

Radiotherapie

MRIdian® Radiation device

Your doctor has told you that radiotherapy on the MRIdian® radiotherapy device is an option. This brochure explains how the treatment works.



Locatie VUmc

What is MRIdian®?

The MRIdian® is an MRI-guided radiation treatment device (made by ViewRay Technologies Inc) that combines an MRI scanner and a radiation treatment device (linear accelerator) in one machine. It shows images of the tumour and healthy organs with an MRI scan, both before and during the radiotherapy. This helps target the tumour more accurately and avoid an excessive dose of radiation to the healthy organs. You may have had an MRI earlier in the course of your illness. MRI stands for magnetic resonance imaging, where images are made with the help of a strong magnet. Because metal objects can disrupt the treatment or cause a hazard, they are not allowed in the treatment room.

We ask you to complete a questionnaire beforehand to determine whether you have metal in your body.

Before a radiotherapy treatment plan can be made, you need two scans. The first scan, performed in our department, is a CT scan. This is followed by a preparatory MRI scan on the MRIdian® device. This does not involve any radiotherapy treatment. We use the information from these two scans to draw up a precise radiotherapy treatment plan. When the plan is ready (this usually takes a few working days), we will schedule your treatment and call you to let you know when you are expected for the first radiation session.

MRI scan

One of our radiographers fetches you from the waiting room and tells you which items of clothing to keep on and which to leave in the changing room. The radiographer then checks again that you are not carrying any metal objects. A metal detector has been placed in the hallway to the radiotherapy device. It emits a beeping sound if it detects any metal. If that happens, we will check you again, for your own safety. In the radiation treatment room, you are positioned on the table as comfortably as possible. Our radiographers assist you and place a 'coil' on your body once you are lying in the correct position. A coil resembles a thin mattress and is a kind of antenna that is necessary for making the MRI images.

During the MRI, you hear a fast ticking sound which varies in intensity. You are given a headset to mute the sound. You can keep in touch with the radiographers in the control room via the headset. You are also given an alarm bell to hold. If you squeeze it, it emits a signal and the radiographers will immediately come to you. When you are ready, the radiographer slides the table you are lying on into an illuminated tunnel that is open at the front and back. The radiographer then leaves the room and monitors you via the cameras in the radiation room.

Preparation

During treatment

As with the preparatory MRI scan, you are told which items of clothing to keep on and which to leave in the changing room. The radiographer checks you again, and you pass through the metal detector. In the radiation treatment room, the radiographers position you in the same way as for the preparatory MRI scan and place the coil on your body. You are given the headset and alarm bell. Music can be played through the headset upon request. After this, the table is slid into the tunnel and the radiographers leave the room to prepare for your treatment session. The treatment can take some time, and we ask you to lie as still as possible. The first step is to make a new MRI scan, after which the original radiation treatment plan is adjusted to the location of the organs and the tumour at the time of radiotherapy. This takes a few minutes. When the radiation treatment plan is completed and approved, the radiotherapy will start.

Depending on the location of the radiotherapy, you may be given breathing instructions through the headset. A method has also been developed in which you can regulate your breathing with the help of a mirror and a monitor. This is shown and explained to you at the preparatory appointment.

Duration

The entire treatment usually takes between 45 minutes and an hour. If you have difficulty lying down for a long time, please inform the radiographers. They can then consider options that make things easier for you.

After the treatment

After the radiotherapy, you can get dressed again. Your entire radiation treatment takes place in a few sessions. You can see when your next radiation session is on your schedule which you will have received from one of the clinic assistants.

Procedure for MRI scans

Eating and drinking

In general, you should be able to eat and drink beforehand, but depending on the location of the tumour, special preparations are sometimes required. Examples of this include a full bladder, an empty rectum, holding your breath or the administration of a contrast agent. Your doctor will discuss these additional instructions with you if necessary.

Clothing, jewellery and make-up

Wear comfortable clothes. The radiographers will tell you which items of clothing have to be removed before the radiotherapy. Your clothing should not contain any metal, such as zippers, buttons and bra underwire. Glasses, dentures and hearing aids are also not allowed in the room where the MRI is located. Please leave your jewellery at home. We advise you not to wear make-up as it can contain metal particles. The same applies to hair gel and hairspray.

Contrast agent and kidney function

For the irradiation of certain areas, it may be necessary to inject a contrast agent before or during the examination so that your organs show up more clearly. This is injected through an IV needle in the forearm. Your kidney function is checked before a contrast agent is used. The contrast agent rarely causes side effects.

You may feel an unpleasant sensation at the injection site such as heat, cold and/or pain. At your visit to the clinic, the doctor will tell you whether the administration of a contrast agent is necessary.

Claustrophobia

If you suffer from claustrophobia (fear of confined spaces), you may find this treatment difficult. Please report this to your radiation oncologist and the MRIdian radiographers. You always have an alarm bell in your hand which you can use to alert the radiographers in the event of an emergency during treatment. The radiographer can also see and hear you at all times during preparation and treatment.

Sensations

During the MRI scan, there is a small chance of you feeling strange sensations such as heat, cold, dizziness or tingling. You may also taste something metallic or see flashes of light.

This is caused by the magnetic field and is not dangerous. Please discuss it with your radiation oncologist.

Questions?

If you have any questions, please contact the Radiotherapy Department. The telephone number is +31 020 444 1571 and can be reached on working days between 08:00 - 17:00.

Questionnaire: contraindications to radio-therapy on the MRIdian®

Information (please read the information first)

During your radiotherapy on the MRIdian® device, you will be in a strong magnetic field. For your safety, and to exclude any risk, we ask you to fill in all the questions below in advance to see if treatment on the MRIdian® is safe.

Name : _____
 Patient number : _____
 Weight : _____
 Height : _____

Do you have	Yes	No	Unknown
claustrophobia (fear of small spaces)?			
a pacemaker or (old) pacemaker wires?			
a cardioverter defibrillator (ICD)?			
a medicine pump (for example, an insulin pump)?			
a neurostimulator?			
an ossicular prosthesis?			
metal ear tubes?			
piercings that you cannot remove yourself?			
tattoos and/or permanent make-up?			
Could there be any metal in your body (splinter, bullet, etc.)?			
Are you an (old) metal worker and/or could you have metal splinters in your eyes?			
Have you had surgery in the past that involved metal or plastic materials (for example, prosthesis, artificial valve, vascular clips)? If yes, What surgery? When?			