



Q.Clear and Q.SUV Making a Difference in the Most Difficult Oncology Cases

Mater Dei Hospital is a private hospital established in June 1980, in Belo Horizonte, Brazil. Jose Salvador Silva, MD, founded the hospital based on three basic pillars: science, culture, and humanity. While he believed that science and technology are important for delivering high-quality healthcare, he also felt it was important to embrace affection, attention, and respect for all people—patients, clients, and professionals—as part of the philosophy of Mater Dei. These ideals have helped Mater Dei achieve several accreditations, including: Level 3, the highest recognition from Brazil's National Accreditation Organization; the National Integrated Accreditation for Healthcare Organizations (NIAHO) from the Accreditation Commission for Health Care and DNV GL Healthcare; and ISO 9001. Widely recognized as one of the best hospitals in the Brazilian state of Minas Gerais, Mater Dei was contracted by FIFA as a partner hospital during the 2014 World Cup.

In 2011, the hospital embarked on an ambitious project to build a new hospital, Mater Dei Contour, which would include for the first time an oncology unit. With these new services, there was also a need for the hospital to acquire its first PET/CT scanner. This acquisition would also help fulfill the need for high-quality oncologic imaging in the community.

Leonardo Lamego, MD, Chief Nuclear Medicine Physician, was a key participant in the PET/CT selection process for Mater Dei. He spoke with all the PET/CT manufacturers and conducted site visits in other countries. "Based on what I saw, GE was capable of meeting the hospital's needs. The GE Discovery™ PET/CT 710 has great spatial resolution, is faster and more comfortable for the patient, and is reproducible and reliable for the clinician."

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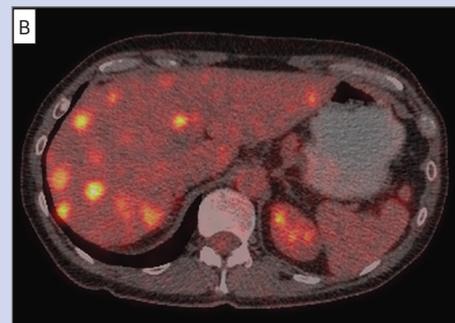
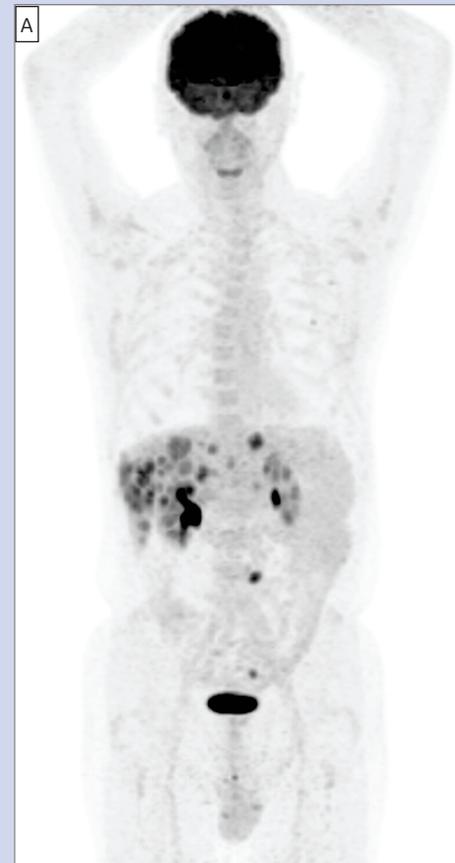


Figure 1. Discovery PET/CT 710 with Q.Clear provides improved small lesion detectability and conspicuity at low dose. Injected dose: 6.75 mCi / 249.8 MBq.



Due to the high spatial resolution and sensitivity, Dr. Lamego can also use lower dose to capture quality images required for diagnosis, therapy planning, and treatment follow up. It's an attribute that has become more pronounced with the increased use of Q.Clear, GE's pioneering image reconstruction technology that provides up to two times the improvement in image quality (signal-to-noise ratio [SNR]) and quantitation accuracy (SUVmean).

Initially, Dr. Lamego was skeptical that this one feature could have a significant impact on image quality. He evaluated it by reconstructing existing exams with Q.Clear and could clearly see the higher image resolution and quality.

Dr. Lamego explains, "Initially, we were using 10 mCi per patient. Now, we are using 5-6 mCi per patient. It's a big difference in dose, and I can also see smaller lesions. Before

Q.Clear, I could see lesions that were 10 mm in size. Now I can see treatable lesions as small as 3-4 mm."

He cites as an example a patient with recurring breast cancer. Discovery PET/CT 710 with Q.Clear detected a previously unknown lesion in the patient's right lung measuring 3 mm. "I can see more lesions. This is a great difference that can possibly change the staging and course of treatment. Also, I can better see the treatment response."

Although there are several hospitals—both public and private—providing oncology services in Belo Horizonte, Mater Dei is widely recognized for its excellent care by other clinicians. Mater Dei oncology services are headed by an internationally recognized physician, Enaldo Melo de Lima, MD, and supported by a multidisciplinary clinical team

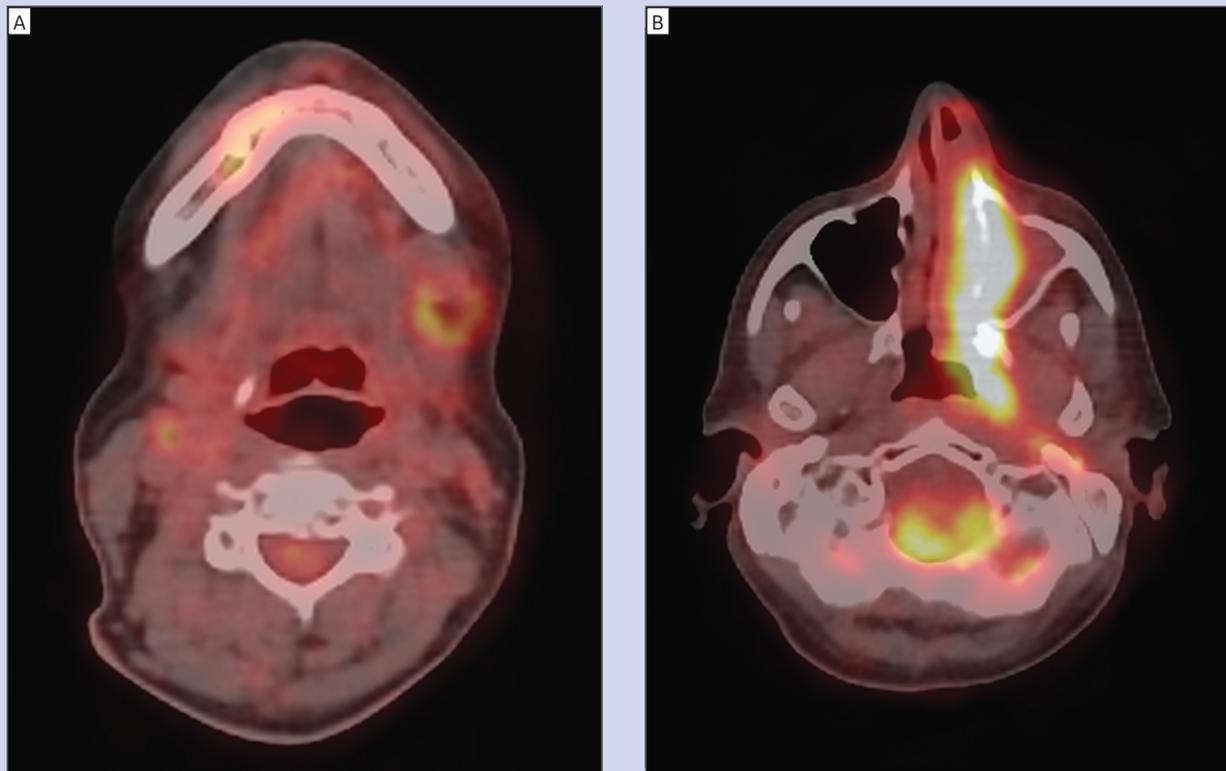


Figure 2. PET/CT images used to localize areas to be irradiated, which reduced the initial planned area of irradiation compared to MR.

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dedicated to providing the best possible care. This demand for Mater Dei's oncology services is evident by the 1,500 oncology appointments and 600 chemotherapy treatments performed each month.

In fact, Dr. Lamego says that many local oncologists are now requesting patients be examined on Mater Dei's Discovery PET/CT 710, even though there are three other PET/CT systems in Belo Horizonte. In cases where a patient may have a study performed at another facility as well as one at Mater Dei, the oncologists often just review the Q.Clear images. “The oncologists know this machine is better and that they will have a better (patient) image when viewing it with Q.Clear.”

In his reports, Dr. Lamego provides the SUV obtained from the Q.Clear images, labeled as Q.SUVs, which clearly informs the oncologists that the SUV is based on the advanced full convergence technology. Similar to the Q.Clear images, the oncologists trust the Q.SUV and prefer to utilize it over SUVs generated by studies performed at other sites.

However, this has led to an interesting challenge for Dr. Lamego. “The use of Q.SUV also grew the oncologists' expectations. Now that they understand Q.Clear has high image quality and Q.SUV is more sensitive, they want more conclusive reports if the treatment is working or not.”

It's a challenge that Dr. Lamego can overcome with Q.Clear and Q.SUV by delivering the data oncologists need to evaluate treatment response. He cites one case of a lymphoma patient who was referred to a PET/CT study with Q.Clear after undergoing two treatment cycles. The images and Q.SUV helped the oncologists determine the patient was not responding. Based on this information, the chemotherapy drug was changed and the patient began to respond; after the second follow-up PET/CT study, the patient was reported as normal and disease-free.

While Dr. Lamego anticipated PET/CT would be useful for evaluating treatment response, he was surprised at the impact it had on treatment planning. Once a week, the system is available for CT simulation. In one head and neck cancer case with multiple lesions, an MRI study showed enhancement in several lymph nodes that would have been interpreted as areas to irradiate. However, the PET/CT study indicated that only three lesions were viable (and necessary) for treatment. The patient was treated based on the PET/CT data and avoided additional and potentially unnecessary radiation treatments.

A key aspect of the Discovery PET/CT 710 Q.Clear images for the oncologists is they have less noise, so the clinicians can identify the features of the lesion. “With the SNR improvement and high lesion conspicuity provided by Q.Clear, the borders of the lesion are better delineated and not as blurred, which helps in contouring the precise target for radiation therapy,” Dr. Lamego says.

Overall, the system is making a difference in the treatment planning and evaluation of treatment response for the oncologists and their patients. Dr. Lamego believes the reports are enhanced by using Q.Clear and Q.SUV. As a result, the system has made an excellent impression on the clinical community and is often the oncologists' first choice for their patients.

“The GE Discovery PET/CT 710 is a very reliable and robust system designed for oncology, so we are seeing a lot of patients being referred to us who have very complicated cases,” Dr. Lamego says.

With the new PET/CT imaging service utilizing Discovery PET/CT 710, Dr. Lamego and his colleagues at Mater Dei Hospital have filled a clinical need in their community, providing the high-quality and precise imaging required for today's advanced cancer treatments. ■