

Information about anaesthesia and anaesthesia-related risks (adults)

Table of contents

Information about anaesthesia and anaesthesia-related risks (adults)	1
Summary	1
Patient consent	3
Risks related to anaesthesia and preventing them.....	3
Taking your regular medication before surgery	4
Why do you have to fast before surgery?.....	4
Venous cannulation	4
Local anaesthesia.....	4
General anaesthesia.....	5
Spinal and epidural anaesthesia.....	6
Nerve block anaesthesia	7
Arterial cannula and central venous catheters.....	8
Pain medications	8
Risks related to blood transfusion.....	9
More information	9

Summary

Anaesthesia-related procedures are invasive procedures. They are performed with your consent and only when they are considered necessary in terms of treatment.

Anaesthesia procedures very often cause discomfort and minor temporary adverse effects, such as pain at the injection site, bruising, headache, sore throat, nausea and shivering similar to that experienced during a cold.

Serious and permanent adverse effects are extremely rare in conjunction with anaesthesia. For example, the incidence of a severe allergic or medication reaction is approximately 1:10,000

patients. Anaesthesia-related death is even rarer, approximately 1:100,000. The risks associated with surgery are usually greater than the risks of anaesthesia.

Table 1. Incidence of anaesthesia-related adverse effects.

Incidence of the adverse effect	Incidence per patient case	All forms of anaesthesia	General anaesthesia	Spinal or epidural anaesthesia
Very common	1:10	Pain, bruising, short-term memory loss, nausea, shivering, thirst	Sore throat	
Common	1:10–1:100		Contusion in the lip and mouth area	
Uncommon	1:100–1:1000	Infection related to blood vessel cannula, prolonged numbness, low-grade fever associated with blood transfusion, mild allergic reaction	Difficulty keeping the airways open, remaining aware during general anaesthesia	Positional headache
Rare	1:1000–1:10,000	Severe allergic reaction, permanent nerve damage, blood circulation problem related to arterial cannula, dyspnoea (shortness of breath) associated with blood transfusion, haemolysis (breakdown of red blood cells)	Minor eye injury, for example, corneal abrasion, damage to the teeth	Bleeding or infection in the spinal cord area

Very rare	1:10,000– 1:100,000	Anaesthesia-related death, permanent brain damage, permanent loss of vision		
------------------	------------------------	---	--	--

Patient consent

The examinations and treatments associated with surgery are invasive, and their purpose is to maintain and promote health, prevent and cure diseases, and alleviate suffering. You are consenting to these procedures and the anaesthesia that may be needed in conjunction with them.

If the patient is incapacitated, we will consult their representative in order to determine the patient's wishes. If it is not possible to assess the patient's wishes, we will treat them in a way that is considered to be in their best interest.

Risks related to anaesthesia and preventing them

All invasive procedures, including anaesthesia, always involve a risk of complications. The risk of post-operative complications and extended hospital care are significantly higher in patients with serious long-term diseases, elderly patients, and in major operations that last a long time. Post-operative problems can include confusion, cardiac events, respiratory insufficiency, pneumonia, or cerebrovascular disorders.

The following can reduce the risk associated with anaesthesia

- Long-term diseases are under control
- Stopping smoking and alcohol use (or even taking a temporary break)
- Physical activity and
- Weight management.

Being significantly overweight increases the incidence of anaesthesia-related problems, for example, the risk of respiratory insufficiency. Being significant overweight also increases the technical problems: blood vessel cannulation, ensuring an open airway and anaesthesia can be very challenging technically.

Another acute illness, such as a respiratory tract infection (a cold) significantly increases the anaesthesia-related risk. As a result, we perform only essential and urgent operations when a person has an acute illness.

Taking your regular medication before surgery

When planning anaesthesia, we need information about any medication you are taking. We will provide separate instructions about which medications you can take before the surgery. Common medications that must be discontinued are anticoagulants (medicines that affect blood clotting), diabetes medication in tablet form, and rheumatoid arthritis medication. The length of the break depends on the medication and the severity of your disease. We will evaluate your situation individually.

Nutrition supplements and natural products that have not been prescribed by a doctor may affect blood clotting and liver function. You should stop taking these and omega 3 products in particular at least 3 weeks before the surgery (and preferably as soon as the surgery is being planned).

Why do you have to fast before surgery?

With the exception of minor local procedures, anaesthesia involves administering medications that can cause the risk of nausea and vomiting. Vomiting during a procedure can cause stomach content to enter the respiratory tract and lead to pneumonia.

We try to minimise the risk of vomiting by ensuring that you do not eat any food or milk products for at least 6 hours prior to the anaesthesia. You can drink small amounts (less than 200 ml, a small glass) of water, weak juice without any pulp, coffee or tea without milk, or a drink developed for this purpose (for example, Nutricia PreOp®) more than 2 hours before the surgery.

Procedures and operations performed on the bowel may require bowel emptying. In these situations, we will provide separate instructions concerning the fast.

Venous cannulation

In conjunction with nearly all types of anaesthesia, we will place a venous cannula (a drip) for administering medication and for emergency situations. Typical adverse effects related to venous cannulation are pain and bruising at the cannulation site. Infections can also occur in conjunction with venous cannulation, and this happens in approximately 1:500 patient cases. Vein blockages (thromboses) and changes in skin sensation are a rare adverse effect.

Local anaesthesia

Local anaesthesia involves making the procedure site painless using a local anaesthetic (for example, an injection into the skin, a cream, eye drop, or anaesthetic administered into the nose). Local anaesthesia is typically used for removing small skin changes and for surgery in the eye and nose area.

The adverse effects of local anaesthesia are mainly pain and bruising at the injection site. The risk of a severe allergic reaction is very small in local anaesthesia, approximately 1:10,000 patient cases.

General anaesthesia

General anaesthesia means a state of unconsciousness and memory loss caused by medications. Anaesthesia medications are administered intravenously and partially also via inhalation. In addition to the medication that causes the actual unconsciousness (sleep), a medication to alleviate pain is given in conjunction with general anaesthesia. A muscle relaxant is also given in some procedures.

General anaesthesia is needed when the procedure lasts for a long time, spinal or epidural anaesthesia is difficult to implement due to the procedure site, or the patient must be completely motionless during the procedure.

General anaesthesia also has a significant effect on the patient's breathing and patients receive respiratory assistance while under anaesthesia. Although breathing can be assisted manually with a bag valve mask during short procedures, a breathing tube is usually placed in the patient's pharyngeal or laryngeal area and breathing is assisted mechanically.

The most typical minor adverse effects associated with general anaesthesia are a decrease in blood pressure, pain in the throat and laryngeal area or a hoarse voice, short-term memory loss, slight difficulty breathing, urination problems, a feeling of thirst, nausea and vomiting, shivering, itching, small contusions and abrasions around the lips and mouth.

The eyes are protected during general anaesthesia, but minor eye injuries (such as corneal abrasion) occur in approximately 1:2,800 patient cases. Tooth damage also occurs in approximately 1:4,500 patient cases in conjunction with keeping the airways open, especially if the teeth are in poor condition.

All in all, modern anaesthesia is very safe – also for sick patients. The risk of death is estimated to be approximately 1:100,000 in general anaesthesia. In the case of general anaesthesia, the most significant risk is related to problems keeping the airways open. If the situation is prolonged, it can lead to permanent brain damage or death in the worst case. The incidence of this so-called difficult airway problem in general anaesthesia is estimated at 1:22,000, but the risk is significantly higher in certain patient groups. It can be up to 1:240 (for example, pregnant patients, patients with cervical spine problems and patients whose stomach is not empty due to insufficient fasting or illness). Breathing problems also occur after general anaesthesia has ended.

As with other forms of anaesthesia, general anaesthesia involves the risk of a severe allergic reaction (approximately 1:10,000 patient cases).

Unintentional awareness during general anaesthesia is rare, occurring in approximately 1–2:1,000 cases of general anaesthesia. This is typically a moment of brief awareness. The situation becomes problematic if the awareness is not noticed immediately, for example, due to the muscle relaxant medication administered. The use of modern anaesthetic depth indicators has reduced the incidence of unintentional awareness.

The risk factors for unintentional awareness are emergency surgery (for example, C-section), surgery in the heart and chest area, other serious diseases, a larger than normal need for medication related to, for example, heavy alcohol use. Unintentional awareness can also be caused by technical problems related to administering the medication. Unintentional awareness may cause a sensation of being touched, pain, unpleasant memories, nightmares or, in the worst case, longer-term depression or trauma-related stress. The long-term adverse effects can be alleviated through discussion and psychological support.

General anaesthesia also involves the rare risk of temporary or permanent nerve damage, the cause of which is often the patient's position and lack of movement during the procedure. The risk of permanent loss of vision is very rare (1:100,000 patient cases).

Spinal and epidural anaesthesia

Spinal and epidural anaesthesia administered into the back is used for surgery on the lower limbs and lower and mid-abdomen. Spinal or epidural anaesthesia is usually administered into the lower or middle part of the back with the patient's body bent forward (fetal position), either sitting or lying on their side.

Spinal anaesthesia normally involves a single dose of anaesthetic to relieve pain during surgery when the objective is to achieve complete numbness and muscle relaxation. Epidural anaesthesia is often used to treat post-operative pain and, for example, to relieve pain during childbirth when the objective is long-term anaesthesia while maintaining the patient's ability to move. Various combinations of these can be used during surgery and later to relieve post-operative pain. During long-lasting anaesthesia, a thin catheter placed in the back can be used to administer additional anaesthetic.

An intravenous relaxant is often used in conjunction with spinal and epidural anaesthesia. This reduces tension and anxiety and unpleasant sensory stimulation (such as sounds) during the surgery and often causes slight loss of memory and light sleep. You may wake up during the surgery. The sleep is so light that you can breathe on your own. Nasal cannula (oxygen whiskers) or an oxygen mask are often placed on your face.

In statistical terms, serious adverse effects are even rarer and the risk of death even lower than with general anaesthesia. In comparison to general anaesthesia, the benefit of spinal or epidural

anaesthesia is a decreased need for relaxant medications. Loss of memory and confusion also occur after spinal or epidural anaesthesia, but they may be less severe than with general anaesthesia. The numbness usually continues for some time after surgery, which can mean less pain immediately after the operation. Spinal or epidural anaesthesia used in conjunction with surgery may also be beneficial in terms of recovery and preventing prolonged pain.

Minor and ordinary adverse effects of spinal and epidural anaesthesia are pain and bruising at the injection site, a temporary sensation of strong or prolonged numbness, a feeling of difficulty breathing, decreased blood pressure, difficulty urinating, shivering, itching, nausea and vomiting, and pain.

The risk of serious or permanent adverse effects related to spinal and epidural anaesthesia (for example, bleeding in the spinal cord area, infection in the spinal cord area, or paralysis) is approximately 1:3,600–1:480,000. The risk of these complications is increased by, for example, serious diseases of the spine and spinal cord, serious generalised infection, or an inadequate discontinuation of anticoagulant medication. The risk of bleeding in the spinal cord area is small when you follow the instructions concerning anticoagulant medication that you receive before the surgery.

After spinal and epidural anaesthesia, you may experience headache when in the upright position. The headache is caused by the puncture in the dura mater (membrane surrounding the spinal fluid), spinal fluid leakage, and the change in pressure. This positional headache associated with the anaesthesia occurs in young patients (incidence approximately 1:100–1:500), while elderly people rarely experience it. The headache is usually benign (temporary) and it can be treated with medication or, in more difficult cases, with a so-called epidural blood patch. This involves using the patient's own blood to close the hole in the dura mater (membrane surrounding the spinal fluid). There is also a risk of complication associated with using an epidural blood patch (pain at the injection site, the risk of a new hole in the dura mater). The risk of infection or bleeding is a very rare adverse effect. The patient may be left with a long-term headache following this. Vein blockages (thromboses) in the head area have been described as extremely rare adverse effect

Nerve block anaesthesia

A nerve block is used for surgery in small and medium-sized areas, such as procedures involving a single limb, breast or an inguinal hernia. This method is often used to treat pain as well, for example, in connection with fractures and following surgery.

Nerve block anaesthesia involves a temporary feeling of numbness that usually passes in a few days. Serious adverse effects (permanent loss of sensation or numbness) are rare, occurring in approximately 1:2,000– 1:5,000 cases.

Arterial cannula and central venous catheters

An arterial cannula is placed when it is necessary to continuously monitor intravascular blood pressure and take arterial blood samples during major surgery and during surgery performed on patients who are very sick. An arterial cannula is usually placed in the wrist or bend in the arm, sometimes also in a lower limb. The most typical adverse effects of an arterial cannula are pain and bruising at the injection site. Infections are an uncommon adverse effect. More serious arterial blood circulation problems are a rare adverse effect related to using an arterial cannula. This may affect blood circulation in the entire limb and require a vascular surgery procedure.

Larger and more reliable venous connections (central venous catheters) may be needed during major surgery, surgery involving very sick patients, and in long-term care. Central venous catheters are placed in, for example, the neck, under the collarbone or in an upper limb. They are used to administer fluids, medications and blood products and to monitor pressure conditions in the blood circulation.

Central venous catheters are usually placed prior to the surgery using local anaesthesia at the injection site or during general anaesthesia in conjunction with the surgery. Typical complications related to these procedures include pain and bruising at the injection site. As with venous cannula, central venous catheters also involve the risk of infections. There is a risk of vein blockages (thromboses), particularly when catheters are placed in an upper limb. Permanent blood vessel damage and air entering the chest or blood circulation are very rare complications.

Pain medications

These procedures can often cause a lot of pain, which is usually treated with pain medication and combinations of other pain relief methods (epidural and spinal anaesthesia, cold). Effective treatment of pain after a procedure is believed to reduce the risk of prolonged pain. Unless you have contraindications (such as an allergy, kidney or liver failure), we use combination therapy consisting of paracetamol, anti-inflammatory analgesics and opioids. It is very important to follow the instructions provided when using combination therapy.

Opioids are powerful painkillers. Opioid products used to alleviate pain after surgery include e.g. codeine (a combination of paracetamol and codeine, Panacod®), tramadol and oxycodone. Opioids have a significant intoxicating effect. Their use affects the ability to drive. They may not be taken simultaneously with alcohol.

Normal adverse effects of opioids include nausea, constipation, drowsiness, dizziness, urination problems, and a feeling of breathlessness. If you take the medication for more than 2 days, we recommend gradually reducing the dose before you stop taking it completely. Sudden

discontinuation after long-term use may cause withdrawal symptoms, such as insomnia, restlessness, anxiety, heart palpitations, or sweating.

Opioid medication prescribed in conjunction with surgery is only intended for immediate treatment of post-operative pain. Opioids have significant potential for abuse. You should keep the medication stored in a locked cabinet and out of the reach of other people. Dispose of the unused medication by returning it to the pharmacy.

Risks related to blood transfusion

Surgery also involves a significant possibility of bleeding and thus the possible need for administering blood products. Blood products are administered when this is considered necessary, which means that other treatment methods are inadequate. The risk of blood transfusion can be reduced by, for example, good pre-operative treatment of anaemia and appropriate discontinuation of anticoagulant medication.

The incidence of typical minor adverse effects related to blood transfusion (slight fever, mild allergic reaction) in Finland is approximately 1:1,000 blood transfusions. The incidence of serious adverse effects related to blood transfusion—severe allergic reaction, dyspnoea (shortness of breath), acute haemolysis (breakdown of red blood cells)—in Finland is less than 1:10,000 blood transfusions. The blood products used in Finland are of high-quality, and there have not been any cases of transfusion-transmitted viral infections in recent years.

More information

1. Act on Health Care Professionals 28.6.1994/ 559, 4, 22§. www.finlex.fi [link checked on 10 October 2022]
2. Act on the Status and Rights of Patients 17.8.1992/ 785, 2, 6§. www.finlex.fi [link checked on 10 October 2022]
3. Terveyskylä. Leikkaukseen tulijan talo. www.terveyskyla.fi/leikkaukseen [link checked on 8 October 2022]
4. Anaesthesia and Risk. Royal College of Anaesthetists <https://rcoa.ac.uk/patient-information/patient-information-resources/anaesthesia-risk> [link checked on 10 October 2022].

5. Finnish Red Cross Blood Safety Reports, Blood Safety Report 2021
(<https://www.veripalvelu.fi/terveydenhuollon-ammattilaiset/verensiirrot/veriturvaraportit>) [link checked on 10 October 2022]

Patient instructions | HUS | Perioperative and Intensive Care | Authors: Noora Skants, Elina Reponen, Minna Ilmakunnas, Eero Pesonen, Fiona O'Sullivan-Salminen = | Approved by: Anne Vakkuri, Vesa Kontinen, Leena Vikatmaa | 11 January 2023