Regionaalhaigla

ENHANCED RECOVERY AFTER SURGERY (ERAS)
GASTRECTOMY AND GASTRIC RESECTION

WHAT IS THE ERAS PROGRAMME?

Enhanced recovery after surgery (**ERAS**) programme helps patients who have undergone a major abdominal surgery to recover faster. The incidence of post-operative complications (blood clots, pneumonia, etc.) is also reduced. A smoother and less painful recovery from surgery usually ensures a quicker return to everyday life.

The building blocks of the rapid recovery programme include:

- a well-planned **DIET**
- effective **PAIN MANAGEMENT**
- early **MOVEMENT**

The main steps of the rapid recovery programme:

- planning and preparation before arriving at the hospital;
- reducing physical stress during surgery;
- a systematic approach to the recovery period;
- immediate post-operative movement.

We encourage patients and their loved ones and carers to participate actively in the process of treatment, care, and recovery!

Studies show that starting to move immediately after surgery, exercising, and a proper diet can help speed up recovery and significantly reduce the incidence of complications:

- normal bowel function is restored more quickly;
- there is a lower risk of pneumonia;
- the normal rhythm of life is restored quicker;
- there is less fatigue;
- the risk of post-operative blood clots is reduced.

You are expected to be discharged from hospital between **days 7–10 after surgery**. If any issues occur after the surgery, the duration of your hospital stay may be longer.

What lies ahead for you

Before hospitalisation, you will have a consultation in the **outpatient** clinic, during which the **surgeon, nurse,** and **anaesthetist** will talk to you. If necessary, a consultation with a dietitian and a physiotherapist will be planned.
You will be informed about the upcoming procedures and the most suitable surgical method will be determined for you, taking into account the state of your health. **You will be able to ask questions!**

A physiotherapist will teach you exercises to help you quickly regain your previous level of physical activity after surgery. If possible, be as active as usual before the surgery.

A dietitian will help you plan post-operative nutrition at home, draw up a diet plan, etc. You can read about pre- and post-operative nutrition and loss of appetite in the sub-chapters of this booklet.

Smokers are advised to stop smoking at least one month before surgery to reduce the likelihood of post-operative complications. We can offer you counselling to quit smoking if you need it.

When you come to the hospital for your surgery, bring your identity document, daily medication, hygiene products, and indoor shoes (slippers). If you wish, you can also bring pyjamas, dressing gowns (also provided at the hospital), or sweatpants and a sweatshirt, so that you can start moving around normally soon after the surgery.

Recommendations before coming to the hospital:

- do all household chores at home that are difficult to do after the surgery, such as the laundry, tidying up, replacing the linen on your bed, etc. if you have a garden, do as much gardening as possible (e.g. mowing the lawn) before coming to the hospital;
- place any items you need frequently at waist or shoulder height so you do not have to bend or reach too far to get them;
- if your home is spread over several floors, bring the things you need to the floor where you spend most of your time;
- if necessary, stock up on easy-to-prepare and longer-preserving food at home, so that you will not have to go to the store straight away;
- we recommend that you drive only when you are sure you can drive safely.

PREPARING FOR SURGERY

Preparing for surgery or prehabilitation means improving the functional capacity of the body before surgery. A major surgery is like running a marathon for your body – you need to train beforehand to perform well.

Fortunately, the techniques for improving the capacity of your body are simple enough:

- **move** a little more each day (if possible, measure your steps with a pedometer);
- **do breathing exercises** to improve lung function:
  - breathe in through your nose;
  - hold your breath for 5–10 seconds;
  - breathe out through your mouth, making the shape of a tube with your lips;
  - rest, repeat the exercise ten times;
  - when this exercise becomes easy, try inflating balloons;
- **quit smoking;**
- **eat** a balanced and healthy diet (ask a dietitian for advice).

GET IN BETTER PHYSICAL SHAPE, EXERCISE EVERY DAY

START BREATHING EXERCISES AT HOME

QUIT SMOKING

THINK POSITIVELY

ASK YOUR DOCTOR FOR INFORMATION ABOUT THE UPCOMING TREATMENT

EAT HEALTHY

SPECIFY WHICH MEDICINES YOU MAY TAKE BEFORE SURGERY

FIND OUT FROM YOUR DOCTOR WHEN YOU WILL BE ABLE TO GO HOME AFTER THE SURGERY AND PREPARE YOURSELF FOR IT

EATING BEFORE SURGERY

Eating a healthy, balanced diet before surgery will help you recover faster afterwards.

You can eat and drink as usually in the days before surgery, unless your doctor has advised otherwise. The food should be rich in energy and protein. If you have had problems with vomiting or eating solid food, we also recommend special high-energy drinks (for more information, see your doctor or dietitian).

Drinking a nutrient- and protein-rich, high-energy drink before surgery helps with wound healing, prevention of infection, and overall good recovery. You can buy protein-rich drinks over the counter from your pharmacy or directly from product representatives. You will be regularly given protein-rich drinks while you are in the hospital. Ask for information about these from your doctor or nurse.

It is also important to drink enough fluids. It is advisable to drink **still beverages** while in the hospital.

The day before the surgery, you can eat solid food until 8 p.m. From 5 p.m. onwards, you will have to drink four special pre-operative drinks over the evening, which will be given to you by a nurse in the surgical department.

On the morning of the day of the surgery, you must not eat, drink dairy products or fruit juice, chew gum, or smoke!

Clear fluids can be drunk up to two hours before surgery.
At 6 a.m. on the morning of the day of the surgery, the nurse will give you two more special high-energy drinks and weigh you.

Please note! When you come to the hospital, bring some chewing gum! Chewing gum after surgery improves the normal functioning of the intestines. Chewing helps to disperse gas and colic-type pains that often occur after abdominal surgery. It is recommended to chew gum three times a day, 30 minutes after eating, for fifteen minutes at a time, until normal bowel function is restored.

Clinical feeding and stenting

Eating and drinking healthy food is the best way to get food energy and nutrients. If, for any reason, your eating is disturbed or incomplete, you may need special medical drinks or artificial feeding, such as tube or intravenous feeding, to help you recover. If necessary, a stent is placed in the area narrowed by the tumour.
Tube feeding or **enteral feeding** – nutrient solutions are introduced into the stomach or intestine through a feeding tube. Tube feeding may be needed for a few days or longer.

Intravenous feeding or **parenteral feeding** – nutrient solutions are administered via a cannula directly into the bloodstream. Intravenous feeding is necessary before or after surgery if your digestive tract is not working or if you have lost weight significantly.

A stent or a self-expanding metal mesh tube is inserted endoscopically using a gastroscope. It dilates the area narrowed by the tumour so that liquid or puréed food can be eaten.

THE EVENING AND MORNING BEFORE SURGERY

In most cases, a medicine is injected daily under the skin of the abdomen the night before surgery and during the hospital stay to reduce the risk of blood clots.

After surgery, it is necessary to continue injecting the antithrombotic at home for about one month after the surgery. Your doctor will also write you a digital prescription. Patients usually administer the injections at home themselves or with the help of a relative, and, if necessary, the nurses in the ward will teach you how to inject.

- You will be dressed in a special gown when you go into surgery.
- Please remove any jewellery and rings/piercings, glasses and/or contact lenses, and loose dentures and hand them to the nurse in the ward.
- Take your hearing aid and/or asthma inhaler(s) with you to the operating theatre!
- If possible, go to the toilet before the surgery!

SURGERY

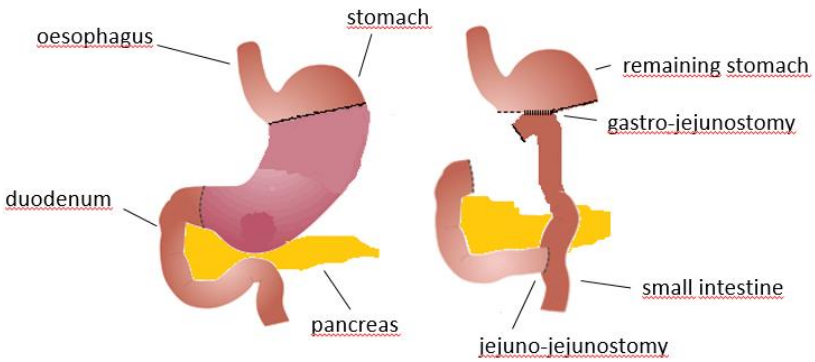
Gastric surgeries are performed under general anaesthesia and usually last 3–4 hours, although sometimes, they can last longer.

A **gastric surgery** usually involves the removal of a part of the stomach (gastric resection) or the stomach completely (gastrectomy). The extent of the surgery depends on the location of the tumour in the stomach and the type of the spread. In addition, the lymph nodes around the stomach are also removed, as well as the gall bladder, in most cases.

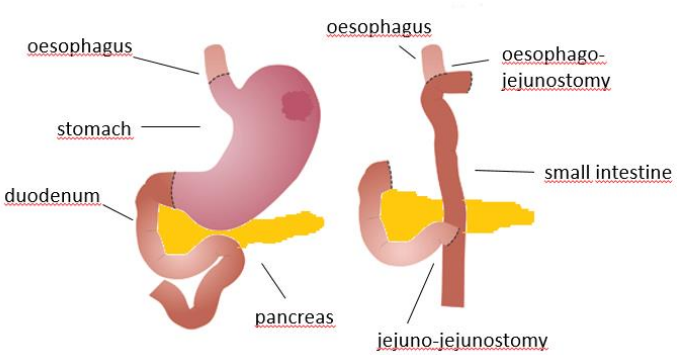
The integrity of the gastrointestinal tract is restored by joining the small intestine and the oesophagus during the gastrectomy and by joining the small intestine and the remaining upper part of the stomach in gastric resection.

At the end of the surgery, drains are placed in the abdominal cavity to drain out any excess fluid after the surgery. The drains are usually removed 3–5 days after the surgery.

Partial removal of the stomach, or resection



Total removal of the stomach, or gastrectomy



POSTOPERATIVE PERIOD

Eating and drinking early after your surgery will help you to regain strength. Starting to eat after the surgery depends on the extent and duration of the surgery. In most cases, eating is restricted to some extent due to the altered gastrointestinal anatomy and digestion.

Clear fluids and special high-energy drinks (e.g. Nutridrink, Cubitan, etc.) are given by sips as early as the in the first postoperative day.

You can usually start eating special puréed food on the third day after the surgery.

The hospital staff will advise you on how to eat.

Physical activity

It is important to do breathing exercises every hour after the surgery to prevent pneumonia.

For the exercises:

- sit (on the bed or on the edge of the bed);
- breathe in slowly and deeply through your nose (you will feel your stomach rise slightly);
- hold your breath for three seconds;
- exhale slowly through your mouth;
- repeat the exercise five times.

Cough regularly to prevent secretions from building up in your lungs! To do this, place a towel or pillow over your stomach wound and support the area of the wound with your hands while coughing. If coughing is difficult, you can use the 'huffing' technique: after a deep inhalation, exhale quickly through the open mouth, as if to fog glass. Repeat the exercise three times.

To prevent clots, do leg exercises while sitting or lying in bed – move your toes up and down and your ankles in a circular motion, slide your heels along the bed.

Staying out of bed, both sitting and standing, and regular walking improve lung function and reduce the risk of post-operative pneumonia, as well as improving blood flow, reducing the risk of deep vein thrombosis, and helping to restore normal bowel function.

Nurses or a physiotherapist will help you sit up in bed six hours after the surgery. Try to sit on a raised bed for up to two hours the night after surgery and be active for up to eight hours in the following days. It is recommended to move at least 60 metres at a time 4–6 times a day.

Pain management

It is important to keep pain under control so that you can move, breathe deeply, eat and drink, sleep, and feel well. You will be given regular painkillers after the surgery, even before the pain has started.

The anaesthetist will discuss pain management with you individually.

Usually, one or a combination of several of the following methods is used:

- **intravenous painkillers** – standard postoperative pain management. The most common painkillers are paracetamol and a non-steroidal anti-inflammatory drug such as ibuprofen;
- **epidural catheter** – a thin plastic tube called an epidural catheter is inserted into the epidural space, near the nerve roots exiting the spinal cord, using a special needle to inject an anaesthetic drug;
- **patient-controlled analgesia (PCA)** – a strong intravenous analgesic (e.g. morphine) administered by a special device (analgesia pump). With this device, you can self-administer painkillers, if necessary. There is no risk of overdosing, as the analgesic pump is programmed to your needs and you will be instructed on how to use it beforehand;
- **TAP block (Transverso-abdominal plane block)** – an anaesthetic is injected between the abdominal muscles during the surgery to temporarily numb the abdominal area and make you feel better afterwards.

You will be given painkillers orally at the earliest opportunity, as this is the simplest and safest pain management method and can be continued at home, if necessary.

If you experience pain that limits your movement, eating, or breathing despite management, tell the nurses immediately!

Nausea and vomiting

You will be given medicines to reduce nausea and vomiting during the surgery, but you may still sometimes feel nauseous and vomit after the surgery.

If you continue to feel nauseous, tell your nurse!

Probes/catheters and infusions

During the surgery, you will be fitted with a bladder catheter to monitor your kidney function and measure the amount of urine excreted. The catheter is removed as soon as possible.

A cannula will be fitted to your arm to administer fluids to prevent dehydration. The cannula is left in for a few more days so that medication can be administered through it, if necessary.

After the surgery, you may need to breathe supplementary oxygen for a short time through an oxygen mask.

Monitoring

Various indicators are monitored during treatment:

- blood pressure, heart rate, body temperature;
- the amount of fluid ingested and excreted;
- the amount of food eaten;
- bowel movements;
- pain;
- time spent out of bed;
- the number of times walked.

Please tell the nurses what you eat and drink!

RECOVERY AT HOME

Although postoperative complications are rare, keep an eye on how you are feeling and contact your doctor or nurse if necessary!

Stomach ache

You may have abdominal pain (colics) for the first week after surgery. The pain usually lasts for a few minutes and disappears completely between spasms.
Severe pain that lasts for several hours may indicate a more serious problem.
If severe pain lasts for more than 1–2 hours, or if you have a fever and feel unwell, contact your doctor immediately, go to the emergency room, or call an ambulance!

Wound

Before you go home, the nurse will remove the dressing and you can take a shower. The stitches will be removed by your family physician 10–14 days after the surgery. For 1–2 weeks after the surgery, the wound may be red and tender to the touch. This is natural.
If the wound becomes very red, painful, swollen, or starts to ooze fluid or pus, contact your physician!

Intestines

Your bowel function may change significantly after the surgery. Please read the chapter on eating after surgery.

Physical activity

It is recommended to start physical activity immediately after the surgery. Exercise regularly several times a day, gradually increasing the load over four weeks until you have reached your preoperative fitness level.
For 4–6 weeks after surgery, avoid lifting weights over 5 kg!

You can resume regular exercising, such as swimming or running, about two weeks after your surgery, starting with a low-impact workout.
If the wound causes you discomfort, reduce the load. Once your wounds are pain-free, you can take part in most sports activities.

Work

In most cases, it is possible to return to work 4–6 weeks after surgery. Physically strenuous work is not recommended until six weeks after surgery.

Driving a vehicle

We recommend that you drive only when you are sure you can drive safely. The pain must be under sufficient control for you to stop the vehicle in the case of an emergency.

Hobbies and interests

It is advisable to continue engaging with your hobbies and interests as soon as you feel well enough. Maintaining your usual activity level will contribute to the recovery. However, it should be kept in mind that lifting weights should be avoided for six weeks after surgery.

Medicines

Continue taking your usual medicines unless your doctor tells you otherwise! If necessary, your doctor will give you a prescription for painkillers and instruct you if you need to continue injecting your antithrombotic medicine at home. The absorption or administration of some medicines may be altered after a complete gastrectomy. Medicines that affect blood clotting (e.g. clopidogrel, warfarin, etc.) must be temporarily discontinued for the duration of the surgery. Ask your physician for details.
Always ask for advice on vitamins and other supplements. You may need to use them before your surgery if you have a restricted diet. Their consumption will certainly be an important part of your future regimen.

EATING AFTER SURGERY

The main function of the stomach in digesting food is to store ingested food for further transportation and to prepare it for absorption by mixing it with the gastric acid and gradually transporting it in portions to the small intestine. The small intestine is where the main absorption of nutrients takes place.

If the stomach is completely removed, the food will end up in the small intestine after swallowing, which is not designed to do this job. Over time, the small intestine will take over some of the role of the stomach and adapt to the new situation, but keeping in mind the changed situation, we recommend the following:

- eat **small portions frequently**, about 6–8 times a day. Over time, portions can be gradually increased according to your tolerance. The amount of food you can tolerate is individual, and pain is usually a sign when it is exceeded. If you are taking strong painkillers, your pain may be reduced, so do not start eating large amounts even if you do not feel pain;
- there may be no feeling of hunger after surgery. To avoid nutrient deficiencies and excessive weight loss and to support recovery from surgery, **you should eat even when you do not feel hungry.** It is a good idea to write down the times of your meals and stick to the schedule. You should also eat late at night before going to bed and even at night if you feel hungry;
- **take time to eat** – this will prevent the excessive stretching of the small intestine;
- it is particularly important to **chew the food properly**. Puréed foods are not necessary in the case of normal mastication, although puréed foods are usually better tolerated immediately after surgery. Puréed home-made foods, ready-to-eat puréed foods (e.g. baby food) sold in stores, and food solutions for enhancing foods can be used;
- foods and drinks that are too hot or too cold can be irritating for you immediately after surgery;
- as it is certainly more difficult to find suitable foods at first, do not worry about the overall healthiness of your diet at first, but focus on practising eating in the new situation;
- **however, both pre- and post-operative diets must be varied** and include different food groups.

Liquid consumption

- In total, you should **get about 2–2.5 litres of fluid per day**.
- Some of the fluid you need comes from food, **but you should also consume about 1.5 litres of different fluids, depending on the composition of your food.**
- Prefer non-carbonated mineral water or protein-rich kefir, yoghurt, or special nutrient-rich drinks.
- After a gastrectomy, **do not drink while eating** to avoid feeling full during a meal. **Drink 30–60 minutes before or after eating.**
- If you have diarrhoea, intense sweating, or fever, you need to drink more fluids.

	Better tolerated foods	Less tolerated foods
Cereal products	Wholegrain wheat and rye breads; potatoes; cereal porridge, wholemeal pasta, buckwheat, pearl barley, barley, crisp bread, savoury crackers, low-sugar breakfast cereals.	Sweet bakery products, high-sugar breakfast cereals.
Root vegetables	Cooked, stewed vegetables	–
Fruits	Fresh peeled fruits; frozen berries; preserved fruit in natural fruit juice	Dried fruit, canned fruit in syrup, juice drinks with added sugar.
Meat, eggs, vegetable proteins	Fish, seafood, poultry, pork, beef, eggs, beans, peas.	–
Dairy products	Cottage cheese, yoghurt, cheese, whole milk, sour cream.	If you are lactose intolerant, use lactose-free products.
Fats and oils	Cold-pressed olive oil, linseed oil, avocado oil, hemp seed oil; margarine, butter, mayonnaise, salad dressings, processed cheese.	Salad dressings made with honey.
Sweets and desserts	Classic biscuits and cakes without frosting, low-sugar products (up to 15 g added sugar per 100 g).	Ice cream, sorbet, sweet pastries, pudding, jelly, sweets, jam, syrup.
Beverages (8–12 glasses)	Water, milk, herbal tea, broth, whole juice diluted with water, beverages made from sugar-free syrup.	Carbonated drinks or drinks with high added sugar content, lemonade, juice drinks, soft drinks; chocolate milk, milk shakes, beer.

Prevention of nutrient deficiencies

In most cases, gastric surgery is accompanied by weight loss. As digestion and absorption are altered, eating is restricted, and intake is reduced, the risk of protein and vitamin deficiencies increases. If your weight remains stable and you eat a varied diet despite small portions, you are less likely to develop nutrient deficiencies.

Most vitamins and minerals are absorbed in the small intestine and their absorption remains unchanged after gastric surgery. An exception to this is **vitamin B12.** After gastrectomy, **there is a persistent problem with vitamin B12 absorption.** Vitamin B12 deficiency does not manifest itself immediately, as the body has about a couple of years of vitamin B12 in reserve, but to avoid a deficiency, you should receive vitamin B12 injections every 4–6 months depending on the baseline level of vitamin B12 in your blood serum and the presence/absence of anaemia. The frequency will be determined by your physician or dietitian.
Due to the low exposure to sunlight and a lack of vitamin D in your diet, you should also take **vitamin D** throughout the year.

Nutritional problems

After gastric surgery, the **dumping syndrome** may develop, with complaints of discomfort after drinking and eating: mild or severe and cramping abdominal pain, feeling of fullness, rapid pulse, dizziness, sweating, diarrhoea, nausea, and vomiting.

For the prevention of the dumping syndrome:

- eat 6–8 small meals a day;
- eat slowly and chew your food well;
- drink small amounts at a time, and do not drink during a meal, but 30–60 minutes before or after eating;
- limit foods containing simple sugars, such as table sugar, soft and juice drinks, sweets, candy, biscuits, and cakes;
- make sure you do not eat a lot of wheat flour and starchy foods and foods with fast-absorbing carbohydrates, such as pasta, white rice, mashed potatoes, etc. at the same time;
- **after a meal, lie down for 15 minutes** to slow down the movement of food into the small intestine.

Usually, the symptoms disappear within three weeks to three months.

CHEMOTHERAPY

Your stomach cancer surgery may be preceded and/or followed by chemotherapy. You will be informed about the exact duration of the chemotherapy, the effects on your body, and the side effects by your chemotherapist or oncologist.

Monitor your **weight** at least once a week during both pre- and post-chemotherapy and ask your doctor to refer you to a dietitian immediately if you experience any eating problems or weight loss.

FOLLOW-UP

About 2–3 weeks after the surgery, the histological examination results of the so-called 'biopsy specimens' removed during the surgery will be available. This will determine your future treatment and monitoring needs. Depending on your wishes, the surgeon will either see you in the outpatient clinic or inform you of the results of the tests over the phone.

The follow-up visit involves an assessment of your condition and planning for further treatment.

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