

STATUS OF MEDICAL PHYSICS PROFESSIONAL DEVELOPMENT AND EDUCATION IN NEPAL

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I. INTRODUCTION

Nepal is a mountainous landlocked country surrounded by India from east, west and south and by Tibet of china from north. Its longitude is 80.10 East to 88.0 East and latitude is 26.20 North to 30.40 North.[1] It is 94th largest and 45th most populous country in the world with area 147181 Sq. Kilometer and 27.8 million populations[2]. GDP Per capita income is \$2313[3]



II. HISTORICAL BACKGROUND

The First use of radiation in Nepal dates back to 1923 when the first X-Ray machine was installed at Military hospital. In 1987 Bir Hospital, Kathmandu started the first nuclear medicine service with gamma camera. The same hospital started the first CT scan in 1988 and Radiotherapy unit with tele Cobalt machine in 1991. First linear accelerator, brachytherapy and simulator established and treatment started in 2002, at B.P. Koirala Memorial Cancer Hospital (BPKMCH) Bharatpur, Chitwan. 3DCRT started in 2007 and IMRT in 2012. Nowadays there are many new Universities and Medical College coming up which led to the installation of new radiation modalities. The number of x-ray Machines, MRI, CT scanners, Linear accelerators and brachytherapy is increasing.

III. MAJOR CANCER CENTERS IN NEPAL

There are few centers in Nepal. Though it is not adequate, there is potential to grow new centers in future. Few of them are as following.

1. B.P. Koirala Memorial Cancer Hospital, (BPKMCH), Bharatpur, Chitwan
2. National Academy of Medical Sciences, (NAMS), Bir Hospital, Kathmandu
3. Bhaktapur Cancer Hospital (BCH), Bhaktapur
4. Manipal Medical College, Pokhara
5. Kathmandu Cancer Care and Research Center (KCC&RC), Bhaktapur
6. Nepal Cancer Hospital and Research Center (NCC&RC) Lalitpur
7. National Cancer Hospital, lalitpur
8. Nepal Cancer Hospital, Banke

IV. PRESENT STATISTICS OF MACHINE AND MANPOWER

The First use of radiation in Nepal dates back to 1923 when the first X-Ray machine was installed

Table 1 Radiology and Nuclear medicine

S.no.	Machine	Number
1	MRI Unit	18
2	CT scanner	45
3	FLuro/X-ray	1000+
4	DR	05
5	CR	45
6	Mammography	12
7	Gamma Camera	03
8	PET Scan	01

Table 2 Radiotherapy

S.No.	Machine	Number
1	Tele-Cobalt machines	4
2	Linear Accelerators	5
3	Simulators	4
4	High Dose Rate Brachytherapy	3
5	Ortho voltage	1

Table 3 Manpower

S.No.	Machine	Number
1	Radiologists	110
2	Medical Physicists	11
3	Radiation Oncologists	27
4	Radiographer/Technologists	250
5	Radiotherapy Technologist	18
6	Nuclear medicine Physicians	03

V. PROFESSIONAL ORGANIZATIONS

Some of the major organizations are as following

1. Nepalese Association of Medical Physicists (NAMP)
2. Nepalese society for Radiation Oncologist (NESTRO)
3. Nepal Radiological Society
4. Nepal Radiologist's Association
5. Nuclear Society of Nepal
6. Nepal Radiological Technology Student's Society

VI. ABOUT MEDICAL PHYSICIST I NEPAL

The entry criteria for Medical Physicist are M.Sc in Physics plus one year Post Graduate Diploma in Medical Physics or M.Sc in Medical Physics or M.Sc. Physics plus one year clinical training.

According to "Reviewing country and Regional Programs RAS/0/057" from the IAEA fact-finding and programming mission to Nepal, Nepal should have at least 25 qualified Medical Physicist [4].

Nepalese association of medical Physicist (NAMP) has been established in 2009 and is actively working for the development and welfare of Medical Physics profession and professionals.

VII. CONTRIBUTION OF ICTP AND IAEA TO NEPAL.

Most of the physicists have participated the college on Medical Physics that encouraged them to continue in the field and supported a lot by providing high standard teaching learning materials and training on modern trends and technology. We have got opportunity to participate medical Physics related training from ICTP and IAEA. Two fellows are doing Master in Medical Physics in ICTP.

Nepal became IAEA member in 2008, since then IAEA has provided short and long term fellowship training for the development and promotion of Medical Physicist. It is conducting project to support Nepal and also helping to formulate the Radiation Act.

VIII. ACADEMIC ACTIVITIES AND PHYSICIST INVOLVEMENT

Biomedical physics is an Optional paper in M.Sc. Program in the Central Department of Physics and Prithvi Narayan Campus Pokhara. Thesis on Biomedical physics is going on in B.P. Koirala Memorial Cancer Hospital, Bir Hospital and Bhaktapur cancer Hospital. Medical physicists are actively involved in as thesis guide in this program. B.Sc. Medical imaging program is going on in 5 different places with intake of about 40 students per year. National Academy of Medical Science (NAMS), is conducting MD Radiotherapy course in collaboration with B.P. Koirala Memorial cancer Hospital. Medical Physicists are involved in as teaching faculty. Eight centers are conducting M D Radio-diagnosis program.

IX. VARIOUS ACTIVITIES OF NEPALESE ASSOCIATION OF MEDICAL PHYSICIST (NAMP)

Since its establishment in 2009, NAMP has been recognized nationally and internationally as an authorized and representative organization for medical Physicist in Nepal. It has been involved in national and international activities for the promotion and development of Medical Physics profession. It is conducting talk program, Seminar, conferences etc. for the promotion of Medical Physics activities.

NAMP conducted an interaction program on the occasion of 116th year of discovery of x-ray in 2011. In the same year it conducted scientific talk program with UN-ICTP visiting Scholar Professor Anna Benini. One day symposium was organized on the occasion of first International day of Medical Physics (IDMP) on 7th Nov 2013. International conference on Medical Physics in Radiation Oncology and Imaging (ICMPROI-2014)[5] was jointly organized by Bangladesh Medical Physics Society (BMPS), Association of Medical Physicist of India, (AMPI) and Nepalese Association of Medical Physicist (NAMP) in Dhaka, Bangladesh. In 2015 a seminar on CT Imaging was conducted with guest speakers from Japan. NAMP is constantly lobbying for the formulation of radiation act and to conduct academic program in Medical Physics. NAMP is in constant communication with international organizations such as IOMP, IAEA,

AFOMP, SEAFOMP, AMPI, BMP and participating and representing Nepal in international forum.

X. ISSUES TO BE ADDRESSED

There are some major issues to be solved in proper time for the strengthening of medical Physics.

Draft of Radiation act is ready and expect to get approved by Parliament in 2017. Formation of Regulatory body is in high demand. Medical Physics certification board is must. Strengthening academic programs for Medical Physicist is felt to fulfill the demand of qualified medical Physicist. Training and increasing opportunities for the Medical Physics professionals is must. The Medical Physicist have specialized skill and rare, so better facilities and moral support from policy maker is necessary to stop brain drain. Establishing guidelines is necessary for the safe and effective use of ionizing radiation and to meet international standards.

There are many universities and medical colleges conducting M.D. in Radio-diagnosis but they have not appointed diagnostic Medical Physicist till date.

XI. DISPOSAL ISSUE OF OLD USED SOURCE

Old cobalt source made in Russia, donated by china could not be sent back to the point of origin and disposed safely in BPKMCH premises. Some Radium needles used to treat cervix cancer are said to be dumped in Kathmandu, near prasuti griha (Maternity Hospital), Kathmandu. Old sources from B.P. Koirala Memorial Cancer Hospital (BPKMCH) and Bhaktapur Cancer Hospital (BCH) are sent back to origin and replaced with new source.

XII. REFERENCES

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