



Lupus Nephritis

What is it?

Lupus nephritis (LN) is one of a larger group of kidney diseases known as glomerulonephritis.

Lupus nephritis occurs in people with **systemic lupus erythematosus (SLE)**, an autoimmune disease in which the immune system attacks healthy tissues. When this attack targets the kidneys – specifically the glomeruli – the tiny filters in the kidneys – it causes inflammation known as **lupus nephritis**. SLE is also known as just lupus.

SLE can affect many organs throughout the body, but not everyone with SLE develops kidney involvement. Some people experience both widespread (systemic) symptoms and kidney problems, while others have kidney involvement with few other symptoms.

This handout will focus only on how lupus affects the kidneys (lupus nephritis - LN).

Here's what happens in lupus nephritis:

- In SLE, the immune system, which normally fights infections, mistakenly produces antibodies¹ that attack the body's own cells and tissues (autoantibodies), leading to inflammation and damage in different organs, including the kidneys. We don't fully understand why this happens.
- These autoantibodies form immune complexes² (clumps of antibodies and other proteins) that get trapped in the kidney's filters (glomeruli).
- The immune complexes trigger an inflammatory response, causing the kidney filters to become swollen and damaged.
- This damage makes the kidneys leaky, allowing blood and protein to spill into the urine.
- Over time, repeated inflammation can lead to scarring (fibrosis) in the kidneys, reducing their ability to function properly.

¹ Antibodies are protective proteins produced by your immune system. They attach to antigens (foreign substances) — such as bacteria, fungi, viruses and toxins — and remove them from your body. Source: <https://my.clevelandclinic.org/health/body/22971-antibodies>.

Autoantibodies are malfunctioning parts of your body's natural defenses. Instead of targeting germs and other invaders, they attack your body. This can lead to lots of different issues and health conditions. Source: <https://my.clevelandclinic.org/health/symptoms/autoantibodies>.

² Immune complex is an antibody bound to an antigen. Immune complexes are part of a normal immune response. However, when immune complexes accumulate in the blood, they can cause autoimmune disorders. Source: <https://clinicalinfo.hiv.gov/en/glossary/immune-complex>.



- There are different classes of lupus nephritis, ranging from mild inflammation to severe scarring that can lead to kidney failure if not treated.

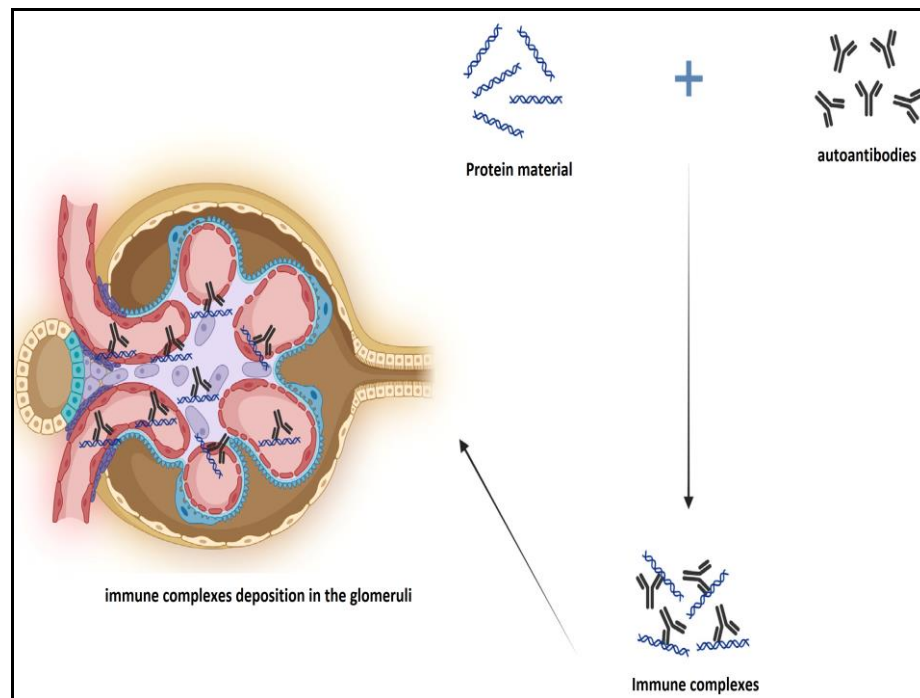


Figure source (modified): <https://www.mdpi.com/1422-0067/25/16/8981>



The symptoms of lupus nephritis may include:

- Swelling in the legs, ankles, or around the eyes.
- Foamy or bubbly urine – due to excess protein leaking into it.
- Blood in the urine (may look pink, red, or brown).
- Weight gain – caused by fluid retention, not actual fat gain.
- Symptoms common for SLE and LN:
 - Fatigue and feeling weak.
 - Joint pain or swelling.
 - Skin rash, often on the face (butterfly-shaped rash).
 - Fever without an infection.

The complications of lupus nephritis may include:

- Risk of declining kidney function, which may lead to kidney failure.
- More frequent infections – the immune system may not work as well due to protein loss.
- Risk of blood clots – the clotting system may not work as well due to protein loss.
- High blood pressure – the kidneys help regulate blood pressure, so damage to the kidneys can cause it to rise.

Effects of SLE on various areas of the body

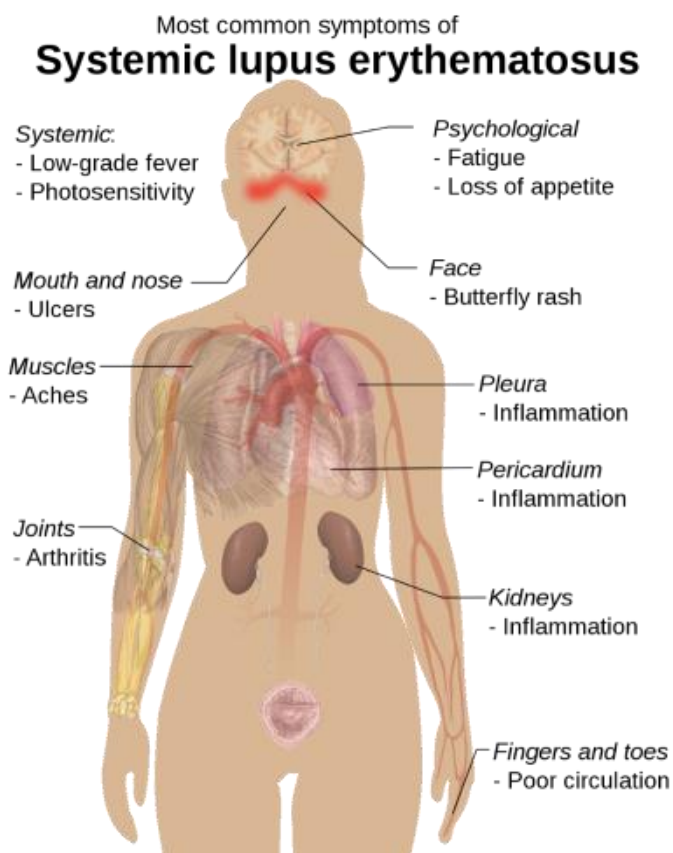


Figure source: <https://storymd.com/journal/lw233xdf8m-lupus/page/4q35qu77q8-symptoms-of-systemic-lupus-erythematosus-lupus>

What happens after you have been diagnosed with kidney disease due to lupus nephritis?

- After your kidney biopsy is reported and a final diagnosis of LN is made, your kidney doctor (nephrologist) and/or kidney care team may order further tests or scans, and will discuss appropriate treatment with you.
- If multiple organs are involved, your kidney care team may refer you to other specialists for assessment of damage in other organs in order to come up with a treatment plan that covers all the disease manifestations. For example, you may be referred to a rheumatologist or a respirologist.

How is lupus nephritis treated?



Note: This section only discusses the treatment of lupus nephritis (the condition that affects the kidneys).

The aim of treatment is to lower the production of autoantibodies and stop the immune system from causing further damage. The treatment for those with kidney involvement is usually conducted in two phases:

- **The initial (induction) phase** of treatment may include corticosteroids, in addition to one or more of the medications below:
 - Mycophenolate mofetil.
 - Cyclophosphamide.
 - Tacrolimus/ cyclosporine.
 - Rituximab.
 - Belimumab.
- During this phase of treatment, you are at high risk of bacterial and viral infection. If you develop a fever, please seek medical attention immediately.
- Other medications may become available for controlling lupus nephritis over the coming years as more research is being done in this area.
- **The subsequent (maintenance) phase** of treatment will start after remission³. Medications in this phase are used to prevent relapses and may include:
 - Mycophenolate mofetil.
 - Corticosteroids.
 - Azathioprine.
 - Tacrolimus/ cyclosporine.
 - Rituximab.
 - Belimumab.
- Treatment with these medications will continue for at least 2 years and may be extended for a longer period.
- The length of treatment is individualized based on disease severity, response to treatment and previous relapses.

General therapies:

- Urine and lab tests: Your kidney doctor and/or kidney care team will follow you closely with frequent urine and lab tests to monitor your response to treatment and help you manage any symptoms.

³ Remission, by definition, is when symptoms of a disease (like cancer) lessen or go away for a period of time. You can have partial or full remission. It can last for months, years or the rest of your life. Remission isn't the same thing as a cure. But if you stay in remission for a long time, some healthcare providers might say that you're cured. Source: <https://my.clevelandclinic.org/health/articles/24673-cancer-remission>.



- **Antibiotics during immunosuppressive therapy:** You may be started on a combination of trimethoprim and sulfamethoxazole, antibiotics that are used to reduce the risk of very serious infection that occurs in patients on medications that interfere with the immune system.
- **Other medications while undergoing treatment for LN:**
 - While on high doses of corticosteroids, your kidney care team may recommend calcium, vitamin D, and medication to maintain bone health.
 - Also, while on immunosuppression, your kidney care team may offer you medication to prevent stomach upsets.
 - Medications to control swelling (diuretics) and blood pressure may be initiated depending on your symptoms.
- **Medication options:** Your kidney doctor and/or kidney care team will support you to learn about the medication options that would be best for you.
- **Medication cost:** BC Renal covers the cost of a wide range of medications used for lupus nephritis treatment.

- **Important:** Patients need to check with their kidney doctor and/or kidney care team before taking any over-the-counter (OTC) medications and natural health products.
- **Important:** Patients with chronic kidney disease like lupus nephritis need to keep their vaccinations updated, since some treatments may reduce the effectiveness of vaccination. You are encouraged to discuss with your kidney doctor and/or kidney care team what vaccinations may be appropriate for you.
- **Important:** Pregnancy may impact kidney function. If you are planning a pregnancy, consult your kidney doctor.
- **Important:** Smoking cessation is important – it can help slow down the worsening of kidney disease.

Living with lupus nephritis

- **Support of kidney care team:** BC kidney patients registered with BC Renal have access to a comprehensive kidney care clinic team that includes nurses, dietitians, social workers. In most cases, patients will also have access to a pharmacist.
- **Support for your wellbeing:** It will be important for you to stay active and healthy. The Kidney Foundation's online Kidney Wellness Hub (<https://kidneywellnesshub.ca/>) has a lot of useful information. It covers staying active, eating well, mental wellbeing, and socially connecting,



including peer support groups. It also provides online classes, webinar recordings, and activity suggestions for patients of all ability levels.

- Unpredictable disease course: Though most patients treated for lupus nephritis with immunosuppression medication improve, the disease course is unpredictable. Relapses are common, even many years after lupus nephritis is diagnosed. You will need ongoing follow-up with your kidney doctor and/or kidney care team.
- Risk of kidney failure: There is a portion of lupus nephritis patients who will end up with kidney failure, despite treatment. If your kidneys fail, your treatment options may include transplant, dialysis, and conservative care⁴. Your kidney doctor and/or kidney care team will be there to educate and support you throughout your journey.
- Participation in clinical trials: Sometimes, people living with lupus nephritis may be invited to participate in a clinical trial for new therapies and medications. If you choose to volunteer in a trial, your kidney doctor and/or kidney care team will help you navigate the process.

Further information

- There may be a lot of confusing information about lupus nephritis and other kidney diseases on the Internet. The following websites are good sources of information for people living with this disease:
 - The Kidney Foundation of Canada - <https://kidney.ca/>
 - Kidney Wellness Hub - <https://kidneywellnesshub.ca/>
 - BC Renal GN web page - <http://www.bcrenal.ca/health-info/kidney-care/glomerulonephritis>
 - Lupus nephritis webpage by Glomcone - <https://www.glomcon.org/kidney-diseases/lupus-nephritis>
- If you continue to have questions about your condition or treatment, please keep track of these questions and ask your kidney doctor and/or your kidney care team.

⁴ Conservative care, sometimes called conservative kidney management (CKM) or supportive kidney care, focuses on treating the symptoms of kidney failure to make you feel as well as possible. It does not treat the causes or attempt to cure kidney failure. Although conservative care does not include dialysis or transplant, it does include all of the other parts of kidney care and support from your team. For more information see this BC Renal's handout: http://www.bcrenal.ca/resource-gallery/Documents/Patient_Guide-Transitioning_to_Conservative_Care-Kidney_Care_Clinics.pdf.