What we tell our patients about a kidney biopsy

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A kidney, or renal, biopsy is a minor but very important procedure to take a sample of kidney tissue, about the size of half a matchstick, which can be examined under the microscope by a specialist pathologist. This procedure will be outlined over the next four pages: the first two pages examine how and why a biopsy is carried out in adults and the second two pages look at the approach taken with children.

Why do you need a kidney biopsy?

Although many kidney problems can be diagnosed from your symptoms, physical examinations, blood tests and X-rays or scans, there are others for which direct examination of a piece of the kidney is essential to make a precise diagnosis and plan the specific treatment. Examples include:

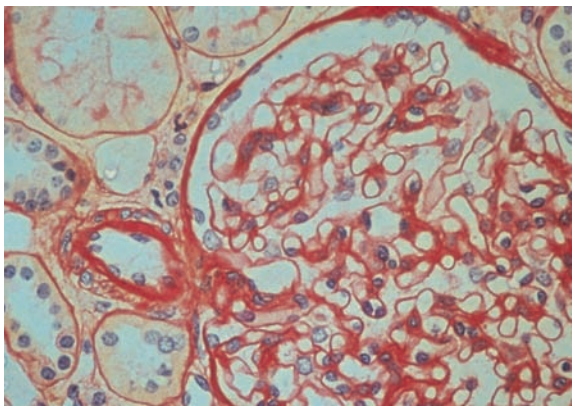
- Unexplained protein in the urine: proteinuria
- Unexplained blood in the urine: haematuria
- The nephrotic syndrome – heavy proteinuria leading to swelling (oedema) in other parts of the body
- Unexplained poor kidney function or renal failure
- An assessment of kidney damage in conditions such as systemic lupus erythmatosus (SLE).

The pathologist will be able to tell if there is inflammation of the filters (glomeruli), which is called glomerulonephritis, or other forms of damage that account for the kidney problem.

Your kidney specialist (nephrologist) will only request a kidney biopsy if it is necessary to help make the correct diagnosis and plan your treatment. He or she will tell you what is being looked for and answer any questions about the procedure. Don't be afraid to ask!

What do the kidneys do?

The kidneys are the specialised organs that filter and purify the blood, ridding the body of excess water, salts and waste products. The blood entering the kidneys is filtered through a series of coils of small blood vessels which, under the microscope, look like balls of wool. These filters, called glomeruli, allow water and chemicals to pass but hold back proteins and cells. The filtered fluid is then processed as it passes down a long tube (called the tubule) so that only the excess water, salts, acids and waste products are left by the time it reaches the end of the tube. The resulting fluid is urine, which dribbles into the pelvis of the kidney and flows down a long muscular tube called the ureter into the bladder. The other important function of the kidneys is to produce three essential messenger substances: (i) active vitamin D, which is necessary for calcium absorption from the gut and healthy bone formation; (ii) renin, which controls the blood pressure; and (iii) erythropoietin, which stimulates the bone marrow to produce red blood cells.



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The pathologist will examine a small piece of the kidney under a microscope. This sample shows cells from a healthy kidney

Where are the kidneys?

The kidneys are at the back of the abdomen lying on either side of the backbone or spine just in front of the last two ribs. They are 9–11 cm long and 4 cm wide (about the size of a small mango) and are shaped like a broad bean.

Will you have to stay in hospital?

Yes! You will usually be admitted into hospital on the day of the biopsy and will probably go home the following afternoon or evening. You should bring in an overnight bag and any medication that you take regularly. If you take anticoagulants (warfarin) or aspirin, you must stop taking them before the procedure, but discuss this with your nephrologist first. We do not advise you to drive yourself into hospital or home again.

What happens when you are admitted?

Your nurse will welcome you to the ward, show you where your bed is and then show you around. You will be asked to provide a sample of urine and the nurse will take some blood samples. You will

then be asked about your health in general, and asked basic information, such as your next of kin, and telephone numbers. This will allow the nurse to get to know you and help in the planning of the care you will receive. You will be examined by one of the nephrologists to check whether the biopsy can proceed. The doctor will ask you to sign a consent form. This confirms that you have understood the reason for the biopsy, how it will be performed, the risk involved and that you have agreed to have it done. If you are unclear about anything, please ask the doctor or any of the ward nurses. You may have breakfast before you come to the ward but it is advisable not to have anything to eat once you arrive until after the biopsy has been done. This is just a precaution, because you will have to lie flat on your stomach during the procedure, which could be uncomfortable. Once you have had the biopsy, you may have a light meal.

The biopsy should not hurt, but may be slightly uncomfortable

The procedure

Just before the biopsy, you may be given a drip into a vein in your arm. This will help to prevent bleeding after you have had your biopsy. The biopsy will usually be done on the ward unless the doctors have specifically asked for the procedure to be done in the X-ray department. When the doctor is ready to do the biopsy you will be asked to lie on your front. The doctor will do an ultrasound scan, using a portable machine to check exactly where your kidneys are. To do the scan, the doctor will put some cold gel on your back and move a small scanner across your skin, which produces a picture that can be seen on a screen. This scan helps to locate the kidney and choose a site from which to take the sample.

The biopsy should not hurt, but may be slightly uncomfortable. You will have two injections of local anaesthetic into the skin over your kidney first. You will feel this injection, but it will quickly make your skin go numb. Once the skin is numb, a special biopsy needle will be pushed through the skin and into one of your kidneys, usually the left. The only thing that you should feel should be a slight pushing sensation. As the doctor takes the needle out, the small kidney sample comes with it. This is done twice and then a plaster is placed over your skin where the needle went in.

You will be required to lie flat for a total of six hours. You may turn onto your sides, but should not sit up in bed. After six hours, the head of your bed will be elevated. You will be required to rest in bed for a total of 18 to 20 hours after your biopsy. During this time, we prefer that you do not get up to go to the toilet. You will have to use either a urine bottle or a bedpan. It is possible that your urine will be bloodstained – this is a normal occurrence after a biopsy. Any bleeding will normally have stopped by the time you go home. You should be allowed to get up during the morning of the next day if everything is all right and go home later that day.

Are there any risks?

The main risk is that your kidney might bleed after the biopsy. This is because your kidneys have a lot of blood going through them. Although this is rare, it is something that we watch closely for. The nurses will check your pulse, urine and blood pressure and will look at the biopsy site. From these frequent checks, the nurses can quickly tell if there are any signs of bleeding and can treat it.

Going home

Before you leave the ward, you will usually be given an outpatient appointment for the renal clinic for one or two weeks' time. Your doctors will then be able to discuss the results of the biopsy with you, and any treatment that you may need. If new medication has been prescribed, you may have to wait until it has been dispensed by the pharmacy before you are discharged. Your nurse will explain what the tablets are for and when you should take them. If you get any discomfort from the biopsy site, you should take a mild painkiller, such as paracetamol, for about 24 to 48 hours after the biopsy.

It would be sensible to rest for the next five days. You should not drive for two days and should avoid any heavy lifting and strenuous exertion until after your outpatient appointment. You can shower or bathe as normal once you are home. If you need a certificate for your work, you should see your own GP. The nephrologist will write to your GP about your biopsy. However, it may take a few days for this letter to get there. If you notice any bright red (fresh) blood in your urine, feel any new discomfort, or become faint after you have gone home, you should contact your GP urgently and tell him or her that you have recently had a kidney biopsy ■

Key points

- **Although many kidney problems can be diagnosed from your symptoms, physical examinations, blood tests and X-rays or scans, there are others for which direct examination of a piece of the kidney is essential to make a precise diagnosis and plan the treatment.**
- **You will usually be admitted into hospital, on the day of the biopsy; and probably go home the following afternoon or evening.**

Acknowledgement
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