**PBTC N12: Phase II study of [18F] FLT for PET imaging of brain tumors in children**

**Nuclear Medicine Procedures**

**Enrollment:**
Participants must be enrolled in PBTC protocol N12. The patient and/or guardian must have signed the approved informed assent/consent document. Subjects must be able to participate without anesthesia or sedation.

**Patient Preparation:**
No PET-specific patient preparation is needed. Laboratory studies (per PBTC N12) are required before and after the FLT-PET scan. The protocol also requires a brief neurological exam before and after the PET scan.

**Radiopharmaceutical:**
Drug: \(^{18}\text{F}\)-fluoro-L-thymidine
Dose: 0.15 mCi/kg (maximum 10 mCi)
Route of Administration: intravenous injection through indwelling or temporary IV access
Vital signs: vital signs (HR, BP) must be recorded before, during, and after \(^{18}\text{F}\)-FLT administration. Baseline temperature and respiratory rate also should be recorded.
Uptake period: imaging should start 30 minutes after \(^{18}\text{F}\)-FLT administration

**PET/CT:**
PET: PET emission scan is acquired for 5-10 minutes per bed position including all areas of suspected tumor (brain, spine, or brain and spine)
CT: a non-diagnostic, low-dose CT is acquired for attenuation correction, following local protocol with the goal of providing the lowest feasible radiation exposure
Image reconstruction: reconstruction should be performed using an iterative protocol with CT-based attenuation correction

Biodistribution Study: some participants also may enroll in the Biodistribution Study arm, which requires three rapid whole body images (see next page).

**Data submission:**
PET/CT and MRI will be anonymized (and identified with a PBTC identifier) and submitted to the PBTC in standard DICOM format. Study data will be submitted on the study-specific Case Report Form (CRF). The DICOM header should include: patient weight, date, administered dose, assay time, injection time, scan start time, and any other information needed to calculate SUV.

**Reporting:**
A written interpretation (report) of the PET/CT is not required, but may be performed depending on institutional policies. If a report is created, it should be submitted with the PET/CT to the PBTC.
**Biodistribution Study:**
Some participants may enroll in the Biodistribution arm of the study. Three full-body PET/CT’s will be performed in addition to the brain PET/CT.

**Image Acquisition:**
PET: performed from the top of the head to the mid-thighs, with a 2-minute emission scan performed in 3-D mode at each bed position.

CT: a non-diagnostic, low-dose CT is acquired for attenuation correction, following local protocol with the goal of providing the lowest feasible radiation exposure.

**Schedule:**

<table>
<thead>
<tr>
<th>Scan</th>
<th>Approximate start time (injection time 0:00)</th>
<th>Scan duration (approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-body</td>
<td>0:05</td>
<td>20 min</td>
</tr>
<tr>
<td>Brain</td>
<td>0:30</td>
<td>10 min</td>
</tr>
<tr>
<td>Full-body</td>
<td>1:00</td>
<td>20 min</td>
</tr>
<tr>
<td>Full-body</td>
<td>2:00-5:00</td>
<td>20 min</td>
</tr>
</tbody>
</table>

Any questions can be directed to:

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