

DIANE'S NGN NCLEX 2026 VISUAL STUDY LIBRARY

Subdural Hematoma

"The slow venous bleed between dura and arachnoid — the elderly faller's silent enemy."

NEUROLOGICAL

NEUROTRAUMA

CRITICAL CARE

HIGH-YIELD NGN

 **Source note:** This topic was not included in Diane's uploaded reference notes. Content is drawn from standard NGN NCLEX 2026 references: Saunders Comprehensive Review (2025 ed.), ATI Adult Medical-Surgical Nursing, Lippincott Manual of Nursing Practice, AANN Neuroscience Nursing Core Curriculum, and Brain Trauma Foundation guidelines.

1 Definition & Overview

- A **subdural hematoma (SDH)** is a collection of blood between the **dura mater** and the **arachnoid mater** of the brain.
- Caused by tearing of the **bridging veins** that drain the cerebral cortex into the dural venous sinuses → **VENOUS bleed = slow accumulation.**
- Why it matters: SDH is the most common type of intracranial hemorrhage from blunt head trauma and a leading reversible cause of cognitive decline in the elderly.

Classifications by Onset

Acute

< **48 hours** after injury. Often severe trauma (MVA, major fall). Mortality 50–90%. Rapidly declining LOC.

Subacute

2 days – 2 weeks.
Progressive decline as clot expands and brain swells.

Chronic

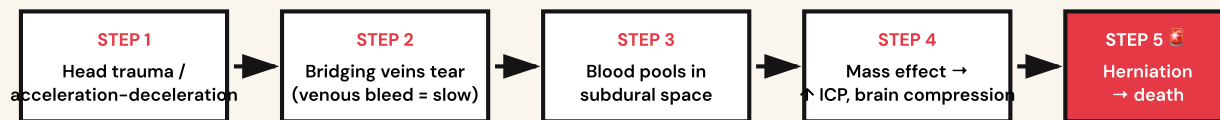
> **2 weeks.** Elderly, alcoholics, anticoagulated patients. Often forgotten trauma. May mimic **dementia.**

High-Risk Populations

- **Elderly** — brain atrophy stretches bridging veins (more vulnerable to tearing)
- **Anticoagulated patients** — warfarin, DOACs (apixaban, rivaroxaban, dabigatran), heparin, antiplatelets
- **Chronic alcoholics** — falls + coagulopathy + cerebral atrophy
- **Infants** — "shaken baby syndrome" (non-accidental trauma)
- **Athletes** — repeated head impacts; "second impact syndrome"

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Pathophysiology



Cascade from trauma → bridging vein tear → ↑ICP → herniation

- **Cerebral perfusion pressure (CPP) = MAP – ICP.** As ICP rises, CPP falls → brain ischemia.
- Once ICP > 20 mmHg, autoregulation fails. Persistent ICP > 25 mmHg has high mortality.
- In chronic SDH, the hematoma is enclosed by a membrane and may slowly enlarge from osmotic shifts or rebleeding.

3 Signs & Symptoms

EARLY (Subtle)

- Worsening **headache**
- Confusion, drowsiness, lethargy
- Slurred speech
- Restlessness or personality change
- Nausea / vomiting
- Dizziness, mild visual changes
- Subtle gait or balance issues

LATE (Red Flag)

- Decreasing LOC → GCS drop
- Unilateral "blown" pupil (fixed, dilated — **IPSILATERAL** to bleed)
- Contralateral hemiparesis/hemiplegia
- Posturing: decorticate → decerebrate
- Seizures
- Coma → herniation → death

CUSHING'S TRIAD = IMMINENT HERNIATION

- ↑ Systolic BP / **WIDENING** pulse pressure (e.g., 168/72)
- ↓ Bradycardia (HR < 60)
- Irregular respirations (Cheyne-Stokes, ataxic, apneustic)

This is a **LATE** sign — not a warning. Brainstem compression is occurring NOW. Call rapid response.

Chronic SDH — Easy to Miss

- Onset over weeks-to-months; **trauma may be forgotten or trivial** (a ground-level fall weeks ago)
- Progressive headache, memory loss, personality change, unsteady gait, mild aphasia
- Often misdiagnosed as **dementia, depression, or stroke** in elderly
- Always ask about falls and anticoagulant use



Priority Nursing Interventions

A B C ABC Framework First

A

Airway

Maintain patency. Prepare for **intubation if GCS ≤ 8** .
Suction < 10 sec only.

B

Breathing

Monitor RR pattern, SpO₂ > 94%, ETCO₂ 35–40 mmHg.
Avoid **hypoxia** (worsens ICP).

C

Circulation

Avoid **hypotension AND hypertension**. Maintain CPP > 60 mmHg. Watch Cushing's triad.

🧠 ICP Management — DO

- **Elevate HOB 30°** — promotes venous drainage (unless contraindicated)
- **Keep head midline, neutral** — avoid neck flexion/rotation (compresses jugulars)
- **Cluster nursing care** — allow ICP recovery time between activities
- **Quiet, dim environment** — minimize stimulation
- **Neuro checks q1h**: GCS, pupils (PERRLA), motor strength, speech
- Seizure precautions — padded side rails, suction at bedside
- Strict I&O; monitor osmolality and electrolytes
- Prepare for **burr hole drainage** (chronic) or **craniotomy** (acute)

🚫 ICP Management — AVOID

- **NO Valsalva** — stool softeners, no straining; teach exhale during repositioning
- **NO suctioning > 10 seconds** (hyperoxygenate before/after)
- **NO hip flexion > 90°** — increases intra-abdominal/intra-thoracic pressure
- **NO morphine/sedatives** as first line — masks neuro assessment
- **NO routine hyperventilation** — causes cerebral vasoconstriction & ischemia (reserved for impending herniation only)
- **NO hypotonic fluids** (e.g., D5W alone) — worsens cerebral edema. Use 0.9% NS.

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Pharmacology

DRUG / CLASS	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
Mannitol (Osmotic diuretic)	Pulls fluid out of brain tissue into vasculature → ↓ ICP	Dehydration, hypernatremia, ↑ serum osmolality, rebound ICP, electrolyte loss	Use in-line filter (crystals!); monitor I&O, serum osmolality (target 295–320), Na ⁺ , K ⁺ . Hold if osmolality > 320.
Hypertonic Saline 3%	Osmotic effect: pulls fluid from brain → ↓ ICP; expands intravascular volume	Hypernatremia, fluid overload, central pontine myelinolysis if corrected too fast	Central line preferred; monitor Na ⁺ closely (target 145–155); slow correction if chronic.
Levetiracetam (Keppra) or Phenytoin	Anticonvulsant — seizure prophylaxis	Keppra: agitation, drowsiness. Phenytoin: gingival hyperplasia, ataxia, narrow range 10–20 mcg/mL	Monitor levels for phenytoin; flush IV line with NS only (no D5W with phenytoin).
Acetaminophen	Antipyretic — fever ↑ cerebral metabolic demand and ICP	Hepatotoxicity at high doses	Target normothermia. Avoid NSAIDs/aspirin (bleeding risk).
Vitamin K + 4-factor PCC	Reverses warfarin — restores clotting factors	Thrombosis risk; allergic reaction	Use for INR > 1.5 with active bleed. FFP if PCC unavailable.
Andexanet alfa / Idarucizumab	DOAC reversal — apixaban/rivaroxaban (andexanet); dabigatran (idarucizumab)	Thrombosis, infusion reaction	Time-sensitive; verify last DOAC dose; coordinate with pharmacy.
Protamine sulfate	Reverses heparin	Hypotension, bradycardia, anaphylaxis	Slow IV push; have emergency drugs available.
Dexamethasone	Steroid — reserved for vasogenic edema (e.g., tumor); NOT routine for traumatic SDH	Hyperglycemia, immunosuppression, GI bleed	Monitor glucose; prophylactic PPI; taper, never abrupt stop.

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NCLEX Test Traps

✗ WRONG THINKING

"Subdural and epidural hematomas are interchangeable." Choose the answer with rapid arterial bleed and lucid interval for either.

✓ RIGHT THINKING

SDH = VENOUS, SLOW (bridging veins). **EDH = ARTERIAL, FAST** with classic **lucid interval** (middle meningeal artery).

✗ WRONG THINKING

"A blown pupil on the left means weakness on the left." Same-side everything.

✓ RIGHT THINKING

Blown pupil = IPSILATERAL to the bleed.
Weakness = CONTRALATERAL (motor tracts cross at the medulla).

✗ WRONG THINKING

"Cushing's triad means the patient is stable — body is compensating." Document and continue routine assessment.

✓ RIGHT THINKING

Cushing's triad is a **LATE, OMINOUS** sign of impending herniation. **Call rapid response/provider IMMEDIATELY.**

✗ WRONG THINKING

"Patient reports a headache; administer morphine PRN."

✓ RIGHT THINKING

Avoid opioids/sedatives before ICP monitoring or neuro stabilization — they **mask LOC changes**. Use acetaminophen; assess pain in context of neuro exam.

✗ WRONG THINKING

"Elderly patient with confusion and gait changes has dementia — schedule outpatient neuro consult."

✓ RIGHT THINKING

In elderly (especially anticoagulated), **always rule out chronic SDH first**. Ask about falls. Get a CT.

✗ WRONG THINKING

"Hyperventilate the patient to lower ICP — drop CO₂ to vasoconstrict."

✓ RIGHT THINKING

Routine hyperventilation is **NOT recommended** — causes cerebral ischemia. Reserved only for **impending herniation** as a short-term bridge.

✗ WRONG THINKING

"Position patient with HOB flat to maintain cerebral perfusion."

✓ RIGHT THINKING

HOB at 30°, head midline — promotes venous drainage and reduces ICP. Flat positioning ↑ ICP.

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Patient & Family Education



Discharge Teaching

- Report **worsening headache, vomiting, vision changes, confusion, weakness, slurred speech, or seizures** — call 911
- Avoid alcohol — interacts with seizure meds and ↑ fall risk
- Avoid contact sports / heavy lifting until cleared
- Take seizure medications as prescribed for full course (often 6–12 months)
- Drive only after provider clearance (often seizure-free for state-mandated period)
- Wear medical alert bracelet



Fall & Anticoagulant Safety

- Remove throw rugs, install grab bars, night-lights
- Wear non-slip footwear; review meds for orthostatic risk
- Use cane/walker as prescribed
- Report ANY head bump while on anticoagulants — even minor
- Bring current medication list to every visit
- Wear helmet for biking, skiing, motorcycle riding



Caregiver Education

- Watch for **subtle personality, memory, or balance changes** in the days/weeks after a fall — chronic SDH is sneaky
- Keep a fall log and bring it to appointments
- Know the warning signs of ↑ ICP at home
- Infant care (post-injury): never shake an infant; report any history of dropping or non-accidental trauma

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Memory Mnemonics

S.D.H. = Slow Drip Hematoma

Subdural = **Slow**, venous bridging veins drip into the subdural space over hours-to-weeks.

E.D.H. = Express Delivery Hematoma

Epidural = **Express**, arterial (middle meningeal), fast — classic *lucid interval*.

"T"PSI for Pupil, "C"ONTRA for Crippled

Pupil dilation = Ipsilateral to bleed. Motor weakness = Contralateral.

Cushing's Triad: "HHH"

High BP (widening pulse pressure), HR low (bradycardia), Irregular respirations → *Herniation Happening Imminently*.

"30 & Midline"

HOB **30°** and head **midline** — the two non-negotiables of ICP positioning.

"Mannitol Makes Mountains of urine"

Osmotic diuretic → pulls fluid into vasculature → big urine output. Watch osmolality & filter the line.

GCS ≤ 8 → Intubate

"Less than eight, intubate." Can't protect their own airway.

Chronic SDH = "Dementia That Wasn't"

Elderly + falls + anticoagulant + new confusion = CT head before any "dementia" diagnosis.

9

NCJMM Clinical Judgment Scenario



CASE STUDY

A **72-year-old male** arrives in the ED 3 days after a ground-level fall in his bathroom. His wife reports he has been "more confused" and complaining of worsening headaches. **Vital signs:** BP 168/72 (widening pulse pressure), HR 52, RR 14 with irregular pattern, SpO₂ 94% on RA, T 98.9°F. **Neuro:** GCS 12 (E3, V4, M5). Left pupil 5 mm sluggish; right pupil 3 mm brisk. Right-sided arm and leg weakness. **History:** Atrial fibrillation on warfarin. Stat INR = 3.8.

1

Recognize Cues

Widening pulse pressure (168/72), bradycardia (HR 52), irregular respirations → **Cushing's triad**. Unequal pupils (left dilated/sluggish → bleed on LEFT). Right-sided weakness (contralateral). Declining GCS (12). Supratherapeutic INR (3.8). Age 72 + recent fall + anticoagulant use.

2

Analyze Cues

Findings are consistent with an **expanding LEFT subdural hematoma with rising ICP and impending herniation**. Warfarin at INR 3.8 prolongs bleeding and worsens hematoma expansion. The 3-day delay fits a *subacute* SDH pattern in an elderly anticoagulated patient.

3

Prioritize Hypotheses

#1 PRIORITY: Increased ICP / impending herniation (life threat — minutes count). **#2:** Anticoagulation-related ongoing bleeding (must reverse). **#3:** Airway compromise as LOC drops. **#4:** Risk for seizure. **#5:** Hemodynamic instability post-herniation.

4

Generate Solutions

Notify provider/rapid response STAT. Reverse warfarin: **Vitamin K IV + 4-factor PCC**. Elevate HOB 30°, keep head midline. Initiate seizure precautions. Prepare for **STAT non-contrast head CT** and possible **emergent burr hole or craniotomy**. Type and crossmatch. Transfer to ICU. Anticipate mannitol or 3% saline for ICP. Pre-intubation preparation given GCS trajectory.

5 Take Action

Call rapid response. Administer prescribed **vitamin K 10 mg IV + 4-factor PCC** per weight-based dose. Hang **0.9% NS** at maintenance (no D5W). Maintain HOB 30°, head midline, suction < 10 sec only with pre-oxygenation. Apply continuous cardiac monitoring & pulse ox. Obtain stat labs: CBC, PT/INR, PTT, type & cross, basic metabolic panel. Bedside neuro check every 15 min. Transport to CT, then OR if indicated.

6 Evaluate Outcomes

Positive outcomes: GCS improving (≥ 13), pupils becoming equal and reactive, BP/HR/RR normalizing (resolving Cushing's triad), INR < 1.5, no new neuro deficits, post-op CT shows hematoma evacuated. **Negative outcomes requiring escalation:** Further decline in GCS, fixed bilateral pupils, persistent hypertension/bradycardia, worsening posturing → may indicate completed herniation.

10 Bonus: SDH vs EDH Quick Compare

🔴 Subdural Hematoma (SDH)

- **Location:** Between dura & arachnoid
- **Vessel:** Bridging VEINS
- **Type of bleed:** VENOUS — SLOW
- **Onset:** Hours to weeks
- **Lucid interval:** Usually absent
- **Population:** Elderly, anticoagulated, alcoholics, infants
- **CT appearance:** CRESCENT-shaped, crosses sutures
- **Treatment:** Burr hole (chronic), craniotomy (acute)

🔴 Epidural Hematoma (EDH)

- **Location:** Between dura & skull
- **Vessel:** Middle meningeal ARTERY
- **Type of bleed:** ARTERIAL — FAST
- **Onset:** Minutes to hours
- **Lucid interval:** CLASSIC — patient "talks then dies"
- **Population:** Young adults, temporal bone fracture
- **CT appearance:** LENS / BICONVEX, does NOT cross sutures
- **Treatment:** Emergent craniotomy