Yangon radiologists, medical physicists juggle to provide cancer patients with quality care

By Miklos Gaspar

Mya Mya Kyi is in a hurry, trying to cut through a throng of patients waiting for their turn in the hallways of the Radiotherapy Department at Yangon General Hospital in Myanmar. As the department's chief medical physicist, she is in charge of therapy planning for the almost 300 patients per day who receive cancer treatment on the hospital's four radiotherapy machines.

"Treatment plans, dosimetry calculations, daily audit of the machines and quality control — the day is never long enough for all of this."

— Mya Mya Kyi, Medical Physicist, Radiotherapy Department, Yangon General Hospital, Myanmar

While the country's Ministry of Health has bought radiotherapy equipment for the Yangon hospital and three similar facilities around the country, training for medical physicists, including training in quality assurance of the radiotherapy equipment, is not available locally. Mya Kyi and her colleagues rely on the IAEA for these services.

"Treatment plans, dosimetry calculations, daily audit of the machines and quality control — the day is never long enough for all of this," she says while making her way from a room with a cobalt-60 machine to her workstation, where she prepares treatment plans.

Medical physicists work with the sophisticated technology used in radiation medicine to diagnose and treat patients with diseases such as cancer. They need to have knowledge of both the human body and the principles of physics, and know how to apply these principles to support the diagnosis and treatment of patients.

Radiotherapy: from the margins to the mainstream

The demand for radiotherapy has increased threefold over the past ten years, said Professor Khin Cho Win, head of the radiotherapy department at Yangon General Hospital. Last year, the Department received 6200 new patients, the majority of whom needed radiotherapy. This compares with just 2000 cases in 2005. "We expect this trend to continue," Cho Win said.

What will hopefully gradually change is the characteristics of the patients. Many people with cancer do not go to see their doctor until it is too late, and at that point are referred to radiotherapy only for palliative care. Half of the radiotherapy patients at Yangon General are in the final stages of cancer, when the only care available is pain relief during the final phase of the disease. By contrast, in developed countries, only 14% of new cancer patients need palliative radiotherapy — the majority undergo treatment intended to cure their cancer. An IAEA mission conducted in 2015 to assess Myanmar's cancer control services recommended the establishment of dedicated palliative care services and an expansion of primary care facilities and home-based care.

Opening up more radiotherapy centres and increasing access to these facilities is high on the country's health agenda. There are just 18 radiotherapy machines for Myanmar's population of 52 million. This is significantly below the level of one machine per one million people recommended by the World Health Organization (WHO).

Myanmar is not alone: according to the IAEA Directory of Radiotherapy Centres (DIRAC) database, most radiotherapy facilities in the world are located in high-income countries, and at least 36 nations do not have any of this equipment to treat cancer.

IAEA assistance

The IAEA is doing its part to help and will continue to support staff at Myanmar's cancer centres, said Ho-Seung Lee, who is in charge of the IAEA technical cooperation programme with Myanmar.

The five medical physicists and the dozen radiologists at Yangon General participate in IAEA-organized training courses, go on scientific visits to institutions in neighbouring countries with more experience in using state-of-the-art radiotherapy equipment, and send dosimetry measurements to the

Staff of the Nuclear Medicine Department at Yangon General Hospital have received training from IAEA experts and partners on the safe and effective use of their new equipment.
(Photo: M. Gaspar/IAEA)

IAEA laboratory near Vienna to check the calibration of their radiotherapy machines. This ensures that patients get the right dose: high enough to be effective, but not a centigray more, so as not to deliver more radiation than absolutely necessary for the treatment. Lately, the health professionals have also begun using the IAEA's online learning tools, offered via the Human Health Campus. "We only wish internet connectivity were better," Mya Kyi says.

Radiation physics and dosimetry are the cornerstone of safe and effective radiotherapy for the treatment of cancer, and are also essential to quality assurance in other radiation medicine disciplines, said May Abdel-Wahab, Director of Human Health at the IAEA. "IAEA support helps countries like Myanmar ensure that accurate doses are delivered and appropriate training is given to medical physicists, radiation oncologists and others involved in radiation medicine to achieve an optimal outcome for patients."

Nuclear medicine: using isotopes to diagnose disease

Staff at the Yangon Hospital Department of Nuclear Medicine, which performs crucial services in the diagnosis of various diseases and in treating thyroid cancer, has also received new equipment from the Government, including the first cyclotron facility and the first positron emission tomography/ computed tomography (PET/ CT) facility in the country.

The cyclotron is used for the production of radioisotopes essential for 'acquisition PET/ CT' studies, which are crucial to the early diagnosis of several diseases, including cancer and cardiovascular disease. The health professionals have also been given two single-photon emission computed tomography (SPECT) cameras; SPECT is another nuclear medicine imaging technique that uses gamma rays to carry out functional scans of the brain, thyroid, lungs, liver, gallbladder, kidneys and skeleton.

Since they were the first in Myanmar to use such equipment, the department's staff did not have anybody to turn to locally for expertise and training, explained the department head, Professor War War Wan Maung. So she sent her colleagues on IAEA-sponsored fellowships to hospitals in neighbouring countries.

Following an earlier request to the IAEA, the department underwent an IAEA Quality Management Audit in Nuclear Medicine Practices (QUANUM) in September 2016, which pointed out a few areas for improvement to ensure higher-quality care.

"We have already corrected all of the six problems found," Wan Maung said. These included replacing the floor in the treatment room, for which the IAEA report helped the hospital secure extra funding from the Government. "This is an excellent outcome for us and our patients."

Myanmar has benefitted from over 30 fellowships and scientific visits and 6 national technical cooperation projects in the field of radiation medicine and health over the past 10 years. Myanmar has also participated in over 30 regional technical cooperation projects dedicated to health.