MEDICAL POLICY

POLICY TITLE	THERAPEUTIC RADIOPHARMACEUTICALS FOR NEUROENDOCRINE TUMORS
POLICY NUMBER	MP 2.371

CLINICAL BENEFIT	☐ MINIMIZE SAFETY RISK OR CONCERN. ☐ MINIMIZE HARMFUL OR INEFFECTIVE INTERVENTIONS. ☐ ASSURE APPROPRIATE LEVEL OF CARE. ☐ ASSURE APPROPRIATE DURATION OF SERVICE FOR INTERVENTIONS. ☒ ASSURE THAT RECOMMENDED MEDICAL PREREQUISITES HAVE BEEN MET. ☐ ASSURE APPROPRIATE SITE OF TREATMENT OR SERVICE.
Effective Date:	**3/1/2024**

I. POLICY

Lutetium (Lu 177) dotatate (Lutathera®)

Initial Treatment
Lutetium (Lu 177) dotatate (Lutathera®) treatment may be considered **medically necessary** when **ALL** of the following are met:

- Individual Is an adult (18 years of age or older); **and**
- Individual has documented low or intermediate grade (Ki-67 index 20% or less), locally advanced or metastatic, gastroenteropancreatic (including foregut, midgut, and hindgut) or metastatic bronchopulmonary or thymus neuroendocrine tumor; **and**
- Individual has documented somatostatin receptor expression of a neuroendocrine tumor as detected by somatostatin receptor-based imaging (see Policy Guidelines); **and**
- Individual has documented disease progression while on octreotide long-acting release or lanreotide therapy; **and**
- Individual is not receiving long-acting somatostatin analogues (e.g., octreotide long-acting release or lanreotide) for at least 4 weeks prior to initiating Lu 177 dotatate and has discontinued use of short-acting octreotide for at least 24 hours prior to initiating Lu 177 dotatate; **and**
- Individual does not have severe renal impairment (creatinine clearance less than 30 mL/min); **and**
- Individual has adequate bone marrow and hepatic function as determined by the treating physician; **and**
- Individual has documented Karnofsky Performance Status score of 50 or greater or similar functional status of another scale.

Continuation of Treatment

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Continuation of Lu 177 dotatate (Lutathera®) may be considered **medically necessary** when **ALL** of the following are met:

- No recurrent grade 2, 3, or 4 thrombocytopenia (see Table PG1); **and**
- No recurrent grade 3 or 4 anemia and neutropenia (see Table PG1); **and**
- No recurrent hepatotoxicity (see definition of hepatotoxicity in the Policy Guidelines section); **and**
- No recurrent grade 3 or 4 nonhematologic toxicity (see Table PG1); **and**
- No renal toxicity requiring a treatment delay of 16 weeks or longer (see definition of renal toxicity in the Policy Guidelines section).

Lu 177 dotatate treatment is considered **investigational** in all other indications and situations in which the above criteria are not met, as there is insufficient evidence to support a general conclusion concerning the health outcomes or benefits associated with this procedure.

Lu 177 dotatate treatment greater than a total of 4 doses as per the Food and Drug Administration (FDA)-approved regimen is considered investigational.

Iobenguane I 131

Iobenguane I 131 (Azedra®)/Iobenguane I 131 may be considered **medically necessary** when **ALL** of the following are met:

- Individual has documented iobenguane scan positive, unresectable locally advanced or metastatic pheochromocytoma and paragangliomas; **and**
- Individual Is 12 years or older; **and**
- Individual has progressed on prior therapy for pheochromocytoma or paraganglioma **OR** is not a candidate for chemotherapy; **and**
- Individual does not have severe renal impairment (creatinine clearance less than 30 mL/min); **and**
- Individual has platelet count greater than 80,000/mcL **OR** absolute neutrophil count greater than 1,200/mcL.

Iobenguane I 131 treatment is considered **investigational** for all other indications including neuroblastoma and gastroenteropancreatic neuroendocrine tumors, as there is insufficient evidence to support a general conclusion concerning the health outcomes or benefits associated with this procedure.

Use of iobenguane I 131 not in accordance with FDA approved dosing (first dosimetric dose followed by 2 therapeutic doses administered 90 days apart) is considered **investigational**. See policy guidelines below.

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The National Comprehensive Cancer Network (NCCN) is a nonprofit alliance of cancer centers throughout the United States. NCCN develops the Clinical Practice Guidelines in Oncology which are recommendations aimed to help health care professionals diagnose, treat, and manage patients with cancer. The National Cancer Institute's PDQ (Physician Data Query) is NCI's comprehensive source of cancer information, which includes evidence-based summaries on topics that cover adult and pediatric cancer treatment. These guidelines evolve continuously as new treatments and diagnostics emerge, and may be used by Capital Blue Cross when determining medical necessity according to this policy.

POLICY GUIDELINES

Somatostatin Receptor-Based Imaging

Preferred somatostatin receptor (SSTR)-based imaging options to assess receptor status include SSTR-positron emission tomography (PET)/computed tomography (CT) or SSTR-PET/magnetic resonance imaging (MRI). Octreotide single-photon emission computed tomography (SPECT)/CT may be used only if SSTR-PET is not available, as it is much less sensitive for defining SSTR-positive disease. Appropriate SSTR-PET radiotracers include Gallium 68 (Ga 68) dotatate, Ga 68 dotatoc, or Copper 64 (Cu 64) dotatate. SSTR-positive status is confirmed when uptake in measurable lesions is greater than the liver.

Lutetium Lu 177 dotatate (Lutathera®)

The recommended dose of lutetium Lu 177 dotatate is 7.4 GBq (200 mCi) every 8 weeks for a total of 4 doses.

There are theoretical concerns regarding the competition between somatostatin analogues and Lu 177 dotatate for somatostatin receptor binding. Therefore, the following is recommended:

- Do not administer long-acting somatostatin analogues for 4 to 6 weeks prior to each Lu 177 dotatate treatment
- Stop short-acting somatostatin analogues 24 hours before each Lu 177 dotatate treatment
- Both long-acting and short-acting somatostatin analogues can be resumed 4 to 24 hours after each Lu 177 dotatate treatment.

Lu 177 dotatate is a radiopharmaceutical and should be used by or under the control of physicians who are qualified by specific training and experience in the safe use and handling of radiopharmaceuticals, and whose experience and training have been approved by the appropriate governmental agency authorized to license the use of radiopharmaceuticals.

Lu 177 dotatate should be discontinued permanently if the patient develops hepatotoxicity defined as bilirubinemia greater than 3 times the upper limit of normal (grade 3 or 4), or hypoalbuminemia less than 30 g/L with a decreased prothrombin ratio less than 70%.

Lu 177 dotatate should be discontinued permanently if patient develops renal toxicity defined as a creatinine clearance of less than 40 mL/min calculated using Cockcroft-Gault equation with

actual body weight, or 40% increase in baseline serum creatinine, or 40% decrease in baseline creatinine clearance calculated using Cockcroft-Gault equation with actual body weight.

Table PG1 describes the grading of severity used in the Common Toxicity Criteria for Adverse Events (version 4.03).

Table PG1. Common Toxicity Criteria for Adverse Events

Grade	Description
1	Mild; asymptomatic or mild symptoms; clinical or diagnostic observations only; intervention not indicated.
2	Moderate; minimal, local, or noninvasive intervention indicated; limiting age-appropriate instrumental activities of daily living and refer to preparing meals, shopping for groceries or clothes, using the telephone, managing money, etc.
3	Severe or medically significant but not immediately life-threatening; hospitalization or prolongation of hospitalization indicated; disabling; limiting self-care activities of daily living and refer to bathing, dressing, and undressing, feeding self, using the toilet, taking medications, and not bedridden.
4	Life-threatening consequences; urgent intervention indicated.
5	Death related to adverse event.

Iobenguane I 131

- Iobenguane I 131 is administered intravenously as a dosimetric dose followed by two therapeutic doses administered 90 days apart.
  - The recommended dosimetric dose is 185 to 222 MBq (5 to 6 mCi) in individuals greater than 50 kg and 3.7 MBq/kg (0.1 mCi/kg) in individuals 50 kg or less.
  - The recommended therapeutic dose is 18,500 MBq (500 mCi) in individuals greater than 62.5 kg and 296 MBq/kg (8 mCi/kg) in individuals 62.5 kg or less.
- Thyroid-blocking medications should be given prior to administration and after each dose.
- Iobenguane I 131 is a radiopharmaceutical and should be used by or under the control of physicians who are qualified by specific training and experience in the safe use and handling of radiopharmaceuticals, and whose experience and training have been approved by the appropriate governmental agency authorized to license the use of radiopharmaceuticals.
- Iobenguane I 131 should be discontinued if:

- Platelet count is less than 80,000 mcL or absolute neutrophil count (ANC) is less than 1,200/mcL.
- Individual has liver dysfunction defined as aspartate aminotransferase or alanine aminotransferase greater than or equal to 2.5 times the upper limit of normal or total bilirubin greater than 1.5 times the upper limit of normal or develops liver disease (including hepatitis and chronic alcohol abuse).
- Individual develops renal toxicity defined as a creatinine clearance of less than 30 mL/min.

Cross-reference:

MP 2.373 Step Therapy Treatment of Stage Four, Advanced Metastatic Cancer, and Severe Related Health Conditions
MP 5.022 Radioimmunoscintigraphy Imaging Monoclonal Antibody Imaging w-Indium-111 Capromab Pendetide for Prostate Cancer

II. PRODUCT VARIATIONS

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This policy is only applicable to certain programs and products administered by Capital Blue Cross and subject to benefit variations as discussed in Section VI. Please see additional information below.

FEP PPO: Refer to FEP Medical Policy Manual. The FEP Medical Policy manual can be found at:
https://www.fepblue.org/benefit-plans/medical-policies-and-utilization-management-guidelines/medical-policies.

III. DESCRIPTION/BACKGROUND

TOP

Radiopharmaceuticals are composed of a radioisotope bond to an organic molecule and are used for diagnostic and therapeutic purposes. The organic molecule conveys the radioisotope to specific organs, tissues, or cells. Lutetium 177 (Lu 177) dotatate, classified as peptide receptor radionuclide therapy is a radiolabeled-somatostatin analogue that binds to somatostatin receptor expressing cells, including malignant somatostatin receptor-positive tumors such as neuroendocrine tumors. It is then internalized and beta particle emission from Lu 177 induces cellular damage by formation of free radicals in somatostatin receptor-positive and neighboring cells. Similar to Lu 177, iobenguane I 131 is a radioactive therapeutic agent, which is similar in structure to norepinephrine. Due to its structural similarity with norepinephrine, iobenguane is taken up by the norepinephrine transporter where it accumulates in adrenergically innervated tissues including pheochromocytoma and paraganglioma cells. The beta and gamma radiation resulting from the radioactive decay causes an anti-tumor affect.

Neuroendocrine tumors

Neuroendocrine tumors are a heterogeneous group of tumors that originate from the neuroendocrine cells in the diffuse neuroendocrine system anywhere in the body but more commonly in the gastrointestinal tract and the respiratory system. Approximately 61% of all

neuroendocrine tumors originate from the gastrointestinal system or pancreas and are referred to as gastroenteropancreatic neuroendocrine tumors. Gastroenteropancreatic neuroendocrine tumors may further be characterized as functional or nonfunctional based on whether they secrete hormones that result in clinical symptoms particularly serotonin, which results in "carcinoid syndrome" that is characterized by flushing and diarrhea. Lung neuroendocrine tumors may also be referred to as pulmonary neuroendocrine tumors, pulmonary carcinoids, or bronchopulmonary neuroendocrine tumors. Bronchopulmonary neuroendocrine tumors comprise approximately 20% of all lung cancers and are classified into 4 subgroups: typical carcinoid tumor, atypical carcinoid tumor, large-cell neuroendocrine carcinoma, and small-cell lung carcinoma. Less than 5% of bronchopulmonary neuroendocrine tumors exhibit hormonally-related symptoms such as carcinoid syndrome. Neuroendocrine tumors of the thymus account for only 5% of all tumors in the thymus and mediastinum.

Neuroendocrine tumors are classified as orphan diseases by the U.S. Food and Drug Administration (FDA). Based on an analysis of Surveillance, Epidemiology, and End Results Program registry data from 1973 to 2012, the overall incidence of neuroendocrine tumors has been reported to be in the range of 6.98 per 100000 people per year.

Diagnosis

Neuroendocrine tumors are not easy to diagnose because of the rarity of the condition. Symptoms are often nonspecific or mimic other disorders such as irritable bowel syndrome (in the case of gastroenteropancreatic neuroendocrine tumors) or asthma (in the case of a lung neuroendocrine tumors) resulting in an average diagnosis delay of five to seven years after symptom onset. In many cases, diagnosis is incidental to imaging for other unrelated cause. Most gastroenteropancreatic neuroendocrine tumors express somatostatin receptors that can be imaged using a radiolabeled form of the somatostatin analogue octreotide (e.g., ^{111}In pentetreotide).

Treatment Approach

There is a general lack of prospective data to guide the treatment of neuroendocrine tumors. Gastroenteropancreatic neuroendocrine tumors are chemotherapy-responsive neoplasms, and platinum-based chemotherapy represents the backbone of treatment for both early and advanced-stage tumors. Surgery alone or followed by chemotherapy along with treatment of hormone-related symptoms may be the initial approach for localized disease. For asymptomatic patients with slow progression, observation with routine surveillance imaging is an option. The prognosis for patients with metastatic well-differentiated gastroenteropancreatic neuroendocrine tumors is highly variable. The median overall survival (from diagnosis) for patients with metastatic pancreatic neuroendocrine tumors has been reported to range from 2 to 5.8 years, while the median overall survival for small bowel neuroendocrine tumors has been reported as 7.9 years.

Pharmacologic Treatment

First-Line Treatment Options

Somatostatin Analogues (Octreotide and Lanreotide)

Somatostatin is a peptide that binds to somatostatin receptors that are expressed in a majority of carcinoid tumors and inhibits the secretion of a broad range of hormones. Somatostatin analogues (e.g., octreotide, lanreotide) were initially developed to manage the hormonal symptoms related to neuroendocrine tumors, they were found to exert antiproliferative activity, and clinical studies have demonstrated prolonged progression-free survival (PFS) in patients with neuroendocrine tumors treated with somatostatin analogues. However, the role of somatostatin analogues in patients with nonfunctioning neuroendocrine tumors is unclear.

Commercially available long-acting release forms of octreotide and lanreotide (e.g., Sandostatin LAR, Somatuline Depot), which are administered intramuscularly on a monthly basis, have largely eliminated the need for daily self-injection of short-acting subcutaneous formulations.

Second-Line Treatment Options

Currently, there are no data to support a specific sequence of therapies and only streptozocin, everolimus, and sunitinib are FDA approved for the treatment of pancreatic neuroendocrine tumors.

Mechanistic Target of Rapamycin Inhibitors

The mechanistic target of rapamycin is an enzyme that regulates cell metabolism and proliferation in response to environmental stimuli. It is upregulated in a variety of malignancies in response to stimulation by growth factors and cytokines. Whole-exome genomic analysis has shown that approximately 15% of pancreatic neuroendocrine tumors are associated with somatic variants in genes associated with the mechanistic target of rapamycin pathway. Everolimus, an oral mechanistic target of rapamycin inhibitor, has been shown to significantly prolonged PFS versus placebo in patients with pancreatic neuroendocrine tumors (RADIANT-3 trial), and lung and gastrointestinal neuroendocrine tumors nonfunctional (RADIANT-4 trial). Note that everolimus is approved by the FDA for adults with progressive neuroendocrine tumors of pancreatic origin and adults with progressive, well-differentiated, nonfunctional neuroendocrine tumors of gastrointestinal or lung origin that are unresectable, locally advanced, or metastatic. The RADIANT-2 trial, conducted in patients with progressive advanced neuroendocrine tumors associated with carcinoid syndrome failed to show a statistically significant improvement in the primary endpoint of PFS.

Tyrosine Kinase Receptor Inhibitors

Neuroendocrine tumors frequently overexpress the vascular endothelial growth factor and receptor. Sunitinib is a multi-targeted tyrosine kinase inhibitor that targets multiple signaling pathways and growth factors and receptors including vascular endothelial growth factor and receptor 1, 2, and 3. It has been shown that daily sunitinib at a dose of 37.5 mg improves PFS, overall survival, and the overall response rate as compared with placebo among patients with advanced pancreatic neuroendocrine tumors. Note that sunitinib is FDA approved for the

treatment of progressive, well-differentiated pancreatic neuroendocrine tumors in patients with unresectable locally advanced or metastatic disease.

Chemotherapy

Response to chemotherapy for advanced neuroendocrine tumors of the gastrointestinal tract and lung is highly variable and, at best, modest. Tumor response rates are generally low and no PFS benefit has been clearly demonstrated. Therefore, the careful selection of patients is critical to maximize the chance of response and avoid unnecessary toxicity. In advanced neuroendocrine tumors, platinum-based regimens are generally used. They include cisplatin and etoposide (most widely used), carboplatin and etoposide, 5-fluorouracil, capecitabine, dacarbazine, oxaliplatin, streptozocin, and temozolomide.

Peptide Receptor Radionuclide Therapy: Lutetium Lu 177 dotatate (Lutathera®)

Lutetium Lu 177 dotatate is a radiolabeled-somatostatin analogue that binds to somatostatin receptor expressing cells, including malignant somatostatin receptor-positive tumors. It is then internalized and beta particle emission from lutetium 177 induces cellular damage by formation of free radicals in somatostatin receptor-positive and neighboring cells.

Pheochromocytoma and Paraganglioma

Pheochromocytoma and paraganglioma are rare neuroendocrine tumors that originate from the chromaffin cells of the adrenal glands. Chromaffin cells produce catecholamine neurotransmitters, such as epinephrine, norepinephrine, and dopamine. Compared to the normal chromaffin cells, pheochromocytomas and paraganglioma express high levels of the norepinephrine transporter on their cell surfaces. The excess amount of norepinephrine causes the clinical signs and symptoms like hypertension, headache, sweating, tremor, and palpitation. While most pheochromocytoma and paraganglioma are non-malignant (non-metastatic), about 10% of pheochromocytoma are malignant and about 25% of paraganglioma are malignant (metastatic) which can spread to other parts of the body, such as the liver, lungs, bone, or distant lymph nodes.

The average age of diagnosis is 43 years old. The estimated annual incidence of pheochromocytoma and paraganglioma is approximately 1 in 300000 population. The 5-year mortality rates for patients with metastatic pheochromocytoma and paraganglioma has been reported as 37% depending on the primary tumor site and sites of metastases. In addition, the medical overall and disease-specific survival were 24.6 and 33.7 years for pheochromocytoma and paraganglioma.

Diagnosis

The initial diagnosis of pheochromocytomas and paragangliomas includes biochemical testing, such as blood tests and urinalysis which measure the levels of metanephrine, a catecholamine metabolite in blood and urine. Imaging may be used to detect the location and size of tumors within the organs or tissues. Other advanced diagnostic procedures, such as ^{123}I-

metaiodobenzyl-guanidine (MIBG) scintigraphy, octreotide scan, and fluorodeoxyglucose-positron emission tomography scan are used to further determine whether the tumors are malignant and metastatic.

Certain genetic disorders such as multiple endocrine neoplasia 2 syndrome, von Hippel-Lindau syndrome, Neurofibromatosis type 1, hereditary paraganglioma syndrome are considered risk factors for pheochromocytomas and paragangliomas and therefore genetic testing is recommended for all patients with pheochromocytoma or paraganglioma.

Treatment Approach

Surgical resection is mostly reserved for benign tumors as curative surgical resection is nearly impossible in metastatic disease. For patients with local, unresectable disease, palliative external beam radiotherapy may be used with or without cytoreductive resection for patients with bone metastases.

Peptide Receptor Radionuclide Therapy: Iobenguane I 131

Prior to the approval of Iobenguane I 131, there was no FDA approved therapies for this indication. Radiotherapy options include off-label use of I 131-metaiodobenzylguanidine (^{131}I-MIBG) for patients with MIBG-positive tumors. I-MIBG contains radioactive iodine, and the compound is structurally similar to norepinephrine. When ^{131}I-MIBG is delivered to the target tissue, it gives off beta-radiation, killing neuroendocrine tumors. Due to the nature of the radiopharmaceutical mechanism of action, ^{131}I-MIBG can cause toxicities including nausea, vomiting, anemia, leukocytopenia, and thrombocytopenia. There is limited evidence for chemotherapy. In the case of unresectable progressive pheochromocytoma or paraganglioma, combination use of cyclophosphamide, dacarbazine, vincristine, doxorubicin, temozolomide, and thalidomide have been used. Tyrosine kinase receptor inhibitors such as sunitinib have also been used.

Regulatory Status

On January 26, 2018, Lutathera® (lutetium 177 dotatate) was approved by the FDA for the treatment of somatostatin receptor-positive gastroenteropancreatic neuroendocrine tumors, including foregut, midgut, and hindgut neuroendocrine tumors in adults.

On July 30, 2018, AZEDRA (iobenguane I 131) injection was approved by the FDA for the treatment of adult and pediatric patient's aged 12 years and older with iobenguane scan positive, unresectable, locally advanced, or metastatic pheochromocytoma or paraganglioma who require systemic anticancer therapy.

On May 5, 2022, Novartis announced that it had temporarily suspended production of Lutathera® at production sites in Ivrea, Italy and Millburn, New Jersey out of an abundance of caution as a result of potential quality issues identified in its manufacturing processes. This production suspension will impact both commercial and clinical trial supply in the US and Canada. At the time of announcement, the company expected resolution of these issues and

resumption of some product supply within 6 weeks, subject to confirmation via an ongoing review. Novartis noted that there is currently no indication of risk to patients from doses previously produced at these sites but has notified treatment sites to closely monitor patients.

IV. RATIONALE

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Summary of Evidence

For individuals with a treatment-refractory gastroenteropancreatic neuroendocrine tumor including foregut, midgut, and hindgut tumors who receive Lu 177 dotatate, the evidence includes a randomized, open-labeled trial and a retrospective cohort study. The relevant outcomes are overall survival, disease-specific survival, quality of life (QOL), and treatment-related mortality and morbidity. The randomized controlled trial (RCT) results showed a consistent statistically significant and clinically meaningful effect on overall response rate, progression-free survival, and overall survival among patients treated with Lu 177 dotatate compared to those treated with long-acting octreotide. The results of the retrospective studies were consistent with the treatment effect observed in the RCT and provide additional support for a clinical benefit of Lu 177 dotatate in patients with a gastroenteropancreatic neuroendocrine tumor. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals with a treatment-refractory bronchopulmonary or thymus neuroendocrine tumors who receive Lu 177 dotatate, the evidence includes a retrospective cohort study, a multicenter registry, and a bicenter, retrospective case series. Relevant outcomes are overall survival, disease-specific survival, quality of life, and treatment-related mortality and morbidity. The retrospective cohort study included a small number of patients with bronchopulmonary (n=23) or thymus (n=2) neuroendocrine tumors. Among the 23 patients with bronchopulmonary neuroendocrine tumor, the median progression-free survival was 20 months, the median time to progression was 25 months, and median overall survival was 52 months. Stratified results of 2 patients with thymus neuroendocrine tumors were not reported. The U.S. Food and Drug Administration in its review of the ERASMUS study for patients with gastroenteropancreatic neuroendocrine tumor concluded that time to event analyses such as time to progression, progression-free survival, and overall survival were not interpretable in the context of the single-arm ERASMUS study because of missing data at baseline, high dropout rates and open-label design of the study. The multicenter registry included 58 patients with bronchopulmonary tumors and reported 0 complete responses, 14 partial responses, a median PFS of 17.6 months, and a median overall survival of 44.8 months. The case series evaluated 48 patients with predominantly atypical carcinoid bronchopulmonary tumors, finding a median progression-free survival and overall survival of 23 months and 59 months, respectively. Of note, despite the current evidence base, National Comprehensive Cancer Network guidelines give a category 2A recommendation for use of Lu 177 dotatate for the treatment of bronchopulmonary and thymic locoregional advanced or distant metastases neuroendocrine tumors if there are clinically significant tumor burden and low grade (typical) tumor or evidence of progression or intermediate grade (atypical) tumor. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals with unresectable, locally advanced or metastatic pheochromocytoma or paraganglioma who require systemic anticancer therapy and who receive iobenguane I 131, the evidence includes a single-arm prospective cohort study. The relevant outcomes include overall survival, disease-specific survival, QOL, treatment-related mortality and morbidity. The pivotal study reported that 25% of patients (95% CI 16.2% to 36.5%) met the primary endpoint of reduction in antihypertensive medication of at least 50% for at least 6 months along with 22.1% of patients having a confirmed, centrally reviewed partial response (95% CI: 13.6% to 32.7%). Of these, 53% of patients who responded to therapy maintained a duration of response for at least 6 months. The single-arm nature of the trial prevents adequate interpretation of the results of time to the event endpoint of overall survival, which was a secondary endpoint of the trial. Given the severity and rarity of the disease condition with an associated high degree of morbidity and mortality, especially in metastatic disease, these outcomes represent a clinically meaningful benefit for patients. As with all other radiopharmaceuticals, iobenguane I 131 is associated with an increased risk for secondary hematologic malignancy including myelodysplastic syndrome or acute leukemias. Due to the risk of serious adverse reactions, iobenguane I 131 is only indicated for patients with unresectable, locally advanced, or metastatic paraganglioma who require systemic anticancer therapy and have no other known curative options. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals with unresectable, locally advanced, or metastatic pheochromocytoma or paraganglioma who require systemic anticancer therapy and who receive Lu 177 dotatate, the evidence includes systematic reviews and meta-analyses of single-arm studies, a multicenter registry, and 2 case series. Relevant outcomes include overall survival, disease-specific survival, quality of life, and treatment-related mortality and morbidity. One meta-analysis reported a pooled overall tumor response rate of 26% (95% CI, 18% to 35%). Another meta-analysis found improved PFS with Lu 177 dotatate compared to iobenguane I 131 among studies enriched with pheochromocytomas. One retrospective case series reported that 8/13 patients were able to reduce dosages of antihypertensive treatment at 3 months. Disease regression was reported in 5/14 patients with available CT imaging. Out of 16 patients with available iobenguane scans, 10 patients had mild or negative uptake. However, patient outcomes were not stratified by iobenguane uptake status. No prospective studies directly comparing Lu 177 dotatate to iobenguane I 131 or assessing Lu 177 dotatate response in a fully non-iobenguane avid population were identified. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

V. DEFINITIONS

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RADIOPHARMACEUTICALS: Radiopharmaceutical agents are used to diagnose or treat various malignancies, endocrinopathies, metabolopathies, and perfusion abnormalities.

THE COCKCROFT GAULT EQUATION: Developed prior to the use of standardized creatinine assays and has not been revised for use with creatinine values traceable to standardized reference materials.

KARNOFSKY PERFORMANCE STATUS: The KPS ranges from values of 100, signifying normal functional status with no complaints nor evidence of disease, to 0, signifying death.

VI. BENEFIT VARIATIONS

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The existence of this medical policy does not mean that this service is a covered benefit under the member's health benefit plan. Benefit determinations should be based in all cases on the applicable health benefit plan language. Medical policies do not constitute a description of benefits. A member's health benefit plan governs which services are covered, which are excluded, which are subject to benefit limits, and which require preauthorization. There are different benefit plan designs in each product administered by Capital Blue Cross. Members and providers should consult the member's health benefit plan for information or contact Capital Blue Cross for benefit information.

VII. DISCLAIMER

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Capital Blue Cross's medical policies are developed to assist in administering a member's benefits, do not constitute medical advice and are subject to change. Treating providers are solely responsible for medical advice and treatment of members. Members should discuss any medical policy related to their coverage or condition with their provider and consult their benefit information to determine if the service is covered. If there is a discrepancy between this medical policy and a member's benefit information, the benefit information will govern. If a provider or a member has a question concerning the application of this medical policy to a specific member's plan of benefits, please contact Capital Blue Cross' Provider Services or Member Services. Capital Blue Cross considers the information contained in this medical policy to be proprietary and it may only be disseminated as permitted by law.

VIII. CODING INFORMATION

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Note: This list of codes may not be all-inclusive, and codes are subject to change at any time. The identification of a code in this section does not denote coverage as coverage is determined by the terms of member benefit information. In addition, not all covered services are eligible for separate reimbursement.

Covered when medically necessary:

Procedure codes							
A4641	A9513	A9590					

Diagnosis for A9513

POLICY TITLE	THERAPEUTIC RADIOPHARMACEUTICALS FOR NEUROENDOCRINE TUMORS
POLICY NUMBER	MP 2.371

ICD-10-CM Diagnosis Code	Description
C7A.00	Malignant carcinoid tumor of unspecified site
C7A.010	Malignant carcinoid tumor of the duodenum
C7A.011	Malignant carcinoid tumor of the jejunum
C7A.012	Malignant carcinoid tumor of the ileum
C7A.019	Malignant carcinoid tumor of the small intestine, unspecified portion
C7A.020	Malignant carcinoid tumor of the appendix
C7A.021	Malignant carcinoid tumor of the cecum
C7A.022	Malignant carcinoid tumor of the ascending colon
C7A.023	Malignant carcinoid tumor of the transverse colon
C7A.024	Malignant carcinoid tumor of the descending colon
C7A.025	Malignant carcinoid tumor of the sigmoid colon
C7A.026	Malignant carcinoid tumor of the rectum
C7A.029	Malignant carcinoid tumor of the large intestine, unspecified portion
C7A.090	Malignant carcinoid tumor of the bronchus and lung
C7A.091	Malignant carcinoid tumor of the thymus
C7A.092	Malignant carcinoid tumor of the stomach
C7A.093	Malignant carcinoid tumor of the kidney
C7A.094	Malignant carcinoid tumor of the foregut, unspecified
C7A.095	Malignant carcinoid tumor of the midgut, unspecified
C7A.096	Malignant carcinoid tumor of the hindgut, unspecified
C7A.098	Malignant carcinoid tumors of other sites
C7A.1	Malignant poorly differentiated neuroendocrine tumors
C7A.8	Other malignant neuroendocrine tumors
C7B.00	Secondary carcinoid tumors, unspecified site
C7B.01	Secondary carcinoid tumors of distant lymph nodes
C7B.02	Secondary carcinoid tumors of liver
C7B.03	Secondary carcinoid tumors of bone
C7B.04	Secondary carcinoid tumors of peritoneum
C7B.09	Secondary carcinoid tumors of other sites
C7B.8	Other secondary neuroendocrine tumors
C74.10	Malignant neoplasm of medulla of unspecified adrenal gland
C74.11	Malignant neoplasm of medulla of right adrenal gland
C74.12	Malignant neoplasm of medulla of left adrenal gland
C75.5	Malignant neoplasm of aortic body and other paraganglia
Z51.0	Encounter for antineoplastic radiation therapy

Diagnosis for A9590

C74.10	Malignant neoplasm of medulla of unspecified adrenal gland
C74.11	Malignant neoplasm of medulla of right adrenal gland
C74.12	Malignant neoplasm of medulla of left adrenal gland
C74.90	Malignant neoplasm of unspecified part of unspecified adrenal gland
C74.91	Malignant neoplasm of unspecified part of right adrenal gland
C74.92	Malignant neoplasm of unspecified part of left adrenal gland
C75.5	Malignant neoplasm of aortic body and other paraganglia
C7B.8	Other secondary neuroendocrine tumors

IX. REFERENCES

TOP

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MP 2.371	**12/12/19 New Policy**. Lutetium Lu 177 dotatate (Lutathera®) and Iobenguane I 131 (Azedra®) treatment are considered **medically necessary** when criteria listed are met. All other indications will be considered investigational. Effective 7/1/2020.
	10/30/20 Consensus review. Policy statement unchanged. References updated. Removed HCPCS codes C9407 and C9408, added A9590, revised diagnosis codes.
	10/7/2021 Consensus Review. References updated. Coding reviewed.
	9/1/2022 Minor Review. Title changed. Criteria updated for clarification. Removal of Karnofsky Performance Status Score. References and rationale updated. Removed codes 78804, 79101, 77300 and 77790.
	11/14/2023 Consensus review. No change to policy statement. Background, Rationale, Definitions and References updated.

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