Investigations for kidney transplantation

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Dear patient,

You have known for some time that your kidneys are not working properly and that you need renal replacement therapy or it has already started. Perhaps you are already thinking about a kidney transplant.

To be eligible for a kidney transplant, a series of investigations must first be conducted. The purpose of these investigations is to confirm your suitability as a candidate and also to reduce the likelihood of future problems. A doctor of the Department of Nephrology determines which investigations must be carried out, taking into account your age, sex, medical history, etc.

The secretariat of the kidney disease centre will schedule these investigations in consultation with you. To ensure that everything goes smoothly, the dialysis manager will draw up a schedule with a clear overview of the dates on which the investigations have been set. This leaflet is intended to provide guidance throughout your investigations.

If you have any questions, please do not hesitate to ask the secretariat of the kidney disease centre or the dialysis manager. You will find the contact details on the back of this leaflet.

When all the results of these investigations are known, one of the doctors will write an accompanying letter, and the dialysis nurse will make an appointment with the transplant team at your chosen transplant centre: Ghent University Hospital or University Hospitals Leuven. The decision on whether you are eligible for transplantation will be made there.

Should you have any questions after reading this leaflet, please do not hesitate to contact us.

The Department of Nephrology

1 Bladder examination

- Uroflowmetry

Uroflowmetry means measuring urine flow. Urine flow is measured by urinating in a special toilet equipped with measuring equipment. The force of the urine stream and the amount of urine excreted is measured.
This test takes place during a urology consultation. The force of urination is measured. This test can only be done with **as full a bladder as possible.** For **peritoneal dialysis patients,** the test must be done with **no fluid in the abdomen**.

- Urine culture and sediment

A sample of urine is requested at the dialysis unit for this purpose. You will be given a small pot and disinfectant to clean yourself first.

- Cystography

Cystography is a procedure in which the bladder and urinary tract are made visible using X-rays. Contrast dye is injected into the bladder through a catheter. The insertion of the catheter feels unpleasant. The contrast medium is then connected to the bladder catheter, and the fluid can flow into the bladder. As this happens, a series of X-rays are made. The bladder catheter will then be removed and you will be asked to urinate in a bed pan or urinal. It is not so easy, but a number of X-rays must also be taken during urination. Then the procedure is over.

This procedure is carried out in the radiology department after a nurse or urologist has placed the catheter. **Peritoneal dialysis patients must not have any fluid in the abdomen for the procedure.**

The procedure takes 30-45 minutes, and you will be allowed to return home afterwards. Antibiotics are also always given to prevent bladder infection.

- Cystoscopy

Cystoscopy is an internal examination of the urethra and bladder. To do this, you must lie on a special table with your legs spread. The penis or vagina is then cleaned, and a lubricant is injected that also has a numbing effect. A cystoscope is then inserted, a thin hollow tube with a strong light source, allowing the specialist to look inside the urethra and bladder. This examination is done at the endoscopy unit and takes about 10 minutes. You can go home immediately afterwards.

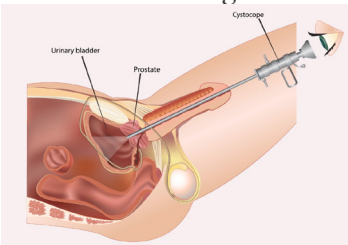


Image: Cystoscopy for a man

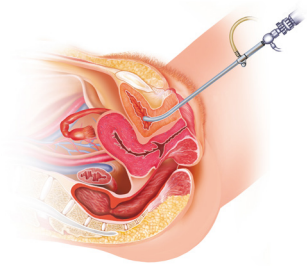


Image: Cystoscopy for a woman

Peritoneal dialysis patients must have no fluid in the abdomen for the examination. Antibiotics are also always given to prevent bladder infection.

After the examination, you may feel an increased urgency and the urine may be bloody. Urination is also often accompanied by a burning, painful sensation. In case of unforeseen circumstances, such as persistent or heavy blood loss and fever,

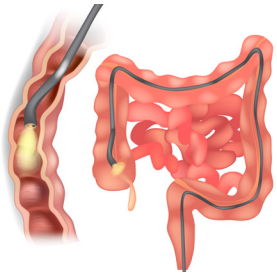
you must contact your GP or treating physician.

- Urine cytology

When you come for a check-up for the investigations or for dialysis, you will be asked to bring three urine samples. You will be given three sample pots for this, which you will give to the kidney disease centre secretary or the dialysis unit.

2 Intestinal examination - colonoscopy

Colonoscopy is an examination of the large intestine. This examination is usually combined with gastroscopy.



You are expected at the kidney disease centre for an examination of the large intestine on .....
at 7:30 a.m. (8 a.m.) at the main entrance of the hospital. **You may not have had anything to eat or drink in the morning. For peritoneal dialysis patients, this investigation must also be done with no fluid in the abdomen. Preventive antibiotics will be given.**

Preparation for the examination

To make the day of admission as pleasant as possible and as smooth as possible, we ask you to take the following into account beforehand:

- If you are taking blood-thinning medication (including aspirin and aspirin-containing pain-relieving combinations, Ticlid, Clopidogrel, Marcoumar, Marevan, Sintrom, etc.), you must consult the doctor to determine whether this should be stopped. In principle, all other medications may be continued. Blood thinners must be stopped unless expressly agreed otherwise with the GP and referring gastrointestinal specialist.
- To ensure that the preparation runs smoothly, we ask you to avoid all high-fibre foods as much as possible for two days before the examination: fruit with seeds and peel, preferably all raw vegetables, fresh fruit, dark bread in general. You may eat white bread, potatoes, meat and cooked vegetables.

Unless you have severe diarrhoea or have agreed otherwise, we recommend that you drink one litre of Plenvu the night before the examination. The aim is to already administer a powerful laxative to empty the bowel as much as possible for the examination.

The *day* of the *examination*

You report to the hospital reception desk at 7:30 a.m. - 8 a.m. at the latest, **fasted** (do not eat or drink). You may still take your blood pressure medication. We request that you delay taking all other medications.
We will then take you to the renal ward, where, in addition to any other investigations (such as a blood test and ultrasound), we will ask you to drink Plenvu until the bowel is completely clean and bowel movements are completely clear (with no solid material). If you develop abdominal cramps or become nauseous, you must inform the nurse.

The *examination*

Colonoscopy is performed by and under the supervision of a gastrointestinal specialist under a mild anaesthetic, for which a product is injected into a vein. This substance is very safe and does not cause any significant side effects. This is therefore

a mild anaesthetic that works very briefly. The product is administered by and under the supervision of an anaesthetist.

Aftercare

In principle, you may eat an hour after the investigation. **For insurance and medicolegal reasons, you may not drive a car on the same day.** This means that you will have to be picked up from the renal ward in the afternoon, usually from 4 p.m.
After the procedure, you will immediately receive a provisional report for your GP, and we will inform you verbally of the result. You may still experience air or intestinal rumbling one to two hours after the examination.
If you have stopped your blood thinner beforehand, it is advisable to ask the doctor to what extent they can now be restarted.

Risks

Every investigation has a certain risk, but with a bowel examination such as colonoscopy, the risk is small. Sometimes a polyp has to be removed. There is then a small risk of intestinal perforation (a hole in the intestine) or bleeding (in world literature: between 0.04% and 2.1% of cases). This may require additional surgery.

3 Ear-nose-throat examination

Examination of the ear, nose and throat. No specific preparation is required. This is usually combined with a CT scan of the sinuses, where a scan of the sinuses is made. This is done before the ear, nose and throat examination.

4 Examination of the oral cavity

In this examination, a complete overview of the teeth is made by means of an X-ray. People with full dentures must also undergo this examination. No specific preparation is required.

5 Lung function tests

A lung function test measures the size of the lung content by blowing into a machine. You do not need to have fasted. **Peritoneal dialysis patients must arrive with no fluid in the abdomen**. It is important to adopt a comfortable sitting position with the shirt collar and belt open.

6 Bicycle test

The bicycle test, or cycle ergometer test, tests the exercise capacity and any symptoms, such as shortness of breath, chest pain, dizziness, etc. This test can detect constrictions and heart rhythm disorders during exercise. The study takes 15 to 20 minutes (including 5 to 10 minutes of cycling) and is conducted by a physiotherapist and a physician.
Peritoneal dialysis patients must not have any fluid in the abdomen. Otherwise, there is no specific preparation.



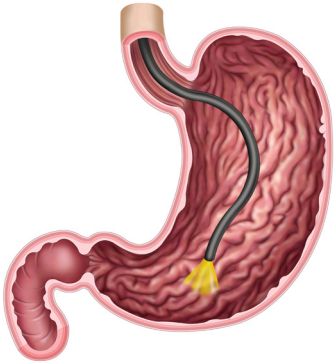
Photo of a bicycle test

7 Cardiac examination - ECG

An electrocardiogram (ECG) is the graphical representation of the electrical activity of the heart over time. With 10 electrodes on the skin (four on the arms and legs and six on the chest), the electrical signals of the heart are recorded by a machine. No specific preparation is required.

8 Gastric examination - gastroscopy

In gastroscopy, a supple, flexible tube (gastroscope) is used to examine the oesophagus, stomach and duodenum. The gastroscope is a flexible tube that is inserted through the throat.



In general, gastroscopy is well tolerated and can be performed by using an anaesthetic throat spray. A mild general anaesthetic may be used if the examination lasts longer. The anaesthetic is administered by means of a needle in your arm. Therefore, it is recommended that you have someone accompany you because it is forbidden to drive a car on the same day after the administration of an anaesthetic drug.

Peritoneal dialysis patients undergoing this examination must not have any fluid in the abdomen. Furthermore, you must have **fasted** from midnight. The examination takes place at the endoscopy department.

Because of the anaesthesia of the mouth and throat, you must not eat or drink until this anaesthetic has worn off, because of the risk of choking. This takes an hour on average. If an anaesthetic has been administered in your arm, you must stay at that location for an average of one to two hours until this drug has worn off! In this case, you may not drive a car for the next 12 hours.

9 X-rays of the bones and chest cavity, sinuses

An X-ray is used to visualise images of the body's interior, such as: bones, the chest cavity (thorax) and sinuses. No specific

preparation is required. This test is quick and painless.

10 Abdominal ultrasound

You are expected at the endoscopy department with as **full a bladder as possible**. This scan is simple, harmless and painless. The doctor can view the organs in the abdominal cavity through the abdominal wall. The doctor applies some gel to the abdomen and then slides a small device over the abdomen. **Peritoneal dialysis patients undergoing this must not have any fluid in the abdomen.**



Example of an ultrasound machine

11 Examination of nerves/muscles - EMG

EMG or electromyography is a test that measures the nerves and/or muscles of the arms and legs. During the examination, you must lie down on an examination table, after which some damp straps will be placed around the arms and/or legs.

When testing the nerves, small electric shocks are delivered to the arms or legs, causing the hands or feet to move slightly. When testing the muscles, a very thin needle is inserted into one or more places in the muscles. You will be asked to contract the muscles a few times. A monitor can display the functioning of the nerves and/or muscles. If you can put yourself in a relaxed position, the insertion of the extremely thin electrode needles is hardly painful.

12 Eye examination

The examination of the eyes by an ophthalmologist is painless and does not require any specific preparation. However, patients who wear glasses must take them to the appointment.

13 CT scan of the abdomen

A CT scan of the abdomen will be taken to assess any intestinal, liver, kidney, spleen, etc. problems. It is important that the patient does not move for this. We will ask you to hold your breath from time to time. We always try to do the examination without using a contrast medium. If a contrast medium is needed, either you must drink one litre of water with a contrast medium, or we will inject some contrast fluid into a vein. **Peritoneal dialysis patients undergoing this scan must not have any fluid in the abdomen.**



Example of a CT scan

14 Cardiac examination - coronary angiography

Cardiac catheterisation or coronary angiography is an examination in which a thin tube or catheter is threaded into the heart. The catheters, which are about a metre long, are inserted via the groin or elbow fold and threaded through the blood vessels to the heart. To do this, certain blood samples are required in advance, and the doctor will check whether your medication can be taken or not.

This procedure requires admission. We will take you to the examination in a bed. There you will get onto the examination table where everything is prepared down to the last detail. Your skin is disinfected and you are covered with large green cloths. The skin where the catheter will be inserted is numbed. You usually do not feel pain inside the blood vessels, and the catheter can be moved freely without any unpleasant sensations.
To get a good picture of the functioning of the heart, a contrast medium is injected. This is usually accompanied by a feeling of

warmth over the body. During filming, the cardiologist will ask you to hold your breath several times. The camera and X-ray equipment make a lot of noise during filming.
Tell the doctor and the nurse if you are allergic to iodine or contrast agents!

The examination takes about an hour to an hour and a half. During an examination through the groin, the entrance location is pressed by hand or with a special device for a long time, and then a compression bandage is applied. After the examination, you will have to stay in bed for a few hours, and you must keep the leg with the compression bandage still. We will take you back to your room for this, where you will be monitored by the nurses.
Peritoneal dialysis patients undergoing this examination must not have any fluid in the abdomen.

15 Carotid ultrasound

Ultrasound is used to examine the blood vessels in the neck. This examination is simple, harmless, and painless. We will first apply some gel to the neck and then slide a small device over the neck. This allows the blood vessels to be made visible. You will not feel anything, but you will hear your blood flow. This examination takes place at the endoscopy department and takes about 30 minutes.

16 Vascular examination - arterial doppler

An arterial doppler is a vascular examination that examines the blood flow of the arteries in the legs and/or arms. During the examination, you will lie relaxed on an examination table with your legs and/or arms completely exposed. The arteries are traced on the skin with a type of pen, making them visible on a screen. The examination is painless and takes about 20 minutes.

17 Heart muscle test - thallium scan

A thallium scan is a procedure during which the blood flow of the heart muscle is examined, both at rest and under stress. This is done using radioactive liquids.

Preparation

On the day before the test and on the day of the test, you may not consume beverages containing caffeine, such as: tea, coffee, cola and cocoa products. It may be necessary to stop some medications about two days before the test.

The test itself consists of two parts, which are conducted on two different days. On one day, the scan is done after an exercise test, and on the other day, it is done at rest. This test always takes place in the morning. You will always need to have fasted for the test. Therefore, no medication may be taken on the morning of the test.
Peritoneal dialysis patients must also not have any fluid in the abdomen.

The test

The exercise test consists of either a bicycle test or a injection of a medication (Persantine) that makes your heart beat faster. Both are with ECG monitoring.

1. The procedure of the test after the exercise test with an exercise bicycle
An intravenous line is inserted so that, at the time of maximum exertion, a radioactive liquid can be injected to subsequently show the blood flow of the heart. The pace is gradually increased while cycling. The aim is to make your heart work as hard as it can.

At the moment of maximum effort, radioactive material is injected, after which you must continue cycling at the same level for another minute. Everything is done with ECG monitoring and supervision by a physician. If you experience any symptoms, report this to the attending physician. After cycling, pictures are taken of your heart.
The exercise test lasts about 20 minutes and recording the pictures also takes 20 minutes.

2. The procedure of the test after stimulating the heart with medication (Persantine)
An intravenous line is inserted for the gradual administration of Persantine, a vasodilator of the heart's coronary arteries, which leads to increased blood flow to the heart muscle.
If possible, you should cycle at a low resistance during and after the administration of Persantine. At the moment of maximum stress on your heart, a radioactive liquid is injected to subsequently show the blood flow of the heart.
Everything is done with ECG monitoring and supervision by a physician. If you experience any symptoms, report this to the attending physician. After the exercise test, pictures of your heart will be taken.
The exercise test takes about 20 minutes and recording the pictures also takes 20 minutes.

3. The procedure of the test at rest
You will be given an injection of a radioactive material, and after about 60 minutes, pictures of your heart will be taken for 20 minutes.
After the test, you may eat or drink again as usual. The radioactive material will lose its activity over the course of a few days.

18 Cardiac examination - echocardiography

Echocardiography is done at the endoscopy department. This examination is simple, harmless, and painless. Some gel is applied to the area of the heart. We then slide a special device over the area. The examination reveals a bit more about the size of the different heart chambers, the pumping function of the heart muscle and the function of the heart valves. Most congenital or acquired structural heart defects can be detected with this technique.

19 Bone density scan

Bone densitometry is a measurement of the density of the bone in various places, such as the hip and spine and possibly the wrist or other bones, to determine the risk of fractures.

While the measurement is carried out, you will lie on a regular examination table. A camera mounted on an arm moves over the lower part of the back and hips. It is important to lie as still as possible during the measurement. Metal objects interfere with the scan, and you must therefore remove clothing with zippers or buttons.

The scan takes approximately 20 minutes. Patients on haemodialysis must have this scan done after dialysis. The scan is completely painless and no specific preparation is required.
Peritoneal dialysis patients must not have any fluid in the abdomen.

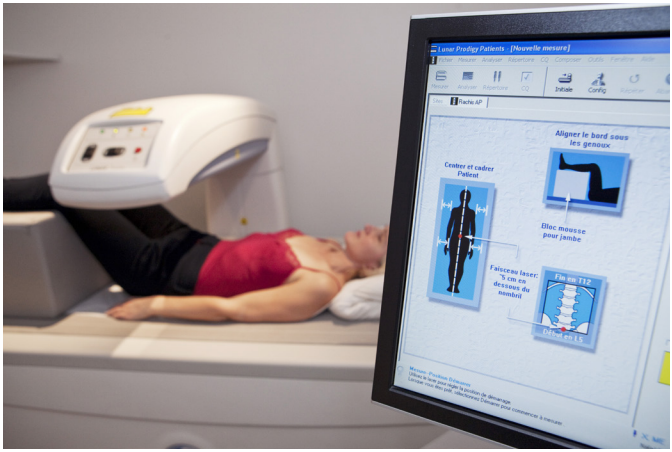


Photo of a bone density scan

20 Glucose tolerance test

This is a test that is done to detect diabetes. The patient must fast before arriving at the testing site. After a blood sample is taken, you must drink a maximum of 300 ml of sugar water, and then we will take a few more blood samples at regular intervals.

21 Tartar removal

During this procedure, a dentist removes all the tartar. Tartar is the name for the brown deposits on the teeth. This allows bacteria to settle under the gums. The gums become inflamed and the roots of the teeth become exposed and thus loose.
In the context of transplantation, it is important to avoid all possible sources of infection. Therefore, removal of any tartar or affected teeth is necessary.

22 Skin examination

This examination will check that there are no abnormal skin formations. This examination does not require any specific preparation.

23 Additional examinations for a woman

- Mammography

Here, X-rays of the breast tissue are taken using a special machine. The breast is compressed to get a better view of the tissues and to keep the radiation exposure as low as possible. This can be painful. The X-rays are best taken after menstruation. To get a good image, the nurse will place you in different positions. These are not always the most comfortable positions. After the X-rays have been taken, the nurse asks you to wait in the waiting room. If the photos are good, you can go home.

It is recommended that you use **no deodorant, talcum powder or lotion** under the armpits on the day of the examination.
A mammogram is sometimes combined with an ultrasound scan of the breasts.



Example of a mammogram.

- Gynaecological examination

A gynaecological examination involves taking a “smear” from the cells present in the cervix to test for cervical cancer. This can be done at the hospital or by your own gynaecologist. Your gynaecologist must then pass on the results to the dialysis nurse so that all the information can be collected for the transplant centre in Ghent or Leuven.
No specific preparation is required. **Peritoneal dialysis patients undergoing this examination must not have any fluid in the abdomen.**

24 Additional examinations for a man

- PSA

PSA is the abbreviation of Prostate Specific Antigen and is a blood test to check whether the prostate is enlarged. This test is usually combined with other blood samples for monitoring purposes.

- Prostate ultrasound

The prostate ultrasound is the best way to obtain images of the prostate. Because the prostate is difficult to see, an ultrasound probe must be inserted through the anus. This examination does not require any specific preparation and takes approximately 10 minutes.
Peritoneal dialysis patients undergoing this examination must not have any fluid in the abdomen.

Notes

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