

ACYANOTIC Congenital Heart Defects

"Pink Babies" · Left-to-Right Shunt · 2026 Test Plan Review



CORE CONCEPT: Acyanotic defects cause **LEFT → RIGHT shunting** OR **obstruction** of flow — blood stays oxygenated, so baby appears **PINK**. Over time → ↑ pulmonary blood flow → **CHF, pulmonary HTN, failure to thrive**.

PINK BABY

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ACYANOTIC CHDS
3 shunt + 3 obstructive

L → R

SHUNT DIRECTION
↑ Pulmonary flow

#1

MOST COMMON CHD
VSD

INCREASED PULMONARY BLOOD FLOW (L → R SHUNT)

CHF Risk

VSD Ventricular Septal Defect



MOST COMMON CHD

DEFECT

Hole between ventricles

S/S

CHF signs, FTT, ↑RR, diaphoresis w/ feeds

Murmur: Loud, harsh **HOLOSYSTOLIC** at LLSB

TX

Small ones close on own · Surgical patch

ASD Atrial Septal Defect



OFTEN ASYMPTOMATIC

DEFECT

Hole between atria

S/S

Often silent until adulthood · fatigue, DOE

Murmur: Soft systolic @ 2nd ICS LUSB + **FIXED SPLIT S2**

TX

Cath device closure or surgical patch

PDA Patent Ductus Arteriosus



PREEMIE RISK

DEFECT

Ductus fails to close after birth

S/S

Bounding pulses, **WIDE pulse pressure**

Murmur: "MACHINE-LIKE" continuous @ LUSB

TX

Indomethacin / Ibuprofen to close · Surgical ligation

OBSTRUCTION TO BLOOD FLOW (NO SHUNT)

↑ Afterload

CoA Coarctation of the Aorta



NEONATAL EMERGENCY

DEFECT

Narrowing of aorta

HALLMARK

↑BP arms / ↓BP legs · Weak/absent femoral pulses · Bounding brachial pulses

TX

Prostaglandin E1 (keep PDA open!) · Balloon angioplasty · Surgery

AS Aortic Stenosis



SPORTS RISK

DEFECT

Narrowed aortic valve

S/S

Chest pain, syncope w/ exertion, poor exercise tolerance

Murmur: Harsh systolic ejection @ RUSB → radiates to neck

TX

Balloon valvuloplasty · **AVOID competitive sports**

PS Pulmonary Stenosis



OFTEN MILD

DEFECT

Narrowed pulmonary valve

S/S

Often asymptomatic · severe: cyanosis, R-sided HF

Murmur: Systolic ejection @ LUSB (2nd ICS)

TX

Balloon valvuloplasty (procedure of choice)

ACYANOTIC MNEMONIC

"VAP + CAP"

- V** VSD — most common
- A** ASD — fixed split S2
- P** PDA — machine-like murmur
- C** Coarctation — BP differential
- A** Aortic Stenosis — syncope
- P** Pulmonic Stenosis — LUSB murmur

♥ "PINK BABIES" CUE

L → R = PINK

- **L → R shunt** = oxygenated blood recirculates
- ♥ Baby looks **PINK** (not blue)
- ⚠ Late: pulmonary HTN → **Eisenmenger** (shunt reverses → cyanotic)
- ⚠ #1 Nursing concern: **CHF + FTT**



Nursing Priorities, Meds & NGN Application

RECOGNIZE CUES — CHF in Infants with Acyanotic CHD

- 🚩 Tachycardia (HR >160) at rest
- 🚩 Tachypnea (RR >60) — earliest sign
- 🚩 Diaphoresis with feeds (classic!)
- 🚩 Poor feeding / tires easily
- 🚩 Failure to thrive (FTT, ↓ weight)
- 🚩 Hepatomegaly (R-sided HF in kids)
- 🚩 Periorbital / sacral edema
- 🚩 Grunting, nasal flaring, retractions
- 🚩 Crackles, wet cough
- 🚩 Gallop rhythm (S3)

TOP NURSING PRIORITIES

CONSERVE ENERGY DURING FEEDS

- ▶ Small, frequent feeds (every 2–3 hrs)
- ▶ High-calorie formula (24–30 kcal/oz)
- ▶ Limit feed to ≤ 30 min (tires out)
- ▶ Soft/preemie nipple; NG feeds if severe
- ▶ Upright position during & after feeds

PREVENT INFECTION

- ▶ Palivizumab (Synagis) for RSV prophylaxis
- ▶ Routine immunizations — flu + COVID yearly
- ▶ Avoid crowds/sick contacts
- ▶ Meticulous hand hygiene
- ▶ Dental care (abx prophylaxis per AHA)

MONITOR FOR CHF

- ▶ Daily weights (same scale, same time)
- ▶ Strict I&O; count wet diapers
- ▶ Apical HR × 1 full minute BEFORE digoxin
- ▶ Lung sounds, RR, work of breathing
- ▶ Assess perfusion: cap refill, pulses, color

FAMILY EDUCATION

- ▶ Teach infant CPR to caregivers
- ▶ Signs of worsening CHF → when to call HCP
- ▶ Cluster care / decrease stimulation
- ▶ Emotional support; grief / chronic illness
- ▶ Growth & development monitoring

HIGH-YIELD MEDICATIONS

DIGOXIN (LANOXIN) — INOTROPE

- 💡 HOLD if: HR < 90 (infant), < 70 (child), < 60 (adolescent)
- 💡 Apical HR × 1 full minute before dose
- 💡 Toxicity: N/V, bradycardia, visual changes
- 💡 Hypokalemia ↑ toxicity risk
- 💡 Give 1 hr before or 2 hr after feeds
- 💡 If vomits → do NOT re-dose; notify HCP

INDOMETHACIN / IBUPROFEN (PREEMIE)

- 💡 CLOSES PDA (prostaglandin inhibitor)
- 💡 Monitor renal function, urine output
- 💡 Watch for GI bleed, ↓ platelets
- 💡 Used in preterm infants with symptomatic PDA

FUROSEMIDE (LASIX) — LOOP DIURETIC

- 💡 Monitor K⁺ (risk: hypokalemia)
- 💡 Daily weight, strict I&O
- 💡 Offer K⁺ rich foods: banana, potato, OJ
- 💡 Watch for dehydration signs

PROSTAGLANDIN E1 (ALPROSTADIL)

- 💡 KEEPS PDA OPEN — used in duct-dependent lesions (e.g., severe CoA)
- 💡 Side effect: apnea → have intubation ready!
- 💡 Continuous IV infusion
- 💡 Monitor BP, temp, perfusion



Quick Compare Table & NGN Case Study



COMPARE AT A GLANCE

Defect	Classic Murmur	Key Finding	Priority Tx
VSD	Harsh holosystolic, LLSB	CHF signs in infancy · #1 most common CHD	Small close on own · surgical patch
ASD	Soft systolic + <i>fixed split S2</i>	Often asymptomatic until adulthood	Cath device closure
PDA	Continuous "machine-like"	Wide pulse pressure, bounding pulses, preemies	Indomethacin / Ibuprofen · Ligation
CoA	Systolic at the back	↑ BP arms / ↓ BP legs · absent femoral pulses	PGE ₁ (keep PDA open) → Surgical repair
AS	Systolic ejection, RUSB → radiates to neck	Chest pain, syncope w/ exertion	Balloon valvuloplasty · no competitive sports
PS	Systolic ejection, LUSB (2nd ICS)	Often mild; severe → R-sided HF	Balloon valvuloplasty (procedure of choice)

NGN CLINICAL JUDGMENT — Apply the Model

1

Recognize Cues

2

Analyze Cues

3

Prioritize Hypothesis

4

Generate Solutions

5

Take Actions

6

Evaluate Outcomes

UNFOLDING CASE SCENARIO

"A 3-month-old exclusively breastfed infant presents for WCC. Mom reports baby is 'always sweaty during feeds,' takes >45 min per feed, and has gained only 4 oz in 3 weeks. VS: T 98.4°F, HR 172, RR 68, SpO₂ 96% RA. Auscultation reveals a loud harsh holosystolic murmur at the LLSB and crackles bilaterally."

- ① **Recognize Cues:** diaphoresis w/ feeds · prolonged feeds · poor weight gain · tachycardia · tachypnea · holosystolic murmur LLSB · bilateral crackles.
- ② **Analyze Cues:** Classic CHF triad in an infant + holosystolic murmur LLSB = **Ventricular Septal Defect with L → R shunt and pulmonary overcirculation.**
- ③ **Prioritize Hypothesis:** CHF secondary to VSD. Immediate priorities: *oxygenation · decrease cardiac workload · optimize nutrition.*
- ④–⑤ **Generate & Take Actions:** Place infant upright · supplemental O₂ · obtain echocardiogram · fortified feeds (24 kcal/oz) · limit feeds ≤ 30 min · initiate digoxin + furosemide as ordered · cluster care · teach parents CHF warning signs.

✓ **Evaluate Outcomes:** Improved weight gain trajectory · HR < 160 · RR < 50 · no diaphoresis with feeds · clear lung sounds · appropriate growth curve.

PARENT TEACHING — "Call Provider Immediately If..."

- ✓ Baby is breathing faster than usual or working harder to breathe (retractions, grunting, nasal flaring)
- ✓ Sweating heavily with feeds or at rest · refusing feeds · tires after a few minutes of feeding
- ✓ Bluish color of lips, nails, or skin (**cyanosis**) — even with an acyanotic defect
- ✓ Poor weight gain — never miss weight-check appointments
- ✓ Extreme fussiness, lethargy, or unable to wake baby
- ✓ Fever ≥ 100.4°F (38°C) — risk for endocarditis

ONE-LINE TAKEAWAY

Acyanotic = PINK baby · L → R shunt or obstruction · Watch for **CHF + FTT** · Priority = feed efficiency, CHF meds, infection prevention 💖