RENAL / UROLOGICAL · NGN NCLEX 2026

Nephritic *Syndrome*

An inflammatory glomerular disorder marked by hematuria, hypertension, oliguria, mild proteinuria, and azotemia — most often triggered by post-streptococcal immune complex injury to the glomerular basement membrane.

COLA-COLORED URINE | ↑ BP · ↓ URINE OUTPUT | RBC CASTS HALLMARK | INFLAMMATION = "-ITIS"

📚 **SOURCE NOTE:** Nephritic syndrome was not included in the uploaded reference notes for this session. Content compiled from standard NGN NCLEX 2026 references: *Saunders Comprehensive Review for NCLEX-RN (Silvestri)*, *ATI RN Adult Medical-Surgical Nursing*, *Lippincott Illustrated Reviews: Pathology*, *KDIGO Clinical Practice Guidelines*, and current pediatric/adult nephrology consensus statements.

SECTION ONE

1 Definition & Overview

Nephritic syndrome is a constellation of findings caused by **inflammation of the glomeruli** — the kidney's filtering units. Damaged capillaries leak red blood cells (not just protein), produce characteristic urinary sediment, and reduce glomerular filtration rate (GFR).

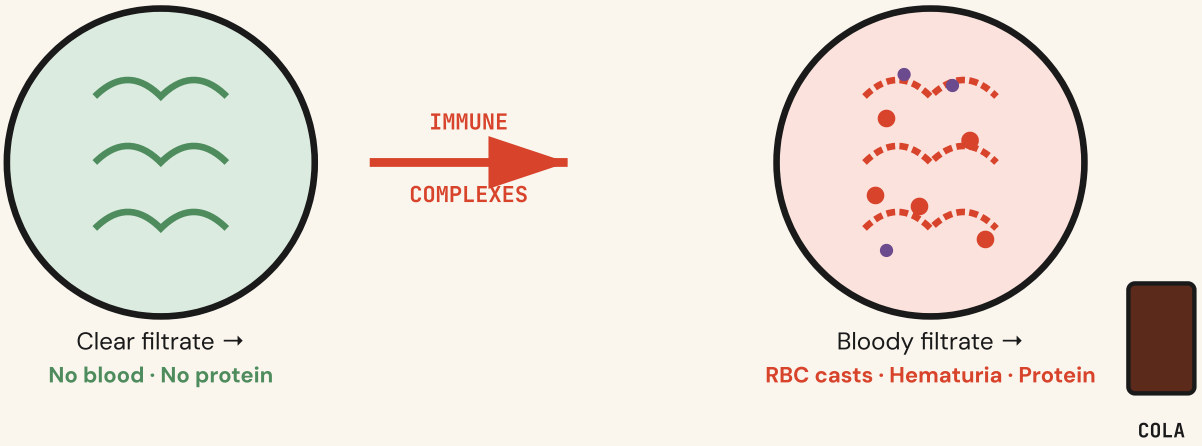
- **Most common cause in children:** Post-streptococcal glomerulonephritis (PSGN), 1–3 weeks after Group A β-hemolytic strep infection of throat or skin.
- **Other causes:** IgA nephropathy (Berger disease), lupus nephritis, Goodpasture syndrome, rapidly progressive glomerulonephritis (RPGN), Henoch-Schönlein purpura.
- **Why it matters:** Untreated inflammation → AKI, chronic kidney disease, hypertensive crisis, and pulmonary edema.

💡 **KEY PEARL** Think "-ITIS = inflammation = BLOOD leaks out." Nephritic = blood in urine. Nephrotic = protein in urine. This single distinction separates the two syndromes on the exam.

SECTION TWO

2 Pathophysiology — Step by Step

Step 1 Group A β-hemolytic strep infection (throat 1–2 wks ago, or skin 3–6 wks ago) →	**Step 2** Body forms antibodies against strep antigens →	**Step 3** Antigen–antibody immune complexes circulate in blood
Step 4 Complexes deposit on glomerular basement membrane (GBM) →	**Step 5** Complement activation → neutrophils swarm → INFLAMMATION →	**Step 6** Capillary walls damaged; pores enlarge
Step 7 RBCs leak through pores → **hematuria + RBC casts** →	**Step 8** ↓ GFR → Na^+ & H_2O retained → **HTN, edema, oliguria** →	**Step 9** ↑ BUN, ↑ Creatinine (azotemia) → toxin buildup



GLOMERULAR INJURY — IMMUNE COMPLEX DEPOSITION CAUSES RBC LEAK & COLA-COLORED URINE

SECTION THREE

3 Signs & Symptoms

Classic Findings

- **Hematuria** — gross, "cola/tea-colored" urine
- **RBC casts** on urinalysis (pathognomonic)
- **Mild proteinuria** (< 3.5 g/day)
- **Hypertension** (mod–severe)
- **Periorbital edema** (worse in AM)
- **Oliguria** (< 400 mL/day)
- Azotemia: ↑ BUN, ↑ creatinine
- Fatigue, malaise, headache, flank pain
- Low-grade fever (post-infectious)

Red-Flag / Severe

- Hypertensive encephalopathy (HA, vision Δ, seizures)
- Pulmonary edema (crackles, dyspnea, ↓ SpO_2)
- Acute kidney injury (anuria, ↑↑ Cr)
- Heart failure from volume overload
- Hyperkalemia → cardiac dysrhythmias
- Severe HTN ≥ 180/120
- Seizures (cerebral edema)
- Encephalopathy / altered LOC

RED FLAG **Cola/tea-colored urine + recent strep infection + edema + HTN = think nephritic syndrome until proven otherwise. This is the highest-yield NCLEX clue pattern.**

Lab Findings

LAB	EXPECTED FINDING
Urinalysis	Hematuria, mild proteinuria, RBC casts, dysmorphic RBCs
BUN / Creatinine	Both ↑ (azotemia)
ASO titer	↑ (confirms recent strep infection)
Complement C_3, C_4	↓ (consumed by immune reaction)
GFR	↓
Serum albumin	Normal or mildly ↓ *(major difference from nephrotic)*
Serum K^+	↑ (risk of dysrhythmia)
Throat culture	May still be positive for GAS

SECTION FOUR

4 Priority Nursing Interventions (ABCs + Safety)

A

Airway

- Assess for pulmonary edema (crackles, dyspnea)
- Position semi-Fowler's if SOB
- Monitor SpO_2 continuously if respiratory distress

B

Breathing

- Auscultate lung sounds every shift
- Watch RR, work of breathing
- Administer O_2 as ordered
- Report SpO_2 < 92% or new crackles

C

Circulation / Renal

- BP every 4 hours (or more often if severe)
- Daily weights — same time, same scale, same clothing
- Strict I&O — measure all output
- Monitor for hyperkalemia (peaked T-waves, dysrhythmias)
- Assess edema (periorbital, sacral, pedal)

S

Safety / Supportive

- Bed rest during acute phase
- Seizure precautions if BP severely elevated
- Restrict Na^+ & fluids per order
- Restrict protein if BUN very high
- Skin care for edematous areas
- Prevent infection (immunosuppressed if on steroids)
- Notify HCP for ↓ UOP, weight gain > 1 kg/day, ↑ BP

SECTION FIVE

5 Pharmacology

DRUG / CLASS	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
Penicillin / Amoxicillin (Antibiotics)	Eradicate residual strep infection	GI upset, rash, anaphylaxis	Assess for PCN allergy. Doesn't reverse glomerular damage — prevents further antigen exposure.
Furosemide / Lasix (Loop diuretic)	Inhibits $Na^+/K^+/2Cl^-$ in loop of Henle → diuresis	Hypokalemia, hypotension, ototoxicity, dehydration	Monitor K^+, daily weights, I&O. IV push slowly. Watch BP.
ACE inhibitors (lisinopril, enalapril)	Block angiotensin II → ↓ BP & ↓ proteinuria	Dry cough, hyperkalemia, angioedema, ↓ BP	Monitor K^+ and creatinine. **Hold if K^+ > 5.0**. Risk if pregnant — teratogenic.
Calcium channel blockers (amlodipine, nifedipine)	Block Ca^{2+} → vasodilation → ↓ BP	Peripheral edema, dizziness, flushing, HA	Used when ACEi contraindicated. Monitor BP before each dose.
Corticosteroids (prednisone)	↓ immune-mediated inflammation	Hyperglycemia, infection, GI bleed, mood Δ, osteoporosis, Cushingoid	Do NOT abruptly stop — taper. Give with food. Monitor glucose, weight, BP. Infection precautions.
Immunosuppressants (cyclophosphamide, mycophenolate)	Suppress lymphocyte proliferation	Bone marrow suppression, hemorrhagic cystitis (Cytoxan), infection risk	Reserved for severe/RPGN. Monitor CBC, infection signs. Push fluids with Cytoxan.
Antihypertensives — IV (labetalol, nicardipine)	For hypertensive emergency	Bradycardia (labetalol), tachycardia (nicardipine), ↓ BP	Continuous BP monitoring, titrate carefully — drop MAP no more than 25% in 1 hour.

💡 KEY PEARL Drugs to **AVOID**: NSAIDs (worsen renal function), nephrotoxic antibiotics (gentamicin, vancomycin without level monitoring), IV contrast dye, and aspirin in children with viral illness (Reye syndrome risk).

SECTION SIX

6 NCLEX Test Traps ⚠️

Nephritic vs. Nephrotic — The #1 Confusion

FEATURE	NEPHRITIC SYNDROME	NEPHROTIC SYNDROME
SUFFIX CLUE	**-ITIS** = inflammation → BLOOD	**-OTIC** = hOles → PROTEIN
URINE COLOR	Cola / tea-colored (gross hematuria)	Frothy / foamy (heavy proteinuria)
PROTEINURIA	Mild (< 3.5 g/day)	Massive (> 3.5 g/day)
HEMATURIA	YES — RBC casts	Minimal or absent
EDEMA	Mild → periorbital (AM)	Severe, generalized (anasarca)
BLOOD PRESSURE	↑↑ Hypertension	Normal or low
SERUM ALBUMIN	Normal / mildly ↓	↓↓ Hypoalbuminemia
LIPIDS	Normal	↑↑ Hyperlipidemia
CLASSIC CAUSE	Post-strep (PSGN), IgA	Minimal change disease, diabetes

Wrong vs. Right Thinking

❌ Wrong Thinking
"Patient with strep throat 2 weeks ago now has dark urine — must be a UTI."

✅ Right Thinking
Dark/cola-colored urine 1–3 weeks *after* strep = post-streptococcal glomerulonephritis. Check ASO titer, BP, & urinalysis for RBC casts.

❌ Wrong Thinking
"BP is high — push fluids to perfuse the kidneys."

✅ Right Thinking
Nephritic patients are fluid *overloaded*, not underperfused. Restrict Na^+ & fluids. Monitor for pulmonary edema.

❌ Wrong Thinking
"Give acetaminophen or ibuprofen for the headache."

✅ Right Thinking
AVOID NSAIDs (worsen GFR). Acetaminophen is OK. The HA may be from severe HTN — check BP first.

❌ Wrong Thinking
"Antibiotics will reverse the kidney damage."

✅ Right Thinking
Antibiotics treat residual infection; they do *not* reverse glomerular injury. Recovery occurs over weeks to months as inflammation resolves.

❌ Wrong Thinking
"Daily weights aren't a priority — vitals are enough."

✅ Right Thinking
Daily weights are the
`most reliable`
indicator of fluid status. 1 kg gain ≈ 1 L of retained fluid. Always same time, scale, & clothing.

❌ Wrong Thinking
"RBC casts mean the patient has bladder cancer."

✅ Right Thinking
`RBC casts = glomerular origin`
— they form in the renal tubules. Pathognomonic for glomerulonephritis.

SECTION SEVEN

7 Patient & Family Education

- **Finish the full antibiotic course** — even if symptoms improve. Treat strep promptly in the future to prevent recurrence.
- **Monitor BP daily at home** with a cuff. Report readings > prescribed target.
- **Weigh yourself every morning** after voiding, before breakfast, same scale & clothing. Report gain > 1 kg (2.2 lb) in 24 hours.
- **Low-sodium diet** (< 2 g/day): avoid canned soups, processed meats, fast food, table salt, chips. Read labels for "sodium."
- **Protein**: follow HCP guidance. May be restricted during high-BUN phase, then resumed normally.
- **Fluid restriction** as ordered — measure all intake including soup, ice, popsicles.
- **Report immediately:** ↓ urine output, brown/red urine, swelling of face/legs, severe HA, vision changes, SOB, weight gain.
- **AVOID NSAIDs** (ibuprofen, naproxen, aspirin). Use acetaminophen if approved. Tell every provider about your kidney history.
- **Recovery timeline:** Urine usually clears in 1–2 weeks; full lab recovery may take months. Children typically recover fully; adults may have residual changes.
- **Follow-up:** Urinalysis, BUN, creatinine, BP checks at scheduled intervals (often for a year or more).
- **Activity:** Bed rest during acute phase; gradually resume activity as symptoms resolve and BP normalizes.
- **Infection prevention:** Hand hygiene, avoid sick contacts, treat sore throats promptly.

SECTION EIGHT

8 Memory Boosters & Mnemonics

PHAROH

The 6 hallmarks of nephritic syndrome:

P — **P** roteinuria (mild, < 3.5 g/day)

H — **H** ematuria (cola/tea-colored)

A — **A** zotemia (↑ BUN, ↑ Cr)

R — **R** BC casts (pathognomonic)

O — **O** liguria (↓ urine output)

H — **H** ypertension

"-ITIS vs. -OTIC"

NephrITIS = inflammation = **BLOOD** leaks out → hematuria

NephrOTIC = hOles in glomerulus = **PROTEIN** leaks out → proteinuria

"**I** tis = **I** nflammation"

"**O** tic = h**O** les for pr**O** tein"

"COCA-COLA"

The strongest urine clue:

Cola-colored urine + recent strep = PSGN until proven otherwise

Don't confuse with rhabdo (myoglobin) or hemolysis — those don't have RBC casts

"AVOID NSAID"

Things to avoid in renal patients:

N — **N** SAIDs (ibuprofen, naproxen)

S — **S** alt & **S** upplements (Na^+, K^+)

A — **A** minoglycosides (gentamicin)

I — **I** V contrast dye

D — **D** ehydration

SECTION NINE

9 NCJMM Clinical Judgment Scenario (6-Step)

CASE VIGNETTE

A 9-year-old male is brought to the ED by his mother. Two weeks ago he had a sore throat that resolved without antibiotics. This morning his mother noticed his face is "puffy," his urine is "the color of Coke," and he hasn't urinated since waking up 6 hours ago. He reports a mild headache. Vital signs: T 99.4°F, HR 88, RR 22, BP 152/96, SpO_2 97%. Weight today: 32 kg (up 1.5 kg from clinic visit 1 week ago). Urinalysis: dark amber, 3+ blood, 1+ protein, RBC casts present. Labs: BUN 38, CR 1.4, K^+ 5.2, ASO TITER ELEVATED, C3 ↓.

STEP 1 — RECOGNIZE CUES

What data stands out?

Recent untreated strep throat (2 wks ago) · cola-colored urine · periorbital edema · oliguria · HTN (152/96 — elevated for age) · weight gain 1.5 kg in 1 week · headache · 3+ hematuria with RBC casts · ↑ BUN/Cr · ↑ K^+ · ↑ ASO · ↓ C3 complement.

STEP 2 — ANALYZE CUES

What do these cues mean together?

The 2-week interval after strep + RBC casts + ↑ ASO + ↓ C3 + HTN + edema strongly point to **post-streptococcal glomerulonephritis (PSGN)** — a nephritic syndrome. The weight gain and BP elevation reflect Na^+/H_2O retention from ↓ GFR. Hyperkalemia (K^+ 5.2) is a developing red flag for cardiac dysrhythmia.

STEP 3 — PRIORITIZE HYPOTHESES

What is the most urgent concern?

Highest priority: fluid overload → hypertensive crisis & risk of hypertensive encephalopathy. Secondary: hyperkalemia → cardiac dysrhythmia. Tertiary: AKI progression. Lowest: residual strep (treat but won't reverse damage).

STEP 4 — GENERATE SOLUTIONS

What interventions are appropriate?

Strict I&O · daily weights · BP every 2–4 hours · Na^+ and fluid restriction · IV furosemide for fluid overload · antihypertensive (ACEi or CCB — caution with K^+) · cardiac monitor for hyperkalemia · penicillin for residual strep · seizure precautions · bed rest · parent education on home BP & weight monitoring.

STEP 5 — TAKE ACTION

What does the nurse do first & how?

First: Place patient on cardiac monitor (K^+ 5.2 with HTN). **Then:** Administer prescribed IV furosemide and recheck BP in 30 min. Initiate strict I&O, obtain admission weight, start fluid restriction (per order, typically 400 mL/m²/day + replace urine output). Begin penicillin. Educate family: report any vision Δ, severe HA, ↓ urine output. Implement seizure precautions.

STEP 6 — EVALUATE OUTCOMES

How will the nurse know it worked?

Expected improvements: BP trending toward age-appropriate range, urine output increasing (> 1 mL/kg/hr), weight decreasing daily, edema resolving, K^+ < 5.0, BUN/Cr trending down, urine color lightening. **Concerning findings requiring escalation:** BP rising, anuria, new crackles, peaked T-waves on monitor, seizure activity, altered LOC.

SECTION TEN

10 Quick Review — One-Glance Summary

- **Definition:** Inflammation of glomeruli → hematuria, HTN, mild proteinuria, RBC casts, oliguria, azotemia.
- **#1 cause (kids):** Post-streptococcal GN, 1–3 weeks after Group A strep.
- **Hallmark urine:** Cola/tea-colored + RBC casts.
- **Key labs:** ↑ ASO titer, ↓ C3 complement, ↑ BUN/Cr, ↑ K^+.
- **Top priority:** Manage fluid overload & HTN (daily weights, I&O, BP).
- **Meds:** PCN (strep), furosemide (fluid), ACEi/CCB (BP), corticosteroids (severe).
- **AVOID:** NSAIDs, nephrotoxic abx, IV contrast.
- **Recovery:** Urine clears in 1–2 weeks; labs may take months. Children prognosis excellent.
- **NCLEX distinguisher:** Nephr**ITIS** = blood. Nephr**OTIC** = protein.