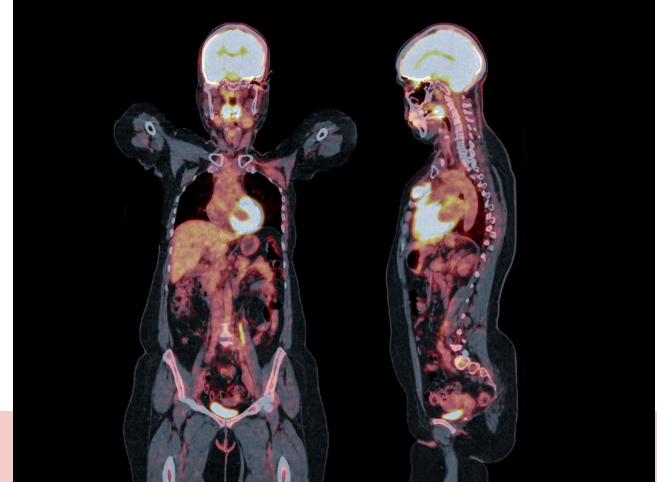


What is a PET Scan used for?



CUNY York College
HPPA 534 Diagnostic Studies
Arianne Diaz
PA-S 1

What is a PET Scan?

✿ a non invasive imaging modality that uses radioactive material to evaluate the metabolic activity in organs and tissues

How does a PET Scan work?

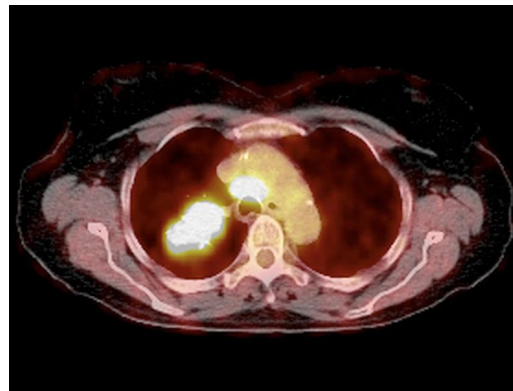
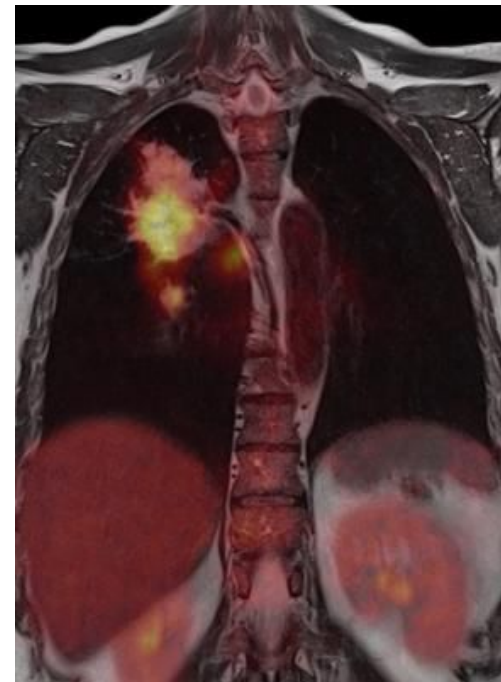
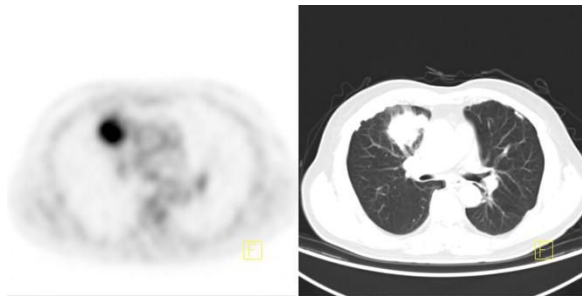
✿ radioactive substance is injected in body

✿ preferred radioactive substance is simple sugar → fluorodeoxyglucose

✿ glucose accumulates in the body and gives off energy in the form of gamma rays

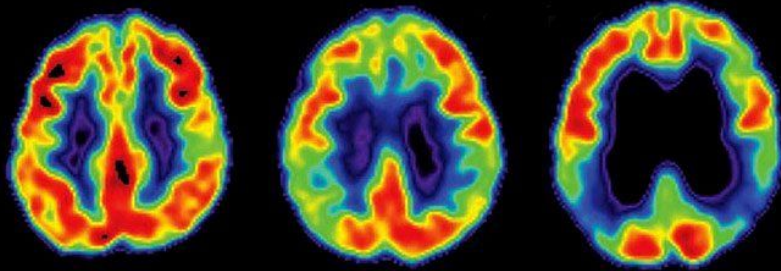
✿ gamma rays are detected by the scanner and converts signals into detailed pictures

✿ structures with higher metabolic activity will “use up” the glucose



What is a PET scan used for?

- * cancer diagnosis
- * metastasis
- * effectiveness of cancer treatment
- * evaluate perfusion to myocardium
- * diseases of the brain and heart:
 - Alzheimer's disease
 - Parkinson's disease
 - Huntington's disease
 - Epilepsy
 - Stroke
 - CAD

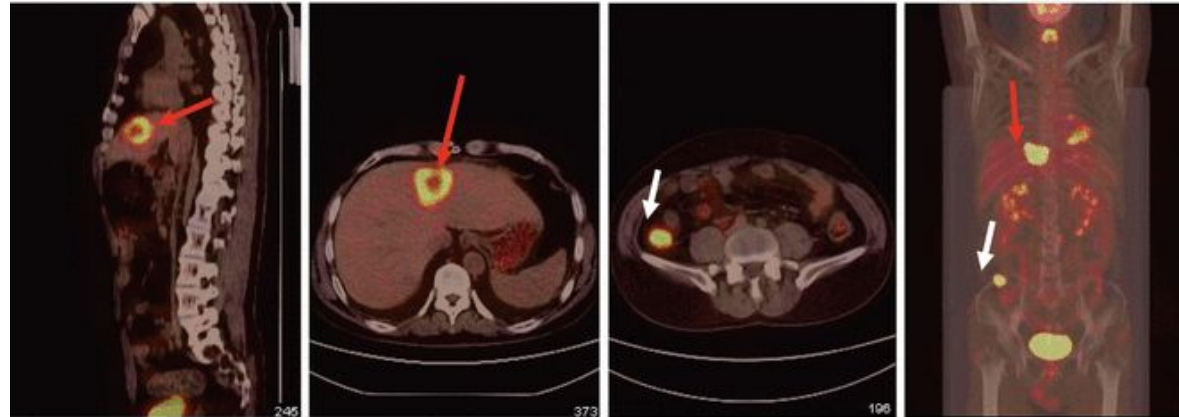


Normal

Mild cognitive impairment

Alzheimer's disease

Amyloid/PET Scan measures build-up of abnormal amyloid deposits in pts w. Alzheimer's



Sagittal plane

Cross section

Cross section

Planar section

Liver metastasis (red arrow)

What are the benefits of PET scan as an imaging modality?

- * non-invasive
- * painless
- * can detect abnormal metabolism before disease shows up on other imaging (ie: CT or MRI)

How to prepare for a PET Scan

Instructions vary depending on type of PET Scan; providers give more direct instruction but generally pts must:

⚕️ avoid strenuous activity or consumption of caffeine 24 hours prior

⚕️ Drink only water 6 hours prior to scan

1
24 hours before test: Low-carb, no-sugar diet; no strenuous exercise

2
6 hours before test: No eating

3
Day of: Blood sample taken to check glucose levels

4
IV delivers radioactive tracer

5
Wait 60 minutes for tracer to circulate through body

6
Lie on scanning bed inside PET chamber. Scans last 20-45 minutes

What to Expect During a PET Scan

verywell



Your Appointment is at **Mercy Health Saint Mary's**
200 Jefferson SE, Grand Rapids MI 49503
Date: _____ Time: _____
Please register in advance by calling **616-685-6054**
Or online at www.MercyHealthPatientRegistration.com

PET-CT Scan Patient Preparation

The Day Prior Your Exam

- Follow the enclosed low carbohydrate diet.
- Refrain from all strenuous activity.
- Hydrate by drinking extra fluids, unless restricted.
- Contact your physician if you need medication for claustrophobia, pain or a contrast dye allergy. Bring these medications with you to the testing center.
- Glucophage must be discontinued for **48 hours** after the injection of iodinated contrast material (i.e. CT contrast dye) and reinstated only after renal function has been re-evaluated and found to be normal. **This order is placed by the referring physician.**

The Day of Your Exam

- Plan on being at the testing center for approximately 3 hours.
- Due to the nature of the medication used, pregnant women and children are not allowed in the uptake rooms.
- Do not eat, drink (except water) or chew gum for **6 hours prior** to your scan. You may take your regularly scheduled medications, **except insulin**, with water, prior to your scan.
- Wear comfortable, loose fitting clothing with minimal metal and avoid wearing jewelry.
- **Diabetics:** Do not take your insulin the day of your exam. If needed, contact your physician for specific instructions for controlling your glucose due to this restriction.

The Procedure

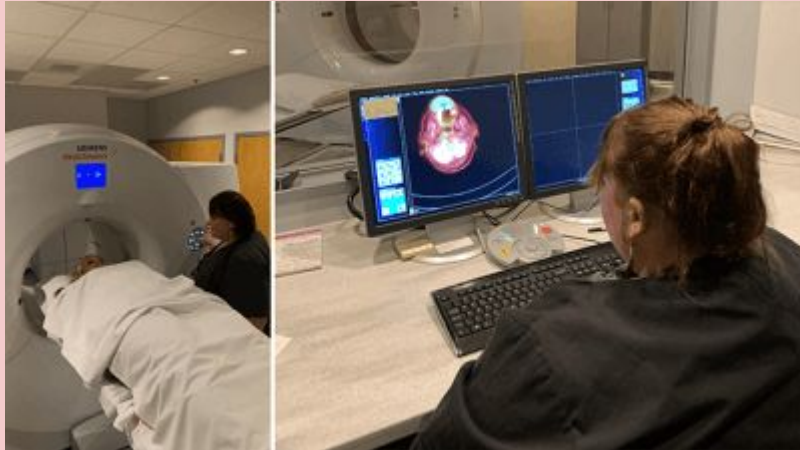
- An IV will be established and kept in place for the entirety of your appointment. A small amount of radioactive glucose (FDG) will be administered and must circulate for approximately 90 minutes prior to your scan. The scan will take 30-60 minutes and may require the use of oral and/or IV contrast dye.
- During the circulation of the FDG, you will be in a private room equipped with cable television and a DVD player. Feel free to bring a movie along to watch.
- A CD player is available for your use during your scan. You may bring along a CD for your listening pleasure or enjoy our music.

After Your Scan

- Please drink extra fluids throughout the day to help rinse the contrast dye and FDG from your system.
- Your PET-CT will be interpreted by a specially trained radiologist and a report will be sent to your ordering physician within 3-5 business days. Please contact your physician for results.

What to expect during/after examination

- ❁ remove any clothing, jewelry or potential artifacts that may interfere with the scan
- ❁ change into gown and empty bladder
- ❁ radioactive substance is injected via IV and is allowed to concentrate for 30-60 minutes
- ❁ scan begins once the radioactive substance has been adequately absorbed
- ❁ IV site will be checked for signs of redness and swelling and patient is advised to drink plenty of fluids



PET Scan & Other Imaging Modalities

✿ PET scans can be combined with other imaging modalities:

- MRI
- CT

✿ PET/CT can pinpoint areas of high metabolic activity

- More accurate diagnosis than either modality alone

✿ PET/MRI can identify areas of tissue necrosis vs viable tissue

- PET/CT cannot

Differences between PET/CT and PET/MRI:

<https://info.atlantisworldwide.com/blog/pet/ct-vs.-pet/mri>

CT Scan

Organs and bones



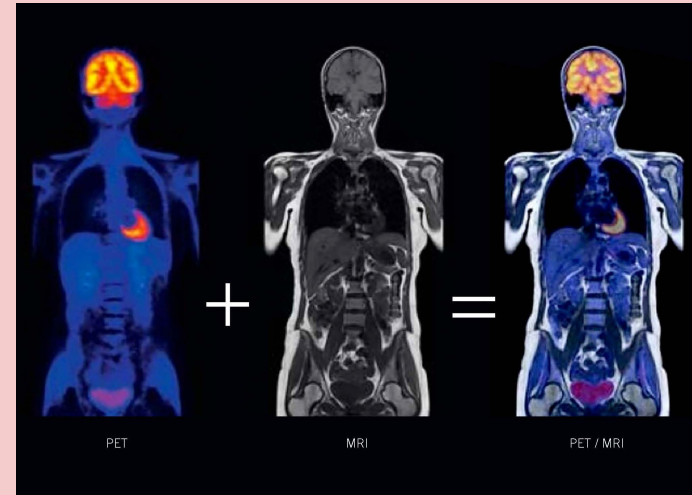
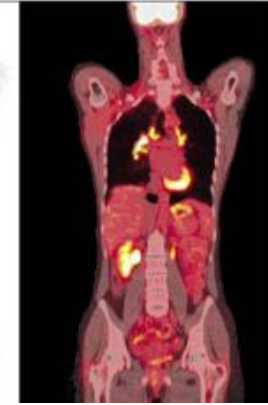
PET Scan

Cell activity



PET/CT Scan*

Exact location of high cell activity



References :

- ✿ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5299095/#:~:text=PET%20is%20a%20noninvasive%20imaging,the%20distribution%20of%20the%20radiotracer.>
- ✿ <https://www.insideradiology.com.au/pet-scan/>
- ✿ <https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/positron-emission-tomography-pet>
- ✿ [https://stanfordhealthcare.org/medical-tests/p/pet-scan/what-to-expect.html#:~:text=conditions%20like%20epilepsy.,A%20small%20amount%20of%20radioactive%20glucose%20\(a%20sugar\)%20is%20injected,glucose%20than%20normal%20cells%20do.](https://stanfordhealthcare.org/medical-tests/p/pet-scan/what-to-expect.html#:~:text=conditions%20like%20epilepsy.,A%20small%20amount%20of%20radioactive%20glucose%20(a%20sugar)%20is%20injected,glucose%20than%20normal%20cells%20do.)
- ✿ <https://www.hopkinsmedicine.org/imaging/exams-and-procedures/pet.html>
- ✿ <https://www.cancer.net/blog/2019-04/preparing-your-pet-ct-scan#:~:text=Avoid%20exercising%2024%20hours%20before,6%20hours%20before%20the%20scan.>
- ✿ <https://www.radiologyinfo.org/en/info/pet#:~:text=Combined%20PET%20scanners%20perform,the%20two%20scans%20performed%20separately.>
- ✿ <https://www.parkside-hospital.co.uk/services/diagnostic-imaging/pet-ct-scan/>
- ✿ <https://www.upstate.edu/ura/pet-ct-scan.php>
- ✿ <https://www.verywellhealth.com/what-to-expect-during-a-petct-scan-2252467>
- ✿ <https://www.yumpu.com/en/document/view/39534603/pet-ct-scan-patient-preparation-the-day-prior-your-exam-a-follow->
- ✿ <https://www.medscape.com/viewarticle/846181>
- ✿ <https://www.hopkinsmedicine.org/imaging/exams-and-procedures/pet.html>
- ✿ <https://abdominalkey.com/diagnostic-value-of-petct-in-metastatic-liver-cancer/>
- ✿ <https://www.everydayhealth.com/alzheimers-disease/amyloid-pet-scans-may-dramatically-change-alzheimers-diagnosis-care-study-finds/>