04-78000-15

Original Effective Date: 11/15/01

Reviewed: 07/2/24

Revised: 05/15/24

Subject: FDG-SPECT

DESCRIPTION:

FDG-SPECT, also referred to as metabolic SPECT (single photon emission computed tomography), or PET using a gamma camera, is a general term describing imaging techniques in which a SPECT camera is used to take images of internal organs (e.g., heart). FDG SPECT imaging of the heart shows the live heart muscle and are usually performed on patients who may have had a heart attack. The information from a FDG SPECT may provide information regarding how much live heart muscle in relation to permanently damaged muscle is left to benefit from angioplasty or surgery.

FDG is an abbreviated name for Fluorodeoxyglucose (2-deoxy-2- [18F] fluoro-D-glucose). Radio-labeled 2-fluoro-2-deoxy-D-glucose (FDG) is a radiotracer used in two nuclear medicine imaging modalities: positron emission tomography (PET) and SPECT. FDG is administered intravenously and is used to determine how certain organs and tissues in the body are functioning at the cellular level by measuring glucose metabolism. FDG is widely used for functional studies in neurology, cardiology, and oncology.

Once FDG is injected into the body, FDG emits a positron that interacts with an electron in the body. This interaction creates a gamma ray with a 511keV energy level that exits the body and is detected by the PET or SPECT camera. SPECT cameras are conventionally used to provide anatomic and functional images. When SPECT is used in conjunction with FDG, SPECT cameras can provide images reflecting the anatomy and metabolic activity of tissues, similar to PET scanning.

FDG-SPECT imaging describes two general techniques. In one technique, SPECT cameras are adapted with collimators that screen out the lower energy photons and thus only detect the high-energy 511 ke-V photons. For the purpose of this policy, this technique will be referred to as FDG-collimated-SPECT. In the second technique, a dual-headed rotating SPECT camera can be operated in the "coincidence mode", meaning that the camera will only count those photons that are simultaneously detected at 180 degrees from one another (referred to as FDG-DHC dual-head coincidence-SPECT).

Summary and Analysis of Evidence: In a review, Slart et al (2006) found that the assessment of myocardial viability has become an important aspect of the diagnostic and prognostic work-up of patients with ischemic cardiomyopathy. Although revascularization may be considered in patients with sufficient viable myocardium, patients with predominantly scar tissue should be treated medically. Patients with left ventricular dysfunction who have viable myocardium are the patients at highest risk because of the potential for ischemia but at the same time benefit most from revascularization. It is important to identify viable myocardium in these patients, and radionuclide myocardial scintigraphy is an excellent tool for this. Single-photon emission computed tomography perfusion scintigraphy (SPECT), whether using (201)thallium, (99m)Tc-sestamibi, or (99m)Tc-tetrofosmin, in stress and/or rest protocols, has consistently been shown to be an effective modality for identifying myocardial viability and guiding appropriate management. Metabolic and perfusion imaging with positron emission tomography (PET) radiotracers frequently adds additional information and is a powerful tool for predicting which patients will have an improved outcome from revascularization. New techniques in the nuclear cardiology field, like attenuation corrected SPECT, dual isotope simultaneous acquisition (DISA) SPECT and gated FDG PET are promising and will further improve the detection of myocardial viability. Also the combination of multislice computed tomography scanners with PET opens possibilities of adding coronary calcium scoring and non-invasive coronary angiography to myocardial perfusion imaging and quantification. Evaluation of the clinical role of these creative new possibilities warrants investigation.

In a 2013 practice guideline, Dorbala and colleagues note that cardiac ^{18}F-FDG imaging is performed for assessment of myocardial viability and for identifying cardiac inflammation (e.g., sarcoidosis). Preliminary retrospective studies suggest high accuracy and superiority compared with 67Ga imaging (38). Fasting 18F-FDG imaging may result in variable physiologic myocardial glucose uptake. Hence, to ensure uptake by inflamed tissue but optimize suppression of 18F-FDG uptake by normal myocytes (reduce nonspecific uptake), patients are instructed to take a diet rich in fats with no carbohydrates for 12–24 h before the test or fast for 12–18 h and/or use intravenous heparin, 15–50 units/kg, about 15 min before the injection of 18FFDG (40,41). A rest MPI study (SPECT or PET, preferably a gated scan) is first performed.

POSITION STATEMENT:

FDG-SPECT **meets the definition of medical necessity** when used to evaluate myocardial viability in patients with known coronary artery disease.

FDG-SPECT is considered **experimental or investigational** for all other indications. The evidence is insufficient evidence in the published peer-reviewed scientific literature to support conclusions regarding the effects of FDG-SPECT on health outcomes.

BILLING/CODING INFORMATION:

HCPCS Coding

S8085	Fluorine-18 fluorodeoxyglucose (F-18 FDG) imaging using dual-head coincidence detection system (non-dedicated PET scan).

ICD-10 Diagnosis Codes That Support Medical Necessity

I25.10	Atherosclerotic heart disease of native coronary artery without angina pectoris
I25.110 – I25.119	Atherosclerotic heart disease of native coronary artery with angina pectoris
I25.700 – I25.709	Atherosclerosis of coronary artery bypass graft(s), unspecified, with angina pectoris
I25.710 – I25.719	Atherosclerosis of autologous vein coronary artery bypass graft(s) with angina pectoris
I25.720 – I25.729	Atherosclerosis of autologous artery coronary artery bypass graft(s) with angina pectoris
I25.730 – I25.739	Atherosclerosis of nonautologous artery coronary artery bypass graft(s) with angina pectoris
I25.750 – I25.759	Atherosclerosis of native coronary artery of transplanted heart with angina pectoris
I25.760 – I25.769	Atherosclerosis of bypass graft of coronary artery of transplanted heart with angina pectoris
I25.790 – I25.799	Atherosclerosis of other coronary artery bypass graft(s) with angina pectoris
I25.810 – I25.812	Atherosclerosis of coronary vessels without angina pectoris

REIMBURSEMENT INFORMATION:

Refer to section entitled **POSITION STATEMENT**.

PROGRAM EXCEPTIONS:

Federal Employee Program (FEP): Follow FEP guidelines.

State Account Organization (SAO): Follow SAO guidelines.

Medicare Advantage products:

No Local Coverage Determination (LCD) were found at the time of the last guideline reviewed date.

The following National Coverage Determinations (NCDs) was reviewed on the last guideline reviewed date: Single Photon Emission Computed Tomography (SPECT), (220.12) located at cms.gov.

DEFINITIONS:

No guideline specific definitions apply.

RELATED GUIDELINES:

None applicable.

OTHER:

Other names used to report FDG-SPECT:

Camera-based imaging

REFERENCES:

1. Blue Cross Blue Association Medical Policy Reference Manual FDG Using Camera-Based Imaging (FDG-SPECT), Archived 12/03/2009.
2. Delbeke D, Martin WH, Patton JA et al. Value of Iterative Reconstruction, attenuation Correction, and Image Fusion in the Interpretation of FDG PET Images with an Integrated Dual-Head Coincidence Camera and X-Ray-based Attenuation Maps. Radiology 2001; 218:163-171.
3. Dorbala S, Di Carli MF, Delbeke D, et al. SNMMI/ASNC/SCCT guideline for cardiac SPECT/CT and PET/CT 1.0. J Nucl Med. 2013 Aug;54(8):1485-507.
4. Mastin ST, Drane WE, Harman EM et al. FDG SPECT in Patients with Lung Masses. Chest 1999; 115:1012-1017.
5. Schinkel AFL, Poldermans D, Elhendy A et al. Assessment of Myocardial Viability in Patients with Heart Failure. Journal of Nuclear Medicine 2007; 48 (7):1135–1146.
6. Slart RH, Bax JJ, van Veldhuisen DJ, et al. Imaging techniques in nuclear cardiology for the assessment of myocardial viability. Int J Cardiovasc Imaging. 2006 Feb;22(1):63-80. [Abstract]

COMMITTEE APPROVAL:

This Medical Coverage Guideline (MCG) was approved by the Florida Blue Medical Policy and Coverage Committee on 07/25/24.

GUIDELINE UPDATE INFORMATION:

11/15/01	New Medical Coverage Guideline.
11/15/02	Guideline revised to include reimbursement statement for codes 78890 and 78891.
12/15/02	Annual review, no change in guideline.
03/15/04	Annual review. Amended the description section. Revised the investigational statement. Added rationale for the investigational statements for: cardiac and oncologic applications and neurologic disorders. Also removed "(Metabolic SPECT)" from title.
01/01/05	HCPCS update. Deleted code 78990.
03/15/05	Scheduled review. No change in coverage statement. Updated references.
04/15/06	Annual review, no change in coverage statement. Added code A9552.
04/15/07	Scheduled review. No change in coverage statement.
06/15/07	Reformatted guideline.
04/15/08	Scheduled review. Expanded ICD-9 diagnoses code range for coronary atherosclerosis, to include 414.06 and 414.07. Updated references.
05/15/09	Annual review. No change in position statements. Updated references.
01/15/11	Revision; related ICD-10 codes added.
05/11/14	Revision: Program Exceptions section updated.
10/15/15	Revision; updated ICD9 and ICD10 coding section. Updated references.
11/01/15	Revision: ICD-9 Codes deleted.
04/15/17	Code update; deleted A9552.
02/15/18	Review; no change in position statement. Updated references.
08/15/20	Review; no change in position statement. Updated references.
08/15/22	Review; revised position statement.

08/15/24	Review; no change in position statement. Updated references.