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Cochlear™ Nucleus® Implants Magnetic Resonance Imaging (MRI) Guidelines

Asia Pacific

For Professionals

Contents

About this guide

This guide applies to Cochlear™ Nucleus® implants. It is intended for:

- Specialised health care professionals who prepare and perform MRI scans
- Physicians who refer a Cochlear Nucleus implant recipient for an MRI scan
- Cochlear Nucleus implant recipients and/or their carers

This guide provides information about the safe application of an MRI scan on Cochlear Nucleus implant recipients.

MRI scans performed under different conditions than those presented in this guide may result in severe patient injury or device malfunction.

Due to the associated risks using MRI with an implanted medical device, it is important to read, understand, and comply with these instructions to prevent potential harm to the patient and/or device malfunction.

This guide should be read in conjunction with the relevant documents that accompany a Cochlear Nucleus implant, such as the Physician's Guide and Important Information Booklet.

For more information, visit www.cochlear.com/mri or contact your regional Cochlear office. Contact numbers are available on the back cover of these guidelines.

Symbols used in this document

Note: Important information or advice.

Caution (no harm): Special care to be taken to ensure safety and effectiveness. Could cause damage to equipment.

Warning (harmful): Potential safety hazards and serious adverse reactions. Could cause harm to person.

Preparation prior to an MRI examination

These guidelines are specific to Cochlear Nucleus implants and supplement other MRI examination considerations specified by the MRI machine manufacturer or protocols at the MRI facility. Recipients should consult with their implant physician prior to an MRI examination.

Non-clinical testing has demonstrated that Cochlear Nucleus implants are MR Conditional. A patient with a Cochlear Nucleus implant may be safely scanned under the conditions described in this document. Failure to follow these conditions may result in injury to the patient.

Cooperation between specialists

Preparing for and conducting an MRI examination for implant recipients requires cooperation between the specialist for the device and/or the cochlear implant physician, referring physician and radiologist or MR technologist.

- **The cochlear implant device specialist** – Knows the implant type and where to find the correct MRI parameters for the implant.
- **The referring physician** – Knows the location of the MRI scan and diagnostic information required, and makes a decision on whether the implant magnet needs to be removed for the MRI examination. Confers with the cochlear implant physician regarding the considerations listed in *Determine eligibility for MRI* on page 6.
- **The cochlear implant physician** – If requested by the referring physician, surgically removes the implant magnet and replaces with a non-magnetic plug or non-magnetic cassette. After the MRI scan, the implant physician replaces it with a new sterile replacement magnet or replacement magnet cassette.
- **The radiologist or MR technologist** – Sets up the MRI scan using the correct MRI parameters and patient positioning. Counsels the implant recipient during the MRI examination.

Determine eligibility for MRI

In order to determine if a patient may receive an MRI scan, you must first identify the patient's Cochlear Nucleus implant model. See *Identifying features* on page 14. After you have identified the implant model, see *Performing MRI safely* on page 17 to locate the MRI safety information for that specific implant model.

If you are a physician referring a Cochlear Nucleus implant recipient for an MRI scan, it is essential that you consider the following:

- Understand and inform the patient of the risks associated with MRI. See *Risks associated with MRI and Cochlear Nucleus implants* on page 7.
- Understand the conditions for an MRI scan and ensure that there is a clear indication for the MRI examination. See *Performing MRI safely* on page 17.

  Also consider:

  - Timing of the implant surgery and MRI exposure
  - Age and general health of the implant recipient and time to recover from the implant magnet surgery or potential trauma
  - Existing or potential for tissue scarring in the location of the implant magnet
- The Cochlear Nucleus implant will create shadowing on the MR image in the vicinity of the implant, resulting in a loss of diagnostic information. Refer to the relevant artefact dimension tables in *Image interference and artefacts* on page 24.
  - If the required diagnostic information is in the area of the implant, the implant magnet may need to be removed. If required, refer the patient to an appropriate physician to arrange for the magnet to be removed before the MRI scan.
- Identify if the patient has any other medical device implants, active or abandoned. If another implanted device is present, verify MRI compatibility before conducting an MRI examination.
  - Cochlear has evaluated the interaction of implants described in this guide with other nearby implanted devices during MRI scanning, and there is no increased heating risk to the cochlear implant.
- For MRI scans at 1.5 T or 3 T, identify if the implant magnet needs to be removed, or if an MRI Kit is required. See *Implant magnet conditions for MRI* on page 17.
  - If the implant magnet needs to be removed, refer the patient to an appropriate physician to arrange for the magnet to be removed before the MRI scan.
  - If an MRI Kit is required, it must be obtained beforehand for use during the MRI scan. Contact the nearest Cochlear office or official distributor to order an MRI Kit.

Risks associated with MRI and Cochlear Nucleus implants

If MRI safety information for the implanted devices is not followed, the potential risks include:

- **Device movement**

  Scanning outside of the parameters contained in these guidelines may lead to the implant magnet or device moving out of position during an MRI examination causing skin or tissue trauma.
- **Damage to the device**

  MRI exposure beyond the values contained in these guidelines may cause damage to the device.
- **Weakening of implant magnet**
  - Scanning at static magnetic field strengths at values other than those contained in these guidelines may lead to a weakening of the implant magnet.
  - Incorrect patient positioning prior to the MRI scan or head movement during the scan may result in implant magnet demagnetisation.
  - The implant magnet has been designed and verified to state of the art standards. Demagnetisation is highly unlikely when the patient is positioned following the instructions in these guidelines.
- **Uncomfortable sensation**

  MRI exposure beyond the values contained in these guidelines may result in the patient perceiving sound or noise and/or pain.
- **Implant heating**

  Use the recommended SAR values contained in these guidelines to ensure the implant does not heat beyond safe levels.
- **Image artefact**
  - The Cochlear Nucleus implant will create shadowing on the MR image in the vicinity of the implant, resulting in a loss of diagnostic information.
  - If inspecting near the implant, removal of the implant magnet should be considered as MR image quality may be compromised with it in place.

Considerations for implant magnet removal

If the implant magnet needs to be removed prior to an MRI examination, close coordination is required between the specialists to perform the implant magnet removal, MRI scan, and subsequent implant magnet replacement.

If the MRI examination, magnet removal and replacement will be completed on the same day, the magnet recess can remain empty. See *Implant magnet conditions for MRI* on page 17.

If MRI examinations are needed over a period of time on the head with the magnet removed, the implant magnet must be replaced in a sterile surgical environment with a non-magnetic cassette or non-magnetic plug. In the magnet's absence, the non-magnetic cassette or non-magnetic plug prevent fibrous tissue growing into the implant recess. Such growth would make implant magnet replacement difficult.

Warning: To minimise the risk of infection or fibrous tissue growing into the implant recess, do not leave the magnet pocket empty for MRI examinations taking place over several days. When removing a magnet cassette or implant magnet, replace with a non-magnetic cassette or non-magnetic plug.

CI600 Series implant coil plate with magnet cassette in pocket

CI500 Series removable implant magnet inside implant magnet pocket

Figure 1: *CI600 Series and CI500 Series implants with removable magnet*

Caution: Non-magnetic plugs for CI500 Series implants are a different size to non-magnetic plugs for CI24RE Series implants and older implants. Ensure the correct non-magnetic plug is used.

With the non-magnetic cassette or non-magnetic plug in place, MRI scans can be done at both 1.5 T and 3 T without the need for bandaging or use of the MRI Kit.

Note: While the magnet is removed, the recipient may wear a Cochlear Disk Retainer to hold their sound processor coil in place. Disk retainers are available from Cochlear.

When there is no further need for MRI examinations, the non-magnetic cassette or non-magnetic plug is removed and replaced by a new replacement magnet cassette or sterile replacement magnet.

The non-magnetic cassette, non-magnetic plug, replacement magnet cassette and sterile replacement magnet are supplied separately in sterile packs. All are single-use items.

Preparation for conducting the MRI examination

All external components of the Cochlear implant system (for example, sound processors, remote assistants and related accessories) are MR Unsafe. The patient must remove all external components of their Cochlear implant system before entering a room where an MRI scanner is located.

A patient with one or two Cochlear Nucleus hearing implants can be safely scanned in an MR system meeting conditions contained within these guidelines.

Confirm the following prior to scanning:

- The implant model has been identified. See *Identifying the Cochlear Nucleus implant* on page 13.
  - For additional information for bilateral recipients, see *Bilateral recipients* on page 11.
- The artefact has been considered, and there is still diagnostic value in performing the MRI scan. See *Image interference and artefacts* on page 24.
- For MRI scans on a body location away from the implant site, MRI safety information for the recipient's implant model must still be followed. See *Performing the MRI scan* on page 11.
- If the referring physician has prescribed that the MRI scan be performed without the implant magnet, the implant magnet has been surgically removed. See *Preparation prior to an MRI examination* on page 5.
- The Cochlear MRI Kit is required for MRI scans at 1.5 T with the implant magnet in place for CI500 Series, CI24RE Series, CI24R Series, CI24M Series and CI22M Series implants. See the ***Cochlear MRI Kit User Guide*** provided with the MRI Kit for instructions on how to apply the MRI Kit prior to the MRI scan. See *Table 6: Implant magnet conditions for MRI* on page 17.
- An MRI Kit must be obtained beforehand for use during the MRI scan.
  Contact the nearest Cochlear office or official distributor to order an MRI Kit.
- Head bandaging is not required for CI600 Series implants, even with a magnet in place, at 1.5 T or 3 T.

  Unnecessary use of a head bandage or splint with CI600 Series implants will apply undue pressure and may increase patient discomfort.

- Discuss the sensations the recipient may experience during the MRI Scan.
  See *Patient comfort* on page 12.
- Explain to the patient how they will be positioned for the scan.
  See *Patient positioning* on page 12.
- Remove the sound processor before entering the MRI room.
  The sound processor is MR Unsafe.

  Note: Once the sound processor has been removed, the patient may no longer be able to hear.

- Position the patient to minimise discomfort. See *Patient positioning* on page 12.
- Comply with the *Scan conditions and SAR limits* on page 18.

Bilateral recipients

Caution: If one or more of the implants is a CI22M cochlear implant without a removable magnet, MRI is contraindicated.

Use the MRI safety information of the recipient's implant model with the most restrictive MRI exposure requirements.

Performing the MRI scan

The MRI scan must be performed using the MRI safety information identified for the patient's implant model.

When an implant recipient requires an MRI scan on a location of their body away from the implant site, you must still follow the MRI safety information for the recipient's implant model.
See *Identifying the Cochlear Nucleus implant* on page 13 and *Performing MRI safely* on page 17.

Patient positioning

For safety, the patient should be in a supine position, lying flat on back with face upward, prior to entering the MRI bore.

Align the patient's head with the bore axis of the MRI machine. Advise the patient to lie as still as possible and to not move their head during the MRI scan.

Caution

When scanning with the implant magnet in place, ensure that the patient does not move more than 15 degrees (15°) from the centreline (Z-axis) of the bore during the MRI scan.

Failure to position the patient correctly prior to the MRI scan may result in increased torque on the implant and cause pain, or may cause demagnetisation of the implant magnet.

Patient comfort

For patients where an implant magnet is in place, explain that they might feel the implant magnet moving slightly and might sense resistance to movement as pressure on the skin.

For devices which require an MRI Kit, the MRI Kit will reduce the likelihood of the implant magnet moving. The sensation will be similar to pressing down firmly on the skin with the thumb.

If the patient experiences pain, consult the patient's physician to determine if the implant magnet should be removed or if a local anaesthetic may be applied to reduce discomfort.

Caution: If administering local anaesthetic, take care not to perforate the implant silicone.

In addition, explain to the patient that they may perceive sounds during the MRI scan.

Identifying the Cochlear Nucleus implant

The implant model can be found on the patient's Cochlear patient implant card.

If the patient does not have their patient implant card with them, the implant type and model can be identified without surgical intervention. See *X-ray information for identification of Cochlear Nucleus implants* on page 13, *X-ray guidelines* on page 13 and *Identifying features* on page 14.

X-ray information for identification of Cochlear Nucleus implants

Cochlear Nucleus implants are made of metal and implanted under the skin behind the ear.

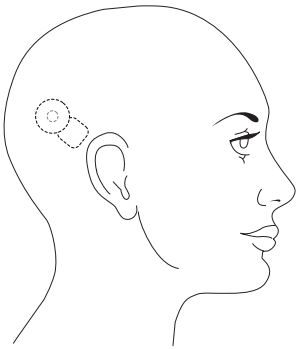


Figure 2: *Location behind the ear for Cochlear Nucleus implants*

X-ray guidelines

Lateral X-ray at 70 kV/ 3 mAs provides sufficient contrast to identify the implant.

A modified Stenver's view is not recommended for implant identification as implants may appear oblique.

Imaging should include an unobstructed view of antenna coils and implant bodies.

Bilateral recipients may have different implant models on either side of the head. A lateral skull X-ray with a 15 degree cranial tube angle will offset the implants in the image, enabling identifying features to be distinguished.

Identifying features

Identifying features on Cochlear Nucleus implant X-ray images are explained on the following pages. Other implant models may have other identifying features.

Cochlear Nucleus CI600 Series and CI500 Series implants*

Cochlear Nucleus CI600 Series implants - CI612, CI622, CI632 – and CI500 Series implants – CI512, CI522, CI532, ABI541 – do not have radiopaque characters.

Using an X-ray, CI600 Series and CI500 Series implants can be identified by the implant shape and electronic assembly layout. If further implant details are required, contact your Cochlear representative who will provide instructions on how to determine the following:

- Manufacturer
- Model
- Year of manufacture

The electronic assembly layout is identical for Cochlear Nucleus CI600 Series and CI500 Series implants. The unique identifier for CI600 Series implants is the magnet shape and the three holes next to the magnet, as illustrated in the table below.

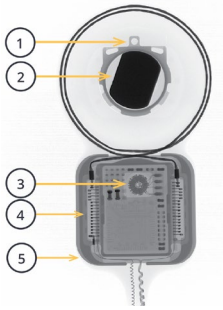
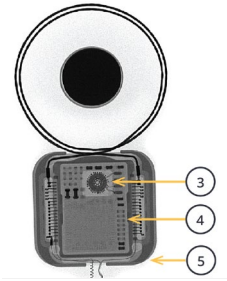
CI600 Series implant X-ray	CI500 Series implant X-ray	Unique identifier
		**1.** Three holes adjacent to magnet **2.** Magnet shape **3.** Round shape at coil exit end of electronic assembly layout **4.** Series of wire connectors that are visible on both sides of the electronic assembly **5.** Square implant body shape

Table 1: *CI600 Series and CI500 Series implants identified by their shape and electronic assembly*

* Not all products are available in all countries. Please contact your local Cochlear representative for product information.

Cochlear Nucleus CI24RE Series, CI24R Series, CI24M Series and CI22M Series implants

Cochlear Nucleus implants that can be identified by the radiopaque characters printed on them are:

- CI24RE Series – CI422, CI24REH (Hybrid L24), CI24RE (CA), CI24RE (CS), CI24RE (ST)
- CI24R Series – CI24R (CA), CI24R (CS), CI24R (ST)
- CI24M Series – CI24M, CI 11+11+2M, ABI24M
- CI22M Series – CI22M

There are three sets of radiopaque characters printed on each implant.

1. The first character identifies the manufacturer – 'C' indicates Cochlear Limited.
2. The second (middle) character identifies the implant model.
3. The third character indicates the year of manufacture. To determine the year of manufacture of your implant, contact your Cochlear representative.

Implant model	Location of second (middle) radiopaque character set	Radiopaque characters
CI422		13
CI24REH (Hybrid L24)		6
CI24RE (CA)		5
CI24RE (CS)		7
CI24RE (ST)		4

Table 2: *CI24RE Series implants identified by radiopaque characters*

Implant model	Location of second (middle) radiopaque character set	Radiopaque characters
CI24R (CA)		2
CI24R (CS)		C
CI24R (ST)		H

Table 3: *CI24R Series implants identified by radiopaque characters*

Implant model	Location of second (middle) radiopaque character set	Radiopaque characters
CI24M		T
CI 11+11+2M		P
ABI24M		G

Table 4: *CI24M Series implants identified by radiopaque characters*

Implant model	Location of second (middle) radiopaque character set	Radiopaque characters
CI22M with removable magnet		L or J
CI22M without removable magnet		Z

Table 5: *CI22M Series implants identified by radiopaque characters*

Performing MRI safely

Implant magnet conditions for MRI

For some implant models and MRI field strengths, bandaging with an MRI Kit is required, or the implant magnet needs to be surgically removed. Refer to *Table 6* on page 17 for information on each Cochlear Nucleus implant model.

Head bandaging is not required for CI600 Series implants, even with a magnet in place, at 1.5 T or 3 T.

Unnecessary use of a head bandage or splint with CI600 Series implants will apply undue pressure and may increase patient discomfort.

Implant type	MRI field strength (T)	Remove implant magnet Yes/No	MRI Kit required Yes/No
CI600 Series implants			
CI612, CI622, CI632	1.5	No	No
	3		
CI500 Series implants			
CI512, CI522, CI532, ABI541	1.5	No	Yes
	3	Yes	No
CI24RE Series implants			
CI422, CI24REH (Hybrid L24), CI24RE (CA), CI24RE (ST)	1.5	No	Yes
	3	Yes	No
CI24R & CI24M Series implants			
CI24R (CA), CI24R (CS), CI24R (ST), CI24M, ABI24M	1.5	No	Yes
	3	Yes	No
CI 11+11+2M	1.5	No	Yes
	3	MRI is contraindicated	
CI22M Series implants			
CI22M with removable magnet	1.5	No	Yes
	3	MRI is contraindicated	
CI22M without removable magnet	1.5	MRI is contraindicated	
	3		

Table 6: *Implant magnet conditions for MRI*

Scan conditions and SAR limits

The MRI safety information provided in these guidelines only applies to 1.5 T and 3 T MRI horizontal scanners (closed bore or wide bore) with a circularly polarised (CP) RF field for a maximum active scan time of 60 minutes.

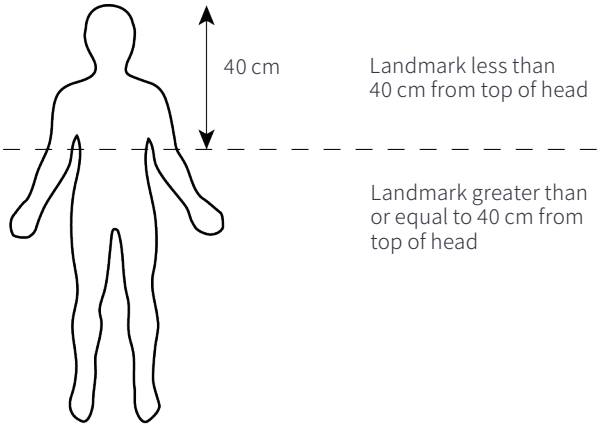
Warning: MRI scans at 3 T must be performed in quadrature mode or CP mode for the radio frequency (RF) transmit coil. Using a multi-channel mode may result in localised heating above safe levels.

All scans shall be performed according to the specified SAR limits for the relevant implant.

Consider the following prior to scanning:

- Transmit/receive head coils and whole body coils may be safely used within the recommended SAR limits. Refer to the MRI safety information and recommended SAR limit tables on the following pages in this section.
- Local cylindrical transmit/receive coils may be safely used, without SAR restriction, provided that the distance between the entire implant and the end of the local RF coil is at least equal to the radius of the local RF coil.
- It is safe to use local cylindrical RF receive only coils with cochlear implants during MRI scanning, provided SAR limits for the transmit coil have not been exceeded.
- Local planar (flat linearly polarised) receive only RF coils should be kept more than 10 cm away from the cochlear implant
- Maximum allowable MRI scan time is 60 minutes of continuous scanning, with the SAR limitations provided in this section.

Figure 3: *Landmark locations*



CI600 Series implants

Implant type	MRI field strength (T)	Maximum allowable spatial gradient field (T/m)	Head average SAR limit (W/kg) Using transmit /receive head coil	Whole body average SAR limit (W/kg) Landmark location	
				<40 cm from top of head	≥40 cm from top of head
CI612	1.5	20	<2	<1	<2
CI622					
CI632					
CI612	3	20	<1	<0.5	<1
CI622				<0.4	
CI632				<0.4	

Table 7: *MRI safety information and recommended SAR limits for CI600 Series implants*

CI500 Series implants

Implant type	MRI field strength (T)	Maximum allowable spatial gradient field (T/m)	Head average SAR limit (W/kg) Using transmit /receive head coil	Whole body average SAR limit (W/kg) Landmark location	
				<40 cm from top of head	≥40 cm from top of head
CI512	1.5	20	<2	<1	<2
CI522					
CI532					
ABI541					
CI512	3	20	<1	<0.5	<1
CI522				<0.4	
CI532				<0.4	
ABI541				<0.5	

Table 8: *MRI safety information and recommended SAR limits for CI500 Series implants*

CI24RE Series implants

Implant type	MRI field strength (T)	Maximum allowable spatial gradient field (T/m)	Head average SAR limit (W/kg) Using transmit /receive head coil	Whole body average SAR limit (W/kg) Landmark location	
				<40 cm from top of head	≥40 cm from top of head
CI422	1.5	20	<2	<1	<2
CI24REH (Hybrid L24)					
CI24RE (CA)					
CI24RE (ST)					
CI422	3	20	<1	<0.5	<1
CI24REH (Hybrid L24)					
CI24RE (CA)					
CI24RE (ST)					

Table 9: *MRI safety information and recommended SAR limits for CI24RE Series implants*

CI24R Series and CI24M Series implants

Implant type	MRI field strength (T)	Maximum allowable spatial gradient field (T/m)	Head average SAR limit (W/kg) Using transmit /receive head coil	Whole body average SAR limit (W/kg) Landmark location	
				<40 cm from top of head	≥40 cm from top of head
CI24R (CA)	1.5	20	<2	<1	<2
CI24R (CS)					
CI24R (ST)					
CI24M					
ABI24M					
CI 11+11+2M	1.5	20	<1	<0.5	<1
CI24R (CA)	3	20	<1	<0.5	<1
CI24R (CS)					
CI24R (ST)					
CI24M					
ABI24M					
CI 11+11+2M	3	MRI is contraindicated			

Table 10: *MRI safety information and recommended SAR limits for CI24R Series and CI24M Series implants*

CI22M Series implants

Implant type	MRI field strength (T)	Maximum allowable spatial gradient field (T/m)	Head average SAR limit (W/kg) Using transmit /receive head coil	Whole body average SAR limit (W/kg) Landmark location	
				<40 cm from top of head	≥40 cm from top of head
CI22M with removable magnet	1.5	20	<2	<1	<2
	3	MRI is contraindicated			
CI22M without removable magnet	1.5	MRI is contraindicated			
	3				

Table 11: *MRI safety information and recommended SAR limits for CI22M Series implants*

Image interference and artefacts

The Cochlear Nucleus implant will create shadowing on the MR image near the implant, resulting in a loss of diagnostic information.

If inspecting near the implant, consider removing the implant magnet as MR image quality may be compromised with it in place.

If the implant magnet needs to be removed, refer the patient to an appropriate physician to arrange for the magnet to be removed before the MRI scan.

The image artefact results in *Table 13* and *Table 14* on page 25 are based on maximum artefact extension from the centre of the implant when scanned at 1.5 T and 3 T using a common Metal Artefact Reduction Sequence (MARS). The MARS parameters detailed in *Table 12* on page 24 were used to produce the artefact sizes detailed on the following pages.

The further optimisation of scan parameters can be used to minimise the extent of the artefact.

Sequence:	MARS Turbo spin-echo	
	1.5 T	3 T
Echo Time (TE) [msec]	17	50
Repetition Time (TR) [msec]	2375	4000
Flip angle [°]	90	90
Bandwidth per Pixel [Hz/pixel]	319	781
Bandwidth [kHz]	82	200

Table 12: *MARS parameter settings*

The artefact images in *Table 13* and *Table 14* on page 25 are representative of the largest axial results across all implants. Individual artefact sizes per implant model are detailed in *Table 15* on page 26 and *Table 16* on page 27.

For bilateral implant recipients, the image artefacts as shown in *Table 13* and *Table 14* on page 25 are mirrored on the opposite side of the head for each implant. There may be some extension of the artefact between the implants.

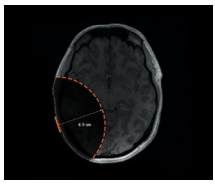
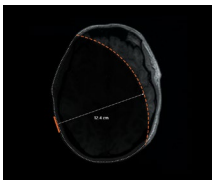
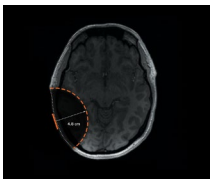
Implant magnet in place (CI600 Series only)	Implant magnet + magnetic splint	Implant magnet removed
		
6.9 cm (2.7 in)	12.4 cm (4.9 in)	4.8 cm (1.9 in)

Table 13: *Maximum artefact extension at 1.5 T across all implant types*

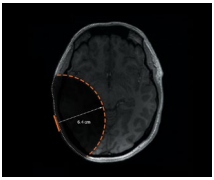
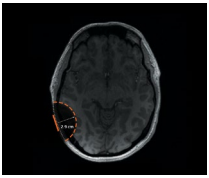
Implant magnet in place (CI600 Series only)	Implant magnet removed
	
6.4 cm (2.5 in)	2.9 cm (1.1 in)

Table 14: *Maximum artefact extension at 3 T across all implant types*

Implant type	MRI field strength (T)	Maximum artefact radius (with MARS sequence) [cm / in]	
		Implant magnet in place	Implant with non-magnetic cassette
		Axial	Axial
CI600 Series implants			
CI612, CI622, CI632	1.5	6.9 / 2.7	2.9 / 1.1
	3	6.4 / 2.5	2.9 / 1.1

Table 15: *Artefact dimensions for CI600 Series implants*

Implant type	MRI field strength (T)	Maximum artefact radius (with MARS sequence) [cm/in]	
		With implant magnet + magnetic splint	Implant magnet removed
		Axial	Axial
CI500 Series implants			
CI512, CI522, CI532, ABI541	1.5	12.4 / 4.9	2.9 / 1.1
	3	N/A†	2.9 / 1.1
CI24RE Series implants			
CI422, CI24REH (Hybrid L24) CI24RE (CA), CI24RE (ST)	1.5	11.3 / 4.4	2.6 / 1.0
	3	N/A†	2.5 / 1.0
CI24R Series implants			
CI24R (CA), CI24R (CS), CI24R (ST)	1.5	11.3 / 4.4	2.6 / 1.0
	3	N/A†	2.5 / 1.0
CI24M Series implants			
CI24M, ABI24M	1.5	11.3 / 4.4	2.8 / 1.1
	3	N/A†	2.5 / 1.0
CI 11+11+2M	1.5	11.3 / 4.4	2.8 / 1.1
	3	MRI is contraindicated	
CI22M Series implants			
CI22M with removable magnet	1.5	11.3 / 4.4	4.8 / 1.9
	3	MRI is contraindicated	
CI22M without removable magnet	1.5	MRI is contraindicated	
	3		

Table 16: *Artefact dimensions for CI500 Series, CI24RE Series, CI24R, CI24M Series and CI22M Series implants*

† Surgically remove the implant magnet before MRI scans at 3 T.

Considerations after an MRI examination

With the implant magnet in place

After the patient leaves the MRI room, remove the MRI Kit contents from the patient's head, as required. Refer to the *Cochlear MRI Kit User Guide* provided with the MRI Kit for full instructions and warnings. Ask the patient to place the sound processor on their head and turn it on.

Confirm:

- Placement of the sound processor is correct.
- There is no discomfort.
- Sound is perceived as normal.

If there is discomfort or a change in sound perception, or problems with the placement of the sound processor, ask the patient to seek assistance from their implant clinician as soon as possible.

With the implant magnet removed

See *Considerations for implant magnet removal* on page 8.

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Notes

Hear now. And always

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