

● NGN NCLEX 2026 · ENDOCRINE SYSTEM · HIGH-YIELD REVIEW

Diabetes Mellitus *Type 2*

A chronic metabolic disorder characterized by insulin resistance and relative insulin deficiency. The most common form of diabetes (~90–95% of cases) and a leading NCLEX topic for prioritization, pharmacology, and patient education.

● Endocrine

● Pharmacology

● Safety · Priority

● Patient Education

01 OVERVIEW Definition & Why It Matters



What It Is

Chronic metabolic disorder where cells **resist insulin** and the pancreas cannot produce enough to overcome it. Results in hyperglycemia.



Who It Affects

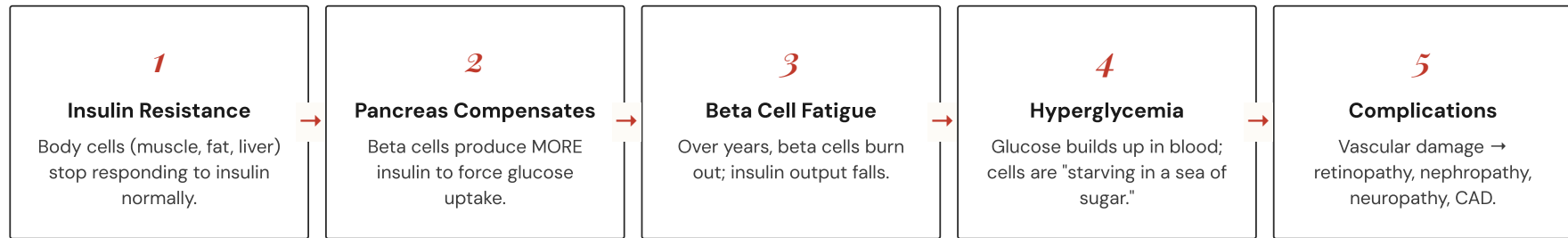
Adults >40 (onset earlier now), obesity, sedentary lifestyle, family history, and certain ethnic groups. Often preventable/reversible early.



Diagnostic Criteria

Fasting BG ≥ 126 mg/dL · Random BG ≥ 200 with symptoms · A1C $\geq 6.5\%$ · 2-hr OGTT ≥ 200 mg/dL

02 PATHOPHYSIOLOGY How It Unfolds — Step by Step



Type 1 DM

- Autoimmune destruction of beta cells
- Absolute insulin deficiency
- Usually childhood/young adult onset
- Prone to DKA · Always needs insulin
- Thin body habitus typical

Type 2 DM

- Insulin resistance + relative deficiency
- Gradual onset, often asymptomatic early
- Adult onset (now seen in children too)
- Prone to HHS · Oral meds + lifestyle first
- Often obesity, HTN, dyslipidemia cluster

03 CLINICAL PICTURE Signs & Symptoms

EARLY / MILD

The Classic "3 Ps"

LATE / SEVERE

Progressive Findings

Polyuria — frequent urination (glucose pulls water)

Polydipsia — excessive thirst (from fluid loss)

Polyphagia — increased hunger (cells starved)

Fatigue — glucose can't reach cells for energy

Blurred vision — osmotic lens changes

Acanthosis nigricans — dark velvety skin (neck/axilla)

Slow wound healing — especially feet/legs

Recurrent infections — UTI, yeast, skin

Peripheral neuropathy — numbness, tingling, foot pain

Retinopathy — vision changes, floaters

Nephropathy — proteinuria, rising creatinine

Unintentional weight loss (advanced disease)



RED FLAG — HHS (Hyperosmolar Hyperglycemic State)

Life-threatening emergency unique to Type 2 DM. BG often >600 mg/dL, severe dehydration, altered mental status, NO significant ketones. Mortality is higher than DKA. **Act fast: IV fluids first, then insulin.**

HHS — Think Type 2

- BG >600 mg/dL (extreme)
- Severe dehydration, hypotension
- Altered LOC, possible seizures
- NO significant ketones, pH normal
- Slower onset (days to weeks)

DKA — Think Type 1 (but possible in T2)

- BG usually 250–600 mg/dL
- Ketones present · Fruity breath
- Kussmaul respirations · Metabolic acidosis
- Abdominal pain, nausea, vomiting
- Rapid onset (hours)

04 PRIORITY NURSING ACTIONS Nursing Interventions (ABCS Priority)

A AIRWAY	B BREATHING	C CIRCULATION	S SAFETY
1 Monitor Blood Glucose Fingerstick per order; AC and HS; more often during illness or insulin changes.		2 Assess for Hypoglycemia Cold, clammy, shaky, confused → check BG → treat if <70 mg/dL with 15g fast carbs.	
3 Administer Meds Safely Right drug, dose, timing with meals. Rotate insulin sites. Verify with second nurse for insulin.		4 Daily Foot Assessment Inspect for cuts, blisters, redness, ulcers. Neuropathy + poor healing = limb-threatening risk.	
5 Monitor for HHS / DKA Mental status, hydration, vital signs, labs (BG, BMP, ABG, ketones). Early recognition saves lives.		6 Diet & Activity Coordination Consistent carb intake; time meals to medications; avoid exercise at peak insulin action.	
7 Sick Day Management Continue meds/insulin, test BG q4h, monitor ketones, hydrate, notify HCP if vomiting.		8 Evaluate A1C & Labs A1C goal <7% for most. Monitor lipid panel, BUN/creatinine, urine microalbumin annually.	

05 PHARMACOLOGY Oral & Injectable Agents

DRUG / CLASS	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
Metformin <i>Biguanide — FIRST LINE</i>	Decreases hepatic glucose production; increases insulin sensitivity	Lactic acidosis, GI upset, B12 deficiency	Take with meals. HOLD 48h before & after IV contrast dye. Avoid in renal impairment.
Glipizide, Glyburide <i>Sulfonylureas</i>	Stimulates pancreas to release more insulin	HYPOGLYCEMIA, weight gain	Give 30 min before meals. High hypoglycemia risk — teach signs. Avoid in sulfa allergy.
Sitagliptin <i>DPP-4 Inhibitor</i>	Blocks DPP-4 → prolongs incretin action → ↑ insulin, ↓ glucagon	Pancreatitis, joint pain, URI	Can be given with or without food. Monitor for severe abdominal pain.
Semaglutide, Liraglutide <i>GLP-1 Receptor Agonists</i>	Mimics incretin; ↑ insulin, ↓ glucagon, slows gastric emptying	N/V, pancreatitis, thyroid tumors (boxed warning)	SubQ injection. Weight loss benefit. Teach injection technique & site rotation.
Empagliflozin, Canagliflozin <i>SGLT-2 Inhibitors</i>	Blocks glucose reabsorption in kidneys → excreted in urine	UTI, yeast infections, dehydration, euglycemic DKA	Encourage hydration & perineal hygiene. Cardiovascular & renal protection benefit.
Pioglitazone <i>Thiazolidinedione (TZD)</i>	Increases insulin sensitivity at peripheral tissues	Fluid retention, heart failure, fractures	Contraindicated in HF. Monitor weight, edema, liver enzymes.
Insulin <i>When oral agents fail</i>	Replaces/supplements endogenous insulin	HYPOGLYCEMIA, weight gain, lipodystrophy	Rotate sites. Refrigerate unopened vials. See insulin chart below.

Insulin Quick Reference — Onset · Peak · Duration

Rapid-Acting

LISPRO · ASPART · GLULISINE

Onset: 15 min

Peak: 1 hr

Duration: 3–4 hr

Give **WITH** meals

Short-Acting

REGULAR (R)

Onset: 30–60 min

Peak: 2–3 hr

Duration: 5–8 hr

Intermediate

NPH (N)

Onset: 1–2 hr

Peak: 4–12 hr

Duration: 12–18 hr

Cloudy appearance

Long-Acting

GLARGINE · DETEMIR ·
DEGLUDEC

Onset: 1 hr

Peak: NONE

Give 30 min before meals · Only IV insulin

Duration: 24 hr
Never mix with other insulins

06 TEST TRAPS NCLEX Pitfalls & Confusion Points

△ TRAP #1

HHS vs DKA Confusion

HHS = Type 2 (no ketones, BG >600, severe dehydration). **DKA = Type 1** (ketones, Kussmaul, fruity breath, BG 250–600).

△ TRAP #2

Metformin + Contrast Dye

HOLD metformin 48 hours before AND after IV contrast (CT, angiogram). Risk of lactic acidosis if given together.

△ TRAP #3

Hypo vs Hyperglycemia Signs

Cold & Clammy → needs **Candy** (hypo). Hot & Dry → sugar's **High** (hyper). Don't mix them up under test pressure.

△ TRAP #4

Treat Hypoglycemia FIRST

Confused + known diabetic? Check BG. If conscious: 15g fast carbs (juice, glucose tabs). If unconscious: **IV D50 or IM glucagon** — NEVER oral.

△ TRAP #5

Exercise & Insulin Timing

Exercise **LOWERS** blood glucose. Don't exercise during peak insulin action. Eat a snack before activity. Check BG pre & post.

△ TRAP #6

Sick Day Rule — DON'T Stop Insulin

Even if not eating, **continue insulin** (illness raises BG). Check BG q4h, sip clear fluids, monitor ketones, call HCP if vomiting.

△ TRAP #7

Mixing Insulins — "Clear Before Cloudy"

△ TRAP #8

HHS Priority — Fluids BEFORE Insulin

Draw up **Regular (clear) first, then NPH (cloudy)**. Never mix glargine/detemir with any other insulin.

In HHS, patient is profoundly dehydrated. **IV NS first**, then insulin. Giving insulin first can cause vascular collapse.

HYPOglycemia

BG < 70 MG/DL

- * Cold & clammy skin
- * Shaky, tremors, weak
- * Tachycardia, palpitations
- * Confusion, irritability
- * Hunger, headache
- * Rapid onset (minutes)

VS

HYPERglycemia

BG > 180 MG/DL

- * Hot & dry skin (dehydrated)
- * Polyuria, polydipsia
- * Blurred vision, fatigue
- * Fruity breath (if DKA)
- * Kussmaul respirations (if DKA)
- * Gradual onset (hours–days)

07 TEACHING Patient Education

D

Diet

- Consistent carb counting
- Portion control; plate method
- Limit simple sugars & sweetened drinks
- High fiber; whole grains
- Limit alcohol (risk hypo)

E

Exercise

- 150 min/week moderate activity
- Check BG before exercise
- Carry fast carbs (glucose tabs)
- Wear proper footwear
- Avoid peak insulin times

F

Foot Care

- Inspect feet daily (use mirror)
- Wash with warm (not hot) water
- Moisturize — NOT between toes
- Never go barefoot
- Cut nails straight across

M

Medications

- Take exactly as prescribed
- Don't stop during illness
- Rotate injection sites
- Store insulin properly
- Carry medical ID

S

Self-Monitoring

- Blood glucose per schedule
- Log readings & trends
- A1C every 3 months
- Annual eye & foot exams
- Yearly kidney labs

I

Illness / Sick Days

- Never stop insulin/meds
- Check BG every 4 hours
- Sip fluids (50g carbs/day)
- Test for ketones
- Call HCP: vomiting >24h, BG >240

NCJMM Clinical Judgment Scenario

A 58-year-old client with Type 2 DM is admitted for a scheduled CT with contrast. He takes metformin 1000 mg BID. Morning BG is 215 mg/dL. He reports increased fatigue and a non-healing sore on his right foot. What do you do?

01 · Recognize

Cues

Elevated BG, metformin + upcoming contrast, non-healing foot wound, fatigue. High risk for lactic acidosis & limb complication.

02 · Analyze

Hypotheses

Metformin + contrast = lactic acidosis risk. Foot wound could indicate infection/diabetic ulcer. Hyperglycemia delays healing.

03 · Prioritize

Actions

Notify HCP to hold metformin 48h pre/post contrast. Assess foot wound, vital signs. Administer sliding scale insulin per order.

04 · Evaluate

Outcomes

BG trending toward 140–180. No contrast-related renal injury. Wound culture obtained; antibiotics if ordered. Glucose log stable.

08

MNEMONICS

Memory Boosters & Pattern Recognition

MNEMONIC

"The 3 Ps"

Polyuria · Polydipsia · Polyphagia

The classic triad of hyperglycemia in any diabetic presentation.

RULE

Rule of 15

BG <70? Give **15 g** fast carbs → wait **15 min** → recheck. Repeat if still low. Then give protein + carb snack.

PATTERN

"2 → 6 → 2"

A1C <7% · BG goal 70–130 fasting · Postprandial <180. Key numeric targets for NCLEX.

MNEMONIC

"Cold & Clammy, need some Candy"

Hypoglycemia = cold, clammy, shaky → give fast carbs.

Hot & Dry = sugar's High → hyperglycemia.

RULE

"Clear before Cloudy"

When mixing insulin: draw up **Regular (clear) FIRST**, then NPH (cloudy). Prevents contaminating Regular with NPH.

MNEMONIC

"DIABETIC" Complications

Depression · Infections · Atherosclerosis · Blindness (retinopathy) ·

Extremity damage · Testicular dysfunction · Increased kidney disease

· Cataracts/Coronary disease