

# PET/CT Patient Information (Cardiac Sarcoidosis)

BC Cancer's provincial Molecular Imaging and Therapy program operates the only three publicly-funded clinical PET/CT scanners in the province. Two scanners are located at its Vancouver site while the other scanner is located at its Victoria site. An additional scanning facility is in development at its Kelowna site and is expected to open in summer/fall 2020.

BC Cancer also operates a PET cyclotron/radiopharmacy facility at its Vancouver site that produces the radiotracers used in PET/CT scanning at all its provincial locations.



## PET, CT, and PET/CT

Positron Emission Tomography (PET) detects increases in cellular metabolism (how active a cell is) often indicating the presence of disease. Computed Tomography (CT) shows exactly where in the body the lesion is located.

By combining these two imaging tools into a single scanner, we are now able to more accurately detect disease and pinpoint its location.

Together, PET/CT can be very helpful, for example, in the pre-operative staging of some cancer types and in localizing suspected cancer recurrence when standard tests are inconclusive. This type of information can help physicians improve treatment planning for individual patients. While PET/CT is most often used among patients with cancer, it can also be used for cardiac and neurology purposes.

## How PET/CT works in Cardiac Sarcoidosis

Active cells, such as those found in inflammatory tissue associated with cardiac sarcoidosis (CS), will use sugar as an energy source and inactive cells will not.

In PET, a special type of sugar is combined with a safe radioactive component to produce the radioactive tracer called FDG (Fluorodeoxyglucose). Once injected into a vein, the tracer, which emits signals detected by the scanner, will be absorbed by inflammatory tissue but not normal tissue. This may indicate whether or not you have CS.

The treatment of CS depends on the accurate and early diagnosis of the disease, however, diagnosis can be challenging. When diagnosed, treatment of CS can be initiated and is directed at minimizing the inflammation in heart tissues associated with the disease. Generally corticosteroid therapy is utilized for treatment.

Currently, the standard of care for diagnosing CS is a combination of imaging techniques or a biopsy of the heart. Heart biopsies can be very difficult because sometimes it is hard to see where the suspected site of disease is, or it is difficult to access the site with the needle for a biopsy. Conventional imaging methods such as CT and magnetic resonance imaging (MRI) have some technical limitations which make it difficult to detect CS. FDG-PET/CT scanning may more accurately identify the sites of CS compared with CT or MRI. The accurate information that is obtained from FDG-PET may have an impact on the treatment management of some patients with CS as it may allow the appropriate type of therapy to be initiated earlier.

If you meet the clinical criteria for a diagnosis of CS, as determined by your cardiologist, you will be eligible to receive this scan.

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## BC Cancer Case Study

A 56 year old male with a history of reduced left heart function and an irregular heart beat shows patchy increased FDG uptake in apical region of the left ventricle (red arrow) compatible with metabolically active cardiac sarcoidosis.



## **Patient Preparation**

You will need to follow a high protein, low carbohydrate diet the day before your scan. In addition, you will have to fast for 12 hours before your scan, during this time you may only have plain water. The heart uses sugar as an energy source, therefore you will need to have low blood sugar levels to ensure that regular uptake in the heart is not confused with uptake due to CS. If you do not follow the diet you will not be able to have the scan, and it will need to be re-booked. More specific preparation instructions follow this information.

## **At the Clinic**

Upon arrival to the Molecular Imaging and Therapy department, you will be asked to complete a brief questionnaire. Once you have completed the questionnaire, you will then be led to a private exam room where you will receive the tracer injection. After receiving the injection, you will be asked to relax in the exam room for approximately 60 minutes. This provides adequate body distribution time for the tracer. When this “uptake period” is complete, we will take you to the scan room to begin imaging.

## **Scanning Procedure**

You will lie on the imaging table that will slowly move you through the scanner while data is collected. The scan will last approximately 20-40 minutes. Once the scan has been completed and reviewed for technical quality, you will be free to leave.

The entire procedure, from the time you arrive until the time you leave, will last approximately 2 hours. A report will be sent to your physician once the scan has been read.

## **Risks**

A PET/CT scan is considered a diagnostic procedure similar to those done in Radiology and Nuclear Medicine. Millions of PET scans have been performed worldwide without any reports of adverse reaction to the tracer. Although there is a small amount of radiation exposure involved in your PET/CT scan, the exposure level is very small and is considered safe for a diagnostic procedure.

In addition, tracers used in PET/CT have very short half-lives. This essentially means they only remain in your body for a short period of time. Within 24 hours of completing your PET/CT scan, the tracer will have completely left your body.

### Website

For more information about PET/CT imaging at BC Cancer, please refer to our website at: <http://www.bccancer.bc.ca/our-services/services/pet-functional-imaging>

### Contact Information

If you have any questions or concerns about your procedure, please contact either reception desk at:

Vancouver: 604-707-5951  
Victoria: 250-519-5754

## PET/CT Scan Patient Preparation Instructions

Follow these instructions for your PET/CT Scan:

<p>One day before your scan Date: _____</p>	<ul style="list-style-type: none"> <li>• Avoid heavy exercise (jogging, weight lifting) as this can affect your test results</li> <li>• Eat a high protein / low carbohydrate diet (see table below for foods allowed and not allowed)</li> <li>• <b>Do not eat anything 12 hours before your scan</b></li> </ul>
<p>On the day of your scan Date: _____</p>	<ul style="list-style-type: none"> <li>• Avoid heavy exercise</li> <li>• Do not eat anything</li> <li>• Do not chew gum, or take cough syrup or cough drops</li> <li>• Take your prescribed medications on an empty stomach (water is okay) if you can. If not, bring your medication with you to take after the scan with food</li> </ul>
<p>2 hours before your scan</p>	<ul style="list-style-type: none"> <li>• Drink 4 glasses of plain water</li> <li>• Complete the attached questionnaire and give it to the technologist before your scan</li> </ul>

### High Protein / Low Carbohydrate Diet

FOODS	YOU MAY HAVE	DO NOT HAVE
Meats and Alternates	<ul style="list-style-type: none"> <li>• Beef, pork, lamb, chicken, turkey, fish, eggs</li> <li>• Nuts / seeds</li> </ul>	<ul style="list-style-type: none"> <li>• Beans (incl. green beans) / lentils</li> <li>• Tofu</li> </ul>
Breads and Cereals		<ul style="list-style-type: none"> <li>• Avoid all foods in this category</li> <li>• Anything made with flour or grains</li> <li>• Rice, pasta, noodles, breads, cereals, buns, crackers</li> <li>• Snack bars</li> </ul>
Vegetables	<ul style="list-style-type: none"> <li>• All vegetables except those listed in the next column</li> <li>• Only have a total of 4 cups of vegetables in the whole day</li> </ul>	<ul style="list-style-type: none"> <li>• Potatoes, sweet potatoes, yams, corn, green beans, peas</li> <li>• Vegetable juices</li> </ul>
Fruits		<ul style="list-style-type: none"> <li>• Avoid all fruit and fruit juices</li> </ul>
Dairy Products	<ul style="list-style-type: none"> <li>• Hard cheese</li> </ul>	<ul style="list-style-type: none"> <li>• Yogurt, milk, soymilk, cottage cheese, rice milk</li> </ul>

FOODS	YOU MAY HAVE	DO NOT HAVE
Other foods		<ul style="list-style-type: none"> <li>Jams, jellies, honey, chips, candy, cakes, cookies, chocolates, Jell-o, pudding, desserts</li> </ul>
Miscellaneous	<ul style="list-style-type: none"> <li>Butter, oils</li> </ul>	<ul style="list-style-type: none"> <li>Salad dressings, sauces, ketchup, rice vinegar, balsamic vinegar, Splenda, chewing gum</li> </ul>
Drinks	<ul style="list-style-type: none"> <li>Only water</li> </ul>	<ul style="list-style-type: none"> <li>Alcohol, soft drinks, all fruit / vegetable juices, flavoured water, sports / energy drinks, <b>all coffee/tea beverages</b>, nutritional drinks (Ensure, Boost)</li> </ul>

### Meal suggestions:

#### Breakfast ideas

- Cheese omelet with vegetables

#### Lunch and dinner ideas

- Grilled meat, chicken or fish with salad
- Chicken vegetable soup (no rice, pasta or beans)
- Chili with meat and vegetables (no beans)
- Stir-fried chicken or beef with vegetables (no sauce, rice or noodles)
- Tuna salad (little mayonnaise) with raw vegetables
- Salmon with roasted vegetables

If you have any questions, please call either BC Cancer PET Reception desk at:

- Vancouver:** 604-707-5951
- Victoria:** 250-519-5754

## Modified Diet and Fasting Questionnaire

### Questionnaire

It is important for us to know if you were able to follow all of the instructions for your scan. Please fill out this questionnaire as best as you can and hand it in to the technologist before your scan. Thank you.

1) Were you able to follow the instructions before your scan (circle one)?    **YES**    **NO**

2) When did you last eat?    Last night at \_\_\_\_\_ or, today at \_\_\_\_\_

3)

<b>YESTERDAY, DID YOU HAVE ANY?</b>	<b>YES</b>	<b>NO</b>
ALCOHOL OR CAFFEINE		
BREAD OR BUNS		
CAKES, COOKIES OR MUFFINS		
POTATOES (including potato chips or fries)		
PASTA OR RICE		
BEANS OR LENTILS		
BREAKFAST CEREALS		
YOGURT OR MILK		
JAMS, JELLIES OR HONEY		
CHEWING GUM		
SOFT DRINKS		
FRUIT		
FRUIT OR VEGETABLE JUICE		
DRESSINGS, KETCHUP OR SAUCES		
<b>WHAT DID YOU EAT?</b>		
BREAKFAST:		
LUNCH:		
SNACKS:		
DINNER:		

4) Did you take any medications today (circle one)?    **YES**    **NO**

If yes, please list them:

5) Did you exercise yesterday or today (circle one)?    **YES**    **NO**

If yes, when?  
What type of exercise?  
Total duration of exercise?