● NGN NCLEX 2026 · RENAL & GENITOURINARY SYSTEM

Chronic Kidney *Disease* — CKD

A progressive, irreversible decline of nephron function — where protein, potassium, and precision define the priority.

CARD № 14
STUDY SERIES
HIGH-YIELD · 2026 PLAN

§ 01

Definition & Overview

What it is

CKD is the **progressive, irreversible loss of nephron function** over months to years — resulting in the kidney's inability to excrete waste, regulate fluid/electrolytes, and maintain acid-base balance.

Diagnosed when GFR < 60 mL/min for ≥ 3 months *OR* kidney damage markers (proteinuria, imaging) are present.

Leading causes: Diabetes Mellitus (#1), Hypertension (#2), glomerulonephritis, polycystic kidney disease.

<15
GFR = ESRD
STAGE 5 · DIALYSIS NEEDED

3mo
MINIMUM DURATION
TO DX CHRONIC

#1
CAUSE · DIABETES
MELLITUS (TYPE 2)

A WET BED
KIDNEY FUNCTIONS
IMPAIRED (SEE MNEMONIC)

CKD STAGING BY GFR — KNOW THESE FOR NGN CASE STUDIES

1	2	3	4	5
GFR ≥ 90	GFR 60-89	GFR 30-59	GFR 15-29	GFR < 15
Normal · kidney damage with normal function	Mild decrease in function	Moderate · symptoms appear	Severe · prep for dialysis	**ESRD · dialysis or transplant required**

§ 02

Pathophysiology — Simplified

STEP 01
Nephron Injury
HTN, DM, or toxins damage the nephron

→

STEP 02
↓ GFR
Filtration rate drops · less waste cleared

→

STEP 03
Compensation Fails
Remaining nephrons overwork & scar

→

STEP 04
Waste Buildup
↑ BUN · ↑ creatinine · uremia develops

→

STEP 05
Multi-System Failure
Fluid, electrolyte, acid-base, endocrine chaos

Fluid Overload
Kidneys can't excrete water → edema, HTN, pulmonary congestion, HF

↓ Erythropoietin
Kidneys can't make EPO → anemia → fatigue, pallor, dyspnea

↓ Active Vitamin D
No vit D activation → ↓ Ca^{2+} → ↑ PTH → renal osteodystrophy

§ 03

Signs & Symptoms — Early vs. Late

EARLY · STAGES 1-3

- **Fatigue** — often first symptom (early anemia)
- **Nocturia** — loss of concentrating ability
- **Mild HTN** — sodium & fluid retention
- **Proteinuria / foamy urine** — glomerular leak
- **↓ appetite, mild nausea** — early uremia
- **Difficulty concentrating** — early CNS effects

LATE · STAGES 4-5 (ESRD)

- **Uremia** — ammonia breath, metallic taste, confusion
- **Oliguria → anuria** — urine output plummets
- **Edema & HTN** — severe fluid overload, crackles, JVD
- **Hyperkalemia** — peaked T waves, dysrhythmias
- **Metabolic acidosis** — Kussmaul respirations
- **Pruritus, uremic frost** — urea crystals on skin
- **Pericarditis** — friction rub, chest pain
- **Bone pain / fractures** — renal osteodystrophy

PRIORITY RED FLAGS — ACT IMMEDIATELY

Hyperkalemia (K^+ > 5.0) with peaked T waves · **Pulmonary edema** (crackles, SpO_2 ↓, pink frothy sputum) · **Pericardial friction rub** with chest pain · **Severe metabolic acidosis** with Kussmaul breathing. These are emergent dialysis indicators.

BUN	Creatinine	Potassium	Phosphorus
> 20 mg/dL	> 1.3 mg/dL	> 5.0 mEq/L	> 4.5 mg/dL

GFR	Calcium	Hgb / Hct	pH / HCO_3^-
< 60 mL/min	< 9.0 mg/dL	Anemia · low EPO	Metabolic acidosis

§ 04

Priority Nursing Interventions

A	B	C	S
AIRWAY · KUSSMAUL? PULM EDEMA?	BREATHING · CRACKLES, SpO_2, RR	CIRCULATION · BP, K^+, ECG	SAFETY · FALL RISK, BLEEDING, INFECTION

01 **MONITOR** daily weights at the same time with same scale & clothing — most accurate measure of fluid status. **1 KG = 1 L FLUID.**

02 **ASSESS** strict I&O every shift. Report urine output < 30 mL/hr.

03 **AUSCULTATE** lung sounds every shift for crackles; inspect for peripheral/sacral edema & JVD.

04 **MONITOR** ECG continuously in stage 4–5 — peaked T waves signal life-threatening hyperkalemia.

05 **RESTRICT** fluids per order (often 500 mL + prior day's UO); include ice chips, Jell-O, popsicles in total.

06 **ADMINISTER** phosphate binders *with meals*, EPO subcut, loop diuretics (if still producing urine), and sodium bicarb as ordered.

07 **PROTECT** the AV fistula/graft arm: *NO* BP cuffs, IV sticks, blood draws, or constrictive clothing. Palpate thrill, auscultate bruit every shift.

08 **PREVENT** infection — uremic patients are immunocompromised; strict aseptic technique with all lines.

09 **ASSESS** skin integrity & provide meticulous skin care for pruritus (cool compresses, soft cotton, avoid hot water/harsh soap).

10 **AVOID** nephrotoxic agents: NSAIDs, aminoglycosides, IV contrast dye (hold metformin 48h pre-/post-contrast).

§ 05

Pharmacology — Core CKD Drugs

Epoetin Alfa (Epogen / Procrit)

ERYTHROPOIESIS-STIMULATING AGENT

ACTION	Synthetic EPO → stimulates RBC production in bone marrow
INDICATION	Anemia of CKD (Hgb goal **10–11 g/dL**)
ADVERSE	HTN, thrombosis, seizures if Hgb rises too fast
NURSING	Monitor BP & Hgb weekly · **hold if Hgb > 11** · SUBQ route

Calcium Carbonate / Sevelamer (Renvela)

PHOSPHATE BINDER

ACTION	Binds dietary phosphorus in gut → excreted in stool
INDICATION	Hyperphosphatemia in CKD
ADVERSE	Constipation, hypercalcemia (calcium-based)
NURSING	**Give WITH meals** — no food in stomach = no phosphate to bind

Furosemide (Lasix)

LOOP DIURETIC

ACTION	Inhibits Na/K/Cl reabsorption in Loop of Henle
INDICATION	Fluid overload in CKD (while kidneys still respond)
ADVERSE	HYPOkalemia, ototoxicity, dehydration, ↑ BUN
NURSING	Monitor K^+, daily wt, I&O · push IV slowly to prevent ototoxicity

Patiromer / Sodium Polystyrene (Kayexalate)

POTASSIUM-BINDING RESIN

ACTION	Exchanges Na^+ for K^+ in the gut → K^+ excreted in stool
INDICATION	Hyperkalemia (K^+ > 5.0)
ADVERSE	Constipation, bowel necrosis (rare), Na overload
NURSING	Must have **active bowel sounds** before giving · recheck K^+ after

Calcitriol (Rocaltrol)

ACTIVE VITAMIN D ANALOG

ACTION	Replaces active vit D → ↑ calcium absorption · ↓ PTH
INDICATION	Hypocalcemia · renal osteodystrophy
ADVERSE	Hypercalcemia, hyperphosphatemia
NURSING	Monitor Ca^{2+} & PO_4^{3-} · give after phosphate binders are working

ACE Inhibitors / ARBs

RENOPROTECTIVE ANTIHYPERTENSIVES

ACTION	↓ glomerular pressure · ↓ proteinuria · slow progression
INDICATION	CKD with HTN or proteinuria (esp. diabetic)
ADVERSE	**HYPERkalemia**, dry cough, angioedema, ↑ creatinine
NURSING	Check K^+ & creatinine before/after starting · *no* K^+ supplements

§ 06

NCLEX Test Traps — Know These Cold

Phosphate binders — WITH meals, not after

Test writers love to offer "1 hour before" or "at bedtime" as distractors. **Binders must meet food in the gut** to work. Give with the first bite.

Fluid restriction includes ice chips, Jell-O, popsicles

Anything that **melts at room temp counts as liquid**. A cup of ice chips = ½ cup of water. Patients commonly forget this.

NO BP, IV, or blood draws on the fistula arm

Classic NCLEX violation. Delegating this to UAP without teaching protection is a dangerous distractor. Always **assess thrill & bruit** every shift.

Salt substitutes are NOT safe — they contain potassium

Patients on ACEi/ARBs + potassium-sparing diuretics + CKD are at massive risk. **"NoSalt" and "Morton Salt Substitute"** = KCl.

Priority lab = Potassium, not BUN/creatinine

When prioritizing labs to report, **hyperkalemia kills fastest** (dysrhythmia). BUN & creatinine are expected to be elevated in CKD.

Weight gain > 2 lb overnight = fluid, not fat

Instruct patient to report **> 2 lb in 24 hrs or > 5 lb/week**. Daily weights are the single most reliable fluid measure.

Avoid NSAIDs & IV contrast — both nephrotoxic

Ibuprofen, naproxen, ketorolac all worsen CKD. For imaging, **hold metformin** 48h before/after contrast to prevent lactic acidosis.

Hold EPO when Hgb > 11 — more is NOT better

Driving Hgb above 11 g/dL increases risk of **thrombosis, stroke, MI**. The goal is symptom relief, not normal Hgb.

NCJMM Clinical Judgment Framework

NEXT-GEN NCLEX 2026

STEP 01
Recognize
Cues: edema, ↓ UO, weight ↑, ↑K^+, crackles, peaked T waves

STEP 02
Analyze
Link cues — is this fluid overload? hyperkalemia? uremia? acidosis?

STEP 03
Prioritize
ABCs first — treat K^+ > 6.0 & pulm edema before routine care

STEP 04
Evaluate
Daily weights, repeat labs, lung sounds, ECG — did the action work?

§ 07

Patient Education — Teaching Points

01 Daily Self-Monitoring

- Weigh yourself **every morning** after voiding, before eating, same scale & clothing
- Report **weight gain > 2 lb in 24 hrs** or **> 5 lb/week** to HCP
- Measure BP daily — keep a log; report > 140/90
- Track urine output & report significant changes

02 Medication Safety

- Take **phosphate binders WITH every meal** (not between)
- **Avoid NSAIDs** — use acetaminophen for pain instead
- Never take OTC meds without checking with HCP (many contain Na, Mg, K)
- Bring all medications to every appointment (including herbals)

03 AV Fistula / Graft Care

- **NO** blood pressure, IV sticks, blood draws, or tight jewelry on the fistula arm
- Feel for **thrill** (buzz) and listen for **bruit** (whoosh) daily — report loss
- Do not sleep on the fistula arm or carry heavy bags with it
- Wash access site with soap & water before each dialysis

04 Recognize & Report

- Swelling of feet, hands, face; shortness of breath at rest or lying flat
- Muscle weakness, irregular heartbeat, palpitations (hyperkalemia)
- Confusion, twitching, seizures (uremia)
- Signs of infection — fever, redness/drainage at access site
- Bleeding (gums, nose, stool, urine) — platelets dysfunction with uremia

05 Lifestyle & Activity

- Stop smoking — accelerates kidney decline & cardiovascular risk
- Light-to-moderate exercise as tolerated — walking is ideal
- Get annual flu & pneumococcal vaccines (immunocompromised)

06 Dialysis Preparation

- Attend all dialysis sessions — missing a session can be life-threatening
- Follow fluid allowance between sessions (usually ≤ 1 kg gain)

→ Avoid people with active infections; hand hygiene critical

→ Hold morning BP meds on dialysis days per HCP (risk of hypotension)

→ Know dialysis access is the "lifeline" — protect it always

Renal Diet Teaching · Low Protein / Na / K / Phosphorus

× AVOID / LIMIT	✓ ENCOURAGE / SAFE
High K^+: bananas, oranges, potatoes, tomatoes, avocado, spinach, cantaloupe, dried fruit	**Low K^+ fruits:** apples, berries, grapes, pineapple, peaches (canned, drained)
High PO_4^{3-}: dairy, nuts, seeds, cola, processed meats, chocolate	**Low K^+ veggies:** cauliflower, cabbage, green beans, lettuce, cucumbers
High Na: canned soup, deli meat, pickles, fast food, soy sauce, chips	**Grains:** white rice, white bread, pasta (lower phos than whole-grain in CKD)
Salt substitutes (contain KCl)	Fresh (not processed) proteins in limited amounts per HCP
Star fruit — neurotoxic in CKD	Herbs & spices for flavor instead of salt

§ 08

Memory Boosters & Mnemonics

MNEMONIC · KIDNEY FUNCTIONS

A WET BED

What the kidneys do (all lost in CKD)

- **A** — Acid-base balance (bicarbonate)
- **W** — Water removal (urine output)
- **E** — Erythropoietin (RBC production)
- **T** — Toxin removal (BUN, creatinine)
- **B** — Blood pressure control (renin)
- **E** — Electrolyte balance (K^+, Na^+, Ca^{2+})
- **D** — vitamin D activation

MNEMONIC · DIALYSIS INDICATIONS

AEIOU

When emergent dialysis is needed

- **A** — Acidosis (severe metabolic)
- **E** — Electrolytes (hyperkalemia > 6.5)
- **I** — Ingestion of toxins / drug overdose
- **O** — Overload (fluid, refractory to diuretics)
- **U** — Uremia (pericarditis, encephalopathy)

QUICK ASSOCIATION

"Bind with Dinner"

Phosphate binders & meals

- → Binders need food to bind — always give *with* the first bite of every meal
- → No food = no phosphate to bind = wasted dose
- → Calcium carbonate, sevelamer, lanthanum — all same rule

PATTERN RECOGNITION

"Dop hurts · Dobut helps"

From titration cards — never use dopamine in CKD

- → *Dop*amine is nephrotoxic — avoid in CKD
- → *Dobut*rex (the one with a **U**) is good for **U**rine / renal perfusion
- → Cross-reference: see *Titration Medications* card

RULE OF THUMB

"2 & 5" Weight Rule

Patient teaching trigger

- → **2 lb** in 24 hrs = call HCP
- → **5 lb** in a week = call HCP
- → 1 kg gained = 1 L fluid retained

LAB SHORTCUT

The CKD Flip

What goes up, what goes down

- ↑ BUN, Creatinine, K^+, Phosphorus, BP
- ↓ GFR, Calcium, Hgb, Hct, pH, HCO_3^-
- → Calcium & Phosphorus are inverse: one up, the other down