

# Cardiac Computed Tomography Angiography (CTA)

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## Patient Education Sheet

### Test Overview

Cardiac Computed Tomography Angiography (CTA) uses x-ray to make detailed images of the heart. The images are processed by a computer into 2 and 3 dimensional reconstructions of the heart, blood vessels, and surrounding structures.

An iodine dye (contrast material) is given intravenously (IV) to make blood vessels and structures easier to see on CT images. Other medications may be given orally or by IV to slow the heart rate and control the heart rhythm. Nitroglycerin may also be given to dilate the coronary arteries so they can be better visualized.

### Why It Is Done

Cardiac CTA can evaluate:

1. Coronary artery disease
2. Heart structure and function
3. Major arteries and veins
4. Structures in the chest (lungs, lymph nodes, etc.)

Cardiac CTA is indicated for patients with symptoms of coronary artery disease (CAD). The Cardiac CTA is NOT for routine CAD screening among asymptomatic adults. Adults older than 65 years old tend to have calcium deposits in their coronary arteries, which makes interpreting the images less reliable.

### Alternatives

1. Exercise Treadmill Test
2. Nuclear myocardial perfusion test
3. Stress echocardiography
4. Cardiac catheterization

### Limitations

1. Heart rate must be <60 beats per minute
2. Heart rhythm must be regular
3. Calcium and metal (clips, stents, wires) can affect interpretation
4. Substantial radiation exposure
5. Obesity decreases the resolution and detail of the images
6. Must be able to lie still
7. Cardiac CTA usually not performed during pregnancy.

## How to Prepare

Before the CT scan, tell your doctor if you:

- Are or might be pregnant
- Are breast-feeding. If you are given the contrast, use formula and throw out your breast milk for 1 to 2 days so the contrast will not be passed to your baby.
- Are allergic to any medications, including iodine dyes
- Have diabetes or take metformin (Glucophage)
- Have a history of thyroid problems
- Have a history of multiple myeloma
- Take Viagra, Levitra, or Cialis (will need to hold 1-2 days)
- Become very nervous in small spaces. You need to lie still inside the CT scanner, so you may be given a medication (sedative) to help you relax. Arrange for someone to take you home in case you are given the sedative.

Talk to your doctor about any concerns you have regarding the need for the test, risks, how it will be done, or what the results will mean. To help you understand the importance of this test, please fill out the medical test information form.

## How It Is Done

A CT scan is usually performed by a radiology technologist and nurse. The pictures are read by a radiologist. Other physicians, such as a cardiologist, may also review the CT scan images.

## Instructions prior to the CT Scan

- DO NOT EAT food for 3 hours before the procedure
- Do not have any caffeinated beverages for 12 hours prior to the scan
- May drink water up to 30 minutes before the procedure
- Continue to take routine medications unless SPECIFICALLY DIRECTED BY YOUR PHYSICIAN. Take a medication to slow your heart rate down for the scan as directed by your physician.
- Do not take Viagra, Levitra, or Cialis 3 days prior to the test
- If taking a medicine called GLUCOPHAGE or Metformin, this will need to be stopped 24 hours before the CT scan and not restarted until 3 days after the scan.
- Fill out all forms given asking about any allergies and any medical illness you may have
- Do NOT exercise the morning of the exam
- Arrive early to minimize anxiety and stress

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**After completing the forms we will prepare you for the procedure by:**

1. Placing EKG leads to your chest to monitor the electrical rhythm of your heart.
2. Starting an IV line so that medications and contrast can be given.

**During the scan**

1. Prior to the scan, you may be given medications to slow your heart rate and dilate your coronary arteries. The medications usually given to slow the heart rate down are *metoprolol* (a beta blocker) or *diltiazem* (a calcium channel blocker). *Nitroglycerin* will be given under your tongue to dilate the coronary arteries.  
Please inform the technologist if you are ALLERGIC to any of these medications.
2. Contrast will be injected through your IV line, resulting in a WARM sensation. This is normal. The technologist will remind you of this feeling and instruct when to hold your breath and NOT move during the procedure. This is very important to obtain good images.

**What is the CT test for?**

A CT scan or CAT scan is a common term for computerized axial tomography, a diagnostic imaging test that displays 2- and 3-dimensional images of internal structures of the body on a computer screen. This test often takes less than 30 minutes to perform. Patients can undergo a CT scan on an outpatient or inpatient basis.

CT scans can be taken of many sections of the body, including the chest, abdomen/pelvis and brain. The images come from the reflection of x-rays off tissues of varying densities. Sometimes a contrast dye is given to a patient intravenously, orally, or rectally to make hollow or fluid-filled structures (i.e. blood vessels) more visible. The use of contrast material during CT scanning doubles the procedure time.



**Risks**

CT scan is usually a very safe procedure.

- There is a chance of an allergic and adverse reaction to the contrast and medications (beta-blockers, Viagra, etc.)
- There is a chance of an adverse reaction to the contrast such as renal problems.
- If you have diabetes or take metformin (Glucophage), the contrast may cause problems.
- There is a slight chance of developing cancer from any tests that use radiation.

The chance is higher in children and people who have many radiation tests. If you are concerned about this risk, talk to your doctor about the amount of radiation this test may give you or your child and confirm that the test is needed.

**CONSENT FOR CARDIAC COMPUTER /TOMOGRAPHY ANGIOGRAPHY (CTA)**

AN INTERPRETER SERVICE IS REQUIRED: Yes No

**Procedure:**

Cardiac CTA is generally a safe and helpful procedure. It is used to evaluate cardiac structure and function including evaluation of the coronary arteries. A cardiac CTA uses computer-enhanced x-rays to produce the images of the heart and coronary arteries. Cardiac CT may occasionally show abnormalities of other structures in the chest which may require further evaluation.

Cardiac CTA requires the injection of iodine containing contrast dye into a vein. The dye circulates through your body and helps us to visualize some of its internal structures. In order to obtain the best images from the study it may be necessary to administer medications including nitroglycerin and/or beta-blockers. Nitroglycerin is a medication which causes the blood vessels to dilate or expand. Beta-blockers are drugs which slow the heart rate and allow the scanner to take better pictures. The procedure will include starting an intravenous line, giving medications to control heart rate and to dilate coronary arteries (oral, under tongue, or intravenous), and subsequently obtaining a CT scan using contrast dye.

The **Benefits** of the procedure include, but are not limited to:

1. Diagnosis of heart disease, especially coronary artery disease.
2. There may also be an incidental diagnosis of other chest abnormalities.

The **Risks** and potential complications of the procedure include but are not limited to the following:

1. Radiation, including possibility of fetal damage if pregnant and possible increased risk of cancer.
2. Unexpected allergy or adverse reactions are possible. Reactions may include rash, hives, headache, nausea, vomiting, dizziness or more serious side effects such as kidney failure, anaphylaxis, and hypotension.
3. Risks related to intravenous catheter placement include infection, fainting, bleeding, and infiltration of medication, contrast dye, or blood into the subcutaneous tissues.
4. Nitroglycerin is a medication which causes the blood vessels to dilate or expand. It may cause a decrease in blood pressure which is usually not significant, but may occasionally be more serious and require treatment. It may also cause a headache which should resolve shortly after the drug has been administered but can occasionally last longer. There has been fatal or adverse interaction of nitroglycerin with Viagra, Levitra, or Cialis (need to be held for >72 hours).
5. Beta-blockers, which are drugs that slow the heart rate.
6. As with any evaluation, there is a small possibility that cardiac abnormalities which are present may not be detected.
7. There may also be abnormalities which are seen on the scan which may require further testing. These findings may or may not be clinically significant. Further testing including cardiac catheterization or other test may be indicated. **Some alternative** tests to cardiac CT include stress testing such as nuclear myocardial perfusion test and stress echocardiography. Other alternative include proceeding directly to cardiac catheterization or continuing with your medical care.

At this time, the following physicians or other practitioners are expected to be performing the following tasks:

Name of Practitioner	Task

If any of the practitioners named above is unable to perform or complete the task, a substitute may do so, and this information will be recorded in your medical record.

**PLEASE INFORM US IF:**

**If there is any possibility of your being pregnant, please inform the Radiology Technologist prior to the x-ray procedure.**

**It is important for you to inform the radiology technician or nurse of any problems you have had with reactions to medications or contrast agents.**

**It is important to let the radiology technician, the nurse and the physicians know if you have severe asthma, or if you have had a reaction to beta-blocker (Inderal, Lopressor, Toprol, Atenolol, metoprolol, propranolol and others).**

If you have any further questions about the procedure, the doctor will answer them before you sign this consent form.

I have had described to me by \_\_\_\_\_ the nature of this procedure, the benefits, the more common risks associated with it, including procedural sedation, the potential for harm and the alternative procedures which could or could not be performed. I am satisfied with my understanding of this information.

My signature below indicates: 1) I have read and understand the information on this form, 2) I have had explained to me the procedure’s risks, benefits, alternatives, and risks of the alternatives, 3) I have had the opportunity to ask questions and they have all been answered to my satisfaction, and 4) I wish to proceed.

Interpreter’s Statement: I have accurately and completely read the foregoing document to (print name of patient or patient’s legal representative) \_\_\_\_\_, in the patient’s or legal representative’s primary language \_\_\_\_\_ (identify language). He/she understood all of the terms and conditions and acknowledged his/her agreement by signing the document in my presence.

Date: \_\_\_\_\_ Time: \_\_\_\_\_ a.m./p.m.

Interpreter’s  
Signature: \_\_\_\_\_ Name: \_\_\_\_\_ (print name)

Patient Consent to Blood Transfusion Required (Check One):    Yes No

## PATIENT QUESTIONNAIRE FOR CONTRAST INJECTION

Please fill out questions below. If you have any questions ask the technologist or the front desk.

Date of Exam: \_\_\_\_\_

Patient Name: \_\_\_\_\_ AGE: \_\_\_\_\_

MR#: \_\_\_\_\_ SEX: Male Female

Is there any chance of you being pregnant? Yes No. N/A Date

of last menstrual cycle: \_\_\_\_\_

Referring Physician: \_\_\_\_\_

### Intravenous Contrast History and Information

Have you had any previous imaging study that required intravenous contrast injection?

Yes No

If yes, did you experience any difficulties from the injection?

\_\_\_\_\_

Do you have a history of Asthma? Yes No

Do you have a history of Hay Fever? Yes No

Do you have a history of Congestive Heart Failure? Yes No

Do you have a history of Diabetes Mellitus? Yes No

If yes, are you currently taking Glucophage (Metformin)? Yes No

Do you have any heart rhythm problems (irregular heartbeat) like atrial fibrillation or flutter?

Yes No

Do you have known heart disease or heart related problems? Yes No

Do you have high blood pressure? Yes No

### PATIENT NOTES FOR CONTRAST INJECTION

Do you have Renal (kidney) Disease? Including a history of kidney failure in the past or a single kidney or surgery for the kidney? Yes No

Have you ever had a Myocardial Infarction (heart attack)? Yes No

Do you have Multiple Myeloma? Yes No

Date of Exam: \_\_\_\_\_

Patient Name: \_\_\_\_\_

MR#: \_\_\_\_\_

Do you have any Pulmonary (lung) Disease?                      Yes    No

Do you have a history of Sickle Cell disease?                      Yes    No

Have you had a mini stroke or a stroke in the past?                      Yes    No

Do you have any allergy to food or medications?                      Yes    No

If yes, please list:

\_\_\_\_\_

Have you taken Viagra/Cialis/Levitra or other medicine for erectile dysfunction or other reason(s)?  
Yes    No

If yes when was the last dose taken? \_\_\_\_\_

Please inform RN or MD if any of the above are abnormal prior to proceeding.