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December 21, 2009

On May 7, 2004 we replaced our Siemens ECAT ART PET (positron emission tomography) scanner with a GE Discovery PET/CT scanner. The scanner is in Room 2120 KU Hospital in the Radiology Department and is operated by the Division of Nuclear Medicine. In conjunction with the PET scanner, we also installed a medical cyclotron, which produces the radiopharmaceuticals for the PET scanner. The cyclotron is housed by the shipping dock and is operated by the Department of Pharmacy and it became operational November 6, 2000. The cyclotron now distributes ¹⁸FDG through Mallinckrodt.

The hours of operation for the PET scanner are Monday through Friday 7:00am to 5:00pm. The telephone numbers to call to answer questions regarding PET are as follows:

Scheduling	588-6735
Technologists	588-6839
Physicians	588-6844
Radiopharmacy	588-6817
Cyclotron	588-8322

The GE PET/CT scanner can scan ten to fourteen patients in a ten-hour workday. The PET injection/scan schedule is as follows:

<u>Injection Time</u>	<u>Scan Time</u>
7:00am	7:45am – 8:15am
7:30am	8:15am – 8:45am
8:00am	8:45am – 9:15am
8:30am	9:15am – 9:45am
9:00am	9:45am – 10:15am
9:30am	10:15am – 10:45am
10:00am	10:45am – 11:15am
10:30am	11:15am – 11:45am

1:00pm	1:45pm – 2:15pm
1:30pm	2:15pm – 2:45pm
2:00pm	2:45pm – 3:15pm
2:30pm	3:15pm – 3:45pm
3:00pm	3:45pm – 4:15pm
3:30pm	4:15pm – 4:45pm

Patient Preparation

The patient will be injected with the radiopharmaceutical and it will circulate for 45 minutes. The patient's scan will take approximately 20 – 30 minutes. For Oncology whole body PET scans and Neurology Brain scans, the patient must be NPO four hours prior to their injection. For Cardiology heart PET scans, the patient must eat one hour prior to their injection time. All patients will have their blood glucose level checked prior to being injected. If their blood glucose level is too high or too low, the patient's study may have to be rescheduled. Each patient will have an IV catheter inserted, preferably into the antecubital vein, so the radiopharmaceutical can be injected without extravasation. On some occasions, your patient may need to have a urinary Foley catheter inserted.

Scheduling a PET Scan

Prior to scheduling a PET Scan, a Medical Necessity form MUST be filled out to document medical necessity (see attached). This is mandated by CMS (Centers for Medicare and Medicaid Services) and must be adhered to. After completing the form, fax it to extension 588-0235.

To schedule a PET scan, call the Nuclear Medicine scheduling desk at 588-6735. PET scans can be performed on inpatients or outpatients, but ALL PET scans must be scheduled. This is necessary so the Radiopharmaceutical can be ordered in advance. Most PET scans will utilize ¹⁸FDG (Fluorodeoxyglucose), which is produced on our medical cyclotron.

When scheduling a PET scan for your patient, the patient's insurance company must be notified and pre-certification procedures must be followed. The information required to schedule a PET scan includes the following:

- Clinical History
- Correct diagnosis code
- Other exams, such as CT scans or X-Rays, must be completed BEFORE the PET scan and are available for the physician to view while interpreting the PET scan
- Patient's insurance company with the plan code number and pre-certification number

PET scans can be scheduled up to 3:00pm for the next business day. The patient must show up for their scan on time because ¹⁸FDG has a half-life of 110 minutes and it will decay rapidly. If a patient cannot make their appointment, please have them call 588-6735 or 588-6839 to reschedule their appointment.

Patient Registration Process

A Nuclear Medicine (416) requisition must be filled out and sent to the Radiology Registration Desk prior to the patient's scheduled appointment time, or it can be faxed to the registration desk at 588-0235. The patient will check in and be registered at the Radiology Registration Desk on the second floor of KU Hospital. The patient will sign an Advanced Beneficiary Notice stating that they will be responsible for payment of the PET scan if their insurance does not cover the procedure.

PET Procedure Codes

Procedure codes have been created for the PET scans which are available though the EPIC Preference Lists and they are also available in Healthworks. The codes and charges are as follows:

<u>CDM Code</u>	<u>CPT Code</u>	<u>Description</u>	<u>Clinical Use</u>
41613001	78608	PET Brain Metabolism	use with ¹⁸ FDG;dementia, seizures
41613019	78609	PET Brain Perfusion	use with ¹⁵ O(H ₂ O);brain blood flow
41613126	78459	PET Heart Metabolism	use with ¹⁸ FDG; cardiac viability
41613134	78491	PET Heart Perfusion	use with ¹³ NH ₃ ;cardiac perfusion
41613209	78810	PET Scan Metabolism	use with ¹⁸ FDG or ¹¹ C-Acetate
41779083	A9552	¹⁸ Fluorodeoxyglucose (FDG)	
41779141	A9526	¹³ NH ₃ (ammonia)	
41792466	A4641	¹¹ C-Acetate	

PET Applications

PET will be utilized for three main applications:

1. Oncology – to differentiate malignant from benign tumors; to determine the extent and stage of the cancer; and to evaluate the response to therapy.
2. Cardiology – to assess myocardial viability and myocardial perfusion when the conventional Nuclear Medicine myocardial perfusion scans are equivocal.
3. Neurology – to differentiate tumor from radiation necrosis; to localize seizure focus in partial complex epilepsy; and to diagnose dementia.

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