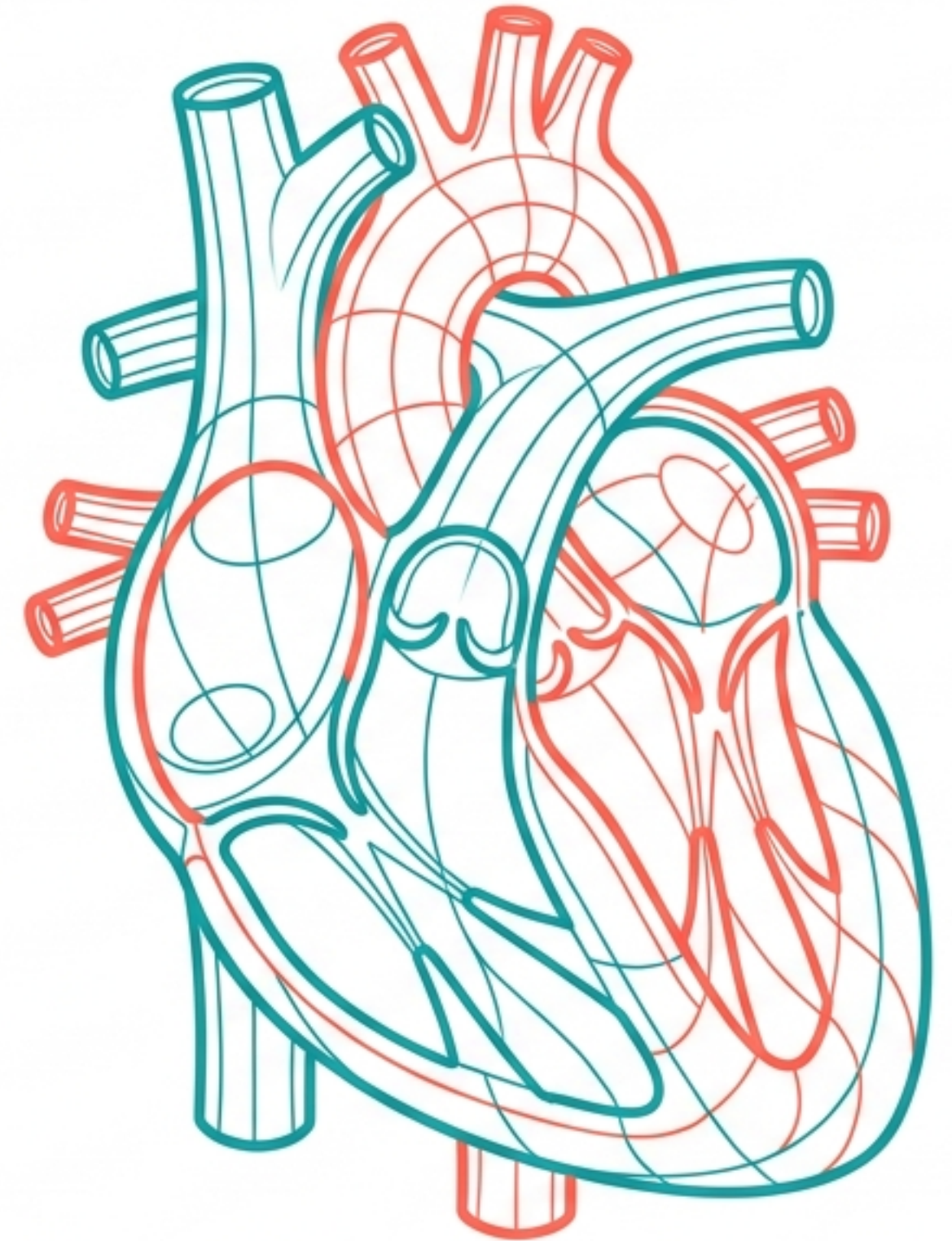


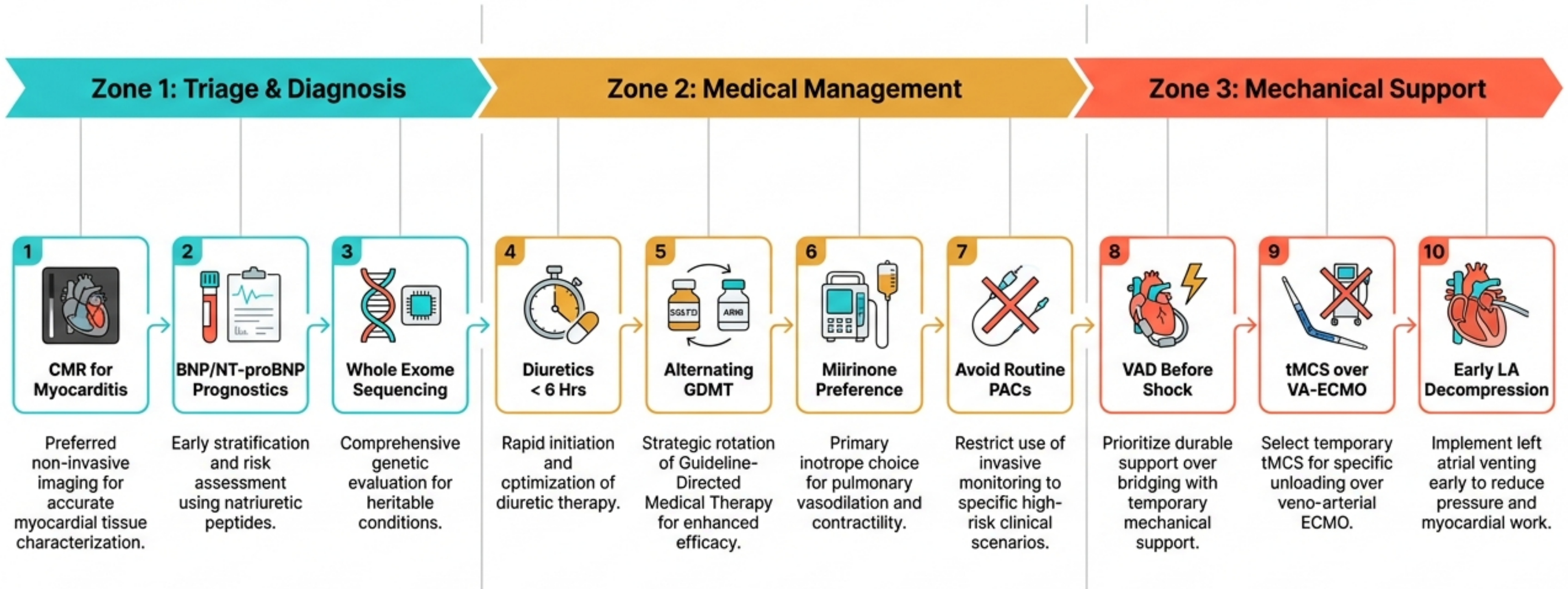
The 2026 Clinical Blueprint for Pediatric Acute Heart Failure

Distilling the CCS/CPCA Guidelines into Actionable Bedside Protocols and Actionable technical

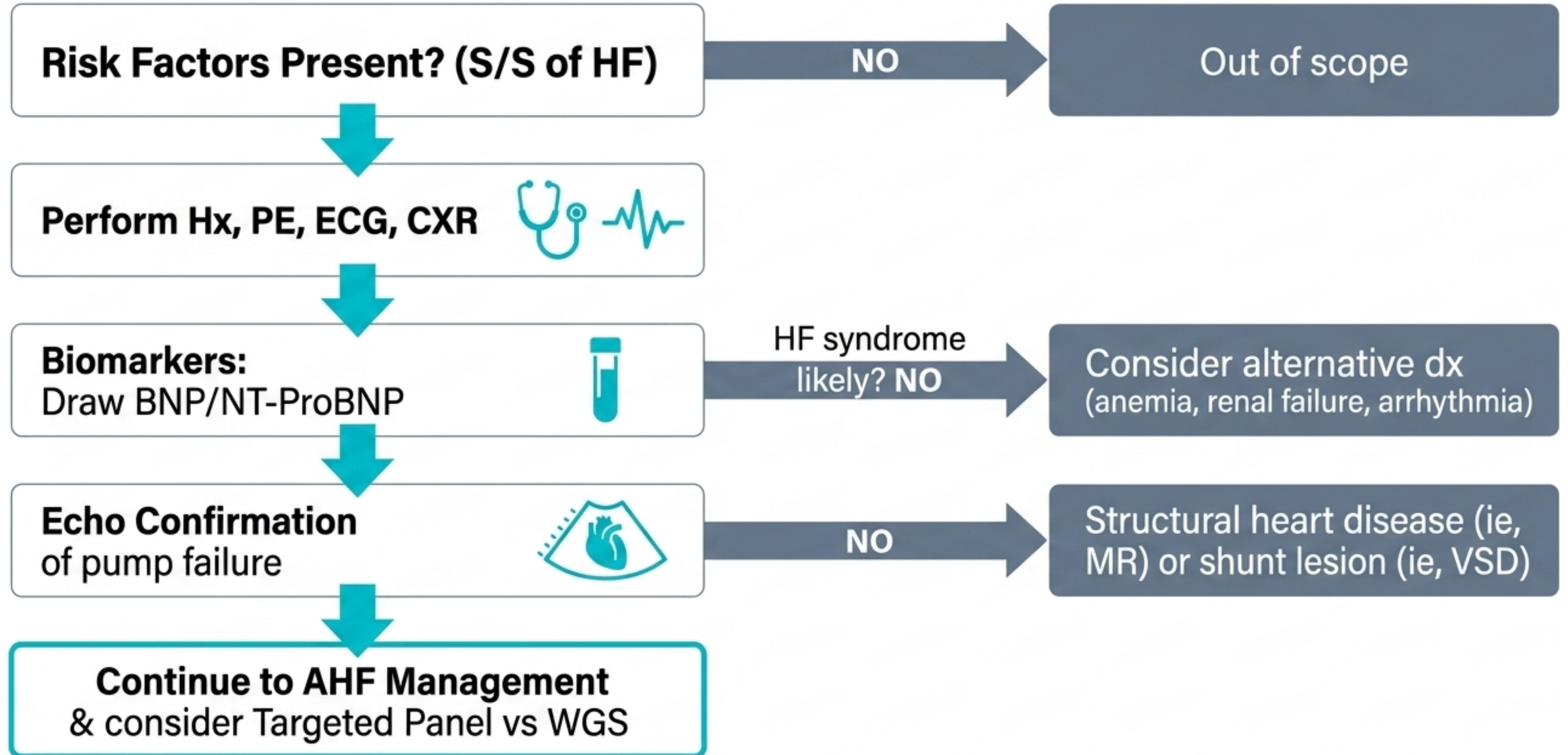


Designed for Intensive Care, Emergency, and Cardiology Specialists

10 Critical Paradigm Shifts Across the Patient Pathway



The Suspected AHF Triage Protocol



Prognostic Anchoring with Natriuretic Peptides

[**CONDITIONAL** / VERY LOW CERTAINTY]

The Initial Assessment (12-24 Hours)



- Draw BNP or NT-proBNP within the first 12-24 hours to capture the stable acute (peak) level.
- Valid across pediatric patients (concordance lower in neonates <30 days or poor GFR).

Serial Monitoring (Inpatient)



- Draw at least weekly to monitor treatment effect.
- Crucial trigger: Always measure when initiating inotropes or MCS to establish a baseline.

The PredischARGE Baseline

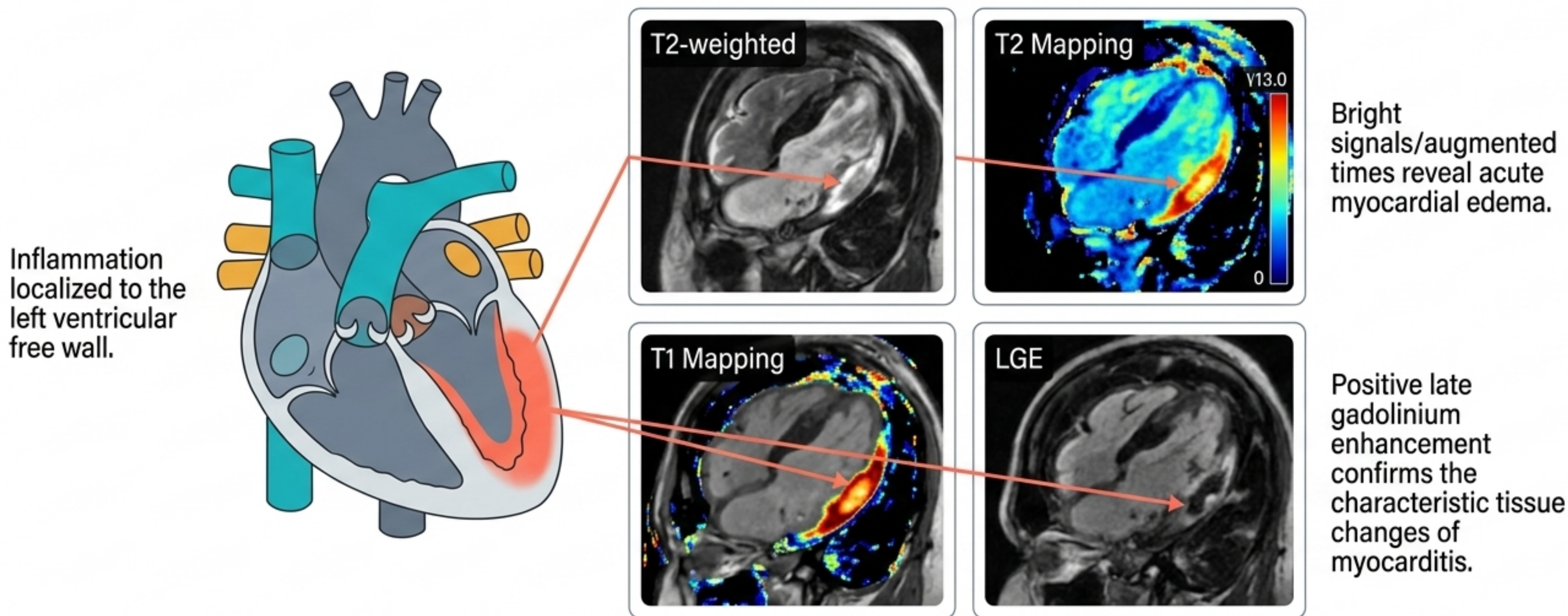


- Establish an ideal patient-specific baseline level before sending the patient home.

Mapping Myocardial Edema: The CMR Dashboard

[CONDITIONAL / VERY LOW CERTAINTY]

Perform **CMR as soon as feasible (within 7–14 days)** in suspected myocarditis to define injury, stratify risk, and rule out dilated cardiomyopathy.

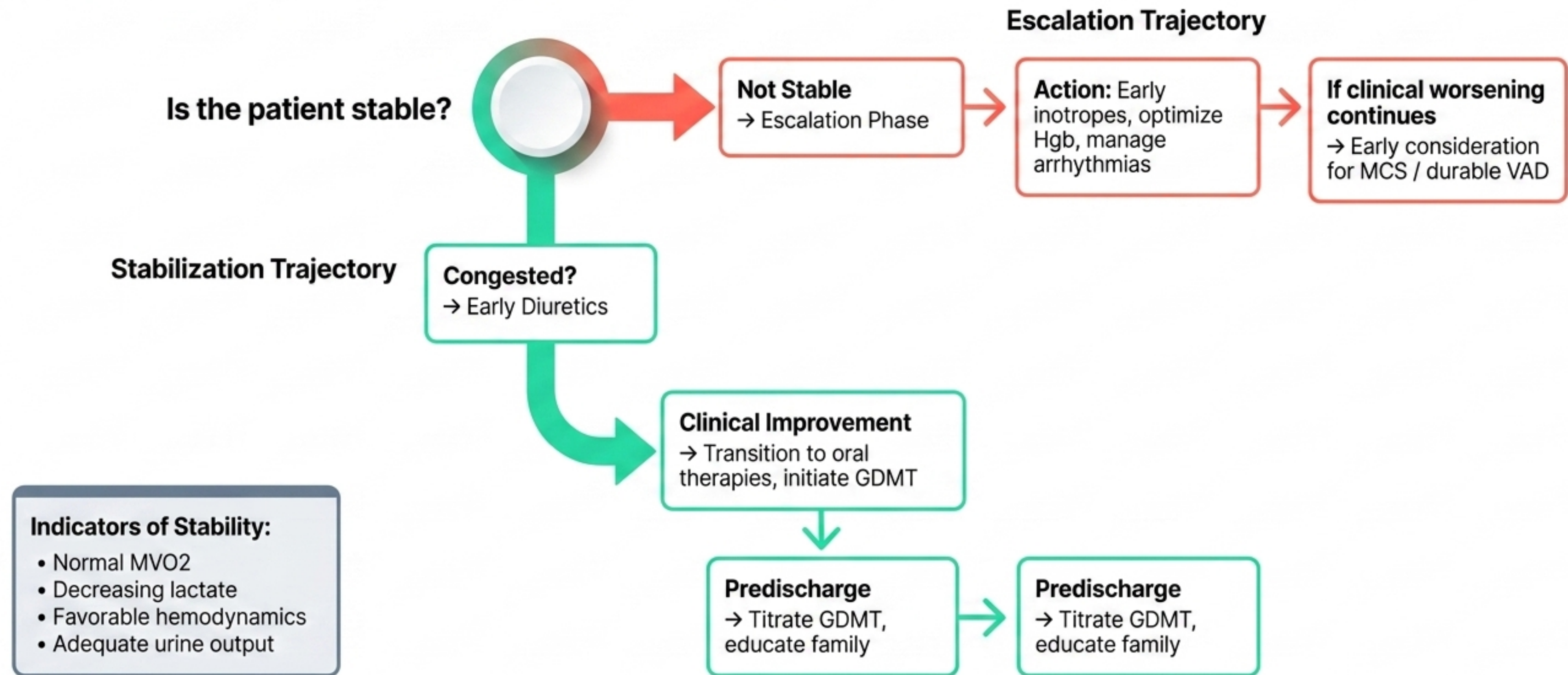


Precision Diagnostics: WES vs. Targeted Panels

Targeted Cardiomyopathy Panel	Whole Exome Sequencing (WES)
Preferred Profile: Older patients with isolated HF	Preferred Profile: Infants < 2 years or multisystem disease presentation
Diagnostic Scope: Limited to known cardiomyopathy genes	Diagnostic Scope: Captures multisystem disorders and informs broad family planning/transplant candidacy
Guideline Recommendation: Use as a secondary option based on acuity	Guideline Recommendation: First-tier approach for children with AHF

Crucial Caveat: Consider supplemental testing for copy number variants and mitochondrial genome variants not captured by standard WES.

The Divergence Point: Stabilization vs. Escalation



The Golden Six Hours for Diuretic Initiation

[CONDITIONAL / LOW CERTAINTY]

Initiate intravenous bolus diuretic therapy within 6 hours of presentation for new-onset symptomatic HF with congestion.

06:00:00

1. Hemodynamic Clearance:

Ensure patient has adequate cardiac output; aggressive diuresis is not tolerated in pure low-output shock.

2. Renal Baselines:

Adjust initial dosing for diuretic-naïve patients or those with baseline renal dysfunction.

3. Output Monitoring:

Strictly track urine output (mL/kg/h), fluid intake, and intravascular fluid status.

The Inotrope Showdown: Optimizing Hemodynamic Support

[CONDITIONAL / VERY LOW CERTAINTY]

Milrinone is the preferred inotrope for pediatric AHF over dobutamine or levosimendan. Start based on symptomatic HF, never purely on echocardiographic findings.

Preferred Milrinone	Dobutamine	Levosimendan

The Milrinone Guardrails

- **Goal:** Keep duration as short as possible; aggressively transition to enteral HF therapies.
- **Monitor For:** Hypotension, arrhythmias, and thrombocytopenia.
- **Track:** Mixed venous saturation, lactate, and liver/renal function.

Phasing Out Routine Pulmonary Artery Catheters

[CONDITIONAL AGAINST / VERY LOW CERTAINTY]



Core Directive

Routine invasive monitoring with a PAC is not recommended in children with AHF.

The Rationale

- Lack of pediatric evidence supporting improved outcomes.
- High risk of bias in indirect adult observational studies.
- Non-invasive and less invasive surrogate markers (MV02, lactate, echo, clinical perfusion) are preferred for routine hemodynamic profiling.

Accelerating GDMT: The Alternating Initiation Strategy

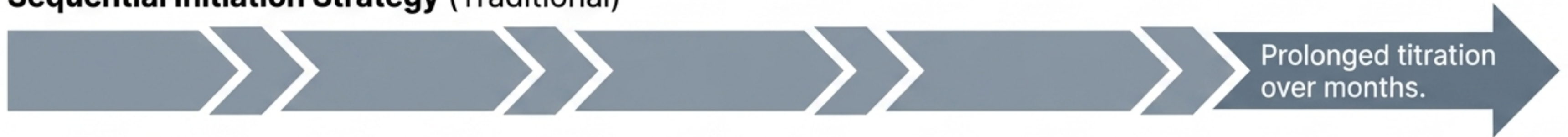
Alternate the initiation of GDMT (starting multiple medications relatively simultaneously at low doses) rather than waiting to max out one drug at a time.

Target therapeutic dosing across multiple neurohormonal receptors in as little as 14 days.

Alternating Initiation Strategy (Preferred)



Sequential Initiation Strategy (Traditional)



- Monitor HR and BP at baseline and every 30 mins for up to 2 hours post-dose.

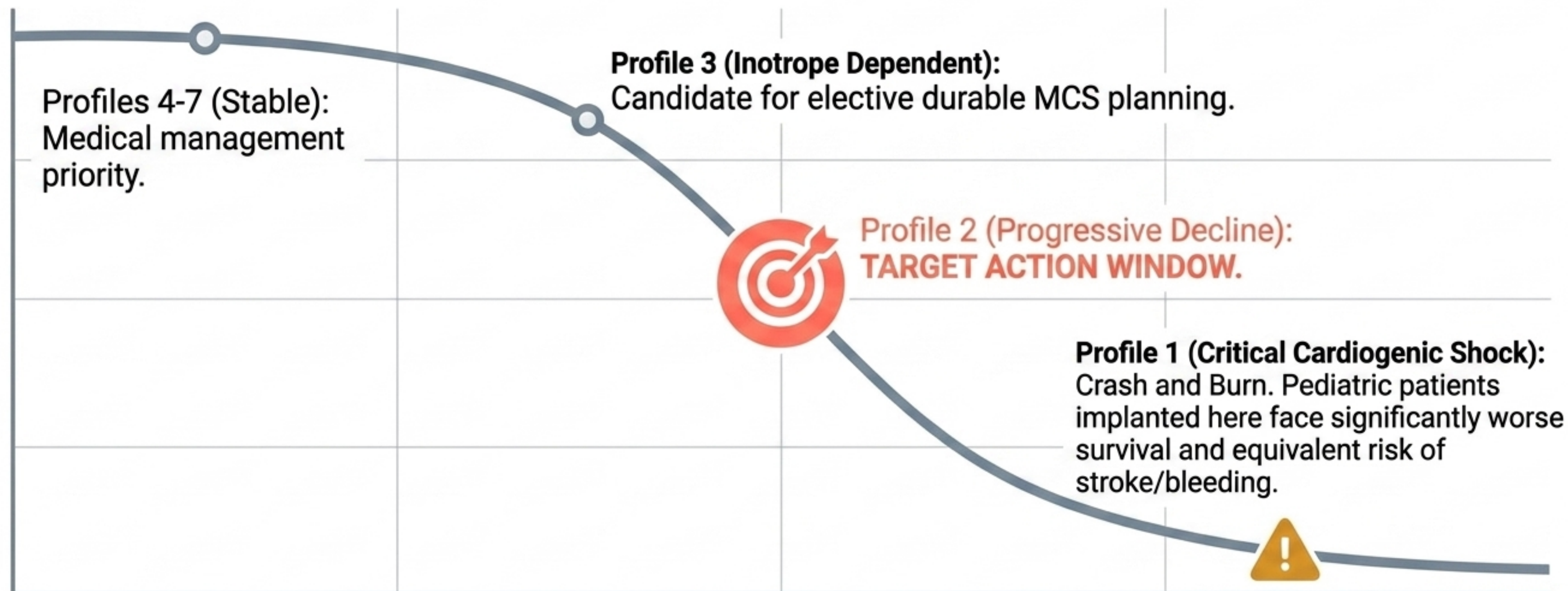
- Increase doses on alternate days (every 24-48 hours).

- **Caution:** Watch for serum creatinine spikes with RAAS inhibitors.

The Escalation Curve: Timing Durable VAD Implantation

[STRONG / VERY LOW CERTAINTY]

Implant VADs before cardiogenic shock develops (Profiles ≥ 2), rather than waiting for circulatory collapse (Profile 1).



Mechanical Support Triage: tMCS vs. VA-ECMO

[CONDITIONAL / VERY LOW CERTAINTY]

tMCS (Centrifugal or Percutaneous Axial Flow)

- **Guideline Status:** Preferred strategy.
- **Benefits:** Promotes earlier mobility, potential for better ventricular unloading.
- **Risks:** Neonates and infants are at higher risk for device thrombosis and infection due to small size and immature immune systems.

VA-ECMO (Extracorporeal Membrane Oxygenation)

- **Role:** Reserved for acute stabilization in patients with severe pulmonary congestion or primary lung pathology prior to VAD transition.

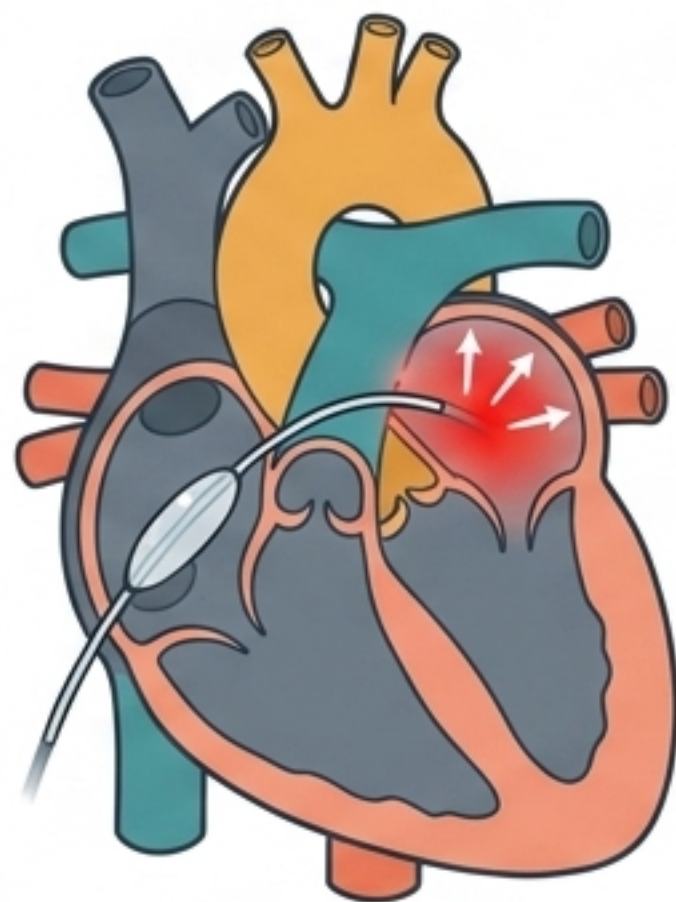
Institutional Prerequisites

Adopting tMCS requires specialized surgical expertise, rigid anticoagulation protocols, and high-volume center infrastructure.

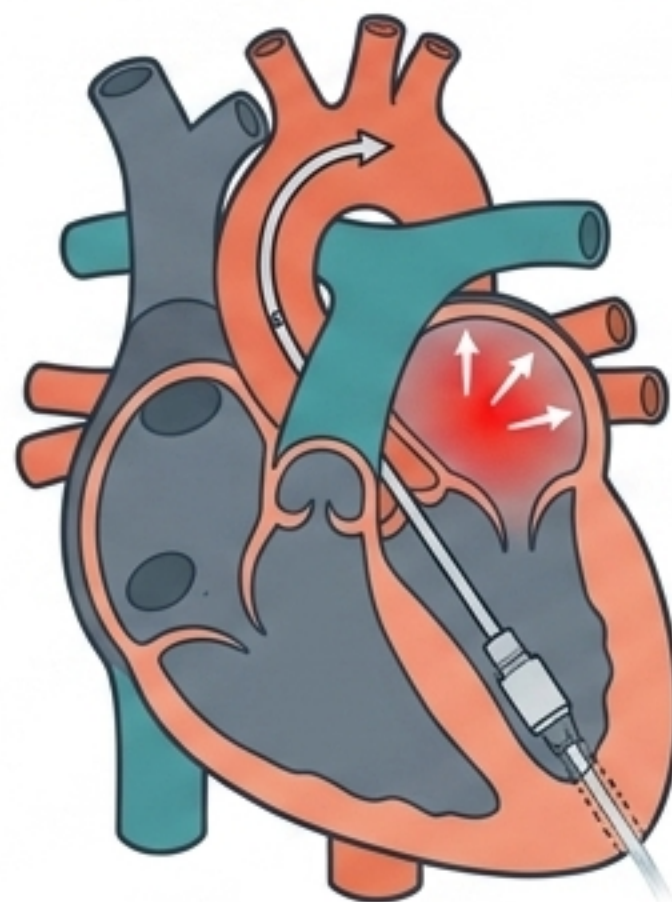
The 24-Hour Rule: Left Heart Decompression on ECMO

[CONDITIONAL / LOW CERTAINTY]

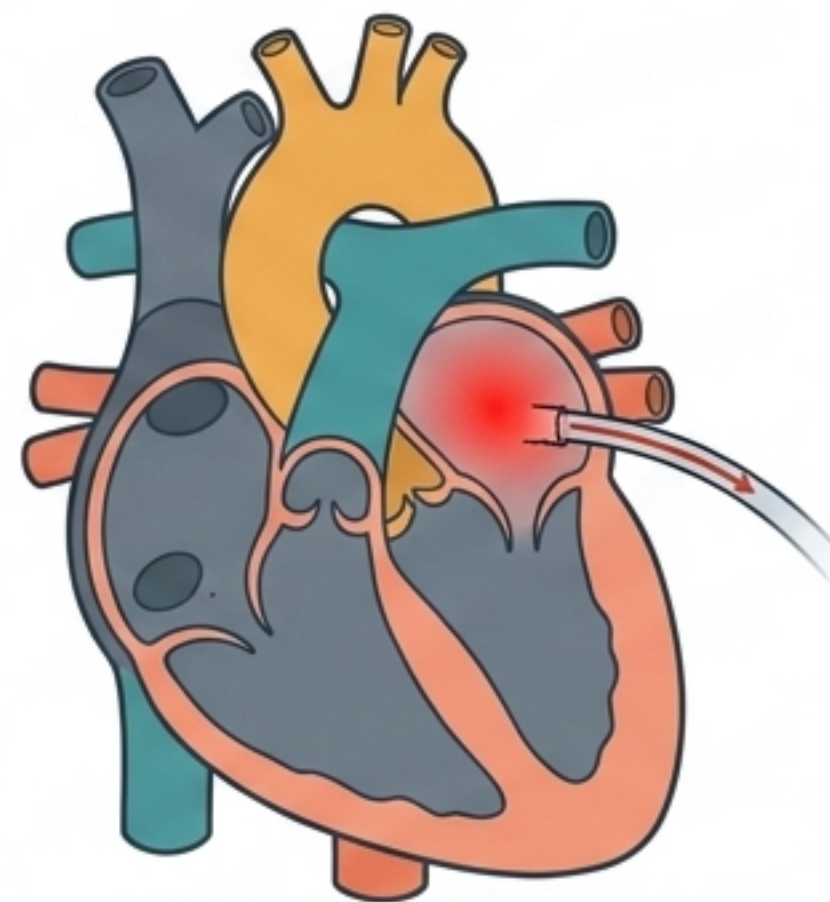
Perform left heart decompression within the first 24 hours of VA-ECMO treatment to prevent clinical sequelae of LA hypertension.



Balloon Atrial Septostomy (A)



Percutaneous Micro-axial Pumps (B)



Surgical Venting (D)



Step 1 (Watch for early signs)

Loss of arterial line pulsatility and increasing pulmonary congestion indicate rising LA pressure.



Step 2 (Intervene < 24 Hours)

Depending on patient size and anatomy, execute Balloon Atrial Septostomy (A), Percutaneous Micro-axial Pumps (B), or Surgical Venting (D).

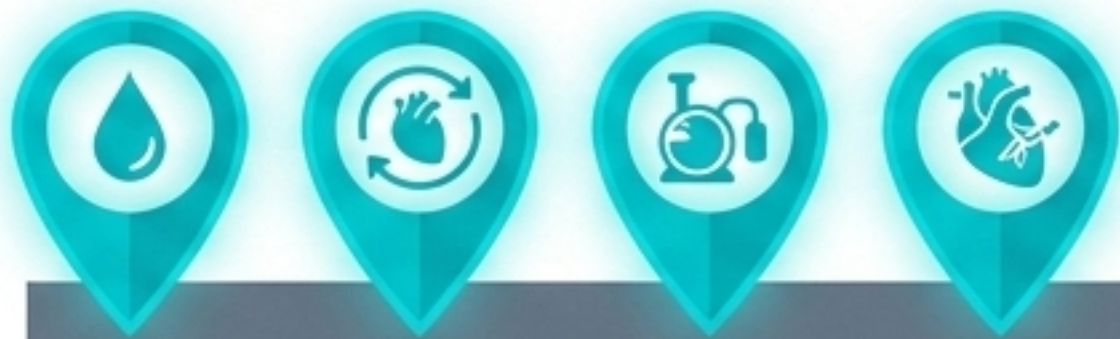


Outcome

Avoids florid LA hypertension and reduces ECMO morbidity.

Synthesis: The Power of Proactivity

The 2026 CCS/CPCA guidelines fundamentally shift pediatric AHF management from **reactive** salvage to **proactive optimization**. Every major update advocates for intervening earlier.



Early Diuresis:

Pushing IV bolus within the first 6 hours.

Early GDMT:

Alternating rapid initiation rather than sequential waiting.

Early VADs:

Implanting at INTERMACS 2 before cardiogenic shock strikes.

Early Decompression:

Venting the left heart within 24 hours of ECMO.

The 2026 Pediatric AHF Bedside Playbook

Triage & Diagnostics

- [] Draw BNP/NT-proBNP within 12-24 hours.
- [] Order CMR within 7-14 days to map edema/LGE.
- [] Trigger WES for infants or multisystem presentations.

Medical Management

- [] **Push IV diuretics < 6 hours** from presentation.
- [] Initiate **Milrinone** (monitor HR/BP closely).
- [] Start **alternating GDMT** (target 14-day optimization).
- [] Avoid routine PAC placement.

Mechanical Support

- [] **Evaluate for VAD at INTERMACS 2** (Before Profile 1 shock).
- [] **Prioritize tMCS** if center volume/infrastructure allows.
- [] **Decompress left heart < 24 hours** if on **VA-ECMO**.