HOSPITAL PABLO TOBÓN URIBE

RADIOTHERAPY TECHNOLOGY OVERHAULING PROJECT

Hospital Pablo Tobón Uribe is a private non-profit institution from the healthcare sector, with a testamentary origin, that provides general healthcare services as a university hospital. It is an institution with an internalized philosophy based on its 'humane hospital' and 'hospital that exists because people become ill' pillars.

The Hospital started operating in 1970 and it has evolved gradually according to the availability of resources and to the possibility of having adequately trained employees who share the Institution's philosophy. Its resources derive from the fees it charges and from the donations it receives from time to time, as well as funds obtained through credits and loans that support its development and growth processes.

The Hospital is open to the entire community and, as of May 2024, it had 520 beds available across all specialties, excepting psychiatry as underlying disease and obstetrics. From the total, 357 beds are for adults, 73 for pediatric patients, 88 for adult critical care, 27 for pediatric critical care and 17 for hematopoietic stem cell transplantation patients, as well as 18 operating rooms. The main entry point for patients is the ER service, which has the capacity to assist 125 patients (both pediatric and adults). In 2023, the Hospital served 84,000 effective consultations in its ER and 22,600 hospital discharges. Additionally, 15,500 surgeries were performed at the Hospital, which also served 125,000 external consultations and 278 transplantations, most of them were liver and kidney transplantations involving living donors.

SITUATION AT ISSUE

With the growing life expectancy in the worldwide context, as well as diverse genetic and environmental factors, the cancer cases occurring every year have increased on a regular basis both globally and locally. According to the report published by the World Health Organization, in 2022 (most recently available data), 14 million new cancer cases are reported every year around the world. In Colombia, 462,867 active cancer cases have been reported, plus 46,870 new cases and, in the Department (State) of Antioquia, there were more than 6,400 new cancer cases, which translates into a rate of 105 people suffering from cancer for every 100,000 inhabitants in our region.

Based on the projections, there will be a significant increase in the incidence of oncological pathologies around the world, reaching a growth rate of 75% by 2030. It is estimated that,

from such cases, between 50% and 60% will require radiotherapy treatment in one of the stages of the corresponding processes, whether it is therapeutic or palliative.

Being well aware of this global healthcare issue, since 2002, Hospital Pablo Tobón Uribe provides comprehensive high-complexity assistance to manage diverse oncological pathologies through its cancerology unit, which has highly trained staff but currently needs a technology overhaul to return to the forefront, to be once again the flagship in its field and to offer comprehensiveness in terms of high-complexity services.

Radiotherapy is one of the main pillars of cancer treatments.

Radiotherapy is a fundamental tool in terms of controlling tumor diseases locally and it is widely used in healing and palliative scenarios for both adult and pediatric patients. This treatment offers increasingly better results in direct correlation with the technological evolution, and it consists in ionizing radiation that has the purpose of controlling or eliminating cancerous cells while causing the least possible damage to healthy organs. Additionally, it is a technique also used to treat benign illnesses such as inflammatory diseases, blood vessel malformations or hypertrophic scars.

In 2002, the Hospital launched its Radiotherapy Service after purchasing a Siemens Primus Accelerator, which had state-of-the art technology at the time, as it enabled conducting 3-dimensional conformal radiotherapy treatments that allowed administering radiation doses adapted to the shape of the tumors. Subsequently, the Hospital was a regional pioneer in terms of the intensity-modulated radiation therapy (IMRT) technique, which has the purpose of offering an even more precise treatment with lower toxicity for the organs surrounding the tumor.

In 2006, a second next-generation accelerator was acquired (Siemens Oncor), which improved the timeliness in the assistance provided to the patients by means of irradiation techniques similar to those of the first device. Since 2015, in collaboration with the hematology service, the total body irradiation (TBI) technique was included in the services provided using the latter device as part of the treatment for hematopoietic stem cell transplantation patients with allogeneic donors.

In 2011, Siemens left the linear accelerator market and stated its commitment to provide support related to these devices until they become 10 years old, that is 2012 and 2016 in the case of the Hospital's accelerators. Despite this, it was possible to negotiate with the supplier the continuity in the supply of spare parts and maintenance until December 2021. Since that moment, the Hospital has depended on the parts that become available when equivalent or similar devices are decommissioned around the world, which means it is increasingly difficult to find parts and to secure the maintenance and repair of the accelerators, as they are no longer available in the market.

As years go by, radiotherapy techniques have advanced dramatically with the development of imaging with higher resolution, superior computers and cutting edge software that enable calculating more precise doses that are applied in shorter periods of time, thus improving the quality and accuracy of the interventions and, therefore, raising disease control rates and lowering the toxicity level for the patients.

Currently, the market offers devices that enable irradiation techniques with sub-millimeter precision and real-time imaging that ensure the accuracy of the treatment on the targeted tumor (image-guided radiotherapy), as well as techniques like the volumetric modulated arc therapy (VMAT), which shorten the treatment time by up to one third, thus making the process more comfortable for the patients. Radiosurgery techniques, both intra- and extra-cranial, that enable treating smaller tumors and benign pathologies such as blood vessel malformations, trigeminal neuralgias and epilepsy, as well as devices that allow monitoring tumor movements (4D radiotherapy), are immensely useful, particularly when treating lung cancer.

The Hospital's current devices do not allow offering any of the aforementioned therapies.

SOLUTION AND NECESSARY RESOURCES

Providing chemotherapy, radiotherapy, oncological surgery, hospitalization and hematopoietic stem cell transplantation services at a single location clearly favors the timeliness in the assistance given to the patients, improves the treatment success rates and represents an unarguable differentiating feature for our Institution.

To be able to fulfill this objective, the Hospital has identified the need **to overhaul the technology of the radiotherapy department**, with the aim of being able to offer safe and reliable oncological treatments with increasingly higher response rates and significantly reduced secondary effects that will ultimately translate into better quality of life for the patients.

The project that has been designed includes the acquisition of **a new linear accelerator** that features all the required computer systems for its operation (information system – treatment planning system) and the respective infrastructure work needed for the adequate performance of the functions of the device.

With this technology, the Hospital will be able to ensure an efficient, cutting-edge service that reduces the treatment times for all patients, thus increasing their adherence to and satisfaction with the treatment, and guaranteeing effective procedures with minimal

damage. Considering the statistics stated above, and due to the fact that the Hospital is a local and international benchmark regarding the treatment of oncological diseases, the acquisition of such new device **would have an impact on 75,000 people** only in the department of Antioquia.

Currently, the Hospital has more than 2,800 active patients in its comprehensive cancer treatment model, and radiation therapy is an indispensable technology when offering disease management possibilities that increase their probability of success in overcoming the pathology.

The price of the device under consideration (linear accelerator) is USD 2,350,000.