CARDIOVASCULAR FDG PET REQUISITION

SPECIAL ACCESS INDICATIONS

Submission (with supporting document) / Information

CardiacFDGPET@ottawaheart.ca

(613) 696-7104 *(613) 696-7000 ext.14869* *New

*Last Name _____ *First Name _____ Middle Initial _____

*OHIP # _____ Version _____ *Postal Code _____ *Phone# (xxx) xxx-xxxx _____

*Sex ☐ M ☐ F ☐ Other

*Date of Birth (yyyy-mm-dd) _____

Preferred language ☐ English ☐ French ☐ Other

*** Choose a PET centre below:**

- ☐ Ottawa – University of Ottawa Heart Institute
- ☐ Mississauga – KMH Cardiology Centres Inc.
- ☐ Toronto – Princess Margaret Cancer Centre
- ☐ Hamilton – McMaster University Medical Centre
- ☐ London – LHSC Victoria Hospital PET Centre
- ☐ Toronto – Sunnybrook Health Sciences Centre

***Priority:**

- ☐ **Inpatient**
- ☐ **Outpatient-Urgent**
- ☐ **Outpatient**

SUPPORTING DOCUMENTATION REQUIRED (recent < 12 months clinical/consult notes, MR, thoracic CT, echo, holter, ecg, labwork)

I. Indications (choose only one indication and check all applicable boxes per indication)

☐ **A. MYOCARDIAL VIABILITY ASSESSMENT (Candidates for cardiac revascularization, transplant or procedures with ischemic LV dysfunction & EF >40%)**

☐ **B. CARDIAC SARCOIDOSIS** (CS)** Click to see indications for expanded definitions

- ☐ **Patients with idiopathic sustained or non-sustained VT and/or high PVC burden >10%**
- ☐ **Patients with a clinical diagnosis of non-ischemic cardiomyopathy to screen for underlying etiology**
- ☐ **Patients with possible arrhythmogenic right ventricular cardiomyopathy**
- ☐ **Other: Patients who do not meet pre-approved criteria and require special access review, Specify:** _____

Required documentation for ALL CS evaluation => recent clinic/consult note and one or both of the following:

- ☐ **Cardiac MRI suggestive of CS**
- ☐ **Abnormal CT thorax suggestive of pulmonary sarcoidosis and/or hilar or mediastinal lymphadenopath**

☐ **C. CARDIOVASCULAR INFLAMMATION OR INFECTION**** Click to see indications for expanded definitions

- ☐ **Implantable Cardiovascular Devices**
- ☐ **Infective Endocarditis**
- ☐ **Myocarditis**
- ☐ **Pericarditis**
- ☐ **Aortitis**
- ☐ **ARVC,AIC**
- ☐ **Vasculitis**
- ☐ **Other Infection or Inflammatory process (specify)** _____

Note: Cardiac FDG PET imaging may not be able to distinguish CS scar and inflammation from hibernating myocardium or other forms of myocardial inflammation. This should be considered when ordering the test and interpreting the findings

Clinical Information **Required

****Ketogenic diet** prep is required for all cardiac sarcoidosis imaging and/or investigation of infection/inflammation affecting the heart or its adjacent structures. Click to see detail

II. Prior Relevant Testing (Check all that apply)

☐ Cardiac MRI ☐ ECHO ☐ Coronary Angio ☐ Pulmonary Testing ☐ Other Test (specify below)

☐ Thoracic CT ☐ Stress Imaging ☐ Cardiac CTA ☐ MUGA _____

III. Pertinent Clinical Information (Indicated 'Yes' or 'No' for all)

NYHA Class ☐ II ☐ III ☐ IV | MI in past 30 days ☐ Yes ☐ No | Previous PCI ☐ Yes ☐ No

Diabetes ☐ Yes ☐ No | Pacemaker/AICD/CRT ☐ Yes ☐ No | Previous CABG ☐ Yes ☐ No

Physician Contact (complete all sections):

*Name (print) _____ Last Name _____ First Name

*Phone # _____ ext. _____

*Fax # _____ (xxx)-xxx-xxxx

*Email@ _____ *Required

*Date of request _____ (yyyy-mm-dd)

Data Centre Use Only

Date Received: ☐☐☐☐/☐☐/☐☐

Date Authorized: ☐☐☐☐/☐☐/☐☐ (yyyy-mm-dd)

Authorized by: _____

	Reviewers	*Approved*
		☐ Yes ☐ No
		☐ Yes ☐ No
		☐ Yes ☐ No

Final Approved : ☐ Yes ☐ No ☐ Incompleted

FDG-PET ID: ☐☐ – ☐☐☐☐ – ☐☐☐☐ (PET centre – number – ID)

(ver.2023-06)

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Indications for Cardiac FDG PET in the evaluation of CARDIAC SARCOIDOSIS (CS)*

Return to Requisition

All supporting documentation must be obtained within 12 months of the request for imaging.

Part 1 – PRE-APPROVED INDICATIONS: Cardiac FDG PET Special Access Program review IS NOT required. Patients must meet pre-approved criteria outlined below. Complete the Cardiac FDG PET requisition and submit directly to your local PET centre.

1. Patients presenting with biopsy proven or clinical diagnosis of pulmonary/systemic sarcoidosis with MRI findings suggestive of cardiac sarcoidosis to screen for cardiac involvement.
Submit recent cardiac MRI report suggestive of CS **and** current clinical consult and/or biopsy report.

2. Patients, presenting at age ≤ 70 years, with unexplained, significant high grade conduction system disease (Mobitz II 2nd or 3rd degree AV block) to screen for CS as underlying etiology. Submit ECG/holter AND current consult/documented history

3. FOLLOW UP RESPONSE TO TREATMENT in patients with positive baseline FDG PET consistent with cardiac sarcoidosis

- **To assess response to treatment when considering a change in treatment** (add or remove immunosuppressants and/or steroids; trial therapy cessation).
- **To assess for disease relapse after a period of planned therapy cessation** (previously suppressed FDG uptake required)
- **To assess for disease relapse, after a period of therapy cessation AND new clinical deterioration** (new ventricular arrythmia and/or deterioration in RV or LV function; previously suppressed FDG uptake required)

A maximum of 3 follow-up scans may be booked up to 3 years post initial diagnostic FDG PET scan.

PART 2. SPECIAL ACCESS APPROVAL REQUIRED: Cardiac FDG PET Special Access Program approval IS REQUIRED if your patient meets the following criteria. Supporting documentation MUST be submitted and include recent (≤ 12 months) clinical/ consult notes, investigations including Cardiac MR, thoracic CT, echo (TEE, TTE), lab report, holter report &/or ECG's.

CLINICAL INDICATION	PATIENTS MUST MEET THE FOLLOWING CRITERIA
4. In patients with idiopathic sustained or non-sustained ventricular tachycardia (VT) and/or high PVC burden >10%, to screen for CS as underlying etiology.	Idiopathic sustained VT is defined as VT **not** fulfilling any of the following criteria • Typical outflow tract VT • Fascicular VT • VT secondary to other structural heart disease (coronary artery disease, any cardiomyopathy other than idiopathic). **AND ONE OR BOTH OF** • Abnormal CT OR MRI THORAX showing findings suggestive of pulmonary sarcoidosis and/or hilar or mediastinal lymphadenopathy • Cardiac MRI suggestive of cardiac sarcoid
5. In patients with a clinical diagnosis of non-ischemic cardiomyopathy, to screen for CS as underlying etiology.	**AND ONE OR BOTH OF** • Abnormal CT OR MRI THORAX showing findings suggestive of pulmonary sarcoidosis and/or hilar or mediastinal lymphadenopathy • Cardiac MRI suggestive of cardiac sarcoid
6. In patients with possible arrhythmogenic right ventricular cardiomyopathy, to screen for CS as possible alternative diagnosis	**AND ONE OR BOTH OF** • Abnormal CT OR MRI THORAX showing findings suggestive of pulmonary sarcoidosis and/or hilar or mediastinal lymphadenopathy • Cardiac MRI suggestive of cardiac sarcoid

* **Note**: Cardiac FDG PET imaging may not be able to distinguish CS scar and inflammation from hibernating myocardium or other forms of myocardial inflammation. This should be considered when ordering the test and interpreting the findings.

Diet preparation (high fat, low carbohydrate, low protein) is a requirement for optimal image results using FDG PET.
Click here for the required Ketogenic Diet preparation.

As a condition of special access approval for FDG PET investigation of cardiac sarcoidosis, all patients should be referred to a CS specialist.
Please forward questions or concerns to cardiacfdgpet@ottawaheart.ca

CARDIOVASCULAR FDG PET SPECIAL ACCESS PROGRAM Return to Requisition

INDICATIONS FOR FDG PET FOR CARDIOVASCULAR INFLAMMATION AND INFECTION: All requests MUST be accompanied by supporting documentation, obtained within the past 12 months, including but not limited to clinical/ consult notes, recent investigations ie. Cardiac MR, thoracic CT, echo (TEE, TTE), lab report, holter report &/or ECG's.

ACCEPTED CLINICAL INDICATION	MUST MEET ONE OR MORE OF THE FOLLOWING CRITERIA
1. Infection in Implantable Cardiovascular Devices such as pacemaker, ICD, CRT, or left ventricular assist devices (LVAD) where there is a high clinical suspicion and/or laboratory evidence of infection	- Generator pocket and/or endovascular lead infection The diagnosis of infection has been made and there is: - Suspected extra-cardiac complications (i.e. septic emboli)
2. Infective endocarditis (using modified Duke criteria) **Graft infection** where there is a high clinical suspicion with laboratory evidence of infection such as aortic or iliac grafts	- Rejected infective endocarditis (according to modified Duke Criteria), but clinical suspicion is high - Definite infective endocarditis or graft infection with: - Suspicion of extra-cardiac complications (septic emboli - Suspicion of cardiac complications (perivalvular abscess) - High clinical suspicion for infected graft (including positive blood culture)
3. Pericarditis	- Persistent symptoms despite 2 weeks of adequate therapy - Recurrent pericarditis/symptoms despite adequate treatment of the initial episode - Assess response to therapy 4 weeks after therapy initiation
4. Myocarditis	- Recurrent symptoms or lack of LV function recovery despite adequate treatment of the initial episode - Persistent elevated troponin levels - Chest pain or shortness of breath, signs, and symptoms of myocarditis post mRNA vaccine where knowledge of extent of inflammation would change management.
5. Aortitis/Vasculitis such as large vessel vasculitis (LVV) or Polymyalgia rheumatica (PMR)	- High clinical suspicion including elevated inflammatory biomarker with negative imaging or biopsy workup
6. Unexplained cardiomyopathy and ventricular arrhythmia (ARVC, AIC)	- Ventricular arrhythmia in the setting of unexplained cardiomyopathy, despite adequate investigation, including referral/consultation with an EP (electrophysiology) specialist.
7. Other Cardiovascular Infection or Inflammatory processes	*Cardiac FDG PET Special Access will consider other cardiovascular infection/inflammation processes on a case by case basis, such as assessment of cardiac masses, rheumatologic disorders or systemic multiple differential inflammatory diagnoses based on MRI/CT imaging. Compelling evidence accompanied by supporting documents must be provided.* ***Consensus of 3 expert panel reviewers will be required for approval.***

**** Ketogenic diet prep is required for all cardiac sarcoidosis imaging and/or investigation of infection/inflammation affecting the heart or its adjacent structures**.

Click **here for required Ketogenic diet prep.**

Please forward questions or concerns to cardiacfdgpet@ottawaheart.ca

ver June 2023

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French Version

University of Ottawa Heart Institute Ketogenic diet (high fat, high protein, low carbohydrate) preparation for FDG PET Imaging of cardiac inflammation

The Ketogenic diet is a high fat, high protein, and low carbohydrate diet that you need to follow for one day before your scan. Following this diet will help improve the imaging pictures obtained from your scan. The Ketogenic diet is safe to follow and is approved for use for one day as preparation for the scan.

Why do I need to change my diet the day before the scan?

The purpose of the scan is to find abnormal areas in your heart. The muscle cells of the heart absorb and use glucose (sugar) for energy. The PET imaging scan uses Fluorodeoxglucose (FDG), a sugar based tracer. When we inject FDG, normal healthy heart muscle cells will absorb FDG because it is a sugar. FDG PET imaging allows the doctors to see areas of the heart that are normal or abnormal.

In certain conditions, such as sarcoidosis or other inflammatory conditions, we do not want the normal heart muscle cells to absorb the FDG because it interferes with the imaging pictures. The ketogenic diet helps ensure high quality images because the high fat content of the diet forces the body to choose fats for fuel and energy rather than carbohydrates (sugars). Therefore, the normal cells are 'tricked' into using fat as energy and the FDG is not absorbed. As a result, only the abnormal areas of the heart are seen.

To follow the ketogenic diet, you must choose high fat and protein foods and avoid carbohydrate foods for the entire day before your scan. High fat and protein foods include meat, fatty fish such as salmon and tuna, eggs, vegetable oil, margarine, and butter. Carbohydrate (sugar) is found in all grains, starchy vegetables, all fruit and dairy products. We have provided a sample menu and food choices below to help you with your food choices.

If you have diabetes, please contact your diabetes doctor or nurse. Your diabetes medications and/or insulin will need to be adjusted so you do not get low blood sugars while following this diet. This diet is only for one day and your diabetes can be managed while you follow the diet.

In addition to following the ketogenic diet, you must also avoid strenuous exercise the day before your scan. You must not eat or drink anything (except water) before the scan. It is important that you drink two to three -12 ounce (355 ml) glasses of water through the day to stay adequately hydrated.

Return to Requisition

Diet preparation for FDG PET Imaging of cardiac inflammation

Return to Requisition

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FOR 1 DAY BEFORE YOUR SCAN: Follow a high fat, high protein, low carbohydrate diet as described below.

FOR 12 HOURS BEFORE YOUR SCAN: Do not eat or drink anything (except water).

SAMPLE MENU FOR THE DAY BEFORE YOUR SCAN

BREAKFAST	LUNCH	DINNER
✓ 2 scrambled eggs with green peppers, mushrooms, onions ✓ 3 slices of bacon or 2 ounces of ham ✓ Coffee or tea × No milk or sugar	✓ Hamburger patty (no bun) or 3 ounces of roast beef or turkey ✓ 1 cup of salad ✓ Low carbohydrate vegetables – see list below	✓ 4 to 6 ounces of steak or salmon or chicken (skin on) × No breading or batter ✓ 1 cup of salad ✓ Low carbohydrate vegetables – see list below

✓ YOU CAN EAT/DRINK THE FOLLOWING:

✓ **Beverages without sugar:**	✓ water, mineral water, seltzer, coffee or tea or herbal tea (no milk or sugar*) * you can use Equal, NutraSweet, Splenda, Stevia, Sweet'N Low
✓ **Meat and alternatives:**	✓ eggs, bacon, ham, fatty red meat, chicken or turkey (skin on), salmon, tuna, sardines, anchovies (Fry or broil your meat. Do not grill. Do not bread or batter.)
✓ **Fats/Oils and seasonings:**	✓ butter, margarine, canola oil, olive oil, salt, pepper
✓ **Nuts:**	✓ ¼ cup of almonds or walnuts or pistachios
✓ **Low carb vegetables in moderation:**	✓ ½ to 1 cup of any of the following: arugula, asparagus, broccoli, Brussels sprouts, cabbage, cauliflower, celery, cucumber, green beans, green peppers, kale, lettuce, onions, radishes, spinach, white mushrooms, zucchini

× DO NOT EAT/DRINK THE FOLLOWING:

× **NO fruits** × **NO sugar or any food containing sugar:** *Be careful – many processed products contain hidden sugars.*	× honey × ketchup × molasses × BBQ sauce × syrup × mustard × peanut butter × beer nuts × jam/preserves × relish × nut butter × candy/mints × mayonnaise/Miracle Whip × Nutella × chewing gum × commercial salad dressings (e.g. Ranch, Thousand Islands) × cough drops
× **NO beverages containing sugar or Aspartame or alcohol:**	× soft drinks × fruit drinks (e.g. Kool-Aid, Tang) × beer × flavoured water × sports drinks (e.g. Gatorade) × wine × juices × non-alcoholic beer × spirits
× **NO dairy products:**	× milk × yogurt × frozen yogurt × pudding × cheese × yogurt drinks × ice cream
× **NO processed meats:**	× deli meat × hot dog × breaded or battered meat/poultry/fish
× **NO grains or starches:**	× wheat × rice × bread × granola bars × rye × pasta × bagels × cakes × oats × quinoa × buns × cookies × barley × buckwheat × cereals × muffins
× **NO root or starchy vegetables:**	× carrots × potatoes × beets × corn × turnips × sweet potatoes × acorn squash × green peas × parsnips × yams × butternut squash
× **NO beans or legumes:**	× black beans × chick peas × baked beans × peanuts × kidney beans × split peas × lentils

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Régime cétogène (forte teneur en gras et en protéines, faible teneur en glucides) de l'Institut de cardiologie de l'Université d'Ottawa en vue d'un examen d'imagerie par TEP pour détecter une inflammation cardiaque

Le régime cétogène est un régime à forte teneur en gras et en protéines, et à faible teneur en glucides que vous devez suivre la journée précédant votre examen. En vous alimentant selon ce régime, vous contribuerez à améliorer les images tirées de votre examen. Le régime cétogène est sûr et approuvé pour une journée à titre de préparation à la TEP.

Pourquoi dois-je modifier mon alimentation la veille de mon examen?

Cet examen vise à mettre en évidence les zones anormales de votre cœur. Les cellules musculaires du cœur absorbent le glucose (sucre) et l'utilisent comme source d'énergie. L'examen d'imagerie par TEP utilise le fluorodéoxyglucose (FDG), un traceur à base de sucre. Quand nous injectons le FDG, les cellules musculaires normales du cœur l'absorbent parce qu'il s'agit d'un sucre. L'imagerie par TEP au FDG permet aux médecins de voir les zones du cœur qui sont normales ou anormales.

Dans certaines conditions, notamment en présence de sarcoïdose ou d'autres états inflammatoires, nous ne voulons pas que les cellules musculaires normales du cœur absorbent le FDG, car cela interférerait avec les images de l'examen. Le régime cétogène garantit l'obtention d'images de très haute qualité, car le régime à forte teneur en gras force le corps à choisir les graisses comme combustible et énergie à la place des glucides (sucres). Ainsi, les cellules normales sont « trompées » et poussées à utiliser le gras comme source d'énergie, de sorte que le FDG n'est pas absorbé. Par conséquent, seules les zones anormales du cœur sont visibles.

Pour suivre le régime cétogène, vous devez privilégier des aliments à haute teneur en gras et en protéines, et éviter les glucides pendant toute la journée précédant votre examen d'imagerie. Les aliments riches en gras et en protéines incluent les viandes, les poissons gras (tels que le saumon et le thon), les œufs, l'huile végétale, la margarine, et le beurre. Les glucides (sucres) se trouvent dans tous les produits céréaliers, légumes farineux, fruits et produits laitiers. Vous trouverez ci-dessous un exemple de menu et une liste d'aliments pour vous aider à choisir des aliments appropriés.

Si vous êtes diabétiques, veuillez communiquer avec votre médecin ou votre infirmière en diabète. La posologie de votre insuline ou de vos médicaments contre le diabète devra être ajustée pour qu'en suivant ce régime votre taux de sucre dans le sang ne soit pas trop bas. Vous devez suivre ce régime pendant une journée seulement, et votre diabète peut être traité pendant cette période.

En plus de suivre un régime cétogène, vous devez éviter de faire des exercices vigoureux la veille de votre examen d'imagerie. Vous devez aussi vous abstenir de manger ou de boire (sauf de l'eau) pendant les 12 heures avant l'examen. Il est important que vous buviez deux à trois verres d'eau de 12 onces (355 ml) pendant la journée pour rester bien hydraté.

Return to Requisition

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Régime pour l'examen d'imagerie par TEP pour détecter une inflammation cardiaque

LA JOURNÉE AVANT L'EXAMEN: **Suivre** un régime à forte teneur en gras et en protéines, et à faible teneur en glucides, tel que l'exemple ci-dessous.

PENDANT LES 12 HEURES AVANT L'EXAMEN: Ne rien manger ou boire (sauf de l'eau).

EXEMPLE DE MENU LA JOURNÉE AVANT L'EXAMEN

DÉJEUNER	DÎNER	SOUPER
✓ 2 oeufs brouillés avec poivrons verts, champignons, oignons ✓ 3 tranches de bacon ou 2 onces de jambon ✓ Café ou thé × Sans lait ni sucre	✓ Galette de viande hachée (pas de pain) ou 3 onces de rôti de boeuf ou de dinde ✓ 1 tasse de salade ✓ Légumes faibles en glucides – voir la liste ci-dessous	✓ 4 à 6 onces de steak ou saumon ou poulet (avec la peau) × Pas de chapelure ni de pâte ✓ 1 tasse de salade ✓ Légumes faibles en glucides – voir la liste ci-dessous

✓ VOUS POUVEZ MANGER OU BOIRE:

✓ **Boissons sans sucre:**	✓ eau, eau minérale, eau de Seltz, café ou thé ou tisane (sans lait ni sucre*) * vous pouvez utiliser Equal, NutraSweet, Splenda, Stevia, Sweet'N Low
✓ **Viandes et substitus:**	✓ oeufs, bacon, jambon, viande rouge grasse, poulet ou dinde (avec la peau), saumon, thon, sardine, anchois (Frit ou grillé, mais pas rôti. Pas de chapelure ni de pâte.)
✓ **Gras, huiles et assaisonnements:**	✓ beurre, margarine, huile de canola, huile d'olive, sel, poivre
✓ **Noix:**	✓ ¼ tasse d'amandes ou de noix de Grenoble ou de pistaches
✓ **Légumes faibles en glucides avec modération:**	✓ ½ à 1 tasse d'un des légumes suivants: asperges, brocoli, céleri, champignons blanc, chou, chou frisé, choux de Bruxelles, concombre, chou-fleur, courgettes, épinards, haricots verts, laitue, oignons, poivrons verts, radis, roquette

× NE PAS MANGER NI BOIRE:

× **PAS DE fruits** × **PAS DE sucre ou produits contenant le sucre.** *Soyez prudent – les aliments transformés peuvent contenir des sucres ajoutés.*	× miel × ketchup × mélasse × sauce BBQ × sirop × moutarde × beurre d'arachide × noix rôties au miel × confiture × relish × beurre de noix × bonbons/menthes × mayonnaise/Miracle Whip × Nutella × gommes à mâcher × vinaigrettes commerciales (e.g. Ranch, Mille-Îles) × gouttes contre la toux
× **PAS DE boissons contenant le sucre, l'Aspartame ou l'alcool:**	× boissons gazeuses × boissons aux fruits (e.g. Kool-Aid, Tang) × bière × eaux aromatisées × boissons énergétiques (e.g. Gatorade) × vin × jus × bière sans alcool × spiritueux
× **PAS DE produits laitiers:**	× lait × yogourt × yogourts glacés × pudding × fromage × boissons de yogourt × crème glacée
× **PAS DE viandes transformées:**	× panées ou enrobées de pâte à frire × produits de charcuterie × hot-dogs
× **PAS DE produits céréaliers et féculents:**	× blé × riz × pain × barres granola × seigle × pâtes × bagels × gâteaux × avoine × quinoa × brioches × biscuits × orge × sarrasin × céréales × muffins
× **PAS DE légumes racines et farineux:**	× carotte × pomme de terre × betteraves × maïs × navet × patate douce × courge poivrée × pois verts × panais × igname × courge musquée
× **PAS DE haricots et légumineuses:**	× haricots noirs × pois chiches × fèves au lard × arachides × haricots rouges × pois cassés × lentilles