

Lupus Nephritis:

The Most Common Lupus Complication

What is lupus nephritis (LN)?

Lupus nephritis (LN) is inflammation of the kidney that occurs as a common symptom of systemic lupus erythematosus (SLE), also known as lupus.ⁱ Proteins in the immune system called antibodies damage important structures in the kidney.ⁱⁱ

Why are the kidneys important?

To understand how lupus nephritis damages the kidney, it is important to understand how the kidneys work. The kidneys' main function is to filter out excess waste and water from the blood through the urine. Kidneys also balance the salts and minerals circulating in the blood, help control blood pressure and make red blood cells. So, when the kidneys are damaged or fail, they can't do their job as well. As a result, the kidneys are not able to filter out waste and water into the urine causing it to stay in the blood.ⁱⁱⁱ

What are the signs and symptoms of LN?

Signs to ask the doctor about include blood in the urine or foamy urine which can mean that there is excess protein. Other signs to notice are swelling of legs, ankles, hands or tissue around the eyes as well as weight gain that can be caused by fluid the body isn't getting rid of.^{iv} Symptoms of lupus nephritis also include high blood pressure, joint/muscle pain, high levels of waste (creatinine) in the blood, or impaired/failing kidney.^v

How common is LN?

Lupus nephritis is the most common complication of lupus. Five out of 10 adults with lupus will have lupus nephritis, while eight out of 10 children with lupus will have kidney damage, which usually stems from lupus nephritis.^{vi} LN is more common among women than men and particularly among those who are Black, Latinx, and/or Asian.^{vii}

How is LN diagnosed?

Lupus nephritis is diagnosed through urine and blood tests and monitored through a kidney biopsy which requires samples of kidney tissue to test for signs of damage or disease within the kidney.^{viii}

What are the complications of LN?

Roughly 10-30% of people with lupus nephritis develop kidney failure.^{ix}

How is LN treated?

It is important to relay all symptoms to the doctor and to follow directions for treatment. Until December, 2020, there were no treatments approved specifically for lupus nephritis. With the approval of Benlysta® (belimumab) for this indication,^x in addition to its existing approved use for systemic lupus erythematosus, and Lupkynis™ (voclosporin) specifically for lupus nephritis,^{xi} treatment for this dangerous complication is about to undergo a transformation.

Previously, the following medicines have traditionally been used to help reduce inflammation, lower immune system activity, and block the body's immune cells or antibodies from attacking the kidney:^{xii}

- Corticosteroids and immunosuppressive drugs like azathioprine (Imuran) and mycophenolate (Cellcept) help suppress the immune system to keep it from attacking the kidneys.
- A type of chemotherapy, cyclophosphamide (Cytoxan), is also given, particularly in severe cases of lupus nephritis to help suppress the overactive immune system.
- Drugs used to control blood pressure also may be used to treat hypertension caused by lupus nephritis including ACE inhibitors, angiotensin receptor blockers, diuretics, beta blockers, calcium channel blockers.
- ACE inhibitors and angiotensin receptor blockers also help protect the kidneys while diuretics help the kidneys remove excess fluid from the body.
- Changing your diet to minimize your intake in salt and protein can help lower and maintain healthy blood pressure.^{xiii}
- Patients with severe damage may need additional treatments such as kidney dialysis (removing waste from the kidneys through a filtering machine) or a kidney transplant (surgically replacing kidneys with a donated organ).^{xiv}

What is LRA's Role in Lupus Nephritis Research?

Over the past 20 years, the LRA has funded more than 40 projects focused specifically on lupus nephritis, and their results have led to critical advances in therapeutic development and treatment of lupus nephritis. In addition, Lupus Therapeutics, an affiliate of LRA, is conducting clinical trials to test the effectiveness of two more potential lupus nephritis treatments – BMS-986165 from Bristol Myers Squibb and guselkumab from Janssen – through its Lupus Clinical Investigators Network, LuCIN. Another study, Dynamic Imaging of Variation in Lupus Nephritis (DIVINE) is comparing the effectiveness of non-invasive imaging to surgical biopsy of kidney tissue for monitoring the progression of lupus nephritis and its treatment.

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- i Lupus and Kidney Disease (Lupus Nephritis) National Institute of Diabetes and Digestive and Kidney Diseases.
 - ii Tecklenborg J, Clayton D, Siebert S, Coley SM. The role of the immune system in kidney disease. *Clin Exp Immunol*. 2018 May; 192(2): 142-150.
 - iii Lupus and Kidney Disease (Lupus Nephritis) National Institute of Diabetes and Digestive and Kidney Diseases.
 - iv Lupus and Kidney Disease. National Kidney Foundation. <https://www.kidney.org/atoz/content/lupus>
 - v Lupus Nephritis. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/lupus-nephritis/symptoms-causes/syc-20354335>. Accessed 7.22.20.
 - vi Lupus and Kidney Disease (Lupus Nephritis). National Institute of Diabetes and Digestive and Kidney Diseases..
 - vii Lupus and Kidney Disease (Lupus Nephritis). National Institute of Diabetes and Digestive and Kidney Diseases..
 - viii Kidney Biopsy. Mayo Clinic.
 - ix Tektonidou MG, Dasgupta A, Ward MM. Risk of End-Stage Renal Disease in Patients With Lupus Nephritis, 1971-2015. A Systematic Review and Bayesian Meta-Analysis. *Arthritis Rheumatol*. 2016 Jun; 68(6): 1432-1441.
 - x FDA approves GSK's BENLYSTA as the first medicine for adult patients with active lupus nephritis in the US. GSK.
 - xi FDA Approves Aurinia Pharmaceuticals' LUPKYNIST™ (voclosporin) for Adult Patients with Active Lupus Nephritis. Aurinia Pharmaceuticals
 - xii Lupus and Kidney Disease (Lupus Nephritis). National Institute of Diabetes and Digestive and Kidney Diseases.
 - xiii Lupus Nephritis. Mayo Clinic.
 - xiv Lupus Nephritis. Mayo Clinic.