

What I tell families about a kidney biopsy in children

We can obtain much of the information about how the kidneys are working by examining your child for signs such as water in the tissues (oedema) and measuring their blood pressure (high blood pressure is called hypertension).

Examination of the urine using a dipstick and microscope will also tell us whether there are blood cells, protein or white cells present. This information is combined with the results from blood tests to tell us how well the kidneys are working and possibly how severe the inflammation is in the kidneys.

If your child has acute inflammation of the kidneys (known as acute glomerulonephritis, or nephritis for short) then we would usually consider carrying out a renal biopsy if:

- The kidney function is getting worse
- The amount of protein in the urine increases and your child develops oedema (swelling) or if we are uncertain of the cause of the poor kidney function.

A biopsy would tell us more about the extent of inflammation in the kidney. It also guides us as to whether we need to use drugs, such as prednisolone, or other immunosuppressants.

Children who have large amounts of protein in the urine, combined with low levels of protein in the blood and swelling are said to have nephrotic syndrome. If your child has the usual type of nephrotic syndrome we do not normally carry out a renal biopsy but start treatment with prednisolone. However, we do consider a biopsy in children who do not respond to the prednisolone treatment when it has been given for four weeks (this is known as initial steroid resistance).

A larger number of children have biopsies because they are found to have blood or protein in the urine, even though they are well. We carefully assess each child and will ask questions as to whether they have had obvious blood in the urine in the past, or whether there are any family members who have also had blood in the urine or deafness. Some chronic nephritis conditions can run in families. In this situation we might wait a little longer and do repeated tests of the urine before considering a biopsy. This is because although the biopsy may reveal the cause of the problem, we do not have any specific treatment to offer. Children who have had a kidney transplant might require a biopsy to diagnose rejection.

Where will the biopsy be carried out?

The exact arrangements will vary but in our unit we carry out most biopsies in the ward treatment room which has been specially decorated to make it more welcoming for children.

If your child has not been admitted to the ward for other investigations, then the biopsy is usually carried out as a day case procedure. This means that your child will be admitted to the ward on the day of the biopsy and then allowed home 6–8 hours after the biopsy if they are well and passing urine. Only very occasionally does a child need a general anaesthetic for a biopsy. This may occur in very young children or when a child is having a general anaesthetic for another procedure, in which case we can do the biopsy at the same time.

Can I prepare my child for the biopsy?

Naturally, you and your child may be concerned about the procedure and we certainly believe it is worthwhile preparing children for anything that might cause them discomfort. We produce a booklet (*Rebecca has a renal biopsy*) which is intended to be read to children before admission to the hospital to help everybody to understand what is involved when the biopsy is carried out. If you have any questions the day case nurse on the ward or the nephrologist are the best people to ask. On admission to the ward you will be allocated a nurse and a play specialist for the day. We offer a preparation package that is appropriate to the child's developmental stage, such as a step-by-step photo guide, which can be used to talk your child through the procedure beforehand and to give them an opportunity to express any worries.

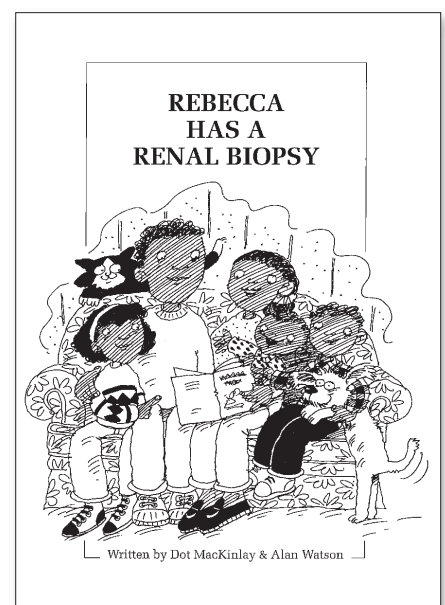
How is the biopsy performed?

When your child arrives on the ward they will have local anaesthetic cream applied to a hand vein. About 30–60 minutes later a cannula will be placed in a vein and a blood test will

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We have produced a booklet – Rebecca has a renal biopsy – to help children to understand what is involved when the biopsy is carried out





be taken to check that your child is not anaemic and that their blood clots properly. Anaesthetic cream will also be placed over your child's back where the biopsy needle is likely to be inserted. You can accompany your child into the treatment room where he or she will be asked to lie flat on their stomach on the bed. You can help the nurse or play specialist by gently reassuring your child until the sedation has begun to take effect. Your child will be sedated (made sleepy) using a slow intravenous injection of painkiller and sedative.

A kidney biopsy only removes tiny pieces of kidney

During the procedure, your child will be monitored and a simple oxygen saturation monitor will be attached to one of your child's fingers to ensure that their breathing remains satisfactory. In the rare instance when your child cannot be sedated adequately and safely, the procedure will be abandoned.

When your child is relaxed and sleepy, the doctor will first locate the position of your child's kidney using an ultrasound machine. A local anaesthetic injection, called lignocaine, will then be injected into the skin over the biopsy site. As the capsule around the kidney is very sensitive, local anaesthetic will be injected into the outer part of the kidney. Usually, two or three insertions of the biopsy needle are necessary to obtain two good cores of kidney. Each core of kidney tissue will be passed to a technician who can examine the specimen under a microscope. This will tell us if the specimen is adequate for the investigation. When a sufficient kidney sample has been obtained a dressing will be put over the biopsy site.

What happens afterwards?

Your child will be returned to the ward and, because of the sedation, will usually sleep for a few hours. Their pulse and blood pressure will be closely monitored. When your child wakes up they will be allowed to drink, and any urine they pass will be tested for blood. If your child is booked as a day case procedure, they will need to stay on the ward for 6–8 hours to ensure that they have recovered and that their urine does not contain

an excessive amount of blood and there is no discomfort over the biopsy site. We usually advise that children do not do heavy exercise or return to school for 48 hours. Competitive sports are best avoided for at least a week.

What are the complications ?

Obvious blood in the urine (haematuria) is expected to occur in up to five in 100 children after a biopsy. A little blood can cause a marked change in the urine and this usually settles quite quickly. If the bleeding is heavy then we may need to check your child's blood count once more and, very rarely, a child may require a blood transfusion. It is extremely rare for a child to require an operation to stop the bleeding. Most children have some discomfort over the biopsy site, which may require a mild painkiller. If your child is in a lot of pain at home then they may need to return to the ward. If your child is at all unwell, with vomiting or severe tummy pain, then contact the unit for advice.

When will the results be available?

If the biopsy is urgent then we can obtain a preliminary result within 4–6 hours. This is necessary when we do a biopsy of a kidney transplant. However, we prefer to process biopsies in the standard manner in the laboratory and examine the tissue under a microscope the next morning. It may be several days before the information is available as we need to do special tests using immunofluorescence or an electron microscope. An appointment will be given to discuss the biopsy results a few days or weeks later.

One point to remember is that a kidney biopsy only removes tiny pieces of kidney and often contains only 10–50 filtering units. Each kidney is believed to contain up to 1,000,000 filtering units so the piece of kidney removed is very small. The slides that are made from the biopsy are often kept for several years in the pathology department in case we need to refer to them for comparison with other biopsies in future years ■

NB: *Rebecca has a renal biopsy* is available from the Secretary, Children and Young People's Kidney Unit, City Hospital, Nottingham, NG5 1PB.

Key points

- We carry out most biopsies in the ward treatment room which has been specially decorated to make it more welcoming for children.
- You and your child may be concerned about the procedure and we believe it is worthwhile preparing children for anything that might cause them discomfort.
- If your child is booked as a day case procedure then they will need to stay on the ward for 6–8 hours after the biopsy.

If you would like to receive additional copies of the *What I tell my patients about...* features from this issue, please send your request and mailing address by post to Charlotte Rust at Hayward Medical Communications, Rosemary House, Lanwades Park, Kentford, Newmarket CB8 7PW. In order to cover postage and packing, there will be a minimum charge of £1.00, together with a cost of 25p per item.