

# Chemotherapy for children

*Chemotherapy is one way your child may be treated for a brain tumour. Chemotherapy uses 'cytotoxic' (anti-cancer) drugs to destroy cancer cells by interrupting or stopping their growth over a period of time or 'cycles'. Chemotherapy can be used on its own, in association with radiotherapy, or it may be used before surgery to shrink your child's tumour, or afterwards to help prevent it from returning.*

## In this fact sheet:

- How chemotherapy works
- Why is chemotherapy given?
- How is treatment is given?
- Preventing infection of your child's central line
- After treatment
- Answers to some common questions you may have about chemotherapy

## How chemotherapy works

Our bodies are made up of cells that divide as part of their natural cycle to reproduce and repair themselves. If this process is disrupted, the cells can begin to grow in an uncontrolled way, creating a lump of cells called a tumour. Chemotherapy drugs disturb the dividing process of both tumour (cancer) cells and healthy cells. Healthy cells are better able to repair themselves however, whilst cancer cells are more likely to die.

The fact that chemotherapy acts on dividing cells explains some of its side-effects. Cells in the body that divide frequently (i.e. skin and hair cells, cells lining the digestive system and bone marrow cells which make blood cells) are therefore vulnerable to chemotherapy. This is why these parts of the body are often affected by chemotherapy. For more information about side effects, see pages 4 and 5 of this fact sheet.

## Why is chemotherapy given?

Your child's health team will carefully consider the best course of treatment for your child. This will depend on several factors, including your child's exact tumour type, their age and size and their general health. You should feel free to ask as many questions as you wish. Chemotherapy may be given:

- Before surgery to shrink a tumour to make it easier to operate on
- After surgery to prevent a tumour from returning
- To treat a tumour that has returned
- To shrink a tumour that cannot be operated on
- To prevent further growth of a tumour
- Prior to radiotherapy.

## How is treatment is given?

Your child may be given chemotherapy in one of a number of ways - intravenous (IV) chemotherapy by injection or drip, or oral chemotherapy by tablet or liquid.

(Very occasionally children are given chemotherapy via a wafer made of gel that contains the chemotherapy drug carmustine. During brain surgery to remove the tumour, the wafers are placed in the space where the tumour was. As the wafer dissolves over the next 2-3 weeks, the drug is slowly released directly into the

brain. However, these wafers, often known as Gliadel® wafers, are only licensed for use in adults with recurrent glioblastoma (GBM) or high grade gliomas, so their use in children is extremely rare).

## Chemotherapy by injection into a vein (intravenous)

For children, chemotherapy is usually administered by injection into the blood stream. This can be done either via a central line or via a drip. An injection is used for a single dose of the drug; a drip is used for the slow delivery of a larger volume of fluid containing the drug.

## Chemotherapy via a central line

If your child has chemotherapy via a central line, the chemotherapy is injected into a vein through a small tube (the central line). They are called central lines because they end up in a central blood vessel in the chest, close to the heart.

These thin, hollow, flexible tubes ('lines'), made from silicone rubber, are inserted into a vein and stay in place for several months. Your child will be under anaesthetic when the tube is inserted, so it will not be painful. The tube (line) carries chemotherapy into the body. A line is often referred to as a 'Wiggly' on children's cancer wards to help make them feel more friendly.

Different IV chemotherapy tubes have different names and your child may have one of the following:

- A central line (central venous catheter) is inserted near the collarbone and runs to a large vein near the heart. The other end of the line will then be tunnelled under the skin to reach the exit site, which is usually in the chest area. (The exit site is the place where the tube comes out of the body).
- An implantable port (portacath) may be inserted into the upper chest or under the arm and runs to a large vein in the lower neck.
- A Peripherally Inserted Central venous Catheter (PICC) is inserted in to a large vein on the arm near to where the elbow bends. It runs to a large vein near the heart.

The type of line your child has depends on factors, which may include their tumour type and their age. There are advantages and disadvantages of different types of lines.

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For more information about these lines, see *What is the difference between the different tubes used in intravenous (IV) chemotherapy?* further on in this fact sheet.

### **Chemotherapy via a drip**

If your child has chemotherapy via a drip, the chemotherapy drugs are diluted in a bag of solution (for example, saline/salt solution), which then go into a vein in your child's arm, through a small tube (cannula). Usually, a nurse would insert the cannula in to the back of your child's hand or in their lower arm and fix it in place using tape. They will then attach the bag of chemotherapy solution to the cannula with plastic tubing.

The amount of chemotherapy released in to the vein is usually controlled by a pump, though sometimes the chemotherapy is given from a syringe over a couple of minutes. Cannulas stay in for a much shorter time than central lines. Usually, they are kept in only while the chemotherapy is being administered and are removed straight afterwards.

Some children can find having a cannula inserted upsetting, particularly if they are scared of needles. Your child should be offered cold spray or local anaesthetic cream to put on the back of their hand before the cannula is inserted - this will numb the area so they feel it less. It is also helpful to make sure your child is warm and well-hydrated, so the veins are easy to find.

If your child is likely to need a cannula frequently, they will usually be offered a line or a port (as described above).

### **Oral (liquid or tablet) chemotherapy**

Your child may have chemotherapy in the form of tablets or liquids, although this is less common. The chemotherapy is absorbed in the stomach and carried around their body in the blood stream to reach the cancer cells. Some types of chemotherapy drugs cannot be absorbed by the stomach, so cannot be taken orally.

If your child is given a tablet or liquid form of chemotherapy, it is important that they take it exactly as prescribed in order to maximise effectiveness. You should not crush the tablets unless you are advised to. Care should be taken to touch the medication as little as possible and you and your child should wash your hands as soon as possible after doing so. Whoever is giving the drugs should wear disposable medical gloves.

Some children may have difficulty swallowing the chemotherapy tablets, as they can be quite large, or they may be fearful of taking tablets in general. This is not uncommon and they should know that they are not alone in their difficulties. Care should be taken not to make medication a battle, as this can increase the anxiety levels of your child further.

In such cases you should discuss with your medical team ways of supporting your child and reducing their anxiety. A pharmacist may advise on other ways the tablets can be administered. Or, depending on your child's age, they could practice with small sweets, such as tic tacs or similar. Your child's medical team may be able to give a referral to a psychologist or psychiatrist who can help your child with coping strategies and help them prepare for treatment. Alternatively, they may recommend a therapist who can help with relaxation and visualisation techniques.

There can be an after-taste to these drugs - chewing flavoured gum afterwards can help to disguise this taste.

## **What is the difference between the different tubes used in intravenous (IV) chemotherapy?**

All lines and ports are usually put in under a general anaesthetic, but occasionally a PICC line may be put in under local anaesthetic in an older child. Your child will not feel pain as the line is inserted, but they may feel some pulling as it is moved around. They may also be uncomfortable or feel some mild pain for a few days afterwards once the anaesthetic wears off.

Once any line is inserted, your child will then have an x-ray to make sure that the line is in the right place.

### **Central lines**

Central lines are often referred to by the name of their inventor or manufacturer. For example, your child may be given a Hickman line<sup>®</sup>, which is a common type of central line used in children. Other trade names or manufacturers of central lines include Groshong<sup>®</sup> and Broviac<sup>®</sup>.

A central line will usually be inserted near the neck around the collar bone area, and one end fed into one of the main veins going towards your child's heart. The other end of the line will then be

tunnelled under the skin to reach the exit site, which is usually in the chest area. (The exit site is the place where the tube comes out of the body).

A length of line is left outside the body, which is kept closed with special caps or bungs that can be attached to a syringe, to inject the chemotherapy drugs, or to a drip. Sometimes there is also a clamp to keep the line closed when it isn't being used. Other lines don't have clamps. They have a special valve inside the line instead that stops air getting into the line. The line outside the body will be held in a 'wiggly bag' or taped to the skin to reduce the chance of it being pulled out accidentally. You will be able to feel a small ring around the exit site of the central line, just under the skin - this is the cuff of the line and helps to stop it from falling out.

### **PICC lines**

A PICC line is similar to a central line except that the line is fed in through a vein in the arm until the end reaches the main vein going to the heart. This means the exit site is in the arm rather than the chest.

### **Portacaths**

A portacath is a bit different in that the tube does not exit the body. While one end is in the vein close to the heart, the other end is in a small chamber (port) that is implanted under the skin in the chest. The chemotherapy drugs are then injected into the port using a special needle. The skin over the portacath can be numbed using local anaesthetic cream before the injection.

### **Advantages/disadvantages**

Central and PICC lines can be helpful if your child feels anxious about needles as it means they won't need to have a needle inserted each time they have chemotherapy. However, the exit sites and lines outside the body need to be kept dry so they require extra care when bathing and swimming is not possible.

There are, however, various products on the market which provide watertight cover for these lines making bathing easier and/or allowing swimming. These include dry suits for children with central lines.

See the Resources section of this fact sheet for more information. Swimming is not recommended with a Hickman line if your child's immunity is lowered, so always check with your medical team.

The advantage of portacaths is that you can't see the portacath and your child will not have tubes coming out of their body. This also means your child can more easily continue swimming while the line is in place (Swimming is not allowed for two weeks after insertion or until the insertion site heals). It also requires less flushing when not in use - flushing is required about once a month. See *Caring for your child's central/PICC line below for more information.*

The disadvantage, however, is that they will need to have a needle put in each time they have treatment, so they are not so good for children who are needle phobic.

For more information and to see what a Hickman line and a portacath look like, please see the following video

[nuh.nhs.uk/our-services/nottingham-children's-hospital/our-services/integrated-cancer-service/helpful-information](http://nuh.nhs.uk/our-services/nottingham-children's-hospital/our-services/integrated-cancer-service/helpful-information)

## Caring for your child's central or PICC line

### Preventing infection

Central and PICC lines can usually stay in place for several months, or longer if needed, but they must be looked after and kept clean.

Staff should take good care with your child's line and should follow correct procedures. This includes disinfecting their hands and your child's skin at the point of line entry before insertion. After insertion, the skin should be left clean, dry and a sterile, transparent dressing placed over the point of entry. (The entry point is often referred to as the exit site).

You may wish to find out about best practice guidelines at your child's hospital, so that you can be aware of whether these are being followed. You can ask a member of your child's health team, such as the Clinical Nurse Specialist or key worker, for more information about this.

You will be given information about how to care for your

child's line once it has been inserted. You may be given a booklet to take away, but you may find it helpful to write instructions down in your own words to help you remember what to do. To help prevent infection, the exit site needs to be kept clean. The exit site needs to be cleaned, and the transparent sterile dressing changed, once a week.

Infections can occur in central and PICC lines at the exit site or in the lumen (the space in the middle of the line). They can often be identified through reddening at the exit site (chest or arm), a discoloured fluid weeping from the exit site or your child developing a fever (a temperature of more than 38°C). If you notice any of these symptoms or your child is unwell, you should contact your child's doctor or treatment centre immediately. If an infection has occurred, it would usually be treated by antibiotics. If these do not clear the infection, or if the infection is serious, the line may need to be removed.

When a central/PICC line is not in use, there is a small risk that it can become blocked or infected. To prevent this from happening, the line will need to be 'flushed', typically once a week. 'Flushing' is where a small amount of fluid (usually a salt/saline solution) is flushed into the central line using a syringe. Either a nurse will do this (in hospital or they may come out to your home) or you may be taught how to do it. Heparin is often also added to the flushing solution to help reduce the chance of clots developing.

If you have any concerns about your child's line, you can call the ward for support and guidance.

### Keeping air out of the line

No air can be allowed to get into your central/PICC line as this can cause complications. The clamps, when they are present, should always be closed when the line is not in use. The line must also not be left unclamped when the caps/bungs aren't in place.

If the clamp comes undone, the line should be flushed and the line reclamped. A nurse or other health professional will ensure that the line is clamped appropriately.

### Accidentally dislodged

If this does happen, do not worry unduly. Apply pressure to the exit site over the exit scar for a few minutes. Usually the blood clots quite quickly to seal up the wall of the vein. The hospital staff will tell you what to do if this happens.

## Caring for your child's portacath

Immediately, and for a few days after the port has been put in, check for any redness, swelling, bleeding, bruising, pain or heat around the wounds. Let your hospital doctor know straight away if your child has any of these signs, as they could mean an infection.

After each treatment with chemotherapy drugs, a small amount of fluid needs to be 'flushed' into the catheter so it doesn't become blocked. If it isn't being used regularly, it will only need to be flushed every four weeks.

## How long will chemotherapy last?

Treatment plans vary enormously and your child's chemotherapy will be carefully planned and tailored to them individually. These variations in treatment depend on many factors including the type of tumour your child has, your child's age, the amount of surgical removal achieved (where relevant), and your child's general health.

As a result, it could vary from daily chemotherapy for a while, as a day case in hospital, to being admitted to the ward for several days every two to three weeks. The length of chemotherapy treatment also varies significantly, and can be from between approximately three months to 12 months or even longer. The duration and frequency will be explained by your child's medical team.

## Is there a maximum number of times my child can have chemotherapy?

This very much depends on the type of chemotherapy drug. Some have to be limited because of 'cumulative toxicity'. This means that with each dose, the side effects that affect the body and its functions increase, so the total dose has to be limited. Other chemotherapy drugs will be stopped if they are not working, if an unacceptable toxicity (side effect) occurs, or if your child can no longer tolerate the drug.

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## Will my child need to stay in hospital?

Chemotherapy is often given as an outpatient treatment, which means that your child wouldn't usually have to stay in hospital overnight, but in certain circumstances they may need to. Your child's doctor will talk to you about this before treatment begins.

If your child is given chemotherapy in tablet or liquid form, they will be able to take this at home. If they are having chemotherapy by injection, they would usually have this in a chemotherapy clinic as an outpatient.

## Why are treatment periods followed by rest periods?

Rest periods between treatment sessions give your child's body a chance to recover from any side-effects and give healthy cells an opportunity to repair themselves. Having chemotherapy in a series of cycles (treatments and rest periods) also enhances its effectiveness. This is because chemotherapy only destroys cells that are in the process of dividing. Cancer cells are not dividing all the time, there will be times when they are resting.

The first time your child is given chemotherapy it won't work on the cells that are resting. The second time they are given it, the cells that were resting the first time may now be dividing and the chemotherapy will destroy them.

## What side effects might my child have?

Side effects vary from child to child and according to the drugs they have been given. As chemotherapy temporarily acts on healthy cells as well as cancer cells, it may cause some unpleasant, short-term side effects, commonly including:

### Lowered immunity

There are three types of cells in the blood - called red, white and platelets. Chemotherapy can temporarily lower the number of all these blood cells. Red blood cells and platelets can be replaced by giving more red blood cells or platelets if the number is very low. This is known as a transfusion.

However, it is not possible to give transfusions of white blood cells. So, as white blood cells play a vital role in fighting infection, your child may become more susceptible to infections. 'Neutropenia' the medical term you may hear, which is used to describe an abnormally low number of neutrophils, the most common type of white blood cell.

It is therefore important that your child has good personal hygiene whilst undergoing chemotherapy. This includes keeping clean and washing their hands after using the toilet. Doctors will monitor your child's health and will give them antibiotics to help fight infection if necessary. It is important that you inform your child's doctor if your child has a high temperature or suddenly feels unwell. Your medical team will tell you what temperature counts as 'high'.

Childhood illnesses, such as chickenpox or measles, can be particularly dangerous when your child has a lowered immune system. Your child should not have contact with anyone who has these conditions and if they have been in recent contact with someone who has developed either chickenpox or measles you should inform their medical team. If your child is immune to these illnesses through previous contact/having had the illness, they are unlikely to develop infection with conventional dosages of chemotherapy. However, you should still tell your child's medical team so they can assess the risk.

### The inoculations/vaccines your child can have

All children in the UK are offered immunisation against key illnesses as part of the national childhood immunisation schedule. In the UK, immunisation can be given in the form of live or 'attenuated/weakened' vaccines (containing a small amount of living bacteria or living virus that has been weakened in the laboratory) by injection. These activate the body's natural defence (immune) system to help fight particular infections, but if your child is having or has had chemotherapy, their immune system will be lowered.

For this reason, your child should not have the following vaccines if they are having chemotherapy or have finished chemotherapy in the last six months:

- Measles
- Mumps
- Rubella (German measles)

- MMR (measles, mumps and rubella) vaccination
- BCG vaccination (protecting against Tuberculosis)
- Yellow fever
- Oral typhoid

However, it is generally safe for your child to have 'inactivated' vaccines, which do not contain living bacteria or viral microbes. Children on chemotherapy are often not given these as they are likely to be less effective while their immune system is lowered. The exception to this is the injectable flu vaccine - it is important for children on chemotherapy to be given a flu vaccine, along with everyone else in their household, as they are at extra risk from flu.

You may have heard about a new nasal spray flu vaccine available for children aged 2 or 3 years old, and, in some parts of the country, also for children aged between 4 and 10. (It is due to be rolled out to all children). However, this vaccine uses weakened flu viruses rather than inactivated ones, so is not suitable for children with weakened immune systems.

You should always check with your child's consultant before they have a vaccination.

### Tiredness

Many children who have chemotherapy experience tiredness and low energy (fatigue). This can be frustrating, particularly for children who enjoy sports or playing outside. As chemotherapy can temporarily lower red blood cell count, your child may become anaemic and look 'washed out' or pale. The tiredness will wear off once treatment has finished, but it may take a few months for their energy levels to return to normal. Speak to your child's doctor if you are concerned. *(For more information about anaemia, see section below.)*

### Anaemia

Anaemia is a relatively common side effect for children who are having chemotherapy. This is because chemotherapy can temporarily lower the number of red blood cells, which carry oxygen around the body (in a substance called haemoglobin). Symptoms of anaemia include extreme tiredness and shortness of breath.

Your child's haemoglobin (Hb) levels will be monitored by blood tests, so that action can be taken if they fall too low. Iron levels may also be monitored by blood tests, as iron is needed to produce the haemoglobin, that carries the oxygen around the body. Some children who experience anaemia, i.e. whose Hb level falls too low, may need to have a blood transfusion to increase their number of red blood cells.

Giving your child foods that are rich in iron (red meat, leafy vegetables, such as broccoli and watercress, nuts, dried fruit and beans) may help to ensure that your child's haemoglobin levels do not drop too low by maintaining their iron levels. However, children are not generally iron deficient when on chemotherapy.

Your child's doctor will advise you as to the best way to help your child if they become anaemic.

### **Nausea**

Your child may feel sick (nausea) or be sick (vomit) after treatment. Not all chemotherapy drugs have this effect, however, and some children experience no sickness at all.

Anti-sickness tablets or liquid medicine can be given if your child experiences nausea or vomiting, or if the particular chemotherapy drugs they are having are known to be likely to cause it.

### **Hair loss**

As hair loss can be very visible, it can be upsetting for both the child and their friends and family. You may find it helpful to arrange a wig before your child loses any hair.

Not all chemotherapy causes hair loss, it depends on which drug or combination of drugs your child has. Some drugs result in no hair loss at all, or only a very small amount. Some cause only hair thinning, rather than loss, but other drugs can cause more substantial hair loss. Generally, any hair loss will start within a few weeks of treatment beginning. Once treatment has finished, hair should begin to grow back over the next few months. It may be different to how it was previously (for example, it may be curly when it was straight before). If your child is under 16 years old, or is under 19 years and in full-time education, they are entitled to a free synthetic wig on the NHS. Speak to your child's health team for more information.

### **Sore mouth (oral mucositis)**

Oral mucositis (inflammation of the inside of the mouth) is a possible side effect of chemotherapy that is more likely with high doses. Some people describe oral mucositis as feeling similar to when you burn your mouth from eating or drinking something that is too hot. If your child experiences oral mucositis, they may also suffer from ulcers in their mouth or on their tongue and lips. Usually, oral mucositis clears up on its own within a few weeks after treatment has ended, but it can be very unpleasant. Sucking on ice cubes or ice lollies can help to relieve discomfort, as can taking medicines, such as paracetamol. You should always consult your child's doctor before giving your child medication.

It is possible for ulcers to bleed and to become infected, particularly as your child's immunity will be lowered from the chemotherapy. It is therefore important that your child keeps good oral hygiene - brushing their teeth using a toothbrush that has soft bristles (e.g. a baby toothbrush) and flossing after each meal and before bed. If you are concerned about oral mucositis, it is important to seek medical advice from your child's doctor.

### **Effects on skin**

It is possible that your child's skin may become more sensitive (for example, to the sun and to chlorine) with chemotherapy drugs, or that they may develop rashes or changes in skin colour. It is important to ensure that your child is protected from the sun and to follow any advice given by your child's health team.

### **Taste, appetite and digestion**

Sometimes, chemotherapy causes changes to taste and appetite. It can also cause diarrhoea or constipation and a sore mouth. *(For more information about these issues and for some practical suggestions about how to deal with them, see our [Helping your child to eat fact sheet](#).)*

### **Future fertility**

Some chemotherapy drugs may cause temporary or permanent infertility (an inability to have children), so it is very important to discuss any effects on your child's fertility with a member of your child's health team before they start

treatment. Boys who have been through puberty will be offered sperm banking.

### **Other side-effects**

These can include:

- bruising more easily than usual, due to platelet counts being affected (platelets are cells that help stop bleeding) - your child may be offered a platelet transfusion
- aches and pains in the legs or jaw (a common side effect of vincristine)
- kidney problems - your child's kidney functioning will be monitored throughout treatment
- hearing loss of high-pitched sounds - this can be a permanent effect, so your child's hearing will be monitored and the chemotherapy changed if they develop significant hearing loss.

## **Names of common chemotherapy drugs for children**

There are around 50 different types of chemotherapy drugs. Names of common chemotherapy drugs used to treat primary brain tumours in children include:

- Cyclophosphamide
- Vincristine
- Cisplatin
- Etoposide
- Carboplatin
- High doses of Methotrexate.

Your child may have a combination of different chemotherapy drugs. There are numerous different combinations, but they often include vincristine. Combinations of chemotherapy drugs are often referred to as an acronym, using their initials. Your child's health team will be able to explain to you why they have chosen particular chemotherapy drugs for your child.

## What are chemotherapy drugs made from?

There are many different types of chemotherapy, which are made from different sources and work in slightly different ways to destroy cancer cells. Drugs are made in a laboratory, but many of them are derived from natural plant extracts.

## How will we know if chemotherapy has worked?

During and after treatment, your child will be carefully monitored by their health team for any side effects, but also to check how well the treatment is working, e.g. for any changes to their tumour. This can be through the use of scans to see whether the tumour is shrinking. Usually Magnetic Resonance Imaging, or 'MRI', is used though sometimes it can be by Computerised Tomography, or 'CT'.

*For more information, see Scans in children fact sheet.*

Another way of detecting whether the tumour is responding to treatment is via 'tumour markers' in the blood. A tumour marker is a product that is secreted by cancer cells.

Decreasing levels of tumour markers suggest that the tumour is shrinking. However, only a few types of brain tumour produce measurable markers. Please speak to your child's health team for more information.

## Resources

Whilst The Brain Tumour Charity cannot recommend any specific resources, you may find the following helpful:

### A parent's guide to children's cancer

This book is a publication jointly produced by Macmillan Cancer Support and CCLG. It covers lots of information including treatments and their side-effects. Available free: [be.macmillan.org.uk/be/p-282-a-parents-guide-to-childrens-cancer.aspx](http://be.macmillan.org.uk/be/p-282-a-parents-guide-to-childrens-cancer.aspx) or call 0800 500 800

### Children's headscarves and hats

The online store 'Not on the high street' sells a range of children's hats and headscarves: [bit.ly/10JClnr](http://bit.ly/10JClnr)

### Bohemia Fashions headwear

This company sells a range of hats and headscarves in a children's and petite range: [bohemiaheadwear.co.uk](http://bohemiaheadwear.co.uk) or call 01582 750083

### Little Princess Trust

This charity provides real-hair wigs free of charge to boys and girls who have lost their own hair through cancer treatment. [littleprincesses.org.uk](http://littleprincesses.org.uk) or call 0845 094 4509

### The ID band company

This company sells children's medical alert bracelets. If your child needs medical assistance at a time when they are unable to tell the doctors about their condition, the bracelet will provide some vital information about this and their treatment: [theidbandco.com/Child-Safety-Child-ID](http://theidbandco.com/Child-Safety-Child-ID) or call 0845 269 4523

### Hammond Drysuits

This company sells 'Hickman line shortie drysuits' to allow your child to go swimming. Please check with your child's medical team before your child goes swimming.

[hammond-drysuits.co.uk/hickman-line-shortie-drysuits.html](http://hammond-drysuits.co.uk/hickman-line-shortie-drysuits.html) or call 01474 704123

You may also find resources listed in our *Helping your child to eat* and *Radiotherapy in children* fact sheets useful.

### Disclaimer:

*The Brain Tumour Charity provides the details of other organisations for information only. Inclusion in this factsheet does not constitute a recommendation or endorsement.*

## 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, which includes a dedicated Children and Families Worker:

Call: 0808 800 0004

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

Email: [support@thebraintumourcharity.org](mailto:support@thebraintumourcharity.org)

Join our online forums at:

[thebraintumourcharity.org/forums](http://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](http://thebraintumourcharity.org), call us on **01252 749043** or email [fundraising@thebraintumourcharity.org](mailto: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 leading neuro-oncologists. 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.



# Chemotherapy for children

Your notes

**Saving lives through research, information, awareness & policy**



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