

Specialised types of pain relief for your child

This leaflet outlines some of the specialised techniques that might be used to give pain relief (analgesia) for your child during or after surgery. Your child's anaesthetist will discuss these with you before surgery if appropriate.

Patient-controlled analgesia (PCA)

This allows children to control their own pain relief using painkillers delivered through a small, plastic tube (cannula) directly into a vein (intravenously). This is done using a push-button device attached to a programmable syringe-pump. A calculated, pre-set dose of painkiller is delivered when your child presses the button. Only the patient (your child) and no one else may press the button. The device is programmed so that only a limited number of doses can be given in any hour (usually 1 dose every 6 minutes). In addition, a low-dose infusion of the painkiller might be set to run continuously between the PCA doses to maintain adequate pain relief.

Nurse-controlled analgesia (NCA)

This works on the same principle as PCA, but only your child's named nurse pushes the button instead. No one but your child's nurse is allowed to press the button. This method is used in younger children and those patients unable to operate the push button device themselves. The lockout time is set for a longer period, such as 20 minutes, and an adequate continuous background infusion is also given so that your child remains pain-free.

Morphine is the drug most commonly used for both PCA and NCA.

Side effects of PCA/NCA

Common side effects of morphine include feeling sick (nausea), being sick (vomiting), itching, and constipation. Morphine can also cause a reduction in the depth and/or rate of breathing, so all children receiving PCA or NCA are closely monitored. Medicines can be given to help prevent these side effects, or to treat them if they occur.

Epidurals

An epidural can be used to provide effective pain relief after some types of major surgery. To insert an epidural, the anaesthetist places a small, plastic tube (epidural catheter) into the epidural space in your child's back. The epidural space is the area which surrounds the spinal cord where pain nerves pass to the spinal cord. These nerves send messages, via the spinal cord, to the brain when your child feels pain. An epidural infusion is when medicine is pumped into this space through the epidural catheter to numb these nerves. As a result nerve messages are blocked.

An epidural is inserted while your child is under a general anaesthetic for their operation. Dressings are placed over the catheter to keep it in place. A urine catheter is also routinely placed in your child's bladder during their operation to avoid any difficulty with passing urine when the epidural infusion is in progress.

There are 2 types of medicine commonly used in epidural solutions, either separately or together. These are:

- a local anaesthetic drug
- a pain relieving medicine, such as fentanyl

Epidural infusions are set up by your child's anaesthetic doctor and given by continuous delivery through a special pump. The pump settings must only be altered by the members of the acute pain team.

In the first few hours after surgery, your child might notice that their legs feel weak, heavy, numb or tingly due to the epidural. Because of this, your child should not try to stand or walk until the epidural's effect has worn off. Normal sensation will return after the infusion is stopped.

Your nurse will closely monitor your child and show you how to care for them while the epidural infusion is in progress. A specialist pain nurse will review your child each day.

Other pain relieving medicines can be given while the epidural infusion is running. They work together to improve the level of pain relief.

If an epidural is not fully effective at relieving pain, the pain team can adjust the solution and the rate of infusion. If that does not help, your child will be given an alternative pain relieving medicine. This is usually intravenous morphine (PCA or NCA), which is given straight into a vein and works quite quickly. In this case the epidural infusion would be stopped and the epidural catheter removed.

The epidural infusion will need to be given for different times, depending on the child and the type of surgery they have had. It is usually in place for 2 or 3 days. Removing the catheter is not painful. Sometimes removing the dressings is uncomfortable. There are things we can do to minimise this discomfort, such as wetting the dressings to make them easier to remove. When the epidural is finished, your child might still need regular pain relieving medicines by mouth or rectally (in their bottom). Any numbness from the epidural should disappear over the next few hours.

For some children an epidural is not suitable. If your child has problems with blood clotting, an allergy to local anaesthetics, an abnormal spine, or infection in their back, an epidural might not be possible.

Epidural side effects

There are side effects associated with all methods of strong pain relief. They can be divided into common side effects (affecting up to 1 in 10 children), and rare side effects (affecting up to 1 in 1,000 children).

Common side effects with epidural infusions include numbness, weakness, heaviness or tingling of the legs, and not being able to easily pee (pass urine). Feeling or being sick and itching can also be side effects if pain relieving medicines such as morphine or fentanyl are added to the epidural.

Minor headaches are common after surgery, with or without an epidural. Sometimes a severe headache can occur after an epidural if the lining of the fluid-filled space, surrounding the spinal cord, is accidentally punctured by the epidural needle during insertion (a 'dural tap'). If this happens, it might be necessary to inject a small amount of the patient's own blood into their epidural space. This is called an epidural blood patch. The blood clots, and plugs the hole in the epidural lining. This will cure the headache in most patients. Very rarely a repeat blood patch may be required.

About 1 in 1,000 children has slow or shallow breathing, drowsiness requiring treatment, or epidural catheter infection. Antibiotics might be given and the catheter will be removed if there is an infection. It is very rare for the infection to spread any further than the insertion site in the skin.

Rare side effects also include damage to the nerves in the back, infection in the spine and allergy to the medicine being infused. A national study has shown that 1 in 2,500 children having an epidural get any of these side effects, but permanent damage is extremely rare. Your child's anaesthetist can tell you more about how these problems are prevented or treated. These risks must be balanced against the good pain relief that epidurals usually provide.

Please note that your child does not have to have an epidural. The choice is yours. For major surgery, an intravenous infusion of morphine (PCA or NCA) might be used for pain relief in children. This is effective, but is also associated with side effects. You, your child's anaesthetist and their nurse will all be involved in deciding what is best for your child.

Caudal block

This involves an injection, by an anaesthetist, of local anaesthetic given lower down in the back than an epidural, near the tail bone (coccyx). The effect is to numb the lower part of the body and legs. Caudal blocks are commonly used during surgery for hernia repair, circumcision, nephrectomy, pyeloplasty, hypospadias, epispadias and some types of leg or foot surgery. A fine catheter might be inserted into the caudal space during this procedure, so that more doses of local anaesthetic can be given after the operation.

Caudal blocks (like epidurals) can cause temporary lower limb weakness for several hours. For this reason, before you allow your child to stand or walk unaided, please check with the nurse caring for them. Side effects of caudal blocks are similar to those for epidurals but they occur less often.

Paravertebral block

This is similar to an epidural. During anaesthesia a thin plastic tube (catheter) is inserted near to one side of the spine. This is used to inject local anaesthetic solution around nerves, causing numbness to the operation site on that side of the body. An infusion of local anaesthetic solution can then be continued for 1 or 2 days after the operation, before the catheter is removed. A paravertebral block might be inserted to give pain relief after some types of spinal surgery.

Subcutaneous catheters

During some types of surgery, local anaesthetic solution is given via a fine catheter inserted under the skin. We use this method in patients having bone grafts. Ward nurses can then give top-up doses via the catheter at regular intervals after the operation.

Peripheral nerve blocks

Individual nerves can be temporarily numbed (blocked), using an injection of local anaesthetic given by the anaesthetist or surgeon while your child is receiving general anaesthesia for their operation.

Nerves in the legs or arms are commonly blocked this way to provide pain relief after limb surgery. These blocks can last for up to 12 hours or more. Oral pain relieving medicines will then be given so that pain relief continues after the local anaesthetic has worn off.

Side effects of nerve blocks include nerve damage, however this occurs in less than 3 of every 100 nerve blocks. In most of those affected (92 to 97 of every 100 patients) nerve damage is temporary.

Permanent nerve damage is rare and is estimated to occur in up to 1 in 5,000 nerve blocks.

With all types of local anaesthetic injection there is an extremely rare but potentially serious risk of the anaesthetic being accidentally injected into a vein and then entering the blood stream. This happens in about 1 in every 1,000 patients. Some types of local anaesthetic are toxic to the heart if they enter the circulation in significant quantities, and this could mean a potentially life-threatening medical emergency. Your child will be monitored closely to detect any early signs of even minor side effects.

Contact us

Please ask your child's anaesthetist if you have any questions about pain relief methods for your child.

For more information on conditions, procedures, treatments and services offered at our hospitals, please visit [web](http://www.evelinalondon.nhs.uk/leaflets) www.evelinalondon.nhs.uk/leaflets

Evelina London Medicines Helpline

If you have any questions or concerns about your child's medicines, please speak to the staff caring for them or contact our helpline, [phone](tel:02071883003) 020 7188 3003, Monday to Friday, 10am to 5pm

Your comments and concerns

For advice, support or to raise a concern, contact our Patient Advice and Liaison Service (PALS), [phone](tel:02071888801) 020 7188 8801 [email](mailto:gstt.pals-gstt@nhs.net) gstt.pals-gstt@nhs.net

Language and accessible support services

If you need an interpreter or information about your care in a different language or format, please contact the service you are seeing.

Leaflet number: 2583/VER5

Date published: May 2022

Review date: May 2025

© 2022 Guy's and St Thomas' NHS Foundation Trust

A list of sources is available on request