AKI, CKD and dialysis

Three kinds of AKI, potassium, CKD stages and diet, fistula and peritoneal care

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1 AT A GLANCE

Acute kidney injury is a sudden loss of kidney function, over hours to days, and is often reversible. Chronic kidney disease persists over months. When the kidneys fail, dialysis does part of their work, but it isn't a cure.

Three kinds of acute kidney injury

Type	What goes wrong	Examples
★ **Prerenal**	Too little blood reaches the kidney	Bleeding, dehydration, shock, heart failure
Intrarenal	The kidney itself is damaged	Prolonged low flow, contrast dye, aminoglycosides, muscle breakdown
Postrenal	Urine can't get out	Enlarged prostate, a stone, a tumor

Treat the cause: The cause decides the treatment. An ultrasound is the preferred test for a blockage.

Chronic kidney disease stages

Stage	GFR (mL/min/1.73 m²)	Meaning
1	90 or higher	Kidney damage, normal filtration
2	60 to 89	Mild
3	30 to 59	Moderate
4	15 to 29	Severe
★ **5**	Under 15	**Kidney failure: dialysis or transplant**

Chronic: Damage or reduced filtration that persists over months, often silent until advanced. Diabetes and high blood pressure cause most cases.

AKI: signs and labs

- ★ Less urine is a common warning, but injury can be **nonoliguric**, found by a rising creatinine.
- ★ **Low output: under 0.5 mL/kg/h, sustained.** Watch the trend; report it promptly per protocol.
- Overload: swelling, high blood pressure, crackles. Wastes: nausea, itching, confusion; asterixis, seizures.
- Labs: creatinine and BUN rise, the filtration rate falls, potassium is high, sodium often low.

CKD: signs and labs

- Overload: swelling, hypertension, breathlessness. Wastes: poor appetite, nausea, a metallic taste, itching, confusion.
- Less erythropoietin: anemia and fatigue; bleeding comes more easily.
- Phosphorus often rises and calcium falls, though it varies: follow the labs. Bones can weaken.
- Labs: high creatinine and BUN, often high potassium and phosphorus, low calcium, anemia.

AKI care

- ★ **High potassium is the most dangerous change**: deadly rhythms. Watch for peaked T waves; report palpitations or a slow, irregular pulse. It may be lowered with insulin and glucose, or a binder.
- Treat the cause. IV fluids go in cautiously, watching for overload; diuretics may help remove fluid.
- Protein isn't cut to delay dialysis; sodium, potassium, phosphorus and fluid are limited as needed, fluid often matched to urine output.
- Dialysis for dangerous potassium, confusion, severe overload or pericarditis; usually short term.
- ★ Intake and output: assistive staff can measure them, but **you analyze the trends and report**. Weigh daily, same scale, same time: 1 kg in a day is about 1 liter of fluid.
- Check every drug dose against kidney function. Before contrast, ask about prior reactions and metformin, and check kidney function.

Plan working: Urine output recovering above 0.5 mL/kg/h, creatinine and potassium moving toward normal, a stable weight, less swelling.

CKD treatment and the kidney diet

	What to know
★ **Blood pressure**	Controlling it slows the damage. **An ACE inhibitor or ARB when indicated**, especially with albuminuria: monitor creatinine and potassium, and **never combine the two**
★ **Potassium**	When high, limit bananas, oranges, potatoes, tomatoes, dried fruit. **Avoid salt substitutes that contain potassium**: check the label. Sodium polystyrene sulfonate may be ordered
Sodium	Generally under 2 g a day, with exceptions: avoid processed and canned foods
Phosphorus	Limit dairy, nuts, seeds, colas; phosphate binders as prescribed. Calcium and vitamin D only as directed
Protein, fluid	Moderate, high-quality protein, with enough calories. In later stages, fluid is limited based on urine output
Drugs	Anemia: erythropoietin-stimulating drugs and iron. Ask the provider before any over-the-counter drug, herb or supplement. Metformin isn't used when GFR is below 30 mL/min/1.73 m²

Individualized: A renal dietitian helps, because the diet is complex and set by labs and stage.

Educational use only. Not a substitute for clinical judgment, your facility's policy or the provider's orders. Where practice varies, follow facility policy and state law. No patient information.

AKI, CKD and dialysis

1 AT A GLANCE, CONTINUED

Three ways to replace the kidneys

	Hemodialysis	Peritoneal dialysis	Continuous (CRRT)
Filter	A machine outside the body	The lining of the belly	A machine, slowly, around the clock
Access	Fistula, graft or catheter	A belly catheter	A large-vein catheter: central line care
Schedule	About 4 hours, 3 times a week	Daily or nightly	24 hours a day, for days or weeks
★ **Best for**	Most clients, in a center	Independent clients at home	**Unstable clients in intensive care**: removes fluid gently
Watch	Low blood pressure, cramps, held medicines	Peritonitis	Potassium, blood pressure, fluid balance

Hemodialysis

- ★ **Know which medicines to hold before a session**: some are dialyzed out, others add to low blood pressure. Ask when in doubt; give held doses after, as ordered.
- Weigh before and after. Dry weight is the weight with no extra fluid: the goal by the end of each session.
- Fast fluid shifts can drop blood pressure (weak, dizzy, nauseated): per protocol, pause removal, lower the head, give saline.
- Diet: limit sodium, phosphorus and fluids, including fluid in foods. Add protein, because hemodialysis removes it.

Peritoneal dialysis

- Fill, dwell, drain: an exchange. By hand, about 4 a day, dwells of 4 to 6 hours; a cycler does 3 to 5 overnight. Don't skip exchanges.
- ★ **Wash hands and wear a mask when connecting**; check each bag. Warm it to body temperature.
- Full or bloated is expected; pain isn't. Clean the exit site daily with antiseptic.
- ★ Normal drainage is straw colored. **Cloudy fluid, pain, fever, nausea: peritonitis. Report it at once.**

Fistula and graft

- A fistula joins an artery to a vein: the **best long-term access**, but it takes months to heal. A graft can be used sooner, but clots and infects more often. A catheter is temporary.
- ★ **Protect the fistula arm: no blood pressures, blood draws, IVs or anything tight.** It's used only for dialysis and isn't flushed.
- ★ Feel a **thrill** (vibration) and hear a **bruit** (whoosh): blood is flowing. **A missing thrill or bruit may mean a clot: report it at once.**

2 PRIORITY AND SAFETY CALLS

★ AKI with a potassium of 6.2 mEq/L, a BUN of 42 mg/dL and a weight gain: **the potassium is the priority**. Monitor the heart; report it now.

★ Output under 0.5 mL/kg/h, sustained, or a rising creatinine: **report it promptly per protocol**.

Traps: potassium salt substitutes, pushing fluids when urine is scant, anti-inflammatory drugs for kidney clients.

A blood pressure cuff or IV on the fistula arm is a trap: use the other arm.

A blood pressure drug due right before hemodialysis: check whether to hold it.

★ Peritoneal dialysis with pain, fever and cloudy drainage: **report it now**. Skipping an exchange isn't the nurse's call.

3 EXAM ANCHORS

1. Acute injury is sudden and often reversible: prerenal, intrarenal or postrenal.
2. Watch urine output, daily weights and potassium, and treat the cause.
3. Chronic disease is slow, usually from diabetes or hypertension, and staged by the filtration rate.
4. Fistula: no pressures, draws or IVs in that arm; feel the thrill and hear the bruit.
5. Peritoneal: fill, dwell, drain; mask and clean hands; cloudy fluid means peritonitis.
6. Continuous therapy: slow and nonstop, for unstable clients.

4 SELF-QUIZ

1. Low urine output is under _____ mL/kg/h, sustained.
2. CKD stage 5 is a GFR under _____ mL/min/1.73 m².
3. Metformin isn't used when GFR is below _____ mL/min/1.73 m².
4. The best long-term hemodialysis access is a _____.
5. The vibration you feel over a working fistula is a _____.
6. Normal peritoneal drainage is _____ colored.

ANSWER KEY 1. 0.5 · 2. 15 · 3. 30 · 4. fistula · 5. thrill · 6. straw

5 SOURCES

1. Open RN, Nursing: Health Alterations, 8.5 Acute Renal Failure. wtcs.pressbooks.pub/healthalts/chapter/8-5-acute-renal-…
2. Open RN, Nursing: Health Alterations, 8.6 Chronic Kidney Disease. wtcs.pressbooks.pub/healthalts/chapter/8-6-chronic-kidn…
3. KDIGO Clinical Practice Guideline for Acute Kidney Injury (PDF). kdigo.org/wp-content/uploads/2016/10/KDIGO-20…
4. KDIGO Clinical Practice Guideline for the Evaluation and Management of CKD (PDF) (2024). kdigo.org/wp-content/uploads/2024/03/KDIGO-20…
5. NIDDK, Hemodialysis. niddk.nih.gov/health-information/kidney-disease/k…
6. NIDDK, Peritoneal Dialysis. niddk.nih.gov/health-information/kidney-disease/k…

Built from RN PocketPal course lessons: Acute kidney injury and chronic kidney disease (c12-l01); Dialysis and continuous renal replacement (c12-l02). Every line on this sheet comes from those lesson scripts.

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