

**Project Leads/Key Contacts**

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**Why are you interested in the Improvement Scholars Program?**

The Improvement Scholars Program will provide a rigorous foundation for our effort to reduce the incidence and severity of cardiac arrest in children with acquired and congenital heart disease and after cardiac surgery. Our team consists of a nurse practitioner and a junior faculty physician who will be part of the core team launching the Pediatric Cardiac Intensive Care Unit as a distinct clinical entity. We envision this project as an opportunity both to provide the best possible patient care but also to contribute to a unit culture of ongoing quality improvement grounded in the principles of improvement science. By participating in the Improvement Scholars Program, we hope not just to achieve our immediate project aims but also to gain the skills needed to execute a wide range of improvement efforts over the course of our careers.

**Problem Statement: What is the problem you are looking to solve?**

The overarching aim of this project is to reduce the frequency and severity of cardiac arrest events in the UNC Pediatric Cardiac Intensive Care Unit through the development of a multidisciplinary cardiac arrest prevention bundle grounded in evidence-based pediatric cardiac critical care practices.

Preliminary unit-level data suggest that cardiac arrest is a significant adverse event within our PCICU population. Since April 2021, 49 patients have experienced at least one cardiac arrest during their PCICU stay. Available severity data demonstrate that arrest events occur across a broad spectrum of illness severity. This finding is consistent with published pediatric cardiac ICU data demonstrating that cardiac arrest risk is not limited to the highest surgical complexity patients and reinforces the need for unit-wide preventative strategies.

**Importance Statement: Why is this project important?**

Successful development and implementation of a cardiac arrest prevention bundle will provide the best possible chances for our patients to avoid cardiac arrest events. Such events can obviously lead to mortality, and even successful resuscitations are associated with substantial morbidity and duration of hospitalization. We anticipate minimal downside risk for patients, and though this effort does have the potential to increase cognitive burden of providers and rounding time, we feel that time spent developing a shared mental model of physiologic deterioration and a precise resuscitation action plan warrants these costs.

Prior multicenter pediatric cardiac ICU studies and collaborative initiatives have demonstrated that standardized risk identification, structured communication, and proactive escalation pathways are associated with reductions in cardiac arrest events, unplanned extracorporeal CPR, and mortality. Care bundles and early warning frameworks are now considered best practice in cardiac critical care environments. Our colleagues in the Duke Pediatric Cardiac Intensive Care Unit have successfully implemented such a program for several years with excellent outcomes. Additionally, a multicenter research collaborative recently published their results showing a 30% reduction in risk-adjusted IHCA in CICU patients after implementation of a structured care bundle (Alten et al, JAMA Pediatrics 2022).

This initiative aligns with institutional priorities of patient safety and high-reliability care and supports the foundational development of the nascent Pediatric Cardiac Intensive Care Unit. We have discussed our goals

and objectives with our division leadership and have their full support for this effort, and we look forward to discussing our plans with the Children's Quality Improvement council.

**Project Scope**

Our project is designed to target the patients most at risk for cardiac arrest in the Pediatric Cardiac Intensive Care Unit. Based on local and national data, we will activate the care bundle for the following patients:

- All neonates after cardiac surgery or interventional cardiac catheterization until 24 hours after extubation
- Patients of any age returning from surgery with an open chest or supported by ECMO
- Patients with new-onset heart failure requiring two or more inotropic infusions
- Patients with known cardiac arrhythmia requiring an anti-arrhythmic infusion
- Patients with known severe pulmonary hypertension requiring inhaled nitric oxide
- Patients requiring high levels of vasoactive/inotropic support for any reason (defined based on local practices as epinephrine > 0.05 mcg/kg/min, vasopressin > 40 mU/kg/hr, or any three vasoactive/inotropic infusions)
- All patients with a history of cardiac arrest during the admission
- Others at the discretion of the PCICU attending physician

Based on historical data, we expect approximately 30 patients per year will meet criteria for activating the care bundle. These criteria define a subset of patients cared for exclusively in the intensive care unit at the most critical phase of their illness. While certain of these criteria may be satisfied by patients in the general PICU, our focus for this program will be on patients admitted to the PCICU service.

**Measures: (Process, Balancing, Structure)**

Measure Name	Measure Type	Measure Calculation	Measure Exclusion	Data Source	Baseline	Goal	Collection Frequency
Cardiac arrest event rate	Outcome	Cardiac arrests per PCICU encounter	Cardiac arrest after redirecting care	EPIC, PC4 database	4.2%	3.4% (20% reduction)	Monthly
Inclusion rate	Process	Patient not on program within 12 hours of meeting criteria, adjudicated by team leadership	PICU patients boarding in PCICU DNR status	Manual review	N/A	>95%	Weekly in initial phase, goal to space to monthly after program well-established
Huddle completion rate	Process	Percentage of shifts initialed by providers while on program (see addendum)		Manual review	N/A	>85%	Monthly
Perceived efficacy	Process	Questions assessing effectiveness of bundle using Likert scale (see addendum)		Survey	To be obtained from pre-	Improvement from baseline	Every 6 months

					bundle survey		
Perceived burden	Balancing	Questions assessing administrative burden of CARP rounds using Likert scale		Survey	N/A	Majority of participants stating minimal/low burden	Every 6 months

### Root Cause Analysis

Patients in the pediatric cardiac intensive care unit are at increased risk of in-hospital cardiac arrest for a range of reasons, both fixed and modifiable. Tenuous cardiovascular physiology pre- and post-surgical intervention is an unavoidable reality for many congenital heart defects, and post-cardiopulmonary bypass cardiac dysfunction is a substantial threat that occurs even with optimal surgical results. Given these facts, historically it has been felt that many occurrences of IHCA in this population are unavoidable. However, careful and comprehensive post-arrest reviews and quality improvement research in this space have found that there is very often a period of physiological deterioration prior to cardiac arrest, and that this deterioration can go unnoticed until after the arrest becomes inevitable. The pre-arrest deterioration can often progress over a relatively short period of time, such that even if the deterioration is detected in a timely fashion, providers may be unable to plan and enact an appropriate response in time to prevent cardiac arrest. Put simply, the **failure to rescue** patients from ICHA stems from the **failure to recognize** the pre-arrest state and the **failure to respond** with appropriate resuscitative measures.

This failure to recognize and failure to respond themselves arise from systemic vulnerabilities in providing patient care in the PCICU. Principal among these is the difficulty of maintaining situational awareness and a shared mental model of cardiac arrest risk for individual PCICU patients with different cardiac anatomies, comorbidities, and at different stages of their convalescence. The bedside nurse may have the most up-to-date information about the patient's vital sign trend but not the awareness of when a particular trend portends decompensation. The patient's physician may have a variety of contingency plans in mind but their utility will be limited if the patient is *in extremis* before they are aware of an issue. The respiratory therapist may not have been made aware that the patient's physiology does not tolerate 100% FiO2, or that in-line suctioning requires pre-sedation to avoid a pulmonary hypertensive crisis. If the patient's pharmacist is not aware of a patient's risk of arrest, appropriate rescue medications may take precious minutes to prepare. All of these vulnerabilities are magnified by factors such as experience level, workload, and interprofessional communication barriers.

### Ideas for Improvement

The core of our proposed program for ICHA prevention is the cardiac arrest prevention (CAP) safety huddle. This constitutes a formal, multidisciplinary bedside discussion to facilitate situational awareness among the entire care team for high-risk patients. The discussion will include the following components:

- Vital signs: a discussion of individualized vital sign ranges based on the patient's physiologic goals, including discussion of alarm-level deviations that portend decompensation and warrant immediate provide notification
- Preventative measures: a discussion of which elements of routine care may need modification based on the patient's perceived risk of arrest. This includes, for example, the need to pre-sedation for noxious stimuli, to have a physician or nurse practitioner at bedside for endotracheal tube manipulation, or to take extra precautions with medication drip changes.

- Availability of resuscitative tools: a discussion of medications to be readily available at the bedside, appropriate settings for temporary pacemakers, and the current routes of access for emergency medications.
- 'First steps' response: a discussion of initial resuscitative measures to be taken by bedside personnel as soon as a peri-arrest state is recognized and while the full team is being mobilized. These should include clear if-then instructions with appropriate thresholds for initiating emergency resuscitation.
- 'Next steps' response: a discussion of when to initiate compressions, targets for adequate CPR delivery, and plan for ECMO activation.

This safety huddle will occur each shift (twice daily) to maintain appropriate vigilance in the setting of changing work shifts. A secondary element of the program will be formal code reviews within two weeks of an IHCA to identify modifiable causes of IHCA, target improvement efforts, and inform future improvements to the safety bundle.

### **Risks and Opportunities**

The most important factor for the long-term success of this program will be ongoing buy-in from team members within the multidisciplinary PCICU team. The goal of reducing IHCA is self-evident; however, fostering the belief that IHCA is preventable and that the safety huddle is an effective prevention tool will be crucial to maintaining engagement with the huddle discussions. Relatedly, a foreseeable risk with a quality improvement program targeting IHCA is the low likelihood of immediate gratification. Even in the PCICU, cardiac arrest is a rare event, and detecting a consistent and measurable change in our IHCA rate will be a project of months and years. The risk is that the huddle will become rote or busy-work, a check-box tacked on at the end of traditional rounds.

These risks can be mitigated by role modeling by clinical leadership and an emphasis on participation and multi-party communication rather than a recitation by the rounding leader. The impact of this program will be strengthened by the ongoing inclusion of a wide array of PCICU providers, including but not limited to nursing, respiratory therapy, pharmacy, Cardiology, and CT surgery. A successful resuscitation after cardiac arrest involves the coordinated participation of all these team members; the safety huddle in essence constitutes a pre-resuscitation whose success depends on these same factors. Another way to keep providers engaged with the program is to celebrate successful resuscitations. This can be done both in-the-moment by team leaders after a patient is stabilized and also more formally by discussing 'near-arrests' in addition to code reviews.

As mentioned previously, one of the motivating factors for implementing this program is the transition of pediatric cardiac intensive care into a dedicated PCICU unit, a transition which involves both a new environment and a high proportion of new care team members. This is both a challenge and an opportunity. Fashioning ourselves into a high-performing team will take time and effort; however, we have the chance to establish fresh goals and expectations and grow a team with IHCA prevention as a core part of its culture.

**Stakeholders and Project Team Members**

Name	Role
Ryan Barbaro, PCCM division chief Tim Hoffman, Cardiology division chief Robert Hanfland, Pediatric CT surgeon Danielle Stolfi, PCICU Nurse Manager	<i>Sponsor(s)</i>
Matthew Foglia, PCICU attending physician Jennifer Talbot, PCICU nurse practitioner	<i>Team Lead</i>
Afsaneh Pirzadeh, PICU/PCICU attending physician Kimberly Jackson, Duke PCICU attending physician	<i>Subject Matter Expert</i>
Matthew Foglia, PCICU attending physician	<i>Data Lead</i>
Danielle Wood, PCICU nurse practitioner Kaitlin Campbell, PCICU nurse practitioner Avis Howell, PCICU RN (nursing liaison)	<i>Team members</i>

**Impact on the Quintuple Aim**

Cardiac arrest is a devastating complication of pediatric cardiac critical care. Beyond the obvious risk of mortality, even successfully resuscitated cardiac arrests carry substantial morbidity. For the patient, neurologic injury is common with lifelong impact; they are also at increased risk of other persistent organ dysfunctions such as renal failure requiring dialysis. The duration of mechanical ventilation, ICU length of stay, and hospital length of stay are prolonged, with predictable impacts on the patient, the patient’s family, and the cost of care. Also notable is the impact of cardiac arrest on the experience of clinicians and hospital staff. Negative outcomes generally, and cardiac arrests specifically, are major stressors for providers of critical care and burnout in this population is substantial. It is not difficult to imagine that a lower rate of IHCA would contribute to decreased rates of burnout and staff turnover, with attendant benefits to team performance and hospital costs. Setting aside the direct benefits of reducing ICHA, even the practice itself of identifying high-risk patients and developing a shared mental model for preventing IHCA will help staff feel more supported and empowered to care for vulnerable patients. Finally, there are persistent disparities in the mortality rate due to congenital heart disease among patients of different races and socioeconomic backgrounds; while this program does not directly address the causes of these disparities, preventing IHCA across the board may disproportionately affect groups that are overrepresented in the PCICU population.

**Sustainment Plan**

The impact of any quality improvement program depends on its sustainability, and this program is no different. As mentioned previously, the transition to a new patient care unit and the onboarding of a relatively high proportion of new care team members offers an important opportunity: if we can establish this program as part of the foundational culture of this unit and its providers, it is substantially more likely to persist even if its initial champions eventually move on to other roles. Enthusiastic participation and sponsorship by clinical leadership will also help keep the team committed to the program.

With the IHQI’s support, we hope that this program will be well-founded on principles of improvement science including appropriate goal setting, high-quality implementation, rigorous data analysis, and continuous evaluation and adaptation through PDSA cycles/iterative learning. Establishing these values and practices at the outset of the program will improve its chances of becoming a long-lasting and effective source of quality improvement in our unit.

## **Carolina Quality Tools**

Carolina Quality Tools will be a key part of our program. As previously noted, the safety huddle will be the centerpiece of our improvement effort and is more fully discussed above. Elements of TeamSTEPPS are integrated into the program in a variety of ways. Most obviously, the safety huddle promotes situation monitoring, situational awareness, and the development of a shared mental model. It also constitutes a kind of pre-brief where roles and expectations are assigned in advance of a critical situation developing in order to facilitate a rapid and effective response. An effective safety huddle will include closed-loop communication and teach-back opportunities between the primary provider running the huddle and the bedside nurse and other team members. As with any substantial change in practice, our program may have unanticipated issues or consequences, which we will encourage staff to help us track using SAFE reporting. Finally, our formal code reviews will be founded on principles of Just Culture, seeking opportunities to learn from negative outcomes, identify systemic sources of error, and solicit ideas for improvement without judgment or blame.

## **References**

- Sponsor letters – see addenda



**DEPARTMENT OF  
PEDIATRICS**

**DIVISION OF CARDIOLOGY**

**FACULTY**

Timothy M. Hoffman, MD

*Division Chief*

Chris Atkins, MD

John Cotton, MD

Elman G. Frantz, MD

Robert J. Hartman, MD

Elizabeth Leong, DO

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Ryan Shea, MD

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February 13, 2026

Institute for Healthcare Quality Improvement  
University of North Carolina

Dear Members of the Grant Review Committee,

I am writing in my capacity as the Division Chief of Pediatric Cardiology to offer my strongest support for the proposed quality improvement project focused on reducing the incidence of cardiac arrests in the Pediatric Cardiac Intensive Care Unit (PCICU). This initiative addresses a critical and timely patient safety priority and aligns directly with our institutional mission to deliver the highest standard of care to children with complex congenital and acquired heart disease. Importantly, our team will be transitioning to a new space this year for the PCICU and having a strong quality improvement infrastructure is paramount to success.

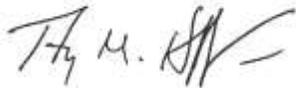
Cardiac arrest in the PCICU is associated with significant morbidity, mortality and prolonged hospitalization with lasting impact on patients, families, and healthcare providers. Many of these events are preceded by identifiable physiologic deterioration, workflow challenges, or system-level gaps in care. A structured, data-driven quality improvement approach aimed at early recognition, standardized response, and prevention of high-risk clinical trajectories is both necessary and overdue. This project proposes to systematically evaluate these contributing factors and implement evidence-based interventions that can meaningfully reduce preventable arrests.

Successful implementation of this project has the potential to substantially improve patient outcomes by enhancing situational awareness, optimizing interdisciplinary communication, and promoting proactive rather than reactive care in the PCICU. By reducing cardiac arrest events, we anticipate improvements in survival, neurologic outcomes, family experience, and resource utilization. The knowledge gained from this work will be scalable and transferable to other pediatric cardiac programs, amplifying its impact beyond our institution.

This initiative is fully aligned with our division's strategic priorities and has my unequivocal support. The project team has the clinical expertise, operational insight, and commitment required to execute this work with rigor and sustainability. Support from the Institute for Healthcare Quality Improvement at the University of North Carolina would be instrumental in enabling this important effort and advancing high-reliability care for our most vulnerable patients.

Thank you for your consideration of this proposal and for your continued commitment to improving the quality and safety of healthcare. I wholeheartedly support this initiative.

Sincerely,

A handwritten signature in black ink, appearing to read "Tim M. Hoffman". The signature is stylized and cursive.

Timothy M. Hoffman, MD  
Governors Club Distinguished Professor in Pediatric Cardiology  
Division Chief, Pediatric Cardiology  
University of North Carolina, Chapel Hill  
UNC Children's Hospital

Institute for Healthcare Quality Improvement  
University of North Carolina at Chapel Hill  
Chapel Hill, NC

**March 12, 2026**

**Re: Letter of Support for Quality Improvement Project – Reduction of Cardiac Arrests in the Pediatric Cardiac Intensive Care Unit**

Dear Members of the Review Committee,

I am writing in support of the proposed Quality Improvement (QI) initiative focused on reducing cardiac arrest events in the Pediatric Cardiac Intensive Care Unit (PCICU) at the University of North Carolina. I am a practicing Pediatric Cardiac Intensivist in the PCICU at Duke University Hospital with expertise in cardiac arrest prevention.

Children with acquired or congenital heart disease are at high risk of clinical deterioration and cardiac arrest while in the PCICU. Cardiac arrest in this population is a devastating complication with significant associated morbidity (such as end organ injury, prolonged mechanical ventilation, prolonged hospital length of stay, etc.) and mortality. Cardiac arrest events have a profound, traumatic impact on patients, families, and healthcare providers.

At my current institution, I led a QI project aimed to increase recognition of clinical deterioration in high-risk patients to increase the rate of rescue and ultimately prevent cardiac arrest events. Structured cardiac arrest prevention efforts - including standardized high-risk patient identification, multidisciplinary safety huddles, early warning systems / monitoring tailored to individualized physiologies of pediatric cardiac patients, and formalized multidisciplinary, post-event debriefings - have led to measurable improvements in team performance and rate of rescue with decreased post-arrest morbidity and mortality. This ongoing QI project has now yielded a highly functioning and vigilant multidisciplinary PCICU resuscitation team with one of the lowest cardiac arrest rates in the country.

Because these practices require deliberate system redesign, rigorous data monitoring, interdisciplinary collaboration, and strong institutional commitment to safety culture, support from the Institute for Healthcare Quality Improvement would represent a meaningful investment in advancing patient safety and clinical excellence in this highly specialized patient population.

I offer my strongest endorsement of this project, and I am confident that these efforts will result in measurable improvements in patient outcomes with improved team performance surrounding clinical deterioration and rescue. Please feel free to reach out to me with questions.

Sincerely,

*Kimberly W. Jackson, MD*

Pediatric Cardiac Critical Care  
Duke University Hospital  
Durham, NC  
kimberly.jackson2@duke.edu  
(205) - 305 - 5747

2/20/2026

Institute for Healthcare Quality Improvement

UNC Children's Hospital

University of North Carolina at Chapel Hill

Re: Letter of Support – Cardiac Arrest Reduction Quality Improvement Project in the Pediatric Cardiac Intensive Care Unit

Dear Members of the Review Committee,

I am writing to express my strong support for the proposed quality improvement initiative focused on reducing cardiac arrest events in the Pediatric Cardiac Intensive Care Unit (PCICU) at UNC Children's Hospital. As an Associate Professor of Pediatric Cardiac Surgery, I have had the opportunity to closely observe the complexity of care delivered in the PCICU and the critical importance of proactive, system-level strategies to prevent clinical deterioration in our most vulnerable patients.

Despite advances in surgical techniques, critical care management, and monitoring technologies, pediatric cardiac patients remain at high risk for sudden hemodynamic instability and cardiac arrest. These events are associated with significant morbidity, mortality, prolonged hospitalization, and long-term neurodevelopmental consequences. A comprehensive, evidence-informed cardiac arrest prevention bundle represents a necessary and timely approach to addressing this persistent challenge.

This project is essential because it moves beyond reactive responses to clinical emergencies and instead focuses on early identification of risk, standardized escalation pathways, multidisciplinary communication, and consistent application of best practices across the care continuum. By integrating data-driven risk stratification, structured bedside assessments, and targeted team-based interventions, this initiative has the potential to significantly reduce preventable cardiac arrests in the PCICU.

The anticipated impact of this work is substantial. Successful implementation of the cardiac arrest prevention bundle will improve patient safety, enhance clinical outcomes, and promote greater consistency in care delivery for pediatric cardiac patients. Moreover, this initiative will strengthen interdisciplinary collaboration among surgeons, intensivists, nurses, and allied health professionals, fostering a culture of shared accountability and continuous improvement. The knowledge gained through this project will also provide a scalable framework that can be adapted to other high-acuity pediatric settings.

Importantly, this proposal aligns with the mission of the Institute for Healthcare Quality Improvement to advance innovative, measurable, and sustainable improvements in patient care. The project team has demonstrated a strong commitment to rigorous methodology, meaningful outcome measurement, and long-term sustainability, which will ensure that the benefits of this initiative extend well beyond the duration of the grant period.

In summary, I believe this project is both necessary and transformative for the care of children with complex congenital and acquired heart disease. I fully endorse this proposal and strongly encourage the Institute for Healthcare Quality Improvement to support this critical work.

Please feel free to contact me if additional information would be helpful.

Sincerely,

A handwritten signature in black ink, appearing to read 'RHF', with a horizontal flourish extending to the right.

Robert Hanfland MD

Associate Professor of Pediatric Cardiac Surgery

UNC Children's Hospital

University of North Carolina at Chapel Hill

DEPARTMENT OF PEDIATRICS

RE: Letter of Support for Cardiac Arrest Prevention Bundle Initiative

DIVISION OF CRITICAL CARE

Dear IHQI Selection Committee,

FACULTY

I am writing as the project sponsor to express my strong support for the Cardiac Arrest Prevention (CARP) bundle initiative proposed by our pediatric cardiac intensive care team.

Matthew Pizzuto, MD  
*Interim Division Chief*

This initiative addresses a critical patient safety concern at a pivotal moment for UNC Children's with our anticipated opening of the new dedicated pediatric cardiac intensive care unit (PCICU). Since April 2021, our PCICU patient population has experienced 49 cardiac arrest events across the spectrum of illness severity with a cardiac arrest rate of 2–3% among admitted PCICU patients. Experiencing a cardiac arrest significantly increases a child's odds of morbidity and mortality. As we establish the PCICU as a distinct clinical entity, we have a unique opportunity to embed evidence-based cardiac arrest prevention practices into the foundation of our unit culture from day one.

Jenny Boyd, MD  
Katherine Clement, MD  
Matthew Foglia, MD, PhD  
Andrew Hopwood, MD  
Margaret Kihlstrom, MD  
Kieran Leong, DO  
Daniel Lercher, MD, MPH  
David McSwain, MD, MPH  
Afsaneh Pirzadeh, MD  
Matthew Pizzuto, MD  
Erin Reade, MD, MPH  
Stephanie Schwartz, MD  
Paul Shea, MD  
Melissa Smith, MD  
Ann Sweeney, MD  
Tracie Walker, MD

The initiative's importance extends beyond immediate patient safety outcomes. Our new PCICU will be staffed predominantly by junior staff, over half of our bedside nurses have less than one year of experience, and our provider team includes junior faculty and newly graduated advanced practice providers. The cardiac arrest prevention bundle will provide staff with clear frameworks for recognizing deterioration, structured communication tools, and specific action plans. This will enhance clinical confidence, promote interdisciplinary collaboration, and establish a proactive, high-reliability safety culture from the outset.

FELLOWS

The evidence supporting this approach is compelling. Recent multicenter collaborative data published in *JAMA Pediatrics* demonstrate that standardized risk identification, structured communication, and proactive escalation pathways significantly reduce cardiac arrest events in pediatric cardiac ICUs. Peer institutions, including Duke University, have successfully implemented similar programs with excellent outcomes. Through our participation in the PC4 registry, we already have a robust mechanism to collect data and rigorously evaluate outcomes in support of this project.

Hanna Carroll, MD  
Sarah Fleisher, MD  
Andrew Hayes, DO  
Evan Meiman, MD  
Allison Steinauer, MD  
Alison Woods, MD

Equally important is the team's participation in the Improvement Scholars Program itself. The two nurse practitioners and junior faculty physician leading this effort are core PCICU launch team members. Their training in improvement science methodology will build sustainable quality improvement capability that extends far beyond this single project, positioning our PCICU as a learning organization deeply committed to continuous improvement.

As project sponsor, I am committed to ensuring this initiative's success through provision of protected time for team participation, access to necessary data systems and analytics support, removal of organizational barriers, and sustained executive engagement.

I strongly endorse this proposal and am confident that this project will yield significant returns in improved patient safety, enhanced clinician capability, and advancement of pediatric cardiac critical care at UNC and beyond.

Sincerely,



Matthew F. Pizzuto, MD  
Associate Professor of Pediatrics  
Divisions of Pediatric Critical Care Medicine and Pediatric Cardiology  
PCICU Medical Director and PMC Service Line Leader  
Interim Division Chief of Pediatric Critical Care Medicine



SCHOOL OF MEDICINE  
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**Danielle Stolfi**

Patient Services Manager III  
Pediatric Cardiac Intensive Care Unit

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Dear Members of the Review Committee,

I am writing in strong support of the proposed project, “Cardiac Arrest Reduction Prevention Bundle in the UNC PCICU”.

As the Nurse Manager of the Pediatric Cardiac Intensive Care Unit (PCICU), I view this initiative as foundational to both patient safety and the development of our new unit’s clinical culture. The PCICU is a newly established clinical environment caring for children with complex congenital and acquired heart disease. Our patient population carries an inherently elevated risk for physiological instability, and the prevention of cardiac arrest must be a central priority of our care model.

This project is particularly meaningful in the context of our workforce. More than half of our bedside nurses have less than one year of experience. A structured cardiac arrest prevention bundle will promote shared mental models of patient deterioration, clarify expectations for early recognition and escalation, standardize communication and response processes, strengthen interdisciplinary collaboration, and reduce variability in care delivery.

For novice nurses especially, clearly defined clinical goals and early escalation pathways provide psychological safety and clinical confidence. For experienced clinicians, this framework supports high-reliability performance and accountability.

This initiative aligns directly with UNC Children’s Heart Center Mission statement, “to promote the wellbeing of all patients with congenital and acquired heart disease through high-quality, comprehensive care from fetus through adulthood”. It also represents a critical step in establishing the Pediatric Cardiac Intensive Care Unit as a high-performing multidisciplinary unit, grounded in a culture of safety and continuous improvement.

As Nurse Manager, I fully support the allocation of nursing engagement, time for education, and interdisciplinary collaboration required for this work. I am committed to partnering with the project team to ensure frontline integration, sustainability, and measurable impact.

I strongly endorse this proposal and believe participation in an Improvement Scholars Project will equip this team with the expertise necessary to achieve meaningful and durable improvements in patient outcomes.

Sincerely,  
Danielle Stolfi

## Cardiac Arrest Reduction Program – Monthly Data Collection

Month: \_\_\_\_\_

Total number of cardiac arrests: \_\_\_\_\_

Total number of patients with cardiac arrests: \_\_\_\_\_

Dates of cardiac arrests: \_\_\_\_\_

Total number of patient-days in CICU: \_\_\_\_\_

Total number of CARP patients: \_\_\_\_\_

Indications for CARP patients:

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\*\*Please contact Wren Wallace for monthly CICU patient-days

## Cardiac Arrest Reduction Program – Safety Huddle Checklist

*Safety Huddle discussion should include the following:*

- Reason for inclusion / Likely etiology of decompensation
- Clinical red flags for pending decompensation
- Vital sign parameters
- Preventative measures to be implemented
- Rescue medications to be available
- Resuscitation plan discussed

*Safety Huddle Personnel:*

Attending physician

Frontline provider

Bedside nurse

Charge nurse

Respiratory therapist

+/- Clinical pharmacist

+/- ECMO specialist

### Bedside Staff CAP Checklist

- Diagnosis: I know what is wrong
- Assessment: I know what to worry about
- Plan: I know what to do
- Anticipatory Guidance: I know when to escalate
- Shared Mental Model: I see what you see



## Cardiac Arrest Reduction Program – Weekly Audit Tool

Date: \_\_\_\_\_ Performed by: \_\_\_\_\_

### Identification

Did all eligible patients have a CARP sheet posted?  Yes  No

Were all eligible patients receiving the CARP bundle?  Yes  No

### Safety Huddle

Were all required members present during the huddle?  Yes  No

Were the following safety huddle elements discussed:

Reason for CARP inclusion  Yes  No

Clinical red flags for decompensation  Yes  No

Vital sign parameters  Yes  No

Preventative measures  Yes  No

Rescue medications  Yes  No

Resuscitation plan  Yes  No

Was a safety huddle completed every 12 hours?  Yes  No

Was a safety huddle completed at least 80% of shifts?  Yes  No

**Check here if no eligible patients for this week**