ASTC Communications
Enlightening Minds for Transformation

CANCER, SCREENING AND PREVENTION



Dr. D Leela
Dr. D Raghunadharao

Academy for Science, Technology and Communication
A Platform to Share Knowledge & Insights



Academy for Science, Technology and Communication

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To Organize science communication activities by disseminating information to the general public with participation of academic industrial and scientific institutions through popular lectures, seminars/ symposia, workshops, refresher courses, panel discussions etc., besides publication of books on science/ newsletter / journals etc.

To conduct periodical academic enrichment programmes, with innovative projects for promotion of science and engineering, involving teachers and students, to pursue curiosity and creativity among budding scientists and to stimulate scientific temper.

To provide an unique forum for scientific community to discuss matters of current interest, bring out publications and encourage with academic Fellowships & Awards for Excellence.

To promote temperament of Science and Technology among Youth.

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A HANDBOOK ON CANCER, SCREENING AND PREVENTION



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Preface



Recall a cut injury from years ago: the wound closed and healed in just a couple of days. This happened because cells from the edges of the cut began dividing and migrating to seal the gap. Remarkably, those cells knew when to stop dividing.

Cancer cells, on the other hand, do not stop, they continue dividing even when not needed. These excess cells form a bulge; a tumour. Normally, cells can only divide a limited number of times (what scientists call "passages") before becoming senescent (aged) and dying. Cancer cells, however, divide indefinitely. These are two hallmarks of cancer: uncontrolled division and evasion of cell death. Worse still, cancer cells can spread; they travel through blood and lymph vessels to distant parts of the body, settle there, and continue dividing and invading, metastasizing to other organs.

Many factors can contribute to cancer: smoking, alcohol, tobacco chewing, viruses, pollution, and carcinogens in food. Even people without these habits can fall victim to this dreaded disease. Regardless of the trigger, they all eventually cause genetic changes that unleash cancer. We all carry genes with the potential to cause cancer, but we also have tumour suppressor genes like p53, BRCA1 and BRCA2 etc., that keep them in check. Cells in our body occasionally turn cancerous, but our immune system usually eliminates them. When the immune system weakens or tumour suppressor genes fail (due to mutations), however, cancer can take hold.

What can we do to protect ourselves? Maintain good physical health by eating a balanced diet rich in green leafy vegetables, avoiding deep-fried foods, reheated oils, and plastic containers. Incorporating antioxidant- and anti-inflammatory foods or nutraceuticals may also help. Get periodic health checkups done, particularly if anyone in the family was diagnosed with cancer.

A doctor couple, Dr. Leela and Dr. Raghunatha Rao, with years of experience treating cancer patients, have compiled essential facts along with practical do's and don'ts. Knowledge is power; this small yet highly informative booklet will aid us in the fight against cancer.

Dr. Ch. Mohan Rao
Chairman-Scientific Advisory Council, ASTC

* Former Director CCMB, Hyderabad and Professor & Head, Department of Biological Sciences, BITS Pilani, Hyderabad.

Editor's Vision



The Academy of Science, Technology, and Communication (ASTC) has published a series of booklets called "ASTC COMMUNICATIONS," aimed at sharing modern scientific topics with a broad audience. The fifth book in this series is titled "A Handbook on Cancer, Screening and Prevention," and it is authored by two distinguished doctors: Dr. D Leela, Consultant Gynaecologic Oncologist, and Dr. D Raghunadharao, Professor of Medical Oncology."Dr. D. Raghunadharao is one of India's distinguished leaders in Medical Oncology, with more than four decades of dedicated service in cancer care research, and patient advocacy. He is known for his deep expertise in chemotherapy and comprehensive cancer management. Dr. Rao has served in leading medical institutions in Hyderabad. Patients and peers regard him as one of India's notable oncology specialists, particularly valued for his clinical judgment, compassionate care, and contributions to cancer treatment practices.

His work is marked by a rare blend of scientific rigor, clinical precision, and deep compassion for patients and families. Dr. Raghunadharao's contributions extend beyond the clinic-he has been actively involved in public education, earlydetection initiatives, and communitylevel cancer awareness programs."Dr. D. Leela is a highly respected Consultant Gynaecologic Oncologist with over thee decades of experience in women's health, cancer prevention, and advanced gynaecologic care.

She specializes in gynaecologic oncology, preventive oncology, and comprehensive management of cancers affecting the female reproductive system, including cervical, ovarian, and uterine cancers. Her clinical approach blends precision, empathy and a strong commitment to patient education. Dr. Leela is known for her compassionate, evidencebased approach and her strong commitment to women's health and cancer awareness."ASTC is pleased to present an informative communication on cancer, authored by these two distinguished medical professionals. This handbook offers comprehensive details regarding cancer, covering topics such as causes, carcinogens, prevention strategies, screening techniques for cervical, breast, and oral cancers, and the application of biotechnology in diagnosis and treatment.

It also highlights the significance of vaccinations against cancer-associated viruses like HPV and HBV, and underscores the important roles of volunteers and lifestyle changes in promoting cancer prevention and early detection."The ASTC remains dedicated to advancing scientific literacy and understanding through the publication of the "ASTC Communications" series at frequent intervals covering a wide range of contemporary scientific subjects, ensuring that readers from various backgrounds have access to current developments and insights in science and technology. Your feedback and suggestions are invaluable to help us continually improve the quality and relevance of the "ASTC Communications" series."

Dr. RBN Prasad
Chief Editor - ASTC Publications

*Former Chief Scientist & Head, Centre for Lipid Research, CSIR-Indian Institute of Chemical Technology, & Former President, Oil Technologists' Society of India.

President's Voice



Cancer remains one of the most significant public health challenges of our time, exerting a profound impact on individuals, families, and societies worldwide. In India, the burden of cancer is compounded by late diagnosis, limited access to screening, and gaps in public awareness regarding prevention and early detection. Against this backdrop, A Handbook on Cancer, Screening and Prevention has been conceived as a practical, evidence-based guide aimed at empowering communities with reliable knowledge and actionable insights.

This handbook brings together contemporary understanding of cancer biology, risk factors, prevention strategies, vaccination, and screening approaches, with a special focus on cancers of public health importance in India—namely cervical, breast, and oral cancers. Written in a clear and reader-friendly manner, it is intended not only for healthcare professionals and students, but also for volunteers, educators, policymakers, and members of the general public who play a crucial role in cancer prevention and advocacy.

The strength of this handbook lies in the vast clinical experience and academic distinction of its authors. Dr. D. Leela, an accomplished Consultant Gynaecologic Oncologist with extensive experience in women's cancers, brings deep expertise in cervical cancer prevention, screening, and HPV-related diseases. Dr. D. Raghunadharao, a nationally and internationally respected Medical Oncologist and academician, contributes decades of leadership in cancer diagnosis, treatment, research, and policy-oriented cancer care. Their combined perspectives bridge clinical excellence with public health relevance, ensuring both scientific rigor and practical applicability.

Published by the Academy for Science, Technology & Communication, (ASTC) this handbook also underscores the pivotal role of awareness, community participation, and volunteer engagement in reducing the cancer burden. It reinforces the message that cancer is increasingly a preventable disease—through lifestyle modification, vaccination, early detection, and timely intervention.

Dr. C. Manikyamba
President, ASTC and DAE-Raja Ramanna Chair (RRC), CSIR-NGRI

Chief Scientist & Head, Geochemistry Division and Former CSIR- Emeritus Scientist,
CSIR-National Geophysical Research Institute

From Secretary's Desk

The Academy for Science, Technology & Communication (ASTC) functions as a professional, non-profit academic body dedicated to the promotion of scientific temper, dissemination of scientific knowledge, and strengthening the interface between science, society, and policy. The Academy undertakes a range of structured activities, including expert lectures, thematic seminars, and public outreach programmes, to promote science-driven communication and evidence-based engagement in domains of national and societal importance, with particular focus on health, energy, the environment, and emerging technologies.

Through these initiatives, ASTC seeks to translate complex scientific concepts into clear and accessible knowledge, thereby fostering informed decision-making at both individual and community levels, with the continued guidance of its Scientific Advisory Council-SAC, presently headed by Dr Ch Mohan Rao and Dr B.Sesikeran as its Chairmen. ASTC gratefully acknowledges the valuable services of Dr. R. B. N. Prasad, Chief Editor and Honorary President of ASTC, in bringing out ASTC Communications. His sincere commitment, sustained efforts, and dedication in moulding scientific content in a clear, appealing, and accessible manner for the benefit of the general public are deeply appreciated and duly recognized.

ASTC as part of its public health communication, has supported and published "A Handbook on Cancer, Screening and Prevention" to enhance awareness and understanding of cancer prevention and early detection. The handbook, authored by Dr. D. Leela and Dr. D. Raghunadharao—both distinguished clinicians and academicians in the field of oncology—reflects the Academy's commitment to scientific accuracy, clinical relevance, and societal impact. By addressing cancers of major public health concern in India, particularly cervical, breast, and oral cancers, this booklet educate the importance of evidence-based screening, vaccination, lifestyle modification, and early intervention as effective strategies for reducing cancer burden.

We, at ASTC, extend our heartfelt gratitude to the Digumarti Foundation, led by Dr. Raghunadharao Garu and Dr. Leela Garu, whose visionary leadership and profound expertise in oncology and cancer research inspire transformative initiatives in cancer prevention, awareness, and compassionate care, and for their generous support of this publication.

The Academy envisions this handbook as a foundational resource to support educational programs, community-level interventions, and policy-aligned public health initiatives.

Sri C.L. Narasimha Rao
Secretary, ASTC

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1. What is Cancer?

Cancer refers to malignant tumors or neoplasms caused by abnormal cell growth. Unlike normal cells, cancer cells ignore signals to stop dividing or die, and they can invade nearby tissues.

Cancer cells can travel through blood or lymph systems to form new tumors in distant organs. This ability to metastasize is what makes cancer especially dangerous.

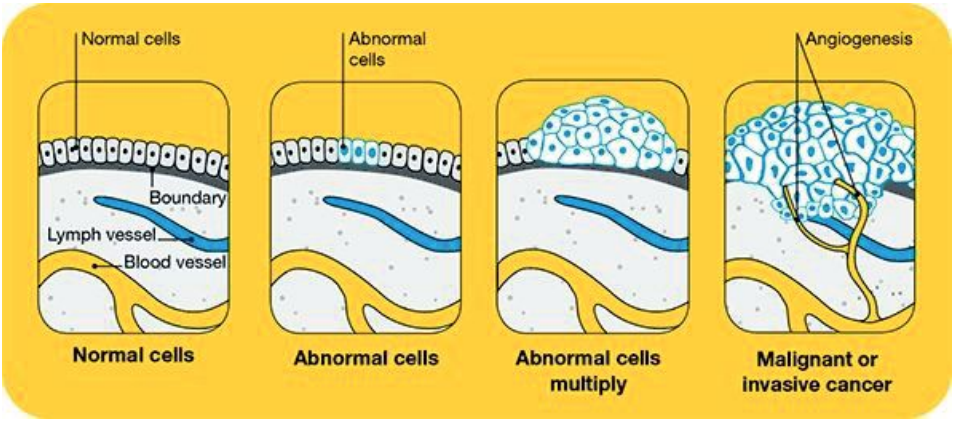
Benign tumors do not spread and are usually less harmful, while malignant tumors (cancerous) invade tissues and can recur after removal.

Genetic mutations, lifestyle factors, environmental exposures, infections and old age are some of the causes and risk factors for the attack of cancer.

Cancer is the second leading cause of death worldwide, with lung and breast cancers dominating.

In India, oral and breast cancers are the biggest challenges, reflecting tobacco use and limited screening.

Figure 1 Genesis of cancer



2. What causes cancer?

For a normal cell to turn cancerous, there must be a change in the genetic control of cell division.

Essentially, this should confer an unlimited ability to multiply, invade the surrounding tissue, and finally detach from the place where it started, spreading all over the body.

It is now known that this occurs through activation of certain cellular genes into oncogenes or through the inactivation of those genes that control cell division, called anti-oncogenes.

There could also be changes that camouflage the cells from the destructive ability of the immune system of the body.

Certain cancers can arise without an alteration of genetic material. This happens through activation or inactivation of controls that help switch on or switch off genes. This is called epigenetic modulation.

Obesity, lack of physical exercise, a meat-based diet, alcohol and tobacco use are the chief causes of cancer around the world, including other life-style disorders.

Figure 2: Causes of cancer



3. What are carcinogens?

An agent that causes cancer is called a carcinogen.

A. Carcinogens can be in the form of environmental or manmade chemicals like polycyclic aromatic hydrocarbons in soot, petrochemical compounds and tobacco.

B. Tobacco use in any form can cause cancer – chewing, pan, pan masala, zarda, khaini, cigar, cigarette, chutta, hukka, snuff or tobacco paste can all cause cancer.

C. Consuming alcohol can cause liver damage that can give raise to liver cancer.

D. Alcohol potentiates the effects of carcinogens, especially tobacco.

E. Infectious agents like certain parasites and viruses like Hepatitis B (HBV), Hepatitis C (HCV) and the Human Papilloma Virus (HPV) can also induce cancers.

F. Chronic irritation from heat or exposure to ultraviolet rays or X-rays can also cause cancer.

G. Chronic inflammation can also induce cancer.

H. Certain heavy metals like mercury and cadmium are carcinogenic.

I. Radioactive elements cause cancer.

J. Several manmade drugs, including those that are used in cancer treatment can be responsible for cancer.

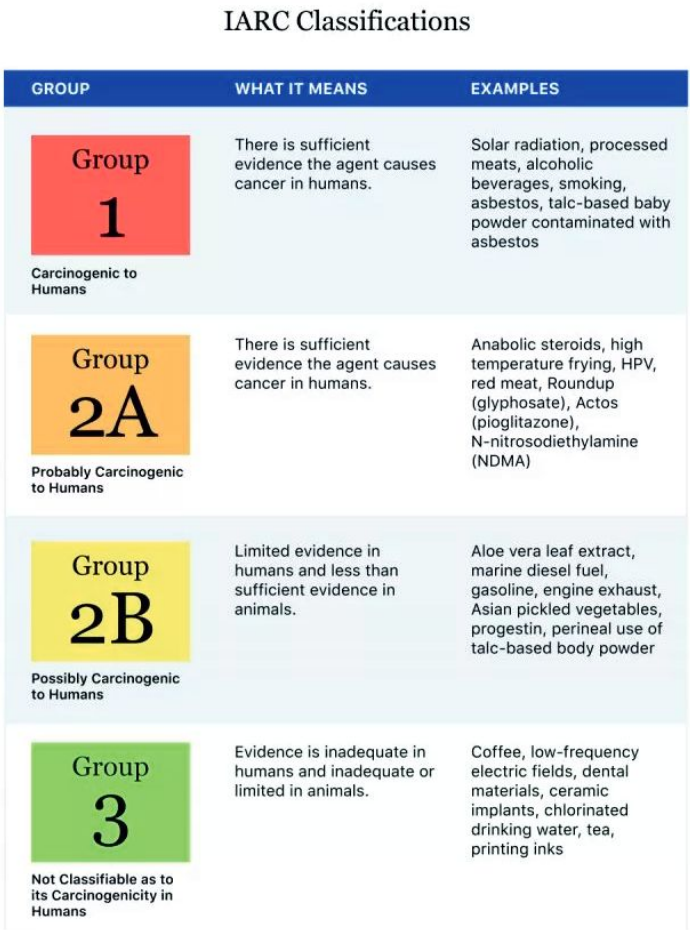
K. Several mycotoxins, including, aflatoxins that is found in the black fungus that invades ground nuts and other food grains, are potent carcinogens.

L. Asbestos, found in roofing sheets and water or drain pipes causes cancer.

M. Certain families and individuals have a higher proclivity to develop cancers: those with certain chromosomal defects, family history of cancers and hereditary cancers. Although not common, such cancers are helpful in understanding the way cancers may arise.

N. Finally, lowered immunity that can occur from diseases like HIV-AIDS can cause cancers, as can the use of immunosuppressive drugs.

Figure 3 IARC Classification of Carcinogens



4. One virus, many problems: the Human Papilloma Virus

Human Papilloma Virus (HPV) infection is a double stranded DNA virus. There are more than 200 HPV subtypes. Of these 14 types are considered "High-Risk". HPV 16 and HPV 18 are the most high-risk types.

This virus is ubiquitous. It enters the body through skin-to-skin contact or by sexual contact. Usually, it remains in the genital parts. It is commonly found in the anogenital tract of men and women with and without clinical lesions.

About 80% to 90% of men and women will be infected at least once in their lifetime. The infection is more prevalent between 20 and 30 years of age. It does not produce any symptoms.

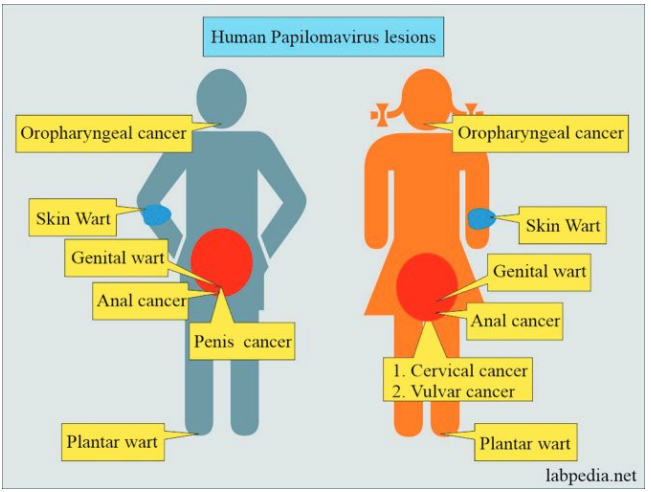
More than 80% of men and women clear this infection naturally by the age of 30. In about 10%, the natural clearance does not happen and the infection remains in the body. These may have an increased risk of developing pre-cancer and cancer in those parts.

The etiological role of HPV infection among women with cervical cancer is well-established and there is growing evidence of its central role in other anogenital sites.

HPV is also responsible for other diseases such as recurrent juvenile respiratory papillomatosis and genital warts, both mainly caused by HPV types 6 and 11. The low-risk types of HPV 6 and 11 are responsible for causing Benign Warts in both sexes. The prevalence of warts in Indian population is about 1%to 2%.

HPV infection is now a well-established cause of cervical cancer and in other anogenital cancers (anus, vulva, vagina and penis) and head and neck cancers.

Figure 4 The Human Papilloma Virus



5. Are there vaccines against cancer causing viruses?

Yes, there are vaccines against Hepatitis B Virus to prevent liver cancer. It is included in the universal childhood vaccination program of children in India.

Vaccination against HPV that can prevent all the 6 cancers, viral warts and infantile respiratory papillomatosis.

Like the vaccines given against many infections from birth, HPV vaccine offers protection against this virus infection if given in the right age and before the start of sexual activity.

The HPV vaccine is made of "Viral Like Particles" of HPV. After taking the vaccine, the immune system of the body is activated and antibodies are produced. These antibodies prevent the virus entering our body. If the virus does not enter, the risk of HPV related cancers would be negligible.

The ideal age to give HPV vaccine is 9 to 14 years. It can be given beyond 15 years as "Catch-up" vaccine till 26 years. The recommended schedule is two doses between 9 to 14 years with 0 to 6-months interval. Three doses between 15 to 26 years with 0 to 2- and 6-months interval.

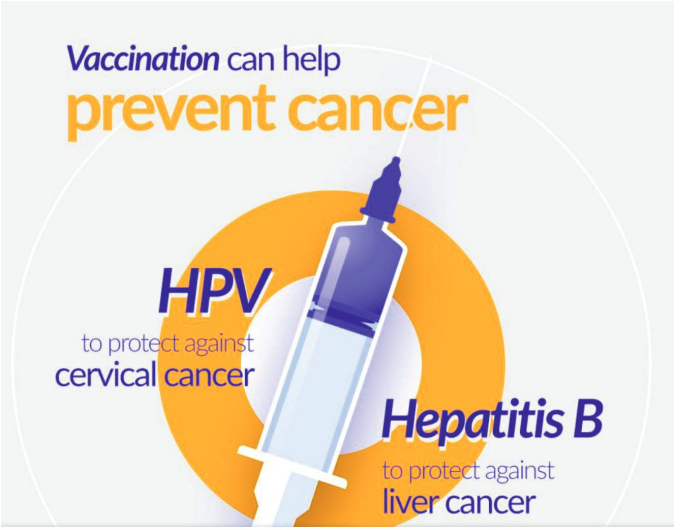
Boys also need the vaccination with the same schedule.

No major side effects as the vaccine contains only viral like particles. Minor side effects like injection site pain, redness, fever and body pain are very rare. The vaccine does not have any effect on future fertility.

The vaccine is offering almost 95% protection in children who are vaccinated between 9 and 14 years of age. The vaccine efficacy is inversely proportional to the age of vaccination. There is no need to take booster dose. The vaccinated girls need to continue to attend regular cervical screening from the age of 30 years even though they are vaccinated in childhood.

About 123,907 new cervical cancer cases are diagnosed annually in India (estimations for 2020). Cervical cancer ranks as the 2nd leading cause of female cancer in India About 77,348 cervical cancer deaths occur annually in India are diagnosed annually (estimations for 2020).

Figure 6 Vaccination against cancer



6. Screening for Cancer

The purpose of screening is to pick up a disease in healthy individuals before there are any symptoms. The goal is to reduce people dying from a particular cancer.

Cancer screening programs look for early signs of the disease or indications that a person is more likely to develop the disease in the future.

In most cases, early detection of cancer increases the chances of successful treatment.

There are three different approaches to screening that include:

- Mass (population-based) screening: An entire population in a certain age group is tested, for example, cervical cancer screening
- Selective screening: Screening of selected groups of people in high-risk categories, for example, genetic screening of people with a strong family history of breast cancer
- Opportunistic screening: Screening tests offered to people who are being examined for other reasons, as part of a routine medical check-up. For example, genetic screening tests are available for people with an established family history of bowel, breast or skin cancers.

For population-based screening programs, the following specific criteria are essential.

1. The cancer is common enough (e.g.: cervical or breast cancer) in the population
2. The cancer has a high rate of morbidity (illness) and mortality (death)
3. The test can detect the disease or condition in its early stages or pick up signs that the disease may develop later
4. The disease or condition is treatable
5. The treatment is effective, affordable, safe or acceptable in the earlier stages
6. The screening test is acceptable to people: not unpleasant or painful
7. Follow-up treatment where required must be available to the 'target population'
8. The target population is easily traceable for such follow-up
9. The program is cost-effective

Devising a test, validating it and implementing it for mass screening poses several problems.

Some of the challenges that need to be overcome include:

- People may find the test invasive, uncomfortable, unpleasant or embarrassing and may not want to undergo the procedure
- Many people are afraid that the test may reveal cancer in them and suffer from anxiety of the result
- No test is perfect:
  - o A 'false negative' result, which means that the test shows the person doesn't have cancer when in fact they do
  - o There is also a small risk of giving a 'false positive', which means that the test concludes the person has cancer when they do not.
  - o This results in worry and mental agony
  - o Some carry a small but usually significant risk of side effects or complications
- Each screening test also carries a small risk of 'over-diagnosis', which refers to the diagnosis of disease that might never cause symptoms or death from cancer during the person's lifetime

There is no universal cancer screening in India. The major reasons are the lack of consensus and cost involved. A few challenges not so unique to India are:

a) Technological: We lack adequate numbers of machines or technology

b) Professional manpower: There is a dearth of trained manpower at all levels: filed staff to motivate, technicians as well as medical personnel to diagnose and treat

c) Logistics: Taking the program to the grass root level without motorable roads, electricity and basic amenities

d) Credibility: The concept of a health checkup or a visit to a screening program is still nascent

7. Which cancers can be screen detected?

Only three cancers namely breast cancer, cervical cancer and oral cancer are eligible for mass screening in India.

a) Cervical cancer can be detected in the pre-cancerous stage through screening. Such women do not have any symptoms of cancer. Simple local treatments, without resorting to hysterectomy, can prevent progression to frank cancer.

b) Oral cancers can also be detected and treated in a precancerous stage.

c) Breast cancer can be picked up in the early, pre-symptom stage, even before a lump is palpable.

8. Screening for cancer:

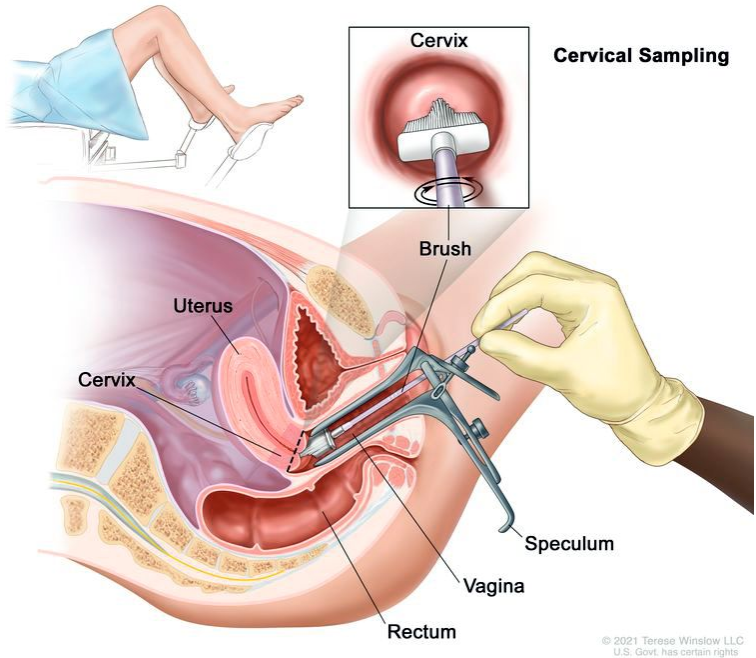
Cervical Cancer:

Regular screening plays a crucial role in early detection and prevention of cervical cancer. It is recommended that women between the ages of 30 and 65 undergo screening at intervals of every 3 to 5 years.

'Smear' test from cervix and HPV virus test from cervical cells are the two primary tests used for the detection of this cancer.

By adhering to these recommended screening schedules, women can significantly improve the chances of detecting cervical cancer at an early, more treatable stage.

Figure 7 Cervical smear for HPV



Breast Cancer

Facts about Breast Cancer: The most common cancer in urban women all over the world. One in 28 women are at risk in India. About 1,40,00 women are diagnosed with breast cancer every year in our country and half of them present with advanced disease.

Many young women are developing breast cancer in India.

Early menarche, late menopause, obesity, smoking and alcohol usage, late childbirth, continuous usage of estrogen and progesterone hormones and a family history of breast cancer are some of the risk factors

Warning Symptoms of breast cancer:

It is important to be aware of the warning signs that may indicate the presence of breast cancer.

Some of the key symptoms to watch for include:

a) A lump in the breast or armpit

b) Retraction of nipple

c) Nipple discharge, especially blood stained and

d) Skin changes over the breast and areola.

Recognizing these symptoms early and seeking timely medical attention can significantly improve the chances of successful treatment.

Prevention of breast cancer:

Lifestyle modifications play a key role in reducing the risk of breast cancer.

Maintaining a healthy weight through proper diet and regular exercise is essential to prevent obesity, which is a known risk factor.

Additionally, it is important to cease smoking and avoid all forms of tobacco use, as well as limit alcohol intake, since these habits can contribute to the development of breast cancer. Currently, there is no vaccination available to prevent breast cancer.

Screening and early detection of breast cancer:

Early detection of breast cancer greatly increases the chances of successful treatment.

There are several recommended methods for screening and early identification of abnormalities in the breasts.

a) Breast self-examination helps to understand if anything is abnormal in one's own breasts.

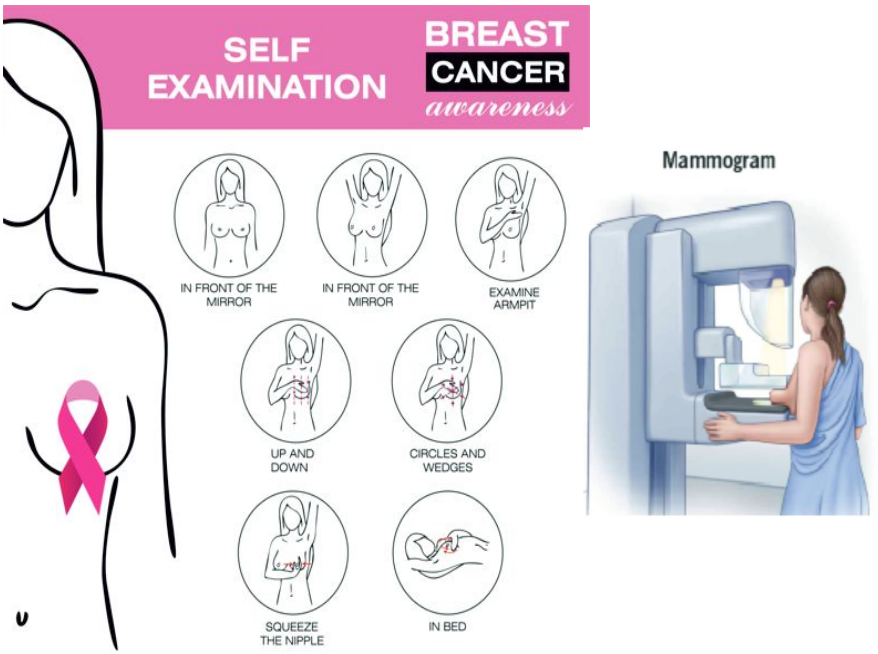
b) Clinical breast examination by trained health care personnel is important in detecting signs that may not be noticed during self-examination.

c) Annual mammography after the age of 40 years, till the age of 54 years and after that once in 2 years till 65 years of age is also recommended.

d) In those with a family history of cancer or hereditary cancers, screening must start a decade early, namely, at 30 years of age. To reduce the harm from radiation from mammograms, an MRI of the breast is the preferred method of screening.

By following these screening guidelines, women can improve the likelihood of identifying breast cancer at an early, more treatable stage.

Figure 8 Breast Self-Examination and Mammography



Oral Cancer

Facts about oral cancer:

Oral cancer is more frequently observed among individuals who use tobacco.

Statistics show that one in twenty tobacco users are at risk of developing oral cancer.

Alarmingly, 60% to 80% of cases are diagnosed at an advanced stage.

The use of tobacco in any form, as well as the habit of chewing betel nut, are established causes of oral cancer.

The risk is further heightened when tobacco use is combined with alcohol consumption, as alcohol acts to potentiate the harmful effects of tobacco.

Additionally, the presence of sharp teeth that repeatedly bite or irritate the cheek or tongue can contribute to the development of cancerous lesions in the oral cavity.

Warning symptoms of oral cancer:

a) White patches on the cheeks that are not removable

b) Non-healing ulcers on the tongue, lips, gingiva, palate

c) An area of redness, velvety feeling, rawness, soreness are the warning symptoms of oral cancer.

Early recognition and medical attention for these symptoms can contribute significantly to timely diagnosis and management of oral cancer.

Prevention of oral cancer:

Preventing oral cancer primarily involves making healthy lifestyle choices and participating in regular dental care.

The most important preventive measure is to avoid tobacco in all its forms, as well as refraining from chewing betel nut and consuming alcohol.

These substances are known to significantly increase the risk of developing oral cancer.

Another preventive strategy is the administration of the HPV (Human Papillomavirus) vaccine to both boys and girls.

This vaccination can help reduce the risk of HPV-related oral cancers and is an important component of comprehensive cancer prevention efforts.

Figure 9 Screening for Oral Cancer



Screening and early detection of oral cancer:

Oral examination by trained health care personal is crucial for improving treatment outcomes and survival rates.

If a suspicious lesion is detected during the oral examination, a biopsy is performed for determining the signs of cancerous changes.

Timely detection and prompt treatment of any lesions found during screening are essential steps in managing oral cancer effectively.

Early intervention can lead to better treatment results and a higher likelihood of recovery.

Figure 10 Awareness camps for cancer screening and vaccination



9. Biotechnology in Cancer Diagnosis and Treatment

Tumours result from a genetic change. This is the result of certain special attributes: immortality through purposeless cell division that escapes the cell's own policing mechanism and the body's immunity.

Deciphering the changes at a molecular level that turn a normal cell or a 'destined' cell to become cancerous requires a fair understanding of the molecular basis of cancer.

Unravelling the molecular changes leads one to the bewildering fact that such molecular changes may impact more than one pathway – proliferation, invasion, angiogenesis, metastases, immune escape and drug resistance, to name a few.

While several metabolic disorders may perhaps be the result of single gene mutations, such an event is rather rare in disorders like cancer: the so called 'driver' mutations.

It is essential to realize that the path to the pathogenesis – the inciting agent – physical, chemical, biologic agent – initiation, promotion or causing cancer (mutagenic, teratogenic and carcinogenic), may well be different, but there appears to be a final common pathway to the immortalization of cell.

Unravelling the predisposition, pathogenesis, the pathways affected and, finally, the druggable targets is essentially the domain of biotechnology.

It is essential to realize that the cancer cell is very dynamic: it tries to stay one step ahead of the treatment offered, all the while choosing redundant or alternate pathways to promote cell division, local invasion or distant metastases. In other words, the tumour that presents today, is not the same when it started or over a period. Indeed, the change may very well be induced by the treatment offered – typically, a recurrence of the tumour after an initial dramatic response, often several years to decades after curative therapy.

Tumours can not only be very accurately diagnosed using molecular tools, but can also be classified into distinct subtypes, using the driver mutations.

Biotechnology essentially uses molecular tools to help precision diagnosis, treatment, predicting response, prognostication and toxicity for a given tumour and the planned intervention. It typically exploits several of the biomarkers that characterize a cancer cell, picking up one that is distinct to be used as a disease marker: for diagnosis, prognosis, prediction, precision targeted therapy, monitoring response to therapy, minimal residual and finally for toxicity.

With rapid advances in methodology and mass production, India has shown the world that biosimilars are cheap to produce and to use, without loss of potency or increase in toxicity.

Indeed, to be totally successful against cancer, biotechnology should perhaps explore and exploit methods of identifying cancer susceptibility in the population and its prevention at a molecular level.

10. Volunteers in the Prevention and Screening of Cancer

Volunteers play a very crucial role in the prevention and screening of cancer. A recommended approach for volunteers is to begin in familiar settings such as their home, neighborhood, street, local community, or village, and then they can expand their involvement.

For those who are employed, your organization may serve as an appropriate starting point for their volunteer activities.

Volunteers can define their role based on their personal interests, strengths, and areas of expertise. Volunteers can choose to focus on education, support, or advocacy so that their involvement can make a meaningful difference.

There are several avenues through which they can contribute as a volunteer to support the cause of cancer prevention like

a. Education and creating awareness

b. Motivation

c. Fundraising

d. Advocacy

e. Service and support

Volunteers play a crucial role in combating oral cancer within their communities by educating the public about the harmful effects of tobacco use, betel nut chewing, and alcohol consumption.

In addition to education, volunteers actively encourage both men and women to quit using tobacco products.

They serve as motivators and supporters, particularly for those who are participating in de-addiction programs, offering encouragement and assistance throughout their recovery journey.

Furthermore, volunteers are instrumental in promoting the importance of regular oral examinations and often they take the initiative to organize oral screening camps within their communities.

Several cancer prevention programs have dedicated awareness months that encourage screening for specific cancers.

11. Conclusions

A. Cancer is a lifestyle disorder, like obesity, hypertension, diabetes, heart disease or obstructive airways disease

B. It can be prevented by incorporating a diet rich in vegetables, whole grains and fruits

C. Avoiding tobacco and alcohol in any form is essential

D. Maintaining correct weight for age, gender, frame and race is essential

E. Vaccination against HBV and HPV at the right age for boys and girls

F. Regular screening for oral, breast and cervical cancer must be incorporated into health plans

G. Volunteers are essential for taking the message of screening and prevention of cancer into the masses, especially the rural hinterland

H. Professional bodies, NGOs and voluntary organisations must move from awareness to advocacy to action for elimination of HPV induced cancers

Figure 11 Volunteers in cancer prevention and screening



Academia Meets Innovation: Be a Part of ASTC"

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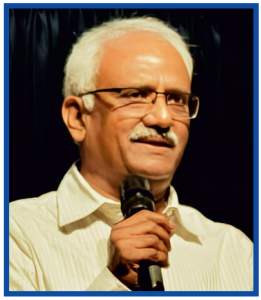
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