MISSION
To work for the cause and care of disadvantaged cancer patients and to improve the quality of their life.

Patrons
Mrs Gursharan Kaur
Dr Vinay Bharat Ram

Trustees:
Mrs Inderjit K Pannu
President & Managing Trustee
Mrs Divjot Kohli – Treasurer
Mrs Padma Venkataraman
Mr Ravi Punde
Maj Gen Gurdip Singh, AVSM, SM (Retd)
Lt Gen PPS Bhandari, PVSM, AVSM (Retd)
Brig B V Ahuja, AVSM (Retd)

Chief Executive Officer:
Dr Harvinder Singh Bakshi

Hony Communication Advisor:
Mr Alyque Padamsee Padma Shri Awardee

Medical Advisors:
Dr B K Mohanti
Dr K T Bhowmik
Dr Rajeev Agarwal
Dr Sapna Nangia
Dr Sunil Kumar Gupta

Settlor & Founder Trustee
Late Maj Gen R S Pannu
Contents

From the President’s Desk 3
Editorial 4
Messages from Ministers 5
About GCCI 20
Snippets 22
Facilities Provided by Government to the Cancer Patients 26
From the Almanac of Cancer Survivors 29
Newspaper Clippings 31

Articles

a) A Personal Perspective on Palliative Care in India
   Prof. Bidhu K Mohanti 38
b) What’s New in Breast Cancer Research and Treatment
   Dr Kumar T Bhowmik 40
c) Palliative Care: A Holistic Approach to Ensure Quality in Both Life and Death
   Dr Sushma Bhatnagar, Dr Mayank Gupta 43
d) Current Management Strategies in Breast Cancer
   Dr Sunil Kumar Gupta 46
e) Arsenic in Ganga: An Infliction to People of Bihar
   Dr Jitender Singh 48
f) Ethical Issues in Palliative Care in India
   Dr Shiv Pratap Singh Rana, Dr Sangeeta Singh 50
g) Recent Advances in Brain Cancer Treatment
   Dr Himanshu Khurana 54
h) Orbital Lymphoma in Children
   Dr Nandini Hazarika, Dr Pankaj Dwivedi 58
i) Current Concepts in the Pain Management of Bone Metastasis
   Dr Suresh Kumar K, Dr Ajith G Nair 60
j) Therapeutic Usage of Grief Management in Palliative Home Care Setting
   Ganesh Bhatt 67
k) An Ode to Pain
   Dr Harvinder Singh Bakshi 70

Regional Offices 71
Global Cancer Concern India has been relentlessly providing service nationwide in the field of cancer care management for the last 18 years through its various interventions like Mobile Palliative Care Units, Primary Health Care and Cancer Screening Centres, School Health Education Programme, Child Educational Sponsorship belonging to cancer victim families, Mass Health Awareness Programmes, Cancer Screening Camps, Vocational Training Programmes, Extension of limited Financial Assistance to cancer victims etc. aiming at the well being of disadvantaged persons afflicted with cancer and their families.

Now we have embarked upon the publication of Research & Development Journal with the objective of increasing the degree of awareness about the dreadful disease of cancer and providing a platform to oncologists, social workers, psychologists and policy makers for cross pollination of research information and ideas.

This is our new initiative which will flourish with the passage of time. I would be failing in my duty if I do not express profusely my appreciation for the GCCI team which have put in hard work to bring out this Journal.

I am sure the medical community and others will find it useful and be greatly benefitted by this venture.

Inderjit K. Pannu
Among various diseases, cancer has a melancholic image of being a potent threat to human beings globally as it is a major cause of morbidity and mortality. The data on epidemiology of cancer shows that India is beset with a monumental challenge of dealing with the burden of cancer. As per the report of International Agency for Research on Cancer GLOBOCON project, it is estimated that India will experience doubling of its cancer burden in next 20 years from over 1 million new cases in 2012 to more than 1.7 million new cases by 2035. The report also portends that deaths due to cancer in India will also increase from about 6,80,000 to 1.2 million in 20 years from 2012. This reflects abysmally poor availability of prevention, diagnosis and treatment of the disease. Cancer can have tremendous negative bearing on the social and economic life of the people and catastrophic personal expenditure can push families into the jaws of poverty. In view of the situation, there is a glaring need for the government and the NGOs to work with high octane enthusiasm in a concerted fashion in the areas of cancer prevention, treatment and cancer care management to keep tryst with the needs of the afflicted people.

Global Cancer Concern India occupies a prominent place in the vanguard of cancer care NGOs in the country. It is working nationwide through 15 offices for the wellbeing of the disadvantaged people afflicted with cancer and their families. The spectrum of activities of Global Cancer Concern India includes provision of Health Education / Awareness about cancer among the masses, holding Free Cancer Detection/Screening through mobile units, Free Mobile Palliative Home care services to terminally ill poor cancer patients, Vocational training to kith and kin of cancer victims, provision of school fees under Child Sponsorship Programme to children of cancer victims, extension of limited Financial Assistance to cancer victims and running well-equipped Cancer Screening Centres.

By publication of Research and development journal, GCCI has added a new dimension to its multifaceted cancer care work. The journal will explore the dynamics of Research and Development under a wide perspective including not only an emphasis on dissemination information but also policy framing and cancer care growth. The aim of this journal is to provide a communication platform to cancer specialist engaged in cancer research all over the world to promote, share and discuss a variety of ideas and interesting development both in the field of treatment and cancer care management. The journal shall present a podium for presenting life experiences, articles, original research reports, guest editorials, letters to the editor and special features etc.

This first issue of the journal embraces the articles by a pleiad of eminent doctors, interesting information on cancer related issues gleaned through newspaper and other print media, stories of cancer survivors and a write-up on cancer care related issues and its management. We hope that with the fullness of time, the journal will become richer in content and will contribute significantly in the crusade against cancer.

- Dr. Harvinder Singh Bakshi
Chief Executive Officer
I am happy to know that the Global Cancer Concern India is bringing out a comprehensive Research and Development Journal with the support of RITES Ltd. and a souvenir is being published to mark the occasion.

I am happy to note that the journal aims to provide a communication platform to cancer specialists engaged in cancer care research all over the world, to promote, share and discuss a variety of innovative ideas and interesting developments both in the field of treatment and cancer management. The promise of the journal to publish original research reports, literature reviews, guest editorials, letters to the editor and special features on current issues affecting the treatment and care of cancer patients is heartening. I am hopeful that it will provide user friendly information for oncologists, health care professionals, policymakers and various stakeholders interested in the best practices for cancer prevention, early detection, treatment and cancer management.

I extend my wishes to the team associated with this endeavour for success of the journal.

(Jagat Prakash Nadda)
MESSAGE

I am happy to know that the Global Cancer Concern India, H.O. C-659, Sushant Lok Ph-1, Gurgaon-122009 (Haryana) is going to bring out a comprehensive Research & Development Journal with the support of RITES Limited.

I have been informed that Global Cancer Concern India is working nationwide through 16 offices with focus on rural areas and urban slums. The GCCI is doing a commendable job in the field of health education, awareness of cancer, free home care services to terminally ill poor cancer patients, vocational training and provision of school fees under Child Sponsorship Programme to children of cancer victims and Primary health-care cum Screening Centers.

I hope the Journal must become a communication platform to cancer specialists engaged in cancer care research all over the world, to promote, share and discuss a variety of innovative ideas and interesting developments both in the field of treatment and cancer management.

I extend my greetings to all participants and successful publication of the Journal and in all its future endeavors.

(Dr. Harsh Vardhan)
MESSAGE

I am happy to know that Global Cancer Concern India is bringing out a comprehensive Research & Development Journal with the support of RITES Ltd., a Govt. of India Enterprises.

The aim of this journal is to provide a communication platform to cancer specialists engaged in cancer care research all over the world, to promote, share and discuss a variety of innovative ideas and interesting developments both in the field of treatment and cancer management.

On this occasion, I extend my greetings and good wishes for all success of the Journal.

(Thaawarchand Gehlot)
MESSAGE

I am glad to learn that Global Cancer Concern India with the support of RITES Ltd. (a Govt. of India Enterprise) is bringing out a comprehensive Research & Development Journal.

The Journal aims at providing a communication platform to specialists engaged in cancer care research all over the world, providing, sharing and discussing a variety of innovative ideas and interesting developments both in the field of treatment and cancer management. The Journal will provide a podium for presenting healthy life experience, articles and unique ideas combating cancer. I hope the Journal will publish original research reports, literature reviews, guest editorials, letters to the editor and special features on current issues affecting the treatment and care of cancer patients. It will contain user friendly information for oncology, health care professions, policy makers, interested in the best practices for cancer prevention, early detection, treatment and management of cancer.

I take this opportunity to congratulate all the members of the Journal and wish the publication of the Journal a great success.

(Rao Inderjit Singh)
MESSAGE

I am glad to know that Global Cancer Concern India is bringing out a comprehensive Research & Development Journal with the aim to provide a communication platform to cancer specialists engaged in cancer care research all over the world.

The Journal will contain user friendly information for oncologists, health care professionals, policy makers and various stakeholders, interested in the best practices for cancer prevention, early detection, treatment and cancer management.

I extend my good wishes for all success of the Journal.

(Krishan Pal Gurjar)
Message

It gives me immense pleasure to learn that Global Cancer Concern India, Gurgaon is bringing out a Research & Development Journal to provide a communication platform to cancer specialists engaged in cancer care research.

Cancer care constitutes an important segment of medical science and the health care system. Over the years, rapid advancements have been witnessed in this field, with the development of new and effective therapeutic and surgical treatments for a wide range of problems.

I am confident that the proposed Journal will prove fruitful for bringing about future improvements in this specialized field and address some of the challenges in management of cancer.

I wish all success to publication of the Journal.

[Signature]

(Prof. Kaptan Singh Solanki)
संदेश

मुझे यह जानकार अति प्रसन्नता हुई है कि ग्लोबल कैंसर कंसर्ट इंडिया द्वारा लोगों ने कैंसर की बीमारी के बारे में जागरूकता उत्पन्न करने के साथ-साथ कैंसर विशेषज्ञों को संचार का एक प्रभावी गतिविधि प्रदान करने के उद्देश्य से कैंसर पर एक अनुसंधान एवं विकास पत्रिका प्रकाशित की जा रही है।

भारत जैसे विकासशील देशों में कैंसर एक मुख्त स्थायी समस्या है। यह अति समय है कि हम लोगों को इस उर्जालय बीमारी के लक्षण एवं उपचार के बारे में जागरूक करें ताकि इस बीमारी का समय राते उपचार करके बेहतर जीवन का दायरा आ सके।

मुझे अति है कि ग्लोबल कैंसर कंसर्ट इंडिया अपनी पत्रिका के माध्यम से लोगों को कैंसर के कारणों, उसके रोकथाम के उपायों और निषेधात्मक जैसे बिन्दु, लोगों पर विस्तृत जानकारी प्रदान करेगी! इसके अतिरिक्त, कैंसर विशेषज्ञों को कैंसर के उपचार और गतिविधि के क्षेत्र में हुई प्रगति पर अपने विचार व्यक्त एवं साझा करने का अवसर भी प्रदान करेगी।

मैं पत्रिका के सफल प्रकाशन के लिए अपनी हार्दिक शुभकामनाओं की श्रद्धांजलि करता हूँ।

(मनोहर लाल)
MESSAGE

It is the matter of pleasure that Global Cancer Concern India (GCCCI), a Cancer Care NGO is bringing out a comprehensive Research and Development Journal on health education and Awareness about Cancer.

Medical field is a noble profession in the Society. Doctor plays a vital role in saving the precious human life. It is more important to keep the medical practitioner abreast with the new developments in the medical science. The advancement in the field of medical science has opened new alternatives for the treatment of ailings.

The aim of the Journal is to provide a communication platform to cancer specialists engaged in cancer care research institute all over the world. GCCCI published the original research work related to the cancer patients and also provide user friendly information.

The present Haryana Government has taken several new initiatives to improve the Health infrastructure and facilities in hospitals. The OPD record across all State Government Hospital will be made online soon.

I convey my best wishes for the publication of Journal.

(Anil Vij)

Room No. 46, 8th Floor, Haryana Civil Secretariat, Chandigarh.
Tel. No. 0172-2740157 (O)
Message

It gives me immense pleasure to know that Global Cancer Concern India is going to bring out a comprehensive Research and Development Journal with the support of RITES Ltd.

The aim of such comprehensive Research and Development Journal is to promote a rapid exchange of scientific information between clinicians and scientists worldwide.

I hope that the journal will provide a platform to its members to share their innovative experience, get words of wisdom from experts in different super-speciality fields that will be helpful in designing better strategies for health-care programmes especially cancer in the country.

I convey my best wishes for the successful publication of the journal.

(Kavita Jain)
It gives me immense pleasure to learn that **Global Cancer Concern India** is working assiduously for the wellbeing of the disadvantaged people affected with cancer for last 17 years.

I have also informed that Global Cancer Concern India is bringing out a comprehensive Research & Development Journal with the support of RITES Ltd.

I extend my best wishes for the successful Publication of journal.

(Arvind Kejriwal)
Dear Dr. Bakshi,

I am glad to know that Global Cancer Concern India is working assiduously for the last 17 years for the wellbeing of the people affected with Cancer. I am happy to hear that GCCI is bringing out a comprehensive Research & Development Journal with the support of RITES Ltd. which will contain user friendly information for the people connected with medical field.

I wish all the success for the Journal and hope that GCCI will continue to provide the quality services.

With regards,

Yours sincerely,

(Satyendar Jain)

Dr. Harvinder Singh Bakshi,
Chief Executive Officer,
Global Cancer Concern India,
C-659, Sushant Lok Phase-I,
Gurgaon-122009 (Haryana).
MESSAGE

It is a great pleasure to know that Global Cancer Concern India (GCCl) is bringing out a Research & Development Journal with the objective of providing a communication platform to Cancer specialists working in the field of Cancer care so that they can promote, discuss and share their innovative ideas and interesting researches. Cancer is a very dreadful disease & the incidence of Cancer in India is rising tremendously.

I appreciate the initiative of Global Cancer Concern India (GCCl) and extend my best Wishes for the Journal.

Shatrughan Sinha

CONSTITUENCY ADDRESS: SHINESHWAAR NWAS, B.P. SINHA PATH, D-BLOCK, KADAM KUA, PATNA, 800003 P.E. 272189 FAX 2721465
DELHI ADDRESS: 10, TALKAI ORA ROAD, NEW DELHI - 110001 TEL. : 23355264-65 FAX : 23702731
Mumbai Address: 49, RAMAYAN, 9TH ROAD, J.V.P.D. SCHEME, JUHU, MUMBAI-400 049 TEL.: 26008121-39 FAX 26000999
MESSAGE

Dr. Jitendra Kumar Singh
(Padmashri Awardee)
National Vice President, IMA, Delhi (HQ)
& Director S. S. Hospital & Research Centre, Patna

The incidence of cancer is increasing very sharply. It is presumed that if it is not checked or controlled, then in coming years all the disease in health sector will go behind & cancer will be the number one challenge in the country. Every year there is addition of 12 lakhs new cancer patients in India. Unfortunately the 3/4th global burden of cancer is in the developing countries.

The time has come, that we should redefine the targets in the cancer management. Apart from providing the best treatment, we should put more focus also on the Awareness, Education, Prevention & Early Detection programme. I am a firm believer that only these things can change the scenario of cancer in the country.

I am happy to know the extensive programme & measures, adopted by the GCCI, will certainly be an eye opener for all the NGO working in this field. I am sure, combined together, we can definitely bring some more changes in this particular area.

My all good wishes to Dr. H. S. Bakshi, Chief Executive Officer & his entire team of GCCI for doing such a commendable job in this field.
MESSAGE

Cancer is increasing day-by-day, if not controlled or checked by now, it will become the number one challenge in the country. This is the right time to put more focus on the awareness, education, prevention & early detection programme. We are hopeful that it will definitely change the situation.

It is a great pleasure to know that Global Cancer Concern India (GCCI) is bringing out a Research & Development Journal with the support of RITES Ltd. The Journal will contain useful information for oncologists, health care professionals and policy makers.

I appreciate the initiative of GCCI and extend my best wishes for the Journal.

[Signature]

( Dr. Jagdish Prasad )
Cancer is a dreadful disease. Number of cancer cases reporting to the institute is on the rise due to multiple factors. In view of this, there is glaring need to accentuate efforts in the area of cancer care management & early detection.

It is a great pleasure to know that GCCI is bringing out a Research & Development Journal with the support of RITES Ltd. and with an objective of providing a communication platform to cancer specialists working in the field of cancer care so that they can promote, discuss and share their innovative ideas and research work.

I appreciate the initiative of Global Cancer Concern India (GCCI) and extend my best wishes for the Journal.

Dr. D.P. Lochan
Director General Health Services,
Haryana, Panchkula

Dr. Harvinder Singh Bakshi
Chief Executive Officer
Global Cancer Concern India (GCCI), Gurgaon
Introduction

Global Cancer Concern India (GCCI) was founded under the Indian Trust Act of 1882, in March 1998 as a Not For Profit NGO, by late Maj. Gen. R S Pannu. After his sad and untimely demise in October 2003, Mrs. Inderjit K Pannu who was already one of the trustees; was elected by the Board of Trustees to be the President and Managing Trustee.

Mission

‘Global Cancer Concern India’ is one of the leading NGOs in the Country working nationwide for cancer care. Its mission is to combat Cancer at all stages by seeking its prevention, early detection, providing palliative care and home care to cancer sufferers enabling them to live their remaining life with dignity and pain free.

Methodology

GCCI seeks to reduce the incidence of cancer through awareness, prevention and early detection. GCCI also financially assists those children to continue with their education who have to drop out due to financial hardship caused by Cancer in the family. It adopts specialized, well-researched and holistic approach for pain management, dwelling on physical, emotional, spiritual and psychological aspects. Further, it trains doctors, nurses and care givers, provides limited free medicines, consumables, disposables and lends a helping hand to the cancer bereaved families in their rehabilitation, in particular vocational training to family members and children of cancer affected families. GCCI has been aptly extending resources to needy sections of society through will defined processes and format meeting all aspiration of our stakeholders. Recognizing our work, we have been accredited by institutions like TISS, IICA, CAF.

Organization

GCCI is working nationwide through 15 station offices across the country. It partners with several hospitals and Cancer oriented societies for implementation and execution of the various activities under its different programmes for the cause. It makes a conscious effort to bring about attitudinal changes towards life, self-esteem, dignity amongst sufferers and their families.

Programmes

GCCI since inception has operated directly as well as in collaboration/partnership with other organization at various locations in the country.

a) Our current National level programmes:

- Cancer Awareness and Detection Camps in rural and urban areas as community out reach programmes.
- Cancer Awareness Programmes in schools, institutions, corporate organization.
- Child Sponsorship Project to help under privileged children of Cancer afflicted families to continue their education through out country.
- Vocational Training to dependents of cancer afflicted families.
- Financial support for medical treatment of poor cancer patients below poverty line.
- Palliative Home Care services to cancer patients.
- Training of cancer care givers with a view to mitigate the suffering of cancer patients.
- Training of Medical and Paramedics in Palliative Home Care in collaboration Pain and Palliative Care Society, Calicut at AIIMS, New Delhi and PGI Chandigarh.

b) Current Regional Level Programmes:

- Running free Primary Health and Cancer Screening Center at Kishangarh, Vasant Kunj, New Delhi.
- Running free Primary Health and Cancer Screening Center at sec. 49, Gurgaon.
- Palliative Home Care Services for needy families, including provision of medicines to cancer patients by teams at Delhi, Gurgaon and Noida covering other areas under NCR supported by BHEL.
• Palliative Home Care Services at Ludhiana, Punjab, partially supported by HelpAge India.
• Vocational Training Programme (Computer Hardware & Software) in association with Indian Red Cross Society Punjab Branch Patiala, Punjab.
• Primary Health Care, Cancer screening, and Palliative Home Care at Chandigarh, supported by Mahindra Swaraj Limited.
• Vocational Training (Sewing and Tailoring) Programmes in collaboration with Manav Sewa Sansthaan at Chandigarh.
• Palliative Home Care Services at Bhopal supported by BHEL.
• Palliative and out-reach Home Care Services in association with Tata Memorial Hospital, Mumbai.
• Palliative Home Care Services in association with Bangalore Hospice Trust, (Karunashraya) Bangalore.
• Cancer Screening Programme in association with Cancer Institute Adyar (VIA), Chennai, Tamilnadu.
• Running Rural Cancer Screening Center (Teen Murti) at Gurgaon Faridabad Highway in Gurgaon.
• Cancer screening and Awareness Programme in the city of Bhopal, Patna, Kottayam, Bengaluru, Kolkatta supported by Union Bank Social Foundation.

FUNDING

GCCl raises its own funds from Schools, Corporate Bodies under their Corporate Social Responsibility programmes, and by making direct appeal to individuals through mail. A certified Chartered Accountant audits our accounts each year.

Glimpses of Year 2014-15

1. 767 children were extended education sponsorship.
2. 9,853 people benefitted from our Cancer detection camps/screening programme.
3. 4,02,817 children were covered nationwide under school awareness programme. About 6,042,255 persons were further sensitized through such programmes.
4. 3,655 patients were given home care.
5. 90 patients were given one time financial assistance.
6. 85 persons belonging to the families of cancer patients were given vocational training.
7. 52 camps were held all over India during 2013-14.
8. 34908 patients availed the primary health centre services.

Glimpses of Year 2013-14

1. 746 children were extended education sponsorship.
2. 9,512 people benefitted from our Cancer detection camps/screening programme.
3. 4,02,196 children were covered nationwide under school awareness programme. About 56,00,000 persons were further sensitized through such programmes.
4. 3,655 patients were given home care.
5. 90 patients were given one time financial assistance.
6. 85 persons belonging to the families of cancer patients were given vocational training.
7. 52 camps were held all over India during 2013-14.
8. 36,252 patients availed the primary health centre services.
Myths and Facts Regarding the Cancer

1. **HAIR DYE CAUSES BRAIN CANCER**
   FACT: It has been thought that hair dye caused several different types of cancers like bladder and breast cancer, but there is no evidence of it causing brain tumors. This cancer myth is believed by many Americans.

2. **CELL PHONE CAUSES CANCER**
   FACT: Cell phones are not believed to be a cause of cancer. There is no credible study available that consistently proves that using a cell phone has the ability to cause cancer.

3. **CANCER IS GENETIC**
   FACT: While it is true that some cancers are genetic, this does not mean that one will definitely develop cancer because of their heredity. Cancers such as breast cancer, ovarian cancer and colorectal cancer are a few of the cancers that can be passed down genetically. If a child inherits the gene, it only raises the likelihood of developing cancer, not guaranteeing a cancer sentence.

4. **CANCER CAUSES HAIR LOSS**
   FACT: Cancer does not cause hair loss. Hair loss is a side effect of cancer treatments like chemotherapy and radiation therapy.

5. **ONLY WOMEN GET BREAST CANCER**
   FACT: This is by far the biggest cancer myth of all. Men get breast cancer also !! Male breast cancer is uncommon, yet still happens.

6. **CANCER IS ALMOST ALWAYS FATAL**
   FACT: Yes, cancer can cause death. But new breakthroughs in early detection of cancer have made it much more treatable.

7. **WEARING ANTIPERSPIRANTS AND DEODORANTS CAN CAUSE CANCER**
   FACT: According to the National Cancer Society, there is no conclusive evidence from recent studies that wearing them can cause breast cancer. This cancer myth is by far one of the most popular among women.

8. **SOME TYPES OF CANCER CAN BE CONTAGIOUS**
   FACT: No type of cancer is contagious except HPV and Hepatitis C that can cause Cervical cancer and liver cancer. Both viruses can be transmitted through unprotected sexual intercourse, although Hepatitis C is more often transmitted through blood to blood contact such as sharing needles and transfusions.

9. **POSITIVE THINKING WILL CURE CANCER**
   FACT: While maintaining a positive outlook during cancer treatment is essential, it will not cure cancer. Being optimistic helps with the quality of life during treatment. There is no scientific evidence that a positive attitude will cure cancer.

10. **DESIGNER LIPSTICKS CONTAIN LEAD THAT CAUSE CANCER**
    FACT: It is not true, there is no brand of lipstick that can cause cancer. Cosmetics are regulated by the FDA and in turn, would not allow dangerous amounts of lead into a product. Most lipsticks do not contain any lead.

11. **IT IS BETTER NOT TO KNOW THAT YOU HAVE CANCER**
    FACT: Many people are tempted to ignore worrying symptoms or signs such as a breast lump, because they don’t want to know they have cancer. There may be a subconscious feeling that if you ignore it for long enough it will go away. But this is not the
case. Modern treatments mean that, usually, the earlier the cancer is diagnosed, the more effective the treatment and the greater the chance of a cure.

12. CANCER SPREADS LIKE WILD FIRE

FACT: Only a few cancers like lung cancer, melanoma (an uncommon skin cancer) and a typical leukaemia spread fast. Many cancers grow slow with warning signals, leaving ample time for diagnosis, with the available methods.

(Source: Internet)

SOME OF THE INTERESTING FACTS REGARDING CANCER ARE:

1. There are more than 200 types of cancers; any part of the body can be affected. (source: www.macmillan.org.uk)

2. Taller women are more likely to get cancer. (source: www.theguardian.com)

3. Red wine kills cancer cells. (source: www.phys.org)

4. The lack of physical activity is one of the leading cause of preventable death worldwide. (source: www.cancer.gov)

5. A single cigarette contains over 4,800 chemicals, 69 of which are known to cause cancer. (source: www.oxygen.org.au)

6. Those who sleep less than 6 hrs a night are more likely to develop colon cancer than those who sleep more. (source: www.webmd.com)

7. Low fat diet can improve outcomes for Breast Cancer patients. (source: http://envirocancer.cornell.edu)

8. About 70% of all cancer deaths occur in low and middle income countries. (source: www.cugh.org)

9. Approximately 77% of all cancers are diagnosed in people who are 55 yrs old or older. (source: www.ncbi.nlm.nih.gov)

10. Some of the known cancer survivors are:

a) Nelson Mandela

Political personality and Noble Peace Prize winner Nelson Mandela was diagnosed with microscopic prostate cancer in 2001, after he was released from prison. He underwent a seven week radiation therapy and successfully fought the disease. It was he who was instrumental in ending the apartheid regime in South Africa.

b) Tom Green

The famous Canadian actor, comedian and rapper Tom Green is the host of the MTV show titled The Tom Green Show. In 2000, thunderbolt struck his fate and he was diagnosed with testicular cancer. But nothing can dampen this man's spirits. In perhaps the first ever and very unique show which he directed, was aired on MTV showing the documentary The Tom Green Cancer Special, which not only tracked the whole cancer story of Tom but also included the graphic footage of his own cancer surgery. Besides, he also supported cancer research by way of starting the Tom Green's Nuts Cancer Fund. He later emerged as a cancer survivor and also took to making students aware of testicular cancer.

c) Robert DeNiro

At the age of sixty, the famous Oscar winning Hollywood actor, Robert DeNiro was diagnosed with prostate cancer. But age is no bar to gather all strength and fight something... and so the actor was determined to get cured. The six times Oscar nominated actor had to face many treatment sessions after which he emerged out victorious as a cancer survivor.

d) Kylie Minogue

Kylie Minogue is a multi talented Australian songwriter, actress and singer. She was diagnosed with breast cancer at the age of 36 years in 2005. She underwent rigorous chemotherapy and even braved many radiotherapy sessions. She is an icon for all the women across the globe who have started becoming aware of this disease and getting their regular check-ups done, a phenomenon termed as the “Kylie Effect”!!
e) Lisa Ray

In 2009 Lisa Ray was diagnosed with multiple myeloma, a very rare form of cancer where in the white blood cells, that are called plasma cells gets affected and in turn weaken the immunity in the body. She had to undergo stem cells transplantation. Although the disease she has is incurable, yet she decided to bravely face her fate and move on. After her treatment she came back to her glamour career. She proved it to the world that nothing can beat you if you wish to win!!

f) Yuvraj Singh

Yuvraj Singh had everything working perfectly with the World Cup 2011 victory and being awarded the title of Player of the Tournament when fate suddenly frowned on him and he was diagnosed with cancer. He flew to Indianapolis for his treatment. His fans across the globe, deep in shock prayed and waited in silence for his recovery. He put up a brave fight against the life threatening disease and emerged out victorious. He regained his health and came back to the game with even more determination. Currently he follows a strict, healthy and rigorous training schedule and has written his autobiography titled – “The Test of My Life: From Cricket to Cancer and Back”. Yuvraj is the epitome of inspiration and true encouragement for all his fans.

g) Manisha Koirala

Manisha Koirala left the nation shocked when she was detected with ovarian cancer after which she had to undergo a treatment in New York. She never felt shy in talking about her disease and the subsequent recovery. She even posted the pictures which shows her with a tonsured head after her chemotherapy sessions. Being cancer-free was a new life for her and she has actively spread awareness about cancer and is now the United Nations Goodwill Ambassador.

h) Christina Applegate

Christina Applegate suffered a setback after being detected with breast cancer. She was a famous face of the American television shows right since her teenage years. Fortunately for her, the breast cancer was detected in a very early stage. Her mother too had been a breast cancer survivor. Christina underwent proper treatment of radiation and breast removal after which she got herself rid of the cancer and staged a comeback to her career. She actively participated in breast cancer awareness programmes thereafter.

i) Barbara Mori

The Uruguay-Mexican model turned actress, Barbara Mori was a huge sensation in India when she played the lead role in Bollywood movie. But little did her fans know back then that she was a cancer survivor. Diagnosed with cancer in quite an early stage but it was shocking for her, nevertheless. After her successful treatment and recovery she announced in 2010 about a short documentary film by Namrata Singh Gujral titled – “1 a Minute” wherein she had been cast along with many other celebrity cancer survivors. The film was an inspiration for many patients and a medium of awareness for others.

j) Lance Armstrong

This man needs absolutely no introduction. The record seven times winner of the Tour De France American biking champion, Lance Armstrong was detected with cancer at a tender age of 25 years. Unfortunately, when diagnosed with testicular cancer, it was already in its third stage. Though the doctors claimed that he had less than 40% chances of survival, Lance Armstrong never let his spirits down. The cancer had spread to his lungs but he bravely faced the chemotherapy sessions in Indianapolis. After his treatment, his organization after his name, Lance Armstrong is the LIVESTRONG helps cancer patients put up a strong fight against the deadly disease.
References


Facilities Provided by Government to the Cancer Patients

Patient Welfare Services

A patient can avail himself/herself of one of several schemes to alleviate some of the financial burden he/she may have to bear during the course of treatment.

Some of the schemes provided by Central and State government are following:

SCHEMES COME UNDER CENTRAL GOVERNMENT.

1. Prime Minister’s National Relief Fund (PMNRF): Patients belonging to low socio-economic status get financial aid from PMNRF for treatment. The maximum amount sanctioned for an individual patient is Rs. 2,00,000/-. To avail himself of the grant, the patient has to apply with his family income certificate issued by the Tahsildar, of resident district, a passport size photo, application in English and an expenditure certificate from the treating doctor. These documents have to be forwarded by the patient to the Prime Minister’s Office through the Member of Parliament before the completion of treatment. Expenditure incurred after the receipt of application in PM Office only will be considered. Reimbursement for prior treatment is not admissible under this scheme.

2. Rashtriya Arogya Nidhi (RAN) (under Health Ministers’ Cancer Patient Fund): This scheme provides financial aid for specific investigations and treatments. Eligible amount for one patient is Rs. 1,50,000/-. The Government of India has provided a scale for each state - rural and urban area. The patient has to provide an original income certificate in English from the Tahsildar of resident district. The amount can be utilised only for surgery, chemotherapy medicines, radiology scans and IP care. Reimbursement is not admissible under this scheme.

3. Health Minister’s Cancer Patient Fund: An amount of Rs. 11.40 crore has been released so far during last 3 years to the cancer patients under the Health Minister’s Cancer Patient Fund within Rashtriya Arogya Nidhi (RAN). The financial assistance upto Rs. One lakh to the cancer patients is provided by the Regional Cancer Centres/ Government Hospitals concerned through the revolving Fund placed at their disposal. The cases of financial assistance above Rs one lakh are referred by the Hospitals to the Ministry of Health & Family Welfare for providing funds from the Central Funds. Financial assistance is provided to the patients, below poverty line, suffering from cancer and undergoing treatment in Government Hospitals and any of the 27 Regional Cancer Centres.

SCHEMES COME UNDER STATE GOVERNMENT

1. Mukh Mantri Punjab Cancer Raahat Kosh Scheme (MMPCRKS) is a special scheme which is meant for cancer and all terminal diseases patients in Punjab. Cashless facility for cancer patients has also been given.

2. Haryana government has decided to provide free travel facility to cancer patients in state roadways buses.

3. Jeevandai Aarogya Yojna (JAY) in Maharashtra which provides Rs. 1,50,000/- to cancer patients for the treatment of cancer basically for persons who are living under BPL.

4. Aarogyasri Health Insurance Scheme for Cancer patients in Andhra Pradesh and Rajiv Aarogyasri Health Insurance Scheme is also there for cancer patients.

5. Delhi Arogya Nidhi (DAN): It is a scheme to provide financial assistance upto Rs. 1.5 Lacs to needy patients who has National Food Security Card for treatment of diseases in Govt. Hospitals only.

6. Cancer Suraksha Scheme (Government of Kerala): Cancer patients up to the age of 18 years in the BPL/APL groups are eligible to be included in this scheme and can avail of totally free treatment. All expenditure for investigations and treatment
will be met from this scheme. Those patients who are yet to complete 18 years of age and need treatment are eligible for the benefit for one more year. To be included in this scheme a confirmed diagnosis of cancer is a must. Those patients who avail of pay ward facility and are eligible for medical re-imbursement from other sources or have medical insurance are not eligible for this scheme. This scheme is applicable only to patients from Kerala.

7. **Thaalolam (Government of Kerala):** Children below 18 years of age are eligible. This scheme is applicable to patients belonging to families too poor to afford treatment irrespective of BPL/APL category. Maximum assistance given under this scheme is Rs. 50,000/- for diseases other than cancer which are lethal or fatal.

8. **Comprehensive Health Care Programme for Scheduled Tribes (Government of Kerala):** The patient should bring a copy of tribal certificate from village officer / tribal Officer. A patient in this category is eligible for full free treatment, including food and travelling expenses for himself. In one day, an APL patient is eligible for treatment worth Rs. 10,000/- and BPL patient for Rs. 50,000/-. 

9. **Financial aid from the Society for the Poor (Government of Kerala):** Cancer patients from low socio-economic backgrounds are helped by paying Rs. 10,000/- for their treatment. Patients on receiving sanction letter from the Government have to report to the hospital with their hospital bills and sanctioning letter. Patients have to apply on a separate application form for this.

10. **CHIS (Comprehensive Health Insurance Scheme) PLUS (Govt. of Kerala):** On production of the health card if the patient belongs to BPL category, he or she is eligible for a maximum of Rs. 70,000/- cashless treatment or for whatever amount is left in the credit.

**MISCELLANEOUS**

1. **ECHS (Ex-Servicemen Contributory Health Scheme):** Applicable for Ex-Service men and their dependents. Patients can report directly from Poly Clinics - Trivandrum, Nagercoil, Tirunelveli, Tuticorin, Kollam, Pathanamthitta, Alappuzha, Kottayam, Ernakulam and Trichur. From other districts patients are routed through Trivandrum/INHS Sanjeevani. Patients have to bring 2 reference letters and identity card. This is valid for one month. If the patient stays in the hospital for more than 12, 30 & 60 days and if the treatment cost exceeds Rs 2 lakh, separate sanction has to be obtained in the forms. Patient is eligible for pay wards on the basis of defined criteria.

2. **Central Government Health Scheme (CGHS):** Applicable for retired Central Government employees and dependents. Every month a reference letter from CGHS local clinics should be produced.

3. **Employees' State Insurance (ESI):** The patient has to produce two reference letters from the ESI Hospital along with eligibility and identity certificate. The reference letter is valid for 6 months (January to June and July to December). Expenditure certificate must be issued from the hospital. All facilities are provided on credit basis. Patients are not eligible for pay wards. Every June and December, these initial formalities have to be repeated.

4. **Employees of Indian Railways** - Railway employees and their dependents are eligible. Every month a new reference letter has to be produced. Report with reference letter from Southern Railway. Credit is for one month. There is no income limit. Rs. 70/- per day will be charged for general ward patients. Not eligible for pay ward.

5. **Railway concession for cancer patient and one bystander:** Travel for the patient is totally free. The bystander has to pay only 25% of the actual II class fare. This concession is applicable only for travel from nearest hometown station to RCC and back. If referred to another centre, concession is issued to that place.

6. **Air concession for cancer patient:** Patient has to pay 50% of the actual charge. This concession is applicable only from nearest hometown airport to RCC and back. If referred to other centre, concession is issued to that place also.

7. **“Revolving Fund”** which is basically for cancer and all terminally ill patients in Jammu and Kashmir.

8. **“Magic Bullet”** to be given free to the cancer patients (Imatinib) in Rajasthan. Currently the tablet is sold in the market by Novartis at a cost of Rs 1.23 lakh per packet which contains 30 tablets. Blood cancer (chronic myeloid leukemia) patients are required to take one tablet each day for the rest
of their life. Now under the chief minister’s Free Medicine scheme, the state will provide a generic version of the tablet free of cost to cancer patients.

9. **Employees of Vikram Sarabhai Space Centre (VSSC)** - VSSC employees, both in service and retired, and their dependents are eligible. Report with reference letter from VSSC. There is no income limit. Eligible for pay ward.

10. **Union Territory Health Welfare Fund**: Patients from Union Territory are eligible for 70% of total treatment expenditure. The hospital must receive a sanction from the Union Territory. Once we receive the sanction, we open credit for treatment. The remaining expenditure is collected on individual bill basis.

**Regional Cancer Centre Welfare (RCC)**

a) **Free food scheme** Below poverty line (BPL) patients who are admitted in the ward are provided free food. Vegetarian food is provided three times a day and tea/coffee with snacks is provided twice. This scheme functions with the help of contributions from well-wishers. All ‘F’ Category patients and those patients in borderline income group if recommended by ward sister are eligible for this scheme.

b) A Free Medicine Bank is open on every working day between 11.30 AM and 1.30 PM on the 6th floor of A Block. The bank is run on the basis of contributions in the form of money or medicines from individuals or groups. NGOs also take up active role in the functioning of drugs bank. First-line and second line chemotherapy, antibiotics, disposables and supportive medicines are issued free of cost individual / group make contribution - by cash/ by medicine.

(Source : Google)
From the Almanac of Cancer Survivors

**A SURVIVOR FROM DELHI**

**ACCEPTANCE AND NON-ENDING BATTLE**

What was my fault? Why I have to undergo all this?

I was leading a smooth healthy normal life when at the age of 52, for the first time I came to know about my illness. These questions were on my mind, when I came to know about my illness in December 1999. It was painful, disturbing, non-ending, unexpected, sleepless; in short it was the worst nightmare of my life. It was difficult to accept that I was suffering from a silent but fast disease of Cancer.

**CONFRONTING CANCER WITH CALM**

I can’t forget the morning of 1999 – December when I discovered the tumor in my right breast. I was doubtful, so took the appointment from the doctor. Doctor confirmed me of breast cancer. Tests, mammography and treatment started. It was depressing rather disturbing in the beginning and turmoil which I was going through was unbearable. Continuous pricking and 24 sessions of radiation and 6 sittings of chemotherapy – it all happened. My hair disappeared from my head, which used to give me spondylitis for my heavy hair (the only disease which I used to have till the age of 52). The treatment was very painful and expensive (eating up our earnings and savings). And the removal of one breast as cancer was detected at the 3rd stage. The treatment continued for five years. But there was no guarantee whether it can revisit my body. The treatment had side effects and after effects.

**NIGHTMARE VISITED ME AGAIN**

In March 2008, I discovered bleeding from uterus and it prolonged for one and half month. I again consulted the doctor and after her diagnosis came to know about the uterus cancer. It was another blow from the destiny. After confirmation and consultation the uterus was removed in 2008. It was an early detection and was not spreaded all over the body.

Then removal of ovaries and appendicitis disturbed my daily routine. Taking 14 to 15 tablets daily, then injections and pain all over my body --- literally went through turmoil. It was a silent but fast disease, which was working swiftly in my body.

**SHADOWS OF CANCER**

Once again in 2010 I consulted doctor regarding the pain in my left breast. Mammography was done and doctor confirmed the cancer in my breast. Early detection made me less vulnerable and only surgery was done to remove the clot in my breast. This time -- no chemo, no radiation – only surgery. I am living with one breast and still don’t know whether cancer can visit me again.

**LEARNING TO LET GO**

In 2012 stone was detected in gall bladder. And then bladder was removed. My immune system didn’t work properly. And the digestive system failed.

Presently in 2015 at the age of 66, doctor is apprehended about a spot in breast again. MRI has to be done. And then procedure will start again.

**PRAISE THE LORD**

In this painful journey what I would like to share with you all – that while going through all this turmoil—my doctor, my husband, my kids, my friends, my relatives—all stood by me to face this. I have learnt to stare at atrocities in the face, to pluck up courage and optimism in bad times. They gave me strength to face the hard core realities of life and about this disease. There was faith, hope and trust for my God and doctor which led me to fight this battle with a smile. I am surviving with two kids and a husband who supported me in every thick and thin of my life. I am living with a hope that one day I will be disease free and will lead a healthy, normal life once again. Earlier it was very difficult for me to accept this but slowly, gradually I have accepted the reality. It’s a non-ending battle of my life. Basically, early detection, awareness and positive attitude matters a lot. I am able to survive just because I got the support and co-operation from everybody around me.

**A SURVIVOR FROM FARIDABAD**

As a human being I was not ready to face all this when it came to me. “My first bout with cancer was in early 2013 when I felt ulcers on my tongue. I made it through treatment successfully, finished up in October 2013, and was very relieved to have that chapter of my life behind me.”
I am Babita Bhadana from Nangla village – Faridabad, 33 yrs old now, working with an Aangan wadi as helper, surviving with three kids and husband. It all started with some painful blisters on my tongue. I felt pain in my tongue and was not able to digest or swallow anything. Color of my tongue was changed to light pink and then I consulted an ENT specialist in Faridabad only. And then he prescribed me some medicines; those medicines did not suit me and I got swelling all over my body. And then doctor got suspicious, even at the initial test he knew something was wrong. He recommended me some tests.

I was just 31 yrs when cancer attacked our lives and was not ready to take the blow. The tests were to be done at AIIMS. When they did the biopsy on my tongue, it was like a living nightmare. Doctor did not give anesthesia and took the sample of that ulcer.

I was diagnosed to have IV stage oral cancer. It was totally beyond my expectation and control. No one can ever understand what I was going through. Cancer entered into our lives.

I wanted to ask the God why me after all? And then I accepted the harsh reality that now I have to deal with this disease. The treatment was very costly and painful; so my parents and my brother took the initiative and helped me a lot – mentally, physically and financially. Then we decided to go to FORTIS – Gurgaon. Here, I got the treatment with patience, care and affection. For six months, I have been treated and now got cured.

I have gone through sessions of chemotherapy and radiation. As the side effects of radiation and chemotherapy treatment, I have lost taste buds and don’t feel any taste for anything. Doctor says that taste buds will develop gradually.

Now I have been cured and on medicines only, have to visit doctor once in three months for follow up treatment. As per doctor, the cancer can come again. Extra precautions have to be taken regarding oral hygiene and nutritional diet should be taken. And it is very clear that this cancer will not travel to the next generation. I am quite hopeful that cancer will not occur again as I will take the nutritional diet and look after the oral hygiene of my mouth.

Today, both the survivors feel great, as they have crossed this tormentous stage. And now they can bravely say that “We are the cancer survivors with a difference as we took this disease in a positive manner. In the starting we were doubtful that we would be able to survive or not but with the passage of time and with due medication, hope and care; we have surpassed this ordeal. Our families have kept us strong, especially during the treatment. All we want to say that faith helped us to get through, and we are thankful to feel as healthy as we did before the treatment.”

They both are the epitome of patience, courage and source of inspiration for others.

Cancer Survivors
BLOOD TEST TO HELP DETECT EYE CANCER IN CHILDREN

Researchers identified Molecules In Patients' Blood Which Can Detect Retinoblastoma

A simple blood test might soon help detect eye cancer in children below the age of five. Early diagnosis helps save the eye through radiotherapy and chemotherapy, but the eye has to be removed if diagnosed late.

Researchers at Sankara Nethralaya have identified micro RNAs (biomolecules) present in the blood of patients with retinoblastoma, a cancer tumour of the retina and the most common cancer of the eye in children. Using the identified micro RNA, they have developed a prototype 'point of care' device that can specifically detect patients with retinoblastoma.

With the device, scientists have conducted a pilot study in which 20 blood samples of children with retinoblastoma and that of 10 normal children were tested. A scientist at Vision Research Foundation of Sankara Nethralaya said that they were able to confirm a specific type of micro RNA in all the blood samples from retinoblastoma patients but not in the normal group.

They also identified a set of other micro RNAs which are present even in normal people, but found at elevated levels in patients with retinoblastoma. Ocular pathology department head Dr. S Krishnakumar said that the device would be useful in monitoring patients before and after therapy.

The incidence of retinoblastoma in the country is 2,000 a year. Sankara Nethralaya treats about 70 cases every year. At present, the cancer is detected only through examination by ophthalmologists or through scans. Doctors said that many children get medical assistance at a late stage.

Ophthalmologist Dr. Vikas Khetan said that 60% of retinoblastoma cases are unilateral, which affects one eye and, within that, 15% are genetic, while the patient has a family history. All of the 40% of cases that are bilateral, where the cancer affects both eyes, are heritable.

Tumours with genetic involvement can be continuously monitored for development of other cancers. Usually when a patient is diagnosed at an extreme stage of the disease, the affected eye is removed. If both the eyes are affected, doctors provide chemotherapy to shrink the tumour and save the life of the child.

With results from the pilot study, the project funded by the department of biotechnology and done in collaboration with PSG College, Coimbatore and Achira Laboratories, Bengaluru will soon have scientists conducting a study with a larger population in the country to validate the device.

(Source : Times Of India – 15/4/15)

HAVE BROCCOLI SPROUT EXTRACT TO PREVENT CANCER

Research suggests cruciferous vegetables such as broccoli, cabbage and garden cress have a high concentration of sulforaphane that can neutralise the effects of environmental carcinogens.

(Source : Hindustan Times 21/4/2015)

THROAT AND MOUTH CANCER COULD SOON BE DETECTED ON YOUR BREATH

Thanks to new technology being developed by Swiss scientists and already tested on patients, blowing into a portable apparatus equipped with sensors will allow for the detection of certain cancers of the head and neck, such as throat and mouth.

(Source : Hindustan Times 20/4/2015)

NOW, A SIMPLE BLOOD TEST CAN PREDICT FUTURE RISK OF BREAST CANCER

While a mammography can detect newly developed breast cancer with a sensitivity of 75%, the new metabolic blood profile is able to predict the likelihood of a woman developing breast cancer within the next 2 to 5 years with a sensitivity of 80%.

(Source : Hindustan Times 16/4/2015)
TOM HANKS' WIFE HAD DOUBLE MASTECTOMY: PEOPLE MAGAZINE

Rita Wilson, wife of Hollywood star Tom Hanks, revealed that she had a double mastectomy following a breast cancer diagnosis, People Magazine reported on Tuesday.

(Source: Hindustan Times 15/4/2015)

NOT JUST A SPICE, SAFFRON POSSESSES ANTI-CANCER PROPERTIES TOO: RESEARCHER

Saffron, world’s costliest spice, famous for dyeing and flavouring has anti-cancer properties, a young researcher from Kashmir claimed while presenting a paper at an international conference on stem cell transplantation at Barkatullah University in Bhopal on Monday.

(Source: Hindustan Times 14/4/2015)

AUSTRALIA PAYS TRIBUTE TO CRICKET LEGEND RICHIE BENAUD

Flags at the Sydney Cricket Ground flew at half-mast as tributes poured in for former Australia cricket captain and pioneering television commentator, Richie Benaud. 84-year-old Benaud, considered one of the most influential cricket identities of the past century, had been fighting skin cancer and died overnight in a Sydney hospice, with his wife, Daphne, and other family members by his side. Planning has begun for a state funeral which has been offered to his family. A veteran of 63 test matches, Benaud played a pivotal role in the formation of World Series Cricket in the 1970s and was one of the world’s most recognised commentators, in Australia where he anchored the Nine Network’s cricket coverage for decades, and in Britain.

(Source: Hindustan Times 10/4/2015)

TAYLOR SWIFT'S MOTHER DIAGNOSED WITH CANCER

Popular singer Taylor Swift took to social media to share the news of her mother’s illness. Her mother Andrea Swift has been diagnosed with cancer.

(Source: Hindustan Times 10/4/2015)

RICHIE BENAUD, THE VOICE OF CRICKET, DIES AFTER BATTLING CANCER

Within hours of his death on Friday, former Australia cricket captain and pioneering television commentator Richie Benaud was described as a "national treasure" and praised by his peers, current players and the country’s prime minister.

(Source: Hindustan Times 10/4/2015)

LIQUID BIOPSY BEING TESTED IN US MAY BE A BOON FOR CANCER PATIENTS

In the usual cancer biopsy, a surgeon cuts out a piece of the patient’s tumor; but researchers in US labs are now testing a potentially transformative innovation. They call it the liquid biopsy, and it is a blood test that has only recently become feasible with the latest techniques. It is showing promise in finding tiny snippets of cancer DNA in a patient’s blood.

The hope is that a simple blood draw – far less onerous for patients than a traditional biopsy or a CT scan – will enable oncologists to figure out if a treatment is working and to continue monitoring the treatment in case the cancer develops resistance. Failing treatments could be abandoned quickly. “This could change the way we follow up response to treatments, and down the line could even be used for really early diagnosis,” said Dr. Jose Baselga of Memorial Sloan Kettering Cancer Center.

Researchers caution that more evaluations of the liquid biopsy's accuracy and reliability are needed. So far, there have been only small studies in particular cancers, including lung, colon and blood cancer. But early results are encouraging. A National Cancer Institute study published in The Lancet Oncology, involving 126 patients with the most common form of lymphoma, found the test predicted re-occurrences more than three months before they were noticeable on CT scans. The test also identified patients unlikely to respond to therapy.

Oncologists who are not using the new test say they are looking on with fascination. “Our lab doesn’t do it, but we are very interested,” said Dr. Levi Garraway of the Dana Farber Cancer Institute.

Mary Susan Sabini, a teacher from Gardiner, NY, has lung cancer that resisted two attempts at chemotherapy and a round of radiation. Her doctors at Sloan Kettering saw cancer DNA in her blood when she began taking an
experimental drug in October.

Four days later, the cancer DNA shards had vanished, a sign, doctors hoped, that the treatment was working. But they dared not tell her the good tidings. The blood test was so new that they were afraid to rely on it. Within weeks, Sabini began to breathe easier. Months later, she had a CT scan, an X-ray test that uses a computer to assemble detailed images of slices of tumor tissue. It confirmed her tumors were shrinking. The idea for the test grew out of a discovery made years ago about fetuses. They shed little pieces of DNA into the bloodstream of mothers-to-be. It turned out that all growing cells, including tumors, shed tiny DNA fragments.

(Source: Times Of India 21/4/2015)

NOT BAD LUCK, LIFESTYLE CAUSES CANCER
INDIAN DOCS SAY RATE OF DISEASE IN COUNTRY VERY LOW IN COMPARISON TO WEST

American scientists recently stirred a hornet’s nest by linking bad luck to the occurrence of cancer, but Indian oncologists would rather turn the equation on its head to say that people in India would find luck on their side as far as the disease is concerned.

Doctors tout two reasons. First, most cancers here are linked to lifestyle and environment, say doctors, and have little to do with bad luck. It means malignancies could be prevented to an extent. The food we eat, the air we breathe and the choices we make—be it to smoke, drink alcohol or not exercise regularly—are more linked to our chances of getting cancer. “Tobacco is the cause for 40-50% of cancers in India,” said Dr. S.D. Banavali who heads medicinal oncology in Tata Memorial Hospital in Parel.

Second, as Tata Memorial Hospital director Dr. Rajendra Badwe says, the rate of cancers in India is very low in comparison to the West. “The incidence of cancer is 90 per 1,00,000 in rural India. The West, on the other hand, has a rate of 350 per 1,00,000,” he said.

The happy picture gets when one considers that India’s population is so high that even a low cancer rate means a high number of patients. As World Cancer Day on 4th February, the fact is that 10 lakh Indians get diagnosed with cancer every year while seven lakh others succumb to it.

Cancer surgeon Pankaj Chaturvedi said, “By blaming genes, we cannot suppress the fact that the majority of cancers are caused by industry, ditto with the fast food industry that is making us obese and thus increasing the risk of cancer.”

Theories about the exact reasons for cancer and why it affects certain people and not others has eluded scientists. Genetic reasons hold true only for around 5% of all cancers. The most heart-wrenching cancers—read pediatric cancers—account for only 3% of the total incidence. Moreover, what about cases in which a woman teacher, who has never smoked or chewed tobacco, gets oral cancer or a young father gets brain cancer? There seems to be no common thread linking all cancers.

In this backdrop, when on January 1, renowned scientists Bert Vogelstein and Christian Tomasetti from Johns Hopkins University in the US mentioned “random bad luck” in their paper on cancer epidemiology, it made headlines across the world.

The University of Oxford has, since 2011, been studying why cancer rates in India while lower than in the west, are suddenly rising. “It is our Indian diet (rich in fibre) that has prevented colon cancer”, said Dr. Badwe.

(Source: Times Of India 29/1/2015)

NEW TEST CAN SPOT CANCER 13 YRS BEFORE IT HITS

Scientists have developed a new test that can predict with 100% accuracy whether someone will develop cancer up to 13 yrs in the future. The discovery of tiny but significant changes taking place in the body more than a decade before cancer was diagnosed helped researchers at Harvard and Northwestern University make the breakthrough.

Their research, published in the online journal Ebiomendicine, found protective caps on the ends of chromosomes, which prevent DNA damage were more worn down among those who went on to develop cancer. Known as telomeres, these were much shorter than they should have been and continued to get shorter until around four years before the cancer developed, when they suddenly stopped shrinking.

“Because we saw a strong relationship in the pattern across a wide variety of cancers, with the right testing these procedures could be used eventually to diagnose a wide variety of cancers,” said Dr. Lifang Hou, the lead study author, told The Telegraph. “Understanding this pattern of telomere growth may mean it can be a predictive biomarker for cancer... We found cancer has
hijacked the telomere shortening in order to flourish in the body.” Though many people may not want to know that they will develop cancer in the future, it could allow them to make lifestyle changes to lower their risk. Stanford University is also working on a project looking at how telomeres can be regrown.

Because cancer cells divide and grow rapidly, scientists would expect the cell would get so short it would self-destruct. But that’s not what happens, scientists discovered. “We found cancer has hijacked the telomere shortening in order to flourish in the body,” added Hou. The team is hoping that if it can identify how cancer hijacks the cell, then methods could be developed to cause cancer cells to self destruct without harming healthy cells.

(Source : Times Of India 2/5/2015)

CANCER NO. 2 KILLER AFTER HEART DISEASE

Cancer is the second biggest killer in India after heart disease, with stomach, liver and oesophageal cancers accounting for the maximum number of deaths in the country, a new global study has found.

According to the Global Burden of Cancer report published in leading medical journal JAMA Oncology, India had more than 1.17 million new cancer cases and 675,000 deaths in 2013, up from 624,000 cancer cases and 426,000 deaths in 1990.

“Most cancers are diagnosed in advanced stages (stage 3 and 4) in India, which means people seek treatment late and are more likely to die,” said study co-author said Dr. Lalit Dandona, professor, Public Health Foundation of India and the University Of Washington, Seattle.

“Symptoms of cancers such as that of the stomach – India’s number one killer – are generalized, so diagnosis is often missed.”

The report – based on an analysis of 28 cancer groups across 188 countries – also found that worldwide close to 15 million people were diagnosed with cancer, with 8.2 million deaths in 2013.

India has the highest number of mouth cancer cases, with new cases doubling between 1990 and 2013 to 84,700 from 34,000.

Breast cancer was the biggest cause of deaths among women in India while lung cancer claimed the lives of most men in the country. Lung Cancer – linked with smoking – was the leading cause cancer deaths among men and women globally, but ranked eighth among Indian women, who have lower smoking rates. “More cases and deaths in India and the world are in part due to rising populations and ageing, and part due to a combination of lifestyle, environment and genetic factors, but some, like oral cancers, can be directly attributed to cancer use” said Dr. GK Rath, head, Rotary Cancer Institute, All India Institute of Medical Sciences.

India had the most cancers of the mouth, throat and voice with new mouth cancer cases more than doubling between 1990-2013 (up from 55,480 to 1,27,168). During this period, breast cancer among women rose from 57,374 to 154,261.

Among Indian men, stomach cancer cases grew by 33% since 1990, while prostate cancer cases shot up by 220%. New Cervical cancer cases in women grew at 0.2% in the same period, while breast cancer had one of the highest increases at 166%.

Prevention, early diagnosis and treatment can prevent many deaths. “Prevention where possible and early detection are crucial as treatment of late stage cancer is often difficult in less developed settings,” said study co-author Dr Lalit Dandona, professor, Public Health Foundation of India and the University Of Washington, Seattle. Globally, prostate cancer cases rose more than threefold among men between 1990 and 2013 – with 1.4 million new cases and 2,93,000 deaths in 2013. Among women, breast cancer remained the leading cancer. In 2013, there were 1.8 million new cases of breast cancer and 464,000 deaths.

Since 1990, cancers of the colon and rectum have increased 92%, stomach cancer has risen by 23% and liver cancer cases are up by the 70%. “The most effective strategies to address cancer will be tailored to local needs,” said Dr Christopher Murray, director of Institute for Health Metrics and Evaluation at the University of Washington, which led the international research consortium that did the study.

(Source : Hindustan Times 29/5/2015)

CANCER IS A CONSTANT THREAT: DOCTOR

Cancer is a global problem. The disease develops within us due to abnormal cell production and collection of these cells, according to Dr Jamal A Khan, a microbiologist who specializes in dendritic cell therapy
in cancer. He says, “Our body is composed of tiny structural units called cells, and old cells wither to give rise to new ones. The cell production helps in growth and repair and maintains life. The massive rate of cell production also gives rise to a small number of abnormal cells that need identification and elimination for the body to carry on with its normal functions. Our immune system identifies the abnormal (cancerous) cells and crushes them out of the system. Each day we face a potential cancer threat but do not develop it, thanks to our immune system. A person turns into a cancer patient when his/her immune system has primarily failed in identifying a cancer cell and has allowed it to multiply till it forms a detectable tumour. The cancer causes significant damage by the time it produces identifiable symptoms. In a developing world, most patients are diagnosed at stage IV of the disease, meaning the cancer has already spread to another distant organ. A stage I is a small and just detectable lesion with no signs of it spreading. Stage II and III come in between as the cancer progresses. Whatever may be the stage of cancer, treatment cannot assure cure. The treatment helps in clearing cancer cells, but cannot stop the defect in cancer cell production. As a result of which, cancer can relapse.”

“The conventional treatment of surgery, chemotherapy and radiation is done only for cancer and not to revive sleeping immunology. No drug can bring about this change either. Dendritic cells (DC) are the master cells of the immune system. They help in identifying an object (mutation/cancer cells) as dangerous and create a large pool of soldier cells (T cells) to combat it. Their discovery has added a new dimension to cancer treatment, which comes under the heading of cancer immunotherapy. It is primarily the lack in either their number or their complete absence that determines the fate of cancer patient. The DC can be made to order in the lab. When we know the cancer, it is easy to develop DC accordingly. This additional treatment helps patients achieve long periods of remission. Being made from the patient’s own cells, it is a non-toxic way of treating cancers. We have been doing DC therapy for a decade now,” adds Dr Khan, who introduced this treatment in India ten years ago. He has published articles on dendritic cell therapy, is a member of ASCO and AACR, and has presented his work at various national and international conferences, including the NIH, US. He is also the recipient of some social awards in India.

(Source : Times Of India 6/6/2015)

‘40 PER CENT CANCER DEATHS IN INDIA DUE TO TOBACCO’

As many as 40 per cent of cancer deaths in India are due to tobacco use and India accounts for the largest number of oral cancer cases in the world.

This was revealed at the public education programmes on effects of tobacco use, organised on the occasion of World No Tobacco Day at JIPMER here on Sunday. May 31 of every year is observed globally as the World No Tobacco Day, highlighting the health risks associated with tobacco use and advocating effective policies to reduce tobacco use. JIPMER hospital observed the day by conducting public education programmes on effects of tobacco use, health related risks, effects of passive smoking, better ways to quit smoking and to adopt a healthy life style.

The health education pamphlets were distributed. During the occasion, videos on tobacco effects and health risks were played in the outpatient departments and wards.

This year, the theme is ‘Stop illicit trade of tobacco products’ and the medico-social services wing made exclusively designed pamphlets and distributed to the petty shops around JIPMER campus emphasising the responsibility of shop owners in preventing tobacco abuse and related issues.

(Source : Indian Express 1/6/2015)

CANCER HIDING IN YOUR HOME?

CHEMICALS IN TOOTHPASTES TOO HAVE ILL-EFFECTS: STUDY

28-Nation Study flags Common Drugs, Chemicals

A staggering range of commonly used chemicals – from insecticides to plastic additives to some common medications – used even in very low quantities are likely to cause cancer.

This was the conclusion reached by a massive study involving 174 scientists from 28 countries – including India – who researched the chemical actions of these chemicals. The study says that it is possible the combined effect of many of these working simultaneously may further enhance the risk of cancers developing.
This is the first study of its kind that investigated cancer causing pathways of common chemicals otherwise not known to be carcinogenic, that is, cancer causing. The researchers investigated 85 chemicals for their effect on 11 essential features that define cancer. Of them, 50 were found to have a low dose effect on cancer causing features, called 'hallmarks of cancer'.

Another 13 had a threshold dose beyond which they started having cancer generating effects. Put together, these dangerous made up nearly three quarters (74%) of the chemicals studied.

The remaining 22 chemicals were not found to have any known effects. Some commonly used chemicals discovered to have potential to cause cancer include popular insecticides, fungicides, pesticides, additives to plastic, PVC and polycarbonate products like food containers and water bottles, biocides used in paints and cosmetics, some commonly used drugs like Phenobarbital and acetaminophen, flame retardants used in paints, construction material, aircraft, and stain repellents used in fabrics and carpets.

“'The idea was to try and avoid chemicals that are known to cause cancer but to focus on everyday chemicals from pesticides, herbicides, BPA in plastics, phthalate, etc. and to look for evidence (from literature) on perturbation on any one of the hallmarks of cancer," Hemad Yasaei, professor at Brunel University, London, and one of the co-authors, told TOI.

The research only shows that there is a possibility that these chemicals may cause cancer once accumulated in the body, Yasaei clarified.

"We are not claiming that these compounds listed in this review are causing cancer. We are hypothesizing that they may have the possibility to initiate cancer when aggregated in the body at low doses. Further research is needed to prove this hypothesis," he stressed.

Many of these chemicals like BPA (used in plastics) or triclosan, used in toothpaste, are known to have other ill-effects on human health. But their cancer causing potential has come as a surprise to many. The study investigated the chemicals by checking out previous research on how they behave in relation to the so-called hallmarks of cancer.

The paper, published in the cancer journal Carcinogenesis published by Oxford University Press, argues that the dominant global approach towards finding out what causes cancer and what does not suffers from serious limitations because it looks at each chemical separately and asks whether it causes cancer.

Calling the WHO’s International Program for Chemical Safety (IPSC) “highly restrictive”, the paper argues that it is working in collaboration with the International Life Sciences Institute, whose “members comprised largely of major corporate interests from the food and beverage, agricultural, chemical and pharmaceutical Industries”.

(Source : Times Of India 25/6/2015)

LAPAROSCOPIC SURGERY EASY WAY TO TREAT CANCER : DOC

With the advent of minimally invasive procedures, there is relatively less pain and faster recovery as compared to conventional open surgery among patients suffering from various forms of cancer. Many patients and their relatives, who avoided surgery for fear of the immune trauma for their loved ones, are now resorting to laparoscopic cancer treatment (surgery) being offered at Asian Institute of Medical Sciences, Delhi NCR. Dr Shailesh Puntambekar says that this technique is quite effective and offers a high chance of cure. The team at Asian Onco Cancer Laparoscopic team undertake laparoscopic cancer surgery which makes it ideally suited for most patients.

The institute has pioneered in advanced laparoscopic cancer surgery and different procedures are routinely performed there. Commonly performed operations by this method include removal of colon and rectal cancer, cervix and uterus cancer, gastric, gall bladder, pancreatic, kidney and andrenal tumour. “Laparoscopic cancer surgery results in benefits such as less pain, shorter hospital stay, quicker recovery and minimally invasive techniques. Patients who undergo laparoscopic colectomy are discharged from the hospital 1-3 days earlier than patients who undergo open surgery, and can return to their usual activities two weeks after surgery, on an average. The entire surgery is recorded, so it becomes an evidence-based surgery, which helps other doctors. The wound being very small, further treatment like chemotherapy and radiotherapy, if needed, can be offered earlier than open surgery,” the doctor says.

(Source : Times Of India 27/6/2015)

BEAT BACK CANCER WITH KIWIS

There are more than a few reasons to scoop out this fleshy fruit. Now, researchers have identified kiwi as a
fruit that aids in reducing risk of cancer. This is because of its capability of repairing damaged DNA. In a study undertaken by the AUT University of Auckland, New Zealand, researchers found that including 2-3 kiwis in your daily diet, along with healthy meals and regular physical activity can prevent the formation of malignant cells in the body.

The research used peroxide to induce damage in the cells of lab rats, and even though no mechanism was proposed by the researchers, they hinted at the antioxidant properties of kiwis that protected the cells from the peroxide challenge.

Kiwi has also been a prized fruit because of its high concentration of Vitamin C and potassium—both good for overall well-being. Add the juicy fruit to your salads and smoothies or eat them raw to protect yourself from different types of cancers.

Buying Tips: A relatively new entrant to the Indian fruit market, buy the right kind of kiwis to enjoy its goodness. Look for kiwis that are plump and firm, not rock hard. Avoid those which show signs of shrivelling and mould. Don’t buy ones that are too soft as they spoil easily.

(Source: Internet)
A Personal Perspective on Palliative Care in India

-Prof. Bidhu K Mohanti*

This is a brief narrative of the palliative care (PC) scenario in India.

I got trained in the specialty of radiotherapy in 1980s at PGIMER, Chandigarh and AIIMS, Delhi. The time when I got into oncology, cancer therapies were giving modest outcomes and comprehensive care in Indian Cancer Centres was in a formative stage. Specialists in radiation oncology, medical oncology and surgical oncology were in their learning phases; and majority of cancer patients got diagnosed in advanced stages often bordering upon incurability. The available cancer-directed treatments were of limited benefit and long-term survival was achieved in a small proportion of the diagnosed cancer patients. My initial years in oncology built up an understanding to balance the academic and research enthusiasm in oncological advances, with a humane approach to address the issues faced by incurable and disease-progressive patients.

Learning the Good of Medicine

The largest good of medicine is served where the problem addressed must be of significance for large populations and scientifically valid interventions suitable at the community level are available. The development of National Cancer Control Programme in India and the World Health Organization's initiative for pain relief in cancer in the mid-1980s recognized the needs of terminal cancer patients (1). The awareness amongst the cancer specialists and the medical community regarding the palliative care components and pain relief measures was poor. In order to provide cancer care in India, my call was to learn the scientific approaches to relieve physical and psycho-social symptoms in a patient. In 1985, I had joined Kidwai Memorial Institute of Oncology (KMIO), Bangalore as a faculty staff. Oral morphine solution was made available and some of us started referring advanced cancer patients to the newly organized pain clinic at KMIO.

My learning in palliative care has remained a slow process. In 1992, I moved to AIIMS, Delhi and the real turn was achieved when I, with a group of doctors from India, got the opportunity to undergo a ten week course at the International School for Cancer Care Fellowship, St. Peter’s College, Oxford, UK in 1993. Dr. Robert Twycross, Ms. Gillian Burn, Dr. Jan Stjernsward and Dr. Michael Minton were the key mentors during that course and we have been able to get their immeasurable support and personal time over these years. Fortuitously, soon after our training in UK, the formation of Indian Association of Palliative Care (IAPC) in 1994 gave us a platform to come together from different specialties. Several of us have worked towards developing palliative care in India, improve ourselves in the practice, and train others.

Need for Palliative Care Worldwide and in India

The modern foundation of palliative care owes its existence to the St Christopher’s Hospice, established in 1967 by Dame Cicely Saunders and the subsequent integration into the National Health Service (NHS) in UK. Palliative care relieves suffering and improves quality of life for both patients and for their families throughout an illness trajectory, not just at the end-of-life (2, 3).

In 21st century, an estimated 100 million people need pain relief and palliative care globally. Tragically however, PC is reaching a lucky few. In fact, the greatest need is in low and middle income (LMI) countries where healthcare resources are the scarcest and two-thirds of those needing palliative care reside (3). Patients in LMI countries require supportive and palliative care from both generalists and specialists; however, trained doctors and nurses at both these levels are not available.

Since the 1990s, palliative care has slowly grown in its reach within India, mainly for cancer patients. The hurdles to the spread of PC include vast rural population, lack of communication, transport and access to health facilities, low literacy, lack of understanding in both patients and healthcare professionals about symptom relief, and existing constraints in pain killer availability (4). During the last 20 years, several doctors and nurses have made efforts to learn palliative care and start the PC services within and outside the cancer centres. At present, approximately 500 palliative care facilities are

* Director & Head, Radiation Oncology, Fortis Memorial Research Institute, Gurgaon, Haryana, Email : bk.mohanti@fortishealthcare.com
functioning as out-patient, in-patient/hospice, home care services in different parts of India. The IAPC has membership strength of 700; has its official journal, and conducts a certificate course to impart basic palliative care knowledge and skills to doctors and nurses (http://www.palliativecare.in).

I am fortunate to be a part of this growth story of palliative care in my country and often get the opportunity to meet professionals from different spheres, who will be the future for its progress.

Two new developments need special mention for record; recognition by the Medical Council of India to start MD in Palliative Medicine as a three year specialty course and budget allocation for palliative care provision under the Twelfth five year plan of the Government of India.

In order to increase the reach of palliative medicine to the needy patients in India, focus on three areas will be required in the coming decade, with the involvement by government and the non-government organizations.

1. **Increase accessibility to the patients and their families**-at the present, more than 90% of the patients who should receive palliative care are not covered by existing facilities. (Policy document, Ministry of Health, Government of India). More than 80% of all palliative care facilities in India are concentrated in the southern states.

2. **Emphasis on man-power development**-with established educational courses like MD in Palliative Medicine, more basic courses like CCEPC, and greater involvement of health professionals and administrators.

3. **Change in policy matters**- Firstly, palliative care is not yet considered an integral component of health system, unlike the provisions made for other communicable and non-communicable diseases. Secondly, the procurement, prescription and supply of morphine still remains a cumbersome process for medical institutions in our country and only 16 states or union territories(out of 33) have simplified the licensing requirements. Morphine (and alternative opioid drugs) is the key to successful implementation of palliative care for a population. These two aspects should be carefully improved by our policy makers and administrators.

**Summary:**
Our vision will be to give a due recognition to the health care professionals in palliative medicine, make the financial resources available for this and encourage a planned growth for making it accessible to the patients.

**Acknowledgement:** the reader can read larger context of this article in J Palliat Care. 2013 Summer; 29(2):107-12.

**References:**

Breast Cancer is fast becoming a major health problem in India. About 1,00,000 new cases of breast cancer are diagnosed every year. Treatment includes surgery, radiotherapy, chemotherapy, hormonal and targeted therapy in combination. Tremendous research is ongoing in this field.

Causes of Breast Cancer

Studies continue to uncover lifestyle factors and habits that alter breast cancer risk. Ongoing studies are looking at the effect of exercise, weight gain or loss, and diet on breast cancer risk.

Studies on the best use of genetic testing for BRCA1 and BRCA2 mutations continue at a rapid pace. Scientists are also exploring how common gene variations may affect breast cancer risk. Each gene variant has only a modest effect in risk (10 to 20%), but when taken together they may potentially have a large impact.

Potential causes of breast cancer in the environment have also received more attention in recent years. While much of the science on this topic is still in its earliest stages, this is an area of active research.

A large, long-term study funded by the National Institute of Environmental Health Sciences (NIEHS) is now being done to help find the causes of breast cancer. Known as the Sister Study, it has enrolled 50,000 women who have sisters with breast cancer. This study will follow these women for at least 10 years and collect information about genes, lifestyle, and environmental factors that may cause breast cancer. An offshoot of the Sister Study, the Two Sister Study, is designed to look at possible causes of early onset breast cancer.

Chemoprevention

Fenretinide, a retinoid, is also being studied as a way to reduce the risk of breast cancer (retinoids are drugs related to vitamin A). In a small study, this drug reduced breast cancer risk as much as tamoxifen.

Other drugs, such as aromatase inhibitors, are also being studied to reduce the risk of breast cancer.

Making Decisions About DCIS

In some women, DCIS turns into invasive breast cancer and sometimes an area of DCIS contains invasive cancer. In some women, though, the cells may never invade and remain localized within the ducts. If the cells don’t invade, DCIS cannot spread to lymph nodes or other organs, and so cannot be life-threatening. The uncertainty about how DCIS will behave makes it difficult for women to make decisions about what treatment to have, if any. Researchers are looking for ways to help with these challenges.

Researchers are studying the use of computers and statistical methods to estimate the odds that a woman’s DCIS will become invasive. Some of these methods are based on routinely available clinical information about the patient and her DCIS, whereas others also include information about changes in her tumor’s genes. Decision aids are another approach. They ask a woman with DCIS questions that help her decide which factors (such as survival, preventing recurrence, and side effects) she considers most important in choosing a treatment.

Another approach is to look at genes expressed by the DCIS cells using a test such as the OncotypeDx DCIS Score. This test can be used to predict a woman’s chance of DCIS coming back or a new cancer developing in the same breast if she does not get radiation. So far, though, it hasn’t been studied well enough to predict how much someone would benefit from radiation after surgery for DCIS.

Another recent area of research and debate among breast cancer specialists is whether changing the name of DCIS to one that emphasizes this is not an invasive cancer can help some women avoid overly aggressive treatment.

NEW LABORATORY TESTS

Circulating Tumor Cells

Researchers have found that in many women with breast cancer, cells may break away from the tumor and enter the blood. These circulating tumor cells can be detected with sensitive lab tests. Although these tests can help predict which patients may go on to have their cancer come back, it isn’t clear that the use of these tests...
will help patients live longer. They may potentially be useful for women with advanced breast cancer to help tell if treatments are working.

**Newer Imaging Tests**

Newer imaging methods are now being studied for evaluating abnormalities that may be breast cancers.

**Scintimammography (molecular breast imaging)**

In scintimammography, a slightly radioactive tracer called technetium sestamibi is injected into a vein. The tracer attaches to breast cancer cells and is detected by a special camera. This technique is still being studied to see if it will be useful in finding breast cancers. Some radiologists believe it may be helpful in looking at suspicious areas found by regular mammograms, but its exact role remains unclear. Current research is aimed at improving the technology and evaluating its use in specific situations such as in the dense breasts of younger women. Some early studies have suggested that it may be almost as accurate as more expensive magnetic resonance imaging (MRI) scans. This test, however, will not replace your usual screening mammogram.

**TREATMENT**

**Oncoplastic Surgery**

Breast-conserving surgery (lumpectomy or partial mastectomy) can often be used for early-stage breast cancers. But in some women, it can result in breasts of different sizes and/or shapes. For larger tumors, it might not even be possible, and a mastectomy might be needed instead. Some doctors address this problem by combining cancer surgery and plastic surgery techniques, known as oncoplastic surgery. This typically involves reshaping the breast at the time of the initial surgery, and may mean operating on the other breast as well to make them more symmetrical. This approach is still fairly new, and not all doctors are comfortable with it.

**Radiation Therapy**

Modern forms of radiation therapy like 3D Conformal Radiation therapy (3D CRT), Intensity Modulated Radiation Therapy (IMRT) and Image Guided Radiation Therapy (IGRT) have become routine in the therapy of breast cancer. Newer forms of brachytherapy are being investigated. Lot of research in treatment delivery are ongoing.

**New Chemotherapy Drugs**

Advanced breast cancers are often hard to treat, so researchers are always looking for newer drugs.

A drug class has been developed that targets cancers caused by BRCA mutations. This class of drugs is called PARP inhibitors and they have shown promise in clinical trials treating breast, ovarian, and prostate cancers that had spread and were resistant to other treatments. Further studies are being done to see if this drug can help patients without BRCA mutations.

**Targeted Therapies**

Targeted therapies are a group of newer drugs that specifically take advantage of gene changes in cells that cause cancer.

Drugs that target HER2: A number of drugs that target HER2 are currently in use, including trastuzumab (Herceptin), pertuzumab (Perjeta), ado-trastuzumab emtansine (Kadcyla), and lapatinib (Tykerb). Other drugs are being developed and tested.

Anti-angiogenesis drugs: For cancers to grow, blood vessels must develop to nourish the cancer cells. This process is called angiogenesis. Looking at angiogenesis in breast cancer specimens can help predict prognosis. Some studies have found that breast cancers surrounded by many new, small blood vessels are likely to be more aggressive. More research is needed to confirm this.

Bevacizumab (Avastin) is an example of anti-angiogenesis drug. Although bevacizumab turned out to not be very helpful in the treatment of advanced breast cancer, this approach still may prove useful in breast cancer treatment. Several other anti-angiogenesis drugs are being tested in clinical trials.

Other targeted drugs: Everolimus (Afinitor) is a targeted therapy drug that seems to help hormone therapy drugs work better. It is approved to be given with exemestane (Aromasin) to treat advanced hormone receptor-positive breast cancer in post-menopausal women. It has also been studied with other hormone therapy drugs and for treatment of earlier stage breast cancer. In one study, letrozole plus everolimus worked better than letrozole alone in shrinking breast tumors before surgery. It also seemed to help in treating advanced hormone receptor-positive breast cancer when added to tamoxifen. Everolimus is also being studied in...
combination with chemotherapy and the targeted drug trastuzumab. Other drugs like everolimus are also being studied.

Other potential targets for new breast cancer drugs have been identified in recent years. Drugs based on these targets are now being studied, but most are still in the early stages of clinical trials.

**Bisphosphonates**

Bisphosphonates are drugs that are used to help strengthen and reduce the risk of fractures in bones that have been weakened by metastatic breast cancer. Examples include pamidronate (Aredia) and zoledronic acid (Zometa).

Some studies have suggested that zoledronic acid may help other systemic therapies, like hormone treatment and chemo work better. In one study of women being treated with chemo before surgery, tumors in the women getting zoledronic acid with chemo shrunk more than those in the women treated with chemo alone.

Other studies have looked at the effect of giving zoledronic acid with other adjuvant treatments (like chemo or hormone therapy). So far, the results have been mixed. Some studies have shown that this approach helped lower the risk of the cancer coming back, but others did not. The results of one study linked the use of these drugs with adjuvant chemo with an increased risk of breast cancer recurrence in younger women. Overall, the data does not support making bisphosphonates part of standard therapy for early-stage breast cancer.

**Denosumab**

Denosumab (Xgeva, Prolia) can also be used to help strengthen and reduce the risk of fractures in bones that have been weakened by metastatic breast cancer. It is being studied to see if it can help adjuvant treatments work better.

**Vitamin D**

A recent study found that women with early-stage breast cancer who were vitamin D deficient were more likely to have their cancer recur in a distant part of the body and had a poorer outlook. More research is needed to confirm this finding. It is not yet clear if taking vitamin D supplements would be helpful.
Palliative care is an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual.\cite{1,2} Symptom management, sustained communication, caregiver support and patient/caregiver education form the main pillars of palliative medicine. It is the person-centered team-based attention to provide relief from pain and other distressing symptoms physical, psychological or spiritual, enabling them to remain as active as possible and optimizes the quality of life of the patients.\cite{3} It is the active total care of patient’s body, mind and spirit. It provides a support system to the family to help them cope during their patient's illness extending even beyond into the bereavement phase. Palliative medicine boasts as the only medical specialty that in addition to providing a support system to the family to help them cope during their patient’s illness extending even beyond into the bereavement phase. Palliative medicine boasts as the only medical specialty that in addition to affirming life, regards and ensures continued quality at end of life. When applied early in the course of illness, in conjunction with other therapies that are intended to prolong life, such as chemoradiation therapy it positively influences the course of and experience during the illness. An integrated curative-palliative approach will ensure that none of them is left behind, improves patient satisfaction and maintain the balance towards a holistic patient care. The focus of care will depend upon the stage, prognosis and response to therapeutic modalities with more emphasis on palliative care needs as the disease progresses. It by providing the sole focus of medical care in the absence of possible curative therapies in advanced and progressive disease ensures that the patient does not feel deserted or dejected by the medical fraternity. 'palliative care' is different from 'hospice care' which is supporting terminally ill patients with a prognosis of less than equal to 6 months to allow them to die in comfort and with dignity.\cite{4} Unlike hospice care, there are no time restrictions in palliative care. Palliative care is applicable to all chronic medical illnesses inclusive of cancer, HIV, chronic renal failure, chronic heart failure, cerebro-vascular, neurodegenerative diseases and old age which entails multidimensional suffering onto mankind and improves this throughout the illness trajectory. Seventy eight and ninety eight percent of adults and children respectively in need of palliative care belong to low-middle income countries. More than one million new cases of cancer occur in India with more than 80% presenting at stage III-IV. Two-third of cancer patients in India are incurable at presentation and need palliative care.\cite{5-8} Despite these staggering figures only < 1% of population has access to oral morphine.\cite{9} Palliative care is an indispensable component of cancer therapy and it has been proposed that at least 10% of the budget needs to be allocated to it at all cancer care services. The recent amendment of NDPS Act might provide a practical solution for the same. The population of elderly is also projected to increase from 100 million at present to 324 million by 2050.\cite{10} Palliative care should be regarded and provided as a 'fundamental human right' to curb the rising twister of unnecessary pain, suffering and to ensure a 'good life and death' for everyone.\cite{3,11}

**Advantages of early introduction of palliative care:**\cite{12-17}

1. Reduction in symptom burden and hence existential distress.
2. Improved patient and caregiver satisfaction as the goals of care are in accordance with patient’s values, beliefs and preferences.
3. Reduced hospital length of stay, costs, unnecessary inpatient admissions, remains safely and adequately cared at home.
4. Facilitates difficult decisions
5. Easing transition of care.
6. Improved survival.
7. Reduced caregiver burden and posttraumatic stress disorder among bereaved caregivers.
8. Optimal symptom management at all stages of illness in a terminally ill patient will allow patients to live as actively as possible and avoid needless suffering, ensuring a dignified life and death i.e. Comprehensive palliative care.
9. Less psychiatric co-morbidities like depression and improved mood.

---

\*Professor & Head, Unit of Anaesthesiology, Pain Palliative Care, AIIMS, New Delhi. Email : sushmabhatnagar1@gmail.com
10 Goals of care and place of death in accordance with patient’s wishes.

Models of Palliative Care Delivery:

Non-Hospital based

Palliative care programs and teams provide symptomatic management, psychosocial support and co-ordination of home care needs. They help in maintaining continuity of care after being discharged from hospitals and avoid unnecessary hospital readmissions. Home based end of life care is in accordance with patient wishes as it is more effective, economical and in accordance with patient wishes. However lack of knowledge and implementation of end of life care policy results in a scenario contrary to the above with majority of patients dying in hospitals after undergoing futile, expensive and painful interventions. Effective, timely and continuing palliative care ensures pain and symptom control, clear decision making, providing time to prepare for death and affirmation of the person as a whole all the components of a good death.

Hospital based palliative care services have been increasingly developed to reduce the suffering of inpatients suffering from chronic ailments like cancer. Most of the hospital palliative care teams are interdisciplinary and provides holistic, comprehensive, total care of the patients often in conjunction with curative services.

To conclude 'palliative care' is gaining momentum in India with increasing allocation of funds and recognition both by public and private sector organizations. A number of political acts are being proposed and implemented around the globe giving people choice and power to choose care for them. Numerous certification programs, textbooks and journals dedicated to palliative care have come up. It is of utmost importance to integrate palliative care into medical education, healthcare system and societal framework. It should be considered as an adjunct not an alternative and complementary but not secondary to acute curative model of medicine. Last but not the least, the patients, caregivers and general public needs to be more cognizant of their right, services available and responsibilities so that they can make informed decisions regarding the care they would like to have, the care they can provide to others and how as palliative care just like democracy is ‘for the people and by the people.’

References:

1 WHO Definition of Palliative Care. Available at: www.who.int/cancer/palliative/definition/en. (Last accessed on 13/01/2015)


Current Management Strategies in Breast Cancer

- Dr. Sunil Kumar Gupta*

Every year hundreds of thousands of women are diagnosed with breast cancer. It is the most common cancer in women worldwide and its incidence is expected to reach approximately 45,000 new cases every year by 2020. It accounts for approximately 40,000 deaths each year making it the number two cause of cancer deaths. The lifetime probability of developing breast cancer in India is one in 22 women compared to one in eight in US and other developed countries. Today, breast cancer has overtaken cervical cancer to become the leading cause of cancer related deaths in metropolitan cities. A tendency of breast cancer to rise over time is observed especially in Metro Cities like Delhi, Mumbai, Chennai, Bangalore and industrial cities. It can affect women of all ages, races and social class although it is more common in women older than age 50. Various risk factors have been associated with the development of breast cancer that includes hereditary (BRCA1, BRCA2, Li–Fraumeni syndrome etc.), environmental, hormonal and nutritional influences. A woman with a positive family history has about two to three times more likelihood to develop the disease than a woman with no family history (sporadic cases) of breast cancer. The most common presenting sign and symptom is a lump within the breast. The other local symptoms includes pain and enlargement of breast, nipple discharge etc. The established reproductive risk factors include increasing life span, low parity & nulli parity, late first birth (after the age of 30), early age menarche (< 12 years), late menopause (age > 55 years) and decreased breastfeeding whereas emerging life style risk factors include lack of exercise, high fat diet, obesity and alcohol consumption.

The goals of therapy across the stages of breast cancer include surgical therapy to eradicate the disease localised to the breast and/or axilla in early stages as well as palliation in stage IV disease; radiation therapy to eradicate micro-metastatic disease in early stages as well as palliation in stage IV disease; systemic therapy for the treatment of locally advanced cases (neo-adjuvant chemotherapy) and for micro-metastatic (adjuvant chemotherapy & hormonal therapy) breast cancer in early stages as well as palliation and extension of survival in stage IV disease.

The recent molecular classification of breast malignancy based on single gene assay such as ER/PR/HER2 gene copy numbers, Proliferation index and Ki-67. This classification has five sub group with distinct biologic features & clinical outcomes: (i) Luminal A, ER+ve cases (responding to hormonal therapy as compared to chemotherapy. These patients are Cytokeratins 8 & 18 positive low grade in nature); (ii) Luminal B (prognosis worse than Luminal A); (iii) Normal like breast tissue (prognosis similar to Luminal B); (iv) HER2/neu amplification (prognosis poor but targeted therapies like Trastuzumab are available to treat such patients); (v) Basal type (Triple negative): Prognosis is poor, few trials suggest that platinum based chemotherapy are more effective in subset of patients those who are BRACA1 mutated. But there is a need of randomized trial to establish this fact). Till date this has not yet been completely reconciled with classic histopathologic classification.

In early stage breast cancer, no difference has been observed in overall survival with mastectomy versus breast conservation surgery (lumpectomy/XRT). Further, surgical removal of primary tumor in women presenting with metastatic breast cancer (MBC) has also not resulted in overall survival (OS) benefit. The majority of women with node positive breast cancer are managed by breast conserving surgery (BCS) followed by whole breast irradiation (WBI) and adjuvant systemic therapy. Results from MA.20 study demonstrated that additional regional nodal irradiation (RNI) reduces the risk of loco-regional and distant recurrence, and improves disease free survival (DFS) with a trend in improved OS. Principles of primary systemic therapy include TNM staging, ER/PR/HER2 receptor, age and co-morbidities of host.

A 21-Gene Recurrence Score Assay Results (Oncotype DX) is useful in determining when to consider chemotherpay in ER/PR+ve patients. This reverse transcriptase-polymerase chain reaction (RT-PCR) assay is intended for use in hormone receptor (HR)-positive node-negative breast cancer patients who will receive 5 years of tamoxifen. It measures the gene expression of 16 cancer-related genes (including ER, PR, HER2, and Ki67) in paraffin-embedded tumor tissue.
and, using a regression model, calculates a recurrence score (RS) that is an estimate of the risk of developing a distant metastasis at 10 years. Two suggested cut-off points categorize patients into low (RS <18), intermediate (RS R18 <31) and high (RS R31) risk groups corresponding to 6.8%, 14.3%, and 30.5% risk of distant recurrence at 10 years after 5 years of tamoxifen therapy, respectively. These risk estimates represent the range of distant recurrence rates for HR-positive, node-negative breast cancers treated with 5 years of tamoxifen.

MammaPrint is an example of the DNA microarray consisting of 70 genes regulating cells cycle, invasion, metastasis and angiogenesis. This assay requires the use of fresh tumor tissue preserved in special buffer designed to preserve RNA integrity. The advantage of MammaPrint is that it can be done both in ER negative and PR positive early stage cases. A gene expression signature that was strongly prognostic for development of distinct metastases in lymph node negative patients was identified.

The GeparSixto study evaluated the neo-adjuvant carboplatin chemotherapy in patients with triple negative breast cancer (TNBC). The NACT HER2 study demonstrated a strong trend towards improved OS with the addition of trastuzumab to neoadjuvant chemotherapy. The ALTTO trial demonstrated no difference in 4-Yr DFS or OS with the addition of Lapatinib.

The NSABP B-38 study evaluated standard anthracyclin/taxane chemotherapy for high risk ER+ve breast cancer. Patients with operable, node-positive, HER2-negative breast cancer with known ER/PgR status and no prior breast cancer treatment were randomized to three treatment arms of DD AC → P (dose-dense doxorubicin and cyclophosphamide followed by paclitaxel); DD AC → PG (dose-dense doxorubicin and cyclophosphamide followed by paclitaxel and gemcitabine) and TAC (docetaxel, doxorubicin, cyclophosphamide). The study demonstrated that addition of gemcitabine to dose-dense AC → P did not improve 5-yr DFS and 5-Yr OS outcomes. More neuropathy and anemia was seen in dose-dense arms whereas more diarrhea and febrile neutropenia was seen with TAC. The BEATRICE study demonstrated that bevacizumab does not add to standard adjuvant chemotherapy in TNBC.

With regards to the use of adjuvant endocrine therapy, ATLAS trial has demonstrated that for women with ER-positive disease, continuing tamoxifen to 10 years rather than stopping at 5 years produces a further reduction in recurrence and mortality, particularly after year 10. These results, taken together with results from previous trials of 5 years of tamoxifen treatment versus none, suggest that 10 years of tamoxifen treatment can approximately halve breast cancer mortality during the second decade after diagnosis. The ATAC (Arimidex, Tamoxifen Alone or in Combination) trial has demonstrated that although anastrozole is superior to tamoxifen for DFS, time to recurrence (TTR), time to distant recurrence (TTDR) and incidence of contralateral breast cancer (CLBC), the same is not true for OS and deaths after recurrence. Similar findings were observed when the analysis was restricted to hormone receptor-positive population only.

In metastatic setting of breast cancer, the BOLERO-2 study evaluated exemestane ± everolimus in nonsteroidal AI-refractory advanced breast cancer. The study demonstrated a significant PFS benefit with everolimus in all patient subgroups including: age, hormone sensitivity, visceral metastasis, ECOG PS, previous chemotherapy, number of previous therapies, and PR status. The BOLERO-3 trial evaluated trastuzumab and vinorelbine ± everolimus in HER2+ breast cancer. The median PFS with everolimus was 7 months as compared to 5.78 months with placebo (P =.0067).
Arsenic in Ganga: An Infliction to People of Bihar

- Dr. Jitender Singh (Padamshree Awardee)*

Arsenic sits at 33rd position on the periodic table and has been classified as a metalloid, usually referred to as heavy metal by toxicologists. Arsenic is a naturally occurring element in our environment chiefly in air, water, and soil. Interestingly, this ubiquitous element has been of immense importance as it is one of the prime constituents of all living organisms. The purpose of undertaking this study is to find out the vicious effects of arsenic in human body and its correlation with cancer in Bihar. Unfortunately excess intake and henceforth accumulation in a living system can lead to metabolic retardation and toxicity. But a curious question bounces back spontaneously in our mind that why and how can arsenic get inside excessively in a living system especially like ours? A natural answer can be fetched from the old and concrete rocks which upon erosion by forces of water currents release multiple ingredients like arsenic, in the water body.

Most of the rivers, originating from big mountains, flow and pave their way through hard rocks, containing arsenic and other heavy metals superfluously. Ganga is one of such rivers, originating from the great Himalayas passes by most of the regions in north and north eastern parts of India. Heavy content of arsenic in Ganga has been reported several times in past by researchers. In addition, literatures on arsenic in soil and food items like rice in the Gangetic plain are available abundantly. Dwellers of Gangetic plain are tremendously prone to several diseases and toxic effects of arsenic. Our team of researchers have identified the districts which are affected by arsenic. Among the districts of the Gangetic zone, mean level of arsenic has been detected in the water sample of Buxar district (556 ppb) followed by Patna (358 ppb), Khagaria (100 ppb), Katihar (70 ppb), Saran (35 ppb) and Begusarai (50 ppb). Further mean level of 51.5 ppb and 45.75 ppb of arsenic level has been detected in Saharsa and Supaul districts of non-Gangetic zone of Bihar, followed by Madhubani (51 ppb), Muzzafarpur (50 ppb), Darbhanga (48 ppb) and Mothiari (42 ppb). Among the non-Gangetic zone of Bihar arsenic contamination has not been detected in the Gaya, Aurangabad and Jahanabad district.

Bihar is one of the states in north eastern states intersected by Ganga and has been observed to be severely affected by arsenic. Somehow arsenic has managed to sneak into underground water and soil of nearby districts. Since Bihar is one of the leading states reported to have the highest number of cancer patients presenting annually. Arsenic has been linked with different diseases including cancer. Skin cancer, gall bladder cancer, prostate cancer, liver cancer, cervix cancer and breast cancer have been documented to be caused by accumulation of arsenic in the body of patients. We have been able to observe the level of arsenic in the body of cancer patients and sadly we have obtained some horrifying results regarding arsenic accumulation in the body. AAS recorded significantly increased level of arsenic contamination (p ≤ 0.0001) in blood samples of prostate, breast, gall-bladder, ovarian, liver and cervix cancer patients than the normal (Range= 50-356 ppb, 50-306 ppb, 20-129.8 ppb, 20-121 ppb, 10-93 ppb and 10-41 ppb respectively) and in the tissue samples of prostate, breast and ovarian cancer patients (Range= 500-17,000 ppb, 200-1110 ppb, 200-631 ppb respectively). Maximum 17,000 ppb arsenic was recorded in prostate cancer patients. The most galvanizing result led us gnaw was the highest arsenic levels in tissue in the same patients which was calculated as 17000 ppb in prostate, followed by 1110 ppb in breast, 631 ppb in ovarian cancer patients. Contamination of arsenic has also been detected in the soil (51 ppb at Bahadurpur, Patna & 21.2 ppb in Bhagalpur) and rice samples (Phulwarisharif, Patna-31.1 ppb maximum). Surprisingly, arsenic has not been detected in the urine samples of cancer patients which indicate its accumulative tendency. Unsurprisingly, arsenic has been found to induce oxidative stress, apoptosis, and necrosis and reduce the rate of spermatogenesis. At the same time, changes in other biochemical parameters like SGPT, SGOT, alkaline phosphatase etc and morphology of cell structure have been common features of arsenic effect in human body.

Contamination of arsenic has also been detected in the soil (51 ppb at Bahadurpur, Patna & 21.2 ppb in Bhagalpur) and rice samples (Phulwarisharif, Patna-31.1 ppb maximum).

Surprisingly, arsenic has not been detected in the urine samples of cancer patients and arsenic administered

*Director, S S Hospital & Research Centre, Doctors Colony, Kankarbagh, Patna, Email : drjksingh147@hotmail.com
mice models, this suggests that arsenic could not be excreted through urine. Once entered in body through food chain, it gets accumulated in tissue and blood and acts as xenoestrogen disturbing signalling pathways finally causes toxicity.

High level of arsenic in the environmental and biological (blood and tissue) samples in Bihar may be one of the factor for increased cancer incidences in this region. Significantly, increased level of MDA in cancer patients indicates role of arsenic toxicity in the development of cancer.

Since cancer is well known disease to be caused due to mutation in genome. So arsenic has to have some association or interaction with the genes responsible for cancer. Arsenic accumulates and exists in organic form in our body as monomethylarsonic acid [MMA(V)] and dimethylarsinic acid [DMA(V)]. The methylation of arsenic takes place in the presence of an enzyme called methyl transferase. Methyl transferase basically is responsible for methylation CpG Island of promoter region of almost all genes on the genome because methylation at this region is required for the onset of transcription of the genes. Arsenic has a greater affinity for the methylation. Hence methyl transferase methylates arsenic very quickly and in turn monomethylarsonic acid and dimethylarsinic acid function to methylate CpG Island of promoter region of genes. Due to presence of arsenic, methylation of the promoter causing over-expression of several oncogenes or tumor suppressor genes might lead to development of cancer. Moreover, DNA damage and genetic mutation have also been observed due to arsenic.

Presence of arsenic in Ganga has been reported from West Bengal and Bangladesh as well. Accumulation of arsenic in the body of cancer patients of Bihar has been observed by researchers. Our visionary team of researchers from Bihar has burnt several years finding hideous effects of arsenic in Bihar and adjacent areas. The team has shown that the regular dosing of arsenic in mice has caused cancer in 3rd or 4th generation. The researchers have identified molecule which might help eliminate arsenic out of body. The team has been working frivulously to spread awareness to local people about the noxious effects of arsenic. Moreover, a deterrent rules should be promulgated with the help of government to discourage or avoid intake of arsenic through any source. We need to stand together to battle as brutal and barbaric disease as cancer which scourges the mankind each moment.
am a Neuro-anesthesiologist and pain and palliative care specialist at Fortis Hospital Noida, a tertiary care hospital in north India. Our team works in coordination with the other specialties like Oncology as a part of multi-disciplinary team. We cater a wide range of patients on an outpatient and inpatient basis. The patients are reviewed on a referral basis from the primary admitting team.

I would like to discuss the case of Mr. Y, 56 year male diagnosed 3 months back with Carcinoma Rectosigmoid with widespread metastasis to liver, lung, bones and lymph nodes. During his extensive workup for the disease, disease was found to be inoperable so he was offered chemotherapy and radiotherapy. Mr. Y was ex army officer, well educated, focused and confident, he was well aware of the side effects of chemotherapy and radiotherapy because one of his friends died 3 years back due to side effects of chemotherapy, he refused to go for chemotherapy. Because he was having pain in the perineal region and perianal area, the surgical oncologist referred him to pain and palliative team for symptom control. At the time our team visited him, he was having shortness of breath, nauseated feeling, constipation and severe perineal and perianal pain. The pain was of intensity of 9/10 and was sharp, knife poking like associated with severe burning in the perianal region. It was aggravated during defecation. He was feeling nauseated and vomiting 2-3 times a day. The medicines like tramadol 100 mg three times a day and gabapentine 300 mg three times a day was not helping him much. We started morphine infusion @ 1.0 mg/hr for him, and titrated the dose to 2.5 mg/hr along with adjuvant drugs. We also started metoclopramide 10 mg 3 times a day, lactulose syrup and dulcolax tablet 2 times day, tablet dexamethasone 4 mg twice a day. With a day, pain was optimized. On the 3rd day, morphine infusion was stopped and fentanyl patch of 50 microgram/hr was started along with oral morphine 20 mg hourly as and when needed for breakthrough pain. During his course of disease, his developed pleural effusion, his breathlessness increased and he became drowsy. Due to severe breathlessness, the critical care team decided him to put on mechanical ventilation. Intercostal drainage (ICD) was done and the pleural fluid was drained subsequently. He was extubated uneventfully on 3rd day. But in the evening, he complained of severe abdominal pain, which was evaluated and diagnosed as severe constipation pain due to fecolith. Manual removal of fecolith was done. After ruling out obstruction, he was put on 3 laxatives and given enema to relieve constipation. He was better till the time he had severe perianal pain and shortness of breath again. At this time he requested the primary team to withhold any invasive treatment and not to put on ventilator again. He also requested to give him terminal sedation due to all the suffering he was facing. At this time, oncologist again offered palliative chemotherapy keeping in mind, that it may relieve his symptoms. There was a difference in family opinion. His wife and two sons were hoping to cure of the disease. They were insisting him to opt for disease prolonging treatment like chemotherapy. But because of side effects like hair loss, severe vomiting and constipation, and he had seen his friend dying even after chemotherapy, his mind was not to opt for these treatment options. He was very educated enough to know all the pros and cons of chemotherapy. After a long discussion with the patient and his family, we decided to respect his wishes. We also offered Ganglion impar neuromytic block for perianal pain, which he decided to go for after initial refusal. His anal pain was completely relieved after the block and oral morphine and fentanyl patch was withdrawn, as a result his constipation also got better. He was very satisfied with the pain management and symptom control done. During the course of his illness later, he was given O2 with face mask and for shortness of breath (SOB); nebulization with morphine solution was started. Because of progressive pleural effusion, his breathlessness increased to a great extent, the wife of the patient demanded for ventilator support, but due conflict with the patient wishes, we provided only comfort care to the patient. Pigtail catheter was inserted after explaining to the patient and tapping was done intermittently. His symptoms were improving slowly. The son brought to his father at home as he expressed wishes to go to home. We decided to provide nursing care at home for symptom relief. His disease progressed and his general condition
deteriorated. Mr. Y expressed his wish to stay at home. He refused the family request to get admitted in the hospital. The family kept on communicating with me on telephone for any problem, they encountered. 6 days following his discharge, he passed away. The death of Mr. Y was very comfortable and peaceful. The family was quite understandable and they know that we did our best of best, we could offer for his symptom control and comfort care. We were successful in making the patient well understood the fact that our main goal was not to increase the duration of suffering by prolonging his life, but our aim was to give him peaceful death.

ETHICAL FRAMEWORK

Respect for Autonomy

Mr. Y was aware of the fact that he is having few days left. He and his family were well aware of the extent of the disease. He decided not to opt for chemotherapy, and after long discussion, we respected his wish of withholding any active treatment. As the majority of patients choose recommended treatment option, the decision making power, as Mr. Y expressed, is usually hidden and not often practiced. During his course of disease, he was also offered mechanical ventilator support by critical care team, but the patient denied any invasive treatment to go further. Cancer patients are very well aware of the seriousness of the decision and its consequences, but they see it as logical and affirmative choice. The wife and both sons of Mr. Y were very supportive. They respected his wish to die at home; they also appointed one nurse for palliation of symptoms at home.

Beneficence

Mr. Y was mainly distressed with the perianal pain, nausea and constipation associated with opioids and despite his decision of not choosing the chemotherapy, he decided to go for the pain intervention, we proposed. Pain interventional techniques have found to increase quality of life in some studies. We were successful in keeping our Hippocratic moral obligation of medicine to provide him net benefit with no harm. Although he refused mechanical ventilator support for his breathlessness, he agreed to go for pigtail insertion. We had repeated meetings and conversation with the patient and their family to ensure that Mr. Y has not changed his mind about the treatment option. Advance directives should be regularly reviewed and assessed to avoid ambiguity.

Nonmalaficience

Despite Mr. Y deteriorating condition, he wished to stay at home. He knows that he would have been admitted in the hospital, but this is not going to make any difference. Palliative care at home has been found to increase the quality of life and patient survival. Although morphine was given to help his pain and agony, he was very badly constipated and felt nausea and vomiting. Morphine is well established pain medicine for cancer pain control since long and according to WHO ladder also, but it causes severe constipation.

Justice

We were fair in the fact that we were able to provide comfort care to Mr. Y. We respected his wish of withholding any disease prolonging chemotherapy treatment and to stay at his own place rather than admitting him in the hospital. The presence of cancer, a sensitive invader completely destroys the health of patients and seriously affects life of not only patients but also his family. The family of Mr. Y was also very anxious about their loved one’s future, once he denied active treatment. The decision of not choosing mechanical ventilator support might have given greater sense of control, quality of life and dignity to him.

Review of Evidence

Not going for active chemotherapy, respiratory support, asking for terminal sedation and repeated hospital admission was the major ethical issues for Mr. Y. Wife of Mr. Y felt that he should have been admitted to the hospital so that he can be cared for the best. But son of the patient wanted to fulfil all the last wishes of their father so they brought him home. Even after his demise, they felt that they were able to take care of their father with good care. When individuals maturely judge that their quality of life is below the minimum, they have a right to die with dignity and respect if they have a settled and reasoned wish to do so. Due to the principle of autonomy, it is satisfactory if competent patients make their wishes to refuse medical treatment. Most of the patients once they diagnose with cancer, seek second opinion for disease status and the treatment available, but some also look for personal experiences, for example, his friend who had gone for chemotherapy and later died with serious complications of chemotherapy. The process of decision making is not only influenced by cultural setting, but also by personal background. A person who has witnessed suffering and distress of malignant disease may ask for sedation, as Mr. Y Did.
We tried to relieve his shortness of breath with nebulization with morphine. Several studies and Cochrane review have shown that opioids in the form of subcutaneous morphine are beneficial for breathlessness in cancer patients. As Mr. Y expressed his wish for terminal sedation, the legal status of euthanasia or terminal sedation in India lies in the Indian Penal Code, which deals with the issues of euthanasia, both active and passive. According to Penal Code 1860, active euthanasia is an offence under Section 302 (punishment for murder) or at least under Section 304 (punishment for culpable homicide not amounting to murder). Up till now, euthanasia is not legalized in India.

**What could we have done better?**

Psychosocial factors play a major role during the disease process. They can sometimes aggravate the pain and other sufferings, if not properly addressed. We could have psychologist evaluation to find out those aggravating factors. Most of the patients are keening for the active disease treatment options; they don’t want to talk about pain and other symptoms. Oncologists are also reluctant in providing palliation of pain and other symptoms because of poor knowledge about opioids and adjuvants. The Primary team might have referred Mr. Y to pain and palliative team during the diagnosis of the tumor, rather than waiting for symptoms to predominate. Although we tried our best, good communication skills help in relieving emotional, spiritual and psychosocial difficulties of cancer patients. We could have discussed advanced care planning (ACP) earlier, when Mr. Y was put on mechanical ventilator. There are barriers on both the sides like patients want their doctor to start conversation on ACP, while doctors sometimes hesitate to initiate the talk on this. Mr. Y was brave enough to discuss his wishes to us.

**Legal Issues**

We felt that there was no legal issue and we able to manage Mr. Y to our best for his comfort care during his last journey. Terminal sedation is an offence according to Indian law.

**Conclusion**

To Summarize, the patient wishes were respected. We tried our best to manage physical, psychosocial and spiritual component of the patient with palliation of symptoms. We were successful in our goal to provide comfort care to the patient, keeping in mind the principals of ethics and legal scenario in India. Family was also taken care of not only during the palliative management in hospital, but also at home and after the peaceful death of Mr. Y.

---

**References:**

12 Gillon R. Medical Ethics: four principles plus attention to scope. BMJ:1994;309(7):184-8
INTRODUCTION

Cancer is the second biggest killer in USA accounting for 22.7% of all deaths. Around 2-4% of all cancers in India are of brain origin. Brain and central nervous system tumors are the most common cancers among children ages 0-19 years and the second most common cause of cancer related death in this age group (first is leukemia).

Survival rate for patients with brain cancer has improved over the last three decades. Data suggests that patients are being diagnosed at an earlier stage and there has been tremendous improvements in treating brain tumors. Advancement in molecular and genetic sciences are giving us a better than before insight into the functioning of brain and tumor behaviour. Researchers are focusing on newer and novel techniques to target tumors and more importantly on how to save the normal surrounding brain tissue to avoid neurological damage. Here are discussed some of promising new advancements in brain and spine tumor treatment. Many of the discussed modalities are in wide use while others, in advance clinical trials.

GENETICS

There is an ever growing interest in the genetic basis for brain and spine tumors. The changes in the structure of the DNA may be responsible for the tumorous behaviour in normal brain cells especially in childhood tumors. Various genes have been implicated for tumors in this population. For example p53 gene in astrocytomas and PTC gene mutation in medulloblastomas.

More elaborate genetic studies are also helping guide treatment. It has been found that patients with oligodendrogliomas whose cells are missing parts of certain chromosomes (known as a 1p19q co-deletion) are much more likely to be helped by chemotherapy than patients whose tumors do not.

A new area of related research, nano delivery techniques to deliver small DNA or RNA fragments to the tumor tissues with the aim of reversing genetic mutations has shown promising results. With better diagnostic techniques, further genetic studies may guide treatment strategies for the oncologists and understand many more diseases better.

Nanotechnology

The last decade has seen developments in brain tumor research in terms of brain tumor-targeted novel nano-drug delivery systems. It is in theory superior over conventional formulations with decreased toxicity and improved pharmacokinetics/pharmacodynamics.

It aims to address the two major obstacles in brain-tumor targeted delivery, blood–brain barrier (BBB) and blood–brain tumor barrier (BBTB), by directly targeting the tumor cells without damaging the cell membrane. Non viral nano particles (NP) like liposomes, lipid NPs, polymer NPs and dendrimers can deliver gene or chemotherapy selectively to the target cells has been shown to result in a 90% increase in survival time in mice with intracranial brain tumors. The technique seems promising and a major breakthrough is expected in the next few years.

NEWER IMAGING TECHNIQUES

Recent advances have made diagnosis and mapping of brain tumors better and more precise. It is also guiding surgeons to spare the non tumorous tissue and making surgery for brain tumors safer and more successful. Some of these newer techniques are:

Functional Magnetic Resonance Imaging (fMRI)

This is now a well established technique to identify important functional areas of the brain and how close they are to the tumor. In fMRI, a subject is placed in the MRI machine, and various different kinds of stimulus are administered, for example, sounds, videos or small motor movements. Serial images are presented graphically to map the functional areas of the brain.

Its application in tumor surgery is

1. To assess the risk of neurological deficit after a surgical procedure,
2. Selecting patients for intraoperative mapping.
3. Guide to the surgical procedure.\(^{(8)}\)

**Magnetic Resonance Spectroscopic Imaging**

In this approach, information is processed to make a map of the chemicals involved in tumor metabolism. This is being developed to help surgeons take biopsies and direct radiation to the most abnormal areas in the tumor. Further scans may help evaluate the effects of chemotherapy or targeted therapy.

**NEWER SURGICAL TECHNIQUES**

**Fluorescence-Guided Surgery**

In this technique, the patient drinks a special fluorescent dye a few hours before surgery. The dye is targeted to be taken up mainly by the tumor cells, which then glows when the surgeon looks at it under certain lights from the operating microscope. This lets the surgeon make a more precise separation of tumor tissue from the healthy brain tissue. The advantage is to spare the normal tissue and complete evacuation of the tumor and improved progression-free survival in patients.\(^{(9)}\)

**Newer Surgical Approaches for Some Types of Tumors**

Certain areas of the brain are too deep to be approachable without transversing through the normal brain tissue and damaging it in the process. Focus in development of newer non conventional approaches to these areas has been made possible by high resolution endoscopes, a thin tube with a tiny video camera lens at the tip. For example, a now widely used approach to approach the pituitary gland is through the nose without disturbing the normal brain.\(^{(10)}\) A similar endoscopic approach is possible for some tumors in the ventricles, where the opening is near the hairline.

**Integration of Imaging and Surgery**

MRI and CT images can now be integrating to the surgical platform to delineate small tumors near vital structures. Use of ultrasound has gained popularity in various deep tumor resections.\(^{(11)}\) Softwares can fuse preoperative and intraoperative MRI images to help place the present surgical device with sub-millimetric precisions. The advantage is in tumor locations near functional areas with minimal exposure of normal brain.

**CHEMOTHERAPY TARGETING**

Along with developing and testing new chemotherapy drugs, many researchers are testing new ways to get chemotherapy to the brain tumor.

**Liposome Drug Delivery System**

Many chemotherapy drugs are effective when tested in-vitro but less efficacious in practice because the tightly controlled openings in the brain capillaries, sometimes referred to as the blood-brain barrier, prevents them from getting from the bloodstream to the brain. Researchers are now trying to modify these drugs by putting them in small droplets of fat (liposomes) or attaching them to molecules that normally cross the blood-brain barrier. Liposomes first described in 1965 have been developed as a novel drug delivery system. These advances have led to clinical trials in diverse areas as the delivery of anti-cancer, anti-fungal and antibiotic drugs and gene medicines.\(^{(13)}\) A number of liposomes (lipidic nanoparticles) have been accepted clinically. This is an area of clinical potential in the near future. Many drugs have been approved for trials and many are in the pipeline.

**Convention Enhanced Drug Delivery**

For another newer method called convection-enhanced delivery, a small tube is placed into the tumor in the brain through a small hole in the skull during surgery. The tube extends through the scalp and is connected to a drug delivery pump. This can be done for hours or days and may be repeated more than once, depending on the drug used. This method is still being studied in clinical trials.\(^{(14,15)}\)

**NEWER STRATEGIES**

Researchers are also testing some newer approaches that may help doctors target tumors more precisely. This could lead to treatments that work better and cause fewer side effects. Several of these treatments are still being studied.

**Tumor vaccines**

Several vaccines are being tested against brain tumor cells. Unlike vaccines against infections, these vaccines are meant to help treat the disease instead of prevent it. The goal of the vaccines is to stimulate the body’s immune system to attack the brain tumor.\(^{(16)}\) Early study results of vaccines to help treat glioblastoma
have shown promise, but more research is needed to determine how well they work. At this time, brain tumor vaccines are available only through clinical trials.

**Angiogenesis Inhibitors**

Tumors increase in size by creating new blood vessels (a process called angiogenesis) to provide nutrition to their cells. There is evidence that tumors secrete certain angiogenesis promoters as not the only but still an important factor in tumor growth. \(^{(17)}\) A new class of drugs “Angiogenesis inhibitors” that attack these blood vessels have a potential to treat such tumors. \(^{(18)}\) One of these drugs, bevacizumab, has been approved by the Food and Drug Authority, USA to treat recurrent glioblastomas. Other drugs that target blood vessel growth, such as sorafenib and trebananib, are in phase of clinical trial. Antiangiogenic therapy is another promising new approaches to anti-cancer therapy.

**Electric Treatment Fields**

The NovoTTF-100A system to treat glioblastomas that are no longer responding to other treatments is now approved for use. To use this device 4 sets of electrodes are placed on the scalp which are attached to a battery pack and are worn for most of the day. They generate mild electric currents that are thought to affect tumor cells in the brain more than normal cells. \(^{(19)}\) In a clinical trial, when compared to chemotherapy, people using the device lived about as long, although they reported a better quality of life because of fewer side effects. \(^{(20)}\)

**ENDNOTE**

Out-of-the-box ideas to selectively target tumor cells and techniques to cut off their nutrient supplies on one hand and, genetic engineering to remodel genes on the other are providing new paradigms in approach to brain cancer. New approaches for even better tumor targeting and sparing of healthy brain tissue will translate clinically to better survival rates and improvement in quality of life.

---

**Reference**

4. Hoang-Xuan K, et al. Temozolomide as Initial Treatment for Adults with Low Grade Oligodendrogliomas or oligoastrocytomas and Correlation with Chromosome 1p Deletions. Journal Clinical Oncology, 2004(22);3133-3138.


18. Gasparini G: The Rationale and Future Potential of Angiogenesis Inhibitors in Neoplasia. Drugs 1999(58);17-38


Abstract: Orbital Lymphoma in children is a rare entity. It is more often seen in adult population. Orbital tumors in children are mostly benign and the most common malignant tumor of orbit in children is Rhabdomyosarcoma. We present three cases of orbital lymphoblastic lymphoma in children with similar clinical presentation.

Key words: Orbital tumor, Children lymphoma

Introduction

Orbital tumors in children are rare and represent a different histologic spectrum than the tumors that occur in adults. Most of the pediatric orbital tumors are benign including developmental cysts and vascular lesions like capillary hemangioma. The most common orbital malignancy in children is rhabdomyosarcoma. Lymphoma of orbit is more commonly seen in adults. Lymphoma of the orbital adnexa is an extremely rare entity in pediatric age group. We present here three cases of lymphoblastic lymphoma in children out of which one is the first reported case in infant.

Case presentations:

Case 1: 7 year old Afghan female presented to us with 2 months history of bilateral proptosis & 20 days history of headache. Examination showed bilateral proptosis, more on left eye than right, exposure keratitis of left eye and left axillary lymphadenopathy. There was no organomegaly. Magnetic Resonance Imaging (MRI) of brain and orbit showed soft tissue mass lesions in both orbital regions with intracranial and retro orbital extensions, destruction of bones of base of skull. There were no intra ocular abnormalities. The child had a PET CT done at other center; showed additional findings of mass lesion in presacral region, enlarged left axillary nodes and B/L iliac nodes. Axillary Lymph node Biopsy was taken which showed features consistent with Non-Hodgkin’s Lymphoma. Immuno histochemistry (IHC) staining showed expression of CD45, TdT, 79a but CD3, CD5, CD30 were not expressed. Based on histology & IHC, a diagnosis of B Cell Lymphoblastic lymphoma was made. Bone marrow examination was done which showed no marrow involvement. CSF demonstrated atypical cells. The child was treated like Acute Lymphoblastic Leukemia (ALL) with a modified BFM 95 protocol including high dose methotrexate and high dose cytarabine and triple intrathecal chemotherapy. CSF was repeated after Induction and at the end of intensive chemotherapy and didn't show any evidence of atypical cells. MRI Scan was repeated at the end of intensive phase of chemotherapy and didn't show any evidence of disease. She achieved complete remission following intensive phase of chemotherapy and was then put on oral maintenance chemotherapy. The child had completed the treatment and was in complete remission for 1 year but lost to follow-up after one year. Though the child did not have any vision impairment but she developed corneal opacity in the left eye due to exposure keratitis.

Case 2: 11 months old Indian male presented to our clinic with one & half month history of proptosis of right eye & 4 days history of proptosis of left eye with no other significant signs or symptoms. His all blood parameters are within normal limit. Magnetic Resonance Imaging (MRI) of brain & orbit showed multiple soft tissue deposits in extraconal compartments of both orbits causing displacement of extra ocular muscles and resultant proptosis (right > left). Biopsy from orbital mass showed malignant round cell tumor. Immuno histochemistry staining showed expression of CD3, CD4, CD43, CD99, TdT, and based on overall findings of Histology & IHC, diagnosis of T cell Lymphoblastic lymphoma (T cell LBL) was made. X-Ray Chest and USG Abdomen were normal. Bone marrow was not involved & CSF was normal. On the basis of histology of round cell tumor & severity of disease on presentation, a pre-phase chemotherapy was given with the intent of early intervention & preservation of vision. Once IHC confirmed the diagnosis of T Cell LBL, Patient was treated like Acute Lymphoblastic Leukemia (ALL) with standard BFM 95 protocol. The child is presently on follow-up and is disease free for last 5 years. Vision in the right eye couldn’t be preserved since the patient had severe exposure keratitis of right eye at presentation and developed phthisisbulbi during the course of treatment.

Case 3: A 3-year-old girl presented with a 1 month...
history of bilateral proptosis with no visual impairment. Her MRI showed bilateral orbital mass. She underwent an orbital biopsy, which was reported as B cell Lymphoblastic Lymphoma. PET CT scan was done for staging which showed additional findings of FDG avid cervical nodes and uptake in the renal cortex and spleen. The child was treated with BFM 95 protocol and is presently undergoing oral maintenance chemotherapy. She had complete metabolic response on PET CT scan post induction chemotherapy.

Discussion

Proptosis in children can be due to vascular anomalies, congenital cysts, orbital pseudotumor, inflammation and malignancies. Cystic and vasogenic tumors are more common in pediatric orbit. Among all the childhood orbital diseases, only 10.6% are malignant, out of which 2.5% are lymphomas and leukemias. Amongst the malignant orbital diseases Rhabdomyosarcoma is the most common followed by infiltration by leukemia or neuroblastoma. Orbital lymphomas are usually of the B cell lineage and mostly occur in adults, whereas T cell tumors of orbital adnexa are extremely rare. The T-cell variant of non-Hodgkin’s Lymphomas often presents as mediastinal mass with associated pleural effusion and involvement of central nervous system is very frequent. The B-cell variant more often present in bone, isolated lymph nodes, bone marrow, liver or soft tissues including the skin. The most frequently used treatment regimens for LBL are LSA2-L2 & its modified forms and BFM group protocols. In the case 1 (B-LBL), patient had stage IV disease with presence of a typical cells in CSF; but, cranial radiotherapy was avoided as the child had received high dose methotrexate and triple intrathecal chemotherapy. In some recent studies with CNS positive B-NHL, patients had 70% EFS rates with BFM protocols. These results were comparable to earlier studies, which used cranial irradiation in addition to intrathecal chemotherapies. Lymphoblastic lymphomas should be taken into consideration in the differential diagnosis of rapidly progressive proptosis in children. Orbital tumors in children can have significant impact on the vision. Therefore early diagnosis and effective treatment is very important which may help in achieving disease free status as well as the vision preservation.

References:

The incidence of bone metastasis varies significantly depending on the primary site, with breast and prostate cancer accounting for up to 70% of patients with metastatic disease (1). Bone metastasis may be found in up to 85% of patients dying from breast, prostate, or lung cancer. Other primary sites with a propensity for bone metastasis include thyroid, malignant melanoma, and kidney cancers. Gastrointestinal sites of primary malignancy give rise to bone metastasis in only 3% to 15% of patients with metastatic disease (2). Some hematologic malignancies including myeloma and lymphoma can also cause significant pain and bone destruction. Solitary bone metastasis occur in <10% of patients.

Metastatic disease to the bone is a common cause of pain that is detrimental to quality of life. Metastasis can occur in any bone, though they are more common in sites containing red bone marrow. Approximately 70% of bone metastasis occur in the axial skeleton, with metastasis most frequently occurring in the spine, pelvis, and ribs. The lumbar spine is the single most frequent site of bone metastasis (3). In the appendicular skeleton, the proximal femurs are the most common site of metastatic disease.

Patients with bone metastasis from lung cancer have short median survival durations of 6 months. However, patients with bone metastasis from breast or prostate primary sites may have significantly longer survival times. Overall survival depends on the primary site and the presence or absence of visceral metastasis. (Perez)

The most common symptom of bone metastases is slowly progressive, insidious pain that is fairly well localized. The pain may be worse at night. Although the pain is frequently localized, pain may radiate to other areas.

Approximately 1% of bone metastases leads to pathologic fracture, with annual fracture rates of 5–20%.

Approximately 10% of all bone metastasis require some form of surgical intervention, with high risk areas including the femoral neck, subtrochanteric, and intertrochanteric regions.

The majority of patients with bone metastasis will experience pain during their disease course, and pain control can significantly improve their quality of life. Pain management may be achieved either by debulking disease using cytotoxic therapy or by symptomatic control with pharmacologic interventions. Pain being assessed - analgesic

The mechanism of pain from bone metastasis is not clearly understood. Possible mechanisms include mechanical instability, irritation of periostea, stretch receptors, tumor-directed osteoclast-mediated osteolysis, tumor cells themselves, or tumor-induced nerve injury, production of nerve growth factor or stimulation of other cytokine receptors (4).

Pain is the most common
Imaging

Plain radiographs are typically the most appropriate first imaging study. The primary disadvantage of plain radiographs is that small lesions are rarely seen. Approximately 30% to 50% of the bone mineral content must be lost before the lesion will be apparent on x-rays presenting complaint for patients with bone metastasis. With advances in imaging, it is now possible to pick up bone metastases earlier. There are multiple treatment options for patients with painful bone metastases which includes, surgical management, external beam radiation therapy, systemic therapy and radionuclide therapy. Any of these treatment modalities maybe opted for depending on the clinical scenario.

Prognostic factors of bone metastasis

1. Histology: median survival of patients with Bone metastasis in breast, prostate, and lung cancer are 69, 40, and 13 weeks, respectively.
2. Presence of only a limited number of bone metastasis and absence of visceral metastasis is a favorable factor.
3. Good performance status
4. Absence of co morbidities
5. Response to treatment especially hormone or chemotherapy.

Evaluation

The physical examination is an important step in evaluating a patient with bone metastasis. Firm palpation will often elicit the specific area of pain, with point tenderness often pointing directly to the affected area in the bone. It is important to carefully evaluate the entire skeletal system with examination, as intense pain at one site often masks subjective reports of pain at other sites. A thorough neurologic examination is also important, especially in patients with spinal metastasis, to carefully evaluate for the possibility of spinal cord, cauda equina, or nerve root compression.

Technetium-99 m bone scintigraphy is the most commonly employed method for screening patients at risk for bone metastasis and is useful to evaluate the extent of metastatic disease in the bone.

False-positive readings may be seen in areas of arthritis, trauma, or Paget’s disease. In addition, the osteoblastic activity in healing bone after treatment may give the appearance of progressive disease. False-negative readings may occur in fast-growing, highly aggressive tumors, especially if these are mainly osteolytic.

Computed tomography (CT) scans are more sensitive than plain radiographs, and may be better able to localize the lesion within the bone. The CT may be useful in defining the extent of cortical destruction and helping to assess the risk of a pathologic fracture (6). In addition, the CT scan may be used to guide needle biopsies to obtain a tissue diagnosis. However, CT scans are more expensive and more time consuming.

Magnetic resonance imaging (MRI) is better than plain
radiography or nuclear medicine bone scintigraphy at assessing the involvement of trabecular bone (red marrow), especially in the vertebral bodies. The findings are best seen on T1 contrast-enhanced images and short tau inversion recovery (STIR) images. The sensitivity of MRI scanning has been reported as 91% to 100%, compared with 62% to 85% for bone scintigraphy (8).

Positron emission tomography (PET) scanning evaluates areas of increased metabolic activity, most commonly using the 18-fluorodeoxyglucose (FDG) isotope. These scans are useful in detecting osteolytic bone metastasis, but are less sensitive for osteoblastic metastasis. Precise determination of the location of lesions is difficult with PET scans, but the use of simultaneous CT scans allows for much better localization of the abnormal FDG uptake (10). PET scan is useful as a whole-body screening tool and to assess the response to therapy. (11)

Comparative studies have shown PET scans to be more sensitive than Tc-99 m scintigraphy or whole-body MRI scans in detecting bone metastases (9).

**Pain Management**

There is a significant discrepancy between the physician estimate of pain and the pain level reported by the patient (12). The use of a validated pain scale, such as the Brief Pain Inventory or universal pain assessment tool, gives the patient an opportunity to describe the severity of pain and the interference of pain with function in a manner that can be understood both by the patient and the physician (13). This also allows for comparisons of pain levels over time, to better assess the effectiveness of treatments.

Pain control can be achieved in the majority of patients using the World Health Organization analgesic ladder. The WHO three-step analgesic ladder provides the most straightforward and universally accepted approach to analgesia. The ladder describes a process for combining nonopioid, opioid, and adjuvant drugs, titrated to meet the individual needs of the patient according to the severity of pain. A randomized controlled trial of an algorithm based upon the WHO ladder demonstrated that a standardized approach to cancer pain management using the algorithm provided more effective analgesia than routine oncology care. (33)

**Step 1**

Step 1 of the WHO ladder focuses on analgesic drug therapy for patients with mild to moderate cancer pain. Such patients should be treated with a nonopioid analgesic that may or may not be combined with an adjuvant drug, depending on the specific pain pathophysiology. For example, in a patient with mild pain from a peripheral neuropathy, the combination of a nonopioid with a tricyclic antidepressant or an anticonvulsant drug would be appropriate.

**Step 2**

Step 2 of the WHO ladder focuses on patients with moderate pain who do not experience adequate pain relief from a nonopioid analgesic. These patients are candidates for a combination of a nonopioid, such as aspirin, acetaminophen, cyclooxygenase 2 (COX-2) inhibitors, or other nonsteroidal anti-inflammatory drug (NSAID), and low doses of opioid analgesics, such as codeine, oxycodone, or morphine, usually dosed at less than 60 mg oral morphine equivalents (OME) daily. These patients often require adjuvant drugs, depending on the pain pathophysiology.

**Step 3**

Step 3 pertains to patients who report either severe pain (often gauged as greater than 7 to 10 on a 0 to 10 scale) or moderate pain that is inadequately managed after appropriate administration of drugs at the second step of the WHO ladder. For these patients, nonopioids are often used in combination with more potent doses of opioids to mitigate the opioid effect, and adjuvants are administered depending on the pain pathophysiology or need to control other concurrent symptoms in the individual patient. Opioid doses on step 3 are commonly greater than 60 mg OME daily.
WHO ANALGESIC LADDER

<table>
<thead>
<tr>
<th>Step</th>
<th>Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paracetamol, NSAIDS (and adjuvants if needed)</td>
</tr>
</tbody>
</table>
| 2    | Mild acting opioids + Step 1 Non-opioids (and adjuvants if needed)  
Mild acting opioids: Codeine, Dihydrocodeine, dextropropoxyphene |
| 3    | Stronger opioids + Step 1 non-opioids (and adjuvants if needed)  
Stronger opioids; Morphine, dimorphine, fentanyl, hydromorphone |

Adjuvant Drugs: Tricyclic Antidepressants, anticonvulsants, Steroids

These medications are increased as necessary until the patient is free of pain. Typically, the medications are given on a routine schedule (-by the clock-) rather than waiting until a certain level of pain (-on demand-). Using this schedule, 70% to 76% of patients will have good pain relief.

Surgical Management

Surgical management of bone metastases is performed primarily to prevent or treat pathologic fractures. The goals of surgical intervention are to prevent or relieve pain, improve motor function, and to improve overall quality of life.

Treatment techniques are simpler and more effective when the procedure is performed prophylactically for an impending fracture. The risk of pathologic fracture depends on location and extent of the lesion whether the lesion is osteolytic, osteoblastic or mixed; and the primary cancer site.

Fractures of the weight-bearing bones are the most likely to cause significant functional deficits. The proximal femur may have a higher propensity for fracture than other sites. The femur accounts for 65% of pathologic fractures requiring surgical intervention (14).

The size of the bone metastasis is an important predictor of risk of fracture, especially with regard to the extent of cortical destruction. A scoring system was proposed by Mirels (15) that had a 12-point scale based on the location of the lesion, pain, extent of cortical destruction, and radiographic appearance.

<table>
<thead>
<tr>
<th>Score</th>
<th>Pain</th>
<th>Location</th>
<th>Cortical Destruction</th>
<th>Radiographic Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mild</td>
<td>Upper limb</td>
<td>&lt;1/3</td>
<td>Blastic</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
<td>Lower limb</td>
<td>1/3-2/3</td>
<td>Mixed</td>
</tr>
<tr>
<td>3</td>
<td>Severe</td>
<td>Peritrochanteric</td>
<td>&gt;2/3</td>
<td>Lytic</td>
</tr>
</tbody>
</table>

A score is assigned for each of the four categories, and the sum of those scores is used to estimate the risk of pathologic fracture.

Prophylactic fixation was indicated for a score of >9.

For patients with a very limited life span, surgery may not be indicated even if the risk of pathologic fracture is relatively high (23 Harrington KD: Orthopedic management of extremity and pelvic lesions. Clin Orthop Rel Res 1995;312:136â€“147.). Clinical prediction of survival may be more accurate than relying on specific parameters such as diagnosis (primary site), performance status, number of bone metastases, presence of visceral metastases, and haemoglobin level.

Metastatic spinal cord compression is an emergency which warrants surgical intervention. Multiple randomized trials have demonstrated that surgical
intervention within 24-48 hours of diagnosis improved the chance of regaining the ability to walk. Early surgical intervention also improved maintenance of continence and median overall survival. Therefore if operable all patients with metastatic spinal cord compression should undergo surgical decompression and stabilization followed by radiotherapy. (Perez)

Systemic Treatment

The pathophysiology of bone metastasis involves hematogenous dissemination and most patients with bone metastasis suffer from multiple synchronous sites of disease. In theory, administering a systemic cytotoxic therapy should deliver palliative benefit by simultaneously addressing all sites of bone metastasis. Systemic chemotherapy may offer palliative benefit if symptoms are diffuse and disease is widespread.

For bone metastasis, the definition of a complete response is complete disappearance of all lesions on radiographs for at least 4 weeks. This is unlikely to occur even if all tumor cells are eradicated. A partial response requires some calcification of lytic lesions, which may not be evident for 6 months or more. PET scans may be more accurate in assessing response in a timely manner. Response to other modalities (i.e., radiotherapy, bisphosphonates) is measured in terms of pain relief and quality-of-life measures. The chemotherapy drugs are frequently given with bisphosphonates or corticosteroids, which may impact on the response rates.

As bone metastasis to the spine is common, some patients may present with symptoms of spinal cord compression. It is in this clinical setting that corticosteroids play a vital role. Corticosteroids must be administered as soon as possible in anyone suspected of having metastatic spinal cord compression, even before radiographic diagnosis, as this can be rapidly discontinued with a negative diagnosis. They effectively decrease cord edema and serve as an effective bridge to definitive treatment. Consolidated data from randomized trials suggest, a loading of 10 mg of IV dexamethasone followed by a maintenance dose of 4 to 6 mg every 6 to 8 hours, after which the dose is to be tapered. Patients can be safely switched to an oral regimen after 24 to 48 hours as there is good oral bioavailability of corticosteroids. In addition patients should be started on a proton pump inhibitor (PPI) for GI prophylaxis.

In patients presenting with bone metastasis, metabolic derangements are commonly seen. Hypercalcemia is one such metabolic derangement. Hypercalcemia is the most common paraneoplastic syndrome, occurring in about 10% to 20% of patients with advanced cancer. It occurs most frequently in patients with multiple myeloma and those with cancer of the breast, kidney, lung, and head and neck. Symptoms of hypercalcemia include nausea, vomiting, constipation, polyuria, and disorientation. The therapeutic interventions utilized depend on the presentation.

Asymptomatic patients with a serum calcium level of 3.25 mmol/L or less can be managed conservatively, whereas symptomatic patients or those with a serum calcium level above 3.25 mmol/L require immediate aggressive measures. The first intervention should be intravenous hydration with isotonic saline. Outpatient hydration can be used for nonurgent cases, while inpatient hydration is mandatory for those requiring immediate therapy. Infusion of 1 to 2 L of isotonic saline over 2 hours expands the intravascular volume and when combined with 20 to 40 mg of intravenous furosemide can enhance calcium excretion by increasing delivery to and blocking transport of calcium and sodium from the loop of Henle.

Together with hydration the bisphosphonates are currently the cornerstone of therapy for malignancy-associated hypercalcemia.

A number of hormonal therapies are available in the management of metastatic prostate and breast cancer. The bisphosphonates are pyrophosphate analogs that bind to calcium phosphate with high affinity and are potent agents affecting bone resorption There is evidence that the bisphosphonates also induce apoptosis in cancer cells. The bisphosphonates include pamidronate, alendronate, ibandronate, risedronate, and zoledronic acid. Zoledronate is much more potent than the other bisphosphonates, in part because it also inhibits tumor cell adhesion to the extracellular matrix. For patients with bone metastases Zoledronic acid is given at a dose of 4mg as a 15 minute infusion intravenously. The dose is usually repeated at 3-4 weekly intervals. Dose modification has been advised based on the creatinine clearance. Zoledronic acid is contraindicated in patients with creatinine clearance less than 30ml/min. Increased risk of hypocalcaemia with aminoglycosides and loop diuretics. Increased risk renal dysfunction with nephrotoxic agents.

Ibandronate is a nitrogen-containing bisphosphonate. Poorly absorbed (mean bioavailability following a 2.5 mg oral dose is about 0.6% compared to intravenous dosing). Absorption is impaired by any kind of food or
drink other than plain water. Half life 10-60 hours. Ibandronate is eliminated by renal excretion. Unabsorbed ibandronate is eliminated unchanged in the feces. Available as both oral preparation and intravenous preparation. Ibandronate has been found to have a much better tolerance in patients with renal failure. Evidence from a phase III randomized study which compared Zoledronic acid Vs Ibandronate in patients with renal failure. The study concluded that ibandronate could be safely administered in patients with renal failure. (45)

**Radionuclides**

Calcium (and to a lesser extent phosphorous) analogs will preferentially accumulate in bone, especially in areas of active bone turnover. A radioactive isotope that is a beta emitter which allows treatment in the areas in which the radionuclide accumulates, thus minimizing side effects and giving an excellent therapeutic ratio.

The radionuclides are given in a single injection that is easily administered. The treatment can be combined with other modalities, including chemotherapy or external-beam radiation therapy.

The first radionuclide used for treatment of bone metastases was phosphorous-32 (P-32). Treatment with P-32 for diffuse bone metastases was successful in giving subjective pain relief, but with unacceptable bone marrow toxicity. Other radioisotopes have been used for the palliation of diffuse osseous metastases, with a better therapeutic ratio than P-32.

Strontium-89 (Sr-89) is chemically similar to calcium, and is deposited in the bone matrix, preferentially in sites of active osteogenesis. Sr-89 is a pure beta emitter with an energy of 1.4 MeV and a half-life of 50.6 days (77).

Samarium-153 (Sm-153) is primarily a beta emitter, but also has a component of gamma emission, which is useful for imaging purposes. The Sm-153 ethylenediaminetetra methylenephosphoric acid (EDTMP) is concentrated in areas of high bone turnover, accumulating in areas of hydroxyapatite. The physical half-life of Sr-153 is 46.3 hours, but the biologic half-life is much shorter because about half of the compound is excreted in the urine within 8 hours of injection (75).

Rhenium-186 is a medium-energy beta emitter (Emax _ 1.07 MeV) with a physical half-life of 89 h. Rhenium forms a stable bisphosphonate complex with hydroxyethylidene disphosphonate (HEDP). Peak skeletal uptake occurs 3 h after intravenous administration. The mean biologic half-life in bone metastases ranges between 4.5 - 6 h (27). Uptake is directly proportional to the metastatic tumor burden, as assessed by the bone scan index (BSI). Clearance is predominantly renal, with 69%+/- 15% occurring within 24 h of administration (28).

**Criteria for Patient Selection for Bone-Seeking Radionuclide Therapy**

**Treatment indications**

Treatment of widespread painful bone metastases.
Positive bone scan; abnormal uptake corresponding to pain sites
Hematology: Hb > 90 g/L; white cell count> 4x10^9/L; platelets> 100x10^9/L
Renal function: urea > 12 mmol/L; creatinine>_ 200 mmol/L

**Absolute contraindications**

Pregnancy
Acute spinal cord compression
Acute or chronic renal failure; glomerular filtration rate< 30 mL/min
Impending fracture
Hypercalcemia

**Precautions**

Urinary incontinence; catheterize before treatment
Vesicoureteric or bladder outflow obstruction; consider ureteric stent or catheterize before treatment

Generally pain relief with radionuclide therapy is seen in approximately 50-80% of patients. Majority of responses are seen between day 7 and day 14 post radionuclide administration. The effect usually lasts for 4-6 months.

**Radiation Therapy**

Radiation therapy has been reported to be effective in palliating painful bone metastases, with partial pain relief seen in 80% to 90% of patients, and complete pain relief in 50% of patients.

These data are primarily from studies using physician evaluation of pain. When patient evaluation of pain is used, pain improvement is seen in 60% to 80% of patients and complete pain relief is seen in 15% to 40% of patients (9).

The response to treatment depends on a large number
Various doses and fractionations have been tested in randomized trials, and results from most trials demonstrated that a large single dose and more fractionated radiation provided similar symptomatic control. Bone metastasis are the most common indication for palliative radiotherapy (5). There are multiple randomized trials which have compared between single and multiple fraction radiotherapy, in order to assess the pain relief. It has been found that most of the response in terms of pain relief occurs 4-6 weeks after radiation. A sustained pain relief is seen in approximately 55-65% of patients. Conclusion

Bone metastasis is a major cancer related end events which warrants multimodality care for good symptom control and quality of life. Optimum oncologic care and symptoms directed palliative care can make patients life better even with advanced bone disease. Cost effective and patients problem centred care will give best palliation.

References

In Palliative Care, one of the goals is to address the pain and suffering that accompany life threatening and life altering disease. There is often physical component but psychological and spiritual aspects also have profound effects. Grief management is one of the most important features in the provision of Palliative Care. So it is essential that cancer patients and caregivers experience and expression of grief should be recognized and revalidated and supported by Palliative Care Providers. In our society, we tend to shy away from thinking about death. The terminally ill generally die in institutions away from our homes. Therefore, we are seldom exposed to people dying. Many people in our society seek to avoid thinking about death. They avoid going to funerals and avoid conversation about death. Many people live as if they believe they will live indefinitely.

Understanding Grief

Grief is a natural response to loss that occurs over time and involves a wide range of emotions, thoughts, and behaviour, as well as physical feelings. Throughout the stages of grief, the nature and intensity of grief reactions and the length of time a person grieves are affected by a variety of factors:

- The nature of the person’s relationship with the deceased.
- The cause of death.
- The age and gender of the person who is grieving.
- The life history of the person who is grieving, including previous experiences with loss.
- The personality and coping style of the person who is grieving.
- The support available from friends and family.
- The customs of the person who is grieving.
- The religious or spiritual beliefs of the person who is grieving.

In addition, the grieving process is often more difficult and complicated when the person who is grieving has unresolved feelings toward or conflicts with the person who has died. People who are struggling with complicated grief may find it helpful to talk with a counselor, such as a social worker, psychologist, or spiritual counselor. Some time sudden death of person afflicted with cancer is more difficult to cope with for three reasons:

1) Cancer patient’s relatives do not have time to prepare for death
2) Cancer patient’s relatives feel loss more severe because they feel the person is missing out on many of good things in life.
3) They do not have the opportunity to obtain “closure” of relationship. They may feel that they did not have a chance to tell the person how they felt about him or her; or they did not have opportunity to resolve interpersonal conflict.

Many health care professionals find death difficult to handle even though they are committed to healing. When someone is found to have terminal illness like cancer, health professional are apt to experience a sense of failure. In some cases, they experience guilt because they cannot do more or because they might make a mistake that may contribute to a terminal illness.

The Grieving Process: Nearly all of us currently grieving about some loss that we have had. It might be the end of a romantic relationship, or moving away from friends and parents, or the death of a pet, or failing to get a grade we wanted, or the death of some one. It is a mistake to believe that grieving over a loss should end in a set amount of time. The normal grieving process is often the life span of the griever. When we first become aware of a loss of very high value, we are apt to grieve intensively-by crying or by being depressed. Gradually, we will have hours, then days, then weeks, then months where we will not think about the loss and will not grieve. However, there will always be something that reminds us of the loss, and we will again grieve. The intense grieving period will, however, gradually become shorter in duration will occur less frequently, and will gradually decrease in intensity. The Westberg Model of grieving process best explains the grieving process. For rendering psychological services, palliative care counselor needs to be familiar with grieving process as

*HOD – Programme Management, E-mail : ganeshbhatt7@yahoo.co.in
10) **Affirming reality**: The grieving persons put his or her life back together again, and the old feeling of having control of one's life returns. The reconstructed life is not the same as the old, and memories of the loss remain. However, the reconstructed life is satisfactory; the grieving person resolves that life will go on.

**Role of Palliative Care Counselor in relation to a dying person in Palliative Care setting:**

1) Palliative Care counselor needs to understand that one need to accept the idea of one’s own death and view death as a normal process. If you cannot accept your own death, you will probably be uncomfortable talking to someone who is terminally ill and will not be able to discuss the concerns that the dying person has in an understanding and positive way.

2) Palliative Care counselor should convey verbally and that he is willing to talk about any concerns that the other person has. Touching or hugging the dying person is very helpful. Remember, the person has a right not to talk about concerns if he or she chooses. What the counselor should convey is that he is emotionally ready and supportive, that he cares, and that he is available.

3) Palliative Care counselor should answer the dying person’s questions as honestly as he can. If he does not know an answer he should seek out a person who will accurately provide the requested information. Evasion or ambiguity in response to a dying person’s questions only increases his or her concerns. If there is a chance for recovery, this should be mentioned. Even a small margin of hope can be a comfort. Do not; however exaggerate the chances of recovery.

4) A dying person should be allowed to accept the reality of the situation at his or her own pace. Relevant information should not volunteer, nor should it be withheld. People who have a terminal illness have a right to have access to all the relevant information. A useful question that may assist a dying person is, “Do you want to talk about it”?

5) If people around the dying person are able to accept the death, the dying person is helped to accept the death, therefore, it is therapeutic to help close family members and friends to accept the death. Remember, they may have a number of concern that
they want to share, and they may need help to do this.

6) If the counselor does not have trouble about certain subjects involving death, he should inform the dying person of his limitations. This takes guesswork out of the relationship.

7) The religious or philosophical viewpoint of the dying person should be respected. Counselor’s own personal views should not be pressed.

References

- Westberg, Granger (1962). Good Greif, Philadelphia: Augsburg
- Westberg, Granger (1979) “From hospital for stress Chaplaincy to holistic Health Center” Journal of Pastoral Care 33(2)
- Kübler-Ross, E. (1969) On Death and Dying, Routledge,
An Ode to Pain

People detest, dread and drift from you away
But some bond with you and bridge the bay.

Despite on you heaped hate and disgrace,
You have another interesting arcane face.

Provenance for great work of literature and art,
You are plaited plangently in Keats’ poetic thought.

In the world of variegated emotions,
You possess an unparalleled position.

Your intensity can empower and laugh;
Foster fortitude and change life’s graph.

You can melt the hearts and moisten the eyes.
Without you, pleasure loses meaning and dies.

Sometimes, when life stumbles and down dashes,
Like phoenix, thou can lift it from embers and ashes.
Regional Offices

1. Global Cancer Concern India
   20, Shakti Kunj Society, Nr Manpasand Diamond center, Nr Samjuba hospital, Bapunagar, Ahmedabad; 380024
   Mob.: 9879496106

2. Global Cancer Concern India
   N/127, Ramkrushna Apartment
   Near Headgewar Smarak Reshimbag
   Nagpur 440009
   Mob.: 9850850696
   Tel.: 0712-2751530

3. Global Cancer Concern India
   Old No. 71 New No. 175
   Singannachetty Street
   Chindatripet
   Chennai
   Tel.: 044-28520170
   Mob.: 09840155208

4. Global Cancer Concern India
   9 A, Mumtaz manzil,
   Professor colony,
   Bhopal- Pin 462002
   PH: -0755-2660530
   Mob no.-9993520581

5. Global Cancer Concern India
   Vengalil House, P.O. Kottamuri
   Changanacherry,
   Kottayam Distt.,
   Kerala – 686105
   Tel: 0481-2443275
   Mob.: 09745576091

6. Global Cancer Concern India
   Flat No-102,
   Gurudarshan Ghat No. -920,
   Balaji Park, Kashnand Road,
   Wagholi, Tal Haveli,
   Distt. Pune - 412207
   (Maharashtra)
   Mob: 9881734517

7. Global Cancer Concern India
   Room No 21, Saraswathi Bhavan
   Cross Ganjawala lane
   Borivilli (w), Mumbai 400 092
   Tel.: 022-28940307
   Mobile – 09892060781

8. Global Cancer Concern India
   No. 1853, 40th Cross Main 26th Jayanagar, 9th Block, Bangalore – 560041.
   Ph. 080-65734657
   Mob.: 98880270824

9. Global Cancer Concern India.
   5708, Ground Floor, Duplex,
   Modern Complex, Manimajra,
   Chandigarh – 160101
   Mob: 09216094777
   0172-6570707

10. Global Cancer Concern India
    D-451 First floor BRS nagar Ludhina
    Pin code-141003
    Ph: 0161-4644031
    Mob:-9317805941

11. Global Cancer Concern India
    L-28, Ground Floor, Kalkaji
    New Delhi – 110019
    Ph: 011-26477829
    Mob:-9810101763

12. Global Cancer Concern India
    16/1 Rajdanga Gold Park
    Kolkata-700107
    Ph: 033-40016287
    Mobile-9836178132, 9674861578

13. Global Cancer Concern India
    Ideal Commerce Center
    Chasma Center Road, Kurji, Patna – 800010
    Ph: 0612-2270450
    Mob: 7677404477
14. Global Cancer Concern India  
C-659, Sushant Lok Phase – 1  
Gurgaon (Haryana)  
Ph: - 0124-2564473-74-75  

15. Primary Health & Cancer Screening Centre  
Global Cancer Concern India  
108/A-9, Saroha Bhavan,  
Opp. Gaushala Main Gate, Kishangarh,  
Vasant Kunj,  
New Delhi – 110070  
Ph: 011-26894092  

16. Primary Health & Cancer Screening Centre  
Global Cancer Concern India  
Huda Dispensary, C-Block  
Rosewood City,  
Sector-49, Gurgaon – 122002  
Ph:-0124-6459555  

17. Mr. Rajiv Sharma  
C/O yashpal Karyana Store  
Opp J.C.B showroom  
Saili Kullian  
Pathankot-145001  
Mob:-9876294624
Information for the Contributors

Global Cancer Concern India Research and Development Journal is the official Journal of Global Cancer Concern India and is published thrice a year. It is devoted to publication of contributions that focus on the information pertaining to many issues concerned with cancer.

Manuscripts

The paper should be only on issues concerning cancer in India. The manuscript should be typed in double space with a wide margin and should not exceed 2000 words. The title page should carry the title of the paper, name and affiliation of the author/s. The official designation and official address should be typed at the bottom of the first page of the script. The paper should be divided into Abstract, Introduction, Material and method, Results and Discussion, conclusion, acknowledgements (if any) and references. Tables should be given in Arabic, serial number and each table on a separate page. References should be listed at the end of the paper in alphabetical order and they should include only works referred to in the text. The format for the reference is:


Note: Please follow above mentioned system to help maintain a particular pattern in the Journal. Submit your contribution both on printed format (hard copy) and soft copy in CD. It should be sent on the following address and soft copy could also be sent by email.

Global Cancer Concern India
C-659, Sushant Lok -1,
Gurgaon, Haryana – 122 009
E-mail: info@gcci.org.in

Helpful Tips:

You can contribute to this column by sending a small article (500 – 600 words) on any subject that concerns with cancer. You can also send us such useful news items published in other magazines or journals. Please give proper reference for the same. Please follow instructions given in column (1) & (2).