

Co-ordinator

Dr. H. B. Tongaonkar
Tata Memorial Hospital, Mumbai

Members

Dr. R. I. Dave

Dr. R. K. Karwasra

Dr. A. C. Katak

Dr. Ravi Kannan

Dr. Joydeep Biswas

Dr. A. Kurkure

Dr. R. A. Badwe

Dr. R. C. Mistry

Dr. A. K. D'Cruz

Dr. A. Puri

Dr. P. J. Shukla

Dr. P. Chaturvedi

Introduction

Of the 10 million new cancer cases diagnosed each year, 4.7 million are in the more developed countries and nearly 5.5 million in the less developed countries. The number of cancer cases in India is increasing due to increasing population, increase in the proportion of older people, changing patterns of lifestyles. Cancer is currently the cause of 12% of deaths worldwide. In approximately 20 years, the number of cancer deaths annually will increase from 6 million to 20 million. However, the impact of cancer is far greater than the incidence and mortality would suggest, including impact on health care costs. The number of cancer cases being diagnosed in India is increasing significantly and it is essential to make provisions in the National Cancer Control Programme as per the projected figures.

Diagnosis and treatment are the most important components of the National Cancer Control Programme. While the basic principles of treatment of a particular cancer are same throughout the world, the emphasis accorded to treatment will depend upon local patterns of the disease, i.e., the incidence of the disease and the relative proportions of the early and late stages of disease. These proportions are a result of the prevailing socioeconomic, dietary and other environmental circumstances as well as the presence and success of the early detection and screening programmes for those cancers for which early detection is feasible, affordable and effective.

The primary goals of cancer treatment are cure, prolongation of useful life and improvement of quality of life. At the same time, it is extremely important to consider the limitations of cancer therapy in order to avoid expenditure on large treatment centres that serve only a fraction of the population, and deflect resources from areas where they could be used more effectively. Since cure for many common cancers is generally not possible e.g. lung and stomach, treatment choices must include co-ordinated curative and palliative elements. The specific treatment approaches adopted in India should depend on the availability of human, physical and financial resources. Diagnostic and therapeutic guidelines to be practiced in a regional cancer center cannot be applicable to and practicable in a district hospital due to divergent infrastructure, expertise, socioeconomic conditions, acceptance of treatment and patterns of cancer incidence. The effectiveness of cancer treatment varies greatly with the site of disease and with a number of social factors. Even within our country, there is a substantial variation according to the socioeconomic considerations as access to the best available therapy.

The main methods of cancer treatment are surgery, radiotherapy and chemotherapy. Each has a well-established role and can cure some types of cancer when used as monotherapy. Multidisciplinary management is more effective than sequential monotherapies and results in more cures and improved organ and function preservation e.g. breast cancer, bone sarcomas and paediatric tumours are now largely treated by combined modalities and this has resulted in more cures and less radical surgery. Surgery is suitable for local and regional disease and may result in cures in early stages of cancer, especially when there is an early detection policy. In patients with localized but extensive tumours, surgery may prove valuable in improving the quality of life and potentially in prolonging life. Consideration of surgery in such patients must weigh the expected benefits against the possible diversion of limited resources from other areas. Surgery has a limited role to play in the treatment of disseminated disease. Since majority of patients in India are diagnosed at an advanced stage, development of low cost effective palliative care is mandatory.

As a single modality, surgery is the most curative for almost all solid tumours. It is thus recommended that a cancer unit is led by a surgical oncologist or by a team headed by a surgical oncologist. Surgery plays an important role in diagnosis, staging and treatment of cancer. It also contributes to cancer prevention, structural and functional reconstruction & rehabilitation; and palliation. Even in highly radio or chemo sensitive tumours, surgery can contribute through removal of tumour masses, palliation and treatment of complications. Except for surgery of very limited disease or precancer, oncological services are dependent on a sound tertiary hospital infrastructure, especially making demands for diagnosis and staging on imaging studies (including nuclear medicine, when available) and on anatomical pathology and histology. Surgery requires the support of other specialties, including anaesthesiology, antibiotic therapy, blood transfusion services, pathology and nursing care. The cost-effectiveness of surgery varies according to the stage of the disease being treated and in some patients, the availability of alternative therapies.

It is extremely important for us to ensure the accessibility and effectiveness of diagnosis and treatment services by establishing evidence based clinical and management guidelines, good referral, follow up and evaluation systems and continuous training of different health professionals involved. Furthermore, guidelines should emphasize the avoidance of offering curative therapy when cancer is incurable and patients should be offered palliative care instead.

The allocation of resources needs to be considered at the following levels of care:

District level hospitals

Oncology wings of medical colleges



Regional cancer centres

Major goals for the 11th five-year plan

Specific

1. To provide good quality tertiary care to all patients afflicted with cancer. This can be accomplished by developing at least 200 cancer hospitals in the country (1 per 5 million population)
2. There should be at least 1 tertiary referral center (regional cancer center) in each state
3. There should be at least 1 medical college with an Oncology wing in for every 2 districts in the country – presently there are 242 medical colleges for 600 districts.
4. One out of every 4 district hospitals should have better infrastructure and trained manpower to function as the primary referral center.
5. Development of trained surgical oncologists (generalists at the district level and site specific specialists at the RCC level)
6. Creation of infrastructure for training surgeons in the discipline of surgical oncology and for training supportive clinical specialists in respective specialties like oncopathology, cytology etc.
7. Development of training programme for surgical specialists in terms of fellowships, courses, seminars, workshops, CME
8. Incorporate surgical oncology training in the undergraduate and postgraduate curricula.
9. Implementation of programme at 3 difference levels viz. district, medical college and regional cancer center
10. To recommend a skill and training based specialist cadre in the health care system: so that trained personnel are retained within specialist units.
11. Development of quality assurance and monitoring systems.

General

1. Primary prevention through education and awareness:
 - a. Anti-tobacco
 - b. General and genital cleanliness (primary schools)

- c. Use of condoms
 - d. Prevention of obesity
 - e. 2 children between 20-25 years and breast feeding for at least 1 year
 - f. Awareness about common cancers
2. Information dissemination through web
 3. Proper documentation and registration for a national audit & patterns of care studies and to document variations in the patterns of care across RCCs and medical colleges. Evidence based guidelines are likely to be impacted with variation in logistics and infrastructure.
 4. Primary health centres should take responsibility for awareness & information needs about diagnosis & treatment; and of screening (stool for occult blood, visual inspection of cervix, physical examination of breast)
 5. Monitoring with cancer registries the variations in the patterns of care, incidence & mortality data and staging.

Situation analysis and Problems

1. 800,000 new cases; 2,500,000 prevalent cases; 550,000 cancer deaths in a year (GLOBOCAN 2000 & 2002, IARC)
2. Relatively young cancer population as per the existent age pyramid (NCRP)
3. Increasing incidence of cancer due to increased life expectancy, increased diagnosis and actual increase in certain cancers
4. Commonest cancers are Head & Neck cancers, breast cancer and cervix cancer. Anticipated increase in lung cancer and ovarian cancer patients
5. Urban vs. rural divide: Head & Neck and cervix commoner in rural areas while Head & Neck, breast, lung and ovarian commoner in urban areas
6. Areas of increased incidence for specific cancers eg gall bladder cancer in the gangetic basin, oesophageal cancer in the North Eastern region and Kashmir, stomach cancer in South India etc.
7. Huge gap between demand and supply (number of trained surgical oncologists needed in the country to handle this patient load and the number of trained surgical oncologists)
8. Inadequate existing diagnostic and surgical infrastructure

9. Variable distribution of infrastructure and trained specialists in different parts of the country
10. Inadequate training in Surgical Oncology at the undergraduate and post-graduate level
11. Inadequate number of training centers and seats for training courses in Surgical Oncology
12. Inadequate facilities for surgeons at District level or medical college level to train in Surgical Oncology
13. Suboptimal development of other related specialties.

District level hospitals (Rural centres)

Number of districts in the country 600

It is recommended that for every 4 district level hospitals, there should be at least 1 nodal hospital where better facilities for cancer diagnosis and treatment in terms of infrastructure, trained surgical specialists and availability of supportive services, which means that there will be 150 hospitals requiring up-gradation.

The district hospital should have a full range of supportive services. These must include arrangements for patients with symptoms indicating a high risk of a diagnosis of a malignancy.

1. Evaluation of the commonest cancers presenting to these hospitals and rural centres is mandatory to make optimum provisions (e.g. oesophageal, bladder cancers more prevalent in the NE India and gall bladder cancer more prevalent in the Gangetic basin)
2. Evaluation whether any screening or early detection programmes are being conducted in the neighbourhood, so that the precancerous (if any) or early lesions may present more commonly to these hospitals. With early detection programmes, facilities must be available for simple diagnostic and therapeutic surgery at local or district hospitals.
3. The first step to good surgical practice and cancer care is correct diagnosis. Development of basic infrastructure for minimal diagnostic tests like X-rays, ultrasonography, FNAC/biopsy/cytology, basic endoscopy, colposcopy etc for diagnosis in patients presenting to the hospital. Development of infrastructure for basic surgical procedures like surgery for early stages of some cancers like breast, buccal mucosa, cervix etc. Surgical facilities (including good operation theatre) and skills for such surgery should be available at the district level. One

surgeon with training to do basic surgical work should be available in each district hospital. Although some cancers such as lung, liver, stomach, and oesophagus may be cured by surgery alone, the number of early stage patients is very small and their treatment may make large demands on skill and resources and these surgeries are better handled at major centres.

4. The surgeon should be encouraged to train in Surgical Oncology by visiting RCCs for training for 6 months initially and by attending focused surgical workshops and CMEs subsequently to update his knowledge. Since there are 600 districts in the country and 24 regional cancer centers, it will take 6 years to train one surgeon from each district hospital if each RCC trains four surgeons each year. We should also aim at having a trained surgical oncologist at one out of every 4 neighbouring districts. Ideally, there should be two trained surgeons at the district level hospital.
5. Development of support infrastructure for related departments eg cytology, anaesthesiology, physiotherapy etc. There should be a trained anaesthetist, cytotechnician, cytopathologist, gynecologist, physician and nurses at each district hospital. There should be blood-banking facilities available at the district level. A good pathological interpretation is the backbone of cancer treatment and the local pathologist in the district hospital should receive training in basic oncopathology at the nearest RCC.
6. Trained technicians or nurses for conducting physical examination of breasts, visual inspection of cervix and oral examination should be appointed in each center for early detection of these common cancers.
7. Development of minimal diagnostic and therapeutic guidelines for common cancers, based on realistic estimates of chance of cure as well as the availability of resources, which can be applied at the district level.
8. Definition of cancers which can be surgically treated at these hospitals
9. Development of guidelines for referral to major centres. The primary care team must know where and to whom to refer patients with apparently curable malignancies. The decisions on therapies to be offered, especially the guidelines about patient referral to specialist oncology treatment centers should preferably be made by a treatment committee designated within the management structure of the NCCP.
10. Development of guidelines of curative vs. palliative therapy
11. Referral of patients for alternative equally effective modality if such facilities exist in the neighbourhood and if surgical treatment of the patient cannot be

effectively managed at this hospital (e.g. radiation therapy and surgery equally effective for early stage cervical cancer)

12. Training of surgeons in the specialty of Surgical Oncology and basic principles of allied specialties like chemotherapy and radiation therapy
13. Training of clinicians in other support services is vital to the development of surgical oncology at these hospitals
14. Clinical trials should be encouraged to evaluate relatively low cost approaches that eventually can be provided to all patients irrespective of their socioeconomic condition.
15. Establishment of good palliative and pain services
16. Providing telemedicine link with major centres for pathology, surgical consultation etc.
17. Planned graded development of infrastructure

List of equipment to augment the existing facilities

1. Colposcope
2. Vaginal specula and spatula
3. Biopsy forceps
4. Electrocautery
5. OT equipment, including general instruments, specific sets of instruments for head & neck, breast & abdominal surgery
6. Suction machine
7. Tongue depressors
8. Bull's lamp & head mirror
9. Laryngeal mirrors
10. Bronchoscope
11. Oesophagogastroscope
12. Direct laryngoscope
13. Cystoscope

14. Microscope
15. Reagents
16. Glassware
17. X-ray machine & films
18. Ultrasound machine
19. Examination couch
20. BP apparatus
21. Computers & accessories
22. ECG machine
23. Anaesthesia machine (Boyle's apparatus) with a ventilator
24. Pulse oximeter
25. Multiparameter monitor

The existing facilities at the District hospitals need to be augmented. Prioritization of the equipment may be done with the help of the designated nodal medical college or RCC within the allocated budget.

Budget allocation

Rupees 15 lakhs as non-recurring expenditure for the first year only for augmentation of the diagnostic and therapeutic facilities to all district hospitals and an additional 10 lakhs to those 150 hospitals which will serve as nodal hospitals for the neighbouring district hospitals.

Rupees thirty five lakhs as recurring expenditure per year for manpower deployment, IEC, training etc. The break up of the same is as follows"

Manpower	Rs. 12 lakhs
Consumables, medicines & contingencies	Rs. 8 lakhs
IEC activities	Rs. 9 lakhs
Training of health personnel	Rs. 6 lakhs
Total	Rs. 35 lakhs

Total budget

One time grant Rs. 15 lakhs per rural hospital X 600 = Rs. 90 crores

Rs. 10 lakhs additional per nodal hospital (1 out of 4 ie for 150 rural hospital) = 15 crores

Total one time grant 90 crores + 15 crores = 105 crores

Recurring grant: Rs. 35 lakhs per rural hospital per year = 210 crores per year

For 5 years: 210 crores X 5 = Rs. 1050 crores

Total Rs. 105 crores + Rs. 1050 crores = 1155 crores

District level hospital: Summary

- 1 in 4 district hospitals designated as nodal hospital for cancer care
- Basic diagnostic facilities
- Training of surgical specialists in Surgical Oncology to perform basic diagnostic & therapeutic surgical procedures
- Basic diagnostic & therapeutic guidelines
- Referral guidelines
- Back up of good cytology, pathology & other supportive services
- Graded improvement in infrastructure
- Creation of specialist cadre
- Telemedicine link

Medical Colleges

Total number of Government medical colleges in the country 120

Total number of medical colleges in the country 242

It is important to include government hospitals not attached to medical colleges to expand the scope of NCCP and to reduce the geographical gaps in cancer treatment facilities in the country by establishing cancer treatment centers in areas where medical colleges are deficient.

1. Higher diagnostic facilities should be provided e.g. CT scan, tumour markers, complete range of fiberoptic endoscopy, nuclear scans etc. Since accurate staging is required for optimum treatment and to limit unnecessary surgery in patients where cure is not possible, reliable diagnostic imaging equipment should be provided.
2. Some medical colleges have separate designated Surgical Oncology & Gynecologic Oncology Units. In those colleges where such units do not exist, at least one surgeon at middle level of seniority should be trained in Surgical Oncology for a period of 6-12 months at a regional cancer center. It is not expected that the Cancer Unit would be separated from the other hospital services in all medical colleges but rather that it would be an integrated part of the hospital. Allied specialties like Urology, Gynecology, ENT, Plastic Surgery & Orthopedics etc also should have one person in the unit trained in Oncologic aspect of that specialty. They will be responsible for offering the standard treatment to the cancer patients as well as train the students and post-graduates in Surgical Oncology. The long-term goal should be to develop Surgical Oncology units with 2-3 trained surgeons at each medical college.
3. The hospital / medical college should ensure site specific consultation in clinics led by consultant specialists for common cancers e.g. breast, head and neck, gynecology and gastrointestinal clinic. The most common cancers are initially managed by surgeons and the provision of appropriate surgical specialists to manage patients in this phase of their illness, either for their diagnosis or for the performance of a major surgical resection, is essential. Surgical sub-specialization in the common cancer sites within the Cancer Unit is advisable and a hospital should only seek to function as a Cancer Unit if the volume of work related to each cancer site is sufficient to maintain such sub-specialization. It is expected that the commoner cancers (breast, head and neck, gynecology and gastrointestinal) will normally be cared for in a Cancer Unit. The presence of appropriately trained site-specialized consultant surgeons in the Cancer Unit and the development of appropriate specialisation providing care for an adequate number of patients are fundamental. In future, the surgical management of cancer should be carried out by consultant surgeons who specialize in a particular anatomical area. This work may encompass non-malignant conditions as well as cancers. This is the pattern in many hospitals at present but the development of such specialty interests as breast diseases and head/neck cancers, which are important for cancer care and for identification as a cancer unit, will have a significant impact on the organization of surgical services in some hospitals. A lead clinician with a well-established interest in cancer care should be identified within the department of surgery to organize and coordinate the whole range of cancer services provided within the Cancer Unit. Specific

sessions to perform this work will be necessary. The lead clinician should be responsible for ensuring that high quality cancer services are delivered and effectively co-ordinated. Specific responsibilities should include:

- Supervision of the facilities for cancer care;
- Adequate non-surgical support;
- Arrangements for audit and for continuing medical education;
- Meeting regularly with colleagues from other Cancer Units and Cancer Centres to guarantee uniform standards;
- Developing protocols between primary care, Cancer Units and Cancer Centres to ensure an effective network of high standard care.

Multi-disciplinary consultation and management are essential and each Cancer Unit should have in place arrangements for non-surgical oncological input into services. One or more clinical oncologists with a special interest may visit the regional cancer centre for training. Else, a medical oncologist may be appointed to work in the Unit. Whatever arrangement is agreed locally, the work of the non-surgical oncologist must allow the opportunity for taking part in professional education, development and audit so that current knowledge is rapidly available and disseminated within the Cancer Unit.

4. Most medical colleges presently have surgeons expert in Minimal access surgery. They should be encouraged to learn the surgical aspects specifically pertaining to minimal access Surgical Oncology.
5. Training of personnel from support departments like anaesthesia, pathology etc. should also be undertaken simultaneously.
6. Facilities for surgical management of all cancers, including well-equipped operation theatres, blood bank, intensive care unit etc. should be provided at the medical colleges.
7. Nurses should be trained in Oncology nursing and stoma care. Nursing care for inpatients at ward level and for outpatients in the Unit must be planned and led by nurses who have benefited from post-registration education in oncology. The Nursing service must be structured to ensure access to specialist nurses: With site specific expertise, for example in breast care; with specialist skills, for example lymphoedema management and cytotoxic chemotherapy administration; with expertise in related areas, for example symptom control, postoperative analgesia, counseling and psychosocial support.
8. All specialities with responsibility for cancer care should form a network for audit with other cancer units and centres.

- The Cancer Unit will have an important role in Education and Research. All trainees in oncology must be trained in the management of patients in a Cancer Unit. Cancer Units will be expected to become involved in appropriate clinical research and the development of diagnostic and support services.

Equipment

Fibreoptic endoscopes
 X-ray machine
 Ultrasonography machine
 CT scan / MRI machine
 Mammography machine
 Gamma camera and nuclear medicine equipment
 Pathology & cytology microscopes and allied equipment
 Colposcope
 Equipment for operation theatres & anaesthesia
 Laparoscopic equipment

Budget allocation

Each medical college and government hospital should be provided a one-time grant of Rs. 5 crores for procurement of any equipment listed above and also for manpower deployment and training, if any money is surplus.

A recurring grant of Rs. 40 lakhs per year may be allotted for training of manpower and for augmentation of existing infrastructure and equipment.

Total budget : one time grant	Rs. 5 crores per medical collegex120 + 600 crores
Recurring grant	Rs. 40 lakhs per year per medical college + 48 crores per year
Total	Rs. 600 crores + Rs. 240 crores + 840 crores

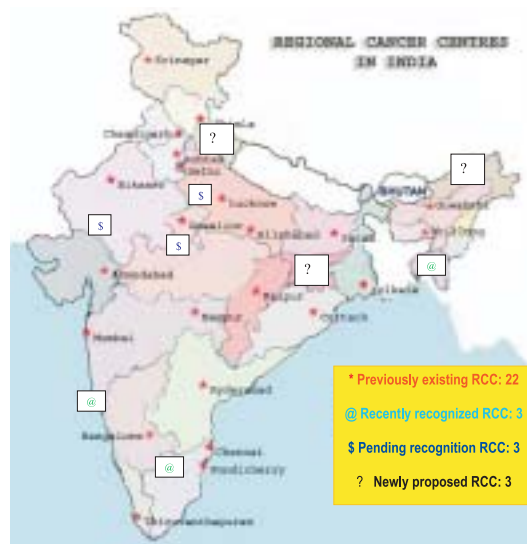
Medical college/ Government hospital: Summary

- Creation of cancer units with 2-3 surgeons
- Training of surgeons in surgical oncology, preferably site specific
- Should not be separated from other hospital services but should be an integrated part of the hospital
- Training of surgeons in other specialties, eg urology, ENT etc in oncologic surgery
- Higher diagnostic facilities – imaging, endoscopy, biomarkers, nuclear scans
- Training nurses in Oncology nursing
- Non-surgical oncology inputs from within or from outside

Regional cancer centres

Total number of RCCs in the country	25
RCCs pending recognition	3
Newly proposed RCCs	3

RCC Map of India



There is an urgent need to reinforce the network of comprehensive cancer treatment centers that are active for clinical training and research and give special support to the ones acting as national and international reference centers. The states, which do not have RCCs, should have one each and at least 10 existing RCCs need upgradation. The ultimate goal should be provide at least 2 regional cancer centres per state or there should be a regional cancer center for every 20 million population – this may be accomplished within the next 10 years.

The hallmarks of a Cancer Centre are a high degree of specialisation and comprehensive provision of all of the facets of cancer care necessary in modern cancer management. The Cancer Centres should provide services for patients with commoner cancers in the same way as the Cancer Unit, as well as an additional range of specialized services, which it will normally provide in support of Cancer Units. The Cancer Centre should deliver a full range of cancer treatments to encompass treatment programmes for less common and rare cancers and those treatment regimens, which are too specialized, technically demanding or capital intensive to be provided in the Cancer Unit. A small number of

very rare cancers (e.g. paediatric cancers) should be managed in a small number of Cancer Centres to ensure adequate specialisation. It is impracticable to devise a satisfactory single blueprint for a Cancer Centre but the essential element defining such a Centre is the expertise of the health care professionals concentrated within it. It is this which has to be comprehensive and of high quality.

1. Definition of magnitude of cancer burden, site distribution, stage distribution within each site, year wise trends for future planning, patterns of care for each site, surgical workload, results of treatment and shortcomings in treatment is the first major step
2. Assessment of present infrastructure and manpower to carry out state-of-the-art surgical procedures for different cancers
3. Development of site specific specialties and multidisciplinary groups for better delivery of treatment, better outcome results and optimum use of resources. Specialization in cancer sites should be further developed in the Cancer Centre both for diagnosis and treatment: surgeons and physicians with special skills should practice here. The opportunity for specialized multi-disciplinary consultation for patients will be available for almost all types of cancer. Links with other specialists from non-cancer areas will ensure a full range of support and rapid deployment of new techniques, which are relevant in many areas. Availability of support services and their assessment e.g. Transfusion medicine, pathology, anaesthesiology, critical care, pain services etc. Pathology services need standardization across the country, as their role is pivotal in evolving cancer care in the country.
4. The onus of testing technology coming from the West rests entirely with the regional cancer centres. The latest diagnostic tools and imaging units e.g. PET-CT etc. and therapeutic approaches like robotic surgery should be made available to test them for efficacy, cost-effectiveness and applicability to Indian conditions. It is not necessary that every newer diagnostic or therapeutic equipment to be tested should be available in all RCCs but different RCCs may be given the responsibility of testing different equipment.
5. Development of evidence based guidelines (which are modified as and when new evidence is identified) and strict implementation of the same within the center. For each priority area, EB guidelines should be elaborated. These guidelines should be accepted by consensus and must address clinical and management aspects, in order to standardize the procedures and contribute to quality assurance of different activities. The process of establishing national diagnosis and treatment guidelines has the dual purpose of determining effective patient management standards as well as promoting equitable access

to the limited treatment resources. These guidelines should then be integrated into national guidelines for diagnosis and treatment.

6. Development of minimal access surgery suites and facilities and application of MAS to Oncology.
7. Development of minimal diagnostic and therapeutic guidelines to be followed in the District level hospitals
8. Nursing care in the wards and departments of a Cancer Centre should be planned and delivered by nurses with a post-registration cancer qualification or who are in the process of gaining such a qualification. Clinical Nurse Specialist skills include: Intravenous cytotoxic chemotherapy, palliative Care, breast care, rehabilitation/Psychosocial support, lymphoedema management & stoma care. The Cancer Centre should also commit itself to providing advanced cancer nursing education for those within and outside the centre.
9. Surgical research studies (including development of indigenous surgical equipment) for improving results in terms of survival, quality of life and cost-effectiveness
10. Development of surgical reconstructive and rehabilitative techniques
11. Development of infrastructure for clinical research and clinically relevant translational research (e.g. minimal residual disease lab). In some circumstances, it may be appropriate to carry out clinical trials to determine the usefulness of therapy in a particular setting. Such trials should be undertaken only where there are good facilities for data management and where resources are adequate for clinical research
12. Training of surgeons and personnel from supportive services from district hospitals, medical colleges and smaller oncology centres in the field of surgical oncology
13. Development of telemedicine link with other smaller centres for initially diagnostic & consultation services and later therapeutic services
14. Data storage in the format of National Cancer Registry Programme and analysis to generate patterns-of-care data from the institute for comparison with self (historical), other institutes in India and abroad.
15. Adequate manpower to manage the current workload and also to make provisions for the future.

Budget allocation

A one-time grant of Rs. 6 crores should be provided to an existing RCC and 8 crores to a newly created RCC. This should be used towards augmentation of treatment facilities, which may include purchase of equipment related to cancer treatment and research; and construction of new building for increasing the in-house patient admission facilities or housing new equipment.

A recurring grant of Rs. 25 lakhs per year may be allotted for training of manpower and for augmentation of existing infrastructure and equipment. However, this may vary according to the workload and the size of the RCC.

Total budget: One time grant of Rs. 6 crores per existing RCC X 25 = 150 crores
One time grant of Rs. 8 crores per new RCC X 3 = Rs. 24 crores
Total one time grant Rs. 150 crores + Rs. 24 crores = Rs. 174 crores
Recurring grant of Rs.25 lakhs per year X 28 =Rs. 7 crores per year
For 5 years: Rs. 7 crores X 5= Rs. 35 crores
Total Rs. 174 crores + Rs. 35 crores = 209 crores

Regional cancer centre: Summary

- Best tertiary care & comprehensive management
- Site-specific surgical oncology units with high degree of specialization
- Multidisciplinary working groups
- State of the art diagnostic & therapeutic facilities
- Testing new technology for applicability to India
- Training of surgeons & other allied specialists in Surgical Oncology
- Educational courses & fellowships / certification courses
- Evidence based management guidelines
- Development of minimal access surgery in Oncology
- Surgical workshops / CMEs
- Training other specialists and nurses
- Clinical research infrastructure & expertise
- Hospital based & population based registry data storage

Educational approaches

Special attention needs to be given to the training of the health workers at different levels of care, the level of complexity of training varying with the role each worker plays.

1. The curriculum for MBBS and MS should have more emphasis on Oncology. When the teachers in medical colleges are trained in Surgical Oncology, the students

will see and get more interested in pursuing this subspecialty. This would ultimately disseminate adequate cancer care throughout the country.

2. Training of other health professionals e.g. nurses, pathologists etc in the discipline of Oncology and its subspecialties during the undergraduate and postgraduate courses
3. Strengthening the MCh Surgical Oncology & DNB Surgical Oncology training courses
4. Starting post-doctoral fellowship and certification courses in different subspecialties e.g. GI Oncology, Uro-oncology etc.
5. Continuous process of training of general surgeons from medical colleges, district hospitals, public sector hospitals etc in principles and practice of Surgical Oncology.
6. Frequent cancer education programmes should be carried out in medical colleges for cancer awareness and knowledge about the latest advances in management.
7. Libraries of medical colleges should have more journals and books pertaining to Surgical Oncology.

Training in Surgical Oncology: MCh course conducted by various centers and approved by MCI

Centre	Students per year
KMIO, Bangalore	4
WCI, Chennai	3
RCC, Trivandrum	2
GCRI, Ahmedabad	4
TMH, Mumbai	2
KGMC, Lucknow	1
Total	16

DNB Surgical Oncology course has been started at the following centres

- Dharamshila Hospital, Delhi
- Army Hospital (R & R), Delhi
- Mahavir Cancer Sansthan, Patna
- Rajiv Gandhi Cancer Hospital, Delhi

Total budget (Rupees, in crores)

	Non recurring	Recurring	Total
District hospital	105 crores (15 lakhs X 450 hospitals & 25 lakhs X 150 nodal hosp)	210 crores/ year X 5 yrs = 1050 (35 lakhs/ year X 600 hosp)	1155 crores
Medical College	600 crores (5 crores X 120 colleges)	48 crores/ year X 5 yrs = 240 (40 lakhs/ year X 120 colleges)	840 crores
Regional cancer centre	174 crores (6 crores X 25 centres & 8 crores X 3 centres)	7 crores/ year X 5 yrs = 35 (25 lakhs/year X 28 centres)	209 crores
TOTAL	879 crores	1325 crores	2204 crores