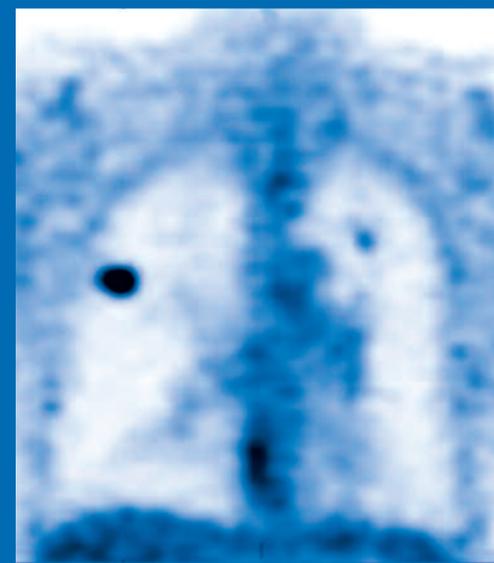


PET/CT

PET/CT is a clinically proven, cost-effective and safe method for imaging a variety of cancers including colon cancer, lung cancer, lymphoma, and breast cancer, as well as heart disease and certain neurological disorders.

PET/CT may eliminate the need for other invasive procedures and by correctly staging and re-staging cancers may prevent unnecessary surgical procedures.

PET/CT can demonstrate certain pathological changes long before they would be evident on CT or MRI alone.



Introducing PET/CT at Rhode Island Hospital

Rhode Island Hospital is now offering state-of-the-art PET/CT services, allowing us to provide referring physicians with superior diagnostic information for their patients with cancer, heart disease, and certain neurologic conditions. In the three decades since its development, PET has been demonstrated to be a clinically proven and safe method for imaging a variety of disorders. In recent years, the advantages of PET have been augmented by the addition of CT in the same gantry and this technology is now available at Rhode Island Hospital. PET/CT allows physicians to take advantage of the metabolic data provided by PET and add that to the anatomic detail of CT to produce one image that incorporates most of the advantages of both techniques.

Our medical staff is experienced in PET and CT interpretation and is board certified in diagnostic radiology, with additional fellowship training and certification in nuclear medicine. Our specially trained technologists are experienced in PET imaging having used this technology for several years. The Philips Gemini GXL PET/CT scanner at Rhode Island Hospital combines the latest in PET technology with a state-of-the-art 16 slice CT scanner.

For more information or to schedule an appointment, please call 401.444.7383.



What is PET/CT?

PET/CT combines the strengths of Positron Emission Tomography (PET) with those of Computed Tomography (CT) to produce images that can be used to help diagnose a number of diseases. PET is a non-invasive, nuclear medicine procedure that is able to detect certain diseases before other imaging modalities by visualizing the metabolic processes occurring in the body. By injecting a radioactive tracer into the body and tracking the tracer's distribution, PET is able to identify chemical and physiological changes related to metabolism. This is important since the metabolic changes shown by PET often occur before structural changes develop. CT produces a detailed anatomic map of the body and shows structural abnormalities in minute detail.

By combining PET with CT, physicians can exactly localize the sites of an abnormality identified on PET by superimposing the PET and CT data on one image. Multiple studies in the literature now show that PET/CT results in superior sensitivity, specificity, and interpreter confidence in staging and re-staging a variety of cancers. PET/CT also has the advantage of greater speed than conventional PET due to the use of an extremely fast CT acquisition for attenuation correction purposes. Therefore, the combined PET/CT scan which includes both the PET and the CT data is acquired in about 20 minutes for most patients, which is about 15 minutes less than the PET alone required on our former scanner.

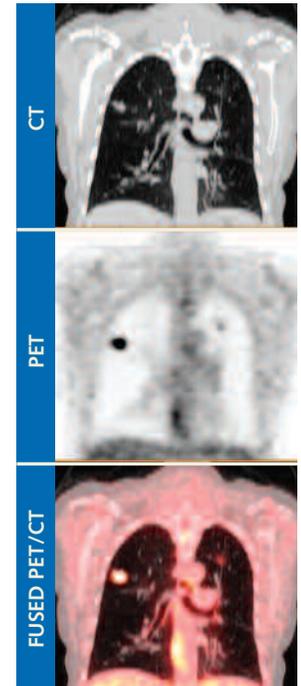
PET/CT is primarily used to:

- Evaluate lung nodules
- Stage and re-stage various tumors
- Determine tumor response to radiation, radiofrequency ablation, and/or chemotherapy
- Diagnose recurrence of tumor growth after surgical removal
- Decide the best location for biopsying a suspected tumor
- Differentiate radiation necrosis from new tumor growth



How does PET/CT work?

PET/CT is a combination of a PET scan and a CT scan obtained at one time and by a single piece of equipment. Positron emission tomography, or PET, is a painless diagnostic test that allows radiologists a unique view of the body's biological functions. The PET scan is different from an x-ray or CT image in that it looks at the body's metabolic activity and provides important information about the body's internal physiology. Almost all diseases alter the body's biological processes. PET is able to discover these changes in their earliest stages, often before any symptoms appear. With this information on early developing cancers, effective treatment plans can be initiated sooner. PET can sometimes eliminate the need for other invasive procedures and, by correctly staging cancers, may prevent unnecessary surgical procedures. Cancer cells have higher metabolic rates than normal cells, and show up as denser areas on a PET scan.



Unlike the PET, the CT scan very accurately evaluates anatomy. By combining these studies, physicians can take advantage of the strengths of both modalities. Before the scan begins, a radiopharmaceutical (tracer), which is comprised of a radiolabeled form of glucose, is injected into the patient. The patient then waits about an hour for the tracer to distribute within the body.

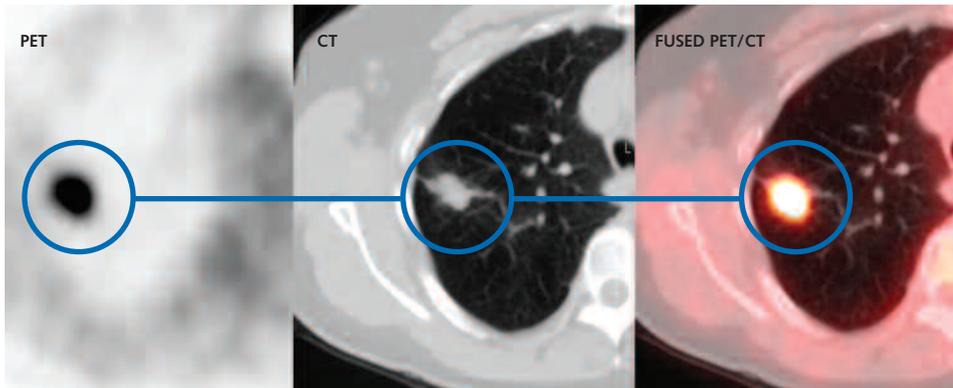
The patient is then placed on a table that moves into the scanner and first undergoes a very fast CT scan. This takes less than a minute in most circumstances. The table then moves the patient into the PET scanning portion of the camera. The PET scanner consists of hundreds of radiation detectors that surround the patient. Using the emissions given off by the injected radionuclide, the PET scanner measures the amount of metabolic activity at a site in the body and a computer reassembles the signals into three-dimensional images of tissue function. The PET scan portion of the exam takes a little more than 15 minutes. The entire exam lasts for about 20 minutes in most patients.

Oncology

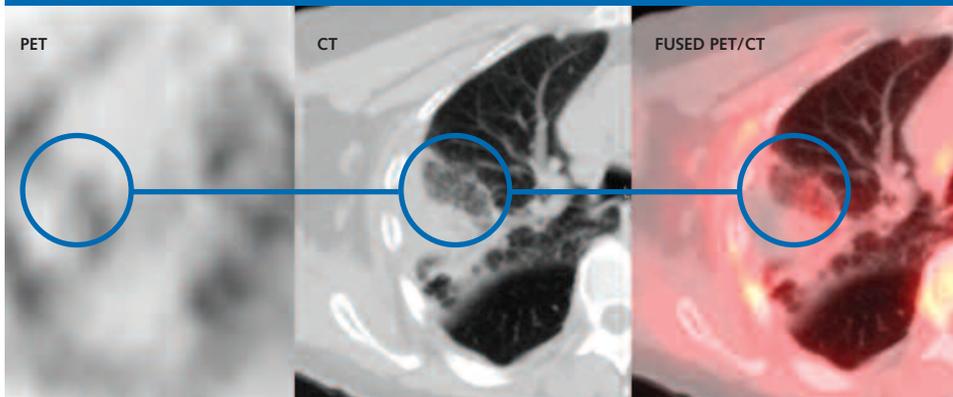
PET/CT is particularly effective in identifying whether cancer is present or not, if it has spread, if it is responding to treatment, and if a person is cancer free after treatment. Cancers for which PET/CT is considered particularly effective include lung, head and neck, colorectal, esophageal, lymphoma, melanoma and breast, as well as a variety of other tumors for which the utility of PET/CT is currently under investigation.

Early Detection

Because PET/CT images biochemical activity, it can accurately characterize some tumors as benign or malignant, thereby avoiding surgical biopsy when the PET/CT scan is negative. Conversely, because a PET/CT scan images the entire body, confirmation of distant metastases can alter treatment plans, in certain cases, from surgical intervention to chemotherapy.



Lung cancer pre-radiofrequency ablation (above), Lung cancer post-radiofrequency ablation (below)



Staging of Cancer

PET/CT is extremely sensitive in determining the full extent of disease, especially in lymphoma, malignant melanoma, breast, lung and colon cancers. Confirmation of the presence or absence of metastatic disease allows the physician to more effectively decide how to proceed with the patient's management.

Checking for Recurrences

PET/CT is currently considered to be the most accurate diagnostic procedure to differentiate tumor recurrences from radiation necrosis or post-surgical changes in many types of cancer. Such an approach allows for the development of a more rational treatment plan for the patient.

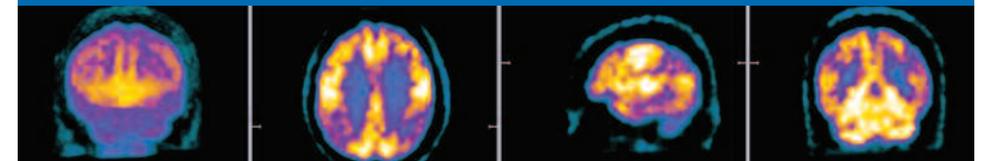
Assessing the Effectiveness of Chemotherapy

The level of tumor metabolism is compared on PET/CT scans taken before and after a chemotherapy cycle. PET/CT can provide important information about the effectiveness of a chemotherapy treatment plan.

Neurological Disease

PET/CT's ability to measure metabolism has significant implications in localizing the site or origin of epilepsy, because it can vividly illustrate areas where brain activity differs from the norm. PET/CT can also be used to differentiate Alzheimer's disease from other causes of dementia in cases where the clinical picture is atypical.

Alzheimer's disease



Cardiovascular Disease

By measuring both perfusion and metabolic activity within the heart, PET/CT scans can pinpoint areas of decreased blood flow such as that caused by artery blockages and can differentiate muscle damage from living muscle. This information is particularly important in patients who have had previous myocardial infarction and who are being considered for a revascularization procedure.

About our medical director



Richard B. Noto, MD, the medical director of Rhode Island Hospital's PET services, is the director of the Division of Nuclear Medicine at Rhode Island Hospital, the medical director of the School of Nuclear Medicine Technology at Rhode Island Hospital, and a staff radiologist at Rhode Island Hospital, The Miriam Hospital, and Women and Infants' Hospital.

In addition, he is an associate professor (clinical) in the Department of Diagnostic Imaging at The Warren Alpert Medical School of Brown University.

Noto is experienced in interpreting PET and CT images and is board certified in nuclear medicine, diagnostic radiology and nuclear cardiology. He has been affiliated with Rhode Island Hospital since 1988. He received his medical degree from the University of Rochester (NY) School of Medicine.

He completed an internship at North Shore University Hospital/Memorial Sloan Kettering, a residency in diagnostic radiology at New York University Medical Center and a two-year fellowship in nuclear medicine at the Hospital of the University of Pennsylvania.

About the division of nuclear medicine

The Division of Nuclear Medicine offers a full range of nuclear medicine and nuclear cardiology services. This enables us to provide convenient and complete oncologic, neurologic and cardiac care to patients and improves efficiency for physicians by providing all necessary services in one location.

About the Comprehensive Cancer Center

Rhode Island Hospital, The Miriam Hospital and Newport Hospital, all partners in the Lifespan health care system, are now partners in an innovative collaboration to provide coordinated and comprehensive care to cancer patients: the Comprehensive Cancer Center. The center brings together experts from all three hospitals, forming a team whose level of knowledge and experience are unparalleled in Rhode Island. The combined strengths of the three hospitals and the convenience of three locations offer patients leading-edge care and treatment close to where they live and work.

About Rhode Island Hospital

Rhode Island Hospital is a 719-bed academic medical center located in Providence, Rhode Island. Founded in 1863, it is the largest of the state's general acute care hospitals and provides comprehensive health services. It is a major teaching hospital for The Warren Alpert Medical School of Brown University. The hospital's department of diagnostic imaging, in association with The Warren Alpert Medical School of Brown University, has a nationally recognized training program, which educates residents in diagnostic imaging and nuclear medicine.



How do I schedule an appointment?

To schedule an appointment, please call 401.444.7383. Our dedicated scheduler will work with you to provide a convenient appointment for your patient, Monday through Friday, 8 a.m. to 5 p.m. We are located on the Rhode Island Hospital campus in the Nuclear Imaging Department, on the second floor of the Zecchino Pavilion/Main Building.

How will I get the results?

PET/CT scans will be read by our staff of nuclear medicine physicians, including medical director Richard Noto, MD. PET/CT scan results will be reported to the referring physician in a timely manner by fax, mail or phone.

For more information or to schedule an appointment, please call 401.444.7383.



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PET/CT

at Rhode Island Hospital



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