

DEPARTMENT OF RADIATION ONCOLOGY

Introduction:

Radiotherapy plays a crucial role in the curative and palliative treatment of cancer. Our institute's radiotherapy department is technologically developed one which is holding out the promise that real improvements can occur both in the process of treatment and also in the proportion of patients achieving complete control of their disease. The concept of radiation is difficult to understand by most of the people. The images of Hiroshima and Chernobyl inevitably link exposure to radiation with an invisible and mysterious sense of danger.

Many patients /even doctors hold fundamental misconceptions about radiation despite the knowledge that the treatment is given in safe environment by experienced and specialized professionals, specifically to cure or control of symptoms



A successful course of radical radiotherapy depends on a number of factors and how these factors are met in our department is detailed below:

1 Accurate localization and assessment of the target volume, i.e. the tumor and margin:

We have a Varian Ximatron unit .This is an X ray simulator, which mimic all movements of the treatment machine. The patients are simulated in this unit. Tumor localization and treatment planning is made. This unit is equipped with Portal vision .The portal imaging device provides data in real time so that the accuracy of alignment of each field used for radiation is ensured.

2 Effective patient immobilization:

Patient immobilization is an important aspect of successful treatment delivery in radiotherapy. This ensures the reproducibility of position both for planning and at the occasion of each treatment .The mould room of the department makes aqua-plast shells for every head and neck cancer patients. We also have Vac-lok system for immobilization

The mould room is equipped with Styrofoam cutting machine for complex field designs like Mantle. We also make individualized cerrobend blocks for shielding purposes.

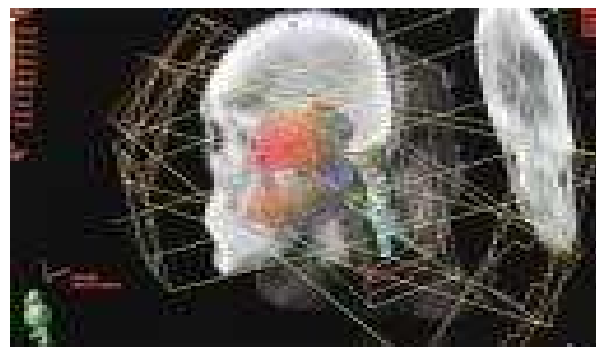
3 Correct delineation of the Target volume.

The department has a state of the art computerized treatment planning system. (TPS)

The TPS has Vidar scanner and a VARIS® CAD plan. Sometimes the treatment volume is delineated from the CT scan image and the plan is computed. This assures accuracy in a multiple field arrangement.

4 Delivery of treatment

Radiotherapy is usually delivered in 2 forms



a) Teletherapy

Teletherapy machines of the institute are all imported. They include 1-Linear accelerator 2300CD with MLC, portal vision, Dual energy photon-6&20MV, various electron energies: 2- Linear accelerator with 6MV photon energy: 3-Telecobalt unit. The modern radiotherapy is a triumph of precision engineering. The gantry of a linear accelerator weighing 3 tons rotates through 360 degrees and positioned with an accuracy of one tenth of a degree. Every time we treat a patient, we take this technological miracle for granted. This astonishing complexity and accuracy are well maintained by an in-house biomedical engineering wing.

b) Brachytherapy

The brachytherapy is application of small sealed sources directly into the body either from within or from near the surface. Relatively high doses of radiation can be delivered by this method .The brachytherapy unit of this hospital utilizes Iridium isotope as the radioactive source. These sources are stored in protected containers and move by remote control to propositioned applicators-a process called remote after loading.

Teletherapy services in consecutive years:

Disease Site	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Head and Neck	69	140	217	268	278	361	359	411	412	439	283	286
Cervix	43	130	186	247	272	301	315	340	389	388	395	360
Lungs	8	31	31	83	61	77	79	103	107	95	144	39
Esophagus	7	22	18	15	28	29	34	24	54	27	37	16
Breast	8	30	29	45	64	75	69	78	110	86	85	102
Rectum	7	8	27	22	22	27	32	40	24	34	24	18
Urinary Bladder	5	11	10	7	9	14	07	19	27	25	44	19
Brain	0	0	0	0	0	0	0	0	0	0	27	32
Prostate	0	0	0	0	0	0	0	0	0	0	18	6
Stomach	0	0	0	0	0	0	0	0	0	0	16	8
Others	26	28	60	50	90	117	166	129	205	258	244	348
Grand Total	173	400	578	737	824	1001	1061	1145	1328	1352	1317	1244

Brachytherapy services in consecutive years:

Disease Site	2002	2003	2004	2005	2006	2007	2008	2009	2010*
Cervix	125	680	618	674	798	715	995	824	880
Esophagus	0	04	02	03	3	4	6	1	0
Vagina	0	00	01	02	01	0	3	1	0
Vault	0	0	0	0	0	0	0	9	0
Endometrium	0	0	0	0	0	0	0	7	0
Other sites	0	0	01	02	6	4	1	0	0

* पति एप्लिक्सन

3D confirmal radiotherapy service in 2010

Disease Site	2007	2008	2009	2010
Head and Neck	87	95	75	35
Cervix	39	42	-	7
Lung	60	63	56	69
Esophagus	18	22	4	18
Breast	0	1	1	6
Rectum	18	21	1	5
Bladder	41	52	6	-
Prostate	9	18	1	6
Stomach	-	-	6	8
Miscellaneous	28	31	32	41
CNS	-	-	-	50
Urinary Bladder				4
Grand Total	310	345	182	249

Other services offered by the Department:

Outpatient services on all week days.

- Inpatient services-16 bedded inpatient wing.
- Day care services-5-10 cases/day
- Electronic patient data system- Data of all the patients on treatment in the department is now computerized.

Upcoming services:

1. **IMRT**- IMRT services to be started very soon and for this purpose all equipments are waiting to be installed in the department.
2. **Telemedicine Program**- Department is planning to start telemedicine program on it's own resource.

Academic activities:

1. "A Bridge of Knowledge, A Bridge to the Future" on 13-14 May, Binay Tara Foundation, New York, USA and Dept. of Radiation Oncology, BPKMCH, Nepal jointly organized two days CME program in the hospital auditorium hall. Dr. Binay Shah and Dr. Randuli were the main speakers and all from hospital participated in the program.

2. Dr. Ranjan B. Bhandari, registrar, participated in oncology seminar in Phuket, Thailand
3. Mr PP Chaurasia assistant chief physicist / RSO participated as invited speaker in International conference on Medical Physics in Radiation Oncology and Imaging (ICMPROI-2011) In Bangladesh.
4. Mr. Surendra Bahadur Chanda, Medical Physicist, presented paper in Asia Europe Physics Summit in Tsukuba, Japan.
5. Mr. Matrika Prasad Adhikari presented a poster titled "To study the variation of dose in Bladder and Rectum in successive application of the applicator and its contributing factors in high dose rate (HDR) intracavitary brachytherapy." In 31st Annual conference of Association of Medical Physicist of India, 18-21 Nov, 2010, Lucknow, India.
6. IMRT Training in Rajiv Gandhi Cancer Institute & Research Centre; Dr. Shivaji Poudel, Dr. Ranjan B. Bhandari, Mr. Matrika Prasad Adhikari, Mr. Narendra Sibakoiti & Mr. Bishal K.C.
IMRT Training in Tata Memorial Cancer Hospital; Dr. Suresh Shrestha, Dr. Pradeep Neupane, Dr. Samir Sharma, Mr. Khyam Prasad Upreti, Mr. Sovit Lal Yadav, Mr. Nanda Kishor Gupta, Mr. P.K. Jha, Mr. Rajiv K. Jha, Mr. Surendra K. Mahato, Mr. Suresh K. Mahato, Mr. Shrawan K. Thakur
IMRT Training in Division of Radiotherapy, Chulalongkorn University Hospital, Thailand: Mr. Surendra B. Chand & Mr. Krishna D. Bhatt.
IMRT Training in Lag Vegas, USA: Dr. A.K. Jha & Mr. P. P. Chaurasia
7. Post graduate (MD Radiotherapy) training- seventh batch of MD (RT) students completed their training for one year at our institute. Undergraduate and post graduate students from other academic institutions are attending the various training programmes in the department.

Other activities:

Dr. A.K. Jha, been appointed as Project Coordinator of IAEA project in Nepal

Dr. Shivaji Poudel, Registrar been elected as Central Member of NMA.

Human resource

The department has 8 radiation oncologists, 1 medical officer, 4 medical physicists, 4 radiation technologist, 3 senior RTT's, 6 RTT's, 2 staff nurses, 1 Jr. Asst., 1 Mouldroom Asst & 8 supporting staffs.

Department of Radiation Oncology welcomed;

Dr. Subhas Pandit, MD, Registrar, Dr. Srijana Koirala, Medical Officer, Mr. Ram Narayan Yadav, Medical Physicist in the department.

