

ENDOCRINE • CARDIOVASCULAR • PHARMACOLOGY

Metabolic *Syndrome*

A cluster of cardiometabolic risk factors — the silent doorway to type 2 diabetes, atherosclerotic cardiovascular disease, and stroke. Diagnosed when **3 of 5 criteria** are present.

HIGH-YIELD NCLEX

NCJMM INTEGRATED

CLINICAL JUDGMENT

NGN 2026

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Definition & Overview

WHAT IT IS • WHY IT MATTERS

- ▶ **Metabolic Syndrome** (formerly Syndrome X / insulin resistance syndrome) is a **cluster of 5 cardiometabolic risk factors** driven by visceral adiposity and insulin resistance.
- ▶ **Diagnostic rule:** the client must have **≥ 3 of 5 criteria** — abdominal obesity, ↑ triglycerides, ↓ HDL, ↑ BP, ↑ fasting glucose.
- ▶ **Why it matters:** 2× risk of cardiovascular disease, 5× risk of type 2 diabetes — yet it is largely *asymptomatic* until end-organ damage appears.

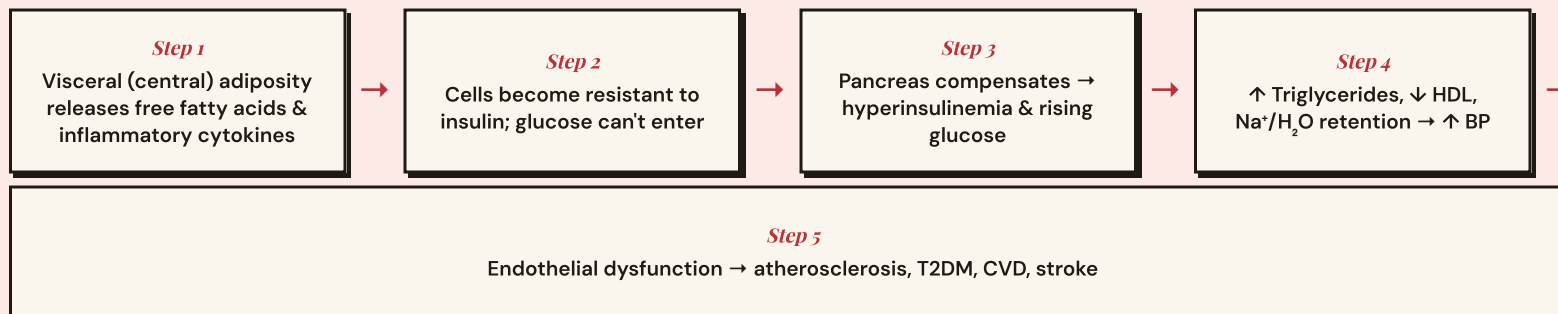
The 5 Diagnostic Criteria — need 3 of 5

1 WAIST > 40 in (M) > 35 in (F)	2 TRIGLYCERIDES ≥ 150 mg/dL	3 HDL ↓ < 40 (M) < 50 (F) mg/dL	4 BLOOD PRESSURE ≥ 130/85 mmHg	5 FASTING GLUCOSE ≥ 100 mg/dL
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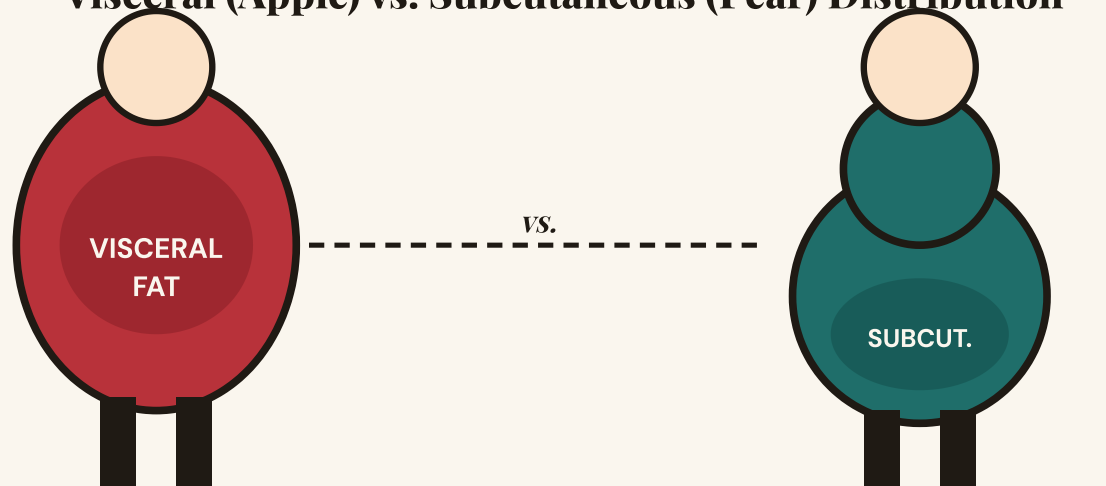
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Pathophysiology — Simplified

VISCERAL FAT → INSULIN RESISTANCE → END-ORGAN DAMAGE



Visceral (Apple) vs. Subcutaneous (Pear) Distribution



APPLE HIGH RISK

PEAR LOW RISK

Visceral (apple-shape) fat is metabolically active and the strongest body-shape predictor of metabolic syndrome.

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Signs & Symptoms

OFTEN SILENT — CLUES ARE IN THE LABS AND EXAM

EARLY / SUBTLE

- ▶ **Central obesity** — apple-shape; ↑ waist circumference
- ▶ **Acanthosis nigricans** — dark, velvety skin patches at neck, axillae, groin (insulin resistance marker)
- ▶ **Skin tags** — multiple acrochordons
- ▶ Fatigue, low energy after meals
- ▶ Mild hypertension noted on routine visits
- ▶ Borderline fasting glucose / HbA1c

LATE / END-ORGAN

- ▶ **Polyuria, polydipsia, polyphagia** — overt T2DM
- ▶ **Chest pain, dyspnea** — atherosclerotic CAD
- ▶ **Stroke / TIA symptoms** — focal neuro deficits
- ▶ Non-healing wounds, recurrent infections
- ▶ Vision changes — retinopathy
- ▶ Peripheral neuropathy, edema



RED FLAG FINDINGS — ACT NOW

Chest pain or pressure (acute MI), **focal neuro deficits** (stroke), **BP ≥ 180/120** (hypertensive crisis), **glucose > 300 mg/dL with ketones / Kussmaul breathing** (DKA), or **HHS** in severe hyperglycemia. ABCs first, call provider, prepare for emergency interventions.

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Priority Nursing Interventions

ABCS • SAFETY • LIFESTYLE FIRST

ASSESS

- ▶ **Measure waist circumference** at the iliac crest (more predictive than BMI alone)
- ▶ Take BP in both arms; recheck if elevated
- ▶ Review fasting lipid panel, fasting glucose, HbA1c
- ▶ Assess for acanthosis nigricans, skin tags, foot ulcers
- ▶ Screen for sleep apnea, depression, family history of T2DM/CVD

MONITOR

- ▶ Daily BP and weight trends
- ▶ Fasting glucose / HbA1c every 3–6 months
- ▶ Lipid panel every 3–12 months until at goal
- ▶ Liver function (NAFLD common in metabolic syndrome)
- ▶ Microalbuminuria — early kidney involvement

EDUCATE & INTERVENE

- ▶ **Lifestyle modification = first-line therapy** before pharmacology
- ▶ Goal: **5–10% weight loss** dramatically reduces all 5 criteria
- ▶ Mediterranean or DASH diet; limit refined carbs, trans fats, sodium
- ▶ **≥ 150 min/week** moderate aerobic + resistance training 2×/week
- ▶ Smoking cessation; limit alcohol (≤ 1 drink/day F, ≤ 2 M)

SAFETY & REFERRAL

- ▶ Fall risk if dizziness from new antihypertensives — orthostatic checks
- ▶ Hypoglycemia teaching for clients started on metformin/insulin
- ▶ Refer to dietitian, diabetes educator, cardiac rehab when indicated
- ▶ Annual eye exam, foot exam if diabetic
- ▶ Mental health screening — depression doubles risk of poor adherence

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Pharmacology — Treat the Components

NO SINGLE "METABOLIC SYNDROME" DRUG — TARGET EACH CRITERION

DRUG / CLASS	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
Metformin (Biguanide — first-line)	↓ Hepatic glucose production; ↑ insulin sensitivity	GI upset, diarrhea, B12 deficiency; lactic acidosis (rare)	Hold 48 h before/after IV contrast ; check renal function (eGFR); take with meals
Statins atorvastatin, rosuvastatin	HMG-CoA reductase inhibitor → ↓ LDL, ↓ triglycerides	Myopathy, rhabdomyolysis , ↑ liver enzymes	Monitor LFTs & CK ; teach to report muscle pain / dark urine; take in evening
Fibrates gemfibrozil, fenofibrate	↓ Triglycerides; ↑ HDL	GI upset, gallstones, myopathy (esp. with statin)	Avoid combining with statin when possible; monitor LFTs
ACE inhibitors / ARBs lisinopril, losartan	Block RAAS → ↓ BP, renal protection	Dry cough (ACE), hyperkalemia, angioedema, ↑ Cr	Monitor K ⁺ , Cr, BP; teach orthostatic precautions ; pregnancy = contraindicated
Thiazide diuretics HCTZ, chlorthalidone	↓ Na ⁺ /H ₂ O reabsorption → ↓ BP	Hypokalemia, hyperglycemia, hyperuricemia (gout)	Monitor K ⁺ , glucose; teach K ⁺ -rich foods; sun-sensitive
Low-dose Aspirin 81 mg (selected pts)	Antiplatelet → ↓ MI/stroke risk	GI bleed, bruising	Only if individualized risk/benefit favors; teach bleed precautions
GLP-1 agonists semaglutide, liraglutide	↑ Insulin, ↓ glucagon, ↓ appetite, weight loss	Nausea, vomiting, pancreatitis , gallbladder dz	SubQ injection; teach injection rotation; report severe abdominal pain

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NCLEX Test Traps ⚠️

WHAT STUDENTS CONFUSE — PICK THE RIGHT ANSWER

Trap #1 — "All 5 criteria are required for diagnosis."

FALSE. Only **3 of 5** are required. Choosing the option that says "all five" is a distractor.

Trap #2 — "BMI alone confirms central obesity."

FALSE. The diagnostic measure is **waist circumference** (> 40 in men, > 35 in women). A normal-BMI client can still meet this criterion.

Trap #3 — "Start medications immediately."

Lifestyle change is FIRST-LINE. Diet, exercise, and weight loss are the priority interventions before adding pharmacology — unless severe values demand urgent treatment.

Trap #4 — "Asymptomatic = low risk."

FALSE. Metabolic syndrome is largely silent. Lab values and waist measurement — not symptoms — drive the diagnosis. Don't be fooled by "the client feels fine."

Trap #5 — "Hold metformin only the day of contrast."

Hold 48 hours before AND after iodinated contrast; restart only after creatinine is verified normal. Risk = lactic acidosis.

Trap #6 — "Statin muscle pain is benign — keep taking it."

Muscle pain + dark/tea-colored urine = **rhabdomyolysis**. Hold the drug, draw a CK, notify provider. Do NOT continue.

Trap #7 — "HDL ≥ 50 mg/dL is bad."

HDL is the "Healthy" cholesterol. The criterion is **LOW** HDL (< 40 M / < 50 F). Higher is protective.

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Patient & Family Education

LIFESTYLE IS MEDICINE — SMALL CHANGES, BIG RETURNS



NUTRITION

- ▶ Mediterranean / DASH pattern: vegetables, fruit, whole grains, fish, nuts, olive oil
- ▶ Limit added sugar, refined carbs, trans & saturated fats
- ▶ Sodium < 2,300 mg/day (1,500 mg if hypertensive)
- ▶ Read nutrition labels; portion control



ACTIVITY

- ▶ ≥ 150 min/week moderate aerobic (brisk walk, cycling, swimming)
- ▶ Resistance training 2x/week — major sites
- ▶ Reduce sitting time; stand/walk every 30–60 min
- ▶ Start slow if sedentary; progress gradually



WEIGHT & HABITS

- ▶ Goal: **5–10% body weight loss** in 6 months
- ▶ Stop smoking — refer to cessation programs
- ▶ Limit alcohol; avoid sugary drinks
- ▶ Sleep 7–9 hr/night; screen for sleep apnea



MONITORING

- ▶ Home BP log; share with provider
- ▶ Self-glucose checks if prescribed
- ▶ Annual labs: lipid panel, HbA1c, LFTs, urine albumin
- ▶ Annual dilated eye exam if diabetic



MED ADHERENCE

- ▶ Take meds even when feeling well — disease is silent
- ▶ Don't stop abruptly (esp. BP meds)
- ▶ Report muscle pain, dark urine (statins)
- ▶ Hold metformin 48 h before/after contrast



STRESS & SUPPORT

- ▶ Stress raises cortisol → worsens insulin resistance
- ▶ Mindfulness, yoga, hobbies, social connection
- ▶ Treat depression — improves adherence
- ▶ Family involvement boosts long-term success

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NCJMM Clinical Judgment Framework

NEXT GENERATION CLINICAL JUDGMENT MEASUREMENT MODEL — ALL 6 COGNITIVE STEPS

STEP 1

Recognize Cues

Waist size, BP, fasting glucose, lipid panel, acanthosis nigricans, family hx of T2DM/CVD, sedentary lifestyle, sleep apnea.

STEP 2

Analyze Cues

Cluster the data: ≥ 3 of 5 criteria met? Identify which components are abnormal and how they connect to insulin resistance.

STEP 3

Prioritize Hypotheses

Highest concern: imminent CV event, stroke, undiagnosed T2DM. Then: long-term risk reduction across all 5 criteria.

STEP 4

Generate Solutions

Lifestyle first (diet, exercise, weight loss). Add pharmacology by component: metformin, statin, ACE/ARB, low-dose ASA if indicated.

STEP 5

Take Action

Educate, screen, refer, administer meds safely (hold metformin pre-contrast), provide self-monitoring teaching, coordinate care.

STEP 6

Evaluate Outcomes

Trends: $\downarrow$ waist circumference, BP at goal ($< 130/80$), HbA1c $< 7\%$, LDL/TG at target, weight loss 5–10%, no CV events.

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Memory Boosters & Mnemonics

FAST RECALL FOR EXAM DAY

"3 of 5" Rule

- ▶ **Need 3 of 5 to diagnose.**
- ▶ Not 1, not all 5 — *three*.
- ▶ If a question says "all five," it's a trap.

CHAOS

- C** Coronary artery disease risk
- H** Hypertension ($\geq 130/85$)
- A** Adult-onset diabetes (FBG ≥ 100)
- O** Obesity (central / abdominal)
- S** Stroke risk

"BIG WAIST"

- B** BP up ($\geq 130/85$)
- I** Insulin resistance / glucose ≥ 100
- G** Good cholesterol (HDL) is LOW
- W** Waist big (> 40 M / > 35 F)
- A** Apple shape
- I** Increased triglycerides (≥ 150)
- S** Sedentary lifestyle
- T** Treat with lifestyle FIRST

"5-10 = WIN"

- ▶ A **5-10% weight loss** improves all 5 criteria.
- ▶ 150 min/week aerobic exercise is the magic number.
- ▶ Lifestyle $>$ pills.

⚡ Number Cheat Sheet

Waist: > 40 in M / > 35 in F

BP: $\geq 130/85$ mmHg

Triglycerides: ≥ 150 mg/dL

Fasting glucose: ≥ 100 mg/dL

HDL: < 40 M / < 50 F

Weight loss goal: 5-10%

Diane's NGN NCLEX 2026 Study Series

METABOLIC SYNDROME • ENDOCRINE & CARDIOVASCULAR • CLINICAL JUDGMENT INTEGRATED