

Your Guide to STAR

Stereotactic Arrhythmia Radioablation

Stereotactic Arrhythmia Radioablation (STAR) is a non-invasive treatment for ventricular tachycardia (VT). This handout will help you understand your treatment, get ready for your appointment, and know what to expect before, during, and after STAR.

Section 1: Understanding STAR

What is Stereotactic Arrhythmia Radioablation (STAR)?

Stereotactic Arrhythmia Radioablation (STAR) is an advanced, non-invasive treatment. It is used to treat certain abnormal heart rhythms, most often *ventricular tachycardia*, or VT. This is a fast, abnormal heart rhythm that starts in the lower chambers of the heart.

STAR uses precise and highly focused radiation to target the small area of heart tissue that is causing abnormal electrical signals. Unlike *catheter ablation* (a treatment that uses a thin tube called a catheter), STAR does **not** require surgery, general anesthesia, needles, or incisions.

STAR is usually recommended for people who still have VT after taking medicines or having catheter ablation. Your doctor may also recommend STAR if invasive procedures are not safe for you.

What is SBRT?

STAR uses the same technology as *Stereotactic Body Radiation Therapy* (SBRT), also called *Stereotactic Ablative Radiotherapy* (SABR). SBRT is a special type of radiation therapy. It gives a very high dose of radiation with very high accuracy. It also limits radiation to nearby healthy tissues as much as possible.

For many decades, UW Medicine has used SBRT to treat tumors in many parts of the body, including the brain, neck, lung, liver, pancreas, spine, prostate, and bones. Today, we are using this same technology to treat carefully selected patients with VT.

How long does STAR treatment take?

STAR treatment usually takes only one treatment session. Treatment is done during one visit, but the effects happen slowly over several weeks to months. During this time, the treated heart tissue becomes less able to create abnormal electrical signals.

Before your treatment day, you will also have an appointment to have a CT simulation scan. It takes **1–2 weeks** between your CT simulation and your treatment day for our team to prepare your custom radiation plan.



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Section 2: How STAR Works

How Radiation Treats Ventricular Tachycardia (VT)

One benefit of STAR is that it is completely **non-invasive**. There are no incisions, needles, or surgery. STAR uses advanced heart imaging, heart rhythm mapping, and very precise external beam radiation to treat VT. This radiation targets the small area of heart tissue that is causing abnormal electrical signals.

Unlike *catheter ablation* (a treatment where catheters are placed in the heart), which quickly destroys abnormal tissue using heat or cold, STAR works slowly. The focused radiation causes changes in the treated heart tissue over time. As the tissue heals over weeks to months, it becomes less able to create or carry the abnormal electrical signals that cause VT. You **must** keep taking your heart medicines and follow your cardiologist's recommendations after treatment.

Finding the Target Area

Before your treatment, your doctors carefully find the exact area that is causing your VT. Your team will use information from several sources, which may include:

- **Cardiac CT and MRI:** detailed pictures of the heart
- **Electrocardiogram (ECG):** tests that record the heart's electrical activity
- **Implantable cardioverter-defibrillator (ICD):** a device that can treat dangerous heart rhythms
- **Electrophysiology (EP) studies:** tests that study the heart's electrical system
- **Catheter ablation maps:** images of areas treated during catheter procedures
- **3-D heart mapping:** detailed three-dimensional maps of the heart
- **4-D CT simulation:** a scan that shows how your heart moves as you breathe

Each piece of information helps your care team build a detailed picture of your heart's electrical system. Your *electrophysiologist* (heart-rhythm doctor) and *radiation oncologist* (doctor who treats conditions with radiation) work together to find the safest and most effective area to treat.

Creating Your Personalized Treatment Plan

After we find your exact treatment area, your radiation oncology team will create a treatment plan just for you. Each person's heart shape, scar tissue, and abnormal electrical pathways are different. Using advanced computer software, specialists carefully decide:

- The exact area and the safest angles for radiation
- How to limit radiation for nearby healthy tissues
- How to check your normal heart and breathing movement during treatment

This planning takes several 1 to 2 weeks. Many members of your care team will review your plan before it is approved. Every plan goes through detailed checks to make sure it meets strict safety standards.

STAR Protects Healthy Tissue

An important benefit of STAR is that it can treat a very precise area of your heart. The heart is close to several important organs and body parts, including the lungs, esophagus (the tube that carries food to your stomach), and healthy heart muscles and blood vessels. Your treatment has two goals:

1. Give enough radiation to treat the abnormal electrical pathway.
2. Protect nearby healthy tissue as much as possible.

Before treatment starts, your team uses imaging to make sure you are in the correct position. During treatment, the system accounts for small changes in your position, and normal heart and lung movements.

Protecting Your Safety

Before your treatment, your plan is independently reviewed by your radiation oncologist, medical physicist (radiation expert), dosimetrist (radiation-dose specialist), radiation therapists (specialists who give the radiation), and cardiac electrophysiologist (heart-rhythm specialist). Advanced software and equipment also check that the treatment can be given safely and accurately before you enter the treatment room.

Section 3: Your CT Simulation Appointment

Before your treatment day, you will have a *4-D CT simulation*. You will not have any radiation treatment at this appointment. Instead, the simulation creates detailed maps of your heart and body so we can aim the radiation with high accuracy during your treatment.

Getting Ready

- Do **not** eat for 4 hours before your CT simulation appointment time.
- Wear comfortable clothing.

What Happens During Your Appointment

- **Custom Positioning (Vac-Lok®):** We place you on a cushion that forms a firm mold of your body. This ensures you stay in the exact same position for treatment.
- **Abdominal Compression:** A gentle band across your belly steadies your breathing and heart.
- **IV Contrast:** We give contrast dye through an IV to show your heart vessels and scar tissue clearly.
- **4D CT Scan:** The scanner takes detailed pictures while tracking how your heart moves as you breathe.

After Your CT SIM

Once your scan is finished, you will go home. Over the next **1 to 2 weeks**, your electrophysiologist, radiation oncologist, and medical physicists will work together to create your custom treatment plan. We will contact you with the date and time of your STAR treatment day.

Section 4: Treatment Day

Before Your Appointment

Most patients receive STAR treatment during one visit and go home the same day.

What should I bring?

- A current list of your medicines.
- Your photo ID and insurance card.
- A responsible adult to drive you home (if your doctor recommends it)

On Treatment Day

Follow these instructions unless your care team tells you otherwise:

- Keep taking your usual medicines.
- Do **not** eat for 4 hours before your appointment.
- Wear comfortable clothes.
- Arrive on time.
- Relax! We will explain each step before treatment begins.

When You Arrive

How You May Feel

Patients have many different feelings on their treatment day. You may feel relieved, excited, nervous, or a mix of emotions. Your feelings are completely normal.

Your care team has spent many hours reviewing your treatment plan and completing safety checks before your appointment. When you arrive, our goal is to make your experience comfortable and stress-free.

Checking In

When you arrive at the Radiation Oncology Clinic, please check in at the front desk and complete any paperwork needed. You may need to wait for a while as your treatment team gets everything ready for you. You will be able to ask your care team questions or share any concerns before your treatment begins.

Getting Ready for Your Treatment

A radiation therapist will take you to the treatment area. We will ask you to:

- Change into a hospital gown
- Remove jewelry or metal objects and make sure your pockets are empty
- Confirm your identity and treatment information

In the Treatment Room

Your radiation therapists will help you get comfortable on the treatment table.

The custom positioning device created during your CT Simulation will be used to help place you in the same position used during treatment planning. This may include a Vac-Lok® (a vacuum cushion that helps hold your body in the correct position), and supports for your arms, knees, and head. Your therapists may make small changes to make sure your position is correct.

Safety Checks

Before treatment begins, different members of your treatment team independently check:

- Your identity
- Your treatment plan
- Your images
- The machine settings
- The treatment target

These safety checks help make sure your treatment is given exactly as planned.

Imaging Before Treatment

Before radiation is delivered, detailed images are taken to check your position. Images help your doctors and therapists check that you are in the correct position, and your heart is lined up exactly as planned. This is a very important step. It helps ensure that your treatment will be safe and accurate.

What does the treatment room look like?

The treatment room has a large machine called a *linear accelerator*. It delivers highly focused radiation to the treatment area. This machine will never touch you. During treatment:

- The machine rotates around you.
- You may hear mechanical sounds.
- Lights in the room may turn on and off.

All these sights and sounds are normal. The treatment team will watch and monitor you the entire time.

During Treatment

Once treatment begins, you will lie comfortably on the treatment table. The therapists will leave the room, but they can always see and hear you using cameras and microphones. You can speak to them any time if you need anything.



Inside the treatment room

How will the treatment feel?

STAR treatment is painless, and you will **not** feel the radiation. Radiation cannot be seen, felt, heard, or smelled. Many patients are surprised by how comfortable the treatment feels.

Can I move?

We ask you to remain as still as possible during treatment. However, you may breathe normally. You do not need to hold your breath unless we ask you to.

If you become uncomfortable, please let us know. Your comfort is important to us.

How long does treatment take?

The actual radiation treatment usually takes about **20–40 minutes**. However, your total appointment may take longer because of positioning, imaging, safety checks, and final treatment review.

The time spent making sure everything is accurate is one of the most important parts of the process.

Will I Feel Different Right Away?

Usually not, because STAR works slowly. Many patients do not notice an immediate change after treatment.

The changes in your heart tissue develop slowly over time. Improvement in VT may happen over several weeks or months. It is important to keep taking all medicines exactly as prescribed, unless your cardiologist tells you otherwise.

Will I Be Radioactive After Treatment?

No. The radiation is given only while the treatment machine is turned on. After treatment:

- There is **no** radiation in your body.
- You are **not** radioactive.
- You may safely be around children, family, friends, and pets. You do not need any special safety steps.

What if I have an ICD?

Many people who receive STAR have an Implantable Cardioverter-Defibrillator (ICD). Your device information will be reviewed before and after your treatment. You may have extra monitoring based on your doctor's recommendations.

Your cardiology and electrophysiology teams will stay involved throughout your treatment process.

Questions?

Your questions are important. Call your doctor or healthcare provider if you have questions or concerns.

- **Radiation Oncology:** Call 206.598.4100 weekdays from 8 a.m. – 5 p.m.
- **After hours, weekends, and holidays:** Call 206.598.6190. Ask for the Radiation Oncologist on call.