

• PEDIATRIC NURSING • HIGH-YIELD REVIEW

5 T'S

NGN NCLEX • PEDS

Cyanotic *Congenital* Heart Defects

Right-to-left shunting bypasses the lungs → deoxygenated blood reaches systemic circulation → **central cyanosis**. Master the 5 T's, recognize tet spells, and prioritize like an NCLEX pro.

1 THE CORE CONCEPT

Why the baby turns blue

In a **cyanotic defect**, deoxygenated blood from the right side of the heart crosses directly into the left-sided systemic circulation without passing through the lungs for oxygenation.

This **right-to-left shunt** causes hypoxemia that oxygen alone cannot fully reverse — a critical NCLEX distinction from acyanotic (left-to-right) defects.

🔥 SpO₂ often 75–85% at baseline · worsens with crying, feeding, exertion

// SHUNT DIRECTION

Deoxygenated blood

↓ Right heart

→ SHUNT

↓ Left heart

→ Systemic

= **CYANOSIS**

2 THE MNEMONIC

The 5 T's of Cyanotic CHD

*If it starts with **T**, think **blue baby** — memorize these five and you've covered the NCLEX high-yield cyanotic defects.*

T Tetralogy of Fallot (TOF)

MOST COMMON CYANOTIC CHD · "BOOT-SHAPED" HEART ON X-RAY

A combination of **four** structural defects that obstruct pulmonary blood flow and shunt deoxygenated blood into systemic circulation. Classic presentation: hypercyanotic "**tet spells**" — acute episodes of worsening cyanosis, often during feeding or crying.

The 4 Defects — "PROVe"

- 1 Pulmonary stenosis (key obstruction)
- 2 Right ventricular hypertrophy
- 3 Overriding aorta
- 4 Ventricular septal defect (VSD)

Classic Clinical Picture

- 💙 Cyanosis worsens with feeding/crying
- 🦶 **Squatting** posture in older children
- 👂 Harsh systolic murmur (LUSB)
- 👉 Clubbing · polycythemia · poor growth
- 👤 "Boot-shaped" heart on CXR

SURGICAL REPAIR · TYPICALLY BY 1 YR OF AGE

T Transposition of Great Arteries

"EGG-ON-A-STRING" HEART · DUCTAL-DEPENDENT

Aorta arises from the **right** ventricle and pulmonary artery from the **left** → two separate, parallel circulations.

- ▶ Incompatible with life unless mixing exists (PDA, PFO, VSD)
- ▶ **Prostaglandin E1 (PGE1)** keeps ductus open
- ▶ Severe cyanosis within hours of birth
- ▶ Arterial switch surgery in first weeks

T Tricuspid Atresia

ABSENT TRICUSPID VALVE · RV HYPOPLASIA

No communication between right atrium and right ventricle. Survival depends on an **ASD + VSD + PDA** to route blood to the lungs.

- ▶ Profound cyanosis in the neonate
- ▶ Tachycardia, dyspnea, hypoxemia
- ▶ PGE1 infusion until surgical palliation
- ▶ Staged Fontan procedure series

T Truncus Arteriosus

ONE GREAT VESSEL INSTEAD OF TWO

A single trunk arises from both ventricles, supplying systemic, pulmonary, and coronary circulations. Always associated with a VSD.

- ▶ Mixed cyanosis + heart failure signs
- ▶ Bounding pulses · wide pulse pressure
- ▶ Poor feeding, failure to thrive
- ▶ Early surgical correction critical

T Total Anomalous Pulm. Venous Return

"SNOWMAN" SIGN ON CHEST X-RAY

Pulmonary veins drain into the **right** atrium instead of the left — no oxygenated blood reaches systemic circulation without an ASD.

- ▶ Severity depends on obstruction
- ▶ Cyanosis + pulmonary congestion
- ▶ Surgical emergency if obstructed
- ▶ Reroute pulmonary veins → LA

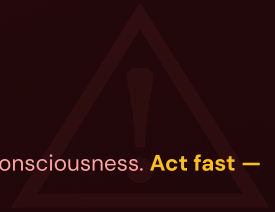


EMERGENCY PRIORITY

⚠️ ACUTE · LIFE-THREATENING

Tet Spell Management

Hypercyanotic episode: sudden cyanosis, irritability, gasping respirations, possible loss of consciousness. **Act fast — in this exact order.**



1

POSITION

Knee-to-chest
(or squatting)

2

OXYGEN

100% O₂
blow-by or mask

3

CALM

Quiet, soothing
environment

4

MORPHINE

↓ Agitation
↓ Infundibular spasm

5

FLUIDS

IV bolus +
call provider

WHY KNEE-TO-CHEST? Flexing the hips **increases systemic vascular resistance (SVR)**, which reverses the right-to-left shunt and pushes more blood into the lungs for oxygenation. This is the #1 NCLEX answer for a tet spell.

3

CLINICAL SIGNS

What you'll see at the bedside



Central Cyanosis

Lips, tongue, mucous membranes — not
peripheral acrocyanosis



Clubbing

Fingers & toes from chronic hypoxia
(after ~2 yrs)



Polycythemia

↑ RBC response to chronic hypoxemia →
stroke risk



Poor Feeding

Tires easily · diaphoresis with feeds · poor
growth



Squatting

Older TOF child's instinct to ↑ SVR &
relieve hypoxia



SpO₂ 75–85%

Baseline hypoxemia — does *not* fully
correct with O₂

4

KNOW THE DIFFERENCE

Cyanotic vs. Acyanotic

RIGHT → LEFT SHUNT

Cyanotic (The 5 T's)

- ✓ Deoxygenated blood → systemic
- ✓ Central cyanosis at baseline
- ✓ Clubbing, polycythemia, squatting
- ✓ O₂ doesn't fully correct SpO₂
- ✓ Often ductal-dependent → PGE1

LEFT → RIGHT SHUNT

Acyanotic (VSD, ASD, PDA, CoA)

- ✗ Oxygenated blood → pulmonary
- ✗ No cyanosis initially
- ✗ CHF signs: tachypnea, FTT, sweating
- ✗ Loud murmurs common
- ✗ Risk of pulmonary HTN over time

5 NURSING CARE

Nursing Priorities • Cyanotic CHD

A

Airway & Oxygenation

Continuous SpO₂ · position for comfort · knee-chest during tet spells

B

Cluster Care

Minimize crying & energy expenditure · pacifier · small frequent feeds

C

Circulation & Hydration

Prevent dehydration → ↓ stroke risk from polycythemia · monitor perfusion

D

Drugs

PGE1 to maintain PDA · digoxin/diuretics if CHF · morphine for tet spells

E

Endocarditis Prevention

Good oral care · prophylactic antibiotics before dental/invasive procedures

F

Family Education

Teach tet spell response · recognize worsening cyanosis · immunizations (esp. RSV)

NGN TEST-TAKING TIP

Think Like the NCLEX

On Next Gen items, expect **Bow-Tie, Matrix, and Drag-and-Drop** formats that ask you to prioritize actions during a tet spell or identify which neonatal findings indicate a ductal-dependent lesion.

🎯 **Pattern recognition:** A neonate with sudden cyanosis, poor feeding, and SpO₂ unresponsive to oxygen = **ductal-dependent cyanotic lesion**. The expected order: *start PGE1 → prepare for transfer to cardiac center → echocardiogram → surgical consult*.

🎯 **Classic distractor:** "Place infant in Trendelenburg" or "Administer 100% oxygen only" are *wrong* for a tet spell — **knee-to-chest** is the priority intervention, then oxygen + calm environment.