

Procedure guideline for Positron Emission Tomography (PET) / Computed tomography (CT) tumor imaging with ^{68}Ga -DOTA- conjugated peptide for Neuroendocrine Tumors (NETs)

Effective Date: July, 2021



Background

Neuroendocrine tumours (NETs) are a family of tumours, occurring with an incidence of about 5.25 cases per 100,000¹. The incidence of NETs is increasing over the last 3 decades. NETs can arise in several organs; the most common sites are the ileum and pancreas, followed by other sites within the GI tract, the lungs, thyroid, parathyroid, adrenal glands, and pituitary gland. However, NETS can occur anywhere in the body^{2,3}. NETs are often classified as functioning or nonfunctioning tumours, the latter of which do not present with hormone hypersecretion, and are often found as a bulky tumours with metastatic disease. The five-year survival rate for patients with NETs depends largely upon the location of the primary tumour and the extent of disease. Patients with localized disease can expect five-year survival rates ranging from 65% for ileal tumours to 84% for lung tumours and 90% for rectal tumours⁴. As expected, patients with distant disease carry a worse prognosis with five-year survival rates ranging from 24% in the rectum and 27% in the lungs to 54% in the ileum⁵.

Neuroendocrine tumours are characterized by expressing somatostatin receptors. This type of functional imaging is unique to NETs and can be used for both diagnostic and therapeutic strategies. 68Ga-DOTA has affinity for somatostatin receptor subtypes 1 to 5⁶. Due to the recent evidence regarding peptide receptor radionuclide therapy (PRRT- subject covered in guideline CPG_Endo_006), there is a necessity to stratify patients for treatment. This type of “theranostic” study has been the subject of recent research. 68Ga-DOTA is more sensitive for detecting NETs than other imaging⁷ (octreoscan & conventional anatomic imaging combined). 68Ga-DOTA-conjugated peptide PET/CT has higher sensitivity for smaller lesions and improves detection sensitivity while decreasing radiation dose and patient time. 68Ga-DOTA- conjugated peptide PET/CT has been proven to have high impact on management of neuroendocrine cancer patients⁸. The purpose of this guideline is to provide evidence-based recommendations on the use 68Ga-DOTA-conjugated peptide PET/CT for NETs and to define which patients are candidates for this imaging. This guideline will focus on the role of 68Ga-DOTA-conjugated peptide PET/CT in the diagnosis and management of NETs.

Guideline Questions

1. Provide standards for the accuracy and performance of 68Ga-DOTA PET/CT for Neuroendocrine Tumors.
2. Determine the clinical impact of 68Ga-DOTA PET/CT on managing patients with neuroendocrine tumors.
3. Compare the diagnostic value of 68Ga-DOTA PET with conventional imaging.

Search Strategy

The National Guidelines Clearinghouse and individual cancer agencies’ websites were searched for guidelines on the use of Gallium68 for Positron emission tomography (PET) / Computed tomography (CT) for NETs. A systematic literature review was performed by using the Pubmed, EMBASE, and

MEDLINE databases. Articles published between 2013 to 2021 are included in the evidence tables in Appendix A.

Target Population

The recommendations outlined in this guideline apply to patients, diagnosed with or clinically suspected to have with neuroendocrine tumors.

Recommendations

1. Clinical Settings for Ga68 DOTA PET Patients^{9,10}:
 - Histologically confirmed NET (or strong suspicion of NET in the absence of a histologic diagnosis) reviewed by, or in discussion with, a multidisciplinary neuroendocrine team member.
 - Selection of patients (G1, G2 and G3) for SSTR-targeted PRRT is essential.
 - To facilitate staging and planning of surgical intervention in NETs.
 - Ga68 DOTA PET is advantageous in evaluating a mass with NET features on conventional imaging which is not easily acquired by endoscopic or percutaneous biopsy.
 - Restaging at the time of clinical or laboratory progression during the follow up with patients.
2. Additional considerations:
 - Breastfeeding should be interrupted for 12 hours after tracer infusion.
 - Treatment with telotristat (Xermelo) can continue uninterrupted.
 - The timing of the Ga68 DOTA PET should be documented in relation to somatostatin analog therapy.

Appendix A: Evidence Tables

Table 1. Clinical Data on PET/CT Tumour Imaging with 68Ga-DOTA

Author, Year	Study Design and Description	Number of Patients	Results and Comments
Josefsson, 2018 ¹¹	Assessment of whole body PET/CT scans with 68Ga tracer	16	<ul style="list-style-type: none"> The highest computed organ absorbed dose coefficients were in descending order to the spleen, pituitary gland, kidneys, adrenal glands, and liver. The effective dose was 0.023+/-0.005 mSv/MBq calculated using CEP with tissue weighting factors ICRP 60. One of the largest differences in absorbed dose coefficient estimates was for the urinary bladder wall 0.040+/-0.011 mGy/MBq (ICRP 110) compared to 0.090+/-0.032mGy/MBq (CEP). Conclusion: The effective dose is slightly overestimated using CEP compared to ICRP 110 phantoms in combination with the latest tissue weighting factors from ICRP 103.
Hope, 2018 ¹²	Systematic review		<ul style="list-style-type: none"> Somatostatin receptor PET has demonstrated a significant improvement over conventional imaging (CI) in patients with NETs. Appropriate use criteria Initial staging after the histologic diagnosis of NET Evaluation of an unknown primary, evaluation of a mass suggestive of NET not amenable to endoscopic or percutaneous biopsy, Staging of NET before planned surgery, monitoring of NET seen predominantly on SSTR PET Evaluation of patients with biochemical evidence and symptoms of a NET Evaluation of patients with biochemical evidence of a NET without evidence on CI or a prior histologic diagnosis, Restaging at time of clinical or laboratory progression without progression on CI, New indeterminate lesion on CI with unclear progression.
Barrio, 2017 ¹³	Systematic review and meta-analysis	14 studies with a total of 1561 pts	<ul style="list-style-type: none"> Change in management occurred in 44% of NET Pts after SSTR PET/CT. 4/14 studies: SSTR PET/CT was performed after an 111In-Octreotide scan- SSTR PET/CT led to a change in management in 39% 7/14 studies differentiated btw inter and intramodality changes with most changes being intermodality
Lawal, 2017 ¹⁴	Retrospective review; reviewed 68Ga scans to assess detection of NETs	203 pts with NETs or other somatostatin expressing tumours	<ul style="list-style-type: none"> Most common tumour was gastroenteropancreatic NET (41% of pts) Most common sites of distant metastases: lymph nodes and the liver (34% and 30.5% respectively). PET detected foci of disease in 19 pts where CT was falsely negative. The sensitivity, specificity, PPV, NPV, and accuracy of 68Ga imaging was 94.16, 91.89, 95.55, 89.47, and 96.55% respectively. Conclusion: 68Ga is better than CT in detecting primary sites of disease and highly sensitive and specific for diagnosis and treatment of NETs.
Merola, 2017 ¹⁵	Retrospective analysis; patients received CT every 6mos unless tumour behavior	143 pts with metastatic entro-	<ul style="list-style-type: none"> FIT affected management in 73.4% of pts mostly when G2 vs G1.

Author, Year	Study Design and Description	Number of Patients	Results and Comments
	required shorter intervals and FIT every 12mos.	pancreatic NETs	<ul style="list-style-type: none"> Changes observed in a 12 mo time frame esp with pancreatic NETs vs small intestine NETs or metastases since diagnosis vs developed during follow up <u>Conclusion:</u> FITs used in addition to CT in the follow up of stage IV enteropancreatic NETs improve pt management esp for G2 tumours.
Panagiotidis, 2017 ¹⁶	Retrospective comparison of PET/CT and SUVs of 68Ga and 18F tracers	104 pts with NETs	<ul style="list-style-type: none"> 68Ga and 18F findings were discordant in 65 pts and concordant in 39pts The results changed the therapeutic plan in 84 pts. In 22 pts: decision making was based on 18F findings In 32 pts: based on findings with both radiotracers In 50 pts: based on the 68Ga results. Most frequent decision based on 18F was initiation of chemo (10 pts). Most frequent decision due to 68Ga was initiation of peptide receptor radionuclide therapy 14 pts. In 11/28 pts with poorly differentiated NETs the management decision was based only on the 18F results. For 68Ga, SUVmax was higher for G1 tumours and lower for G3 tumours. However, no sig differences in 18F derived SUVs were observed btw different grades. Mann-Whitney test showed significant differences in 68Ga SUVmax btw tumors with Ki-67 of less than 5% and tumors with Ki-67 of >5% OS declined rapidly with increasing grade at an est. 91mo for G1, 59mo for G2, and 48mo for G3. <u>Conclusion:</u> 18F had no clinical impact on G1 NETs and a moderate impact on G2 NETs. However in poorly differentiated NETs 18F played a significant role in combination with 68Ga. 68Ga SUVmax relates to grade and Ki-67 can be used prognostically. <u>Limitations:</u> Only patients with histologically proven NETs were enrolled restricted the possibility of specificity measurement; histology was not performed.
Sampathirao, 2017 ¹⁷	Retrospective study; analysis of confirmed NETs identified with conventional imaging (US, CT, MRI, and endoscopic US).	51 with met CUP-NETs who all underwent 68Ga and 18F imaging.	<ul style="list-style-type: none"> Unknown primary was detected on 68Ga in 31/51 pts Overall lesion detection sensitivities were 97.75%, 87.5%, 100%, 100%, and 66.67% respectively. 68Ga uptake decreased in metastatic and primary lesions (mean SUVmax= 43.5 and 22.68 g/dL in group 1 to 22.54 and 16.83 g/dL in group 5 respectively). 18F uptake showed gradual rise (mean SUVmax, 3.66 and 2.86g/dL in group 1 to 7.35 and 9.58g/dL in group 5 respectively). Corresponding decrease in 68Ga to 18F uptake ratio with increasing MIB-1/Ki-67 index <u>Conclusion:</u> The pattern of uptake on 68Ga and 18F correlates well with tumour proliferation index with a few outliers; combined PET/CT with MIB-1/Ki-67 index would aid in better whole body assessment of tumour biology in CUP-NETs. <u>Limitations:</u> Small population in each sub group.
Tirosh, 2017 ¹⁸	Retrospective analysis; correlations between biomarkers and 68Ga TV were analyzed	232 (112 pts with NETs)	<ul style="list-style-type: none"> 68Ga TV correlated with Cg-A (r=0.6, P=0.001, Spearman). In pts with MEN1 (n=39) 68Ga TV correlated with glucagon (r=0.5, P=0.01) and PP levels (r=0.5, P=0.049). In pts with von Hippel-Lindau (n=24), plasma VIP (r=0.5, P=0.02) and PP levels (r=0.7, P<0.001) correlated with 68Ga TV.

Author, Year	Study Design and Description	Number of Patients	Results and Comments
			<ul style="list-style-type: none"> In pts with SINET (n=74) 68Ga correlated with CgA (r=0.5, P=0.02) and 5-HIAA levels (r=0.7, P<0.001) with 5-HIAA >/=8.1mg/24 hr associated with met disease with high positive (81.8%) and negative (85.7%) PVs (P=0.001). 68Ga in pts with NETs of UK 1o (n=16) and those with NETs of other 1o location (n=30) correlated with 5-HIAA levels (r=0.8, P=0.002 and t=0.7, P=0.02 respectively). <u>Conclusion:</u> Data supports use of specific NET biomarkers based on the site of 1o NET and presence of hereditary syndrome associated NET. <u>Limitations:</u> The vast majority of the patients in the current study had gastroenteropancreatic (GEP) NETs which limits the ability to make strong conclusions about biomarkers utility among pt with primary tumors at other sites. Plasma CgA levels may be elevated in patients with atrophic gastritis and can lead to positive results, not all pts had endoscopy and biopsy to determine the presence of this.
Chang, 2016 ¹⁹	Retrospective review and analysis of lesional intensity and patterns of uptake.	23 pts with PGLs and PHEOs	<ul style="list-style-type: none"> 68Ga and 18F: positive at most sites of disease Uptake intensity : higher in 68Ga with a median SUV of 21 compare to 12.5 for FDG Overall 68Ga detected similar number but has significantly greater lesion-to-background contrast compared to 18F. <u>Conclusion:</u> 68Ga should be considered the ideal first line investigation for imaging. <u>Limitations:</u> <ul style="list-style-type: none"> Relatively small patient population with selection bias. Not all pts had MIBG studies to permit better comparison of newer molecular imaging techniques to the current molecular imaging gold standard in PGL and PCC imaging. Histopathology was not performed on all lesions to confirm the reasons for apparent differences in DOTATATE, FDG and MIBG uptake.
Deppen, 2016 ²⁰	Systematic review and meta-analysis; search of Medline, EMBASE, Web of Science, and Cochrane Reviews	42 eligible articles (974 pts)	<ul style="list-style-type: none"> Estimated 68Ga sensitivity 90.9% and specificity 90.6%. Report of harm possibly related to 68Ga rare (6 out of 974) and no study reported safety or toxicity issues. No literature comparing octreotide and 68Ga has been published.
Lastoria, 2016 ²¹	Prospective observational study. Diagnostic performance of 68Ga for detection of NET was evaluated as well as prognostic role of SUVmax.	18 pts with genetically confirmed MEN1	<ul style="list-style-type: none"> 68Ga uptake in 11/11 pts with pancreatic lesions, 9/12 with pituitary adenoma, 5/15 with parathyroid enlargements, and 5/7 with adrenal lesions. 68Ga showed sensitivity and specificity of 100% in pancreas, 83% in pituitary, 100% in parathyroids, and 100% in adrenals. Compared with CI no sig difference in sensitivity for pancreas, pituitary, and adrenals found while CI had a better sensitivity for parathyroids (P=0.002). On the ROC analysis progression of pancreatic lesions was significantly associated to SUVmax <12.3 (P<0.05). <u>Conclusion:</u> 68Ga is very helpful in work-up of MEN1 providing a panoramic view of lesion.
Moradi, 2016 ²²	Prospective study; assessment of PET/CT 1 hr after admin of 68Ga.	104 pts with NETs	<ul style="list-style-type: none"> High uptake (SUVmax>7): spleen, renal parenchyma, adrenal gland, pituitary gland, stomach, and liver (in decreasing order).

Author, Year	Study Design and Description	Number of Patients	Results and Comments
			<ul style="list-style-type: none"> Moderate uptake (3.5-7): prostate, jejunum, pancreas, ileum, and salivary glands. Mild uptake (2-3.5): uterus, colon, thyroid, rectum, and skeleton. 678 lesions were included in analysis including 127 benign and 54 intermediate lesions. Uptake significantly higher in malignant lesions than benign but overlap noted. <u>Conclusion:</u> 68Ga uptake in normal and abnormal structures is highly variable in pts with NET
Sadowski, 2016 ²³	Prospective study ; pts underwent an imaging modality in blinded fashion along with comprehensive biochemical testing.	131 with GEP NETs	<ul style="list-style-type: none"> 68Ga detected 95.1% of lesions, anatomic imaging detected 45.3% of lesions , and 111In detected 30.9% of lesions 4/14 pt: 68Ga found a previously unknown 1o tumour and detected 1o GEPNET, lymph node, and distant metastases correctly in 72/113 lesions (63.7%) when compared to histopathology with 22.1% and 38.9% detected with 111In and anatomic imaging respectively. On basis of findings of 68Ga 43/131 pts had a change in management recommendation. 68Ga detected lesions in 65.2% of pts, 40% of which were detected neither by anatomic imaging or 111In. <u>Conclusion:</u> 68Ga imaging provides important information for accurate staging of GEPNETs and selection of appropriate treatment even in absence of bchem evidence of disease symptoms. <u>Limitations:</u> <ul style="list-style-type: none"> Histopathology was not done for every lesion. No randomized controlled trial and follow-up to answer that whether the therapeutic options selected on the basis of 68Ga-DOTATATE PET/CT imaging resulted in improved long-term patient outcome. Number of lesions found in patients by using 68Ga-DOTATATE PET/CT imaging is an approximation of tumor burden and not a precise measurement of tumor mass/burden.
Skoura, 2016 ²⁴	Cross-sectional study; demographic data, clinical outcome, survival, and change in management after 68Ga were evaluated.	728 pts (1258 scans)	<ul style="list-style-type: none"> In most pts the 1^o site was located in midgut (26.4%). Analysis of NET grading in pts with known histopathologic data revealed that 35.7% had NET grade G1, 12.2% G2, and 8.7% G3. The most common indications for 68Ga were follow up (24.24%) and initial tumour staging (23.4%). Of the 1258 scans 75.7% were positive and 24.3% were negative- there were 14 false positive and 29 false negative scans. Sensitivity, specificity, accuracy, PPV, and NPV were 97%, 95.1%, 96.6%, 98.5%, and 90.4% respectively. In 40.9% of pts the treatment plan was changed after the scans owing to unexpected findings. Statistically significant differences in survival seen btw G1, G2, and G3 pts (P<0.0001) and also btw pts with bone mets vs soft tissue mets (P<0.0001). <u>Conclusion:</u> 68Ga scanning is safe and influences management in a large proportion of pts. <u>Limitations:</u> Retrospective study; some patients lost the follow-up. Patients received a wide variety of treatment regimens depending on the scan results, and this could not be controlled for in survival analysis.

Author, Year	Study Design and Description	Number of Patients	Results and Comments
Albanus, 2015 ²⁵	Prospective study; included grading, assessment, and consensus	54 Pts with NETs	<ul style="list-style-type: none"> • True positive lesions: PET/ceCT vs standalone ceCT detected 139 vs 48 bone lesions, 106 vs 71 lymph node metastases, and 26 vs 26 pulmonary lesions. • PET/ceCT achieved higher sensitivity (100% vs 47%) and specificity (89% vs 49%) for bone lesions than ceCT. • Lymph nodes: effect was similar (sensitivity 92% vs 64% and specificity 83% vs 59%). • Pulmonary: sensitivity identical while specificity of PET/ceCT was superior to ceCT-alone • <u>Conclusion</u>: PET/ceCT leads to an increase in sensitivity and specificity in detecting NET metastases compared to ceCT alone. • <u>Limitations</u>: Histological confirmation was not conducted for every single lesion.
Herrmann, 2015 ²⁶	Prospective physician survey; assessment of 68Ga scans for likelihood of NETs.	100 (age 18 and above) 88 questionnaires returned	<ul style="list-style-type: none"> • The indications for 68Ga were initial and subsequent treatment strategy assessments in 14% and 86% of pts respectively. • 68Ga led to change in suspicion for metastatic disease in 21pts and decreased in 9 and 12 pts respectively). • Intended management changes were reported in 53/88 of pts. • 20 pts scheduled to undergo chemo were switched to treatments without chemo and 6 were switched from watch-and-wait to other treatments. • 5 pts were switched from their initial treatment strategy to watch-and-wait. • <u>Limitations</u>: The surveyed physicians were all users of PET. The study evaluated only intended changes of treatment strategy and not implementation of intended management changes as well as the impact of PET on patient outcome. Heterogeneous group of patients were used.
Sadowski, 2015 ²⁷	Prospective study comparing 68Ga, 111P and triphasic CT scan to clinical, biochemical, and pathologic data	26 with MEN1	<ul style="list-style-type: none"> • 68Ga detected 107 lesions, 111In-P detected 33 lesions, and CT detected 48 lesions. • Lesions detected on 68Ga had high SUVmax (median 72.8 (range 19-191)). • In 7/26 pts (27%) 68Ga was positive with a negative 111In-P and in 10 pts (38.5%) additional metastases were detected (range 0.3-1.5cm). • In 8/26 pts (31%) there was a change in management recommendations as result of findings on 68Ga that were not seen on 111In-P and CT scan. • 68Ga more sensitive for detecting NETs than 111In-P and CT scan. This imaging technique should be integrated into radiologic screening and surveillance of pts with MEN1 b/c it can significantly later management. • <u>Limitations</u>: No follow-up on patients who had 68Gallium-DOTATATE-avid lesions to determine whether the amount of avidity correlates with disease progression. Histopathology was not done for every lesion.
Armbruster, 2014 ²⁸	Prospective study; DCE MRI and PET/CT using to find regions of interest	32 with liver mets from NETs	<ul style="list-style-type: none"> • AUC: Very high for SUVmean derived from 68Ga and 18F. • DCE-MRI parameters: arterial flow fraction and intracellular uptake fraction showed highest AUCs • Combination of DEC-MRI and PET-CT parameters resulted in highest AUC. • <u>Conclusion</u>: PET and DCE show high diagnostic accuracy in distinction btw liver metastases and liver tissue. Provide complementary information.

Author, Year	Study Design and Description	Number of Patients	Results and Comments
			<ul style="list-style-type: none"> <u>Limitations:</u> Only lesions >2 cm in size were imaged as lesions <1 cm would show lower sensitivity. Significant selection bias for identifying trace avid metastases as PET/CT examination with proven uptake on previous studies.
Armbruster, 2014 ²⁹	Prospective study; DCE MRI and PET/CT using either 18F or 68Ga as tracer	42 hepatic mets of NETs	<ul style="list-style-type: none"> Lesion-to-background ratios of arterial plasma flow and arterial flow fraction of liver metastases correlated negatively with lesion-to-background ratios of SUVmean derived from 68Ga, but correlated positively with lesion-to-background ratios of SUVmean derived from 18F Lesion-to-background ratios of DCE-MRI parameters extracellular mean transit time and extracellular volume correlated weakly with lesion-to-background ratios of SUVmean from 68Ga whereas venous plasma flow, total plasma flow, hepatic uptake fraction, and intracellular uptake rate showed no correlation. <u>Conclusion:</u> 68Ga and 18F correlate with MRI perfusion parameters from the dual-inlet, 2 compartment uptake model. Paired imaging methods deliver complementary functional information.
Yang, 2014 ³⁰	Systematic review and meta-analysis; included a comprehensive lit search of studies up to April 2013 on 68GA DOTATOC and DOTATATE.	10 studies with 416 pts	<ul style="list-style-type: none"> Pooled sensitivity of Ga-DOTATOC and DOTATATE calculated on per-pt basis and was 93% (95% CI=89-96%) and 96% (95% CI=91-99%). Pooled specificity of 68Ga DOTATOC and DOTATATE was 85% (95%CI=74-93%) and 100% (95%=82-100%). The area under the ROC curve of 68Ga DOTATOC and DOTATATE was 0.96 and 0.98 on per pt analysis. <u>Conclusion:</u> Both imaging modalities are highly sensitive and specific. 68Ga DOTATATE might be more sensitive and specific than 68Ga DOTATOC.
Schmid-Tannwald, 2013 ³¹	Retrospective study; two radiologists evaluated T2-weighted (T2w), T2w +DW MRI, T2w +contrast enhanced T1w MRI, and PET/CT.	18 pts with pancreatic NETs	<ul style="list-style-type: none"> NETs: 8/23 and 9/23 were detected on T2w images by observers 1 and 2 respectively. Detection rates improved significantly by combining T2w with DW MRI Detection rates with PET/CT were 100% for both observers and significantly higher than with MRI The mean ADC value of NET was significantly lower than that of normal pancreatic tissue <u>Conclusion:</u> (68)Ga-DOTATATE PET/CT is more sensitive than MRI in the detection of pancreatic NET.

Table 2: Relevant Published Guidelines

Guideline Developer	Recommendations
NCCN 2019 ³	Most NETs express high affinity receptors for Somatostatin, PET/CT Ga68 imaging could be used. This can provide overall tumor burden, location which confirms the location of Somatostatin receptor. Metastatic lungs, Carcinoid tumor
EJNMMI 2017 ³²	<p>⁶⁸GaPET/CT can be performed in patients with hypothyroidism and Kidney failure.</p> <ul style="list-style-type: none"> Activity 1.8–2.2 MBq 68Ga-PSMA per kilogram bodyweight Administration i.v., Flushing with at least the same volume of saline Uptake time 60 min (acceptable range: 50 to 100 min) CT Protocol FOV: base of the skull base to mid-thigh; Phase: portal venous (80 s after contrast agent, 1.5 mL per kilogram bodyweight) <p>Quality issues of the 68Ga-PSMA PET/CT study, e.g. motion artefacts, halo artefacts should be reported.</p>

Guideline Developer	Recommendations
ESMO 2012 ³³	<p>Overall survival of improved sensitivity by ⁶⁸Ga-DOTA- PET/CT is not answered yet.</p> <p>Somatostatin analog therapy is first-line therapy in all functional NET and small intestine NET G1/G2. In patients with R0/R1 resected Net G1/G2 , it is recommended that imaging is performed every 3-6 months (CT or MRI) and in NEC G3 performed every 2-3 months</p> <p>Somatostatin receptor imaging either Octreoscan or PET/Ct using Ga-DOTATATE should be included in the follow-up and is recommended after 18-24 months if expression of somatostatin receptor 2a has been proven on the tumor cells.</p> <p>Somatostatin receptor imaging besides standard imaging (CT and MRI) is part of standard of care.</p> <p>The diagnosis of NETs should be confirmed by histopathology.</p>
EJNMMI 2010 (Eur J Nucl Med Mol Imaging) ³⁴	<p>⁶⁸Ga-DOTA can be used in imaging of tumors other than NETs but</p> <p>⁶⁸Ga-DOTA-conjugated peptide PET/CT is recommended for high density SST-receptor, specifically</p> <ul style="list-style-type: none"> • Localized primary tumors and also detect site of metastatic • Follow up patients with known disease to detect residuals, recurrent and progressive disease. • Determine SST receptor status • Select patients with metastatic disease for SST receptor radio therapy (Lu177 or Y90 –DOTA) • Can't be used as first choice functional imaging modality in the management of patients with tumor other than NETs. • Sensitivity of ⁶⁸Ga-DOTA PET/Ct is likely to vary among <ul style="list-style-type: none"> ▪ Tumor types ▪ Density of SST-receptor <p>⁶⁸Ga-DOTA can't be useful for dosimetry.</p> <p>Activity administered ranges from 100 to 200 MBq. Maximum tumor activity is in between 70±20 min.</p> <p>Consideration</p> <ul style="list-style-type: none"> • Breastfeeding should be interrupted • Ionizing must be carefully evaluated in subjects less than 18 years of age. <p>In the case of diagnostic procedure for pregnancy people, it is necessary to consider the pros and cons.</p>

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Development and Revision History

This guideline was reviewed and endorsed by the Alberta Provincial Endocrine Tumour Team. Members include [surgical oncologists, radiation oncologists, medical oncologists, dermatologists, nurses, pathologists, and pharmacists]. Evidence was selected and reviewed by a working group comprised of members from the Alberta Provincial Endocrine Tumour Team, external participants identified by the Working Group Lead, and a methodologist from the Guideline Resource Unit. A detailed description of the methodology followed during the guideline development process can be found in the [Guideline Resource Unit Handbook](#).

This guideline was originally developed in 2021.

Maintenance

A formal review of the guideline will be conducted in 2023. If critical new evidence is brought forward before that time, however, the guideline working group members will revise and update the document accordingly.

Abbreviations

CT, Computed Tomography; DOTATATE, DOTA-DPhe1Tyr3-octreotate; FDG, F-fluorodeoxyglucose; NET, Neuroendocrine tumours; PRRT, Peptide receptor radionuclide therapy; PET, Positron emission tomography,

Disclaimer

The recommendations contained in this guideline are a consensus of the Alberta Provincial Endocrine Tumour Team and are a synthesis of currently accepted approaches to management, derived from a review of relevant scientific literature. Clinicians applying these guidelines should, in consultation with the patient, use independent medical judgment in the context of individual clinical circumstances to direct care.

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Conflict of Interest Statements

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* Guideline working group lead