If you see errors, please let me know! wendy-galbraith@ouhsc.edu

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| **Radiopharmaceutical** | **Trade Name “Common name”** | **Clinical Use** | **Dosages\***  **(mCi)** |
| **99mTc Physical Half-life (P) 6h**  Technetium-99m-pertechnetate (from Molybdenum-99 generator) High Specific Activity from LEU of U235 fission A9969 $10 | “Tech”  “TcO4”  “Tc99m” “99mTc” | Lantheus (11994-0091-12) AWP $30380.54; WAC $25317.12 (11994-0091-11) AWP $24699.68; WAC $20583.07  No Curium information | Range  10  10  0.1  1  10 |
| Tc99m pertechnetate labeled carbon sys. | Technegas aerosol, 9/2023 Cyclomedic-73814-0986-20; AWP pkg $18600 unit; WAC pkg $15500 unit $310; C9150 per study dose $372 pass through | Ventilation -HCPCS Level II code A9506 Graphite crucible for preparation of technetium Tc-99m labeled carbon aerosol, one crucible | 30 |
| Tc99m-bicisate (ECD) | Neurolite Lantheus; A9557 per study dose; up to 25 mCi CMS 2025 $683.80 | Lantheus (11994-0006-02) AWP pkg $8799.18 unit $4399.59; WAC pkg $7332.65 unit $3666.33 | 25 |
| Tc99m-disofenin (DISIDA) | Hepatolite (Pharma is DC Dec 2019) | Hepatobiliary Imaging  Gallbladder EF | 5 |
| Tc99m-exametazine (HMPAO) | Ceretec-available from DraxImage and GE; A9521 up to 25 mCi CMS 2025 $802.34  A9569 WBC per study dose CMS 2025 $1040.32 | Brain perfusion imaging-stabilized  Infection WBC label-unstabilized  GE (17156-025-05) no preserv AWP pkg $10798 unit $2159.60; DIR pkg $8998.33 unit $1799.66 | 25  Range |
| Tc99m-macroaggregated albumin | “MAA” Curium and DraxImage; A9540 up to 10 mCi | Pulmonary perfusion and embolism,  Pre Y-90 SIR Spheres distribution test | Particle dependent 3-5 |
| Tc99m-mebrofenin | Choletec  “Mebro” Bracco, Sun Pharma; A9537 up to 15 mCi | Hepatobiliary Imaging  Gallbladder EF  Bracco (00270-0083-20) 10 vials per pkg; AWP pkg $6637.50 unit $663.75; DIR pkg $5650 unit $565  Sun (45567-0455-02) 30 vials per pkg AWP pkg $3403.80 unit $113.45; DIR pkg $2836.50 unit $94.55 | 5 |
| Tc99m-medronate | “MDP” DraxImage MDP-25; Cardinal Health, Sun Pharma A9503 | Sun (45567-0040-02) 30 vials per pkg AWP pkg $2946.60 unit $98.22; DIR pkg 2455.50 unit $81.50  Jubilant Draximage (65174-0660-30) 30 kits per pkg No AWC or WAC or DIR  Cardinal Health (65857-0505-10) 10 vials per pkg No AWP no WAC or DIR | 25 |
| Tc99m-mertiatide | “MAG3” Curium, DraxImage, Sun Pharma; A9562 up to 15 mCi | Renal imaging (ERPF)  Curium (69945-0096-20) no AWP or WAC (5 vials per pkg)  Jubilant Draximage (65174-261-05) | 10 |
| Tc99m-oxidronate | “HDP” Curium; A9561; up to 30 mCi | Bone imaging | 25 |
| Tc99m-pentetate  Pentetate Kit Jubilant-Drax (12/89) | “DTPA” DraxImage; A9539 up to 25 mCi  A9567 up to 75 mCi | Renal imaging (GFR function, renal flow studies)  Lung Ventilation for matching with MAA  Cardiac first pass  Cerebral-Peritoneal shunt | 3, 10  35-75  25  1 |
| Tc99m-pyrophosphate  Cis-Pyro Sun Pharm (6/87)  Technescan PYP Kit Curium (5/74) | “Hot pyp” A9538 up to 25 mCi  “Cold pyp” or “pyp” | Curium (69945-0094-20) no AWP no WAC  Sun (45567-0060-02) 30 vials per pkg; AWP pkg $2305.80 unit $76.86; DIR pkg $1921.50 unit $64.05  Sun (45567-0060-02) (30 vials per pkg) | 15  25  1  0 |
| Tc99m-red blood cells | Ultratag Curium (69945-068-20) A9560; per study dose; up to 30 mCi  Curium No AWP no WAC | GI bleeds  Hemangioma  ENVG (MUGA)  RNVG (MUGA)  L to R shunt  Spleen (heat damaged RBC’s) | 30  30  30  30  30  30 |
| Tc99m-sestamibi Cardinal Health, Curium, DraxImage, Lantheus, Sun Pharma A9500 Per study dose up to 40 mCi | “Sestamibi” or “mibi” | Lantheus (11994-0003-20) AWP pkg $2335.79 unit $116.79; WAC pkg $1946.46 unit $97.32  Lantheus (11994-0001-20) Cardiolite AWP pkg $2835.23 unit $141.76; WAC pkg $2362.69 unit $118.13  Curium (69945-0092-20) AWP pkg $3247 unit $646; WAC pkg $2706 unit $541.2  Sun (45567-0555-02) 30 vials per pkg AWP pkg $13517.28 unit $450.57; DIR pkg $11264.40 unit $375.48  Cardinal Health (65857-0500-05) 20 vials per pkg no AWP/WAC or DIR  Jubilant Draximage (45548-0141-10) 10 vials pkg no AWC no WAC no DIR | 10/30  25  25 |
| Tc99m-succimer | “DMSA” Nephroscan Feb 2022 Theragnostics (71083-0020-05) Distributed by GE; A9551 up to 10 mCi; | Renal cortical imaging | 5  0.1 to 0.05 ped |
| Tc99m-sulfur colloid  AN-Sulfur Colloid Sun Pharm (4/79)  Sulfur Colloid Kit Jubilant-Drax (11/23) | “Sulfur colloid”  Sun (45567-0030-01) 5 vials per pkg AWP pkg $3757.02 unit $751.41; DIR pkg $3130.85 unit $626.17  Jubilant Draximage (NO NDC INFORMATION) | Liver-spleen, Bone marrow  Lymphoscintigraphy  Gastric emptying  Gastric reflux  Aspiration/Salivagram  Cystography (augmented bladder)  Peritoneo-venous shunt (LeVeen shunt) | 5  0.4  1  0.3  0.2  1  0.5 |
| Tc99m-tetrofosmin  Myoview GE (2/96 – 0.23 mg)  Myoview 30 GE (3/05 – 1.38 mg) | Myoview A9502 Per study dose GE (17156-0024-05) 10ml vial AWP pkg $4093.09 unit $818.62; DIR pkg $3410.91 unit $682.18; GE (17156-0026-30) 30ml vial AWP pkg $14619 unit $2923.80; DIR pkg $12182.50 unit $2436.50 | Myocardial perfusion imaging | 10/30 |
| Tc99m-tilmanocept | Lymphoseek (Cardinal Health 2017) (65857-450-05) AWP pkg $19847.16 unit $ 3969.43; WAC pkg $16539.30 unit $ 3307.86; A9520 up to 0.5 mCi | Lymphoscintigraphy  250 mcg per vial | 0.5 |

\*ACR–SPR (American College of Radiology-Society of Pediatric Radiology) Technical Standard for Diagnostic Procedures Using Radiopharmaceuticals. Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/Radiopharmaceuticals.pdf>. Revised 2016. American College of Radiology. ACR-AAPM practice parameter for reference levels and achievable administered activity for nuclear medicine and molecular imaging. 2015; Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/RefLevels-NucMed.pdf>.

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| **Radiopharmaceutical** | **Trade Name “Common name”** | **Clinical Use** | **Dosages (mCi)** |
| Carbon-11 choline (2013)  (P = 20 min) | Mayo Clinic-Rochester, Minn, Zevacor ANDA A9515 up to 20 mCi CMS-2025 $2062.94/dose | Prostate cancer recurrence | 10-20 |
| Copper (Cu)-64 dotatate (8/20) (P = 12.6hr) | **DETECTNET** (Curium) Available everyday & Friday after 10:30 Pass-through until Jan 1 2024; A9592 CMS 2025 per mCi $595.10 = $2618.44 | Somatostatin receptor positive neuroendocrine tumors  Curium (69945-0064-01) AWP unit $4620; WAC $3850 | 4.4 (1mCi/mL) |
| Flourine-18 florbetaben  (P = 109 min) | **NEURACEQ** -Now Lantheus (Life Molecular Imaging) (Primal) Contract manufacturing Q9983 up to 8.1 mCi CMS 2025 $1273.76 per dose  (54828-0001-01) AWP $4080’ WAC $3400; DIR $3400 | Risk of Alzheimer’s | 8 |
| Flourine-18 florbetapir | **AMYVID** (Lilly) (00002-1200-01) AWP $3428.88; WAC $2857.40; DIR $2857.40  CMS 2025 $2194.62; Contract manufacturing Distributed by Petnet and some Cardinal PET facilities; A9586 up to 10 mCi | Risk of Alzheimer’s | 10 |
| Fluorine-18 flortaucipir (5/20) | **TAUVID**™ (Avid Radiopharmaceuticals, Inc bought by **Lilly**) (00002-1220-01) AWP $4200; WAC $3500; Contract Manufacturing Distributed by Petnet and some Cardinal PET facilities; A9586 CMS 2025 dose $2194.62 | Risk of Alzheimer’s | 10 |
| Fluorine-18 flotufolastat (5/23) | **POSLUMA** (Blue Earth Diag.) (69932-0002-01) AWP $6078.96; WAC $5065.80; Distributed by PetNet- A9608 $614.78/mCi pass through | Prostate cancer initial or recurrence | 8 |
| Fluorine-18 fludeoxyglucose | “FDG” Various ANDA; A9552 up to 45 mCi | Lantheus (11994-0015-01) single-dose AWP pkg&unit $555.44; WAC pkg&unit $462.87 | 10 |
| Fluorine-18 fluciclovine (5/16)—Replaced by Posluma | **AXUMIN** (Blue Earth Diagnostics) (69932-0001-01) AWP $6199.78; WAC $5166.48; Distributed by Petnet: A9588 per 1 mCi CMS 2025 $268.42 = $2684.20 | Prostate cancer recurrence | 10 |
| Fluorine-18 fluorodopa (1/22) | Feinstein Institute, Manhasset, NY (Tom Chaly); NDA 200655 must have ANDA - GE FASTLAB 2 HPLC+). CMS has removed the NCD, PET centers could get the coverage for Fluorodopa PET studies through the local CMS contractors.A9602 CMS 2025 $458.62/mCi = $2293.10 | Suspected parkinsonian syndromes-ANDA | 5 |
| Fluorine-18 fluoroestradiol (5/20) | **CERIANNA™ (GE** bought Zionexa, US) Contract manufacturing through PETNET – A9591 per 1 mCi CMS 2025 $498.67 = $2992.02  GE (72874-0001-01) AWP $5538; DIR $4615 | Estrogen receptor (ER)-positive lesions as an adjunct to biopsy in patients with recurrent or metastatic breast cancer | 6 |
| Fluorine-18 flurpiridaz (10/2024) | **FLYRCADO** (GE) (00407-8787-01) up to 10 mCi; AWP $2700; WAC $2250  2025-CMS Pass-through HCPCS Level II code A9611, “Flurpiridaz F 18, diagnostic per 1 millicurie | myocardial blood flow (MBF) 2.5 to 3 mCi rest/9 to 9.5 stress (1 hr apart); if pharmalogic use 6 to 6.5 mCi for stress (0.5 hr apart) | 3/9 |
| Fourine-18 flutemetamole (10/13) | **VIZAMYL (GE)** (17156-0067-30) AWP $95070-30 mL MDV; DIR $79200; Contract manufacturing Distributed by Pharmalogic and Cardinal PET facilities Q9982 CMS 2025 $874.10 per dose | Risk of Alzheimer’s | 5 |
| Fluorine-18 piflufolastat (PSMA) (5/21) | **PYLARIFY Lantheus –** (Progenics Pharmaceuticals) (71258-0022-00) A9595 AWP $ 6642.62; WAC $5535.52; Distributed by any contract manufacturer A9595 CMS 2025 $332.44/mCi = $3324.40 | Prostate cancer initial and recurrence | 10 |
| Flourine-18 sodium fluoride | “NaF” Various ANDA; A9580 up to 30 mCi | Bone metastasis | 5 |
| Gallium-68 dotatoc (8/19)  (P = 68 min) | Univ of Iowa Hosp & Clinics; Various ANDA C9067 CMS 2025 $4.05/0.01 mCi = $1620 | Somatostatin receptor positive neuroendocrine tumors | 4 |
| Gallium-68 dotatate (6/16) | **NETSPOT** (Advanced Accelerator Applications- Novartis) (69488-0001-40) AWP $3600; WAC $3000; DIR $3000; Generator distribution various; A9587 per 0.1 mCI CMS 2025 $51.09 = $2758.86 | Somatostatin receptor positive neuroendocrine tumors  Pass-through ended Jan 2022 | 5.4 |
| Gallium-68 PSMA – CALI-cGMP 212 (approved 12/2020)  Gallium-68 PSMA (KIT) | CALI-cGMP under 212: PSMA-11 with HBED-CC chelator; A9594 (ucla) CMS 2025 $372.17 per mCi = $1860.85; A9593 (ucsf) CMS 2025 $534.91 per mCi = $2674.55  FDA approved: Telix: Feb 2022 68Ga-HBED-PSMA-11 (gozetotide- **Illuccix-**74725-0100-64); A9596 CMS 2025 $1026.05/mCi = $5130.25; AWP $6199.20; WAC $5166; pass through until July 1 2025-Novartis is trying to get a second passthrough  Novartis/AAA: Mar 2022 68Ga-HBED-PSMA-11 (gozetotide-**Locametz** 69488-0017-61) AWP $6921.60; WAC $5768; A9800 CMS 2025 $873.44/mCi x 7 = $6114.08  Not approved yet: Theragnostics/GE: now AAA agreement distribution: (GalliProst) 68Ga-THP-PSMA THP- | Prostate-specific membrane antigen (PSMA) positive lesions in men with prostate cancer with suspected metastasis who are candidates for initial definitive therapy or with suspected recurrence based on elevated serum prostate-specific antigen (PSA) level | 3-7 PI  3-5 reg $  6 =$$  7 =$$$ |
| Nitrogen-13 ammonia  (P = 10m) | “Ammonia” Various ANDA; A9526 up to 40 mCi | Myocardial perfusion | 10-20 |
| Rubidium-82 Chloride  (Sr-82 generator) (P = 75s) | Cardio-Gen-82 (Bracco-00270-0150-00) Ruby-Fill (DraxImage-65174-0021-10); A9555 up to 60 mCi per study dose | PET cardiac perfusion imaging | 30-60 |
| Cyclotron Products non-PET |  |  |  |
| Gallium-67 citrate (P=78h) | “Gallium” (Lantheus DC 2022); A9556 per mCi | Soft-tissue tumor  Inflammatory process imaging | 7 |
| Indium-111 chloride (P=68h) | Indiclor (Curium) | Labeling monoclonal antibodies and peptides | 3 to 9 |
| Indium-111 pentetate  Indium DTPA GE (2/82) | Indium DTPA (GE) (17156-0251-08) AWP $3187.81; DIR $2656.51; A9548 per 0.5 mCi CMS 2025 $715.61 | Cerebral Spinal Fluid (CSF) kinetics  SDV; 1 mCi/mL | 0.5 |
| Indium-111 oxyquinoline | Indium Oxine (GE 12/85) and (BWXT 7/2018); A9547 per 0.5 mCi CMS 2025 $772.61; A9570 WBC per study dose CMS 2025 $1031.39 | Labeling leukocytes and platelets  GE (17156-0021-01) AWP $5051.95; DIR $4209.96 | 0.7 |
| Indium-111 pentetreotide | **Octreoscan** (Covidian-); A9572 up to 6 mCi; CMS 2025 $1914.61 | Imaging neuroendocrine tumors | 6 |
| Iodine-123 iobenguane(metaiodobenzylguanidine) (P=13.2h) | **Adreview-**GE (17156-0235-01) 2 mCi/mL vial AWP $6130.09 DIR $5108.41; A9582 up to 15 mCi CMS 2025 $2074.81 | Neuroendocrine tumor imaging 78803  Sympathetic nerve activity in heart failure 0332T | 10 |
| Iodine-123 ioflupane | **DatScan** –GE (17156-0210-01) AWP $2961.60; DIR $2468 (2 mCi/mL); ioflupane-**Curium** (3/2022) M-F early delivery No AWP or WAC | Dopamine receptor imaging for Parkinson’s disease 78803  A9584 up to 5 mCi CMS 2025 $1388.02 | 5 |
| Iodine-123 sodium iodide | “123 caps” Curium, Cardinal A9509 Use for 1-4 mCi doses of I-123 for whole body imaging for less than 1 mCi and thyroid imaging see A9516 100 to 999 mcrCi | Thyroid imaging and uptake | 0.3 |
| Thallium-201 Chloride (P=73h)  Thallous Chloride Curium (10/79) | “Thallium” (Lantheus DC 2022); (Curium Not Returned to market 12/2022) TRACE (Discontinued Mount Sinai Medical Center, FL. 11/2001) | Myocardial perfusion imaging  Parathyroid Tumor imaging | 4 |
| Naturally Radioactive Products |  |  |  |
| Carbon-14 Urea (P=5,730y) | Pytest Haylard Health (63584-0001-00) AWP $2947.48 (AVENT DC Dec 2023)  510-947-6828 trimedamericas.com? | Detection of H. Pylori infection | 0.001 |
| Reactor Products |  |  |  |
| Strontium-89 (P=52.7d) | Metastron (GE DC MF FEB 2019; available BioMed through Triad-Drax 2020); A9600 $3975/mCi | Palliative treatment of bone pain of skeletal metastases | 4 |
| Iodine-125 human serum albumin (P=60d) | Jeanatope, “RISA” (IsoTex); A9532 per 5 mcrCi | Plasma volume determination | 0.005 – 0.01 |
| Iodine-125 iothalamate | Glofil (IsoTex) | Measurement of glomerular filtration | 0.01-0.03 |
| Iodine-131 human serum albumin (P=8d) | Megatope (IsoTex); A9524 per 5 mcrCi | Vascular volume studies-protein turnover studies | 0.01 |
| Iodine-131 metaiodobenzylguanidine | I-131 MIBG; | Pheochromocytomas and neuroblastomas Diagnostic | 0.5 |
| Iodine-131 sodium iodide | “Iodine” Draximage, International Isotopes; A9517 $23.73/per mCi | Whole Body Scan  Thyroid therapy | 2  10 - 200 |
|  |  |  |  |
| Xenon-133 gas (5.2d) | “Xenon” Curium, Lantheus ; A9558 per 10 mCi | Lantheus (11994-0128-25) AWP pkg $3117.06 unit $623.41; WAC pkg $2597.55 unit $519.51 | 10-20 |
| Yittrium-90 ibitumomab (P=64h) | **ZEVALIN** (Acrotech Biopharma-72893-0007-04) now Spectrum); AWP $81165.58; WAC $66804.65; A9543 $65,476.58 up to 40 mCi | Non-Hodgkin's lymphoma | 32 max |
| Radium-223 dichloride (P=11.4d) Ac227>Th227>Ra223 | **XOFIGO** (Bayer-50419-0208-01) distributed by Cardinal Health-DENVER)-A9606 $157.91/mcrCi AWP $36102.57 WAC $30085.56 | CRPC with symptomatic bone metastases  4-apha decays with gamma 81 keV (15%), 84 (24%), and 154 5% | About 0.14 total x6 |
| Lutetium Lu-177 dotatate (P=6.6d) | **LUTATHERA** (AAA-69488-0003-01) Feb 2018 (DISTRIBUTED TO HOSPITAL IN VIAL) Lu-177m (Tp1/2 160 days) contaminant [Lu-176(n,g)Lu177 & Lu177m] A9513 $/mCi AP $71770.46; WAC $59808.72; DIR $59808.72 | NE Tumors with somatostatin receptors | 200 q8 wks x 4 doses |
| Lutetium Lu-177 vipivotide tetraxetan (March 2022) | **Pluvicto** -Endocyte/Novartis/AAA-69488-0010-61;AWP $58444.48; WAC $48703.73; lutetium-177 (Lu-177) PSMA 617 [n.c.a Yb-177(n,g) Lu-177] A9607 $229.76/mCi | Metastatic Prostate Treatment - | 200 q6wks x6 doses |

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| **Investigational Radiopharmaceuticals** |  | **Indication** |
| F-18 | 126 FDA registered ongoing clinical trials  FLT (AML) and FMISO (hypoxia) | 18F-flurpiridaz (MBF) -NOS (inflammation in every disease state)-FMAU (uracil agent –cancer) –FEOBV (Parkinson) -FTT (PARP inhibitor breast/ovarian) –FAZA (lung) –FCH (hepatocarcinoma) –TFB (thyroid) -CETO (primary aldosteronism) –FSPG (liver) -PSS232 (amyotrophic lateral sclerosis) |
| Zr-89 | 7 | -panitumumab (squamous cell head and neck) –DFO-YS5 (multiple myeloma) –Df crefmirlimab (CD8 Tcells) –AP-101 (ALS) |
| Ac-225 | 15 | -FPI (neurotensin receptor tumors) –daratumumab (AML) |
| Lu-177 | 55 | -dotatate (Breast, pancreatic, meningioma, CNS) – PMSA (prostate) |
| **Brachytherapy Devices** | **Trade Name “Common name”** | **Indication** |
| Iodine-125 iodohydroxybenzenesulfonate (LIQUID) &  Cecium-131 Chloride in NS (LIQUID) | Iotrex  Cesitrex | Use in GliaSite device for recurrent malignant gliomas – MFG change now IsoRay in Richland, WA (2014) |
| Ir-192 (P=74d) | Checkmate | Decrease in-stent restenosis |
| Sr-90 (P=29y) | Novoste BetaCath | Decrease in-stent restenosis |
| P-32 (P=14d) | Guidant Galileo | Decrease in-stent restenosis |
| Y-90 glass (64h) | TheraSphere | Hepatocarcinoma |
| Y-90 resin-polymer | SIR-Spheres | Hepatocarcinoma/Colorectal mets 27-81 mCi |
| **Discontinued Radiopharmaceuticals** | **Trade Name “Common name”** | **FDA Indication and off label uses** |
| Chromium-51 sodium chromate (P=27.7d) | Chromitope | Labeling RBC's (DC MFG 2011) |
| Cobalt-57 cyanocobalamin (P=270d) | Rubratope | Detection of pernicious anemia (DC MFG 2006) |
| Cobalt -57 & -58 cyanocobalamin | Dicopac | Detection of pernicious anemia |
| Indium-111 capromab pendetide | ProstaScint – Ayto Bio distributed by Cardinal | Monoclonal antibody for imaging prostate cancer DC MFG 5 2018 |
| Indium-111 Imciromab | Myoscint | MAB for diagnosis of myocardial necrosis |
| Indium-111 satumomab pendetide | OncoScint CR/OV | MAB Colorectal and ovarian cancer |
| Iodine-131 iodohippurate | Hippuran | Renal imaging and function studies (ERPF) |
| Iodine-131 metaiodobenzylguanidine (7/2018) | AZEDRA (Lantheus owns Progenics) A9590 per $338.06/1 mCi | TX Pheochromocytomas and neuroblastomas Diagnostic (DC MFG 3/2024) (±2.5) mL of solution with a total radioactivity  of 240–413 mCi/vial |
| Krypton-81m gas (Rb-81 generator) (P=13s) |  | Pulmonary ventilation imaging |
| Phosphorus-32 Chromic phosphate | P-32 Phosphocol | TX intracavitary malignancies DC MFG 2009 |
| Phosphrous-32 Sodium phosphate | “P-32” | Therapy of polycythemia vera DC MFG 2009 |
| Samarium-153 lexidronam (EDTMP) | Quadramet (Lantheus)(Jazz) | Palliative treatment of bone pain of skeletal metastases DC MFG 10/2021 |
| Technetium-99m-pertechnetate (from Molybdenum-99 generator) Low Specific Activity from Mo98 (Feb 2018) Northstar | Radiogenix | Same as U235 source (DC MFG Nov 2023) |
| Tc99m-albumin colloid | Microlite | Imaging RES (liver/spleen) |
| Tc99m-arcitumomab | CEA-Scan | Monoclonal antibody for colorectal cancer  DC MFG 2007 |
| Tc99m-apcitide | AcuTect | Peptide imaging of DVT DC MFG 2006 |
| Tc99m-depreotide | Neotect | Somatostatin receptor-bearing pulmonary masses (NSCLC) |
| Tc99m-fanolesomab | NeutroSpec | MAB Infection-DC MFG 11/05 |
| Tc99m-gluceptate | “Gluco” | Renal cortical imaging DC MFG 12/08 |
| Tc99m-human serum albumin | “HSA” | Imaging of cardiac chambers |
| Tc99m-lidofenin | “HIDA” | Hepatobiliary imaging |
| Tc99m-nofetumomab merpentan | Verluma | MAB Fab fragment for imaging SCLC |
| Tc99m-teboroxime | Cardiotec | Myocardial perfusion imaging |
| Iodine-131 tositumomab | Bexxar | Treatment of Non-Hodgkin's Lymphoma DC MFG 2/2014 (112 to 168 mCi with avg 110 mCi) |

\*Usual dosage range of radiopharmaceutical used dosages are adjusted for patients’ weight, sex, and clinical diagnosis. Pediatric doses are appropriately lowered on an age and weight bases. ACR–SPR (American College of Radiology-Society of Pediatric Radiology) Technical Standard for diagnostic Procedures Using Radiopharmaceuticals. Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/Radiopharmaceuticals.pdf>. Revised 2016. American College of Radiology. ACR-AAPM practice parameter for reference levels and achievable administered activity for nuclear medicine and molecular imaging. 2015; Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/RefLevels-NucMed.pdf>.

**1. What is the new packaging threshold for diagnostic radiopharmaceuticals unbundled for HOPPS in 2025?**  
CMS finalized a packaging threshold of $630 for determining separate payments for diagnostic radiopharmaceuticals

**2. Why did CMS choose a $630 threshold for unbundling diagnostic radiopharmaceuticals and a 2.0 multiplier?**  
The finalized $630 threshold, which was broadly supported by the nuclear medicine community, reflects the unique status of diagnostic radiopharmaceuticals as supplies for nuclear medicine procedures that warrant a specific threshold that is distinct from the broader drug packaging threshold for therapeutic products. The diagnostic radiopharmaceutical threshold of $630 is two times the average amount CMS assumes is attributed to packaged diagnostic radiopharmaceuticals ($314).

The final 2.0 multiplier CMS adopted is consistent with the two-times rule CMS uses to assign services to Ambulatory Payment Classification (APC) levels, which also uses a single 2.0 multiplier.  Many commenters also supported a threshold based on a 1.75 multiplier, which is one of the multipliers used to determine whether a service qualifies for additional payments as high-cost outlier under the HOPPS. CMS declined to adopt that approach, stating it believed 1.75 was an appropriate multiplier for outlier payments because services qualifying for outlier payments also must exceed an additional fixed-dollar threshold. Since CMS intends to only have a single threshold to determine separate payment for diagnostic radiopharmaceuticals, it believes the higher 2.0 multiplier is more appropriate.    
**3. How will the threshold be adjusted in future years?**  
The threshold will be updated by the Producer Price Index (PPI) for Pharmaceuticals in future years.

**4. How does CMS determine which diagnostic radiopharmaceuticals receive separate payment?**  
CMS finalized as proposed the methodology to identify products to be paid separately. CMS will use claims data to estimate the per day cost of each product.  Products that have a per day cost at or below the $630 threshold will remain packaged.

**26 products that were proposed to be paid separately also qualified for separate payment in the final rule**

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| **HCPCS** | **APC** | **Short Description** | **Qualifier if appliable** | **Prop** | **Final** | **Updated if applicable** | **Pt Dosage** |
| A9515 | 9451 | Choline C11 |  | $2036.25 | $2062.94 |  | 1 dose |
| A9521 | 0766 | Tc99m exametazime |  | $5161.14 | $5450.36 | $802.34 | 1 dose |
| A9542 | 0769 | In111 ibritumomab |  | $844.76 | $798.02 |  | 1 dose |
| A9547 | 0770 | In111 oxyquinoline |  | $783.61 | $772.61 |  | 1 dose |
| A9548 | 0771 | In111 pentetate | Per 0.5 mCi | $708.32 | $715.29 |  | 0.5 mCi |
| A9557 | 0774 | Tc99m bicisate |  | $714.49 | $683.80 |  | 1 dose |
| A9568 | 0775 | Tc99m arcitumomab |  | $812.29 | $809.51 |  | 1 dose |
| A9569 | 0776 | Tc99m wbc |  | $1029.28 | $1040.32 |  | 1 dose |
| A9570 | 0777 | In111 wbc |  | $1052.58 | $1031.39 |  | 1 dose |
| A9572 | 0779 | In111 pentetreotide |  | $1919.76 | $1914.61 |  | 1 dose |
| A9582 | 0780 | I123 iobenguane ADREVIEW |  | $2102.06 | $2074.81 |  | 1 dose |
| A9584 | 0781 | I123 iofluopane DatScan |  | $1435.64 | $1388.02 |  | 1 dose |
| A9586 | 1664 | F18 florbetapir TAUVID |  | $2148.39 | $2194.62 |  | 1 dose |
| A9587 | 9056 | Ga68 dotatate NETSPOT | Per 0.1 mCi | $50.82 | $51.09 |  | 5 mCi |
| A9588 | 9052 | F18 fluciclovine AXUMIN | Per mCi | $273.55 | $268.42 |  | 10 mCi |
| A9591 | 9370 | F18 fluoroestradiol CERIANNA | Per mCi | $524.15 | $677.08 | $498.67 | 6 mCi |
| A9592 | 9383 | Cu64 dotatate DETECTNET | Per mCi | $1084.19 | $1468.21 | $595.10 | 4.4 mCi |
| A9593 | 9409 | Ga68 psma-11 ucsf CYCLOTRON | Per mCi | $580.50 | $886.70 | $534.91 | 5 mCi |
| A9594 | 9410 | Ga68 psma-11 ucla CYCLOTRON | Per mCi | $371.02 | $868.23 | $372.17 | 5 mCi |
| A9595 | 9430 | F18 piflufolastat PYLARIFY | Per mCi | $337.46 | $515.12 | $332.44 | 8-10 mCi |
| A9596 | 9443 | Ga68 psma ILLUCCIX | Per mCi | $975.48 | $1026.05 |  | 5-7 mCi |
| A9602 | 9053 | F18 fluorodopa CYCLOTRON | Per mCi | $146.88 | $458.62 |  | 5 mCi |
| A9800 | 9055 | Ga68 psma LOCAMETZ | Per mCi | $873.44 | $873.44 |  | 5-7 mCi |
| C9067 | 9923 | Ga68 dotatoc CYCLOTRON | Per 0.01 mCi | $4.07 | $4.05 |  | 5.4 mCi |
| Q9982 | 9459 | F18 flutemetamol VIZAMYL |  | $2256.50 | $874.10 |  | 8 mCi |
| Q9983 | 9458 | F18 florbetaben NEURACEQ |  | $1154.70 | $1273.76 |  | 1 dose |

**5. How often will CMS determine separately payable diagnostic radiopharmaceuticals?**  
This determination will be made on an annual basis using more recent claims data.

**6. What payment methodology will CMS use in 2025 for separately payable diagnostic radiopharmaceuticals?**   
For 2025, CMS finalized payment based on **mean unit cost (MUC), with no exceptions.**

**7. Why did CMS reject the use of ASP (Average Sales Price) data for the payment methodology?**  
In response to comments recommending the use of ASP data, CMS acknowledged the potential value in using ASP information in the future but indicated that more consistent, validated, and universal reporting would be necessary before ASP data could be a viable payment methodology for the agency to adopt.

**8. How will new diagnostic radiopharmaceuticals be paid if they lack pass-through status or claims data?**  
Payment for diagnostic radiopharmaceuticals with HCPCS codes that do not have pass-through status and for which there is no claims data will be paid based on ASP data. If ASP data is not available, payment rates will be based on wholesale acquisition cost (WAC), and in the absence of WAC, CMS will pay 95 percent of the product’s most recent average wholesale price (AWP), e.g. HCPCS Level II code A9611, “Flurpiridaz F 18, diagnostic, 1 millicurie?

The AWP & WAC state up to 10 mCi for AWP $2700; WAC $2250.

**9. Does this policy affect diagnostic radiopharmaceuticals with pass-through status?**  
CMS confirmed that this policy does not affect the qualifications or payment methodology for products with pass-through status.

**10. How will the offset amount be applied?**  
CMS will continue to subtract an offset amount from the payment for services using pass-through products to avoid double payment for the radiopharmaceutical. CMS did not apply an offset to separately payable diagnostic radiopharmaceuticals without pass-through status.

**11. What is the economic impact of this change in CMS policy?**  
The separate payment provisions for diagnostic radiopharmaceuticals will be budget neutral. CMS indicates it will monitor for any unintended consequences and may propose modifications as necessary in the future.

\*Usual dosage range of radiopharmaceutical used dosages are adjusted for patients’ weight, sex, and clinical diagnosis. Pediatric doses are appropriately lowered on an age and weight bases. ACR–SPR (American College of Radiology-Society of Pediatric Radiology) Technical Standard for Diagnostic Procedures Using Radiopharmaceuticals. Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/Radiopharmaceuticals.pdf>. Revised 2016. American College of Radiology. ACR-AAPM practice parameter for reference levels and achievable administered activity for nuclear medicine and molecular imaging. 2015; Available at: <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/RefLevels-NucMed.pdf>.