

Heart Health after Cancer Treatment

Most cancer survivors do not develop heart problems. However, there are some types of cancer treatment that may cause problems with the heart. Since heart problems may happen many years after cancer treatment, it is important to be aware of any treatments you may have received that can affect your heart. That way, you can take steps to keep your heart healthy. This includes having regular medical check-ups and tests to check your heart function. If a problem develops, it can be detected and treated early.

If you have any questions,
please talk with your
physician or nurse.

Cancer treatments that can cause heart problems

Chemotherapy

Anthracycline antibiotics are chemotherapy medications. They can cause heart problems during treatment or many years later. Anthracycline antibiotics include:

- › Daunorubicin (daunomycin)
- › Doxorubicin (Adriamycin®)
- › Idarubicin
- › Epirubicin
- › Mitoxantrone

Anthracyclines may cause problems with how the heart muscle normally contracts and relaxes. This can lead to conditions that make it harder for your heart to pump blood to the rest of your body.

Arrhythmias (irregular heartbeats) can happen when there are changes in the electrical pathways that send impulses to control heart rhythm. The pathways may be scarred or damaged. This can cause abnormally fast, slow or irregular heartbeats.

Radiation

Radiation therapy to the chest or spine area around the heart may cause scarring and stiffening of the heart tissues. This can lead to the following conditions:

- › Arrhythmias
- › Problems with the heart muscle
- › Heart valve problems
- › Blood vessel problems such as coronary artery disease
- › Problems with the membrane around the heart

Risk factors for heart problems

Some other medical conditions may also increase the risk of heart problems from chemotherapy or radiation therapy. These include the following:


- › Obesity
- › High blood pressure
- › High cholesterol or triglyceride levels in the blood
- › Diabetes
- › Smoking
- › Being inactive
- › Eating a diet high in fat
- › Menopause
- › Family history of heart problems

Cancer treatment risks for developing heart problems

The risk of developing a heart problem after cancer treatment is related to several factors. Some of which include:

- › Age of the person at the time of cancer therapy
- › Total dose of anthracycline chemotherapy
- › Total dose of chest radiation
- › Amount of the heart tissue exposed to radiation
- › Treatment with other medications that affect heart function

Overall, the risk of having heart problems after cancer therapy is highest in people treated with higher doses of anthracyclines or chest radiation. People who received treatment at a younger age also have a higher risk of heart problems.



It is unknown why some people develop heart problems after treatment for cancer and others do not (even when they have gotten the same treatment). Therefore, it is important for each person treated with anthracyclines or chest radiation to continue to have regular medical check-ups. That way, your care team can find and treat a heart problem early.

Symptoms of heart problems


These symptoms may be a signs of a heart problem:

- › Shortness of breath
- › Dizziness
- › Lightheadedness, fainting or near fainting
- › Severe fatigue (tiredness) that prevents you from exercising or doing normal activities
- › Chest pain that feels like a heavy pressure or fullness and spreads to your arm, chin or face
- › Sweating, nausea or shortness of breath with chest pain
- › Sharp, piercing pain in the center or the left side of your chest (often gets worse when you take a deep breath)
- › Very swollen feet or ankles (so swollen that if a finger is pressed firmly on the area for a few seconds, it leaves an indentation)
- › Cough and wheezing that does not go away
- › Feeling your heart racing, throbbing or skipping beats at times

Sometimes mild to moderate heart problems do not show symptoms. In this case, you might need more testing. Cardiac tests like an echocardiogram (echo), an electrocardiogram (EKG or ECG) or a multigated acquisition (MUGA) scan may find a heart problem. Your care team will tell you more about the tests if you need them.

Effects of exercise on the heart

People treated with anthracyclines and chest radiation therapy should check with their care team before beginning a heavy exercise program. If you choose to do heavy activity or team sports, you should talk with your cardiologist (heart specialist) about activity guidelines and check-ups.



Some aerobic exercise, like walking fast and jogging, is generally safe and healthy for your heart. Always talk with your cardiologist or care team before you start an exercise program.

Other heart stressors

If anthracyclines and chest radiation treatment has affected your heart, you may not be able to handle the stress of certain conditions that increase the heart rate, blood pressure or blood volume in the body more than usual. These changes may happen

during pregnancy or during illnesses with high fevers. If your cancer treatment included medications that can affect heart function, tell your care team so they can plan your care to reduce the stress on your heart.

Some medications and supplements can increase stress on your heart. These include:


- › Diet pills
- › Ephedra (ma huang)
- › Cocaine
- › Performance-enhancing drugs such as anabolic steroids and human growth hormone

These types of medications and supplements may worsen heart function. They may even cause death in cancer survivors who received anthracycline chemotherapy.

Special precautions

Survivors with leaky or scarred heart valves or those with currently active chronic graft-versus-host disease (cGVHD) following a stem cell transplant may need to take an antibiotic before dental work or any invasive procedure. Some of these procedures include:

- › Dental procedures
- › Respiratory tract procedures
- › Gastrointestinal procedures
- › Urinary tract procedures



Bacteria entering the bloodstream during such procedures may cause a serious infection of the heart (endocarditis). The dentist or healthcare professional performing the procedure generally will prescribe the antibiotic.

If you have a heart valve problem, you can get a prevention of infective endocarditis (IE) wallet card from the American Heart Association. The card includes antibiotic prescriptions instructions for certain procedures. Go to **heart.org** and search for “IE wallet card.”

Checking for heart problems

Anyone treated with anthracycline chemotherapy or chest radiation for cancer should have a check-up every year, with special attention to any heart symptoms. When you begin long-term follow-up care, you will have testing based on your age at the time of treatment, total anthracycline dose and radiation dose to your chest, abdomen, or spine (thoracic or whole) and other risk factors. Your care team will let you know what tests you need. Testing may include:

- › **Electrocardiogram (EKG or ECG).** This records the electrical impulses of the heart to check your heart rate and rhythm. The care team will put electrodes (small sticky patches) on your chest, arms and legs. They will attach wires to the electrodes.
- › **Echocardiogram (echo).** This test uses an ultrasound, or high frequency waves, to see the heart structure, muscle function and how well your heart pumps. You will lie on a table. The care team will apply conductive jelly to your chest. Then, they will put a transducer (a small probe that emits the ultrasound waves) on your chest to get different views of your heart. You may also have electrodes on your chest to monitor your heart’s electrical impulses during the test. During the test, they will put slight pressure on the transducer that may cause discomfort. They will take many measurements to help find out if your heart muscle is pumping blood well. The ultrasound test also looks at your heart valves to see that they open and close normally. The physician will review the videotape and photographs from the test.

Echocardiograms are the preferred test for those who received radiation involving the heart. The test provides detailed information about heart structures, including the heart valves.

- › **Cardiac stress test.** This measures heart function when your heart is working hard. This could include exercise or other movement. The care team will monitor your heart and blood pressure while you walk on a treadmill. Cancer survivors who received higher doses of radiation and anthracycline chemotherapy usually have this test. They will have this test 5 to 10 years following radiation and repeated, as needed.
- › **Blood tests** (lipid profile and fasting glucose). These check for other cardiac risk factors, such as high levels of fat or sugar in the blood. Cancer survivors who received radiation to the heart area may have these tests every 3 to 5 years.

Care for female survivors who are pregnant or planning pregnancy

Female cancer survivors who are pregnant or planning pregnancy may need additional care. This could include an evaluation and monitoring by a cardiologist. Let your care team know if you had the following therapy:

- › Anthracycline chemotherapy at a dose of 300 milligrams per square meter (mg/m²) or more
- › Radiation at a dose of 30 gray (Gy) or higher to the heart or surrounding tissues
- › Radiation to the heart (at any dose) in combination with anthracycline chemotherapy or high doses of cyclophosphamide (Cytosan®)

You may need heart monitoring due to the extra strain on the heart during the later stages of pregnancy, labor and delivery. Monitoring may include:

- › Echocardiogram before and during pregnancy especially during the 3rd trimester
- › Cardiac monitoring during labor and delivery

Cardiac monitoring results

If your care team finds a heart problem, they will let you know what follow-up care you need. Sometimes, they may refer you to a cardiologist for more evaluation and/or treatment with medications.

Preventing heart problems

As you get older, the risk of certain types of heart disease (such as heart attacks and hardening of the arteries) increases.

You can reduce your risk of heart problems by:

- › Not smoking (or quitting if you currently smoke)
- › Staying at a healthy body weight
- › Limiting the fat in your diet to no more than 30% of the calories you eat
- › Doing moderate exercise for at least 30 minutes on most days of the week

Medical conditions that increase the risk of heart problems include diabetes, high blood pressure and high blood cholesterol. If you have any of these conditions, follow your care team's instructions to keep the condition under good control with diet or medication. Let your care team know right away if you have any symptoms of heart problems.

For more information

If you have questions, please talk with your care team.

You can find more information about cancer survivorship at the following websites.

- › *The Children's Oncology Group Long-Term Follow-Up Guidelines for Survivors of Childhood, Adolescent, and Young Adult Cancers*

Go to **survivorshipguidelines.org**

- › *National Comprehensive Cancer Network (NCCN) Survivorship Care for Cancer-Related Late and Long-Term Effects*

Go to **nccn.org/patients**

For more information about Northwestern Medicine, please visit our website at **nm.org**.