietin

In selected cases bone marrow transplant





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## What is cancer?

Each of the cells of the body has a tightly regulated system that controls their growth, maturity, reproduction and eventual death. Cancer begins when cells in a part of the body start to grow out of control. There are many kinds of cancer, but they all start because of out-of-control growth of abnormal cells.

### The Role of Physiotherapy in Oncology and Palliative Care

Here comes the role of physiotherapist and palliative care –palliative care is a new concept in medicine which is given to patient with incurable diseases and reduced life span. The palliative care is intended to provide best possible quality of life to patient and their care takers. It is not a curative treatment.

Rehabilitation is a treatment or treatments designed to facilitate the process of recovery from injury, illness, or disease to as normal a condition as possible.

Physiotherapist forms a part of rehabilitation team, helps patients to lead an independent life, they also educate the patients and their care takers about the progressing diseases, helping them to develop coping skills with the diseases.

### COMPLICATIONS AND MANAGEMENT

#### PAIN MANAGEMENT

Pain can reduce strength, vitality, activity tolerance and mobility .Cancer patients with pain report significantly lower levels of performance status than those without pain.

#### Techniques:

\*Transcutaneous Electrical Nerve Stimulation (TENS)

TENS is a non-invasive form of electrical stimulation, which has been used for many years to treat a wide range of pain problems.

- Heat and cold therapy
- Manual massage
- Stretching
- Manual mobilization

#### LYMPHOEDEMA

Lymphoedema is a incurable condition observed as swelling of the body tissues (usually in the arms and legs) caused by failure of the lymphatics either as a result of localised trauma e.g. post breast surgery

#### Lymphoedema physical therapy consists of:

- Massage
- Manual drainage of the blocked lymph fluid
- Management of the condition with compression garments
- Elevation of the affected limb
- Treatment with air compressed bladder

#### RESPIRATORY CARE

Following surgery and treatment interventions patients develop poor lung function and shallow breathing .Physiotherapist teach breathing exercises and techniques to improve lung function.

- The physiotherapy aims to focus on teaching the patient breathing control, to slow the respiratory rate and focus on relaxed breathing.
- Posture is important and a good shoulder-down position is taught to

encourage breathing using the lower part of the chest and upper abdomen.

- Try to be aware of what is normal for you and pace yourself so that your rate of breathing remains under your control.
- Carry out activities as slowly as necessary to keep your breathing rate under control.

### **CONTRACTURES**

The muscle or tendon when maintained too tight for long duration becomes short, and becomes a problem to move with stiffness developing. Thus physiotherapist educate proper positioning to patient and care takers to prevent contractures of limb or following surgery by joint mobilization, stretching and scar tissue mobilization.

### **MUSCLE REDUCTION AND STRENGTHENING**

In the process of cancer therapy patients tend to lose their muscle power and endurance. Exercises designed by physiotherapist along with the patients set goals that are realistic to improve their livelihood

They also organize group exercise sessions so that patient can meet similar people like them and gain confidence. Those exercises will improve their aerobic activity.

General fatigue is another major problem patient faces during and after cancer treatment. Physiotherapist assess each patient their energy level, along with the patient depending upon their requirements they design exercises and motivate them to follow the exercise regimen.

### **PHYSIOTHERAPY FOR BREAST CANCER**

- Many women with breast cancer have some kind of surgery. It may be a:
  - Breast biopsy
  - Lymph node biopsy or removal
  - Breast conservation surgery
  - Mastectomy
  - Breast reconstruction.

### **EXERCISES:**

- Lie down and raise your affected arm above the level of your heart for 45 minutes. Do this 2 or 3 times a day. Put your arm on pillows so that your hand is higher than your wrist and your elbow is a little higher than your shoulder. This will help decrease the swelling that may happen after surgery.

- Exercise your affected arm while it is raised above the level of your heart by opening and closing your hand 15 to 25 times. Next, bend and straighten your elbow. Repeat this 3 to 4 times a day. This exercise helps reduce swelling by pumping lymph fluid out of your arm.

- Do not sleep on your affected arm or lie on that side

### **THINGS TO KEEP IN MIND BEFORE EXERCISE**

Start exercising slowly and increase it as you are able. Stop exercising and talk to your doctor if you:

- Gets weaker, start losing your balance, or start falling
- Have pain that gets worse
- Have new heaviness in your arm
- Have unusual swelling or swelling gets worse
- Have headaches, dizziness, blurred vision, new numbness, or tingling in your arms or chest
- It is important to exercise to keep your muscles working as well as possible, but it is also important to be safe. Talk with your doctor about the right kind of exercises for your condition, and then set goals for increasing your level of physical activity.

### **CONCLUSION**

Collectively palliative physiotherapy care when given to patients from the time of diagnosis and throughout the course of treatment inspires and gives them the ability to lead a respective and independent life, also strengthen their ability to face pain and complication of cancer. This will help other people to gain knowledge and confidence to fight against cancer.

# 24x7 Free Expert Medical Consultation Over Phone



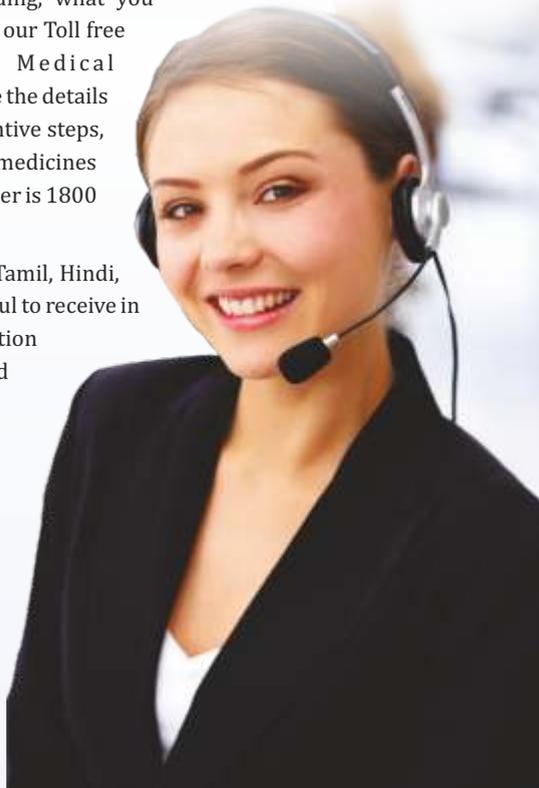
It has been our motto to ensure preventive care information and assistance for good health. Our policy holders can refer the health magazine and the new initiative is 24x7 free expert medical consultation over phone.

### **When do you utilize this service**

Whenever you would like to visit a doctor, say, for a common ailment viz, cold, cough or body pain, before proceeding, what you can do is to call our Toll free number. The Medical personnel will take the details

from you and you will be advised for a simple preventive steps, over the counter medicines or suggest you to go for a medicines or to go for a medical consultation. Our Toll free number is 1800 425 2255 and it is mentioned in the policy document.

**Language:** The receiver of the call will converse in Tamil, Hindi, Malayalam and of course in English. We will be thankful to receive in English. We will be happy to receive your communication on any suggestions to make the system better and more effective to the editor of this magazine at [editor@starhealth.in](mailto:editor@starhealth.in)



## CLAIMS PROCEDURE

At Star Health Insurance, we always interact with customers with a humane and healing touch. We ensure it remains the same when customers need assistance by keeping the claim process simple and easy. We have a 24x7 medical assistance for consultation and facilitation with regard to hospitalization needs. Our aim is to provide cashless hospitalization in a hassle - free and time bound manner.

We have entered into arrangements with network hospitals to provide cashless hospitalization, so you don't have to worry about any advance payments. The steps to avail this benefits are as follows:

Inform the Star Health Call Centre by quoting the Star Identity Card or Policy number within 2 hours of admission. This is mandatory.

Show the Star Identity Card / quote the Policy number at the hospital reception and request for cashless hospitalization.

Ensure that the completed Pre-authorization form and related medical reports are faxed to the Star Health Call Centre by the hospital. This is mandatory.

A copy of Pre-authorization form duly filled along with all relevant medical reports (that substantiates the need for hospitalization) should be provided by the hospital to the visiting Star Health doctor.

On receipt of duly filled Pre-authorization form and based on the feedback from Star Health's doctor, appropriate decision will be communicated to the hospital by us.

The authorization letter mentioning the amount sanctioned for the treatment will be faxed to the hospital. This helps the policy holder to get treatment without paying any money to the hospital.

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