Implementation of a threshold based Pediatric Heart Center High Risk Pathway Quality Improvement Initiative to reduce Failure to Rescue Rates

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Background

- PC4 "Failure to Rescue" (FTR) occurs when a patient experiences at least one complication and does not survive the hospitalization.
- Despite an established "PROactive Mitigation to decrease Serious adverse Events" (PROMISE) system, Nationwide Children's Hospital (NCH) Heart Center identified a higher-than-expected FTR rate in 2023.

Project AIM: To formalize a new High-risk pathway to reduce our Overall surgical FTR O/E ratio from a baseline of 2.74 in 2023 to less than 2 in 2025 and sustain for 3 years through 2027.

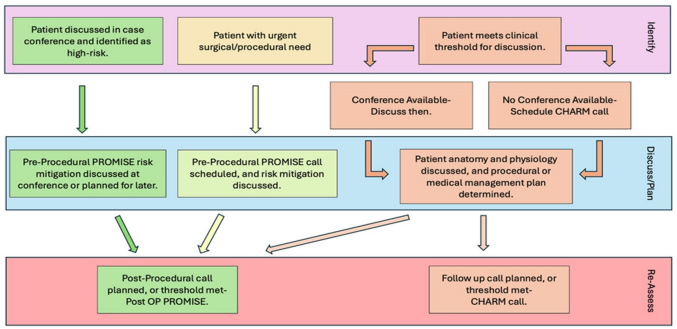
Methods

A multidisciplinary team updated the procedural risk mitigation PROMISE system and created the CHARM (Comprehensive Heart Assessment Review of Management) pathway. The pathway launched in January 2025.

Key Features:

- Standardized clinical thresholds
- Streamlined electronic scheduling and patient tracking
- Daily High-risk Navigator to coordinate urgent cases and document discussions

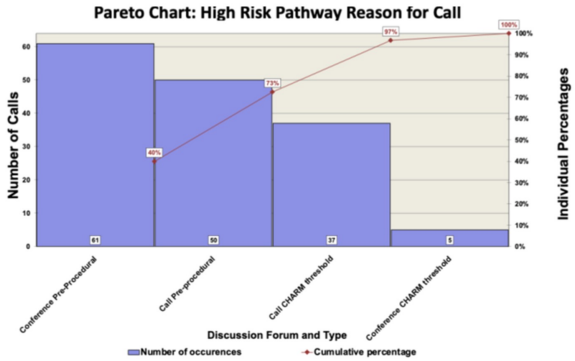
Heart Center High Risk Pathway Process Map



Results

Patient Enrollment

- 153 patients underwent initial multidisciplinary review
  - 66 (43%) discussed at the Heart Center case conference
  - 79 (57%) discussed via virtual review

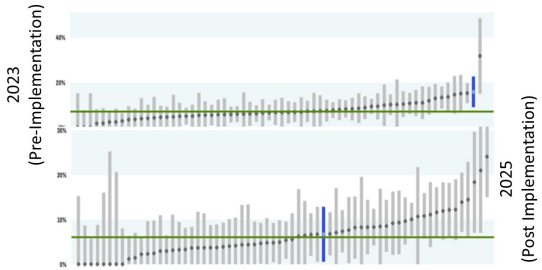


Clinical Impact

- Overall surgical FTR O/E ratio improved 2.74 (2023) → **1.16 (2025)**
- Major surgical FTR O/E ratio improved 1.90 (2023) → **1.57 (2025)**

Data source Arbor Matrix, abstracted 1/22/2026

Overall Surgical Failure to Rescue Rates



Comprehensive Heart Assessment Review of Management

Nationwide Children's Heart Center
High Risk Pathway
Thresholds of Deviation

Proactive Mitigation to decrease Serious adverse Events

Cardiac OR

Intra-OP 2nd surgical opinion AND PROMISE/CHARM afterwards:

1. Second bypass run to re-do a significant portion of the actual repair
2. New or worsened (moderate +) valvular dysfunction
3. New severe ventricular dysfunction – Also consider intra-OP PAACT or CTICU consult to review causes and discuss need for support
4. Intra-OP cardiac arrest with >3 minutes of CPR
5. Inability to separate from bypass

Intra-OP Specialty consult AND PROMISE/CHARM afterwards:

1. Arrhythmia out of expected by surgeon or administration of intra-OP antiarrhythmics – Intra-OP EP consult, placement of A and V wires
2. AV block with insufficient escape for age – Intra-OP EP consult, placement of A and V wires consideration of redundant wires or permanent PM
3. Un-expected VT, ST changes, or segmental wall motion abnormalities on TEE – Cath consult for coronary angiogram
4. Pulmonary Hypertensive event: Reassess operative plan (MPA band instead?) PH consult, iNO, plan to leave intubated
5. VIS score > 10 to maintain adequate hemodynamics for age – Intra-OP PAACT or CTICU consult to review causes and discuss need for support

Echo Lab

Intra-OP Angiogram AND PROMISE/CHARM call afterwards:

1. Segmental wall motion abnormalities on TEE

Conference Presentation or CHARM call if no conference within 48 hours:

1. New severe systemic AV valve regurgitation or severe AI
2. New severe RV or LV dysfunction

Cath Lab

Post Cath PROMISE call:

1. Limb threatening concern – call to include hematology and vascular surgery
2. Uncontrolled vascular tear
3. Single source pulmonary blood flow with refractory hypoxemia or hemodynamic instability
4. Pulmonary hemorrhage requiring endotracheal epi, protamine, or bronchial blocker
5. Intra-procedural or post-procedural concern for stroke
6. Active retroperitoneal bleed
7. HLHS MS/AA or PA/IVS with persistent ST changes or increased inotropic support
8. PA/IVS with concern for inadvertent cardiac/MPA perforation

Cardiac Step Down (H4A)

Conference Presentation or CHARM call if no conference within 48 hours:

1. New severe systemic AV valve regurgitation or severe AI
2. New severe RV or LV dysfunction without end organ dysfunction
3. Diagnosis without "in-house expertise" to guide decision making

Cardiac ICU

PROMISE/CHARM call (Immediate):

1. VIS > 10
2. Post-transplant primary graft dysfunction with CVP>15 and/or rising lactate

PROMISE/CHARM call within 12-24 hours:

1. New severe RV or LV dysfunction with end organ dysfunction
2. Any unplanned ECMO

Conference Presentation or PROMISE/CHARM call if no conference within 48 hours:

1. New severe systemic AV valve regurgitation or severe AI
2. New severe RV or LV dysfunction without end organ dysfunction
3. Diagnosis without "in-house expertise" to guide decision making
4. Medical bounce back to CTICU x2
5. Surgical bounce back to CTICU x1

Conclusion

Implementation of a novel High-risk pathway at NCH was associated with improvement in FTR rates. Continued monitoring and improvement efforts aim to further reduce FTR events and increase pathway utilization through EMR integration.

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