Nephritic Syndrome and Glomerulonephritis

A plain-English guide for you and your family

WHAT IS HAPPENING

Your kidneys are full of tiny filters called glomeruli (each one is like a coffee filter for your blood). Every minute, blood rushes through them; they catch waste and extra water but let protein and blood cells stay in your bloodstream. In nephritic syndrome and glomerulonephritis, your immune system gets confused and attacks those filters—either because of an infection somewhere else (like strep throat) or because the immune system misfires on its own. The damaged filters start leaking red blood cells into your urine (so it may look tea-colored or cola-colored) and let protein slip through. At the same time, salt and water pile up in your body because the kidneys can't clear them fast enough, so you swell (especially around your eyes and ankles) and your blood pressure shoots up. If caught early—before too much scarring sets in—medicines that calm the immune system and lower blood pressure can protect your kidneys and let them heal. If it goes on too long, scar tissue replaces the filters, kidney function drops, and the damage becomes permanent.

What you might feel

- Dark or tea-colored urine (hematuria)
- Puffiness around the eyes and ankles (edema)
- Foamy or bubbly urine (proteinuria)
- High blood pressure (hypertension)
- Feeling tired or weak (fatigue)
- Reduced urine output (oliguria)
- Shortness of breath (dyspnea)
- Sudden weight gain

Call the doctor right away if...

- Shortness of breath or chest pain (may mean fluid is backing up into the lungs or the heart is struggling)
- Very little or no urine for 12 hours or more (may signal kidney shutdown)
- Severe headache, blurred vision, or seizure (may mean dangerously high blood pressure is hurting the brain)
- Sudden confusion or drowsiness (may mean waste products are building to toxic levels in the blood)

What the care team will do

- Measure blood pressure every 2 to 4 hours and notify provider immediately if systolic is above 160 or diastolic above 100
- Monitor strict intake and output every shift, measuring all oral intake and urine output to the milliliter
- Weigh the patient daily at the same time with the same scale and minimal clothing
- Assess for swelling (edema) by checking periorbital areas in the morning and ankles and sacrum in the afternoon; grade pitting swelling 1+ to 4+
- Restrict sodium intake to less than 2 grams per day and limit fluids to 1 to 1.5 liters daily if low urine output (oliguria) is present
- Inspect every urine sample for color and clarity, reporting tea-colored, cola-colored, or red urine immediately
- Assess respiratory rate, oxygen saturation, and lung sounds every 4 hours, watching for crackles or increased work of breathing
- Hold all nephrotoxic medications including NSAIDs, aminoglycosides, and contrast dye until provider reviews the medication list

Medicines you may be given — and why

Prednisone or methylprednisolone (corticosteroid)

Turns down the immune system's attack on the kidney filters (glomeruli). The immune system mistakenly attacks its own tissue in many forms of glomerulonephritis; steroids quiet that overactive response and reduce inflammation inside the tiny kidney filters so blood can be cleaned properly again.

Cyclophosphamide

Kills or stops rapidly dividing immune cells (the cells launching the attack on the kidney). Used in severe glomerulonephritis (such as ANCA-associated vasculitis or lupus nephritis) when steroids alone are not enough. It is stronger than steroids and helps prevent the kidney from being destroyed by ongoing immune inflammation.

Mycophenolate mofetil (CellCept) or mycophenolic acid (Myfortic)

Blocks a key enzyme (IMPDH) that immune cells (especially B-cells and T-cells) need to multiply. Because these cells rely heavily on this enzyme to make DNA building blocks, blocking it slows the immune attack on the kidney filters without hitting other fast-growing cells as hard as cyclophosphamide does.

Azathioprine (Imuran)

Mimics a building block of DNA and RNA. When immune cells try to use it, their DNA gets scrambled and they cannot divide properly. This slows the production of new immune cells attacking the kidney. It is an older drug, often used as a maintenance (long-term) therapy after stronger drugs like cyclophosphamide bring the disease under control.

Rituximab (Rituxan)

A man-made antibody that latches onto a marker (CD20) found on the surface of B-cells (the immune cells that make antibodies). Once rituximab binds, the B-cells are marked for destruction and cleared away by the body's cleanup system. This is especially useful in glomerulonephritis driven by harmful antibodies (such as ANCA-associated vasculitis or membranous nephropathy).

ACE inhibitors (e.g. lisinopril, enalapril) or ARBs (e.g. losartan, valsartan)

These drugs block angiotensin II (a hormone that squeezes blood vessels and raises blood pressure). In the kidney, angiotensin II especially squeezes the vessel leaving the glomerulus, which raises pressure inside the filter and forces more protein to leak out. By blocking angiotensin II, these drugs relax that outgoing vessel, lower the pressure inside the filter, and reduce protein spillage (proteinuria). They do NOT fix the immune attack, but they protect the kidney from further damage while other drugs work on the inflammation.

Furosemide (Lasix) or other loop diuretics

Blocks a transporter (the Na-K-2Cl cotransporter) in the loop of Henle (a hairpin turn deep inside each kidney tubule) so the kidney cannot pull salt and water back into the blood. Salt and water stay in the urine and leave the body, which shrinks swelling (edema) and lowers blood pressure. This does NOT fix the kidney disease itself—it only treats the symptom of fluid overload that often comes with nephritic syndrome.

Where this information comes from

- KDIGO Clinical Practice Guideline for Glomerulonephritis 2021
- UpToDate: Overview of the classification and treatment of rapidly progressive (crescentic) glomerulonephritis
- American Society of Nephrology
- National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)

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