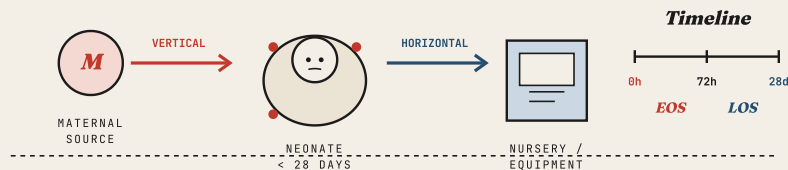


CRITICAL • TIME-SENSITIVE • SUBTLE PRESENTATION

Neonatal Sepsis.

A life-threatening systemic infection in newborns <28 days old. In neonates the signs are quiet, not loud — temperature instability, poor feeding, and lethargy are the loudest the body gets. Recognition speed = survival.

SYSTEM: IMMUNE / INFECTION	POPULATION: NEONATE	PRIORITY: AIRWAY → CIRCULATION → ABX
NGN FOCUS: RECOGNIZE CUES		



01 Definition & Overview

WHAT IT IS • WHY IT MATTERS

What is neonatal sepsis?

A systemic, bloodstream infection occurring in newborns up to 28 days of age, caused by bacteria, viruses, or fungi. It can rapidly progress to septic shock, meningitis, DIC, and death if not identified and treated emergently.

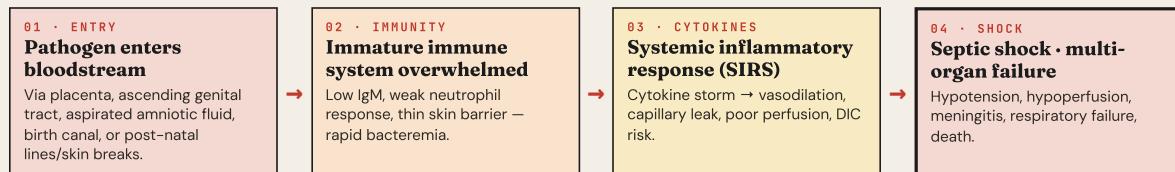
Why it matters for NCLEX

Neonatal sepsis is a leading cause of newborn mortality. The exam tests **early recognition of subtle signs** (temp instability, lethargy, poor feeding), correct **order of interventions** (cultures → antibiotics → support), and identification of **high-risk maternal history**.

Early-Onset Sepsis (EOS)	Late-Onset Sepsis (LOS)
Onset: ≤ 72 hours of life (most < 24 h)	Onset: > 72 hours up to 28 days
Source: <i>Vertical</i> — maternal genital tract, amniotic fluid, intrapartum	Source: <i>Horizontal</i> — environment, caregivers, lines, equipment
Top organisms: Group B Strep (#1), <i>E. coli</i> , <i>Listeria</i>	Top organisms: Coag-neg Staph, <i>S. aureus</i> , gram-negatives, <i>Candida</i>
Empiric Tx: Ampicillin + Gentamicin	Empiric Tx: Vancomycin + Gentamicin (or cefotaxime if meningitis)

02 Pathophysiology

MECHANISM • STEP-BY-STEP



NEONATAL DIFFERENCE: Unlike adults, neonates often present with **HYPothermia rather than fever**, and the inflammatory response is **blunted** — meaning the WBC may be normal, low, or high. Trust the clinical picture, not just the labs.

2A Risk Factors

WHO IS AT RISK

Maternal / Intrapartum

- GBS-positive mother (without adequate intrapartum prophylaxis)
- Chorioamnionitis — maternal fever $\geq 38^{\circ}\text{C}$ (100.4°F)
- Prolonged ROM > 18 hours before delivery
- PROM (preterm premature rupture of membranes)
- Previous infant with invasive GBS disease
- Maternal UTI / bacteriuria during pregnancy
- Foul-smelling amniotic fluid

Neonatal / Postnatal

- Prematurity < 37 weeks (immune immaturity)
- Low birth weight (especially < 1500 g / VLBW)
- Prolonged NICU stay / nosocomial exposure
- Invasive devices: central lines, ETT, urinary catheter
- Total parenteral nutrition (TPN)
- Mechanical ventilation
- Birth asphyxia / resuscitation at delivery

03 Signs & Symptoms

SUBTLE > OBVIOUS



In neonates, the classic adult signs (high fever, tachycardia, focal infection) are **often absent**. The earliest cue is often **"just not acting right"** — poor feeding, sleepy, color changes. **Trust the parent or nurse who says the baby looks "off."**

Early / Subtle Signs

FIRST

- Temperature instability — hypothermia ($< 36.5^{\circ}\text{C}$) MORE common than fever
- Poor feeding — weak suck, refusing feeds, decreased intake
- Lethargy / decreased activity / "not waking for feeds"
- Irritability or high-pitched cry
- Hypotonia — "floppy baby"
- Subtle color change — pale, mottled, or grayish skin
- Glucose instability (hypo- OR hyperglycemia)

Late / Severe Signs



CRISIS

- Apnea (>20 sec) and/or bradycardia (HR <100)
- Respiratory distress: grunting, nasal flaring, retractions, tachypnea (>60)
- Cyanosis, central or peripheral
- Delayed cap refill > 3 sec, weak pulses (poor perfusion)
- Hypotension (late sign in neonates!)
- Jaundice appearing in first 24 h
- Petechiae / purpura (DIC)
- Seizures, bulging fontanel (meningitis)
- Vomiting, abdominal distention, ileus

NORMAL NEWBORN VITALS • KNOW WHAT IS OUT OF RANGE

TEMP (AXILLARY) 36.5–37.5°C 97.7–99.5°F	HEART RATE 110–160 bpm awake	RESP RATE 30–60 / min irregular OK	GLUCOSE $\geq 40\text{--}45\text{ mg/dL}$ first 24 h
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QUICK PEARL — "TEMPS": Temperature instability • Eating poorly • Mottled skin • Poor tone • Sleepy/lethargic. Full mnemonic deck on page 6.

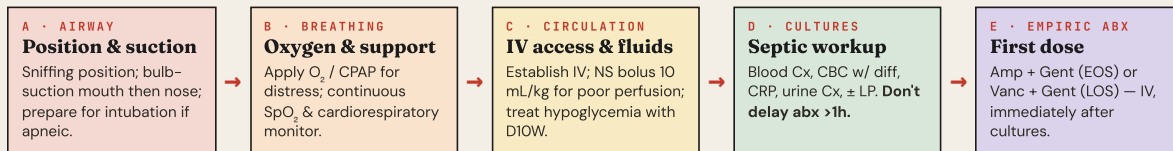
04 Priority Nursing Interventions

ABCS • SAFETY • SPEED



GOLDEN HOUR RULE: Cultures & first dose of empiric IV antibiotics should be given **within 1 hour** of recognizing suspected sepsis. **Do NOT delay antibiotics waiting for culture results.**

PRIORITIZATION ORDER • ABCS FIRST, THEN ANTIBIOTICS



Monitor & Assess

- ✓ **Continuous** cardiorespiratory monitor & pulse oximetry
- ✓ Vital signs **q15 min** until stable, then q1h
- ✓ Strict **I&O**; daily weights
- ✓ Capillary refill, peripheral pulses, color, perfusion q1h
- ✓ Bedside **glucose** on admission and per protocol
- ✓ Neuro: tone, fontanel, level of activity, seizure activity
- ✓ Skin: petechiae, mottling, jaundice, IV-site integrity

Diagnostic Workup (before/with antibiotics)

- ✓ **Blood culture** — minimum 1 mL, peripheral preferred
- ✓ **CBC with diff** — watch for ↓ neutrophils, immature/total (I:T) ratio > 0.2, thrombocytopenia
- ✓ **CRP & procalcitonin** — serial trending
- ✓ **Urine culture** by cath (esp. LOS)
- ✓ **Lumbar puncture** for CSF if stable & meningitis suspected
- ✓ **Chest x-ray** if respiratory symptoms
- ✓ ± Tracheal aspirate, surface cultures

Supportive Care

- ✓ **Thermoregulation:** radiant warmer or isolette to keep temp 36.5–37.5°C
- ✓ **Maintain IV fluids** per weight; monitor glucose
- ✓ **NPO** if respiratory distress, ileus, or unstable
- ✓ Cluster cares; **minimize stimulation** (reduces O₂ demand)
- ✓ Maintain neutral thermal environment
- ✓ Parent presence & bonding when stable

Infection Prevention & Safety

- ✓ **Strict hand hygiene** — single biggest preventive measure
- ✓ Contact / droplet precautions per organism
- ✓ Sterile technique for all line care
- ✓ Limit visitors; screen for illness
- ✓ **Hold immunizations** while acutely septic
- ✓ Verify **two patient identifiers** before every medication

05 Pharmacology

EMPIRIC · TARGETED · SUPPORTIVE



EMPIRIC ANTIBIOTIC PAIR — MEMORIZE: EOS → Ampicillin + Gentamicin (covers GBS, *Listeria*, *E. coli*). **LOS / nosocomial → Vancomycin + Gentamicin** (covers CONS, MRSA, gram-negatives). Add **Acyclovir** if HSV suspected (skin vesicles, seizures, maternal HSV).

Ampicillin

B-LACTAM · CELL-WALL INHIBITOR

MOA	Bactericidal — disrupts bacterial cell wall synthesis.
COVERS	Group B Strep , <i>Listeria</i> , some <i>E. coli</i>
SIDE FX	Rash, diarrhea, hypersensitivity, rare seizures at high doses
NURSING	Check for PCN allergy ; assess renal function; give over 15–30 min IV.

Gentamicin

AMINOGLYCOSIDE

MOA	Bactericidal — inhibits bacterial protein synthesis (30S ribosome).
COVERS	Gram-negatives (<i>E. coli</i> , <i>Klebsiella</i> , <i>Enterobacter</i>)
SIDE FX	Nephrotoxicity · Ototoxicity (irreversible hearing loss)
NURSING	Monitor peak & trough levels (trough < 2 mcg/mL); BUN/Cr; daily weights; hearing screen .

Vancomycin

GLYCOPEPTIDE

MOA	Bactericidal — inhibits cell wall synthesis (different site than β-lactams).
COVERS	MRSA , Coag-neg Staph (CONS), <i>Enterococcus</i>
SIDE FX	"Red man" syndrome (infuse over ≥ 60 min) · nephrotoxicity · ototoxicity · thrombophlebitis
NURSING	Infuse slowly ; monitor trough levels; assess IV site; BUN/Cr; flushing on chest/neck = stop infusion.

Cefotaxime

3RD-GEN CEPHALOSPORIN

MOA	Bactericidal — β-lactam; crosses blood-brain barrier well.
COVERS	Gram-negatives; preferred for meningitis
SIDE FX	Rash, diarrhea, eosinophilia; ↓ risk than ceftriaxone in neonates
NURSING	Avoid ceftriaxone in neonates — displaces bilirubin → kernicterus risk. Cefotaxime is the neonatal-safe alternative.

Acyclovir

ANTIVIRAL · NUCLEOSIDE ANALOG

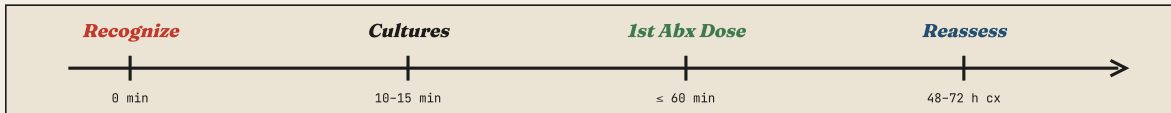
MOA	Inhibits viral DNA polymerase — for HSV / VZV.
INDICATED	HSV suspected: skin vesicles , seizures, ↑ liver enzymes, maternal HSV
SIDE FX	Nephrotoxicity, neutropenia, infusion site irritation
NURSING	Adequate hydration; monitor renal function and CBC; infuse over 1 hour.

Supportive Therapies

ADJUNCT CARE

D10W	For hypoglycemia (BG < 40 mg/dL); 2 mL/kg bolus, then infusion.
NS BOLUS	10 mL/kg over 10–20 min for shock / poor perfusion.
SURFACTANT	If RDS confirmed (intubated, premature).
VASOPRESSORS	Dopamine / epinephrine for refractory hypotension (NICU).

ANTIBIOTIC SEQUENCING · "CULTURE, THEN COVER"



06 NCLEX Test Traps ⚠️

COMMON ERRORS • MISREADS

✗ The Trap

- ✗ Waiting for a **fever** before suspecting sepsis
- ✗ Drawing labs but **delaying antibiotics** for culture results
- ✗ Calling lethargy & poor feeding "normal newborn behavior"
- ✗ Treating temp instability with blankets only — no workup
- ✗ Selecting **ceftriaxone** for a neonate (kernicterus risk!)
- ✗ Stopping antibiotics at 48 h with positive culture or persistent symptoms
- ✗ Picking "obtain a thorough history" as the **FIRST** action when baby is decompensating
- ✗ Choosing "feed baby" or "warm baby" over **IV access & cultures**

✓ The Right Move

- ✓ **Hypothermia is the more common** temp finding in neonatal sepsis
- ✓ Draw cultures & **give empiric abx within 1 hour**
- ✓ Any subtle change ("not acting right") = full sepsis workup
- ✓ Take temp + assess perfusion + start workup simultaneously
- ✓ Use **cefotaxime** in neonates needing 3rd-gen cephalosporin
- ✓ Continue antibiotics per provider for 7–21 days based on source & cultures
- ✓ ABCs & circulation first — history can be collected by another nurse
- ✓ **Cultures + IV abx** are the priority interventions

LOOKS LIKE ...	COULD BE CONFUSED WITH	HOW TO DIFFERENTIATE
Respiratory distress in newborn	Transient tachypnea of newborn (TTN) — usually self-limits in 24–72 h	Sepsis: persistent / worsening, with temp instability , poor feeding, abnormal labs.
Jaundice	Physiologic jaundice (after 24 h)	Sepsis: jaundice in first 24 h , with lethargy & poor feeding — pathologic.
Hypoglycemia	Transient hypoglycemia in IDM / SGA	Treat hypoglycemia AND consider sepsis if persistent or with other signs.
Seizures	Hypoglycemia, hypocalcemia, HIE	Sepsis (meningitis): bulging fontanel , fever/hypothermia, ↑ WBC in CSF.
Lethargy + poor feeding	"Sleepy newborn"	Never assume normal — full vitals + glucose + sepsis screen.

07 Patient & Family Education

DISCHARGE • PREVENTION

Discharge teaching for parents

- ✓ **Complete full antibiotic course** — don't stop early even if baby looks better
- ✓ Return to ER for: **fever $\geq 38^{\circ}\text{C}$ OR hypothermia $< 36.5^{\circ}\text{C}$** , poor feeding, lethargy, color change, breathing changes, fewer wet diapers, bulging fontanel
- ✓ Watch for hearing or developmental concerns — schedule **follow-up hearing screen** (gentamicin exposure)
- ✓ Attend all pediatric follow-up appointments & labs
- ✓ Keep newborn away from large crowds & sick contacts
- ✓ Resume immunizations only when cleared by pediatrician

Prevention & bonding

- ✓ **Hand hygiene** for everyone before holding baby
- ✓ **Breastfeeding** supports passive immunity (IgA)
- ✓ Skin-to-skin / kangaroo care once stable supports bonding & thermoregulation
- ✓ Prenatal: importance of **GBS screening** at 36–37 weeks & intrapartum antibiotics if positive
- ✓ Recognize that future pregnancies may need intrapartum prophylaxis if this infant had GBS
- ✓ Encourage parents to **trust their instincts** — early reporting saves lives

08 Memory Boosters

MNEMONICS • PATTERNS

"TEMPS"

Early-warning sepsis signs in the neonate.

- T** Temperature instability (hypo > hyper)
- E** Eating poorly • weak suck
- M** Mottled / pale / gray skin
- P** Poor tone / "floppy"
- S** Sleepy / lethargic / hard to rouse

"SEPSIS"

Action sequence when sepsis is suspected.

- S** Suspect early — subtle signs are the loudest
- E** Establish IV access & ABCs
- P** Pan-cultures (blood, urine, ± CSF)
- S** Start empiric IV antibiotics ≤ 60 min
- I** Isolate & protect (hand hygiene, precautions)
- S** Support — thermoregulate, glucose, O₂

"AG for Early"

Empiric antibiotics for EOS (≤72 h):

- A** Ampicillin — covers GBS, *Listeria*
- G** Gentamicin — covers *E. coli* & gram-negatives

For LOS: swap Ampicillin → **Vancomycin** (covers nosocomial Staph / CONS).

"Just Not Right"

The clinical pearl every newborn nurse learns:

"A baby that just isn't acting right — even with normal vitals — is sick until proven otherwise. Trust the gut. Start the workup. Don't wait for fever."

🔍 Pattern Recognition — Recognize these scenarios FAST

SCENARIO 1

Mom GBS+ no prophylaxis, ROM > 18 h, baby at 4 h "sleepy, won't feed, temp 36.0°C" → **EOS suspected**. Cultures + Amp/Gent.

SCENARIO 2

NICU baby, day 10 with central line, becomes apneic + mottled → **LOS / line infection**. Cultures + Vanc/Gent; consider line removal.

SCENARIO 3

Newborn with **vesicular rash + seizures**, maternal HSV history → suspect **neonatal HSV**. Add **Acyclovir** to empiric regimen.

★ One-Page Summary

LAST-MINUTE REVIEW

DEFINITION

Systemic infection in newborn ≤ 28 days. **EOS ≤ 72 h** (maternal / GBS, *E. coli*, *Listeria*); **LOS > 72 h** (nosocomial / Staph, gram-neg, *Candida*).

TOP RISK FACTORS

GBS+ mom, ROM >18 h, chorioamnionitis, prematurity, LBW, invasive lines, mom fever ≥38°C.

EARLIEST SIGNS (SUBTLE)

TEMPS: Temp instability (HYPO ↑↑), Eating poorly, Mottled, Poor tone, Sleepy. NOT high fever like adults.

PRIORITY ACTIONS

ABCs → IV access → **blood cultures** → **empiric abx within 1 h** → thermoregulate → support glucose.

EMPIRIC ABX

EOS: Ampicillin + Gentamicin • **LOS:** Vancomycin + Gentamicin • **HSV:** add Acyclovir • **Avoid ceftriaxone** in neonates.

#1 NCLEX TRAP

Delaying antibiotics to "wait for culture results" or assuming the baby just needs to be warmed/fed. Treat the cue, not the comfort.

EDUCATION

Finish full ABX course, report fever/hypothermia or poor feeding, follow-up **hearing screen** (gentamicin), hand hygiene at home.

NGN PEARL

"Just not acting right" = full sepsis workup. **Trust subtle cues**. ABCs > history. Cultures + antibiotics > everything else.