# Australian Diagnostic Reference Levels for Nuclear Medicine

The national Diagnostic Reference Levels (DRLs) for nuclear medicine, as of July 2023, are listed below. For additional information, statistical tables and a DRL comparison template, please visit ARPANSA’s website (www.arpansa.gov.au/ndrls).

## General Nuclear Medicine

<table>
<thead>
<tr>
<th>Category</th>
<th>Scan</th>
<th>Pharmaceuticals*</th>
<th>DRL (MBq)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cardiovascular</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gated blood pool scan</td>
<td>Pertechnetate, RBCs</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>MPI 1-day: 1st phase (rest)</td>
<td>Tetrofosmin, MIBI</td>
<td>350</td>
</tr>
<tr>
<td></td>
<td>MPI 1-day: 2nd phase (stress)</td>
<td>Tetrofosmin, MIBI</td>
<td>1150</td>
</tr>
<tr>
<td></td>
<td>MPI 2-day: 1st phase</td>
<td>Tetrofosmin, MIBI</td>
<td>600</td>
</tr>
<tr>
<td></td>
<td>MPI 2-day: 2nd phase</td>
<td>Tetrofosmin, MIBI</td>
<td>600</td>
</tr>
<tr>
<td><strong>Endocrine</strong></td>
<td>Thyroid</td>
<td>Pertechnetate</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>Parathyroid: without subtraction</td>
<td>MIBI</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with subtraction</td>
<td>900</td>
</tr>
<tr>
<td></td>
<td></td>
<td>thyroid subtraction</td>
<td>Pertechnetate</td>
</tr>
<tr>
<td><strong>Gastrointestinal</strong></td>
<td>Gastric emptying (solid phase)</td>
<td>Colloid, DTPA</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Colonic transit</td>
<td>$^{67}$Ga Citrate</td>
<td>20</td>
</tr>
<tr>
<td><strong>Genitourinary</strong></td>
<td>MAG3 Renal scan</td>
<td>MAG3</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>DMSA Renal scan</td>
<td>DMSA</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>Renal Imaging DTPA (not GFR)</td>
<td>DTPA</td>
<td>500</td>
</tr>
<tr>
<td><strong>Hepatobiliary</strong></td>
<td>Hepatobiliary</td>
<td>HIDA, DISIDA, Mebrofenin</td>
<td>200</td>
</tr>
<tr>
<td><strong>Infection</strong></td>
<td>Infection</td>
<td>$^{67}$Ga Citrate</td>
<td>220</td>
</tr>
<tr>
<td><strong>Lymphatic</strong></td>
<td>Sentinel node (breast)†:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Same day surgery</td>
<td>Colloid</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Delayed</td>
<td>Colloid</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sentinel node (melanoma)†</td>
<td>Colloid</td>
<td>52</td>
</tr>
<tr>
<td><strong>Nervous system</strong></td>
<td>Brain</td>
<td>ECD, HMPAO</td>
<td>800</td>
</tr>
<tr>
<td><strong>Pulmonary</strong></td>
<td>Lung perfusion</td>
<td>MAA</td>
<td>220</td>
</tr>
<tr>
<td><strong>Skeletal</strong></td>
<td>Bone scan</td>
<td>MDP, HDP</td>
<td>900</td>
</tr>
</tbody>
</table>

*Unless otherwise specified, all pharmaceuticals are labelled with $^{99m}$Tc.

† Quoted DRL is for the total dose delivered, not per injection. The most common approach reported was 4 x 10 MBq injections for same day surgery.
## CT component of SPECT/CT

<table>
<thead>
<tr>
<th>Category</th>
<th>Region</th>
<th>CTDI(_{vol}) (mGy)</th>
<th>DLP (mGy.cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac</td>
<td>Chest (heart)</td>
<td>2.1</td>
<td>50</td>
</tr>
<tr>
<td>Lymphatic (breast ca.)</td>
<td>Chest</td>
<td>3.8</td>
<td>135</td>
</tr>
<tr>
<td>Neurological</td>
<td>Brain</td>
<td>-</td>
<td>255</td>
</tr>
<tr>
<td>Parathyroid</td>
<td>Neck/Chest</td>
<td>7.2</td>
<td>240</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>Chest (lung)</td>
<td>4.6</td>
<td>150</td>
</tr>
<tr>
<td>Skeletal</td>
<td>Single width</td>
<td>4.8</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>Double width</td>
<td>4.8</td>
<td>365</td>
</tr>
</tbody>
</table>

CTDI\(_{vol}\) – volume computed tomography dose index  
DLP – dose length product

## Positron Emission Tomography

<table>
<thead>
<tr>
<th>Scan</th>
<th>Pharmaceutical</th>
<th>DRL MBq/kg*</th>
<th>MBq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole body†</td>
<td>(^{18})F FDG</td>
<td>3.5</td>
<td>270</td>
</tr>
<tr>
<td>Parkinsonian/ Alzheimer's</td>
<td>(^{18})F FDG</td>
<td>-</td>
<td>230</td>
</tr>
<tr>
<td>NETs</td>
<td>(^{68})Ga DOTA-TATE</td>
<td>2.2</td>
<td>200</td>
</tr>
<tr>
<td>Prostate cancer</td>
<td>(^{68})Ga PSMA</td>
<td>2.2</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>(^{18})F DCFPyL</td>
<td>3.7</td>
<td>270</td>
</tr>
</tbody>
</table>

* Variable DRLs only applicable for patients weighing between 50 and 120 kg.  
† Includes oncology, infection, inflammation and vasculitis scans

## CT component of PET/CT

<table>
<thead>
<tr>
<th>Region</th>
<th>Arm position</th>
<th>CTDI(_{vol}) (mGy)</th>
<th>DLP (mGy.cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain vertex to prox./mid thighs</td>
<td>Up</td>
<td>4.2</td>
<td>430</td>
</tr>
<tr>
<td></td>
<td>Down</td>
<td>5.3</td>
<td>555</td>
</tr>
<tr>
<td>Brain vertex to toes</td>
<td>Up</td>
<td>3.9</td>
<td>675</td>
</tr>
<tr>
<td></td>
<td>Down</td>
<td>4.6</td>
<td>825</td>
</tr>
<tr>
<td>Brain</td>
<td>Down</td>
<td>-</td>
<td>325</td>
</tr>
</tbody>
</table>

CTDI\(_{vol}\) – volume computed tomography dose index  
DLP – dose length product