

Imaging Services
<b>CONTROLLED DOCUMENT</b>
PIL Having an MRI scan with a cardiac implantable electronic device

## Having an MRI scan with a cardiac implantable electronic device

Your Doctor has asked us to perform an MRI (Magnetic Resonance Imaging) scan in the knowledge that you have a cardiac implantable electronic device (CIED). This information leaflet will explain what to expect when having an MRI with a CIED. Please read this leaflet carefully. If you have any questions or concerns not answered by this leaflet, please contact the RVH MRI Unit, details at the end of this leaflet.

### What is a cardiac implantable electronic device (CIED)?

This term refers to internal cardiac pacemakers and defibrillators. They generally consist of a generator box (battery and computer) and one or more wires, known as leads, which attach to your heart from the generator. A pacemaker is used to keep your heart beating at a normal rate, and defibrillators send electrical shocks to the heart to get it functioning normally. There are devices that can also do both these things.

### What's the issue with CIEDs and MRI scanning?

In the past MRI was considered contraindicated (not allowed) for patients who had a CIED. This was due to the powerful magnetic and radiofrequency fields associated with MRI, which could cause injury or interfere with the device function. More recently, manufacturers of CIEDs have created MR Conditional generators and leads – these are systems that can be scanned in MRI under strict conditions, tested by the manufacturer. It is important to be aware that these conditions must be met to scan these devices safely.

For a CIED to be considered MR Conditional, all components within the system – generator and leads – must be MR Conditional and from the same manufacturer.

If you have received this patient information leaflet, we have already confirmed with the help of Cardiac Clinical Physiologists (CCPs) that your CIED is MR Conditional, and you have been appointed on a specific MRI CIED list.

Please read the accompanying information regarding other implants or issues that you must make us aware of prior to attending for your scan – there may be something else that needs to be considered before having an MRI scan.

### What are the benefits of having an MRI scan?

MRI has evolved as a powerful and versatile diagnostic imaging modality since its introduction into clinical use in the early 1980s. MRI is a non-invasive imaging modality that has high diagnostic accuracy, which can be of great benefit to help aid the Doctors who are treating you. Additionally, MRI does not use ionising radiation (e.g. CT and x-ray use ionising radiation), instead strong magnetic fields and radio waves are used to create the images.

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## What are the risks?

Provided all manufacturer MR Conditions are met including device reprogramming, patients with CIEDs can safely undergo MR scanning. [Joint British Society consensus recommendations for magnetic resonance imaging for patients with cardiac implantable electronic devices.](#)

However, potential risks include arrhythmia (irregular heartbeat), bradycardia (slow heart rate), discomfort, syncope (fainting), worsening heart failure, loss of beep function (some devices give an audible warning if battery is low), and in extremely rare cases, death.

## Are there any alternatives?

Your referring Doctor has decided that an MRI scan would be the most useful for you in this case. The examination will help your referrer to assess you more fully and plan any further treatment that might be necessary. If you would like more information about alternative imaging tests, please speak to the Doctor managing your care.

## Before your procedure:

Your referring Doctor has sent us through information relating to the body area they would like us to scan and details of your CIED. The RVH MRI Unit has contacted the RVH CCP Team and with their assistance it has been agreed that your CIED is MR Conditional, and you have been appointed on a specific MRI CIED list. This involves CCPs being in attendance in the RVH MRI Unit during your scan appointment. There has been a lot of preparation work before you even set foot in the hospital for your scan.

Because this is specialised, we have a lot of patients waiting for this appointment and we ask that you phone in to confirm you can attend your appointment. We will ask you some MRI safety questions over the phone – it is very important that you are always accurate with the information you provide us regarding implants. If not this could result in a delay or you being turned away from your appointment. MRI safety is extremely important.

## What happens on the day of your MRI scan?

Please arrive on time for your scan. We aim to call you at your appointed time, but as this is an acute site, there may be emergency patients who will need to be scanned ahead of you.

We ask that you book in with CT/MRI reception and take a seat in the waiting room. An MRI Radiographer will call you from the waiting room and bring you to another waiting area within the RVH MRI Unit. Here you will complete an MRI Safety Questionnaire; it is extremely important you are as detailed as possible when answering the safety questions. Once the questions are complete, you will be asked to place all valuables into a locker and change into a hospital gown and scrub trousers. The hospital gown must be worn with the opening to the front, to place MR Conditional ECG electrodes on your chest to monitor your heart during the scan.

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You will then be brought to meet the CCP within the main MRI Unit, who will:

- Perform pre-MRI checks as recommended by the CIED manufacturer
- Place your CIED into the correct mode for scanning i.e. MRI Mode

Once the CCP has completed their checks and prepared your device for scan, the MRI Radiographer will accompany you into the MRI scanner room:

- They will once again perform a verbal safety check before you enter the room
- Place MR Conditional ECG electrodes on your chest, attach the ECG monitor and pulse oximetry finger probe
- In the opposite hand to that used for the finger probe, you will be given an alert buzzer. This is used to gain the attention of the MRI Radiographer during the scan if you need them – if you feel unwell, pain or discomfort. The MRI Radiographer will keep verbally checking in with you throughout the scan – it is important you verbally respond.
- The scan will be performed within the MR Conditional guidelines set out by your device manufacturer
  - We limit how much radiofrequency energy the scanner will input into your body
  - We limit the strength and rate of change of the gradient magnetic fields
- The CCP will monitor your heart rhythm throughout the scan
- In the event of cardiac struggle, there is a resuscitation trolley with an external defibrillator machine outside the MRI scanner room throughout your scan. We also can call a team who are trained in advanced cardiac life support (ACLS) to attend the department and have Cardiology support on site.
- Once the scan is completed, the MRI Radiographer will remove you from the scanner and give you a seat back with the CCP.
- The CCP will perform their post scan checks, ensure that your device is operating correctly, and place your device back to its original settings. If you and the CCP are happy, you are free to get changed and go home.

### Asking for your consent

The MRI Radiographer will ask you if you are happy for the MRI scan to go ahead. This is called verbal consent. If you do not wish to have the MRI scan or are undecided, please tell the MRI Radiographer.

Students/trainees may be present during the examination but only with your verbal consent.

Please remember that you can ask the MRI Radiographer any questions you have at any time before, during or after your scan.

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## What happens after your MRI scan?

Once the examination is complete you can go home. The scan will be reported by the Radiologist, and the report will be sent to the Doctor who referred you for the scan.

## When will I get the MRI scan results?

We will aim to have your MRI scan reported and the report available for your referrer within 2 weeks. If you have not had any updates from your referrer, your general practitioner (GP) would be the next point of contact with any queries.

## Further Reading

Further advice or information is available from: [mrimypacemaker.com](http://mrimypacemaker.com)

## Image sharing

Your images will be electronically stored on the hospital picture archiving system. This data can be accessed throughout the Belfast Health and Social Care Trust and other doctors and health care professionals who are directly involved in your care. The ability to share images and radiological reports will improve the safety and quality of your care by ensuring that the right information is available in the right place at the right time.

To improve the medical services we provide we may also use your data as anonymously as possible for internal audit and medical education. If you would prefer that your data is not used for these purposes, please inform a member of staff when you attend for your examination.

If your data is to be used for research, then a separate consent process will be used. You will be asked for your consent, should this be the case.

## Contact us

If you have any queries, we will be happy to answer any questions on the day of your MRI scan or you can contact us on the number given on your appointment letter.

- RVH MRI Unit **028 96150130** (Monday – Friday 0830-1630)
- The referring Doctor
- The Cardiologist looking after you and your device

## Feedback

We hope you found the information in this leaflet helpful. If it did not tell you what you needed to know or you would like to provide any feedback on your experience, please let us know so that we can make any necessary improvements.

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**You can provide feedback on your experience:**

Telephone: **028 9504 8000** (Monday-Friday: 9am-4pm)

Textphone: **18001 028 950 48000**

By email: [compliments@belfasttrust.hscni.net](mailto:compliments@belfasttrust.hscni.net)

By email: [complaints@belfasttrust.hscni.net](mailto:complaints@belfasttrust.hscni.net)

By completing an online form: <https://belfasttrust.hscni.net/contact-us/compliments-and-complaints/feedback-form/>

**Care Opinion**



What's your story?

We invite you to share your experience by clicking the following link:

<https://www.careopinion.org.uk/>

or by scanning the following QR code on your smartphone or tablet:



**Language and accessible support services**

**Deaf/ Hard of Hearing**

If a Sign Language interpreter is required, please either telephone **028 9615 8900** via the Sign Video remote interpreting service <https://signvideo.co.uk/deaf-community/> or email us at [MPHAdminFOH@belfasttrust.hscni.net](mailto:MPHAdminFOH@belfasttrust.hscni.net) and we will arrange one for your appointment. Please have your H&C number ready when calling or include it in your email. This can be found at the top right corner of any Health and Social Care letters you may have received.

If you are unable to hear on the phone and need to contact us with regards to your appointment you can email us at [MPHAdminFOH@belfasttrust.hscni.net](mailto:MPHAdminFOH@belfasttrust.hscni.net)

**Do you need this information in another format or language?**

The Trust has access to interpreting and translation services. If you need this information in another language or format, including Braille, large print, CD, audio tape please contact the telephone number **028 9615 8900** or e-mail address [MPHAdminFOH@belfasttrust.hscni.net](mailto:MPHAdminFOH@belfasttrust.hscni.net), and we will do our best to meet your needs.

**Polish - Czy potrzebujesz tych informacji w innym formacie lub języku?**

Fundusz ma dostęp do usług w zakresie tłumaczeń ustnych i pisemnych. Jeśli potrzebujesz tych informacji w innym języku lub formacie, w tym w piśmie Braille'a, dużym druku, na płycie CD, kasecie magnetofonowej, skontaktuj się z nami pod numerem telefonu lub adresem e-mail **028 9615 8900/ MPHAdminFOH@belfasttrust.hscni.net**, a my dołożymy wszelkich starań, aby spełnić Twoje potrzeby.

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### Arabic - هل تحتاج هذه المعلومات بصيغة أو بلغة أخرى؟

تستطيع الجمعية توفير خدمات الترجمة الفورية والتحرييرية. إذا احتجت هذه المعلومات بلغة أو بصيغة أخرى، بما فيها بصيغة برايل أو صيغة بالأحرف الكبيرة، أو في سي دي CD أو في شريط مسموع، يُرجى الاتصال برقم التليفون أو عبر البريد الإلكتروني [MPHAdminFOH@belfasttrust.hscni.net](mailto:MPHAdminFOH@belfasttrust.hscni.net) / [028 9615 8900](tel:02896158900) وسوف نبذل قصارى جهودنا في تلبية احتياجاتك.

### Lithuanian - Ar jums reikia šios informacijos kitu formatu ar kalba?

Tarnyba gali suteikti vertimo žodžiu ir raštu paslaugas. Jei reikia šios informacijos kita kalba ar formatu, įskaitant Brailio raštą, didelį šriftą, kompaktinį diską, garso įrašą, skambinkite telefonu arba susisiekite el. paštu [028 9615 8900](tel:02896158900) / [MPHAdminFOH@belfasttrust.hscni.net](mailto:MPHAdminFOH@belfasttrust.hscni.net) ir mes padarysime viską, kad patenkintume jūsų poreikius.

### Romanian - Aveți nevoie de aceste informații într-un alt format sau altă limbă?

Trustul are acces la servicii de interpretariat și traducere. Dacă aveți nevoie de aceste informații într-o altă limbă sau într-un alt format, inclusiv Braille, tipărire cu caractere de mari dimensiuni, CD, înregistrare audio, atunci vă rugăm să ne contactați la numărul de telefon sau la adresa de e-mail [028 9615 8900](tel:02896158900) / [MPHAdminFOH@belfasttrust.hscni.net](mailto:MPHAdminFOH@belfasttrust.hscni.net), iar noi vom face tot posibilul pentru satisfacerea necesităților dumneavoastră.

### Tetum - Ita presiza atu informasaun ida ne'e iha formatu ka lian seluk ka lae?

Fidusiáriu ida ne'e iha asesu ba servisu durubasa no tradusaun. Se Ita presiza informasaun ida ne'e iha lian ka formatu seluk, inklui letra Braile, letra boot, CD, kasete audio, entaun favór telefone númeru ka enderesu e-mail [028 9615 8900](tel:02896158900) / [MPHAdminFOH@belfasttrust.hscni.net](mailto:MPHAdminFOH@belfasttrust.hscni.net), no ami sei halo esforsu tomak atu kumpre Ita-nia nesesidade sira.

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