

Scans for children

Scans are used to give a detailed image of the brain. Your child may have a brain scan so that doctors can see whether a tumour is present and, if it is, its size and position. Scans are used during diagnosis, as well as for monitoring during and after treatment. The two scans that are most commonly used are CT scans (image below) and MRI scans.



In this fact sheet:

- CT scans: what they are and the scan procedure
- Answers to some common questions you may have about CT scans
- MRI scans: what they are and the scan procedure
- Answers to some common questions you may have about MRI scans

CT scans

CT stands for Computerised Tomography. You may also hear doctors referring to CT scans as CAT scans - these are the same thing. CT scans use x-rays to build up a three-dimensional image of the inside of your child's head by taking several pictures from various angles.

The CT scan procedure:

- Your child is likely to be given a 'contrast medium' (either an injection or a drink) that enables a clearer image to be given from the scan. This does not hurt but could make them feel warm all over.
- If your child is very young or anxious, they may be sedated before they have a scan. Some children need to have sedation before each scan if they find the procedure particularly upsetting. If this is the case with your child, each scan could take much longer than would otherwise be expected.
- The scanner is shaped like a doughnut or ring, with a round hole in the middle - this is where your child's head will go. It will take a bit of time to get them into the right position, which is added on to the time it actually takes to get the scan.
- The scan takes around 5-10 minutes. It's important that your child lies very still during the scan. Staff will leave the room, but will be nearby and able to see and hear your child. Likewise, your child will be able to hear the medical staff.
- During the scan, your child will hear a soft humming from the scanner and clicking sounds when it is taking pictures.
- After the scan, your child would usually be allowed to go straight home.

Before your child has a CT scan, you should let the doctors know if your child:

- Is very frightened of having a scan or has become distressed having one in the past
- Has any allergies
- Is on any medication
- Has had a recent illness.

CT scans are quicker and quieter than MRI scans and children tend to find them less claustrophobic - however, they do need to stay as still as possible for both types of scan.

Is the scan painful?

No, but the contrast medium may make your child feel hot or flushed. This feeling usually lasts only for about a minute. Less commonly, some people have reported feeling cold after having the contrast medium. If your child is given the contrast medium as a drink, they may find it tastes a little unpleasant, so it could be a good idea to take some mints or sweets with you to the appointment.

For some children it is fear of having the scan as opposed to pain that is a problem. Medical teams are used to this so don't be afraid to mention that your child is very scared, as they can help by sedating your child or referring them to a play therapist. It is much better for the medical team to be aware of a problem, so they can address it before it happens, than for your child to become upset during a scan and it needing to be stopped.

How long does the CT scan take?

The CT scan itself takes around 5-10 minutes, although more time will be spent beforehand to get your child into the correct position ready for the scan. If your child is worried about the scan and does not settle it could take quite some time to carry out the procedure. Equally, if your child needs to be sedated for their scan, this will add time on to the whole process as they will need to be seen by the doctor administering the sedative.

My child is claustrophobic - what can you suggest?

If your child feels claustrophobic, it's a good idea to let the hospital staff know before the day of their scan. If necessary, your child may be given a sedative to help calm them before the procedure, but you'll need to ask in advance if you think your child may require one.

Can my child breathe normally during the CT scan?

Yes, it's fine for your child to carry on breathing quietly during their scan. They may be asked to hold their breath a few times

during the procedure to prevent the image from blurring, but they will be told about this beforehand and it will only be for a few seconds each time.

Can I stay with my child during their CT scan?

Yes, as long as you are not pregnant. If you are, you could ask a friend or relative to stay with your child while you wait outside the room. You might also like to think about how to help put your child at ease with the idea of having a scan. This could include talking through with them what to expect before their first scan and perhaps showing them a picture of a scanner (*see the How can I help prepare my child for a scan section in this fact sheet*). You could also make a scanner at home out of a box and a sticky tape roll - you could then use this to 'scan' your child's toys whilst making the noises with pots and pans.

If your child is very young, you could consider telling them an adventure story where they are a lead character, with the scan being part of the story. The scanning machines look quite futuristic so, if your child likes space, you could create a story involving a spaceman and a spaceship.

If your child is very anxious, it is a good idea to speak to the doctors before the scan to ask whether they can give your child any medication to help calm them.

How long will we have to wait for the results?

This varies between hospitals. Some hospitals are able to give results within a day, whilst others may take around a week. You should be given a time frame for the results by your child's doctor or clinical nurse specialist.

Are CT scans dangerous?

CT scans are used only when they are considered necessary, with the benefits outweighing the risks. Although radiation is used, it is kept at a very low dose.

Information if your child has been sedated for a scan

If your child was sedated for their CT scan, they may feel or be sick in the 24 hours afterwards and not feel like eating very much during this time. They will not be let out of hospital until it is considered safe for them to leave. Once home, the main thing is that you encourage your child to drink and ensure that they are well hydrated.

Clumsiness and tiredness are relatively common after sedation and is not a cause for concern. However, you should be cautious of which activities they undertake for 24 hours after sedation. Although medical staff will check that it is safe for your child to go home, if you find that they are very difficult to wake once you have returned home, seek medical assistance.

After the scan

Unless your child was sedated, you will usually be able to take your child straight home. If your child was sedated, the hospital staff will first check that it is safe for them to go home.

The radiography team will send a copy of the scan to your child's medical team in time for your next appointment, when you will be given the results.

MRI scans

Magnetic Resonance Imaging, or MRI, uses magnetic fields to build up a three-dimensional image of the brain. Like the CT scan, it takes pictures from several angles and builds up a detailed picture. Due to its use of powerful magnets, staff will check that your child does not have any metal on their body (e.g. jewellery, zips, metal belt buckles or clasps on clothing, wrist watches and hair clips).

The MRI scan procedure:

- Your child is likely to be given a contrast medium (an injection or a drink) that enables a clearer scan image. This may make them child feel warm all over. The contrast medium could be given to your child before, or part way through, the scan.

- Metal items, such as hair clips, metal belt buckles and jewellery, will need to be removed. During your child's scan, staff will leave the room, but they can see and hear your child, and your child can hear them.
- The scan is very noisy (making a loud knocking sound), so your child may be given headphones or earplugs to wear during it. Some children find the noise a bit frightening, so it is often helpful to prepare them for what they will hear before the day of their scan.
- Most children's hospitals run a DVD or music to help keep children entertained during the scan. You could take your child's favourite DVD or music with you and ask the hospital to play it during your child's scan.
- The scanner is a cylinder with a hole through the centre. Your child's head and shoulders fit inside it. To some people, it can feel claustrophobic. If your child is likely to feel claustrophobic, let the hospital staff know before the day of the scan as they will be able to arrange for your child to have a sedative. With some MRI scans, the radiographer can place an angled mirror so your child can see out of the scanner, which can help to make it feel less claustrophobic.
- The scan can typically take between 30 and 60 minutes.

Important information if your child has an adjustable shunt

If your child has an adjustable shunt this will need to be reset following an MRI scan, as the magnetic field will change the settings. The medical team should be aware of this, however, it is good practice to also keep a note of the settings of your child's shunt and check with the medical team that the correct levels have been reset after the scan. It is also good practice to put the settings on a medical alert bracelet so medics can access them should they ever need them and you are not there.

What if my baby or very young child needs an MRI scan?

If your baby or young child needs to have an MRI scan, it may be necessary for them to have a general anaesthetic. This is

to ensure that your child does not become overly anxious. If you go in to the scanning room with your child, you will need to remove your watch and any items in your pocket that have metal on, such as credit cards or other cards that have a magnetic strip - the powerful magnets in the scanner can affect their working.

What if my child is claustrophobic?

If you are concerned that your child will feel claustrophobic in the MRI scanner it is a good idea to talk this through with them and the radiographer before the day of the scan. The scanner is open-ended, so your child would never be completely enclosed while having their scan and newer machines are wider than older style ones. Often a mirror can be placed so your child can see out of the scanner, which can help to make it feel less claustrophobic. If your child is likely to feel anxious they will be able to have a sedative.

Can I stay with my child during their MRI scan?

You can be in the scanning room with your child while they have their scan, but you should let the radiographers know if you are within the first trimester (i.e. first three months) of pregnancy. You will also need to remove anything metal, such as your wristwatch. You may wish to place a hand on their leg to provide reassurance that you are there with them.

My child has braces on their teeth - is this a problem?

Having an MRI scan while wearing braces is not dangerous. However, as braces could affect the quality of the scan image, your child's braces may be removed if possible.

Are MRI scans dangerous?

MRI scans are completely safe. There are no risks associated with them, although they are not suitable for people who have metal in their body (for example, skull sections).

After the MRI scan

If your child has had an anaesthetic or sedative, you'll need to wait for them to fully awake before you can take them home. This could take up to a couple of hours after they have had their scan.

What other types of scans might my child have?

MRI scans and CT scans are the most common type of scan your child is likely to have, but there are some other types of scan that may be used to diagnose or find out more about a brain tumour. These include:

- **PET (Positron Emission Tomography) scans**
These are often used to help detect whether a brain tumour is low grade (slow growing) or high grade (fast growing).
- **Advanced MRI scans**
These can help doctors to decide how and when they will treat your child's tumour.
- **SPECT (Single Photon Emission Computerised Tomography) scans**
These are similar to PET scans. They can be used to help doctors find out more about the tumour and about chemicals within your child's brain.

If your child is having an anaesthetic

If your child's health team think it would be best for your child to have an anaesthetic before any type of scan, they will give you specific information. As a general guide:

- Your child must have an empty stomach they can have an anaesthetic. This is to make it less likely that they will be sick. Being sick while unconscious is dangerous due to choking complications. You should, therefore, not give your child anything to eat or drink for a number of hours before they will have their anaesthetic. The doctor will advise on the latest time your child can have anything to eat or drink.
- On the day, doctors will assess whether it is safe for your child to have the anaesthetic, based on whether they have stuck to the fasting guidance and whether they are well enough. If your child has a bad cold or a chest infection, for example, they will not be able to have an anaesthetic.

- Children can be fearful of needles. If this is the case with your child, the medical team should be able to provide a cream that can be put on the area where the anaesthetic needle goes in. This is usually put on an hour before the injection and helps numb the area so your child will not feel the needle as much. It can sometimes be the case that unforeseen delays hold up the scans. If this happens, the numbing effect of the cream can wear off and you may need to wipe the area and ask for a second dose.
- After having sedation or a general anaesthetic, your child could feel sick and disorientated for up to 24 hours afterwards. Don't be worried if your child does not feel like eating much over the next day or two, so long as they are drinking.

How can I help my child prepare for a scan?

Having a brain scan is an unfamiliar experience for most people and for children in particular, it can be very daunting. It may therefore be helpful to talk your child through what to expect. There are several resources that may help with this:

- If your child has a clinical nurse specialist, they will be specialised in working with children and will be able to help explain the procedure to help your child understand.
- The Headstrong website www.headstrongkids.org.uk has some basic information about scans that is written and presented for young children.
- Your child may be given a play therapist, who can work with them to help them mentally prepare for a scan and to cope with feelings of anxiety.
- You can help your child prepare for a scan by looking up images on the internet and talking with them about what they might see. For example:
CT scan: www.cancerresearchuk.org/cancer-help/about-cancer/tests/ct-scan
MRI scan: www.cancerresearchuk.org/cancer-help/about-cancer/tests/mri-scan

- The Guy's & St Thomas' NHS Foundation Trust website has two MRI scan photo stories:
for children aged up to 10 years
www.guysandstthomas.nhs.uk/resources/patient-information/childrens/mri/jacksmriscan.pdf
and those aged 11 and over
www.guysandstthomas.nhs.uk/resources/patient-information/childrens/mri/YourMRIscan.pdf
You can also hear the noises of an MRI scanner:
www.guysandstthomas.nhs.uk/our-services/childrens-services/childrens-mri/children-over-11.aspx
- You could also make a model scanner together and scan their favourite toy. You can even replicate the bangs with pots and pans, to reduce your child's fear when they are in the scanning machine and it makes a loud noise.

What is sedation?

If your child is under 5 years, they are likely to be given sedation (medicine that makes them go to sleep so that they lie still) for CT scans, but for MRI scans, which are lengthy, noisy and more claustrophobic, they may need a general anaesthetic. This is because the length of time sedation lasts is less predictable, so an anaesthetic is needed to keep them safely asleep for the duration of the scan.

Older children tend not to sedate well i.e. don't go to sleep with oral medication, so if your child is older than five years and cannot stay still, they may be given a small dose of a sedative medicine, such as levomepromazine or lorazepam, which can make them feel less anxious and relax them, but doesn't make them go to sleep.

If they are particularly anxious or unable to stay still, for example, if they have learning difficulties and don't understand what is happening, they may need to be given a general anaesthetic. Sedation can be given by a trained children's nurse who will monitor your child during and after the scan until it is safe for them to go home.

If your child has a general anaesthetic, they will be closely monitored during the scan by an anaesthetist, who in the case of MRI scans, will use special non-magnetic equipment. They will also be monitored by a member of their health team until it is safe for them to go home.

What if I have further questions?

If you require further information, any clarification of information, or wish to discuss any concerns, please contact our Support and Information Team:

Call: 0808 800 0004

(Free from landlines and most mobiles:
3, O2, Orange, T-Mobile, EE, Virgin and Vodafone)

Email: support@thebraintumourcharity.org

Join our online forums at:
thebraintumourcharity.org/forums

About us

The Brain Tumour Charity makes every effort to ensure that we provide accurate, up-to-date and unbiased facts about brain tumours. We hope that these will add to the medical advice you have already been given. Please do continue to talk to your doctor if you are worried about any medical issues.

We are the UK's leading brain tumour charity. We fund scientific and clinical research into brain tumours and offer support and information to those affected, whilst raising awareness and influencing policy.

We rely 100% on charitable donations to fund our vital work. If you would like to make a donation, or want to find out about other ways to support us including fundraising, leaving a gift in your will or giving in memory, please visit us at thebraintumourcharity.org, call us on 01252 749043 or email fundraising@thebraintumourcharity.org

About this fact sheet



This fact sheet has been written and edited by The Brain Tumour Charity's Support and Information Team and is supported by the Children's Cancer and Leukaemia Group (CCLG).

The accuracy of medical information has been verified by a leading neuro-oncologist. Our fact sheets have been produced with the assistance of patient and carer representatives and up-to-date, reliable sources of evidence. If you would like a list of references for any of the fact sheets, or would like more information about how we produce them, please contact us.



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Your notes

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