Cancer diagnostic and treatment has evolved with Cancer Radiology and Therapy (CRT)

Announcer:

This is a podcast by Lumina, the perfect space to innovate, collaborate, and grow in health, science and tech.

Host: Rebecca Griffin

Shayne White and Dr. Sophie Huang, welcome to HealthTech Talks.

Guest speaker: Shayne White

Thank you for having us. Pleasure to be here.

Guest speaker - Sophie Huang:

Thank you for the invitation.

Host - Rebecca Griffin:

Shayne, you're a nuclear medicine technologist with more than 38 years experience in nuclear medicine, including broad experience managing medical imaging practices in major public and private hospitals throughout Australia. And Sophie, you're a highly accomplished dual-trained radiologist and nuclear medicine specialist. It's great to have you both here. Thank you so much for your time. Now you're both in nuclear medicine. Shayne, can you tell me what nuclear medicine is?

Guest speaker - Shayne White:

Nuclear medicine uses very small amounts of radioactive traces, which are bound to compounds that get absorbed into the target organs, dependent upon their blood flow and metabolism. So where other scans show us the structure of what we're looking at, nuclear medicine is very much focused on the metabolism and the function of the disease processes that we're looking at.

Host - Rebecca Griffin:

And what interested you in nuclear medicine all those years ago?

Guest speaker - Shayne White:

Yes, so all those years ago is correct. So nuclear medicine, for me, really provided a really good balance, particularly interested in radiation physics, but I also wanted to have quite a bit of patient contact as well. So nuclear medicine scans typically take an hour or more. So you get to spend quite a good amount of time with the patients, getting to know them, explaining the tests, and making sure that they're comfortable. So nuclear medicine, for me, really allows me to get my geek on. The technology is

fascinating, but it also allows me to spend some time with the patients and provide really good care. And it's an evolving field as well. So you know those technological advancements are happening all the time. Sometimes incrementally for a decade or so, and then sometimes they're just absolutely groundbreaking.

Host - Rebecca Griffin:

And Sophie, what about yourself? You're a radiologist and nuclear medicine specialist. What got you into those fields?

Guest speaker - Sophie Huang:

So it is a fascinating field because nuclear medicine is actually a sub-specialized area that combine radiology and with the use of radioactive material, the radiopharmaceuticals. It's fascinating for me because it allows us to see how the body functions at a cellular level, which can be very crucial in helping diagnosing conditions early. My interest in this field stem from the ability that we can combine the technology with the direct patient care, and that allows us to make a significant impact on patient life.

Host - Rebecca Griffin:

So what sort of disease might you be trying to diagnose with the use of nuclear medicine?

Guest speaker - Sophie Huang:

So we actually can diagnose wide variety of disease, not only oncology cancer care, but nuclear medicine also encompasses pretty much every organ and system in the body. Starting from brain functioning, esophageal functioning, thyroid functioning, cardiac functioning to bone functioning, just to name a few.

Host - Rebecca Griffin:

Now Shayne, you've had a long career in medical imaging, and so I imagine you've seen a lot of change in the industry. What's been one of the biggest and most beneficial changes?

Guest speaker - Shayne White:

When I first started in nuclear medicine, we were still using 35 millimeter cameras. We were still processing film. So taking the image, exposing a film, taking it through the darkroom, and developing it through an automatic developer. So I just missed the very early phases of nuclear medicine. So when I first came in, the gamma camera was established. So there's been so many changes. When I first started, it was all dials, and it was all manual. You set up your camera, you had to make sure that the peak was set right by turning dials and looking at the count rates. So now it's digital mostly. So the technology has come along in leaps and bounds, the cameras are better, they're faster, they're more

sensitive. Probably the biggest change has been PET and the role that it plays in cancer imaging. Certainly a PET is one of those groundbreaking technologies.

Host - Rebecca Griffin:

Shayne, you're the general manager for the Cancer Radiology and Therapy Centre or CRT, which is the first and only dedicated private cancer diagnostic medical and imaging theranostic provider in Queensland. It's a beautiful brand new centre located here on the Gold Coast at Lumina. It's in the Proxima building, which is a stone's throw from the Gold Coast Private Hospital. When did it open, Shayne, and why is it dedicated to cancer?

Guest speaker - Shayne White:

So we opened in mid-June. I worked with our medical director, Dr. Tom Huang at Gold Coast University Hospital, and we have very similar values. And we felt that those values were not well met in the marketplace at the time, so we decided that we would go and open our own practice. And we were very concerned about patients having to wait for their scans, and we really wanted to stop the need for local patients to be traveling to Brisbane or to go on a waiting list. So we decided to open our own practice. And those core values are at the centre of the business.

Host - Rebecca Griffin:

And why did you choose here at Lumina?

Guest speaker - Shayne White:

There are Medicare regulations about where you can put PET cameras. They have to be near treatment facilities. Tom and I worked at Gold Coast University Hospital. Tom is actually still the subspecialist for nuclear medicine at Gold Coast University Hospital. And there's a high concentration of referrers around this area, which is what naturally happens with medicine. So this was a good site for us. So it was a new building as well. So we weren't trying to retrofit a theranostics centre and a PET centre within an established building. We were able to design our own practice.

Host - Rebecca Griffin:

What is unique about CRT?

Guest speaker - Shayne White:

First of all, we locally owned and operated, we're not a corporate practice. And that allows us to be able to provide the services that we want to provide. So we're very much focused on not having patients wait for scans. Some of the indications for PET scans are not medically urgent. However, once that patient has heard that word cancer, the anxiety for them and the stress for them is huge, and we really wanted to be able to take that off them. So we will typically do PET scans the next day. We've also had patients

walk across from their specialist from Gold Coast Private or GCUH to make a booking, and we've just scanned them then and there. So this is something that is very important to us, and of great benefit to the patient.

And they feel that their journey has started because their journey has started. They're not waiting at home for two weeks with that diagnosis of cancer hanging over their head. They're seen as soon as we can possibly do them. And the staff that we've chosen are all very experienced staff with many, many years of medical imaging experience. They're chosen because they align with those core values. It's all about the patient, patient care, the compassion, the respect, and the trust. And that's something that we feel is quite unique in the field. Yeah, and that really does make us quite unique.

Host - Rebecca Griffin:

Now, what services does the centre provide? We've touched on a couple.

Guest speaker - Shayne White:

We provide a wide variety of services from your general radiology to quite specialist cancer imaging and therapies. So we provide BMD, which is bone mineral densitometry, which is quite important for a lot of cancers because some of the drugs that they given can actually affect the calcium content in their bones. We have a mammogram which does tomograms and also contrast mammograms, which is a relatively new technology that's being seen as being very, very effective. We have an ultrasound room as well. We have a 3 Tesla MRI and a PET/CT, which is the only 32 centimeter. And we have general X-ray as well.

Host - Rebecca Griffin:

You mentioned there about the PET scanning, so that's been one of the major projects you've been involved in during your career, as you mentioned, was the introduction of PET into mainstream diagnostic imaging. What does PET scanning bring to patients, and why would somebody need to have a PET scan?

Guest speaker - Shayne White:

PET scan is a very non-invasive way of diagnosing cancer. All most cancers, not all cancers are amenable to PET scanning, but a lot of the very common and major cancers are. So for instance, lots of patients have single nodules in their lungs. This can be an old infection; it can be tuberculosis. There's really no way of knowing whether it's going to be cancer or not simply by looking at it on a CT scan. Now, in the past, the patient would either had to have a very invasive biopsy, or they would've actually had to go to hospital, have their chest cracked open, the nodule removed and taken to pathology. So with PET, the main tracer that we use is a radioactive glucose solution. And lots of cancers like to use glucose for its energy source. So we can inject the patient with a small amount of a radioactive glucose solution.

And if that nodule is not active, if it's not using glucose, it's very unlikely to be cancer. So just for that single indication alone, there would've been hundreds of thousands of people who have not had to undergo unnecessary surgery. So that's a huge benefit. Sometimes unfortunately the nodule is active and it is cancerous, in which case the patient would need to go and have surgery. If however it's already spread, and this is something we see quite often on PET scans, because we can pick up very small metastases. But if it's already spread, there's no point in that patient having surgery to remove that nodule. They now need a more systemic treatment. So that, again, is a way that PET can fundamentally affect patient's journey through cancer. It can stop them from having unnecessary surgery. Because we're injecting a radioactive tracer, we can measure how much radioactivity is in that area, and we get something called an SUV, a specific uptake value.

We can use that to see if the patient is responding to their treatment. So if the patient has cancer, they go away, they have a course of chemotherapy and they come back, and their SUV is the same or it's increased, that treatment's not working. And the worst thing for a patient is to be on the wrong treatment. So that's very valuable information for the treating physician that this treatment is not working. You need to change combination of drugs that you're giving or you need to change their treatment regime.

Again, that's of great benefit to the patient. There are serious side effects to a lot of the drugs that are used to treat cancer. And we can also monitor them for disease. So once they've been through their treatment and there's no sign of active disease, they can have a scan every 12 months. And again, we can pick up very small metastases as long as they're active, as long as they're taking up the radioactive glucose, then often we can see them. So it is also good for the patient's peace of mind every 12 months, that they know that the PET scan is clear.

Announcer:

You're listening to HealthTech Talks, a podcast series delivered by Lumina. To find out more about Lumina, visit the website luminagoldcoast.com.au, and sign up today to receive your Lumina Opportunities Pack.

Host - Rebecca Griffin:

Dr. Sophie, in addition to your medical and specialty radiology training, you've completed a PET fellowship at the Royal Brisbane and Women's Hospital, and pursued a comprehensive two-year nuclear medicine fellowship specializing in radionuclide therapy and PET imaging at Liverpool Hospital, Sydney and the Royal Brisbane and Women's Hospital. You have expertise in multimodality oncology, hybrid and theranostic imaging. Now, theranostic imaging is one of the services that CRT provides, and you're one of only a few facilities in Australia with a dedicated theranostics operation. Can you explain what theranostics is?

Guest speaker - Sophie Huang:

So theranostics is an advanced and personalized approach to cancer treatment, that combines the diagnosis and therapy in one powerful technique. So at CRT Imaging, we use specialized PET scan

imaging to identify specific targets known as tumor receptors, so on cancer cells. So if these targets are present, we can then use a radioactive drug to treat the cancer. And this drug is injected, and selectively targets the tumor cells while sparing the healthy tissues. So our dedicated theranostic operations, one of the only few in Australia, is designed to optimize patient experience and comfort.

We work closely with the multidisciplinary teams to ensure that each patient received the most appropriate treatment tailored to their specific cancer. This approach is especially promising for patient with complex cancers like metastatic prostate cancers and neuroendocrine tumors who may not have responded to other treatments. So as the research continues, the theranostic is set to play an increasing vital role in the future of cancer care.

Guest speaker - Shayne White:

The way that I describe theranostics is we do a diagnostic scan with the particular chemical tracer that we use. We attach a diagnostic atom to that. So the diagnostic atom, we want to come out of the body, we want to be able to image it, and we can't image it if it doesn't come out of the body. We can then see where the cancers are and how active they are. We can then weaponize that tracer for the therapy, so we know exactly where it's going. We know exactly how much it's going to take up. And we can deliver that payload, that radiation directly to the tumor.

Host - Rebecca Griffin:

So Sophie, tell us about the actual CRT facility and the equipment. Your imaging equipment is the most advanced of its kind. Actually, I saw a great video of the MRI machine being craned into the building, and I believe it's the first of its kind in Queensland. So can you tell me a bit about the facility and your equipment?

Guest speaker - Sophie Huang:

Yeah, so at CRT, we are proud to offer some of the most advanced imaging technology available. So just starting off with our GE Omni Legend 32 Digital PET/CT. So this is a cutting edge system. Features a digital detector that is six times more sensitive than conventional scanners. So allows for ultra-fast, ultra-low dose without compromising image quality. It produces high resolution diagnostic images and support novel PET tracers for specialized research and trials. Our MRI machine is a GE SIGNA Hero 3 Tesla. This is one of the Australia's newest MRI system, featuring a large 70 centimeter bore in the AIR coil. This is a flexible blanket-like coil that enhance patient comfort and efficiency.

It uses deep learning reconstruction to reduce scan times while maintaining high quality results. We also have a GE Senographe Pristina 3D mammography. This is designed for patient comfort. The system ensures a smooth, fast 3D mammogram experience every time. We also have the GE Lunar iDXA, known for its precision and clarity. This bone mineral density systems provides high resolution image for research-grade applications including bone score and body composition analysis. And also we have a purpose-built facility that includes consultation rooms, a theranostic bay, uptake rooms, and hot lab, all aimed at delivering comprehensive, efficient patient care.

Host - Rebecca Griffin:

What's a hot lab?

Guest speaker - Shayne White:

That's where we store, and make up, and ultimately draw up our radioactive tracers. So it's hot because it's radioactive, and lab because it's laboratory.

Host - Rebecca Griffin:

So Sophie, what do you hope CRT can provide for its patients?

Guest speaker - Sophie Huang:

Our goal is to offer not just medical services, but a comprehensive care experience. We want our patient to feel supported throughout their journey, knowing that they are receiving the most advanced and personalized treatment available.

Host - Rebecca Griffin:

Now, September is Childhood Cancer Awareness Month. What services does CRT offer to our beautiful children who are going through cancer treatment?

Guest speaker - Sophie Huang:

So at CRT, we provide critical imaging services for pediatric oncology within a supportive and caring environment. Our advanced nuclear medicine techniques such as the 18F-FDG PET/CT plays a key role in diagnosis, staging, and monitoring treatment in children. We take pride in offering the lowest achievable PET/CT doses in Queensland, ensuring the highest safety standards without compromising the diagnostic accuracy. Additionally, our fast 3T MRI with the AIR coil blanket technology helps reduce the scan times, increase the patient comfort. And where possible, allows the children studies to be done without the general anesthesia. This approach helps to make the imaging process less stressful for both the children and their family. Our commitment is to combine cutting-edge technology with compassionate care to support the best possible outcome for our young patient.

Host - Rebecca Griffin:

And Sophie, does a patient need to have cancer or suspected cancer to come to CRT for imaging?

Guest speaker - Sophie Huang:

No, they don't have to. We accept anyone. So we are a subspecialist oncology imaging centre offering of theranostics, but we are just like normal radiology clinic offer comprehensive radiology services for people that have sore shoulders, abdominal pain. We do offer injections for their facet joints, shoulder

injections, things like that. We also have mammograms and ultrasounds. You don't have to have cancer to come to us for screening for breast cancer. And it's actually a good thing that if you come to us for that, because we could do everything in a single location, one-stop shop.

So starting with as early screening with mammogram and ultrasound. And if we did find something, we could biopsy it. And then if it did turn out to be cancer, and your doctors want you to have a PET/CT scan, we can also offer that. And if they need MRI, we also have MRI services. And after you started the cancer treatment, if you need to monitor your bone mineral density, we also have a BMD scanner.

Host - Rebecca Griffin:

Now Sophie, what do you love about your work in radiology and nuclear medicine?

Guest speaker - Sophie Huang:

That's a very good question. I love that our work allows us to be at the forefront of the medical technology, while making a real difference in patient's life. Every day presents a new opportunity for us to help someone, whether it's through early diagnosis or by providing a targeted treatment plan. It is incredibly rewarding.

Host - Rebecca Griffin:

And Shayne, what about yourself? What do you love about what you do?

Guest speaker - Shayne White:

Just being able to treat patients really well, provide a good quality scan. And it's actually a really interesting field, I'm constantly learning. Fortunately, I have a group of radiologists who love to answer all my questions. So the field itself, it's a great place for lifelong learning, and to have a real impact on that patient's care.

Host - Rebecca Griffin:

Now you're the general manager, do you still get in and do any of the scanning?

Guest speaker - Shayne White:

Absolutely.

Host - Rebecca Griffin:

You do.

Guest speaker - Shayne White:

Absolutely. I love the clinical side of nuclear medicine. Perhaps in the future, that may not be the case. In which case, we do have some very good nuclear medicine technologists within our staff. But hopefully I can't ever envisage me not running the camera at least one or two days a week.

Host - Rebecca Griffin:

Now how do people get an appointment at CRT?

Guest speaker - Shayne White:

Well, they can just phone us. They can also email through their referral. They can upload their referral through our website. Our receptionists are very experienced, so if they just give us a call, we can certainly book them in. And since we're close to a lot of major referrers here in Southport, a lot of patients just walk across with their referral form and get an appointment instantly.

Host - Rebecca Griffin:

You mentioned earlier that you're an independent radiology practice. Are there many like you?

Guest speaker - Shayne White:

We're the only dedicated cancer radiology and therapy centre, but there are some small independent radiology practices in the Gold Coast. But our particular niche is in that the oncology imaging sphere.

Host - Rebecca Griffin:

And such an important niche and so needed. Congratulations on the opening of CRT, and thank you so much for talking with us this morning.

Guest speaker - Shayne White:

No, it's a pleasure. Thank you very much.

Guest speaker - Sophie Huang:

Thank you for having us.

Announcer:

Thank you for listening. If you've liked this episode and other episodes of HealthTech Talks, we'd love it if you could write a review or give us a five-star rating, so that others can find our podcast.