

## **CHAPTER 2**

**THE CANCER DISEASES - ITS CONTROL AND PREVENTION :  
AN OVERVIEW**

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### THE CANCER DISEASES - ITS CONTROL AND PREVENTION : AN OVERVIEW

Indeed some aspect of cancer diseases i.e. the disease, its type, sign and symptoms, spreading , causes behind , treatment , curability and its prevention has been presented in the preceding discussions. Apart from these, an attempt also has been made to highlight the aspects of national cancer control programme in the country .

#### I

##### **Aspects of Cancer Diseases**

In fact , an attempt has been made in the preceding delineation in brief to highlight some various aspects of cancer diseases . Cancer is an abnormal growth of a cell or an organ due to a specific stimulus (carcinogen). This growth is an uncoordinated, purposeless one, which continues to grow even after the cessation or withdrawal of the stimulus. Cancer can originate from any organ or part of the body. The natural behaviour of a particular cancer depends upon the site of involvement and the histopathological type of the cancer. Some of the cancers are very mild and can be controlled very easily while some are very aggressive and results of treatment are very poor.

##### **Signs and Symptoms of Cancer**

The signs and symptoms of cancer depend upon the body part affected by the disease. The primary tumour or the spread of tumour to lymph nodes or distant parts of the body may cause symptoms. In general, cancer has a tendency to start as a nodule or mass of tissue, which keeps on growing. The growth rate of cancers is variable with some cancers growing very rapidly and others growing slowly. With further growth, cancers, which affect external or internal body surfaces, can form wounds or ulcers leading to dirty discharge, bleeding etc. Common symptoms of cancer as per World Health Organization (WHO) can be described as follows.

- a) Lump or swelling; b) sore that doesn't heal c) Recent change in a wart/mole ; d) Unusual bleeding or discharge ; e) Changes in bladder or bowel habits ; f) Nagging cough or hoarseness ; and g) Difficulty in swallowing or dyspepsia.

As Cancer grows it invades the surrounding structures and interferes with the local function. It spreads to the draining lymph nodes through the lymphatic. Through the blood streams it spreads to the others parts of the body. The common organs of distant metastasis are lung, liver, bones, brain etc. Still now the exact cause of cancer is not yet known. However, there are certain risk factors, which may cause this disease in individual prone to develop Cancer. Among the common factors, chemicals are one of the important causes. These chemicals may be in the form of Tobacco or chemicals present in food, air, water, etc. These chemicals are known as carcinogens. Till now about 60 agents have been identified. Some common risk factors that cause cancer, are as follows :

#### **Risk Factors/Causes**

- ~ Tobacco
- ~ Smoking: Cigarette, Bidi, Cigar, Hukka, others
- ~ Smokeless: Zarda, Gutka, Khaini, Snuff, etc.
- ~ Alcohol
- ~ Infections (viruses, parasites, bacteria)
- ~ Electromagnetic radiation (Organize radiation, ultraviolet rays, others)
- ~ Diet (dietary carcinogens)
- ~ Occupational exposure to carcinogens
- ~ Pollution (air/water/food)
- ~ Reproductive hormones

#### **Treatment of Cancer**

Basically, there are three main modalities of Cancer treatment – Surgery, Radiotherapy and Chemotherapy (Therapy by Drugs). The treatment of cancer is described as a multimodality approach as a large number of patients need to be treated with a combination of the approaches available. Thus, some patients may need only one modality of treatment, some need a combination of two modalities and some need to be treated with all three modalities to achieve the best results. To decide the best treatment for a

given patient, initial testing is done to make the diagnosis (diagnostic investigations) and decide the stage of disease (staging investigations). After the initial treatment plan, the treatment is started. The progress of treatment and response of disease is assessed from time to time. A review of the progress is made in subsequent tumour board meetings to decide whether any change in the treatment plan is required or not. Once the planned treatment is completed, cancer patients need regular follow-up.

### **Curability of Cancer**

Yes, Cancer is curable if detected early. The results of treatment in stage I and stage II (early stage cancer) are about 80%. In late stage diseases (stage III & stage IV) the results are very poor. (Less than 20%). In India, about 70% patients present in advanced stage diseases and hence difficult to treat. In majority of Indian patients, cancer can definitely be prevented. About 50% cancer are tobacco related e.g. Lung cancer, Oral cancer (Cancer of mouth), Laryngeal cancer (Voice box), Oesophageal cancer (Food pipe), etc. and they can be prevented to a large extent by avoiding intake of tobacco. Certain other cancers like bowel cancers can also be prevented by dietary habits.

### **Staging of Cancer**

Staging describes the extent or severity of an individual's cancer based on the extent of the original (primary) tumor and the extent of spread in the body. Staging is important:

- ◆ Staging helps the doctor plan a person's treatment.
- ◆ The stage can be used to estimate the person's prognosis (likely outcome or course of the disease).
- ◆ Knowing the stage is important in identifying *clinical trials* (research studies) that may be suitable for a particular patient.

Staging helps researchers and health care providers exchange information about patients. It also gives them a common language for evaluating the results of clinical trials and comparing the results of different trials. Staging is based on knowledge of the way cancer develops. Cancer cells divide and grow without control or order to form a mass of tissue, called a growth or tumor. As the tumor grows, it can invade nearby organs and tissues. Cancer cells can also break away from the tumor and enter the bloodstream or

lymphatic system. By moving through the bloodstream or lymphatic system, cancer can spread from the primary site to form new tumors in other organs. The spread of cancer is called metastasis.

## National Cancer Control Programme

The National Cancer Control Programme (NCCP) was launched in 1975-76 with the objectives of primary prevention, early detection, treatment and rehabilitation. In order to cater to the changing needs of the disease the programme has undergone three revisions with the third revision in December 2004. Under the revised programme, the primary focus is on correcting the geographic imbalance in the availability of cancer care facilities across the country. The scope of the programme and the quantum of assistance under the various schemes have been increased.

### Global

Cancers in all forms are causing about 12 per cent of deaths throughout the world. In the developed countries cancer is the second leading cause of death accounting for 21% (2.5 million) of all mortality. In the developing countries cancer ranks third as a cause of death and accounts for 9.5% (3.8 million) of all deaths. Tobacco alcohol, infections and hormones contribute towards occurrence of common cancers all over the world.

### India

Cancer has become one of the ten leading causes of death in India. It is estimated that there are nearly 1.5-2 million cancer cases at any given point of time. Over 7 lakh new cases of cancer and 3 lakh deaths occur annually due to cancer. Nearly 15 lakh patients require facilities for diagnosis, treatment and follow up at a given time. Data from population-based registries under National Cancer Registry Programme indicate that the leading sites of cancer are oral cavity, lungs, oesophagus and stomach amongst men and cervix, breast and oral cavity amongst women. Cancers namely those of oral and lungs in males, and cervix and breast in females account for over 50% of all cancer deaths in India.

WHO has estimated that 91 per cent of oral cancers in South-East Asia are directly attributable to the use of tobacco and this is the leading cause of oral

cavity and lung cancer in India. Cancer usually occurs in the later years of life and with increase in life expectancy to more than 60 years, an estimate shows that the total cancer burden in India for all sites will increase from 7 lakh new cases per year to 14 lakh by 2026.

### **Goals and Objectives of National Cancer Control Programme**

- Primary prevention of cancers by health education regarding hazards of tobacco consumption and necessity of genital hygiene for prevention of cervical cancer.
- Secondary prevention i.e. early detection and diagnosis of cancers, for example, cancer of cervix, breast cancer and of the oro-pharyngeal cancer by screening methods and patients' education on self examination methods.
- Strengthening of existing cancer treatment facilities, which were inadequate.
- Palliative care in terminal stage cancer.

### **Existing Schemes under National Cancer Control Programme**

**Financial Assistance to Voluntary Organizations:** This scheme is meant for IEC activities and early detection of cancer. Under the scheme financial assistance up to Rs.5.00 lakh is provided to the registered voluntary organizations recommended by the State government for undertaking health education and early detection activities in cancer. A linkage with the Regional Cancer Centre (or Medical College/District Hospital if there is no RCC) is now mandatory by the NGO concerned.

**District Cancer Control Scheme:** It is known that a large number of cancer cases can be prevented with suitable health education and early case detection. Accordingly the scheme for district projects regarding prevention, health education, early detection and pain relief measures were started in 1990-91. Under this scheme one time financial assistance of Rs.15.00 lakh is provided to the concerned State Government for each district project selected under the scheme with a provision of Rs.10.00 lakh every year for the remaining four years of the project period. The project is linked with a Regional Cancer Centre or an institution having good facilities for treatment of cancer patients. The patients are provided treatment at the concerned Regional Cancer Centre or the nodal institution.

**Cobalt Therapy Installation:** To strengthen the cancer treatment facilities, the financial assistance of Rs. 1.0 crore for charitable organizations and 1.5 crore for government institutions is provided for procurement of teletherapy and brachytherapy equipments etc. This is one time grant as at present.

**Development of Oncology Wings in Govt. Medical College Hospitals:** This scheme had been initiated to fill up the geographical gaps in the availability of cancer treatment facilities in the country. Central assistance is provided for purchase of equipments, which include a teletherapy unit beside other equipments. The civil works and manpower are to be provided by the concerned State Government/ Institution. The quantum of central assistance is Rs.2.00 crore per institution under the scheme. The scheme provides one time grant only.

**Regional Cancer Centers:** There are 19 Regional Cancer Research and Treatment Centers recognized by Government of India and recurring grant of Rs.75 lakh is being given to these Regional Cancer Centers.

### **New Initiatives**

There are some activities, which are carried out under the National cancer control programme out of WHO funding under the biennium pattern. In WHO biennium 1998-1999, 16 workshop/training programmes were carried out throughout India. The Pap Smear Kits and Can scan software were supplied to 12 Regional Cancer Centers. Morphine tablets were also supplied to them. In the WHO biennium 2000-2001 following new initiatives were carried out:-

#### **New Initiatives**

- Outreach activities by medical colleges for early detection and awareness of cancer .
- Training of personnel in early detection and awareness of cancer.
- Supply of Morphine.
- Telemedicine and supply of computer hardware and software.
- IEC activities.
- Modified District Cancer Control Programme.
- National Cancer Awareness Day.
- Training of cytopathologists and cytotechnicians in the quality assurance in Pap Smear technology .
- Participation in Health Melas and distribution of health education material .

- Postage stamp depicting a women carrying out 'self breast examination' was brought out by Department of Posts on National Cancer Awareness Day .
- Likely telecast of a health magazine 'Kalyani' in the current year, with cancer and anti tobacco items under the agreement with Prasar Bharti and MOHFW .
- Broadcast of health education audio material developed by CNCI, Kolkatta, through FM Radio .

### **Modified District Cancer Control Programme**

Modified District Cancer Control Programme has been initiated in four states namely Uttar Pradesh, Bihar, Tamil Nadu and West Bengal. Sixty Blocks have been taken and 1200 'NCD workers, 30 supervisor doctors, and consultants have been appointed. This will be a Survey cum health education drive in which about 12 lakh women in the age group 20-65 years are being contacted. Health education about general ailments, cancer prevention and early detection besides 'Self Breast Examination' will be imparted. The project will be completed in about a year's time.

### **National Cancer Awareness Day**

Cancer Awareness day was observed on 7-11-2001. Hon'ble Min. of State, Ministry of Communications Shri Tapan Sikdar at Vigyan Bhawan on the same day, released a commemorative stamp on Cancer and first day cover portraying Madame Curie. A newspaper advertisement on National Cancer Awareness Day was also released in prominent dailies across the country.

### **List of Regional Cancer Centers**

- I. Kidwai Memorial Institute of Oncology, Bangalore (Karnataka) .
- II. Gujarat Cancer and Research Institute, Ahmedabad (Gujarat) .
- III. Cancer Hospital Research Institute, Gwalior (Madhya Pradesh) .
- IV. Cancer Institute, Madras (Tamil Nadu) .
- V. Regional Cancer Centre, Thiruvananthapuram (Kerala) .
- VI. Regional Centre for Cancer Research and Treatment Society, Cuttack (Orissa) .
- VII. Dr.B.B.Cancer Institute, Guwahati (Assam) .
- VIII. Chittaranjan National Cancer Institute, Kolkatta (West Bengal) .
- IX. Institute Rotary Cancer Hospital (AIIMS), New Delhi.
- X. Tata Memorial Hospital, Mumbai (Maharashtra) .

- XI. Kamala Nehru Memorial Hospital, Allahabad (U.P.) .
- XII. MNJ Institute of Oncology, Hyderabad (Andhra Pradesh) .
- XIII. R.S.T.Cancer Hospital, Nagpur (Maharashtra) .
- XIV. Indira Gandhi Institute of Medical Sciences, Patna (Bihar) .
- XV. Acharya Harihar Tulsi Das Regional Cancer Centre, Bikaner, Rajasthan .
- XVI. Indira Gandhi Medical College, Shimla (Himachal Pradesh) .
- XVII. Post Graduate Institute of Medical Sciences, Rohtak (Haryana) .
- XVIII. Pt. J.N.M. Medical College and Hospital, Raipur, Chattisgarh .
- XIX. JIPMER, Pondicherry .

### Schemes under the Revised Programme

There are five schemes under the revised programme , as follows :

- Recognition of new Regional Cancer Centres (RCCs) by providing a onetime grant of Rs. 5.00 crore.
- Strengthening of existing Regional Cancer Centers by providing a one-time grant of Rs. 3.00 crore.
- Development of Oncology Wing by providing enhanced grant of Rs. 3.00 crore to the Government institutions (Medical Colleges as well as government hospitals).
- District Cancer Control Programme by providing the grant-in-aid of Rs. 90.00 lakh spread over a period of 5 years.
- Decentralised NGO Scheme by providing a grant of Rs. 8000 per camp to the NGOs for IEC activities.

### Guidelines for the durable scheme

- There are **25 Regional Cancer Centers** providing comprehensive cancer care services. There are 210 institutions possessing radiotherapy installations.
- A **National Strategic Task Force** has been constituted to formulate a strategy for the National Cancer Control Programme for the Eleventh Five year Plan.
- **Training:** In order to increase the capacity of the health staff at all levels of health care, training manuals have been developed in cancer control, tobacco cessation, cytology and palliative care.
- **Onconet-India:** C-DAC Trivandrum has been entrusted with the responsibility of preparing the DPR for Operationalisation of Onconet India. Under the project, all 25 Regional Cancer Centers will be linked with each other and also each Regional Cancer Center would in turn be linked to 5 peripheral centres.
- **Membership of IARC:** India has become a member of the International Agency for Research in Cancer that shall provide a fillip to cancer research in the country.

- Q **National Cancer Awareness Day** : November 7<sup>th</sup>, the birth anniversary of Madame Curie is observed as the National Cancer Awareness Day. Number of banners are displayed for creating awareness among the general masses about cancer on the day.

### **Cancer Patient Fund Under “Rashtriya Arogya Nidhi (RAN)”**

The “Health Minister’s Cancer Patient Fund” (HMCPF) within the Rashtriya Arogya Nidhi (RAN) Scheme has also been set up in 2009. In order to utilize the HMCPF, it is proposed to establish the revolving fund like RAN in the Various Regional Cancer Centre(s) (RCCs) which are getting fund for equipments from Cancer Programme of Govt. of India. Such step would ensure and speed up financial assistance to needy patients and would help to fulfil the objective of HMCPF under RAN. The Financial Assistance to the Cancer Patients up to Rs. 1,00,000/- (Rs. One lakhs only), would be processed by the concerned Institute/Hospitals on whose disposal, the revolving fund has been placed. The cases of financial assistance above this limit would be referred by the Hospitals/Institutes for assistance from Central Funds. Initially, 27 Regional Cancer Centres have been proposed, for whom revolving funds of (Rs.10 lakh) have been released (Source: National Portal Content Management Team, Reviewed on: 07-07-2010 ).

It is the fact that there are tremendous increase in cancer in past few years. As per the National Commission on Macroeconomics & Health (NCMH), around 8-9 lakh new cancer cases/ year and 2.5 million cases at any given time point are estimated in the country. The goal is to reduce the morbidity and mortality from cancer and improve the quality of life of cancer patients and their families. Vision 2015 for India is to offer affordable and accessible diagnostic, therapeutic and palliative care services in the country. Major preventive thrust on tobacco control and infection (especially HPV) control has to be sustained at every cost.

National Cancer Control Programme (NCCP) launched in 1975-76 has seen three major revisions. The first revision (1984-85) stressed on primary and secondary prevention. Launch of District Cancer Control Programme was fundamental theme of the second revision (1990-91). The current National Cancer Control Programme implementation identified layered cancer care

delivery system with Community Health Centers (CHCs; Level-0; for early detection and referral), Cancer care Services at District Hospitals (Level-I, -II), Oncology Wing at Medical Colleges (Tertiary level care; Level-III, -IV) and comprehensive cancer care through Regional Cancer Centers (RCCs). The other vital components of National Cancer Control Programme include IEC, research and training. Translational research on aspects of etiology, early diagnosis, treatment selection, monitoring including prognostication in Indian context is the need of the day. The multi-factorial functionality of National Cancer Control Programme is obviously linked to a five fold increase in budget allocation to around 2000 crore in the current five year plan. Regional Cancer Centers are endowed with an enhanced responsibility of leading cancer prevention, early detection, diagnosis and treatment, pain relief and palliative care and most importantly, coordination of activities of all the stakeholders of health care delivery system in public health setting. Each segment has its own strengths and weaknesses in comprehensive cancer care.

Effective implementation of National Cancer Control Programme through existing infrastructure is the objective that needs to be achieved chiefly through education of non-oncology medical professionals, paramedical professionals and those who render oncology related services. Teaching and training of all strata of stakeholders thus are the most important aspects and demand detailed discussions that lead to coordinated successful comprehensive cancer care.

### **Cancer Prevention and Treatment Strategies for India**

India is one of the few developing countries that has formulated a National Cancer Control Programme. The programme envisages control of tobacco related cancers; early diagnosis and treatment of uterine cervical cancer; and distribution of therapy services, pain relief and palliative care through augmentation of health infrastructure. Suggested surrogate outcome measures include change in tobacco use, 'Knowledge, Attitude, Practice' (KAP) pattern, compliance to screening programmes, changes in referral practices and shift in stage distribution.

## **Primary Prevention and Screening Programmes**

Primary prevention is the most cost effective prevention program as it aims to reduce the incidence of cancer by risk factor modification. Fifty percent of all cancers in males are tobacco related and a large proportion of them can be prevented by anti-tobacco programs. This has to be organized more widely. Teen age students need to be targeted as most of them pick up habits at this time. The school curricula should involve messages for a healthy life style and warn about the harmful effects of tobacco and alcohol. Legislation has to be enforced for prohibiting tobacco advertisement and sale of tobacco to youngsters. A proportion of cancers are considered to be related to the dietary practices and the importance of a healthy diet rich in green and yellow vegetables and fruits has to be highlighted. Cancer of the uterine cervix can be controlled to a certain extent by practicing genital hygiene and safe sexual practices.

Cervical cytology (pap smear) screening programs were found to be successful in reducing cervical cancer incidence and women in the age group 35 to 64 years should undergo regular pap smear screening. Given the limitations in large scale population based screening programmes, India can consider primary prevention of Cervical cancer by promoting genital hygiene and sexual behaviour. States that have achieved a high level of health care delivery can consider starting organized screening programmes. The primary target should be to offer once a life time screening for all women at the age of 40 years. Government and private health care providers can join in this effort and offer these services.

Mammographic screening for breast cancer may not be cost effective in India at present, but regular breast self examination needs to be promoted for early detection of breast cancer. Breast self examination can be propagated through print and electronic media as well as through health care personnel in various settings. Measures identified and propagated for cancer control in the developed countries may not be applicable for the Indian context. We have to find answers to our problems through methods which are feasible and evaluable in the Indian context. Cancer prevention needs to be considered as part of the Non Communicable Diseases prevention programme as it will

make it more effective and feasible. The risk factors, Alcohol, Tobacco, Bad Diet and Physical inactivity are risk factors for most of the Non Communicable Diseases and has to be approached together as lifestyle modification.

### **Cancer Detection and Prevention Clinics**

Late stage at presentation is the main reason for the poor survival from cancer in India. The late presentation is mainly due to the lack of diagnostic facilities at the peripheral levels. District hospitals in India have the services of specialists and provide reasonable services. These hospitals can have a 'Cancer Detection and Prevention Clinic', which will provide diagnostic services and minimal treatment.

The diagnostic services set up in the hospital can also be of use to all the patients who attend this hospital. Cost recovery may be attempted from the beginning and an experience in Kerala has demonstrated that such services are feasible and sustainable. The services as well as the organogram of such a centres is shown in This centre in Kerala provides a good range of services and the cytology services have helped to diagnose cancers at an early stage. Provision of Palliative Care services has also been accepted by the community. Capital funding may be raised through people's participation and from various other sources and once established, the income generated by the various investigations is sufficient to run the programme. Existing staff of the hospital can be trained to provide the services. Regional Cancer Centers can set up cancer detection and prevention centers in District hospitals.

### **Palliative Care**

More than 75% of cancers in India present in advanced stages and Palliative care and pain relief are essential to provide good quality life for these patients. Oral Morphine is the mainstay of cancer pain management and this has to be made available at all centers. The medical doctors as well as the administrators have to be sensitized and educated about the use of Oral Morphine and the regulations have to be made simple so that this essential drug is made available to those in pain. Half way homes and Hospices may be considered through Non Governmental Agencies as well as other sources, but they can work well when they are attached to a major cancer treatment

centre. Facilities and services to be made available at different levels of health care delivery in India can be concerned.

### **Cancer Registry Network**

Evaluation of the programme has to be undertaken with reliable data on the incidence and mortality from cancer. A network of cancer registries have to be set up towards this end. Death registration and death certification are inadequate and incomplete at present and cancer registries are the only means of obtaining data on the disease. To start with hospital based cancer registries can be initiated by the regional cancer centers and they can later on be expanded to population based cancer registries. Registries under the Indian Council of Medical research as well as those outside can be networked. Cancer control programmes may be initiated in Registry areas so that effective strategies can be identified by monitoring the registry data.

### **Human Resource Generation**

Cancer control programmes need a large number of trained personnel in various specialities. These include Epidemiology and Statistics, Cancer Registry Operations, Cytotechnicians and Cytotechnologists, Nurses trained in Palliative Care and in care of cancer patients on Chemotherapy and radiotherapy, medical personnel in all aspects of cancer treatment, Physiotherapists and Occupational Therapists, Counsellors and various other specialists. Once the programme is initiated the services of all the above categories of personnel are needed and the Regional cancer Centers should take this as a priority and start training programmes.

### **Treatment Facilities**

A multidisciplinary approach to cancer treatment is essential and this has to be made available at all Regional Cancer Centers. The services of a trained surgeon and a Clinical Oncologist are needed to plan the most appropriate treatment. Radiotherapy services are still the mainstay of treatment given the large proportion of advanced epithelial cancers in India. Given the long waiting lists and the distance that patients have to travel to reach treatment facilities, optimal strategies have to be identified.

Patients for palliative treatment and curative treatment need to be identified at the beginning of the treatment plan and palliation may be achieved with the minimum machine time. An essential drug list has to be prepared for cancer chemotherapy and chemotherapy services for common cancers have to be made available in all centers. Advanced facilities for high intensity chemotherapy for leukaemia's and other cancers where chemotherapy is the mainstay of treatment need to be provided at the Regional Cancer Centers. Surgical Oncology training has to be provided to General Surgeons during their training as well as to those in practice as majority of the cancers are likely to present themselves to a surgeon in the first instance.

### **Strategy Matrix**

Cancer Control is an area in which we need participation from all sectors of the society. There are areas in which various agencies can put in their contributions. Keeping targets will help to monitor the programme as well as to identify the usefulness of the strategies, which are as follows :

#### **■ Regional Cancer Center**

Health Promotion/Home Care/Early Detection/Pain Relief/Palliative Care/ Comprehensive Cancer treatment/ Organize screening programmes/ Cytology training/ Basic and applied research/Training of all categories of personnel/ Cancer Registries/Epidemiology .

#### **■ Medical College Hospital**

Health Promotion / Home Care / Early Detection / Pain Relief / Palliative Care/Treatment of common cancers / Training of medical officers / paramedical personnel.

#### **■ District Hospital**

Health Promotion/Home Care/ Early Detection/Pain Relief/ Palliative Care/ Treatment of common cancers .

#### **■ Taluk Hospital /Sub-District Hospital**

Health Promotion/Home Care/Early Detection/ Pain Relief/Palliative Care .

## II

### **Chittaranjan National Cancer Institute (CNCI) (Chittaranjan Cancer Hospital)**

#### **History of Hospital**

Human suffering due to cancer and the plight of the cancer patients inspired a spirited young gynecologist and a campaigner for cancer treatment and research Dr. Subodh Mitra to organize a cancer treatment and research centre in Calcutta as there were no such specialized centre during that time. With the help and support of Dr. B.C. Roy, an eminent physician and the then Chief Minister of West Bengal, the foundation of the present day Chittaranjan Cancer Hospital (CCH) was laid. which was committed to basic research on cancer.

During that time. With the help and support of Dr. B.C. Roy, an eminent physician and the then Chief Minister of West Bengal, the foundation of the present day Chittaranjan Cancer Hospital (CCH) was laid. The hospital was formally inaugurated by Prof. Madam J. Curie in January 2, 1950 and named after Deshbandhu Chittaranjan Das, as a tribute to and in acknowledgement of the enormous donation of his land and property for the cause. Initially this was a cancer treatment centre, which gradually expanded its activities in basic and clinical research with the assistance from government funding organizations. This eventually led to the founding of the Chittaranjan National Cancer Research Centre (CNCRC), funded by the Government of India in 1957, which was committed to basic research on cancer. The Chittaranjan Cancer Hospital and Chittaranjan National Cancer Research Centre functioned as separate entities in adjacent buildings until their merger in 1987 and emergence of Chittaranjan National Cancer Institute (CNCI) with the objective of serving as a premier Regional Cancer Center (RCC) for the Eastern Region of the Country.

The Chittaranjan National Cancer Institute Hospital (established in 1950) with a 200-bed indoor facility attends to an average of 6500 new cancer patients and about 43904 cases for investigation, treatment and follow up every year.

70% of the patients are getting free treatment facility and 30% patients are paying category patients. It renders modern multidisciplinary diagnostic and therapeutic services to the patients. It has a state of art Radio diagnosis and Radiotherapy Department, Surgical Oncology Departments with well equipped five OT's. It has a Pathology Department with Histopathology, Cytology and Clinical Biochemistry labs. The Hospital 12 bed I.C.U. and modern blood bank.

### **Departments of Research Wings**

1) Dept of Epidemiology & Biostatistics, 2) Dept of Experimental Haematology, 3) Dept of Immunoregulation & Immunodiagnosis, 4) Dept of Invitro Carcinogenesis & Cellular Chemotherapy , 5) Library, 6) Dept of Metabolic Regulation, 7) Dept of Neuro-endocrinology, 8) Dept of Oncogene Regulation, 9) Dept of Pathology & Cancer Screening, 10) Dept of Receptor Biology & Tumor Metastasis, 11) Dept of Signal Transduction & Biogenic Amines , 12) Dept of Viral Associated Human Cancer, 13) Dept of Animal Care & Maintenance, 14) Dept of Anticancer Drug Development & Chemotherapy, 15) Dept of Cancer Chemoprevention, 16) Dept of Central Research Instrumentation Facility (CRIF), 16) Dept of Environmental Carcinogenesis & Toxicology.

In research wing, there are 17 department, of which one is library and one is Animal care and maintenances. In fact, 20 Scientists of research wings perform research work along with 5 Technical Officer, 32 Laboratory Staff, 12 General Duty Attendant. 51 Research Fellow perform their research work under 20 Scientists. Only Pathology and Cancer Screening Department of Research Wing is catering to comprehensive cancer screening and awareness along with research side by side for the last 30 years. Cancer screening and awareness programme (camp) had been conducted in different urban slums and rural areas of West Bengal.

### **Departments of Hospital Wings**

1) Blood Banking & Transfusion ; 2) Dept of Anaesthesiology ; 3) Dept of Dentistry ; 4) Dept of ENT- Head & Neck Oncology ; 5) Dept of Gynaecologic Oncology ; 6) Dept of Medical Oncology ; 7) Dept of Pathology ; 8) Dept of

Radiation Oncology ; 9) Dept of Radio Diagnosis ; 10) Dept of Surgical Oncology ; 11) Medical Records Unit ; 12) Sudhira Memorial Library.

In Hospital wing, there are 12 wings, of which one is library and one is Medical Record wings. Total number of Doctors at Hospital wings are 66 ( including House Surgeon , Registrar and Post doc. trainee) perform their duty along with the help of 57 nursing staff and 61 General Duty Attendants.

Only Gynaecologic Oncology wing of Hospital is conducted Cancer screening and awareness programme (camp) in different urban slums and rural areas of West Bengal.

The number of Doctors along with other Para-Medical Staff in Hospital Wings is given on Table 1 .

Table 1 : Doctors and other Para-Medical Staff strength in CNCI

Doctors and Para-Medical Staff	Number
Specialist Doctor	18
Medical Officer	10
Registrar	17
House Surgeon	18
Post Doctor Trainee	3
Physicist	4
Bio-Chemist	1
Laboratory Technician	17
Junior Scientific Assistant	3
Nursing Sister	57

Source : Chittaranjan National Cancer Institute , Kolkata ,2009

#### Other Departments of CNCI

1)Administrative Section ; 2) Accounts Section ; 3) Internal Audit Section ; 4) Director's Section ; 5) Stores ; 6) Purchase ; 7) Maintenance Section ; 8) Academic and Computer Facility ; 9) Hospital Administration ; 10) Nursing Staff ; 11) Wardmaster's Section ; 12) Supporting Admiliistrative Staff .

#### Load of Patients

Number of patients according to new and old OPD cases attended including number of indoor admission (both new and old cases) each year from 2004 to 2008 has been shown in Table 2 to visualize the patients load of Chittaranjan National Cancer Institute .

Table 2 : Patients Load at Chittaranjan National Cancer Institute , 2004-2008

Year	Number of new cases attended OPD	Number of old cases attended OPD	Number of indoor admission ( new and old cases).
2004	5870	43548	3122
2005	5751	39374	3546
2006	5826	41934	3492
2007	6003	45886	3523
2008	6029	48779	3558

Note : OPD denotes Out Patient Department (Out-Door)

Source : Chittaranjan National Cancer Institute , Kolkata ,2009

A rural based field centre of CNCI is situated at Chanden Nagar in Hooghly District, named Ruplal Nandy Memorial Cancer Research Centre (RNMCR). There was one Medical Officer , one Nurse and 8 other staffs. The activities conducted from the centre mainly are - 1) Cancer Early Detection, 2) Cancer Screening, 3) Cancer Awareness and Education, 4) Tobacco cessation clinic, 5) Home palliative care service. To implement these programs the RNMCR staffs have to move out to the community and hold outreach programs. The center is being renovated and reorganized to improve the diagnostic and treatment facilities.

### **Tele Medicine**

Chittaranjan National Cancer Institute today provides diagnostic and tertiary treatment facilities to cancer patients of West Bengal and Eastern region of the country. The Institute is well equipped to handle the large number of patients who regularly attend the OPD. However it has been observed that delayed referrals, irregular follow up and inability to reach the Institute in time are some of the reasons for which treatment results are often disappointing. Recognizing the importance of Telemedicine in providing services to cancer patients, Chittaranjan National Cancer Institute is presently actively participating in the West Bengal Telemedicine Project. This is expected to benefit cancer patients, particularly those from remote areas and also allow CNCI to be connected to the other Regional Cancer Centers (RCC) to form a national cancer network. Webel ECS Ltd, the implementing agent for the West Bengal Telemedicine Project is presently providing logistic & manpower support to CNCI with regard to developing the telemedicine facility

CNCI has been chosen to become a Cancer Referral Center in the existing Telemedicine Program of West Bengal which already interconnects various Hospitals of the State. Under this program CNCI has been connected to through Fibreoptic State Wide Area Network (SWAN) via Leased and ISDN connectivity. Initially CNCI has been connected to the following 4 nodal centers under the West Bengal Telemedicine Project .

1. Tamluk Sadar Hospital, Midnapore (E).
2. Raiganj District Hospital, Uttar Dinajpur .
3. Arambag Sub-Divisional Hospital, Hooghly.
4. Darjeeling District Hospital, Darjeeling .

In addition, CNCI is connected to the following referral hospitals in West Bengal.

1. School of Tropical Medicine, Kolkata
2. Calcutta Medical College, Kolkata
3. Nilratan Sarkar Hospital, Kolkata
4. North Bengal medical college and Hospital, Siliguri, Darjeeling District

### **Chittaranjan National Cancer Institute -Telemedicine Consultations**

Chittaranjan National Cancer Institute –Telemedicine Consultations functions 4-days per week (Monday, Wednesday, Thursday & Friday) in Room No H-102, between 1 pm to 3 pm.

The following is the present departmental schedules .

- Surgical Oncology - Monday, Wednesday, Thursday, Friday
- Gynecologic Oncology - Monday, Thursday
- ENT-H&N Oncology - Wednesday, Thursday
- Medical Oncology - Monday, Friday
- Pathology - Monday, Thursday
- Radiation Oncology - Monday, Wednesday, Thursday, Friday
- Radiodiagnosis - Wednesday, Friday

Specialists/Medical Officers from the above departments are available for at least two days per week. All Head of the Departments and Medical officers (Hospital Departments) have been provided a Training Program through Webel ECS. CME PROGRAMS & Telemedicine Video conferencing is to be started very soon on last Friday of every alternate month.

## **The ONCONET Telemedicine Project of the Govt. of India: (under implementation)**

The Ministry of Health & Family Welfare, Govt. of India, has decided to include the provisions of Telemedicine as one of its core area of budgetary allocation. The ONCONET Telemedicine Program currently running successfully at Regional Cancer Center, Thiruvananthapuram will be implemented on a nation wide basis. At the initial phase 25 Regional Cancer Centers will be connected through satellite connectivity (VSAT) to form the ONCONET network.

Each Regional Cancer Center in turn will connect to 4 Nodal centers at the District Hospital level. It has been decided that CNCI will be connected to the following nodal centers in West Bengal under the ONCONET program.

1. Barahampur New General Hospital, Murshidabad, PIN 742101
2. Deben Mahato Sadar Hospital, Purulia, PIN 723101
3. Raiganj District Hospital, Uttar Dinajpur, PIN 733134
4. Darjeeling District Hospital, Darjeeling

The Centre for Development of Advanced Computing (CDAC) involved with the ONCONET Program at Regional Cancer Center, Thiruvananthapuram has been entrusted to take up the feasibility study in consultation with the RCCs. CNCI is presently working actively with CDAC with regard to fulfillment of its obligations as per the requirement criteria. Several visits by ONCONET to the Institute has take place and service providers like Reliance Infocom, BSNL, etc are presently doing the feasible study.

### **The objectives of the ONCONET Project**

- Tele-consultations
  1. Reduce crowd at the Regional Cancer Centers
  2. Early Detection
  3. Follow-up
  4. In-between consultations
- Tele-pathology
- Tele-radiology
- Online appointments – Registration – Admissions
- Information exchange: Cancer Registry/Cancer Atlas
- Electronic Classroom: CME programs
- Coordination in research
- Sharing of expertise, resources and facilities whenever feasible and possible.
- Electronic Medical Records
- Digital Library
- Mobile telemedicine Unit

**III****Health Profile of West Bengal**

The main methods of cancer treatment are surgery , chemotherapy , and radiation therapy, mainly used either alone or in combination. Radiotherapy ranks with surgery as the most important methods of curing cancer. On the basis of availability of data, names and location of some cancer hospitals / research institutes (both private and government) in West Bengal is given in Table 3.

Table 3 : The Cancer Hospitals/Research Institutes in West Bengal

Name of the Hospitals / Research Institute	Place	Under
Bankura Sammilani Medical College	Bankura District.	Government
Burdwan Medical College and Hospital.	Burdwan District.	Government
Chittaranjan National Cancer Institute (CNCI).	Kolkata.	Government
Medical College and Hospital.	Kolkata.	Government
Nilratan Sarkar Medical College.	Kolkata.	Government
North Bengal Medical College.	Dargeeling District.	Government
P.G. (SSKM) Hospital.	Kolkata.	Government.
R. G. Kar Medical College.	Kolkata.	Government
<b>Private Hospitals going to start as above Hospital, within a short period</b>		
Tata Medical Center .	Rajarhat, Kolkata.	Private.
B. P. Poddar Hospital.	Kolkata.	Private.
Westbank Hospital.	Howrah District.	Private.
AMRI	Kolkata	Private
Apollo Gleneagles Hospital.	Kolkata.	Private.
Barasat Cancer Research & Welfare Centre.	North 24 Parganas District.	Private
Cancer Centre & Welfare Home. (CCWH).	Thakurpukur, Kolkata.	Private
North Bengal Oncology Center.	Darjeeling District.	Private
Coochbehar Cancer Centre.	Cooch Behar District.	Private (Govt.Aided)

However, the state-wise number of hospitals in India where the cancer patients are fully or partially taken care of depending on infrastructural facilities of the respective hospital are also shown in Table 4.

Table 4 : State-wise Number of Cancer Treating Hospitals in India

Sl. No.	Name of State	Number of Hospitals
1	Andhra Pradesh	14
2	Assam	2
3	Bihar	3
4	Chandigarh	1
5	Delhi	7
6	Goa	1
7	Gujrat	5
8	Hariyana	1
9	Himachal	1
10	Jammu & Kashmir	3
11	Karnataka	12
12	Kerala	6
13	Madhya Pradesh	8
14	Maharashtra	16
15	Manipur	1
16	Meghalaya	1
17	Orissa	3
18	Pandichery	1
19	Punjab	4
20	Rajasthan	5
21	Tamilnadu	17
22	Tripura	1
23	Uttar Pradesh	11
24	West Bengal	8

It may be relevant to look into the health profile of West Bengal with a view to grasp over the related health situation at a glance in this regard. In this context, the comparative figures of major health and

demographic indicators of West Bengal with national average are shown in Table 5 .

**Table 5 Health profile of West Bengal State as compared to India figures**

Health Item	Year	West Bengal	India
Sex Ratio	2001	934	933
Infant Mortality Rate	2003	46	60
	2004	40	58
	2005	38	58
	2008	35	53
Total Fertility Rate (SRS)	2008	1.9	2.6
Under five Mortality Rate	1998-1999	67.6	94.9
Maternal Mortality Rate / Ratio (SRS)	1998	266	407
	2004 - 2006	141	254
Birth Rate (SRS)	2003	20.3	24.8
	2008	17.5	22.8
Death Rate (SRS)	2003	6.6	8.0
	2008	6.2	7.4
Life Expectancy (2001)	Male	65	62.4
	Female	69	63.4
Mean age at Marriage (IIPS)	Male	24.7	24.5
	Female	18.5	19.5
Beds per lakh population(2003)		86	

Source : Census of India 2001 ,

The Total Fertility Rate of the State is 1.9. The Infant Mortality Rate is 35 and Maternal Mortality Ratio is 141 (SRS 2004 - 2006) which are lower than the National average. Beside, birth and death rate are also lower in the State as compared to national average. The Sex Ratio in the State is 934 as compared to 933 at National level. Life expectancy in the state has been 65 years for male and 69 years for female. This has been higher in the State as compared with national average.

Health Infrastructure of the State West Bengal along with other Health Institution within the State have been given in Table 6 and Table 7 respectively .

Table 6 : Health Infrastructure of West Bengal

Particulars	Required	In position	shortfall
Sub-centre	12,101	10,356	1,745
Primary Health Centre	1,993	924	1,069
Community Health Centre	498	349	149
Multipurpose worker (Female)/ANM at Sub Centres and Public Health Centers	11,280	6,051	5,229
Health Worker (Male) MPW(M) at Sub Centres	10,356	4,215	6,141
Health Assistant (Female)/LHV at Public Health Centers	924	300	624
Health Assistant (Male) at Public Health Centers	924	225	699
Doctor at Public Health Centers	924	810	114
Obstetricians & Gynecologists at Community Health Centers	349	38	311
Physicians at Community Health Centers	349	107	242
Pediatricians at Community Health Centers	349	25	324
Total specialists at Community Health Centers	1,396	186	1,210
Radiographers	349	127	222
Pharmacist	1273	830	443
Laboratory Technicians	1273	441	832
Nurse/Midwife	3367	5215	-

Source: RHS Bulletin, March 2008, M/O Health & Family Welfare, Government of India.

Table 7 : The other Health Institutions in the West Bengal

Health Institution	Number
Medical College	9
District Hospitals	16
Ayurvedic Hospitals	4
Ayurvedic Dispensaries	295
Unani Hospitals	1
Unani Dispensaries	3
Homeopathic Hospitals	12
Homeopathic Dispensary	1220

Source: RHS Bulletin, March 2008, M/O Health & Family Welfare, Government of India.