

 **SOURCE NOTE:** This topic was not in the uploaded personal notes. Content is compiled from *Saunders Comprehensive Review for the NCLEX-RN Examination (2026)*, *ATI Nursing Care of Children (2025)*, *Hockenberry & Wong's Essentials of Pediatric Nursing (11th ed.)*, AAP Bright Futures Guidelines, and PALS 2025 vital sign parameters. Cross-verified against current NCLEX 2026 Test Plan.

NCLEX 2026 • HEALTH PROMOTION & MAINTENANCE • PEDIATRICS

Pediatric Vital Signs, *Weight & Height* by Developmental Stage

Age-specific norms are non-negotiable in pediatric nursing. Adult parameters do not apply. Master these ranges to recognize the difference between a stable child and an impending emergency.



NEWBORN → ADOLESCENT



HR • RR • BP • TEMP



GROWTH MILESTONES



RED FLAGS

01

DEFINITION • OVERVIEW

Why Age-Specific Vitals Matter

- ▶ Vital signs **change predictably** as a child grows — HR and RR are **HIGHEST** at birth and gradually **decrease** with age; BP starts **LOW** and gradually **increases** with age.
- ▶ A pediatric vital sign is only "normal" when interpreted against **age-appropriate norms** — applying adult parameters to children is a common, dangerous error.
- ▶ Weight, height, head circumference, and BMI must be plotted on the **WHO (0–2 yr) or CDC (2+ yr) growth chart** at every well-child visit. **Trends** matter more than any single reading.
- ▶ Children compensate longer than adults — by the time pediatric vitals look like adult shock, the child may be near cardiopulmonary arrest. Early subtle changes save lives.

02

PATHOPHYSIOLOGY • GROWTH PRINCIPLES

How Children Grow

PRINCIPLE 01

Cephalocaudal

Growth proceeds **head** → **toe**. Infant lifts head before sitting; sits before walking.

PRINCIPLE 02

Proximodistal

Growth proceeds **center** → **periphery**. Trunk control before fine motor; arms before fingers.

PRINCIPLE 03

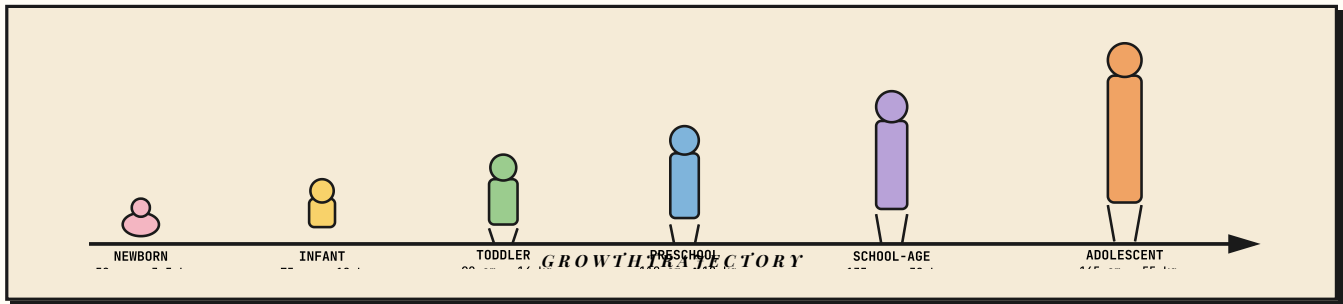
General → Specific

Whole-hand grasp before pincer grasp. Gross motor before fine motor.

PRINCIPLE 04

Continuous but Spurted

Steady growth with two big spurts: **infancy** (most rapid) and **adolescence**.



03

ANTHROPOMETRICS • GROWTH MILESTONES

Weight & Height by Stage

0-1 MONTH

NEWBORN

 **3.0-3.5 kg** (6.5-7.7 lb)

 **~50 cm** (20 in)

 **HC 33-35 cm**

 Loses 5-10% in first week, regains by day 10-14

1-12 MONTHS

INFANT

 Weight **doubles by 6 mo**, **triples by 12 mo**

 Length ↑ ~50% by 12 mo (~75 cm)

 HC > chest until age 2

Anterior fontanel closes 12-18 mo

1-3 YEARS

TODDLER

 Weight **4× birth wt by age 2**

 Gains **~2.3 kg/yr** (5 lb)

 Grows **~7.5 cm/yr** (3 in)

Pot-belly appearance is normal

3-5 YEARS

PRESCHOOL

 Gains **~2 kg/yr** (4.5 lb)

 Grows **~6-8 cm/yr** (2.5-3 in)

Doubles birth length by age 4

Body proportions become more adult

6-12 YEARS

SCHOOL-AGE

 Gains **~2-3 kg/yr** (4.5-7 lb)

 Grows **~5 cm/yr** (2 in)

Steady, predictable growth before pubertal spurt

12-18 YEARS

ADOLESCENT

 Girls gain **~7-25 kg** · Boys **~7-30 kg**

 Girls grow **~5-20 cm** · Boys **~10-30 cm**

 Girls peak: **10-14 yr**

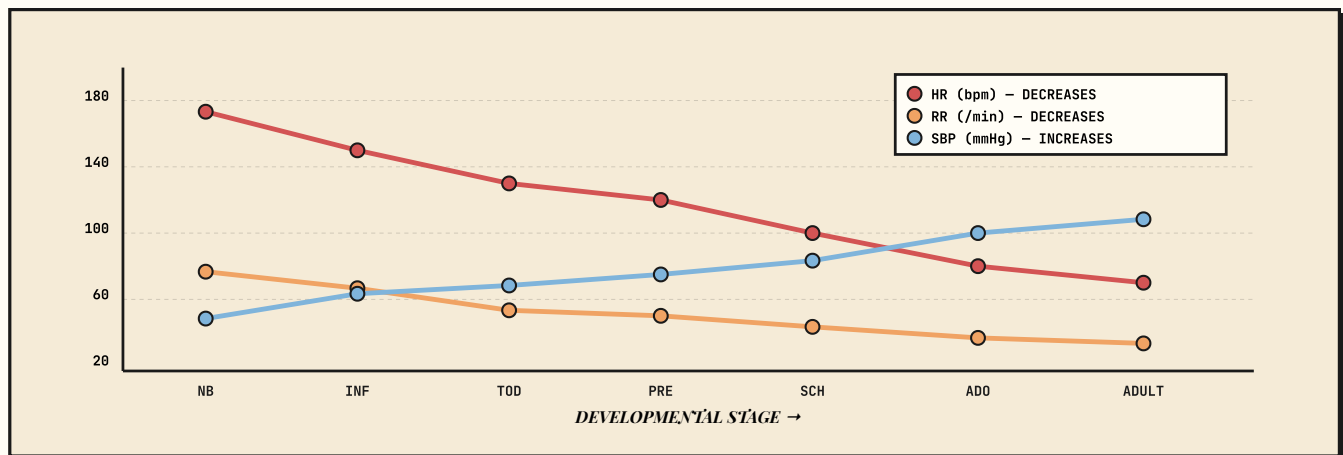
 Boys peak: **12-16 yr**

04

SIGNS & SYMPTOMS · THE CORE REFERENCE

Vital Signs by Developmental Stage

AGE GROUP	HEART RATE (BPM, AWAKE)	RESPIRATORY RATE (/MIN)	SYSTOLIC BP (MMHG)	DIASTOLIC BP (MMHG)
Newborn 0-1 month	100-160 (up to 180 crying)	30-60	60-90	20-60
Infant 1-12 months	90-160	25-40	87-105	53-66
Toddler 1-3 years	80-130	20-30	95-105	53-66
Preschooler 3-5 years	80-120	20-25	95-110	56-70
School-Age 6-12 years	70-110	18-22	97-120	57-71
Adolescent 13-18 years	55-105	12-20	110-131	64-83
Adult ≥ 18 years	60-100	12-20	< 120	< 80



Temperature (all stages): Normal range **97.5–99.5°F (36.5–37.5°C)** · Newborns may be wider (97.7–100.4°F / 36.5–38°C). > 100.4°F (38°C) in any infant under 3 months is a medical emergency until proven otherwise.

RED FLAGS • EMERGENCY CUES

05

When to Worry

RESPIRATORY

Tachypnea in Infant (RR > 60)

Earliest and most sensitive sign of respiratory distress in infants. Look for nasal flaring, retractions, grunting.

CARDIAC

Bradycardia in Any Child

LATE sign of hypoxia → impending arrest. PALS threshold: HR < 60 with poor perfusion = start CPR.

SHOCK

Hypotension in Pediatric Patient

LATE sign of shock — children compensate longer than adults. Tachycardia + delayed cap refill come first; hypotension is preterminal.

NEURO

Cushing's Triad (↑ICP)

Bradycardia + bradypnea + widened pulse pressure + bulging fontanel = increased intracranial pressure. Emergent.

APNEA

Apnea > 20 seconds in Infant

Pathologic in any infant — distinguish from periodic breathing. Associated bradycardia or cyanosis = stat intervention.

FEVER

Fever in Newborn < 3 Months

Rectal temp ≥ 100.4°F (38°C) = full sepsis workup (CBC, blood/urine/CSF cultures), empiric antibiotics, admission.

06

ABC • SAFETY • PRIORITIZATION

Priority Nursing Interventions

1

Assess Least to Most Invasive

Count **RR first** (before disturbing) → then HR → then BP → temp last. Crying alters every value.

2

Count RR for a FULL Minute

Infant/young child breathing is **irregular**. A 15-second count multiplied is unreliable.

3

Apical Pulse for Age < 2

Auscultate at the apex (4th–5th ICS, MCL) for a **full 60 seconds**. Radial pulse is unreliable in young children.

4

Use Age-Appropriate Equipment

BP cuff width = **40% of arm circumference**; bladder length 80–100%. A cuff too small falsely **raises** BP; too large falsely **lowers** it.

5

Choose the Right Temp Route

Axillary or temporal for routine/screening. **Avoid rectal** in immunocompromised, neutropenic, neonates with rectal anomalies, or post-rectal surgery.

6

Plot on Growth Chart Every Visit

WHO chart (0–2 yr), CDC chart (2+ yr). Watch for **crossing percentile lines** — >2 lines down = failure to thrive workup.

7

Recognize Subtle Decompensation

Sustained tachycardia, prolonged cap refill (> 3 sec), cool/mottled extremities, ↓ UOP, altered LOC = compensated shock. Act now.

8

Interpret as Trends, Not Snapshots

A single elevated HR may be fear or fever. Three readings showing climbing HR with falling SpO₂ = trouble. Document patterns.

⚠️ TEST TRAPS • WRONG VS RIGHT

07

Common NCLEX Misconceptions

✗ WRONG THINKING

"HR of 160 in a 4-month-old is dangerously high — call rapid response."

✓ RIGHT THINKING

HR 90–160 is **normal for an infant**. Crying can push it to 180+. Assess context first — adult parameters don't apply.

✗ WRONG THINKING

"The toddler's HR dropped from 130 to 70 — finally stable!"

✓ RIGHT THINKING

Bradycardia in pediatrics = pre-arrest. A drop from tachycardia to "normal-for-adult" range in a sick child means the heart is failing. Notify provider STAT.

✗ WRONG THINKING

"BP is 88/52 in this 5-year-old after trauma — but still < 90/60 cutoff, so probably fine."

✓ RIGHT THINKING

Normal SBP for a 5-year-old is ~95–110. 88/52 with trauma = **decompensated shock**. Pediatric hypotension is a LATE sign — fluid bolus 20 mL/kg now.

✗ WRONG THINKING

"Counted RR for 15 seconds × 4 = 28 — slightly elevated."

✓ RIGHT THINKING

Pediatric RR is **irregular**; always count for a **full 60 seconds**. A 15-second count can miss apneic pauses entirely.

✗ WRONG THINKING

"Take the infant's rectal temp — it's the most accurate."

✓ RIGHT THINKING

Rectal is reserved when others are unreliable. **Axillary or temporal** is preferred for routine screening; rectal is **contraindicated** in neutropenic, immunocompromised, or post-anorectal-surgery patients.

✗ WRONG THINKING

"Toddler is screaming. I'll get the BP first to get it over with."

✓ RIGHT THINKING

Count RR FIRST, while the child is calm/observable. Save invasive measures (BP cuff, rectal temp) for last. Crying inflates HR, RR, and BP.

08

PATIENT • PARENT • CAREGIVER EDUCATION

Teaching the Family

1 Well-Child Visit Schedule

AAP schedule: 2 wk, 1 mo, 2 mo, 4 mo, 6 mo, 9 mo, 12 mo, 15 mo, 18 mo, 24 mo, then annually. Each visit = vitals + growth chart + immunizations + anticipatory guidance.

2 When to Call the Provider

Fever > 100.4°F under 3 mo (ER); breathing fast/labored; refusal to feed; lethargy or "not acting right"; fewer than 6 wet diapers/day in infants; bulging fontanel.

3 Home Thermometer Use

Teach axillary for < 3 yr; oral after age 4–5 if cooperative. Avoid glass mercury thermometers. Wait 30 min after hot/cold drinks for oral temps.

4 Anticipatory Guidance — Growth Spurts

Expect rapid weight/height gain during infancy and adolescence. Increased appetite is normal during spurts. Adolescents need extra protein, calcium, and iron.

5 Nutrition Foundations

Exclusive breastfeeding/formula × 6 mo. Iron-fortified cereals at 6 mo. Whole milk after 12 mo (not before — kidney load + iron-deficiency anemia).

6 Safe Sleep & Positioning

Back to sleep, alone, in a crib, no soft objects, no bed-sharing. SIDS peaks 2–4 mo of age. Educate about safe sleep at every infant visit.

09

MEMORY BOOSTERS • PATTERN RECOGNITION

Mnemonics & Quick Tricks

"HR + RR ↗, BP ↗"

THE GOLDEN PATTERN

↗ As children in age, HR and RR

↗ BP with age

shock If a child's HR or RR is rising while their BP falls =

"160 · 120 · 100"

UPPER-LIMIT HR BY STAGE

160 Newborns & Infants (up to)

120 Toddler / Preschooler

100 School-age / Adolescent

Step down by ~30 per stage

"30·60·90"

NEWBORN BASELINE

RR 30–60 /min

SBS starts ~60, climbs to 90 over first year

HR ranges 100–160

"DOUBLE, TRIPLE, QUAD"

INFANT WEIGHT MILESTONES

2× birth weight by 6 months

3× birth weight by 12 months

4× birth weight by 24 months

"R·H·B·T"

ASSESSMENT ORDER

R espirations first (don't disturb)

H eart rate (apical < 2 yr)

B lood pressure (correct cuff!)

T emperature last (most invasive)

"BRADY = BAD"

PED CARDIAC ALERT

B radycardia in kids = hypoxia

A lways pathologic — not "rest"

D ecompensation imminent

HR < 100 or perfusion = start CPR (PALS)

NCJMM • 6-STEP

Clinical Judgment Scenario

SETUP: A 6-month-old infant (weight 7.5 kg) is brought to the ED for "fast breathing." Vitals: **HR 168, RR 64, T 102.2°F (39°C) tympanic, SpO₂ 91% on room air, BP 75/45.** Mother reports decreased PO intake × 24 hours, wet diaper count down from 6 to 2. Infant appears listless; nasal flaring and mild intercostal retractions noted.

STEP 1 — RECOGNIZE CUES

What's abnormal here?

- **RR 64** — above upper limit (40) for an infant
- **HR 168** — high-normal/tachycardic for age
- **Fever 102.2°F** in a 6-month-old
- **SpO₂ 91%** — hypoxia (target ≥ 94%)
- Decreased wet diapers + ↓ PO intake = **dehydration cues**
- Nasal flaring + retractions = **increased work of breathing**

STEP 2 — ANALYZE CUES

What do they mean together?

Tachypnea + hypoxia + retractions = **respiratory distress**. Fever increases metabolic O₂ demand. Tachycardia is compensatory for both hypoxia and fluid loss. The listlessness raises concern for impending decompensation. Risk for respiratory failure, dehydration, and sepsis.

STEP 3 — PRIORITIZE HYPOTHESES

Most likely problems, in priority order

- ① **Respiratory distress / impending failure** (airway/breathing — top of ABCs)
- ② Hypovolemia from fever + ↓ intake
- ③ Possible viral lower respiratory infection (RSV/bronchiolitis) or sepsis

STEP 4 — GENERATE SOLUTIONS

What interventions match the priority?

- Supplemental O₂ via nasal cannula → target SpO₂ ≥ 94%
- Continuous cardiopulmonary monitoring
- Establish IV access; obtain CBC, blood culture, CMP, viral panel
- Weight-based antipyretic (acetaminophen 15 mg/kg PO)
- Isotonic IVF bolus 20 mL/kg NS if perfusion poor
- Notify provider; prepare for possible ICU admission

STEP 5 — TAKE ACTION

Execute in order

- **Airway/Breathing first:** O₂ NC 1–2 L/min, semi-Fowler's position, suction nares if needed
- **Circulation:** IV start, draw labs, NS bolus 150 mL (20 mL/kg × 7.5 kg)
- **Medicate:** Tylenol 112 mg PO (15 mg/kg × 7.5 kg)
- **Reassess** RR, HR, SpO₂, work of breathing q15 min

STEP 6 — EVALUATE OUTCOMES

Is the infant improving?

-  Expected: RR ↓ toward 40s, HR ↓ as fever resolves, $\text{SpO}_2 \geq 94\%$, retractions resolve, improved feeding, ↑ wet diapers
-  Worsening: RR continues to climb OR **begins to drop with worsening LOC** (fatigue), HR drops to "normal adult" range → **pre-arrest** → escalate to PICU and prepare for intubation
- Document trends; communicate with SBAR