

NCLEX-RN • 2026 TEST PLAN • NGN/NCJMM ALIGNED

PHARMACOLOGY • ENDOCRINE / ANTI-INFLAMMATORY • DRUG CLASS PROFILE

Systemic *Corticosteroids*

Hydrocortisone • Prednisone • Methylprednisolone • Dexamethasone • Betamethasone

Class	System	NCJMM
Glucocorticoids	Endocrine • Immune • Anti-Inflammatory	High-Alert • NGN-Tested

Hydrocortisone CORTEF • SOLU-CORTEF SHORT • 8-12 H	Prednisone DELTASONE INTERMED • 12-36 H	Methylprednisolone SOLU-MEDROL • MEDROL INTERMED • 12-36 H	Dexamethasone DECADRON LONG • 36-72 H	Betamethasone CELESTONE LONG • 36-72 H
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01

DRUG OVERVIEW

Why we give it.

CORE INDICATIONS

- **Anti-inflammatory:** RA, lupus, IBD, asthma/COPD exacerbation
- **Immunosuppression:** organ transplant, autoimmune flare
- **Allergic reactions:** anaphylaxis adjunct, severe dermatitis, drug rxn
- **Adrenal insufficiency:** Addison's, adrenal crisis (**hydrocortisone** = drug of choice)
- **Cerebral edema:** brain tumors, ↑ ICP (**dexamethasone**)
- **Fetal lung maturity:** 24–34 wk preterm labor (**betamethasone**)

HIGH-YIELD CLINICAL USE

- **Asthma/COPD flare:** oral prednisone burst OR IV methylprednisolone
- **Croup:** single-dose dexamethasone PO/IM
- **MS exacerbation:** high-dose IV methylprednisolone
- **COVID-19:** dexamethasone (RECOVERY trial)
- **Chemo-induced nausea:** dexamethasone antiemetic
- **Bacterial meningitis:** dexamethasone before/with first abx dose

02

MECHANISM OF ACTION

How they shut down inflammation.

- 01 Lipid-soluble steroid **crosses cell membrane** → binds **cytoplasmic glucocorticoid receptor**
- ↓
- 02 Receptor complex enters nucleus → alters **gene transcription**
- ↓
- 03 ↓ **Phospholipase A₂** → ↓ arachidonic acid → ↓ **prostaglandins & leukotrienes**
- ↓
- 04 ↓ Cytokines (IL-1, IL-6, TNF-α) · ↓ neutrophil/eosinophil recruitment · ↓ capillary permeability
- ↓
- 05 **RESULT** → ↓ inflammation · ↓ immune response · ↑ gluconeogenesis · Na⁺/H₂O retention · K⁺ loss
- ↓
- 06 **HPA axis suppression** → exogenous steroid signals adrenal to STOP making cortisol → atrophy → **cannot stop abruptly**

GLUCOCORTICOID EFFECT → ANTI-INFLAMMATORY

MINERALOCORTICOID EFFECT → NA⁺/H₂O RETENTION

HYDROCORTISONE = HIGHEST MINERALOCORTICOID

DEXAMETHASONE = NO MINERALOCORTICOID

03

THERAPEUTIC EFFECTS

What tells you it's working.

EXPECTED IMPROVEMENTS

- ↓ Pain, swelling, redness, warmth at inflammation site
- ↑ Joint ROM & ↓ morning stiffness (RA, lupus)
- ↑ FEV₁, ↓ wheezing, ↓ accessory muscle use (asthma)
- ↓ Diarrhea frequency, ↓ abdominal pain (IBD)
- ↓ Rash, pruritus (allergic/dermatologic conditions)
- ↓ Cerebral edema · ↓ HA, ↓ vomiting, improved LOC

LAB/CLINICAL MARKERS

- ↓ **CRP** & **ESR** (inflammatory markers)
- ↓ **WBC differential** shift (↓ eosinophils, ↓ lymphocytes)
- ⚠ WBC may **rise** early (demargination — NOT infection)
- Resolution of adrenal crisis: ↑ BP, ↑ glucose, ↓ K⁺
- Stable peak flow & ↓ rescue inhaler use
- Improved lung sounds in preterm neonate (betamethasone)

04

SIDE EFFECTS & ADVERSE REACTIONS

The Cushingoid cost.

COMMON (EXPECTED)

- **Hyperglycemia** — even in non-diabetics
- **↑ Appetite, weight gain, fluid retention**
- **Mood swings, insomnia, euphoria, irritability**
- Thin skin, easy bruising, striae, acne, hirsutism
- GI upset, heartburn (take with food)
- Cushingoid: moon face, buffalo hump, central obesity

SERIOUS 🚨 / LIFE-THREATENING

- **Adrenal crisis** w/ abrupt withdrawal → shock, death
- **GI bleed / perforated peptic ulcer**
- **Severe hyperglycemia** → DKA / HHS
- **Masked infection** (no fever, no ↑ WBC) → sepsis
- **Steroid-induced psychosis** (high dose)
- Osteoporotic fx · avascular necrosis (hip)
- Cataracts, glaucoma · growth suppression in kids
- Hypokalemia → arrhythmias · hypertensive crisis

Memory anchor: the CUSHINGOID profile

C Cataracts

S Striae · Skin thinning · Suppressed immunity

I Infection (masked)

G Glucose ↑ · Growth suppression

I Impaired wound healing

U Ulcers (peptic / GI bleed)

H Hypertension · Hyperglycemia · Hirsutism

N Necrosis (avascular, femoral head)

O Osteoporosis · Obesity (central)

D Depression · Psychosis · Diabetes

05

PRIORITY NURSING CONSIDERATIONS

Assess • Monitor • Hold • Notify.

MONITOR

- → **Blood glucose** q6h (or sliding scale) — even in non-DM
- → **BP & weight daily** — fluid retention
- → **K⁺** — hypokalemia risk
- → **S/Sx infection** — fever may be ABSENT
- → Mental status, mood, sleep pattern
- → Stool for occult blood; epigastric pain
- → Bone density (long-term use)

HOLD & NOTIFY PROVIDER IF

- **Active untreated systemic fungal infection**
- S/Sx of GI bleed: melena, hematemesis, severe epigastric pain
- Glucose > 250 mg/dL or symptomatic hypo/hyperglycemia
- S/Sx adrenal crisis: hypotension, weakness, N/V, hypoglycemia
- New-onset psychosis, suicidal ideation

CONTRAINDICATIONS / CAUTIONS

- **Systemic fungal infection** (absolute)
- **Live vaccines** (MMR, varicella, intranasal flu, rotavirus, yellow fever)
- Active peptic ulcer disease
- Uncontrolled diabetes, HTN, HF
- Recent live vaccine within 2–4 weeks
- Pregnancy: **betamethasone/dexamethasone** cross placenta — used intentionally for fetal lung maturity; others preferred for maternal use

KEY DRUG INTERACTIONS

- **NSAIDs / aspirin** → ↑ ↑ GI bleed risk
- **Loop / thiazide diuretics** → ↑ hypokalemia
- **Digoxin** → ↑ dig toxicity (via low K⁺)
- **Warfarin** → ↑ bleeding risk
- **Insulin / oral hypoglycemics** → ↓ effect (need ↑ dose)
- **CYP3A4 inducers** (phenytoin, rifampin) → ↓ steroid effect
- **Live vaccines** → infection risk

06

LABS & DIAGNOSTICS

What the numbers reveal.

KEY LABS TO MONITOR

- **Blood glucose:** goal < 180 mg/dL inpatient; report > 250
- **HbA1c:** baseline & q3mo on chronic therapy
- **Serum K⁺:** 3.5–5.0 mEq/L — replace if < 3.5
- **Serum Na⁺:** may rise (retention) on hydrocortisone
- **WBC w/ diff:** demargination raises total WBC; eosinophils ↓
- **BUN/Cr:** baseline kidney function
- **Cortisol & ACTH:** baseline before tapering long-term
- **DEXA scan:** long-term use > 3 mo

CRITICAL VALUES · WHAT THEY MEAN

- Glucose > 400 → DKA risk · hold dose, notify
- K⁺ < 3.0 → arrhythmia · ECG, replace, hold diuretic
- WBC ↑ but afebrile patient → may be steroid effect, NOT infection — assess clinically
- Na⁺ > 145 → fluid overload, ↑ BP, peripheral edema
- Low AM cortisol after taper → HPA axis NOT recovered → resume steroid
- ↓ Bone density T-score < -2.5 → start bisphosphonate
- **Hypoglycemia + ↓ BP + ↑ K⁺** in patient who stopped steroid → adrenal crisis

07

ADMINISTRATION & SAFETY

Right route. Right time. Right taper.

ROUTE & TIMING

- **PO:** give in **AM with food** — mimics natural cortisol peak; ↓ insomnia & GI
- **IV:** hydrocortisone (Solu-Cortef), methylprednisolone (Solu-Medrol), dexamethasone — for acute/emergent dosing
- **IM:** betamethasone (Celestone) for fetal lung maturity (q24h × 2 doses)
- **Alternate-day dosing** on chronic therapy → ↓ HPA suppression
- **Stress dosing** required: surgery, trauma, severe illness, infection

HIGH-ALERT PRECAUTIONS

- ⚠ **NEVER stop abruptly** after > 2 weeks of therapy → **TAPER**
- ⚠ Wear **medical alert ID** — chronic steroid users
- ⚠ IV push: dilute, give slowly to avoid **perineal/genital burning** & arrhythmia
- ⚠ Verify allergy: sulfite (in some IV preparations)
- ⚠ Avoid live vaccines × 3 months after high-dose
- ⚠ Add PPI / H₂ blocker for GI prophylaxis if high-dose or +NSAIDs
- ⚠ Ca²⁺ + Vit D + bisphosphonate for > 3 month therapy

08

PATIENT EDUCATION

What they **MUST** know before discharge.

DAILY LIVING & SAFETY

- **NEVER stop suddenly** — even if you "feel better"
- Take with food or milk; AM dose if once-daily
- Wear **medical alert bracelet** identifying steroid use
- Check blood sugar more often — even if not diabetic
- Low-Na, ↑ K, ↑ Ca, ↑ protein diet
- Avoid crowds & sick contacts (immunosuppression)
- NO live vaccines without provider OK
- Weight-bearing exercise, Ca²⁺ + Vit D supplements
- Eye exams annually (cataract/glaucoma)

WHEN TO SEEK HELP IMMEDIATELY

- **Black/tarry stools, vomiting blood** → GI bleed
- **Fever, sore throat, productive cough** → infection
- **Severe abdominal or hip pain** → ulcer / AVN
- **Mood changes, suicidal thoughts, hallucinations**
- **Sudden weakness, dizziness, N/V if dose missed** → adrenal crisis
- Vision changes, eye pain, halos
- Rapid weight gain > 2 lb/day or swelling
- Glucose persistently > 250 mg/dL

09

NCLEX TEST TRAPS

What students get wrong.

TRAP 1 • WITHDRAWAL

"Patient feels great, wants to stop steroid early." Wrong — abrupt cessation after > 2 weeks causes **adrenal crisis**. Always TAPER. The right answer is education, not discontinuation.

TRAP 2 • MASKED INFECTION

"Afebrile patient on prednisone — must be stable." Steroids **blunt fever & WBC response**. Look for tachycardia, ↓ BP, malaise, change in mental status, ↑ glucose, localized symptoms — NOT just temp.

TRAP 3 • HYPERGLYCEMIA IN NON-DM

Students assume only diabetics need glucose checks. **WRONG**. Steroids cause hyperglycemia in **everyone**. Always monitor BG, even in non-diabetic patients.

TRAP 4 • LIVE VACCINES

Patient on chronic prednisone shouldn't get MMR, varicella, intranasal flu, rotavirus, yellow fever. **Inactivated flu shot is OK and ENCOURAGED**.

TRAP 5 • STRESS DOSING CONFUSION

Patient on chronic steroid going for surgery → needs **increased** dose, not held. Their adrenals can't mount a stress response. **Hold** is the wrong answer; **stress dose** is correct.

TRAP 6 • WBC MISINTERPRETATION

↑ WBC on steroid does NOT automatically = infection. **Demargination** from steroid pulls WBCs into circulation. Look at **differential** + clinical picture.

TRAP 7 • WRONG STEROID FOR THE JOB

Adrenal crisis → hydrocortisone (mineralocorticoid activity). **Cerebral edema** → dexamethasone (no mineralocorticoid, crosses BBB). **Fetal lung maturity** → betamethasone (or dexamethasone). Don't pick prednisone for any of these.

TRAP 8 • TAKE "WITH FOOD"... AND WHAT ELSE?

"Take prednisone with food" is correct but incomplete. Best answer: **"Take with food in the morning."** AM timing prevents insomnia & mimics circadian cortisol.

10

MEMORY BOOSTERS

Mnemonics that stick.

"-SONE / -OLONE" suffix rule

Most systemic glucocorticoids end in **-sone** or **-olone**:

predni**SONE** • methylpredni**SOLONE** • dexametha**SONE** •
betametha**SONE**

Exception: hydrocorti**SONE** — name has it too.

"6 S's" of steroid harm

S ugar (hyperglycemia)
S alt (Na⁺/H₂O retention, HTN)
S kin (thinning, striae, bruising)
S keleton (osteoporosis, AVN)
S tomach (ulcer, GI bleed)
S usceptible (infection, masked)

"NO STOPS" rule

Never abruptly discontinue:

N o tapering = adrenal crisis
O nset of crisis: hypotension, hypoglycemia
S tress dose for surgery/illness
T aper slowly over weeks
O bserve for ↓BP, weakness, N/V
P rovide medical alert ID
S teroid replacement for life if Addison's

Potency ladder (low → high)

"Hot Pred Met Dex Bet"

H ydrocortisone = 1× (anchor)
P rednisone = 4×
M ethylprednisolone = 5×
D examethasone = 25-30×
B etamethasone = 25-30×

Smaller mg dose = more potent drug.

MOST TESTED DRUGS IN THIS CLASS • SIDE-BY-SIDE

The five steroids — compared.

FEATURE	HYDROCORTISONE CORTEF • SOLU-CORTEF	PREDNISONE DELTAZONE	METHYLPREDNISOLONE SOLU-MEDROL • MEDROL	DEXAMETHASONE DECADRON	BETAMETHASONE CELESTONE
Duration	Short 8–12 h	Intermediate 12–36 h	Intermediate 12–36 h	Long 36–72 h	Long 36–72 h
Anti-inflammatory potency	1× (anchor)	4×	5×	25–30×	25–30×
Equivalent dose	20 mg	5 mg	4 mg	0.75 mg	0.6–0.75 mg
Mineralocorticoid (Na⁺/H₂O retention)	HIGH	Moderate	Low	<i>None</i>	<i>None</i>
Routes	PO, IV, IM, topical	PO only (<i>prodrug</i>)	PO, IV, IM intra-articular	PO, IV, IM ophthalmic	IM, topical oral solution
Crosses placenta	Inactivated	Inactivated	Inactivated	YES	YES
★ Signature NCLEX use	Adrenal crisis • Addison's DOC	Asthma/COPD burst • RA • IBD flare	IV pulse: MS flare, anaphylaxis adjunct, transplant	Cerebral edema • croup • COVID • antiemetic • meningitis	Fetal lung maturity 24–34 wk preterm labor OB
Key warning	↑ Na/H ₂ O retention & HTN	Liver activation needed (avoid in liver failure → use prednisolone)	Rapid IV → arrhythmia, sudden death (high dose)	HPA suppression most severe; long half-life	q24h × 2 doses IM; full benefit 24–48 h after 2nd dose

NGN · NCJMM · CLINICAL JUDGMENT SNAPSHOT

Think like the NCLEX.

Recognize cues · Analyze cues · Prioritize hypotheses · Generate solutions · Take action ·
Evaluate outcomes.

Q • THE #1 PRIORITY RISK

Adrenal crisis from abrupt withdrawal.

After >2 weeks of systemic therapy, the HPA axis is suppressed and the adrenal cortex atrophies. **Stopping the drug suddenly** — or failing to stress-dose during illness, trauma, or surgery — causes **profound hypotension, hypoglycemia, hyperkalemia, hyponatremia, and shock**. This is a true endocrine emergency.

Q • WHAT HARMS THE PATIENT FIRST

Hyperglycemia & masked infection — within hours to days.

Long before osteoporosis or AVN, steroid patients face **immediate hyperglycemia (even non-diabetics)** and **blunted infection response**. A patient with normal temp and "normal" WBC may already be septic. The acute risk hierarchy: **hyperglycemia → GI bleed → masked sepsis → adrenal crisis (if missed dose)**.

Q • The FIRST nursing action

Assess for infection & check blood glucose — every shift.

Before discharge teaching, before charting, before notifying: **assess for subtle infection cues** (HR, BP, mental status, localized pain) and **verify glucose**. Then confirm the patient has **NOT** abruptly stopped a chronic steroid and has a **medical alert ID** + **stress-dose plan**. Cue recognition saves the life.