

Kidney Health Information

Glomerulonephritis

Glomerulonephritis is a family of kidney diseases that can cause renal failure at any age.

Anatomy & Functions of the Glomerulus

The *glomerulus* is a tiny ball of capillaries (very small blood vessels inside *Bowman's capsule*, through which the urine is filtered.

The glomerular filtration rate (GFR) is the amount that is filtered. Usually, this is about 100ml per minute – only an espresso cupful, but this adds up to 150 litres per day! This is produced by the 2 million nephrons in the average healthy pair of kidneys in a young adult. 99% of this filtrate is re-absorbed, leaving one to two litres of urine to be passed each day.

The filter keeps blood cells and all large proteins (albumin, for example) in the blood and out of the urine.

With the natural aging process the GFR decreases very slowly. Usually this is not noticed and is not a problem. If the rate slows down markedly, as in a diseased kidney, symptoms and signs of kidney disease result.

What goes wrong in glomerulonephritis?

This group of kidney diseases affects the kidney filters, described above.

Some typical signs and symptoms can be:

- high blood pressure
- a urine test may reveal blood in the urine (haematuria)
- a urine test may reveal protein in the urine (proteinuria)
- swelling (oedema).

Nephrotic syndrome

This can occur where there is a severe protein leak from the kidneys caused by glomerulonephritis. Severe oedema, usually occurring in the ankles, can have a number of possible causes.

For further information on nephrotic syndrome follow the links below:

Nephrotic syndrome in adults from EdREN

<http://renux.dmed.ed.ac.uk/EdREN/EdRenINFObits/NephroticLong.html>

Nephrotic syndrome in adults from the NKF (UK)

http://www.kidney.org.uk/Medical-Info/kidney-disease/nephsyn_adult.html

Nephrotic syndrome in children from the NKF (UK)

http://www.kidney.org.uk/Medical-Info/kidney-disease/nephsyn_child.html

Diagnosis

A kidney biopsy is often needed to confirm glomerulonephritis and which type it is. It will also show whether the condition is serious and which treatments could help.

Kidney Biopsy

There are several types of glomerulonephritis. Information is available by following the links in the table below.

Minimal change nephropathy	From NIDDK – National Institute of Diabetes & Digestive & Kidney Diseases (USA) http://kidney.niddk.nih.gov/kudiseases/pubs/glomerular/index.htm
Membranous nephropathy	http://renux.dmed.ed.ac.uk/EdREN/EdRenINFObits/Membranous.Long.html
	National Kidney Federation http://www.kidney.org.uk/Medical-Info/kidney-disease/Iga.html
	The International IgA Nephropathy Network http://www.igan-world.org/infopatients.htm
Lupus nephritis (SLE)	http://www.kidney.org.uk/Medical-Info/kidney-disease/lupus.html
	http://renux.dmed.ed.ac.uk/EdREN/EdRenINFObits/LupusLong.html
Focal necrotising glomerulonephritis	http://renux.dmed.ed.ac.uk/EdREN/EdRenINFObits/FSGSLong2.html
	http://renux.dmed.ed.ac.uk/EdREN/EdRenINFObits/NephroticLong.html
Focal segmental glomerulosclerosis (FSGS)	http://renux.dmed.ed.ac.uk/EdREN/EdRenINFObits/FSGSLong2.html#anchor873535
IgM nephropathy	http://www.kidney.org.uk/Medical-Info/kidney-disease/igm.html
Membranoproliferative glomerulonephritis (mesangio capillary glomerulonephritis)	http://www.kidney.org.uk/Medical-Info/kidney-disease/mpgn.html
Vasculitis	http://www.kidney.org.uk/Medical-Info/kidney-disease/vasc.html
	http://renux.dmed.ed.ac.uk/EdREN/EdRenINFObits/VasculitisLong.html

Some of our recent research into glomerulonephritis

2001 The glomerulonephritis DNA bank. This large project has been funded jointly with the Medical Research Council. It is one of 13 similar

nationwide initiatives across a variety of disease areas that together form the Medical Research Council DNA Banking Initiative.

A national collection of DNA and data from affected people and their families has been developed for the 5 most common diseases of the glomeruli. This will allow further investigation of which genes make you more likely to get glomerulonephritis and suggest targets for future drugs and preventive treatments.

2004 Dr Andrew Lemmey. Estimating Glomerular Filtration Rate Using Measured Muscle Mass. The direct measurement of kidney function is expensive; however prediction is not always accurate. This study has tested the theory that kidney function estimates can be improved by measuring muscle mass more directly.

<http://www.kidneyresearchuk.org/images/pdfs/research/lemmey.pdf>

2005 Prof. Peter Mathieson. Membranous Nephropathy Trial. This trial, funded jointly with the Medical Research Council, compares two treatments that should limit the deterioration caused by this condition. Xxx patients are needed to provide the answer.

<http://www.kidneyresearchuk.org/content/view/228/294/>

2006 Dr Andrew Salmon. Anti-proteinuric effect of Angiotensin-1 in human glomeruli. This trial aims to develop a greater understanding of protein leakage in the glomeruli.

<http://www.kidneyresearchuk.org/content/view/276/334/>



2006 Dr Simon Satchel. Engineering the Glomerular Filtration barrier in vitro. The construction of a 'model' kidney, in the laboratory, using two types of live specialised renal cells, so that their function can be fully understood.

<http://www.kidneyresearchuk.org/content/view/274/332/>

For more of our **Current Research Projects**, please visit our research pages at: <http://www.kidneyresearchuk.org/content/view/103/143/>

Please be aware that we have made every effort to ensure this information is accurate, however we cannot guarantee that there are no mistakes. Also, the best management plans for individual patients may vary from those outlined here. Only the doctors caring for the patient will be able to advise on this. Please consult your own doctor.

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