NUCLEAR MEDICINE SERVICES

SUBJECT: CEREBRAL BLOOD FLOW

Indications

☐ This study is performed to evaluate cerebral perfusion in patients suspected of having no blood flow to the brain. These patients are often victims of motor vehicle accidents or other intracranial injuries.

Examination Time

☐ 30 minutes.

Patient Preparation

☐ None.

Equipment & Energy Windows

☐ Gamma camera: Large field of view.

☐ Collimator: VXGP

☐ Energy window: 20% window centered at 140 keV.

Radiopharmaceutical, Dose, & Technique of Administration

☐ Radiopharmaceutical: Tc99m DTPA.

☐ Adult Dose: 20mCi.
Pediatric Dose: 5 mCi minimum, 0.3 mCi/kg

☐ Technique of administration: Bolus in intravenous line. Prefer antecubital.

Patient Position & Imaging Field

☐ Patient position: Supine.

☐ Imaging field: Make sure the patient’s head is as straight as possible.

☐ It may be necessary to secure head with tape, or use towels to keep the head straight.
Acquisition Protocol

Flow study:
   - Dynamic 1 sec/frame 120 images.
   - Matrix 128 x 128
   - Zoom 1.46

STATICs:
1. ANTERIOR, POSTERIOR, RIGHT AND LEFT LATERALS.
   - Static image: 300 sec.
   - Matrix 256 x 256
   - Zoom 1.46

Data Processing

Flow:
1. Compress 10 frames, 3X4 configuration
2. Annotate orientation, dose, tech initials.

Statics:
1. Display all 4 statics
2. Annotate orientation, dose, tech initials.

Optional Maneuvers

None.

Principle Radiation Emission Data - Tc-99m (7)

Physical half-life = 6.01 hours.

<table>
<thead>
<tr>
<th>Radiation</th>
<th>Mean % per disintegration</th>
<th>Mean energy (keV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma-2</td>
<td>89.07</td>
<td>140.5</td>
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</tbody>
</table>

Dosimetry - Tc-99m-ECD (45)

<table>
<thead>
<tr>
<th>Organ</th>
<th>rads/20 mCi</th>
<th>mGy/740 MBq</th>
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</thead>
<tbody>
<tr>
<td>Bladder wall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 hour void</td>
<td>2.2</td>
<td>22.0</td>
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<tr>
<td>4.8 hour void</td>
<td>5.4</td>
<td>54.0</td>
</tr>
<tr>
<td>Gallbladder wall</td>
<td>1.8</td>
<td>18.0</td>
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<tr>
<td>Large intestine</td>
<td>1.2</td>
<td>12.0</td>
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<tr>
<td>Small intestine</td>
<td>0.7</td>
<td>7.0</td>
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<tr>
<td>Kidneys</td>
<td>0.5</td>
<td>5.4</td>
</tr>
<tr>
<td>Brain</td>
<td>0.4</td>
<td>4.0</td>
</tr>
</tbody>
</table>
### Dosimetry - Tc-99m-HM-PAO (46)

<table>
<thead>
<tr>
<th>Organ</th>
<th>rads/20 mCi</th>
<th>mGy/740 MBq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lachrymal glands</td>
<td>5.2</td>
<td>52.0</td>
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<tr>
<td>Gallbladder wall</td>
<td>3.8</td>
<td>38.0</td>
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<td>Kidneys</td>
<td>2.6</td>
<td>26.0</td>
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<tr>
<td>Thyroid</td>
<td>2.0</td>
<td>20.0</td>
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<tr>
<td>Large intestine</td>
<td>1.6</td>
<td>16.0</td>
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<tr>
<td>Liver</td>
<td>1.1</td>
<td>11.0</td>
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<tr>
<td>Small Intestine</td>
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<td>9.0</td>
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<tr>
<td>Bladder wall</td>
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<td>9.0</td>
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<tr>
<td>Brain</td>
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<td>5.0</td>
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<tr>
<td>Ovaries</td>
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<tr>
<td>Total body</td>
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<td>3.0</td>
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<tr>
<td>Testes</td>
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<td>1.0</td>
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### References

Normal Findings


