Canon



Theranostics: A Precision Revolution in Cancer Care

Transforming Outcomes for Patients Like Becky



Pictured: Becky, Neuroendocrine tumor patient, University Cancer and Blood Center, Athens GA

A Personal Story That Echoes a Nationwide Challenge

Becky is a recently retired Marketing VP, but she is hardly slowing down. She plays tennis, golf, and pickleball, and serves on the boards of several charities.

Becky's story begins in January 2023 when she woke up in the middle of the night in pain. Assuming it was acid reflux; she took an antacid. In the morning, the pain hadn't subsided, and Beckly realized it may be something more serious. She walked into a local hospital and walked out with a diagnosis: neuroendocrine tumors—carcinoid cancer.

Her world changed. But her resilience didn't.

"I said, I'm not dead. Let's just take it a step at a time."

A Growing Challenge with New Hope

Neuroendocrine tumors (NETs), like Becky's, have historically been considered rare cancers, although their incidence rate is rising, particularly among aging populations in the U.S. These tumors can develop anywhere in the body and often remain undiagnosed for years due to vague or absent symptoms.[1] Traditional treatments such as chemotherapy and radiation are often ineffective against these slow-growing or atypical cancers.

> "These are often patients (with NETs or Prostate cancer) that did not have many good treatment options."

— **Gordon Schoenfeld, MD**
Medical Director
Theranostics and Radiation Oncology

Metastatic prostate cancer presents a similar challenge. As the second most common cancer in men, prostate cancer can become especially aggressive once it spreads and becomes resistant to hormone therapy—a stage known as metastatic castration-resistant prostate cancer (mCRPC). Once prostate cancer spreads beyond the prostate it is no longer considered curable, and treatment focuses on managing the disease rather than eliminating it.[2]

Enter Theranostics; an emerging field that combines diagnostics and targeted therapy into one seamless approach. While nuclear medicine has long used agents like Iodine-131,[3] newly approved Theranostic agents for NETs and prostate cancer are reshaping the treatment landscape. With over 1200 trials currently registered, and North America forecasted to be the largest market for Theranostics, this innovative approach is offering new hope to patients who previously had limited options in the US.[4,5]

Theranostics Trials by Cancer Type

With **over 1,200 different agents** in the pipeline worldwide, this chart shows the number of clinical trials by cancer.[4]

282	Prostate Cancer
116	Breast Cancer
95	Lung Cancer
95	Neuroendocrine Tumors (NET)
84	Liver Cancer
69	Head and Neck Cancers
59	Pancreatic
49	Colorectal Cancer
45	Kidney Cancer
45	Non-Hodgkin Lymphoma
28	Melanoma
28	Myeloma
25	Cholangiocarcinoma
21	Ovarian Cancer
20	Gastric Cancer
16	Esophageal Cancer
13	Cervical Cancer
12	Hodgkin Lymphoma
11	Acute Myeloid Leukemia
366	Other Cancers

Local Burden, Systemic Impact

Based in Athens, Georgia, University Cancer & Blood Center (UCBC) serves a wide area with 11 satellite locations in Northeast Georgia. Despite a growing population, the region lacked adequate access to high-resolution PET/CT imaging which is considered crucial for identifying candidates for Theranostics.

Until recently, the entire region relied on a single, often overbooked and outdated PET scanner, leading to delays in diagnosis and treatment.

Recognizing this gap, UCBC set out to not only expand access but to elevate the standard of care. They identified digital PET/CT imaging, with its superior sensitivity and resolution, as essential to launching a comprehensive Theranostics program.[6]

> These are patients who have gone through years of cancer treatment, the treatments have been effective to some extent, but their cancer has transitioned into a more aggressive form and often a lot of available treatments, stopped working. Having Theranostics for those patients is often almost a miracle treatment for them, where they can have a much longer life span than they would without that treatment.

— **Gordon Schoenfeld, MD**
Medical Director
Theranostics and Radiation Oncology



Digital PET/CT: Empowering Theranostics with Precision

Digital PET/CT systems, such as Canon Medical's Cartesion Prime SP, deliver superior lesion detectability, image quality, and diagnostic confidence compared to analog platforms.[6]

UCBC's requirements were met in Canon Medical's Cartesion Prime SP digital PET/CT, a high-performance imaging solution featuring a balanced detector design with the advanced technology needed for a robust Theranostics program, included in the standard configuration, not as costly add-on.

> "In evaluating this system, I read an article that was comparing all commercially available digital PET/CT systems, and the key word that kept popping up on the Canon system was a balanced scanner. It does everything very well."

— **Chris Tuttle**
Imaging Director
University Cancer and Blood Center
Athens GA

Cartesion Prime's standard configuration combines high-resolution technologies with advanced reconstruction techniques, enabling accurate localization of small-volume disease such as intraprostatic lesions, nodal involvement, and early skeletal metastases. The system's use of Lutetium Yitrium Oxyorthosilicate (LYSO) crystals and synergistic Point Spread Function (PSF)+Time of Flight (TOF) reconstruction work together to reduce noise and amplify virtual sensitivity, allowing radiologists to fully exploit the scanner's spatial resolution.[8]

Comparing the Performance of Digital PET versus Analog PET[6,7]

All Canon systems are digital.

↑41%
Increase in lesions found

↑13%
Increase in lesion SUVs and TNM Upstaging*

↑26%
Increase in Patient Sensitivity

↑16%
Increase in Diagnostic Accuracy

65%
Digital PET/CT images were found to be of superior quality and were visually preferred by Radiologists compared to analog images

*TNM Classification of Malignant Tumors (TNM) is a globally recognized standard for classifying the anatomical extent of the spread of cancer, which originates from a solid tumor: T describes the size of the primary tumor and whether it has invaded nearby tissue, N describes nearby lymph nodes that are involved, M describes distant metastasis.

Cartesion Prime: A Balanced, Purpose-Built System

Canon Medical offers a digital-only PET/CT portfolio, ensuring every system comes equipped with critical tools needed for high performance imaging. The Cartesion Prime SP is equipped with standard technologies that empower Theranostics programs by providing all the tools and imaging capabilities that are beneficial for success.



Technologies that support Theranostics Treatments

- **Lutetium Yitrium Oxyorthosilicate (LYSO) Crystals:** All Canon MI scanners are equipped with silicon photomultipliers (SiPM) and LYSO Crystals, yielding precise and sensitive lesion detection.[9]
- **Time-of-Flight (TOF):** Standard on the Cartesion Prime, TOF improves signal-to-noise ratio directly enhances lesion detection and therapy planning in radioligand treatments.[8]
- **27 cm Axial Field of View (aFOV):** The 27cm extended aFOV, also a standard feature, increases whole-body coverage per bed position to boost sensitivity and efficiency in Theranostic workflows.
- **Extended 200 cm Scan Range:** Supports scanning of taller patients without having to be turn the patient around.
- **Point Spread Function (PSF):** Integrated PSF improves resolution and quantitative uniformity across the field of view, enhancing lesion conspicuity which is especially valuable in complex anatomical regions such as the pelvis and spine.[8]
- **AI with Deep Learning Reconstruction (DLR):** Canon's next-generation DLR produces sharp, high-contrast images that maintain quantitative integrity, essential for detecting subtle disease progression or treatment response.

Real Results: Enhancing Lives & Increasing Access to Better Care

Thanks to UCBC's investment in Canon's Cartesion Prime SP digital PET/CT and the establishment of a dedicated Theranostics program, patients like Becky from across the region now have access to cutting-edge treatments—without needing to leave their community.

According to UCBC the impact has been extraordinary:

- UCBC now performs more Theranostic treatments than any other community cancer center in the U.S.
- Referrals are increasing as surrounding counties recognize the value of comprehensive cancer care in a regional setting.
- Participation in clinical trials has expanded, thanks to the Cartesion Prime SP's ability to meet imaging requirements for protocols.
- UCBC, the only private practice in Georgia awarded an NCORP Grant by the NCI as a research site, is also the second-largest cancer research center in the state, attracting new trials, research funding, and top-tier talent.

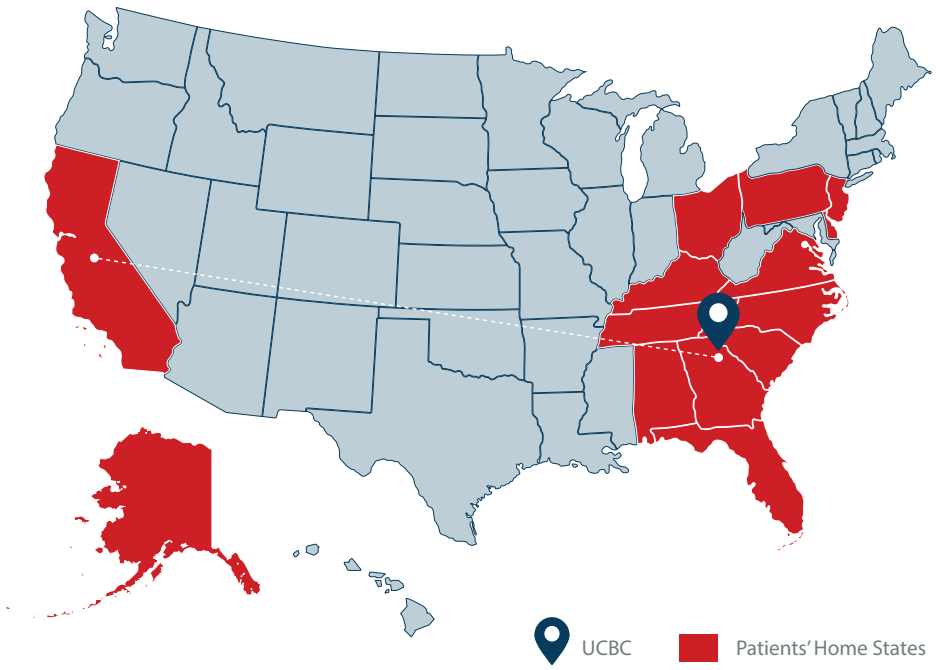
UCBC's foresight in investing in Canon's Cartesion Prime SP and a robust Theranostics program has positioned them for sustained leadership in this promising frontier of cancer care as new Theranostics agents become available.

"These are treatments that often patients were traveling out of the country to receive, and we identified early on the impact that would have locally for our patients."

— **Gordon Schoenfeld, MD**
Medical Director
Theranostics and Radiation Oncology

Patient Travel For Theronostic Treatments

Patients have traveled to UCBC from as far away as California and Alaska to receive this life-changing treatment.



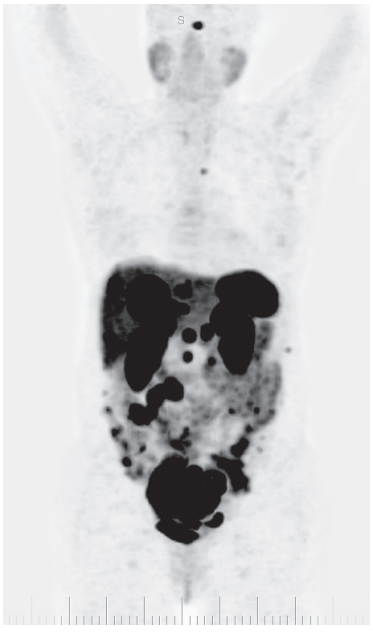
A Life Saving Treatment



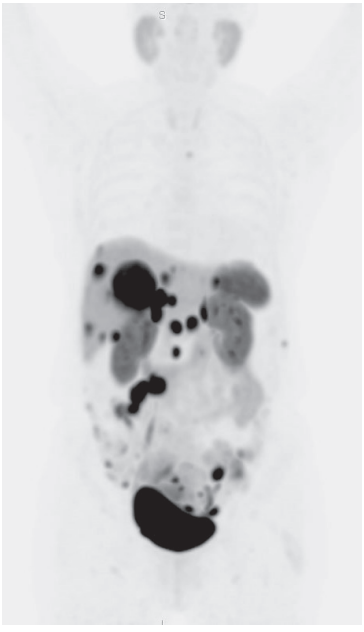
According to Dr. Schoenfeld, Medical Director of Theranostics, the Cartesion Prime SP, digital PET/CT has enhanced the Theranostic program, enabling them to coordinate very complex treatment with appropriate timing of diagnostic imaging and getting patients to a life-saving treatment without delay. With the Cartesion Prime SP, UCBC teams can review and share high-resolution images across their entire oncology department as well as with outside providers, ensuring continuity of care.

Becky's latest scans tell a powerful story. Her tumors have significantly reduced in size, thanks to Theranostics and precision imaging.

"I thought I've won the lottery because I could still play pickleball. I can still live life normally, not lose hair, not lose anything. People bring food over and I don't have to cook for a week."



Analog PET: Pre-treatment scan



Digital Cartesion Prime SP: Post-treatment scan

Becky's Scans

The initial PET/CT scan showed highly active tumor burden, confirming that Becky was a good candidate for Theranostics treatment.

The post-treatment scan on the right shows that Becky's tumor burden is significantly reduced.

In Neuroendocrine Tumors or Carcinoid Cancer, Theranostics is used to slow down tumor progression, potentially turning active disease into a more chronic and stable state, improving a patient's quality of life and reducing the risk of disease progression.

Life is Good

Dr. Schoenfeld explains the impact of Theranostics. "Since starting our Theranostics program, we've improved the lives of hundreds of cancer patients. Patients are living longer and that really has been a wonderful thing to see."

> "As far as I'm concerned, I'm going to be cured, and life is good."













As for Becky, she's back on the court, on the golf course, and in the boardroom—living life on her terms.

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