

MEDICAL PHYSICS IN MONGOLIA

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Mongolia is a large, landlocked and sparsely populated country in the northern part of Central Asia, located between Russia on the north and China on east, south and west. Its total land area of 1.5 million square kilometers, but contains only 3.2 million population or 1.3 people per square kilometer.

Mongolia, as a peace-loving country, has a strong commitment to the nonproliferation of nuclear weapons and the peaceful use of nuclear energy.

Mongolia has been cooperating with the International Atomic Energy Agency on such projects as manpower development and development of nuclear analytical techniques, the introduction of nuclear techniques in health, and upgrading nuclear medicine services.

Mongolia has been working together with other countries in making with using gamma rays treating patients with radiation and in the early detection of genetic disorders in infants, of cancer, heart disease and other ailments.

In the 1960s, two X-ray machines and the most advanced technology of the time, the Cobalt-60 generator, were installed to treat cancer patients with radiation and to use nuclear technology in the medical field.

Cardiovascular diseases and cancer are among the leading causes of death in Mongolia. Nuclear Medicine in Mongolia-1975-1981 Beginning First Medical Application of radioisotopes - First Rectilinear scanner, 1972.

Single and dual scintillation detectors system, Thyroid Uptake Test; 1982-1999 Settlement, IAEA TC Project since 1982, Thematic Program on Health Care (RAS) since 1997, First Gamma Camera since 1997, Radio immunological Laboratory and first Radioiodine treatment since 1982,

First SPECT and Quantitative Measurement in 2000 Second Gamma Camera, New Thyroid Uptake System-Atom lab 950 PC Spectrometer Radio immunological Laboratory replacement, Myocardial Perfusion Scintigraphy, Liver Cancer Treatment with Re-188, Radiosynovectomy with Re-188.

The National Cancer Center Mongolia has a long history in cancer care, with treatments dating back to 1961 with radiotherapy in Mongolia going back even further. Currently, the National Cancer Center Mongolia provides nation-wide services in cancer treatment. This includes surgery, chemotherapy and radiotherapy. In Mongolia, the number of total high energy radiotherapy machines per million people is 0.7.

Radiotherapy services in Mongolia have been improved, and two Linacs became operational in June 2019. Quality assurance systems for ensuring that patients receive the correct radiation doses were upgraded and new technologies and a radiation safety system for radiotherapy services were also introduced. In addition, donors provided support in 2016 for a state-of-the-art cancer diagnosis and treatment system, and training through IAEA assistance helped to introduce highly accurate 3D radiation therapy and other modern technologies to the country.

IAEA support has been crucial for Mongolia in the acquisition of a gamma beam radiation protection system and an X-ray calibration system to support the country's cancer control, diagnosis and treatment program.

The IAEA is also assisting Mongolia in upgrading a computed tomography (CT) and single-photon emission computed tomography (SPECT) medical imaging system at the First General Hospital.

Combined PET-CT imaging technology, which is mainly used in the diagnosis of cancer, cardiac disease and nervous disorder, is to be introduced in the State Central Second Hospital.

Mongolian Society of Medical Physics & Informatics (MSMPI) - a member of (IOMP) & (AFOMP), the professional organization was founded in 2003, current 25 members.

Medical physicists (MPs) working in the clinical environment are health professionals, with education and specialist training in the concepts and techniques of applying physics in medicine, competent to practice independently in one or more of the subfields (specialties) of medical physics.

Preparation of Medical Technical Engineers in Mongolia:

Before the 1990s, there were 3 ways:

- Mostly educated in the former the Soviet Union
- graduated at Mongolian National Technical University under an Electrical Engineering
- graduated at Mongolian Medical College under a Radiology technician

Present, there are 3 ways:

- Mongolian National University of Medical Science offers BS in Health Information Technology
- Mongolian University of Science and Technology offers BS in Medical Equipment Engineering
- National University of Mongolia offers BS in Nuclear Engineering

The purposes of the MSMPI are as follows:

- To advance and safeguard the profession of Medical Physics in all its aspects;
- To unite and promote cooperation and understanding among medical physicists and workers in the medical allied professions; and
- To promote the welfare and professional development of medical physicists of Mongolia.

The MSMPI shall undertake the following activities to achieve its primary goal:

- To initiate a Master's Degree Program in Medical Physics at Mongolian National University of Medical Sciences in collaboration with AFOMP and other organizations.
- To develop and disseminate scientific and technical information in medical physics and related fields;
- To organize and sponsor conventions, scientific meetings, clinical residency training programs, training courses, workshops, and seminars in medical physics, and courses related to the roles, responsibilities, and development of medical physicists;
- To send our specialists to developing countries, especially member countries of Asia-Oceania Federation of Organizations for Medical Physics, to gain an experience
- To invite professionals to Mongolia to teach and give a lecture to our specialists
- To collaborate with Nuclear Energy Agency Government of Mongolia and other scientific organizations;