

Zilkha Radiology's introduction to Pet-Ct

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Zilkha Radiology has one of Long Island's newest PET-CT in our East Islip location.

The PET-CT is an amazing imaging device mostly used in the diagnosis and management of patients with cancer. Research has demonstrated that PET-CT is superior to standard imaging in this group of patients. There are certain cancer types that PET-CT plays a critical role in diagnosis/treatment. These include lung cancer, colorectal cancer, lymphoma, melanoma, ovarian cancer, breast cancer, head and neck cancers, pancreatic cancer and brain tumors.

The PET-CT is composed of two very advanced imaging machines working as one diagnostic juggernaut. We are very familiar with CT (CAT scan) aspect. The CT takes X-rays at different angles and with the use of powerful computers, makes images or slices. Think of the body as a loaf of bread. The CT scan makes slices through the body just like slices in a loaf of bread. The radiologist carefully studies each slice to detect any abnormality such as a mass or tumor.

Before we discuss the PET aspect of the PET-CT, let us get a short overview of what cancer is. Cancer is defined as "the uncontrolled growth of abnormal cells". At one time, cancer cells were normal cells performing normal functions. For some reason, these cells become slightly damaged. The damage is not enough to kill the cell but just enough to transform it into a cancer cell. The cell damage occurs at the DNA level. The cancer cells then begin to grow and divide uncontrollably. Many cancers also have the ability to spread to other parts of the body, damaging those organs as well.

To grow and divide at such a rapid rate, cancer cells require a tremendous amount of energy. The energy is supplied by sugar in the form of glucose. Cancer cells have a voracious appetite for glucose. Cancer has the ability to move tremendous amounts of glucose into their cells to power its machinery of replication. The PET aspect of the PET-CT takes advantage of this

significant appetite for glucose. We give the patient an injection containing molecules that are almost identical to glucose. This special molecule is called FDG and cancer cells actually confuse it with glucose. Cancer cells consume as much FDG as possible. The FDG is "tagged" (combined) with a tracer that is detected by the PET. Cancers that consume the FDG will light up on the PET portion of the PET-CT.

In summary, the CT detects the mass and the PET detects if this mass consumes a lot of energy in the form of FDG. The PET-CT fuses the CT and PET images. If a mass accumulates FDG, it is highly likely to be cancer (See example of an early lung cancer).

PET-CT also plays a role in assessing the effect of treatment on the tumor. If chemotherapy is used and is effective, there will be fewer cancer cells in the tumor and the tumor will not light up as much on the second PET-CT. A positive response to chemotherapy can be measured in as little as one week after the start of chemotherapy. If the tumor takes up more FDG on the second PET-CT, this could mean that the chemotherapy is not effective. Your doctor may alter the treatment. PET-CT also plays a role in assessing the effect of radiation therapy, to detect residual tumor after surgery, to distinguish local recurrence of tumor from post surgical/post radiation change (scar tissue) and to diagnose metastatic disease. For more detailed indications of PET-CT, please visit our website.

Dr. Albert Zilkha served as a Professor of Clinical Radiology at the State University of New York at Stony Brook School of Medicine. The offices of Zilkha Radiology are very easy to get to, conveniently located next to major parkways. The West Islip office is located right off the Robert Moses Causeway just across the street from Good Samaritan Hospital. The East Islip office is located just off the Heckscher Parkway adjacent to the East Islip Library. There is plenty of parking in both offices. The offices are open Monday through Friday from 7am to 8pm and on Saturday from 8am to 3pm. Call 631-277-1600 or visit www.zilkharadiology.com.

