Anaesthesia

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Dear patient,

You will soon undergo a diagnostic or therapeutic procedure under anaesthesia. The doctor treating you has already informed you about this.
One of AZ Delta's anaesthetists will be in charge of the anaesthesia.

This information brochure provides you with more details about the different types of anaesthesia, pain relief techniques, preparation, and their possible risks and side effects.
We ask you to read this brochure thoroughly.
If you still have questions after reading this information brochure, you can always ask staff at the pre-operative assessment clinic (Dienst Voorbereiding Opname, DVO) and, alternatively, during the consultation with an anaesthetist, so that you can be well-informed when you give your consent. We also ask you to sign the consent for anaesthesia and analgesia in the patient booklet.

Before the procedure, you will see the anaesthetist to discuss the final anaesthesia plan and any additional analgesia techniques and give your approval for these.
Consent for children and individuals who are unable to make decisions themselves for other reasons is given by the legal representative.

We wish you a good recovery.

The anaesthetic team

1 The anaesthetist

The anaesthetist is a doctor who has specialised in various forms of anaesthesia, pain management and care in the intensive care unit.
He or she is aware of your current illness, your medical history and medication use.

He or she goes over everything with you again before the anaesthesia. During anaesthesia, the anaesthetist stays by your side to adjust the anaesthetic if necessary.
Among other things, he or she takes care of suppressing the pain and stress of the procedure, stabilising vital signs (blood pressure, heart rate, blood oxygen levels, etc.) and ventilation.

Several anaesthetists at AZ Delta have also undertaken additional training in subfields such as anaesthesia for children, for cardiac surgery, for pain management, for intensive care, for local and regional anaesthesia (epidural, spinal or nerve block) and for emergency admissions.

The anaesthetist is a specialised doctor who holds the required certificates (diploma, visa and registration on the list of the Order of Physicians) to practise medicine legally in Belgium.
He or she is also insured regarding his or her professional liability with an insurer recognised in Belgium.

2 What is anaesthesia?

The word anaesthesia" means that one "feels nothing" during a diagnostic (e.g., examination) or therapeutic (e.g., surgery) procedure. However, it is much more than this.
Without modern anaesthesia, surgeons would not be able to perform some difficult and dangerous procedures.
This is because the anaesthetist ensures that, no matter how weak you are and how invasive the operation is, you will be able to get through it safely.

After all, surgery disrupts the functioning of several important organ systems (heart, lungs, gastrointestinal tract, etc.), which may make your recovery after the surgery more difficult.
It is the anaesthetist's goal to protect you from these negative effects and to take you safely through the operation and the first hours or even days after surgery.

3 Types of anaesthesia

- General anaesthesia
- Sedation
- Regional anaesthesia
- Local anaesthesia

General anaesthesia (anaesthesia/narcosis)

This anaesthesia technique renders you unconscious and insensitive to pain. We use drugs that act on the brain for this. They are usually administered through a vein and sometimes through a mask placed on the face.

This artificial sleep is very different from natural sleep. During surgery, care is taken to monitor you continuously: your depth of sleep, breathing, heart rate, body temperature, blood loss, etc., are continuously observed and adjusted as needed. We have various kinds of monitoring equipment for this purpose. Usually, a ventilator is also used, and a tube is placed in the airway to provide the blood with sufficient oxygen.
At the end of the procedure, the anaesthetist will wake you up by stopping the administration of the anaesthetic drug.

After surgery, you will be taken to the recovery room, where you will continue to be monitored until the anaesthetic has fully worn off and you are sufficiently pain-free.
Only when the anaesthetist judges your condition to be stable will you be transferred to a regular room.

Sedation

Sedation is a much lighter form of general anaesthesia.
The safety conditions for sedation are the same as for general anaesthesia. Among other times, it is used during unpleasant or painful examinations (e.g., bowel examinations) or during local or regional anaesthesia when someone is very anxious or tense.

Regional and local anaesthesia

In regional and local anaesthesia, anaesthesia is achieved by injecting local anaesthetics around the nerves. This technique is given a different name depending on the area of the body involved. Thus, a part of the body, such as an arm or a leg (peripheral nerve blocks) or the entire lower body (epidural and spinal anaesthesia), is temporarily anaesthetised.

This anaesthetic technique ensures that only part of your body is numb and pain-free. During this time, you remain awake or receive a light form of sedation. The regional anaesthetic is given while you are awake, so you can indicate if you experience pain during the injection. If necessary, a mild sedative is administered. A nerve block involves the use of an ultrasound machine and often a nerve stimulator. The nerve is sometimes stimulated with a low-intensity electrical current. You will notice that the body part moves involuntarily.

However, it is not the case that all sensations disappear. You may still feel you are being touched in some cases. Choosing this anaesthesia has important advantages, but there are also some things to consider.

Key advantages of regional anaesthesia:

- You can resume eating and drinking immediately after surgery.
- You are not nauseous.
- You are less drowsy or not drowsy at all.
- You will need fewer or no painkillers in the first hours after the procedure.
- You have a lower risk of bacterial infection in the surgical wound, and healing will be smoother.
- If a combination with general anaesthesia is still needed, the amount of anaesthetic drugs required is less.

A few points to note

- Your arm or leg will be partially or fully numb for several hours. This depends on the product chosen. Afterwards, you will gradually be able to move your arm or leg, and the feeling in your arm or leg will gradually return. Protect the limb as long as it is numb! Also, do not place it on a heater, over hot steam, or on sharp objects.
- If feeling has not returned after 24 to 36 hours, contact your doctor.
- You must also be fasting and follow the pre-operative guidelines.

Recovery of nerve function is gradual. This can take up to several hours. At some point, you will be able to move the affected part of your body again, without feeling anything. It is therefore important not to fully lean on the limb until full strength has returned. If you have any further questions, please contact the anaesthesia department.

4 The most appropriate anaesthesia

Which anaesthesia is most suitable for you now depends on various factors, including age, your physical condition, pre-existing diseases and the type of surgery.
This is decided in mutual consultation by the surgeon and the anaesthetist together with you.

The pre-operative assessment

For various reasons, it is preferable to make a number of preparations prior to an operation or examination under anaesthesia.
The aim is to make the entire procedure safer, more comfortable and of the highest quality.

The anaesthetist needs to have the correct medical records. He or she relies on the medical records of the doctor treating you for this. The general practitioner is the key figure in this.

To get to know you and your medical history better, you will receive a (digital) questionnaire that you can complete on your own or with the nurses of the pre-operative assessment clinic. This questionnaire is necessary because it enables evaluation of the risks associated with the procedure. We therefore ask you to answer the questionnaire accurately, as it concerns your safety. Additional investigations may also be required, or you may be asked to consult another medical specialist (e.g., a cardiologist).

We also pay close attention to your medication. It is of utmost importance to accurately record all of the medications you take, including the dose and time. You also note dietary supplements, herbs, and even if you take aspirin for a headache. A decision can then be made as to which medicines you can continue taking and which you should stop (e.g., blood thinners).

During this consultation, explanations can also be given about the possible anaesthetic techniques, their procedure and possible side effects or complications. It is therefore important to contact the pre-operative assessment clinic in good time before the scheduled surgery date.

You will find the contact details at the back of this brochure. If your attending physician, general practitioner or the anaesthetist himself judges that a pre-operative consultation with an anaesthetist is necessary, an appointment can thus be made for this here.

5 The risks of anaesthesia

All necessary safety measures are taken during any anaesthesia. Due to improved monitoring equipment, better drugs and good training of anaesthetists and staff, anaesthesia is very safe today.

Nevertheless, as with any medical procedure, side effects or complications may occur. It is very difficult to distinguish between the risks of anaesthesia, the risks of the surgery itself and your general condition.

The risk you face as an individual is partly determined by:

- the presence of conditions other than the one for which you are having surgery
- personal risk factors (e.g., overweight, smoking, alcohol)
- the difficulty, length and/or urgency of the surgery you are undergoing.

The more complicated the anaesthesia and the procedure, the greater the risk of side effects and complications. That is why a form of anaesthesia is always recommended that is best suited to your state of health and the planned procedure. The anaesthetist will inform you about the anaesthetic to be used, balancing the maximum benefits with the minimum risks. Various drugs are used. Most of these drugs used in Belgium have been in use for a long time and have been extensively tested.

6 Side effects and complications of anaesthesia

- Side effects are the almost always present unwanted effects of a medicine or treatment (e.g., nausea, vomiting and sore throat). They don't usually last long. Some can be prevented, some can be treated and some disappear on their own.
- Complications are unwanted and unexpected events

resulting from a treatment (e.g., an allergic reaction after administering a medicine).

7 Overview of possible side effects and complications

RA = Regional anaesthesia
GA = General anaesthesia

(Very) common

Nausea and vomiting (RA, GA)

Some operations and certain drugs cause more nausea and vomiting. This can also be caused by stress, anxiety and pain. People who suffer from motion sickness or car sickness are also more susceptible.
Usually, this can be treated or prevented; sometimes it can last from a few hours to a few days.
If you have previously experienced easily becoming nauseous or vomiting after surgery, it is advisable to mention this during your pre-operative assessment interview. That way, we can try to prevent this from happening.

Sore throat - hoarseness (GA)

This occurs as a result of a tube placed in the airway or stomach. It can also last from a few hours to a few days and can be treated with a lozenge or mouthwash.

Dizziness and double vision (RA, GA)

Due to the anaesthesia, loss of fluids and lower blood pressure, you may feel weak. This can be treated with extra fluids and drugs. Blurred vision may be caused by the after-effects of the anaesthetic products or by the protective eye ointment.

Shivering (RA, GA)

This is caused by heat loss during surgery, certain drugs and stress. A blanket with warm air and/or medication can remedy this.

Headache (RA, GA)

This can be caused by the anaesthesia, the surgery, lack of fluids or stress. Usually, this headache will disappear after a few hours. If necessary, it can be treated with medication. More severe headaches sometimes occur after epidural or spinal anaesthesia. You should report this to the doctor so that specific treatment can be instituted.

Itching (RA, GA)

This is a side effect of strong painkillers, but it can also indicate an allergic reaction. In both cases, it can be treated with medication.

Muscle, joint and back pain (RA, GA)

Even though great care is taken during surgery with your positioning on the table, you may experience back pain or pain in other joints after the operation. The cause of this is the unnatural position during surgery, where you lie in the same position on a hard table for what could amount to a long time (also after an epidural). As the back muscles are completely relaxed, the natural curvature of the back disappears, which can also lead to back pain afterwards. These discomforts usually disappear on their own.

Painful bruises (RA, GA)

These occur at injection sites or where an intravenous drip was placed. They result from damage to a small blood vessel, movement of a nearby joint or an infection. They usually disappear over time.

Pain during drug injection (RA, GA)

Some drugs cause pain or discomfort during injection.

Confusion or amnesia (RA, GA)

Confusion or memory loss is more common among elderly patients undergoing surgery. Mild concentration difficulties, blurred vision and coordination disorders may also occur. It is usually temporary, but can sometimes last for days or even weeks. For these reasons, you may not drive a car, operate machinery or make important decisions for at least the first 24 hours after anaesthesia.

Insufficient pain relief (RA)

Sometimes the anaesthetic may not work sufficiently. The anaesthetist may then give additional anaesthetic if needed.

Extension of anaesthesia upwards (RA)

You may notice this because your hands start tingling. You may also find it a little harder to breathe. The anaesthetist will take supportive measures.

Uncommon side effects or complications

Lung infections (GA)

These are more common in smokers and can cause breathing difficulties. Therefore, it is important to stop smoking for about six weeks before undergoing surgery. Sometimes, undigested food can enter the trachea. This usually occurs if you have not fasted or if you are overweight. Of course, everything is done to prevent this and treat it if necessary.

Difficulty urinating (RA, GA)

After some operations and regional anaesthesia, men in particular may sometimes find it difficult to urinate, while involuntary leakage of urine is more common in women. A bladder catheter is sometimes inserted preventively for this.

Impaired breathing (RA, GA)

This is a temporary phenomenon caused by some painkillers. When muscle relaxants have not yet fully worn off, general muscle weakness may occur, including in the respiratory muscles. Both problems can be treated with medication.

Damage to the teeth, lips or tongue (GA)

While waking up, patients sometimes damage their teeth, lips or tongue by forcefully biting their mouth shut as they emerge from general anaesthesia. Teeth can also be damaged if the anaesthetist has difficulty placing the tube in the airway or stomach. This is more common if you have a small mouth opening or lower jaw, a stiff neck or teeth in poor condition. Unfortunately, despite all precautions, this cannot always be avoided.

Waking up during surgery or a procedure (GA)

This greatly depends on your general condition, the type of surgery you are undergoing, your medication and alcohol consumption, and the type of anaesthesia used. If you think this happened during a previous procedure, you should report it beforehand. If you are seriously ill, the anaesthetist may choose a lighter anaesthetic because you would not be able to cope with a deep anaesthetic. This may make it possible for you to remember certain things.

The manifestation of a pre-existing condition (RA, GA)

A pre-existing condition (e.g., diabetes, heart or vascular disease), which may not have been known before surgery, may manifest during or after surgery. This will therefore be followed closely. In the case of diabetes, for example, specific measures are taken. This involves following the procedures outlined in an internal protocol drawn up in consultation with an endocrinologist.

(Very) rare

Eye damage (GA)

Even though the anaesthetist takes great care that nothing can injure your eyes during anaesthesia, superficial, even painful damage to the eye can sometimes occur. However, this is temporary and heals spontaneously. With appropriate eye ointment, the pain can be relieved.

Infection (RA)

Rarely, infection occurs at the insertion site of the lumbar puncture or near the central nervous system, even if performed under sterile conditions. The consequences of this depend on the pathogen and the severity of the infection.

Severe hypersensitivity (allergic reaction) to drugs (RA, GA)

During surgery and anaesthesia, you come into contact with all kinds of substances that are foreign to your body: sleep medication, pain medication, muscle relaxants, antibiotics, intravenous fluids, latex, contrast agents, disinfectants, etc. You may be allergic to one or more of these without knowing it. This can range from mild problems: skin rash, itching or a drop in blood pressure. However, sometimes these products can cause a severe reaction (anaphylactic shock). This can be potentially life-threatening, even in healthy people. The

anaesthetist will do everything possible to stop an allergic reaction and treat its consequences. That is why it is important that you inform us of any possible hypersensitivities that you or your family members have.

Embolism (RA, GA)

During or after surgery, blood clots may develop in the veins, especially due to (prolonged) immobility of the limbs. When such a blood clot blocks the blood circulation, this is referred to as an embolism. This can be dangerous if the blood clot blocks the blood supply to an important organ (e.g., the lungs or brain). Factors that increase the risk of a blood clot: history of embolism, varicose veins, certain cancers, contraception, smoking, obesity and clotting disorders. We try to prevent the formation of blood clots by administering blood thinners before and/or after surgery. There are also fat embolisms. These usually develop from large bones (e.g., a broken thigh bone). These can also be dangerous. There is no fat-dissolving medication, and treatment is mainly supportive. Air embolisms are rather rare and are especially dangerous in patients with pre-existing heart disease.

Loss of strength - and/or sensation (RA, GA)

This can be caused by nerve damage from a needle or bleeding during regional anaesthesia, or by pressure on a nerve during surgery under general anaesthesia. Most nerve damage is temporary and heals, albeit very slowly, on its own.

Toxic reactions (RA)

The nerves that have to be anaesthetised run close to (large) blood vessels. It is therefore possible that some of the anaesthetic drug enters the bloodstream. This may manifest as a metallic taste, tingling around the mouth, feeling drowsy, cardiac arrhythmias, epileptiform seizures or possibly unconsciousness. Treatment is usually quite possible.

Delayed or failure to wake up after general anaesthesia (GA)

Recovery of consciousness is gradual and is determined by how the medication loses its effect. Nowadays, anaesthetic drugs wear off quickly after their administration is stopped. The most common cause of delayed awakening is thus a prolonged effect of anaesthetic drugs or sedatives. Patients who do not wake up after their general anaesthesia have undergone a serious complication, such as a stroke or brain damage. This risk is extremely rare. If you are a patient at risk of a stroke, surgery can, of course, increase this risk, especially for certain procedures that place great strain on cerebral blood circulation.

Nerve damage (RA)

Nerve damage due to directly puncturing a nerve is very rare. Symptoms can range from tingling and disturbances in skin sensitivity to nerve pain or even paralysis. Usually, this is temporary, only rarely permanent.

Collapsed lung (RA)

A collapsed lung can occur with certain types of peripheral nerve block of the upper limb. Depending on the severity, a drain may be placed between the pleural layers of the lungs.

Death (RA, GA)

This risk is extremely low and is almost always caused by a confluence of multiple complications occurring simultaneously. This depends mainly on your medical history, the underlying disease for which you are having surgery and the type of surgery.

8 Blood transfusion

Sometimes it is necessary to receive blood during a procedure.

Why a blood transfusion?

Normally, the body can produce enough blood cells and plasma. If there is too much blood loss, however, administration of blood products may be necessary.

Types of blood transfusion

Red blood cells carry oxygen, which is absorbed by the lungs, to the tissues. If there is a severe shortage of red blood cells, insufficient oxygen is thus carried to the tissues. Certain organs may be damaged because of this (e.g., the heart and kidneys). Platelets and plasma factors ensure blood clotting when bleeding occurs due to damage to blood vessels. Heavy blood loss can cause a shortage of platelets or plasma factors. Sometimes, due to medication use or a particular disease, insufficient platelets or plasma factors are produced temporarily or for a prolonged period.

How safe is a blood transfusion?

The blood comes from voluntary donors. It is collected at Red Cross centres. Strict controls are carried out here to monitor quality.

Why check the blood type?

A blood sample is taken to determine blood group, the rhesus factor and other factors. This determination is so important that a blood sample is taken at two different times. Sometimes, antibodies are present against blood cells from others. In that case, it can take longer for suitable blood to be available.

How does a blood transfusion take place?

Blood products are administered through an intravenous drip into a blood vessel. The duration of this can vary. Just before administration, your name and date of birth are checked again, and whether the blood product is indeed intended for you is verified. Side effects are monitored.

Side effects

Transfusion reactions: fever, chills, itching, feeling unwell or shortness of breath due to too much volume being administered in too short a time.

Can I refuse a blood transfusion?

You can, and this must be respected. Bear in mind, however, that there are not always other options. Blood transfusions are often life-saving. If you refuse a blood transfusion, it is sometimes a greater risk than if you consent. Discuss any doubts with the doctor treating you in good time.

9 After the procedure

The recovery room

After surgery, you will be taken to the recovery room. There, you will remain under the supervision of specialised nurses until the anaesthetic has fully worn off.
You may still feel drowsy and occasionally doze off. This is quite normal.
There may also be pain after the anaesthetic wears off. Additional painkillers may then be administered for this.
As soon as you are sufficiently awake, pain-free, or the epidural has worn off sufficiently, you will be allowed to go to your room. You will still not be allowed to get out of your bed without help; this is to prevent falls.

If you are admitted for a day admission, make sure an adult accompanies you and that you are not alone at home.
You are not allowed to drive a car yourself on the day of anaesthesia!

Take it easy at home for the first 24 hours. Choose easily digestible foods and beverages; do not drink alcohol or smoke. Also, do not make any major decisions for at least the first 24 hours after anaesthesia.
It is quite normal not to feel fit for some time after surgery. This is not only due to the anaesthesia, but also because of the significant event that every operation inherently is. The body needs to recover at its own pace and this recovery takes time.

Intensive care or midcare

Sometimes it is necessary for you to stay in a special monitoring ward because the nature of the surgery requires somewhat longer intensive care or because your medical history necessitates specialised care.

10 Pain relief after surgery

After surgery, we try to manage the pain as much as possible. A pain scale is used to estimate the amount of pain. After all, this is highly individual.

There are 2 methods of pain relief:

- **Medication you take by mouth or that is injected** (through an intravenous drip, into a muscle or subcutaneously)
- **Pain relief via a pain pump** (PCA = patient-controlled analgesia)

Pain medication is administered via a pain pump that you can operate yourself within preset safety limits. So you do not need to wait for the nurse or doctor to administer painkillers. This allows you to manage your pain relief more quickly and precisely.

There are 3 types:
- PCIA (intravenous)
- PCEA (epidural)
- PCRA (regional, near a nerve bundle)

The anaesthetist will therefore determine the dose of pain medication and the time interval at which it may be given in advance, so that no overdose can be administered. There is no danger that you will receive too much medication.
You can then administer a dose of pain medication by pressing a button. Keep in mind that the pain relief will take 5 to 15 minutes to take effect.

This can still be adjusted in the room if necessary, and it will be monitored. When the pain is sufficiently reduced, the pain pump and catheter are removed. Treatment then continues with simple painkillers.

Side effects and complications of a PCIA, PCEA or PCRA

The most common are listed here.

After PCIA

- Nausea and vomiting
- Itching
- Dizziness, fatigue
- Low blood pressure, slow heart rate
- Difficulty breathing

After PCEA/ PCRA

- Itching
- Headache: a severe headache you experience when rising from a lying position, mainly in the forehead or at the back of the head, accompanied by tinnitus, double vision, nausea and vomiting. If this is too pronounced, you should contact a doctor or nurse.
- Loss of feeling and/or muscle weakness in the lower limbs
- Back pain: sometimes due to the relaxation of the back muscles after epidural anaesthesia, causing the natural curves to flatten out, which can result in back pain.
- Systemic toxicity: very rare, due to accidental injection of the local anaesthetic into a blood vessel.
- Nerve damage: tingling, muscle weakness, or paralysis of the lower limbs, which may or may not be permanent

Contact information

Anaesthesia administration

e secr.anesthesie.rumbeke@azdelta.be

t 051/23 70 39

Zorgcontact (Pre Admission Clinic)

e zorgcontact@azdelta.be

t 051 23 82 00

www.azdelta.be

Source: Department of Anesthesiology