



MEET PRENUVO: ADVANCED FULL BODY MRI FOR CANCER SCREENING & MONITORING

By: Lennard M. Gettz, Ed.D

The NY Cancer Resource Alliance and HealthTech Reporter proudly introduces the latest installation of the Prenuvo clinic in New York City. All Prenuvo facilities offer the most current diagnostic advancement in whole body MRI imaging. Recognized for its volume of diagnostic-quality images acquired under one hour, Prenuvo's capacity to capture whole-body imaging through its unique, cutting edge analytic software offers a comprehensive array of next generation applications for early detection and real-time monitoring of complex diseases and cancers.



On April 20, NYCRA NEWS conducted a special interview with DR. RAJ

ATTARIWALA, Nuclear Medicine Radiologist, PhD Biomedical Engineer and Founding Radiologist of Prenuvo. Known commonly as "Dr. Raj", he shares his commitment to improving on the current state of modalities in cancer diagnostics by offering advancements on the performance, range and design of our current MRI technology.

INTERVIEW PART 1: FROM CONCEPT TO DEVELOPMENT by Dr. Raj Attariwala



I bought my first MRI machine in 2009 and published my concepts about the very first whole body diffusion images at a conference called the International Society for Magnetic Resonance and Medicine or ISMRM back in 2011. It was well received and led to an invited review on the topic in the Journal of MRI in 2013. The imaging society recognized this as a powerful and highly beneficial solution at a time when most facilities can only scan individual organs or body parts (ie. prostate, breast, chest, abdomen etc). Scanning the entire body is really challenging from an MRI hardware and software point of view because MRI machines and associated software were simply not designed to do that.

The need 'to see more' has always been part of the diagnostic equation. In the field of nuclear medicine which looks at function of tissue, we often scan the whole body when we inject a radioactive tracer, because you don't ever want to bring a patient back and re-inject them again. The beauty of MRI's absence of radiation and the ability to combine traditional anatomic (form) images with the power of functional imaging techniques invited the idea of covering more (actually the entirety) of the body without the need for any injection. I learned about the power of combining form and function years ago here in New York when I was training in the emerging field of PETCT at Memorial Sloan Kettering.

This collaboration cycle to build the whole body paradigm was a continuous process between MRI Physicists/ ENGINEERS and RADIOLOGISTS to expedite the design and prototyping stage. Having a doctorate in both fields made me the translator to both groups who commonly do not 'speak' the same language. Materializing concepts mean communicating features radiologists need to see with those who could build programs and luckily, the progress became fairly streamlined and this process does not alter the FDA approval of a MRI.

THE FULL-BODY STRATEGY FOR CANCER SCANNING

In simplistic terms, having a full-body access comports to the fact that everything is connected in one way or another.

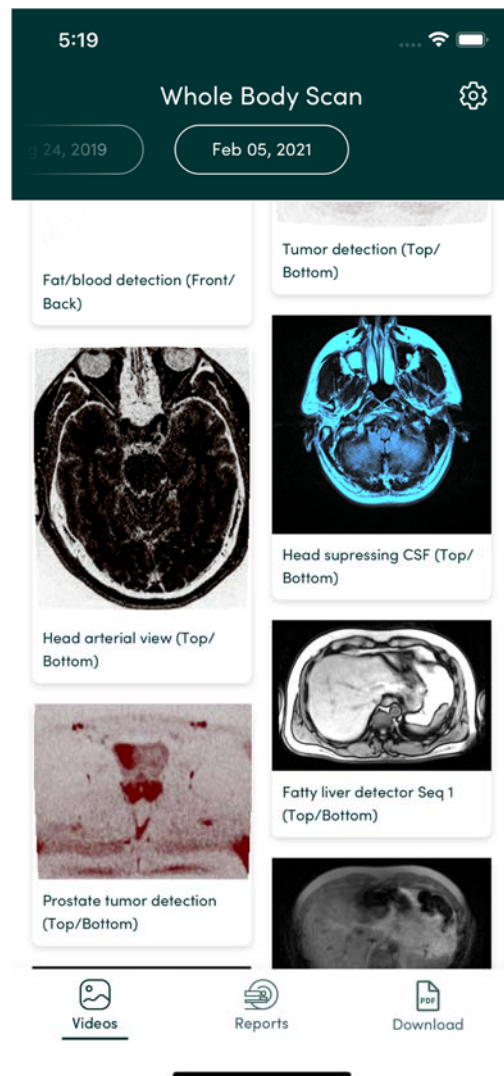
Tumor cells start somewhere, but they can spread almost anywhere they want. If we find a cancer in stage one (which usually means confined to the organ of origin) what happens afterwards is to ask if it is IN FACT confined to that organ, or if it has spread somewhere else. This is called staging.

After a cancer is detected, patients often go into a panic asking "What stage is it? ... Is it metastatic?" Working with the conventional MRI or CT of the past, they would have to wait to get a brain MRI, then a chest, abdomen, pelvis study and a bone scan etc. With our technology, we already have all that. We've routinely found people with stage one cancer as part of early detection. This is a good basis where you want to find it. From here, searching 'full body' is the best next step to make sure that it's not anywhere else in the body. Using an MRI with diffusion, we can see it all.

An MRI is known as the most detailed imaging available for scanning a tumor anywhere in the body. Creating a treatment strategy becomes more effective when you know no areas have been overlooked. Patients and physicians both have a higher and more confident level of understanding about what they're dealing with. A great example is confirming that the pounding headache that a patient suffers from after a diagnosis of cancer is stress related, not due the fear of a metastasis...Whole body MRI coverage can preempt this concern.

REPLACING CONTRAST?

From a tumor perspective, you frequently get an increased number of cells which contributes to increased metabolism which often requires more energy. Injecting contrast – ie MRI gadolinium or CT iodine – ends up going to areas of increased blood flow where there is more energy needed, whereas FDG Positron Emission Tomography delivers increased glucose to the cells that are growing and have more energy demand. Instead of contrast our diffusion system works to track cellular density – whereby increased cellular density usually means a high concentration of cells (which is a tumor) which gives off a lot of signal. So as a result we're actually looking with diffusion at cells at a cellular level to see how dense (or hard) they are. That's how we're able to characterize what the tissue is composed of with that functional diffusion sequence.





COMMUNICATION TOOLS FOR EARLY DETECTION

Ideally, we want to find things in stage one, but the only way we can do that is to SCREEN. To create a full-body baseline scan of anyone offers a new layer of peace of mind whether we find something or not. In our decade long history, we have luckily found many early stage cancers in patients who were not expecting anything wrong – and this adds to the success and fortunately efficacy of the treatment phase.

After a Prenuvo scan, diagnostic-quality images are provided to each patient, which are available for review between patient and physician. For those who receive a Prenuvo scan because of potential concerns, correlating what is on the

images with their possible symptoms is a major benefit to confirming a disorder. If a patient has concerns of symptoms expressing as night sweats, unusual weight loss, bone pain etc, a one hour Prenuvo scan can provide almost unequivocal imaging answers, or at the very least eliminates most major concerns and provide peace of mind, because with MRI we have looked through the entire body where the eyes cannot see.

Once an issue is identified, our radiology team communicates the report. For continuity of care, our team of health practitioners will go through and explain what's going on. If there's no cancer per se, then the report goes directly to the patient with the findings combined with simplification of terms so anyone can understand what it means. However if there is a finding, the scans directly go to a group of health practitioners who discuss next steps directly with that patient and ensure they're connected into the medical system. We remain involved with the entire patient journey and want to be part of the whole imaging continuity of care spectrum that the patient should have.



"CANCER DETECTIVE" FINDS GROUNDBREAKING SCAN

On April 20th @ 4:30PM, Dr. Robert Bard scheduled his first FULL-BODY MRI on 312 West 34th Street. Prior to its opening date on 4/27, PRENUVO welcomed special guests to test drive their cutting-edge imaging solution. Positioned in NYC as the 8th installment is a significant landmark in Prenuvo's international footprint. As a prominent figure in cancer diagnostic imaging and non-invasive research, Dr. Bard found great interest in experiencing this full-body innovation firsthand.

For over 3 decades, Dr. Bard has committed his life's work in the use and support of diagnostic imaging to detect cancer tumors. He is aligned with a global network of fellow cancer 'detectives' and clinical specialists. He is often called to 'test drive' the latest ultrasound upgrades as part of developers' R&D, prior to market deployment. In addition, Dr. Bard is also a clinical researcher using ultrasound imaging to quantify therapeutic effects of non-invasive medical devices.

On April 27, 2023, Prenuvo officially announced the opening of their first New York City clinic. Founded in Vancouver, Canada, the company is recognized for their design of proactive whole-body imaging for the early detection of cancer and other diseases. With this expansion, New Yorkers will now have access to the fastest,

safest, non-invasive whole-body screening on the market so that they can take personal control of their health and seek proactive solutions. [Source: Penuvo press release]

PRENUVO REBOOTS HOLISTIC IMAGING WITH FULL BODY MRI

By: Robert Bard, MD | Originally published in HealthTechReporter.com

Unlike the many MRI's without contrast of almost every part of my body over the years, this was actually an interactive and possibly enjoyable experience. In addition to not having to worry about getting a contrast infusion, the fact that it was getting so much of the body minus the hands and feet offers an excellent overview. Because disease in one part of the body may cascade dysfunction in other parts of the body, the developers of this full body scan offers a diagnostic solution to address this. For example, a gallstone can drop into the pelvis, or an ovarian tumor can spread to the axilla or a melanoma of the calf can metastasize to the brain. The idea of full body imaging to rule out any kind of metastatic disease or primary disease like an aneurysm or an unsuspected kidney cancer is very important.



For such a comprehensive scan that takes a little more than an hour without any preparation is quite impressive to me. In the case of abdominal imaging (specifically) for prostate studies, the fact that you don't need an enema or pre-op work is a major upgrade. Conducting a procedure becomes much easier due to the multiple areas of monitoring that are simultaneously available. This means you're getting more than one "workup".



What I find special about the Penuvo experience is that after the scan, you are contacted by a specialist who will explain the procedure and your imaging report. For non-medical people, this process is invaluable. Also the video presentations of the pathology are placed before you in a three dimensional hologram- making it easy to navigate through the scans.

Penuvo promotes their technology as a PREVENTATIVE tool for anyone interested in a full-body view of their health. This also works as part of an EARLY DETECTION protocol because the sooner you can catch something, the more time you have to address it- especially with cancers. Also, this is an advantage with inflammatory disease since psoriasis of the nail or the fingers can involve the joints anywhere in the body, especially in the pelvis and the sacroiliac joints. This would tell you if the treatment you are getting is responding slowing or if the progression is not working at all. This full body scan offers a whole look at where the problem is and where it isn't and lets you confidently focus on the treatment technology in a more suitable direction.

INTELLIGENT SCAN FOR COMPLEX DISORDERS

Currently, the modern thinking of disease has changed. Something like psoriasis (a worldwide skin disease) not only affects the skin and the joints, but gives you an increased risk of stroke and cancer development. So

when you get the full body scan, you check if your heart or brain are involved by the vasculitis. This is an inflammatory disease- and because it's a whole body disorder, we want to treat the whole body. As a matter of fact, it makes sense to scan the whole body first- making the Penuvo ideal for producing a proper base line.

The same thing goes with metastatic cancer. You need to see where it is, where it's going to and where it hasn't gone to. The conundrum occurs with a tumor vs. the inflammation that usually appears with a tumor. We are seeing this more often- where a large cancer is actually part-cancer, part scarring fibrosis and part-inflammation. In other words, what you see and feel isn't necessarily disease. Through advanced imaging, you may distinguish suspicious tissue from fibrosis, an inflammatory tissue or cancer which is where the ultrasound compliments the full body imaging.

MISSION AND VISION: THE DRIVING FORCE BEHIND THE FULL-BODY MRI

An exclusive interview with ANDREW LACY, PRENUVO CEO



INTRODUCTION

My wife speaks around five languages and I've always been fascinated with the origin of language. The word DISEASE is a really interesting because prior to the 14th century, it actually meant a lack of ease. And I think it captures that idea so poetically. This health system that we have where disease is really the fruit of not having insight early enough. I would say if I was to articulate the ultimate vision of the company, it's really about working to redefine our relationship with disease, and to help redefine things that are associated with advanced scary medical interventions, expensive poor outcomes-- to bring something that is routine early lifestyle interventions, inexpensive and not scary at all. That's really the mission of the company. For the public, it starts with these scans- by ultimately removing FEAR (induced by conventional medicine) by showing that there's a different way to really manage your health.

LAUNCHING A MOVEMENT STARTS WITH A PERSONAL NEED

The starting point for me was reaching my forties, maybe you want to call it a midlife crisis. I had been working very hard as a startup entrepreneur, and I started asking myself the question, "...am I actually healthy? Am I going to be around to see this future that I'm working so hard to build?" I went out and tried to get an answer to that question (through conventional health checkups) and I found I could learn about my health through bits and pieces. I did a colonoscopy, I did a genetic test, I did blood tests, and it all told me segmented bits about my health- but there was no sort of holistic answer.



My own explorations led me to Dr. Raj Attariwala in Vancouver, Canada. He was offering these scans for several years just by word of mouth. I went and got a scan myself- and I learned more from that one scan than I had learned from the medical system my entire life.

Being a fairly rational person, I found this full-body concept really made sense to me! It just felt like I was staring right at the future of healthcare. It reflected much of what the "smart, non-invasive future-science

of Star Trek"-- that vision of health that we thought we would have arrived at by now. This felt like the closest thing to that. And from that moment on, it really just became my mission to continue to work very hard and find ways to bring this to as many people as possible and have a positive impact on as many lives as we can.

IMPROVING ACCESS TO HOLISTIC IMAGING

The success behind our design is a combination of two things. Our customized **HARDWARE** that accommodates whole body screening allows us to scan many parts of the body a lot faster than the conventional 'single body part' scan. These machines are very expensive, so time in the machine really equates to cost of the procedure. We have some incredible innovations to the hardware that enables us to price a lot less expensively than you might think.

And speaking of price, we also wanted to build something that would be as accessible as possible and prior to Penuvo, the closest you could get to a whole body diagnostic scan would cost in the order of 30 to \$50,000. Addressing the price factor is critical in building a new strategy for access; we wanted something that more and more people could access. And in fact, one of the core goals of the company is to bring the cost down even more. We imagine offering a scan that's may be around \$500 in the future and something that everyone would do every year or two, either because it's inexpensive enough that they can afford it themselves, or that insurance companies then start to include this in standard of care.



PREVENTION: RESPONDING TO PUBLIC DEMAND FOR LONGEVITY

Introducing this scan to the public is transformative as we start thinking more about healthcare. I think there's really three reasons to get a scan. The one that people generally focus on when they come in the first time is to find out if there's anything crazy and life threatening that I need to know about today?

The next (second) common reason is in some ways is the most exciting-- is we're really starting to help people understand the impact of their lifestyle on their underlying physiology. Through a full-body scan, we're able to see the early stages of age-related disease now. This includes metabolic diseases, diabetes, NAFLD (Nonalcoholic fatty liver disease) and even seeing the end organ damage that comes from high blood pressure. The idea here is to be able to provide feedback to patients while they're still asymptomatic.

And while these disease processes are still very early, having these answers ideally help us avoid a medical intervention. Instead, you can just make a lifestyle modification and hopefully reverse some of those age related degenerative conditions.

The third value to this scan is really for peace of mind. Part of why I invested so much of my time in all this is because of the peace of mind that I got after doing my first scan. Ultimately, there will be things that the scan may pick up- but just knowing that a routine scan could pick those things early enough to make a difference in health outcomes really gives tremendous peace of mind.