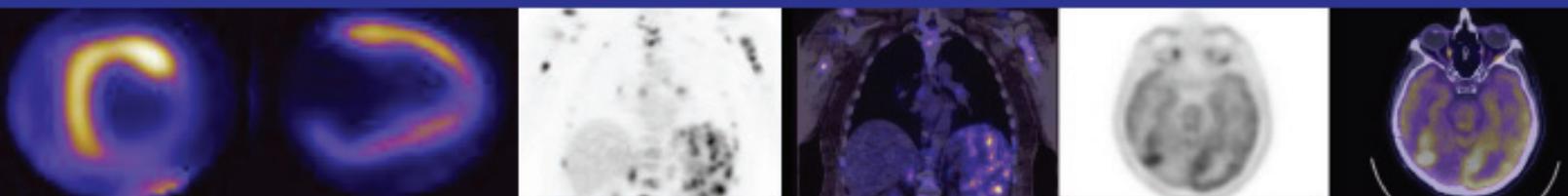


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Colorectal Cancer and Molecular Imaging: Get the Facts

About Colorectal Cancer

Every year, approximately 148,000 patients are newly diagnosed with colorectal cancer, and it is estimated that more than 49,000 people die from the disease each year. New developments in molecular imaging (MI) technologies are dramatically improving the ways in which colorectal cancer is diagnosed and treated. Research in molecular imaging is also contributing to our understanding of the disease and helping to direct more effective care of patients with colorectal cancer.

What are molecular imaging procedures, and how can they help colorectal cancer patients?

Molecular imaging procedures are highly effective, safe and painless diagnostic imaging and treatment tools that present physicians with a detailed view of what is going on inside an individual's body at the cellular level. Most nuclear medicine procedures are molecular imaging procedures using radioactive substances.

The most commonly used molecular imaging procedure for diagnosing or guiding the treatment of colorectal cancer is positron emission tomography (PET) scanning, which is often used in conjunction with computed tomography (CT) scanning. The National Oncologic PET Registry (NOPR)—a nationwide database documenting the use of PET and PET/CT in managing cancer—shows that in more than one out of three cases, PET/CT scan results prompt changes in a patient's treatment. The results, published in *The Journal of Clinical Oncology*, demonstrate the vital role that PET/CT can play to properly diagnose or verify the suspected recurrence. (For more information on PET/CT scanning, please see *PET Scans: Get the Facts*.) In addition, the National Comprehensive Cancer Network (NCCN) has incorporated FDG PET/CT in the practice guidelines and management algorithm of most malignancies, including colorectal cancer.^{1,2}

What types of molecular imaging technologies are currently available for colorectal cancer patients?

The MI technologies most commonly used in diagnosing and guiding treatment of colorectal cancer patients include PET/CT scanning. (See also *PET/CT Scans: Get the Facts*.)

How can PET/CT scanning help colorectal patients?

Specifically, PET/CT scanning is a powerful tool for colorectal cancer to:

- Establish how advanced the cancer is and whether it has spread to other parts of the body
- Help physicians and patients decide on courses of treatment that are tailored to patients' individual conditions and needs
- Determine whether chemotherapy or other treatments are working as intended
- Detect whether the disease has recurred after treatments are completed and assist physicians in determining a site that is appropriate for biopsy, if necessary

How does PET/CT scanning work?

PET scanning is a molecular imaging procedure that allows physicians to obtain three-dimensional images of what is happening in a patient's body at the molecular and cellular level. For a PET scan, a patient is injected with a very small amount of a radiotracer such as fluorodeoxyglucose (FDG), which contains both a sugar and a radioactive element. The radiotracer travels through the body and is absorbed by tumors or cancer cells. The patient then lies down on an examining table and is moved to the center of a PET/CT scanner. The PET/CT scanner contains a PET scanner and a CT scanner next to each other. The CT scan and the PET scan are obtained one after the other. The PET scanner is composed of an array of detectors that receive signals emitted by the radiotracer. Using these signals, the PET scanner detects the amount of metabolic activity while a computer reassembles the signals into images. (For more information on PET/CT scans and how they work, visit *PET/CT Scans: Get the Facts*.)

How can PET/CT scanning help in the long-term management of colorectal cancer?

PET/CT scanning can help physicians gain a clear understanding of where the disease is occurring and how aggressive it is. Armed with this knowledge, physicians and patients can decide together on the best courses of treatment. PET/CT changes the management of about

a third of patients with colorectal cancer. After treatment, a common occurrence is a recurrence of the disease where it first occurred. PET/CT can determine whether any suspicious tissue masses are active tumors or scar tissue after surgery. Another common occurrence is the cancer's spread to the liver. These patients may opt for surgery to remove the diseased section of the liver. PET/CT scanning is recommended for these patients; the main contribution is in detecting other sites of disease, leading to a reduction of unnecessary surgeries. Therefore, the five-year survival rate of patients who are screened with PET/CT prior to undergoing the surgery is higher.³

How many PET/CT scans will patients require?

Depending on the course of treatment selected by physicians and patients, colorectal cancer patients may require several PET/CT scans during the course of their disease to make an accurate diagnosis and determine whether courses of chemotherapy or radiation are working as intended and ensure that patients are cancer-free after treatments have ended.

How long does it take to get PET/CT scan results?

A trained radiologist or nuclear medicine physician will interpret the results and write a report for the physician who ordered the tests. A verbal report is available the day of the PET/CT scan and the written report is usually delivered to the physician within two or three days.

Will insurance reimburse for PET/CT scans?

Medicare and insurance companies will cover the cost of most PET/CT scans. Because of the mounting evidence of the effectiveness of PET/CT scanning for the diagnosis and treatment of a wide range of cancers, coverage levels continue to expand. For the most updated information, check with your insurance carrier or physician.

Where can I find more information about molecular imaging?

To learn more about PET/CT scanning and other nuclear medicine or molecular imaging procedures, visit the SNM Molecular Imaging Center of Excellence and SNM PET Center of Excellence.

REFERENCES

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