GUNDERSEN HEATLH SYSTEM
NUCLEAR MEDICINE DEPARTMENT
PROTOCOL MANUAL

PROCEDURE: **POSITRON EMISSION TOMOGRAPHY (PET)**

SECTION: **PET 12.1**

ORIGINAL DATE: **2 – 13 – 02**

DATE REVISED: **9 – 5 - 19**

REVIEWED: **ANNUAL**

Indications

PET is a non-invasive imaging procedure that assesses perfusion or the level of metabolic activity in various organ systems. Rubidium-82 is the positron emitter used for cardiac perfusion. 2-(F-18) Fluro-D-Glucose (FDG) is used for metabolic imaging and competes for uptake in metabolically active tissue, including tumors.

Examination Time

Injection: 1 to 2-1/2 hours (Depending on imaging area)
Imaging: Up to 1 hour

Patient Preparation

***Please see PET/CT patient education found on Gladiator/Top Clinical Resources-Patient Education/ Type in "Nuclear Medicine".**
No GSF – 3weeks
(See attachment for instructions and time schedules)
******* Patients will be asked to dress comfortably and limit metal on clothing.**
(i.e. zipper, bra clips/under wires, piercing with studs/wires
******* Table limit= 500lbs for Skull-Thigh and 400lbs for a Whole Body**
******* Scanner same size as CT**
******* Precautions –** FDG is glucose analog and competes with endogenous glucose for uptake by metabolically active tissues including tumors. However, FDG uptake is inhibited by hyperglycemia and hyperinsulinism. Patients will be given intravenous saline during the test. Screen for the following contraindications to saline infusion:
******* Diabetes, Cardiovascular Disease / CHF, Renal disease, or conditions involving fluid restrictions. **********

<u>Previous Day</u>
- 48 oz water the day before
- No strenuous exercise day before
- High protein, low carbohydrate diet throughout the day

<u>Day of Exam:</u>
- Light-low fat breakfast minimum of 6 hrs prior to exam. No food after that time.
- TPN (**T**otal **P**arental **N**utrition) should be discontinued for 6 hrs prior to the exam.
- Drink 24 oz water during the 6 hrs prior to the exam.
- Routine meds (if diabetic see diabetic area)

<u>In department:</u>
- Glucose <250 mg,
    - For Brain, it would be preferable to have blood glucose in range of 150-200 mg/dl or less.
    - For SPN evaluation, because of the diagnostic significance of the SUV, it would still be preferable to have blood glucose of 200 mg/dl or less.
    - For hematology patients who are research study patients already (or will be if the first PET/CT is for Adult Hodgkin's Lymphoma) all glucose values at the time of the PET/CT must be below 200 mg/dl as per study protocol to stay in the research study.

- Previously ordered anti-anxiety meds, if ordered,
  - Give 30 min prior to injection if for anxiety; 30 min prior to scan if for claustrophobia.
  - For Brain, given at least 20 minutes after radiopharmaceutical injection, close to scan time. Note medications taken prior to arrival.

Diabetic Patients
- Try to schedule in the 7:00 am slot
- Need to have a blood sugar <250 mg/dl at time of appointment.
  - For SPN evaluation, because of the diagnostic significance of the SUV, it would still be preferable to have blood glucose of 200 mg/dl or less.
  - For hematology patients who are research study patients already (or will be if the first PET/CT is for Adult Hodgkin's Lymphoma) all glucose values at the time of the PET/CT must be below 200 mg/dl as per study protocol to stay in the research study.
- No insulin for 4 hrs prior to exam. NPO 6 hrs prior to exam

Equipment & Energy Windows

GE STE PET/CT scanner – 511kev energy

Radiopharmaceutical, Dose, & Technique of Administration

1. **Complete SOPHIE Isotopes ordering form.**
   - **3D Imaging**

     Whole Body:

     Adult Dose: 0.1 mCi FDG / kg body wt., up to 12 mCi

     Minimum dose 5 mCi

     Pediatric Dose: 0.075 mCi FDG / kg body wt.

     Minimum dose 2.0 mCi, *Maximum* dose 8 mCi

     Brain imaging: Adult Brain 6 mCi

     Pediatric Brain: 4 mCi
2. **Fax to SOPHIE.**

   '**Daily FDG Customer FAX Order Form', send by 5:00 pm**

   FAX # 815-372-1067

   PH # 877-334-4738

   If **no scans** are scheduled, please notify us by faxing a sheet indicating no scans
3. **SOPHIE will pick old delivery containers when they bring in a new order. Do not return spent syringes.**

General technique below:

1. An IV will be started at which time a blood sample will be obtained to measure blood glucose with a glucometer**. Range needed of 60-250 dl/mg.** May inject if glucose greater than 200 mg/dl but discuss with Radiologist first, see patient preparation notes above.
    a. Brain imaging set IV and wait 10 min before RpH injection. Leave IV in place during uptake phase.

2. Contrast- Oral and/or Intravenous:

a. Oral- Patients with a history of Lymphoma, GI malignancies, GYN malignancies, Prostate, Testicular, Bladder and Unknown primary cancers will receive oral contrast. Patients with a diagnosis other than the above may receive oral contrast; both instances will be outlined in the radiologist 'Protocol Summary 'section of EPIC Radiant PET work list.

b. Intravenous- If a referring provider requests IV contrast with PET/CT we can go ahead and give it following the contrast manual guidelines. This will be given during our regular CT that is used for attenuation correction. (See IV Contrast in PET/CT).

3. FDG injected and IV flushed while sitting/lying comfortably in a dimly lit and quiet room. Measure residual in both syringe and tubing.
    a. Brain imaging inject patient in awake resting state with eyes open. Do not talk with patient during injection.

4. Patient will be kept in injection room resting quietly.
    a. General cases, patient rests quietly for 45 minutes.
        i. ENT cases, it is **very important** that the patient not talk, as uptake will occur in larynx.

b. Brain cases, Patient resting quietly for 35-60 min post injection. The room needs to be darkened and without visual or auditory stimuli.

5. Patient will void prior to scan, if no Foley.

6. When study is complete, check to make sure it was sent to PACS.

Dear PET patient,

Your PET scan is a wonderful technology that can greatly improve your care at Gundersen Health System. We want to assist you in your day by giving you the preparation for the exam and what to expect the day of the procedure.

Day Prior to Your Exam:

- Have a high protein, low carbohydrate diet for the day.
- Drink 48 oz. of water
- No strenuous exercise

Day of Exam:

- You may have a light-low fat breakfast a MINIMUM of 6 hrs prior to your exam. No food after that time.
- TPN (Total Parental Nutrition) should be discontinued for 6 hrs prior to the exam.
-Please dress comfortably. Try to eliminate wearing extra metal.

- **You will be asked to remove:**
  - **Zippered clothing, Belts/suspenders, Bra with clips/under wires, navel clips or any other metal piercing on the body below the neck, etc….**

- Please drink 24 oz of water during the 6 hrs prior to your exam.
- You may take your routine medications (if diabetic please see diabetic area).

Your Exam:

1. **You will check in at the Imaging Services-East Building front desk for registration.**
2. **After you are registered a technologist will take you to a preparation room. Your family is welcome to come in for this portion of the exam. If you are scheduled for a Foley catheter you will be asked to change into a gown.**
3. **To prepare you for this exam we will do the following:**
   a. **Set an IV and check your glucose level**
   b. **We will turn the lights down and allow you to rest quietly while we get your radioactive injection ready.**
4. **We will give you a radioactive injection through your IV. .**
5. **You can now rest quietly for 45 minutes. Your family will be asked to leave and to meet you in the waiting area about 2 hours later.**
6. **After your 45-minute rest, we will have you use the restroom. We will then take you down to the imaging room.**

Diabetic Patients:

- You will need to be NPO for 6 hrs prior to the exam
- We need your fasting blood sugar to be <200mg/dl.
- You may not take your insulin 4 hrs prior to the exam. High insulin levels affect the quality of the exam. We hope this information will help you with your procedure.

SOPHIE Molecular Daily FDG
Customer FAX Order Form
Romeoville, IL Fax: + 1-815-372-1067

Hospital/Department: **Customer #**	**Date:**
Ordering Technologist:	**P.O.:** **4550**

Isotope	**Indication**	**Cal. Time**	**Activity**	**Patient Name**

Please contact an SOPHIE Molecular Pharmacist if you have any questions. 1-877-334-4738
3D
Whole Body: Adult Dose: 0.1 mCi FDG / kg body wt., up to 12 mCi
Minimum dose 5 mCi
Pediatric Dose: 0.075 mCi FDG / kg body wt.
Minimum dose 2.0 mCi*, Maximum* dose 8 mCi
Brain imaging: Adult Brain 6 mCi
Pediatric Brain: 4 mCi