Department of Science and Technology
PHILIPPINE NUCLEAR RESEARCH INSTITUTE

Ensuring Accessible Healthcare

Nuclear Medicine

Around 33 nuclear medicine facilities in the Philippines are licensed by PNRI. These facilities use Technetium-99m and other radioisotopes for diagnosis of the state of health of various human organs and treatment of certain diseases.

Local Production of Technetium-99m (Tc-99m)

With technical and financial assistance from the IAEA and the Department of Science and Technology (DOST), PNRI has established the first Tc-99m generator plant in the Philippines which will supply the local Tc-99m requirements of nuclear medicine facilities in the country. The facility will save the medical industry up to around 20 percent of the average cost for imported Tc-99m radiopharmaceuticals.

The Tc-99m hot cell facility inside the Radioisotope Laboratory building.

Over 80 percent of the world's nuclear diagnostic imaging procedures rely on Tc-99m, with its applications ranging from lung, bone and renal scintigraphy, liver scanning, DMSA and DTPA renal scanning, gastroesophageal reflux, continuous ambulatory peritoneal dialysis, among others.

The PNRI GammaGen™ Tc-99m Generator

Centralized Medical Cyclotron and Positron Emission Tomography Facility

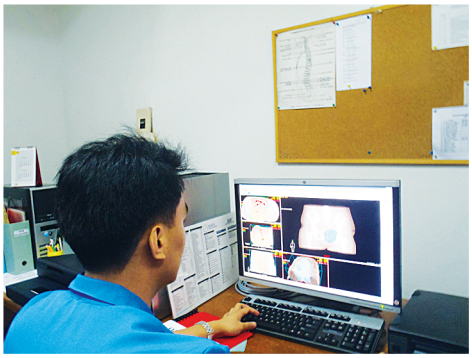
PNRI coordinated a task force composed of private and government sectors to set up the second medical cyclotron in the Philippines. The cyclotron is now being established by the private sector in cooperation with the National Kidney and Transplant Institute to further modernize nuclear medicine in the country. With this facility, the Positron Emission Tomography - Computed Tomography imaging procedures can now be available to several hospitals and the cost of such procedures could be reduced by half.

The first medical cyclotron in the country was set up in 2001 at St. Luke's Medical Center as an in-house facility.

Radiotherapy

Aside from surgery and chemotherapy, radiotherapy is another method for treating cancer through the application of ionizing radiation. There are about 36 radiotherapy hospitals and medical centers in the country which are being monitored to maintain the required level of safety and security according to IAEA standards.

Linear accelerator for radiotherapy



A medical physicist conducting treatment planning for the target organ

Radiation-Processed Materials from Natural Polymers

Hemostats

Hemostats are materials used to help arrest bleeding of ruptured blood vessels. Hemostats with different formulations and forms were prepared from natural polymers and cross linked with gamma radiation. These formulations are being tested for hemostatic efficacy.

Injectible Hydrogel Implant for Treatment of Vesicoureteral Reflux

PNRI researchers have developed an injectible hydrogel implant based on chitosan and polyvinyl pyrrolidone through radiation crosslinking. This can be used for endoscopic treatment of primary vesicoureteral reflux, a common urologic anomaly in children associated with urinary tract infection.

Wound Dressings

- **Skin-Up™ PVP-Carrageenan Hydrogel Dressing**

PNRI successfully developed a hydrogel dressing for wounds, burns and bedsores based on carrageenan and polyvinyl pyrrolidone. Gamma radiation was used for crosslinking and sterilization of this product. With the trademark name of Skin-Up™, the product has been awarded with a patent and is ready for commercialization.

- **Honey Alginate Wound Dressing**

A honey alginate wound dressing was also developed from local honey sources to produce a cheaper and comparable alternative to commercial antibiotics for treating exudating wounds and burns. The patent for the wound dressing and its manufacturing process was filed at the Intellectual Property Office.

*Tissue Bank for Irradiated Bone Allograf*ts

Under a joint project by the University of the Philippines – Philippine General Hospital (UP-PGH), the Philippine Orthopedic Center and PNRI (then the Philippine Atomic Energy Commission) with funding from IAEA, the very first tissue bank for bone allografts was established in the Philippines in 1990.

Donated bone grafts are either deep-frozen or processed to become a lyophilized/freeze-dried graft before sterilization through gamma irradiation at PNRI. The grafts are used for replacement of diseased bones for hip and knee surgeries and reconstruction of defects caused by tumors and massive bone loss caused by traumatic injuries. The availability of the bone allografts has allowed the legs and arms of patients to be spared from amputations through limb-saving surgeries.