Staffing for Success:
Nurse Experience Profiles in High Performing CICUs

Justin Elhoff, MD
Sunrise Children's Hospital,
Las Vegas, NV

Kevin Hummel, MD
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Phoenix, AZ

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Rady Children's Hospital
San Diego, CA

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Background

- Prior PC4 site surveys were distributed to understand organization and staffing structure:
  - July - September 2017 (N=32)
  - July - October 2020 (N=54)
  - December 2022 (N=72)
  - October 2024 (N=74)

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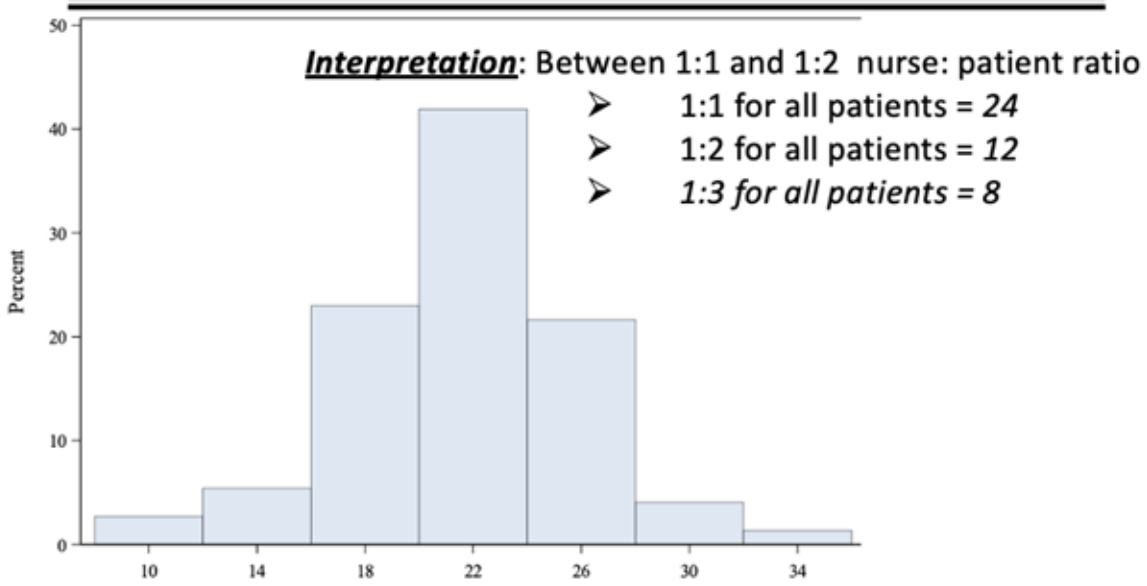
The data showed what we're feeling at the bedside

- Nurses are being asked to do more with less

Average hours of registered nursing care hours per patient day (RNHPPD)?

	2017	2020	2022	2024
MEDIAN	21	21	21	**21.5**



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Resources are tight

% PC4 Sites using TRAVEL Nurses

2017	2020	2022	2024
53%	63%	92%	74%

Does your cardiac critical care program have a *dedicated nursing staff* (distinct staffing/scheduling from another ICU)?

2017	2020	2022	2024
--	91%	81%	81%

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The proportion of inexperienced nurses is growing

What percentage of RNs working in your CICU or the dedicated Cardiac beds in the PICU *have less than 2 years of cardiac critical care experience*?

	2017	2020	2022	2024
MEDIAN	**24%**	**24%**	**30%**	**31%**
IQR	16-35	14-35	20-41	20-42
Range	2 - **63**	1 - **83**	7 - **80**	**0-80**

But with a trend towards more commitment from units?

What % of eligible RNs working in your CICU had the *CCRN certification for critical care nursing from the American Association of Critical-Care Nurses (AACN)*?

	2017	2020	2022	2024
MEDIAN	**22%**	**28%**	**27%**	**30%**
IQR	15 - 41	15 - 43	18 - 43	20-47
Range	0 - **54**	0 - **80**	0 - **89**	**0-100**

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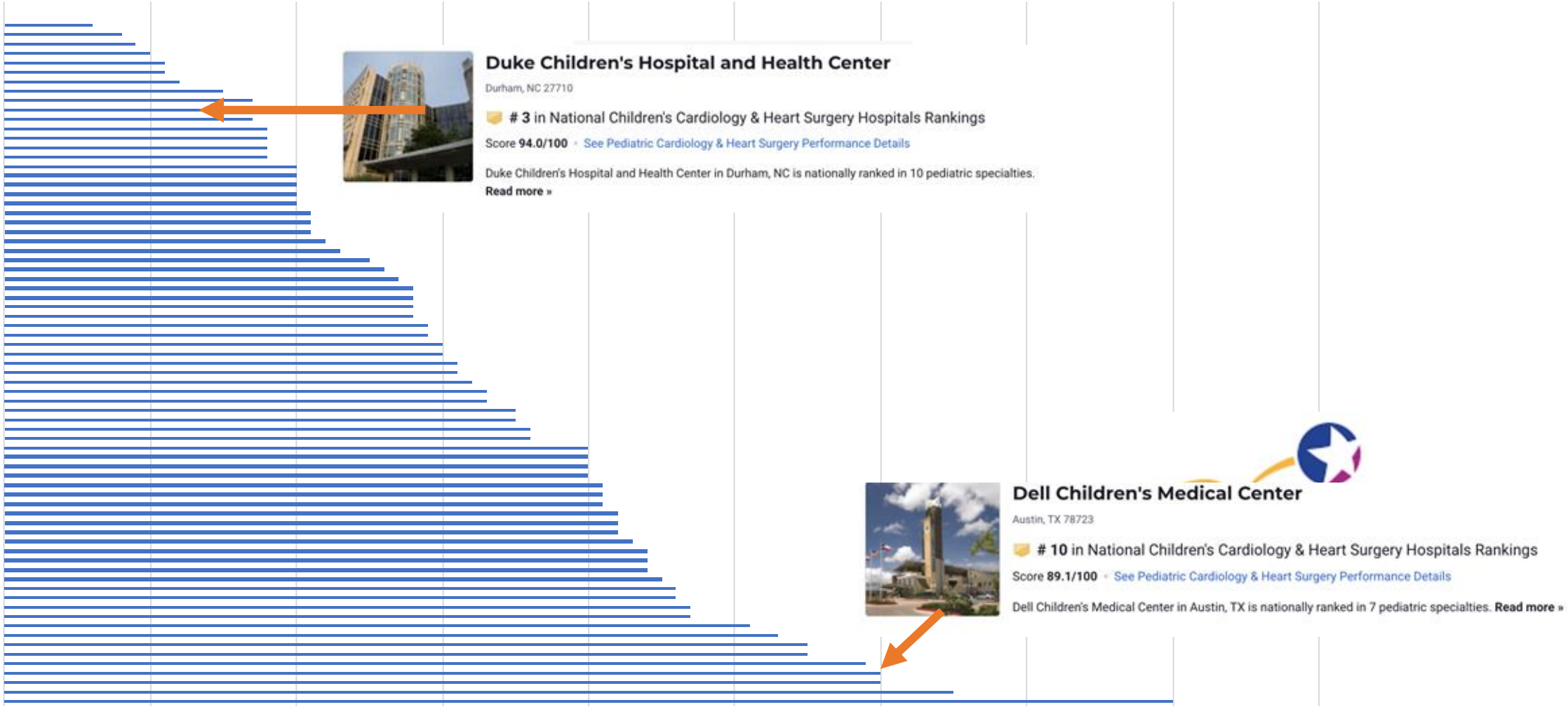
Unanswered questions remain…

- Retention from the first two years
- Variability from day to night
- Relationship with acuity, churn, outcomes
- Experienced nurses shifting to non-clinical roles

How do we make it rewarding for good nurses to stay at the bedside in our units?

% RN's with <2 years experience



Duke Children's Hospital and Health Center

Durham, NC 27710

 # 3 in National Children's Cardiology & Heart Surgery Hospitals Rankings

Score **94.0/100** · See Pediatric Cardiology & Heart Surgery Performance Details

Duke Children's Hospital and Health Center in Durham, NC is nationally ranked in 10 pediatric specialties.
Read more »

Dell Children's Medical Center

Austin, TX 78723

 # 10 in National Children's Cardiology & Heart Surgery Hospitals Rankings

Score **89.1/100** · See Pediatric Cardiology & Heart Surgery Performance Details

Dell Children's Medical Center in Austin, TX is nationally ranked in 7 pediatric specialties. **Read more »**

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How do units with high and low nurse experience and training deliver exceptional outcomes?

Session Objectives

1. Examine strategies to enhance retention of nursing staff in high-performing cardiac intensive care units.

2. Explore protective factors allowing less experienced nursing staff members to function proficiently in high-performing cardiac intensive care units.

3. Discuss nurse onboarding/orientation and continuing professional development strategies utilized in high-performing cardiac intensive care units.

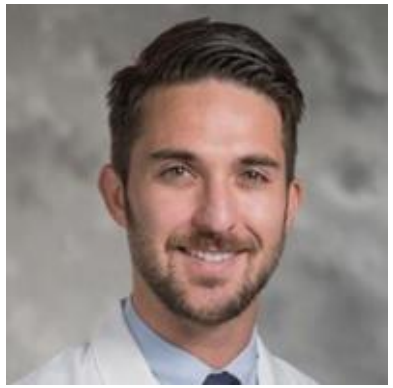
Session Speakers

Amanda Hodges, BSN, RN CCRN

Duke University Health System

Jennifer Talbert, BSN, RN, CCRN

Duke University Health System



Joseph Zakhar, MD

Duke University Health System

Lindsay Davis, BSN, RN

Dell Children's Ascension

Catherine Erickson, BSN, RN, CCRN

Dell Children's Ascension

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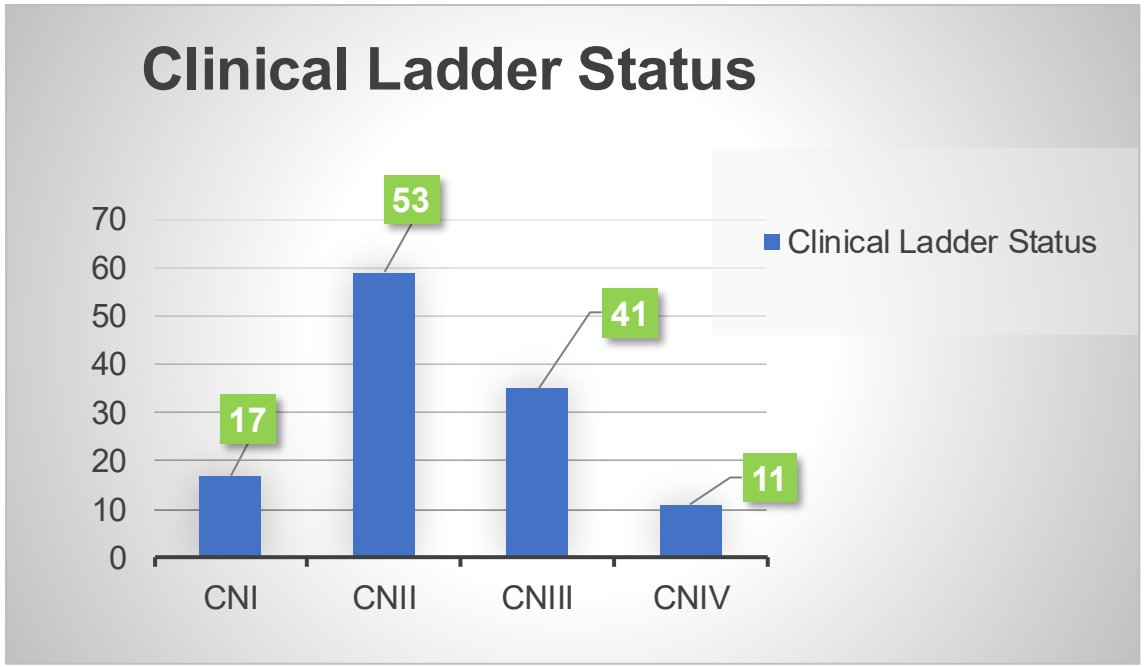
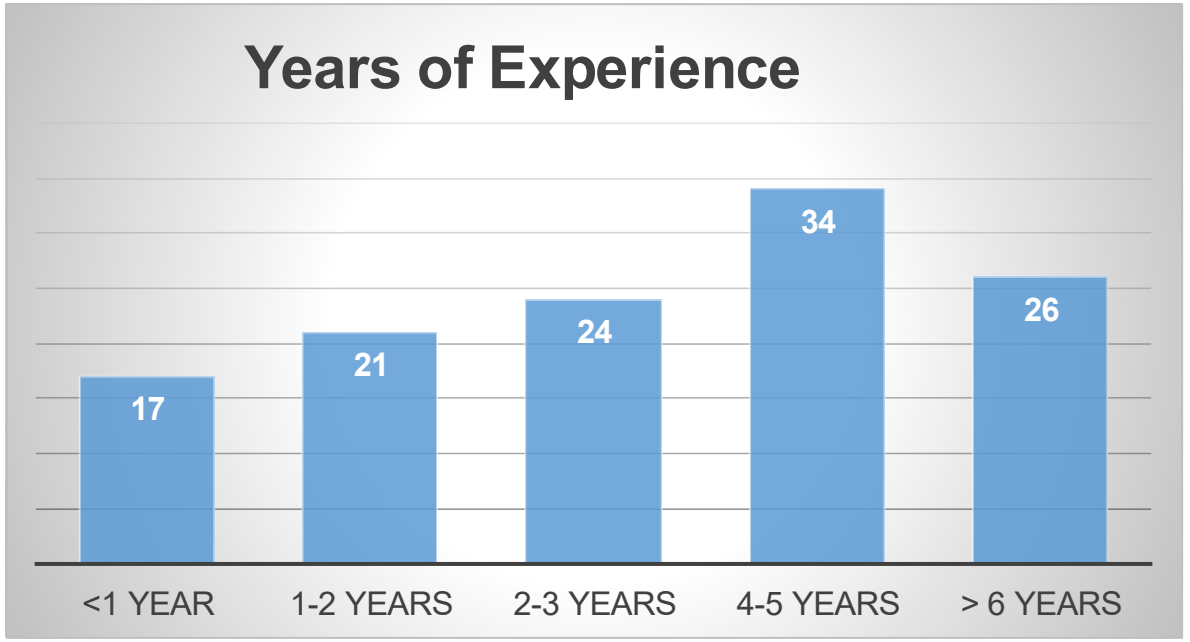
Staffing for Success: Nurse Experience Profiles in High-Performing CVICU's

Amanda Hodges, BSN, RN, CCRN
Jennifer Talbert, BSN, RN, CCRN
Joseph Zakhar, MD

Duke University Health System

Nursing Staff Overview





Total RNs = 122

- 29 Certified Nurses: Pediatric CCRN
- 47 Charge Nurses
- 16 Rapid Response Team Nurses
- 66 Post-Operative Trained Nurses
- 109 Blood Gas Trained Nurses

Recruitment/Hiring

- **Students**: Our area is home to many nursing schools (Duke, UNC, Watts, Elon, App State, Durham Tech, Wake Tech) who complete clinical rotations or shadowing experiences in our PCICU
  - This is a great opportunity to evaluate if the student is a potential fit for the unit; also allows the student to determine if acuity and patient population is right for them

- **PNA Program**: Duke offers a 10-week summer nurse externship for nursing students; they are paired 1:1 with an RN preceptor and work within the scope of an NCAI
- **Hiring Events**: Duke hiring events with manager representation to meet potential candidates
- **Transfers within Duke**: Duke is a 1,000+ bed health system with many nursing specialties
  - Nurses working in adult units (med/surg and critical care) that express an interest in pediatrics are able to shadow to determine interest in transferring
  - Nurses in other pediatric units are able to transfer or cross-train to the PCICU
- **Job Sharing/Cross-Training**

Onboarding Process

New Graduate Nurses: 16 weeks total orientation
- 13 weeks 1:1 with 2-3 primary preceptors
- 3 weeks "Resource" with 1 preceptor to 2 orientees – each orientee takes full assignment

Experienced Nurses: 6-10 weeks total orientation
- Length depends on previous experience
- Attendance required at Pediatric Core Classes and New Hire Skills Days

Education

• 6 Pediatric Core Classes
• 3 New Hire Skills/Sim Days
• Nurse Residency Program
  • 6 Foundational Classes
  • Specialty Track Classes

All New Staff:
- Must obtain PALS certification within 1 year (required for CNII advancement)
- Must complete educational classes for devices: Impella, HM3, Berlin, Spectrum, CRRT
  - No advancement into post-operative nurse role and ECMO training until competence is demonstrated on all devices

Supporting our New Hires: Education

Pediatric Core Class Series:

- Initial focus on general pediatric management of care: difference in pediatric assessments, child life services, nutrition, respiratory modalities

- Advances to critical care/cardiac specific content: ABG interpretation, mechanical ventilation, single ventricle physiology, pacemakers/EKG, congenital and acquired heart disease

- Final class focuses on neurodevelopment in patients with CHD

New Hire Skills Days Focus Content:		
• Emergency Medications • Defibrillator • Pressure Injury Prevention • Central Line Care/CLABSI Prevention	• Alaris Guardrails • Bedside Monitors/Alarms • Chest Tubes • Temporary Pacemakers • Bereavement	• Code Simulations • Drip compatibility • Clean Environment • Post-Op Pain Management

Duke Children's
PEDIATRIC & CONGENITAL HEART CENTER

Core Day 5: Thursday, May 14, 2026
Duke South Amphitheater (0730 – 1730) – confirmed
WCH1824B Management of Pediatric Cardiac Defects
WCH1822B Pediatric Cardiac Surgical Interventions (1415-1645)

Time	Lecture/Material	Presenter	Units Attending
0800-0930	Cardiac Surgical Corrections^	Susi Hupp	1B/2B/3B/3A
0930-1030	Single Ventricle/Cardiac Output	Kimberly Jackson *	1B/2B/3B/3A
1030-1045	Break – 15 min.		
1045-1130	Antiarrhythmic Medications^	Austin Cutler *	1B/2B/3B/3A
1130-1230	Advanced EKG	Katelyn Hausfeld *	1B/2B/3B/3A
1230-1315	Lunch – 45 min.		
1315-1415	Pacemakers	Danielle Sturkey *	1B/2B/3B/3A
1415-1500	Cardiac Catheterization	Amanda Picart	1B/2B/3B/3A
1500-1515	Break – 15 min.		
1515-1645	Post Cardiac Surgery Nursing Considerations -	Karen Osborne/Amanda Hodges	3B
1515-1615	Casual Conversations with Social Work – Breakout Room: DMP2W91, DCT 1st Floor Conf Room (back-up)	Kelly Smith*	2B

Sample Core Class Agenda

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Supporting our New Hires: Staffing

CNI Support Nurse

- Shifts with 5 or more CNI's scheduled
- 4-hour blocks of time (1100-1500) or (2000-midnight)
- Assist with patient care tasks (bathing, dressing or line changes, weights, preparation for travel off unit to procedural area)
- Assist with breaks/lunches for CN I providing direct patient care
- Answer questions or direct CN I to available resources (policies, unit standards) when applicable

General Unit Support:

- Nursing Staffing Ratios: 1:1 or 1:2
- Freestanding Charge Nurse
- 1-2 Freestanding Clinical Lead nurses on each shift
- Vascular Access Team support for IV and PICC placement
- Rapid Response Team nurse available to support all children's units

Progression into Roles/Device Competency

Professional Development Plan:

- Nurses will follow one of two professional development plans (new grad or experienced nurse)
- Outlines all required classes and timeline for completion
- All VAD classes must be completed (or proof of registration) by 12 months
- Bedside “buddy” experience required for CRRT competence

Post-Operative/ECMO Advancement:

- Must meet experience/education requirements
- Must attend PCICU Post-Op Nursing class and Pediatric Critical Care ECMO class

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Complete between 12 Months or Greater of Hire Evaluated During MidYear/Annual Performance Evaluation			
	COURSE CODE	ESTIMATED TIME TO COMPLETE	COMPLETION REQUIRED BY:
Preceptor Development			
Online Module Bundle (Pre-requisite for Preceptor Development Program)	CEPD954		12-18 months
DUHS Preceptor Development Program	DEV1447B		12-18 months
The Basics of Communication	DEV815G	4 hours	12 months
DUHS Preceptor Expo	*Sent out via flyer when available*		12-18 months; *optional*
Peds Heart Center Preceptor Workshop	WCH1693C		*optional*
Post-Op/ECMO Development – (timing for advancement discussed per unit leadership/performance feedback)			
PCICU Post-Op Nursing Care Education	WCH1701C	2 hours	18-24 months; *variable based on feedback*
Pediatric Critical Care Core Day – ECMO	WCH1699D	2 hours	18-24 months; *variable based on feedback*
Charge Nurse Development - (timing for advancement discussed per unit leadership/performance feedback)			
The Effective Charge Nurse	DEV699H	4 hours	18-24 months
PCICU Charge Nurse Class	WCH1802B	3 hours	24 months
The Basics of Communication – *also required for preceptor development; only needs completed once*	DEV815G	4 hours	12 months

Snapshot from New Graduate Professional Development Plan

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Post-Operative/ECMO Advancement

For <u>New Graduate RNs</u> who started in the PCICU:

<u>Minimum</u> 2 years of experience in PCICU by the date of the ECMO/Post-op class

Provides independent care for patients with PCICU devices (all VADs and CRRT)

Must be a Preceptor and have completed the DUH Preceptor class (Peds Heart Center Preceptor Workshop recommended)

Must have support from the Peer Review Committee

Must have favorable feedback from staff surveys about post-op readiness

- These surveys will be sent to charge RNs prior to bi-annual Peer Review Committee meeting

For <u>Experienced RNs</u> who transfer to the PCICU:

Minimum 2 years total experience in PCICU (outside hospital + Duke) or equivalent adult ICU (7w)

1 year must be within the <u>Duke PCICU</u>

Device- same as new grad

Preceptor-same as new grad

PALS certification

Must have favorable feedback from staff surveys about post-op readiness

- These surveys will be sent to charge RNs prior to Peer Review Committee

Must have support from the Peer Review Committee

****Staff who transfer to PCICU with ECMO experience will be evaluated on a case-by-case basis for pediatric ECMO readiness****

Team huddle prior to post-op admission

Progression to Precepting/Charge Nurse

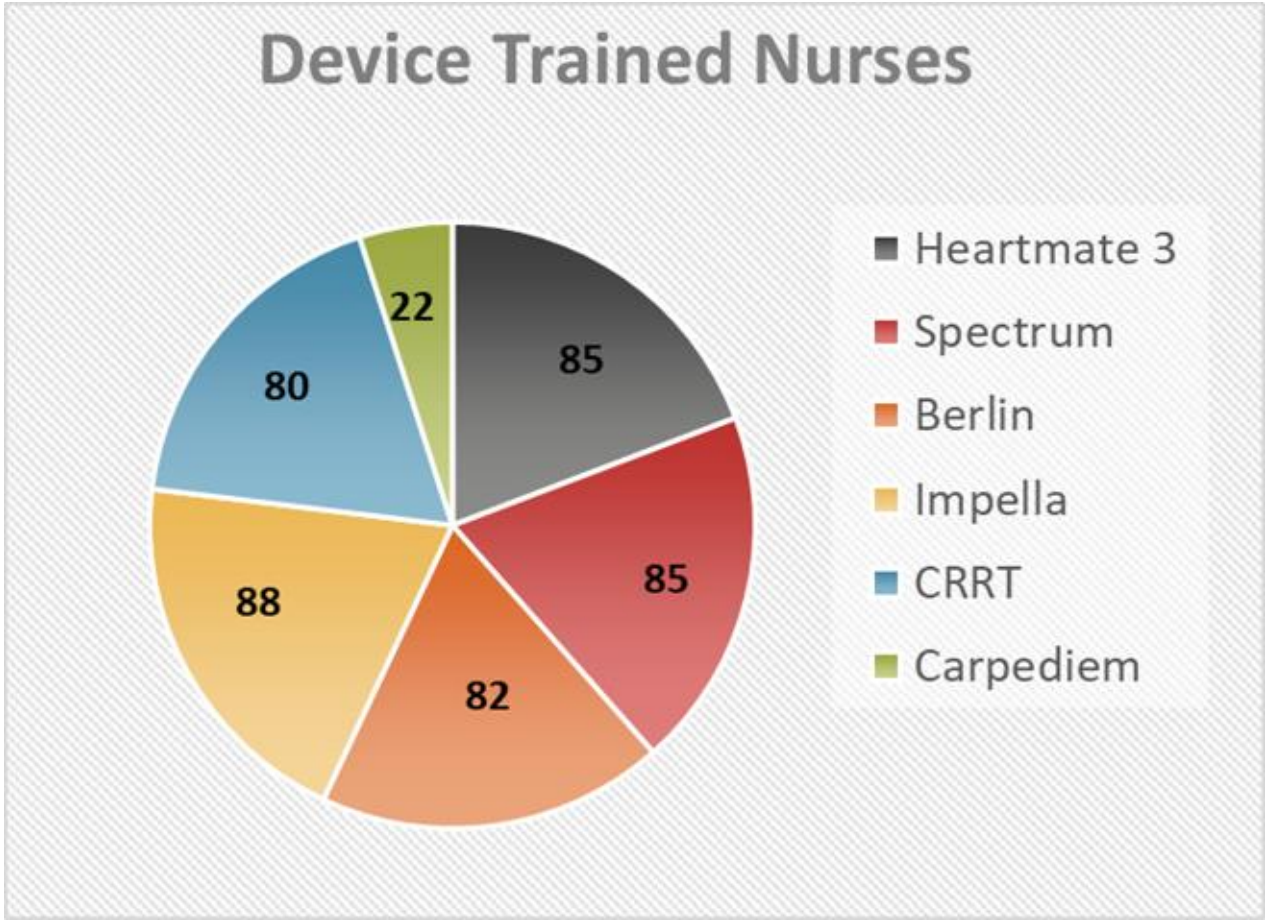
Criteria for precepting:

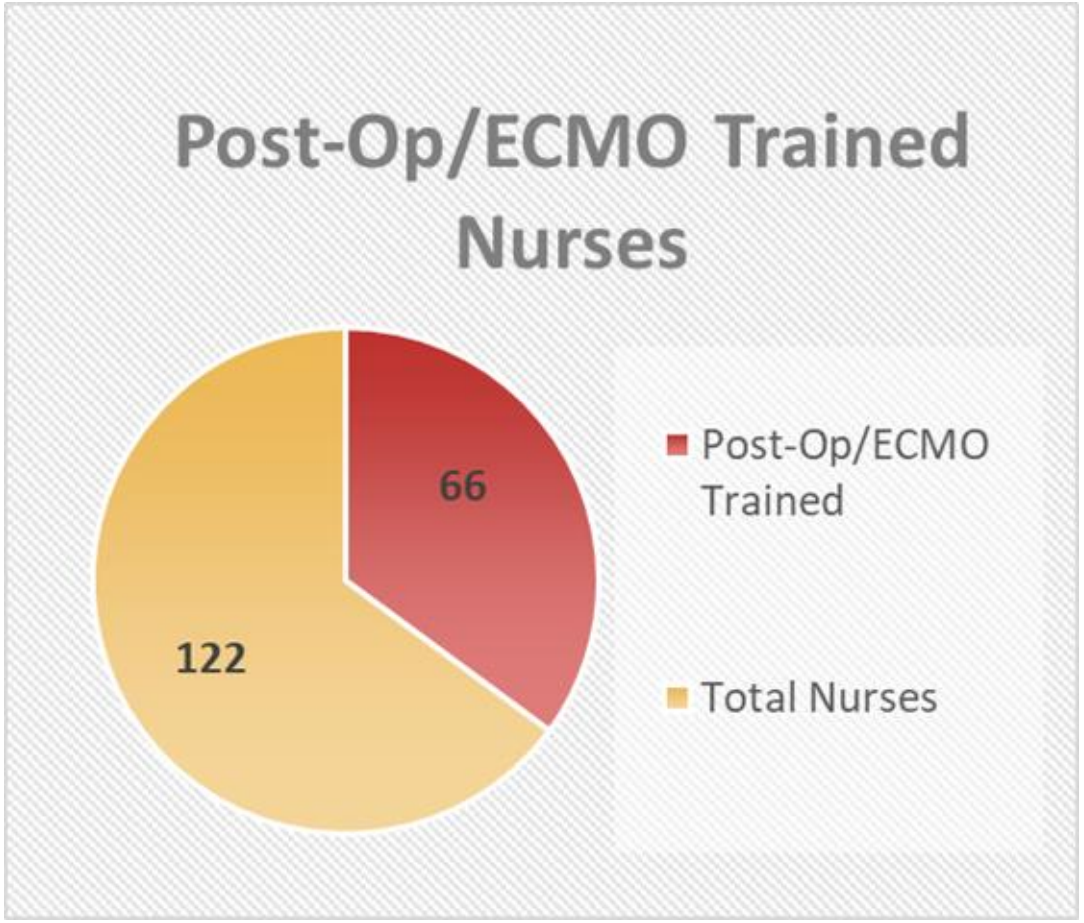
- Preceptor Development Program (hospital-based precepting class)
- 6 months on the unit minimum
- Heart Center Preceptor Workshop
- Student/PNA prior to precepting hired RN

Criteria for Charge RN:

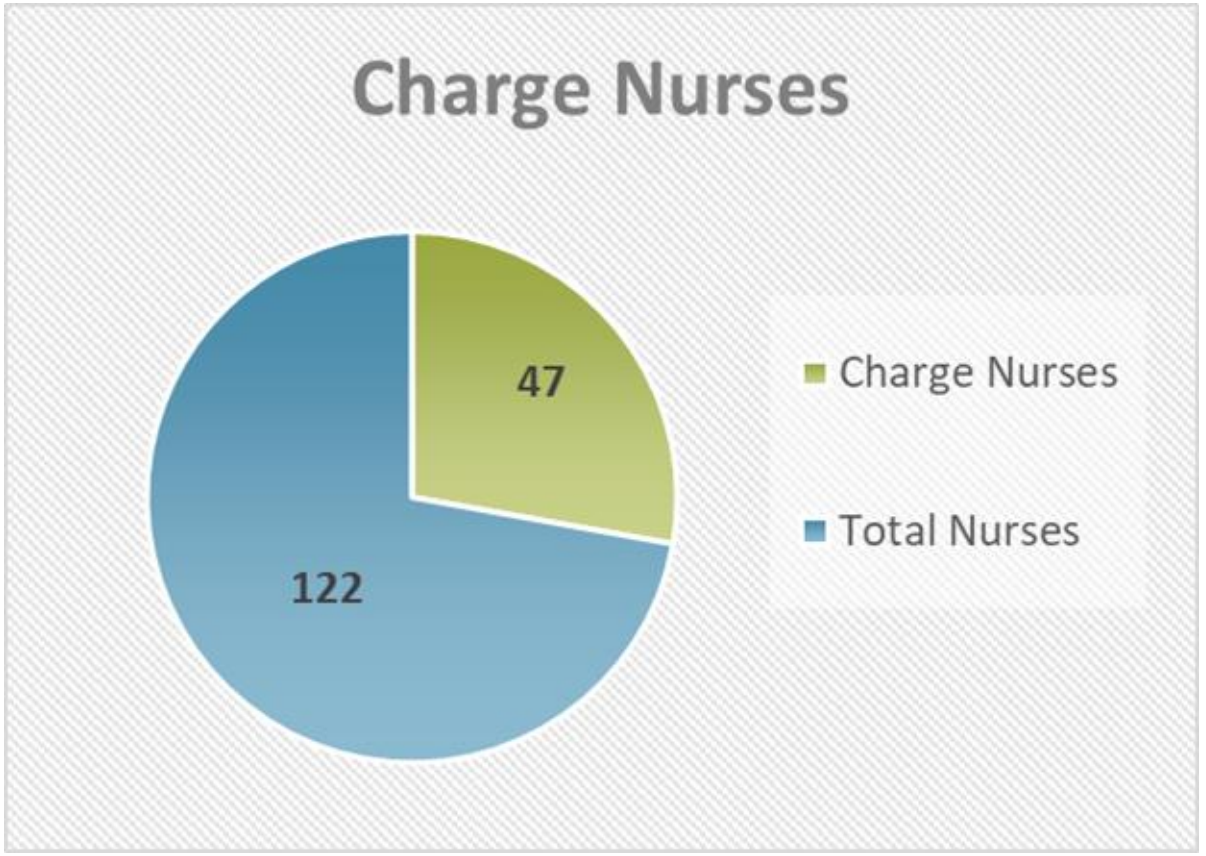
- Completed training on all devices
- Completed training to post-op/ecmo role
- Experience precepting at least 1 hired RN
- Required Classes:
  - The Basics of Communication (hospital-based class)
  - The Effective Charge Nurse (hospital-based class)
  - PCICU Clinical Lead/Charge Nurse Class (unit-specific class)
- Positive feedback from peers in a Clinical Lead role (approx./ 6 months)

Advanced Training: Numbers at a Glance





Advanced Training: Numbers at a Glance



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Making Assignments in a High Acuity Unit

Total of **466** congenital cardiac surgery index case operations in 2024

Observed to expected mortality ratio of 0.37 for STAT Category 5

Operative and Adjusted Operative Mortality (January 2021 - December 2024)

Population: Neonates, Infants, Children & Adults	# / Eligible	Observed	Expected	O/E Ratio (95% CI)	Adj. Rate (95% CI)
Overall	24 / 1636	1.47%	3.66%	0.4 (0.27, 0.58)	1.07 (0.72, 1.53)
STAT Mortality Category 1	3 / 698	0.43%	0.58%	0.74 (0.15, 2.17)	0.44 (0.09, 1.28)
STAT Mortality Category 2	2 / 364	0.55%	1.85%	0.3 (0.04, 1.06)	0.6 (0.07, 2.14)
STAT Mortality Category 3	2 / 282	0.71%	3.83%	0.19 (0.02, 0.66)	0.61 (0.07, 2.2)
STAT Mortality Category 4	8 / 190	4.21%	7.54%	0.56 (0.24, 1.08)	4.15 (1.81, 8.02)
STAT Mortality Category 5	9 / 102	8.82%	23.55%	0.37 (0.17, 0.68)	5.75 (2.68, 10.48)

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Ongoing Education Support

- Unit simulations offered monthly
  - Required for all staff with < 5 years of experience
  - Scenarios based on decompensation events from recent patients

- Skills Day
  - Required annually for all staff (hands-on review of skills)

- Monthly newsletters/education
  - "Defect or Surgery of the month", includes knowledge check
  - "Medication of the month"

Ongoing Education Support

- "Toilet Learnings"
  - Learnings from any recent hospital acquired harm events
  - Surgical procedures and defects
  - Practice CCRN questions

- Zoom education once a month

- Transplant Workshop (offered once/year)

- Single Ventricle Day (offered once/year)

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Education

March Unit Education

- 3/9: PCICU Monthly Simulation, 2-3:30pm, 3B55
- 3/17: Carpediem Virtual Training (provider focused, nursing welcome), 12-2pm, Zoom
- 3/18: ABG Interpretation with Dr. Sherwin, 2-3pm, Zoom
- 3/25: PCICU M&M/Code Review, 12-2pm, Zoom

The Basics of Communication

Preceptor Development Program

The Effective Charge Nurse

Prismaflex CRRT

HEARTMATE 2/3: EDS1192 (REGISTER IN API)

New Hire Education

Pediatric Core Class Series

- **3/19/26**: Peds Core Day 1 (WCH1141E): Intro to Pediatric Nursing
- **4/2/26**: Peds Core Day 2 (WCH1831C): Pediatric Nursing Beyond the Basics
- **4/16/26**: Peds Core Day 3 (WCH1817B): Managing Care of the Pediatric Patient
- **4/30/26**: Peds Core Day 4 (WCH1821): Intro to Peds Cardiac Defects and Management of Care
- **5/14/26**: Peds Core Day 5 (WCH1822B/WCH1824B): Pediatric Cardiac Surgical Interventions/Management of Pediatric Cardiac Defects
- **6/5/26**: Peds Core Day 7 (WCH1828B): Pediatric NeuroCardiac and Development

New Hire Skills Days

- **4/17/26:** Skills Day #1 (WCH1800C)
- **5/1/26**: Skills Day #2 (WCH1801B)
- **6/4/26**: Skills Day #3 (WCH1813B)

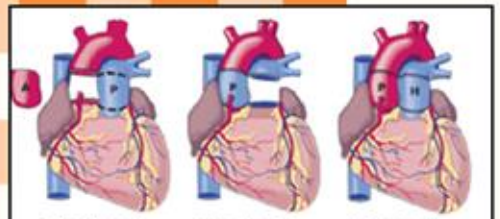
PCICU VAD Education: EDS1781
(Impella, Spectrum, Berlin)
4/13/26 ☘ 7/20/26 ☘ 10/21/26

Ross Procedure

Nov Cardiac Surgery of the Month

What is it?

- Removal of the diseased aortic valve
- Replacement of the aortic valve with the pulmonary valve
- Implantation of a donor valve in the position of the pulmonary valve



The diseased aortic valve and a portion of the aortic artery (A) are removed.

The pulmonic valve and a portion of the pulmonic artery (P) are excised and placed in the aortic position. The left and right main coronary arteries are attached to the pulmonary artery (P).

A homograft (allograft) pulmonary valve and portion of artery (H) are placed in the pulmonary position.

Benefits of the Ross:

- **Natural Tissue Replacement:** Using the patient's own pulmonary valve minimizes the risk of rejection and complications associated with artificial valves, such as blood clots and hemolysis (destruction of red blood cells).
- **Long-Term Durability:** The Ross Procedure has shown excellent long-term outcomes, with many patients maintaining a quality of life similar to those without heart disease. Studies indicate that the procedure can last 15 to 20 years or more without the need for reoperation.
- **Growth Potential:** This procedure is particularly beneficial for children and young adults, as the pulmonary valve can grow with the patient, adapting to the higher pressures of the aortic position over time.
- **Reduced Need for Medications:** Patients typically do not require long-term anticoagulation therapy, which is often necessary with mechanical valves, thus reducing the risk of bleeding complications.

Post-Op Considerations:

- **Neo-aortic root dilation** can occur over time
- **Pulmonary homograft degeneration** is a common long-term issue
- **Reoperations** are more complex due to the dual valve replacement nature of the Ross procedure.
- Common reasons for reoperation include:
  - Autograft failure
  - Homograft stenosis or regurgitation
- **Blood pressure control** is critical to reduce stress on the autograft and prevent dilation. Beta-blockers or ACE inhibitors may be prescribed.

Test Your Knowledge Here!

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MEDICATION OF THE MONTH: DIGOXIN

Class: Group V Antiarrhythmic, Inotrope

Digoxin inhibits the sodium-potassium ATPase pump, which indirectly increases intracellular calcium and strengthens heart contractions

Indications: Interstage med for single ventricle patients

- Improves cardiac contractility
- Helps control HR in conditions like heart failure or certain arrhythmias

Route of Administration: PO but can be IV

Pediatric Dosage: 4-5 mcg/kg q12h

Considerations:

- Narrow therapeutic range
- Pediatric patients can be more sensitive to digoxin's effects
- Impaired renal clearance raises digoxin levels
- Signs of toxicity: nausea, vomiting, decreased appetite, visual changes, new arrhythmias

Fun Facts:

- Digoxin comes from the foxglove plant
- Foxglove was originally used by herbalists to treat "dropsy", which we now know was heart failure
- One of the most unique signs of toxicity is Xanthopsia, a yellow-tinted vision change. Some historians believe Vincent van Gogh may have been treated with digitalis and his yellow-heavy paintings (like Starry Night) reflect this effect

CCRN TOTM JUNE 2025

RENAL SYSTEM

QUENCH YOUR THIRST FOR KNOWLEDGE!

STUDY GUIDE

QUIZLET CLASS

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Multi-Disciplinary Collaboration & Education

- Simulation
- Quality Improvement initiatives
- Morbidity & Mortality Review and Code Review
- Core Curriculum for new nurses
- Provider staffing ratios / Safety culture

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Simulation

- High acuity vignettes
  - Based on recent cases or core concepts
  - Neonatal to adolescent age range,
- Multi-disciplinary, but geared mainly towards bedside RN
- Run by PCICU attending, +/- fellow or NP or RT
  - Skill development
  - Shared mental model
  - Take risks / gain confidence in low-risk environment

Topics carried through in the core curriculum

- Essential topics in Pediatric Cardiology, CT surgery, Intensive Care
- VAD / Device education
- Heart Center wide education available weekly

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PEDIATRIC & CONGENITAL HEART CENTER

Week of March 23rd, 2026

Upcoming educational opportunities and conferences for the Duke Pediatric and Congenital Heart Center.

Monday, Mar 23rd	7am	Pediatric Cardiology Fellow Conference Speaker: Nina Morgan Topic: ACHD and pregnancy https://duke.zoom.us/j/91227519102?pwd=PfbkYWumDHGxYtnddHEg6qWp8vS82e.1
Tuesday, Mar 24th	7am	Pediatric Cardiology Fellowship Cath Conference Speaker: Dr. Reid Chamberlain Topic: ICE imaging/angio roulette https://duke.zoom.us/j/91227519102?pwd=PfbkYWumDHGxYtnddHEg6qWp8vS82e.1
	3pm	PCICU Clinical Conference See calendar invite for Zoom link
Wednesday, Mar 25th	7am	Pediatric Cardiology Fellowship Imaging Conference Speaker: Dr. Mike Camitta Topic: Ebstein anomalies https://duke.zoom.us/j/91227519102?pwd=PfbkYWumDHGxYtnddHEg6qWp8vS82e.1
	7:45am	Flight Plan Review https://duke.zoom.us/j/95962314669?pwd=V1FqaFJ2VjA1N3M5SWZ2UUdPZmNqdz09
	12pm	PCICU Code/M&M/PI See calendar invite for Zoom link
Thursday, Mar 26th	7am	Pediatric Cardiology Fellowship EP Conference Speaker: Dr. Salim Idriss Topic: Vasovagal syncope/dysautonomia https://duke.zoom.us/j/91227519102?pwd=PfbkYWumDHGxYtnddHEg6qWp8vS82e.1
Friday, Mar 27th	7:30am	Duke Pediatric Heart Center Patient Care Conference https://duke.zoom.us/j/96906755862?pwd=dOyao3PLpA6Et18DG87uMh7vwVATZs.1

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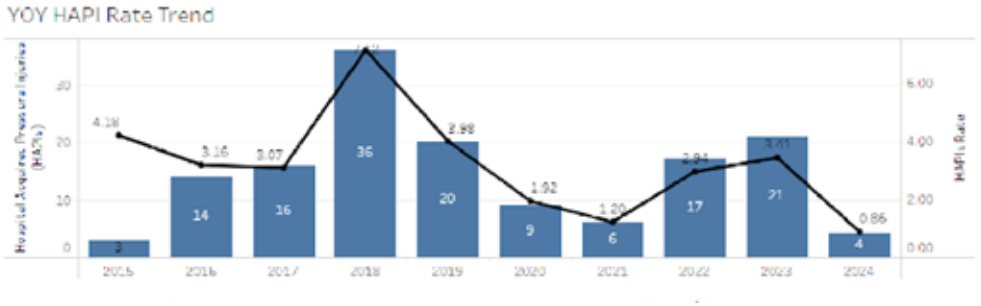
Quality Improvement work

Hospital Acquired Pressure Injury Initiative in the CICU

Tyler Eudy, Jenny Talbert, Michelle Rice, Alexis King, Meredith Lloyd, Sharah Collier, Katherine Cashen, Madeline Ueking, Erica Tily, Renee Hartney, Hailey Weeks, Rebecca Bagley

↓ HAPI from 3.41/1000 patient days to 0.58/1000



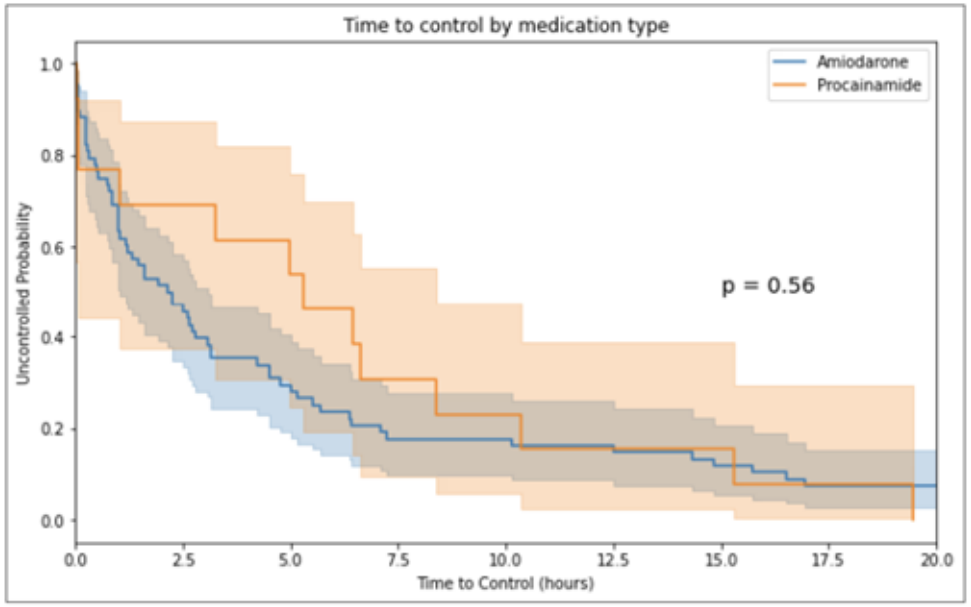
Increasing CPR Comfort and Knowledge in the PCICU

Karen Osborne, Emily Albergotti, Danielle Wood, Katherine Cashen

Quality Improvement work

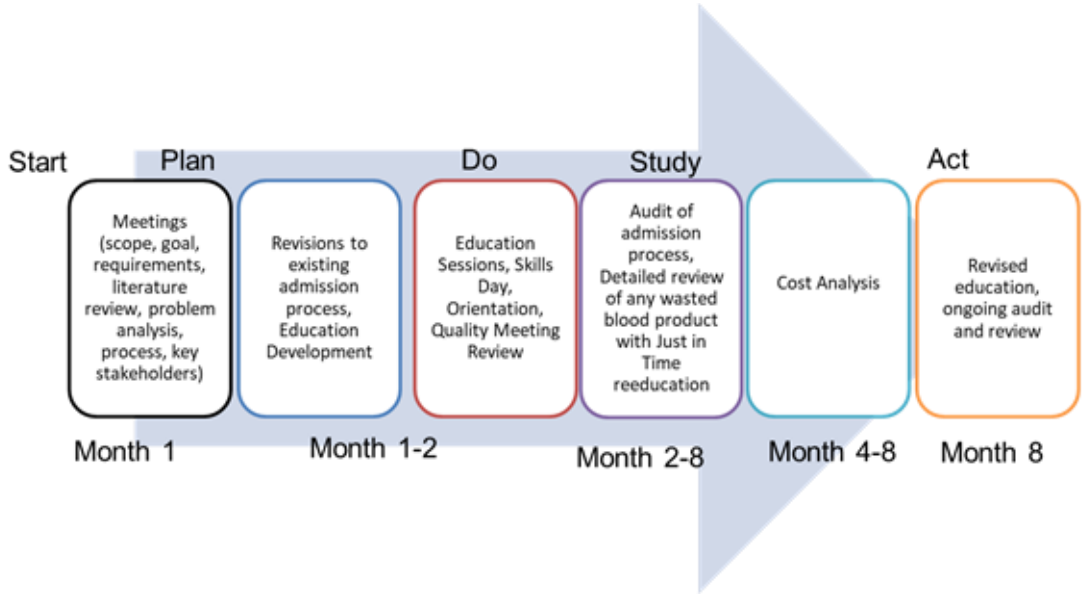
Comparison of antiarrhythmic therapies for junctional ectopic tachycardia

Henry Foote, Katie Cashen, Christoph Hornik, Zebulon Spector, Elizabeth Thompson



Decreasing blood waste for children with congenital heart disease

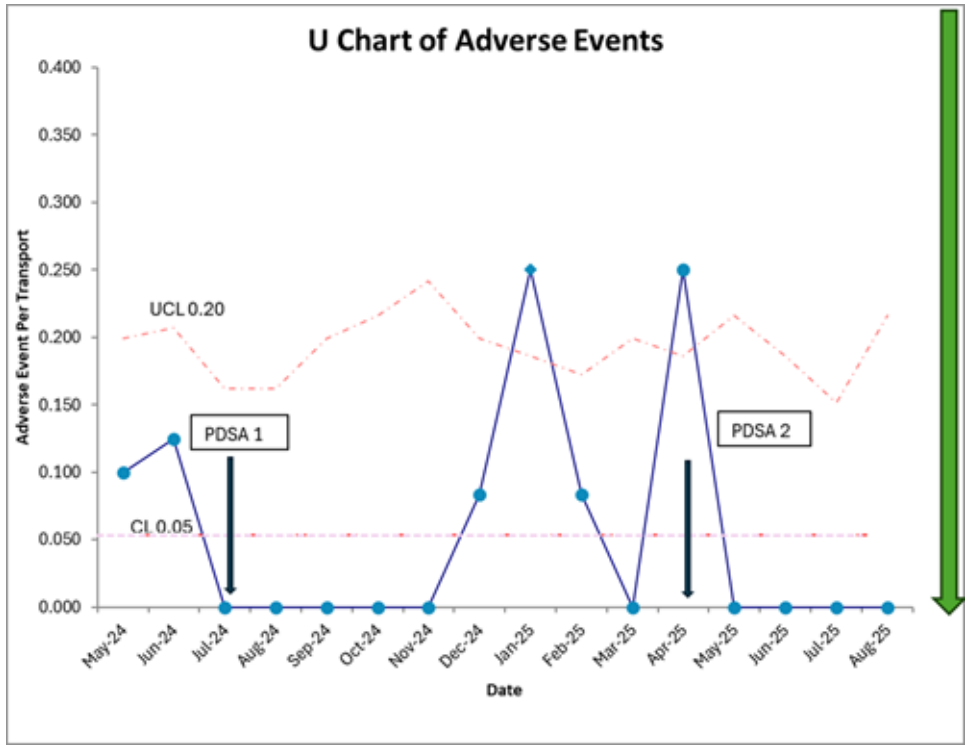
Lindsay Radtke, Jeannie Koo, Jenny Talbert, Karen Osborne, Sharah Collier, Jen Sherwin, Mike Greenburg, Katie Cashen



Quality Improvement work

Safe Medical Actions for Reliable Transport: SMART MOVES Initiative

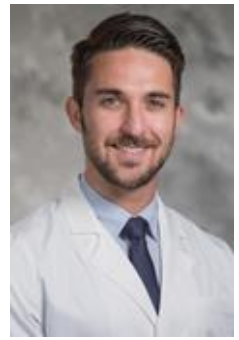
Shelby Tigabayan, Amanda Hodges, Ann Fletcher, Chasity Peoples, Terry Froman, Chandler Quinn, Emily Disney, Jen Sherwin, Sharah Collier, Katie Cashen



The Critical Role of Post-Operative Nurses in Cardiac Arrest Prevention

Michelle Mason, Cheyenne English

Pediatric Ventilator QI Group



- Multidisciplinary group with a goal of reducing duration of mechanical ventilation without increasing reintubation
  - Includes RTs, RNs, physicians, fellows, and APPs

Association Between Dead Space to Tidal Volume Ratio and Duration of Respiratory Support After Extubation in Children With Congenital Heart Disease

ORIGINAL RESEARCH

Postextubation Arterial Blood Gas to Predict Reintubation in Children With Congenital Heart Disease

Andrew G. Miller,[1–3,*] Katherine Cashen,[1] Elizabeth J. Thompson,[1,4] Joseph Zakhar,[1] Rachel M. Watts,[2] Veerajalandhar Allareddy,[1] Anna Fritz,[5] and Alexandre T. Rotta[1]

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Morbidity & Mortality Review

- Large monthly conference
- Good attendance from all disciplines
- Well-maintained safety culture
- Major topics reviewed for all mortalities and for chronic or complex cases
  - Input from many perspectives / backgrounds
  - Intentional and educational environment

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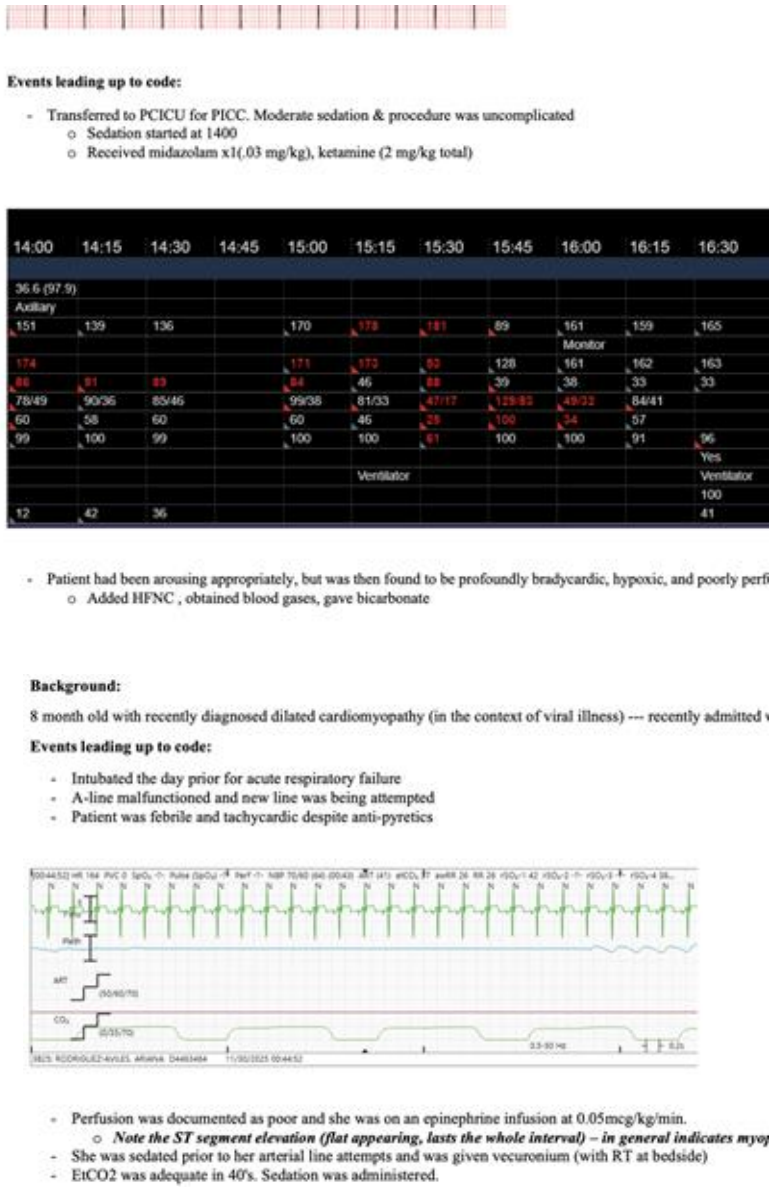
Code Review

- Presented monthly at M&M
- Multi-disciplinary Code Committee prepares cases
  - (MDs, NPs, MDs)
- Review of telemetry, data, code events, including areas for improvement

- ICU Debrief after codes / substantial resuscitation
  - Created a debrief tool coupled with post-arrest care (*QI project)
  - CAP Project



Events leading up to code:

- Transferred to PCICU for PICC. Moderate sedation & procedure was uncomplicated
  - Sedation started at 1400
  - Received midazolam x1(.03 mg/kg), ketamine (2 mg/kg total)

14:00 14:15 14:30 14:45 15:00 15:15 15:30 15:45 16:00 16:15 16:30

- Patient had been arousing appropriately, but was then found to be profoundly bradycardic, hypoxic, and poorly perfi
  - Added HFNC , obtained blood gases, gave bicarbonate

Background:

8 month old with recently diagnosed dilated cardiomyopathy (in the context of viral illness) --- recently admitted

Events leading up to code:

- Intubated the day prior for acute respiratory failure
- A-line malfunctioned and new line was being attempted
- Patient was febrile and tachycardic despite anti-pyretics

- Perfusion was documented as poor and she was on an epinephrine infusion at 0.05mcg/kg/min.
  - ***Note the ST segment elevation (flat appearing, lasts the whole interval) – in general indicates myo***
- She was sedated prior to her arterial line attempts and was given vecuronium (with RT at bedside)
- EtCO2 was adequate in 40's. Sedation was administered.

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Staffing Ratios & Safety

Long path to this staffing ratio – has required advocacy and demonstration of need to maintain its support.

- For example, our unit – currently has 24 bed capacity
- 2 teams , 2 attendings (max 12 per team)
- 2 providers per team (6 max/provider)
- 1-2 ‘resource’ provider (usually experienced NP)
- Attending in-house 24/7

* Safety Culture: The idea is if everyone feels free to raise concern, question, or express an idea – then the patient will be safer and have better a better outcome.

Staff Recognition and Retention

Unit Specific

- **27** Shared Governance Committees
- **3** Mission trip opportunities in 2026 (Honduras & Ghana)
- T-Shirt Days
- Staff shout-out's
- Self-scheduling
- Seniority Perks
- PTO Lottery
- Great Catch Recognition in monthly newsletter
- Monthly debriefs

Hospital Based

- Career Ladder Program
  - salary increases with each advancement
- Tuition Reimbursement
- Nursing School Student Loan Forgiveness
- Stipends for conference attendance/presentations
- Nursing Certification Bonus
  - at time of initial completion and at each renewal
- Daisy Award Program
- Great Catch Recognition
- Personal Assistance Service
- Magnet designated hospital

- Coming Up Next:
  - Bed expansion
  - Onboarding new grad nurses
  - Standard Work

- The Nursing Team who makes it all possible:
  - Nurse Manager
  - CN IV Leaders
  - Education Supervisor
  - Clinical Nurse Specialist
  - CN IV's
  - Clinical Nurse Educator
  - Quality Nurses

#3 in Nation and #1 in NC for Pediatric Cardiology and Heart Surgery

Duke Children's is ranked the #3 pediatric cardiology program in the nation and the best in North Carolina by U.S. News & World Report.

The University of Texas at Austin
UT Health Austin

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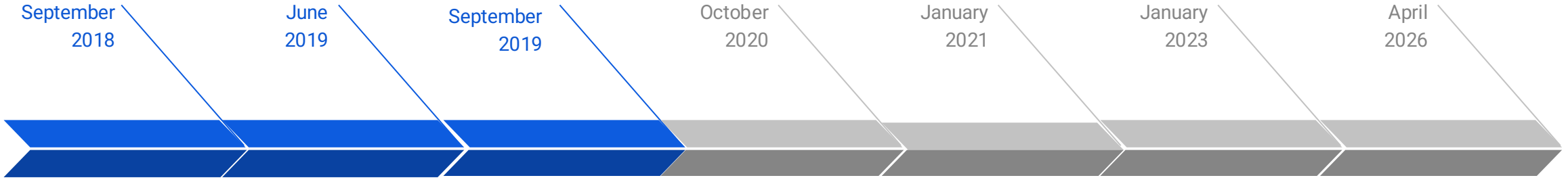
Ascension

CCU Nursing Education and Support Structure

Building a High-Performing Team with a Novice Workforce

Lindsay Davis, BSN, RN- Education Specialist
Catherine Erickson, BSN, RN, CCRN- Clinical Lead

CCU Program Milestones



TCPCHD Program Inception

Shared unit with PICU

12 reserved beds

CCU Opens

20 core nurses

24 beds

Average daily census 12 patients

First VAD

HeartWare

First Heart Transplant

First Berlin

CCU Expanded to 48 beds

Hired cohort of IMC nurses

Present State

>140 core nurses

32% nursing staff has less than 2 years experience

48 total beds, average daily census 36 patients

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Program Overview & Complexity

- Rapid growth of patient census
  - Average daily census increased from 12 (2019) to 36 (2026)
- Increasing patient acuity and complexity
- High performing CCU

Workforce Challenges

- Rapid expansion of core nursing staff-
  - 20 core nurses (2019) → >140 core nurses (2026)
- 32% nursing staff with less than 2 years of experience
- Sustained use of travel nurses

Impact:

- Variability of nursing practice
- Inconsistent skill levels at the bedside

Clinical Challenges

- Knowledge gaps identified:
  - Congenital heart disease physiology
  - Complex concepts (critical thinking)
  - Advanced therapies (VAD, transplant)
- Preceptor shortages and mismatch
- Inconsistent orientation experiences

Creating Order from Chaos: Building an Education Model

Program Development (2019-2022)

- CCU split from mixed PICU
- Nursing and Medical leaders develop policies and unit standards of care
- Competency and education needs identified:
  - Transplant
  - VAD
  - CVAD
- Rapid hiring and team expansion

Critical Gap Identified (2022)

- No dedicated education leader for post orientation development
- Lack of structure for:
  - Annual competencies
  - Simulation training
  - Just in time education

Consequences:

- Unclear expectations resulting in:
  - Poor compliance with requirements
  - Difficulty making safe patient assignments
  - Staff frustration
  - 11-14 extra days per year required to complete education

Strategic Intervention

Objective:

Create a **clear, predictable, and sustainable education structure** for bedside nurses.

Key Actions:

- Defined annual education and competency requirements
- Developed a **standardized quarterly education model**
- Aligned expectations with nursing leadership
- Built education into scheduling
- Multidisciplinary support recruited

Quarterly Education Model (Launched August 2023)

- 1 dedicated education day per nurse per quarter
- Scaled delivery:
  - 4 education days per quarter to accommodate volume of nursing staff
- **Each Education Day Includes:**
  - Staff meeting
  - Core Competency Validation: VAD, transplant or CVAD
  - High-fidelity simulation
  - Interactive education stations

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Education Day Design

Protected Time:

- Education built directly into nurse schedules
- Strong leadership support for attendance

Multidisciplinary Involvement

- Physicians
- APPs
- PT, OT, ST
- Nursing leadership,
- Quality and Infection Prevention teams
- Product representatives

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Education Days: Annual Competency Integration

- Coordinated with Specialty Teams:
  - VAD team
  - Transplant team
  - Vascular Access Safety Team (VAST)
  - Infection Prevention

Result: Streamlined competency completion

Education Days: Simulation Program

- High fidelity scenarios
- Led by multidisciplinary simulation team

Design Approach:

- Based on real unit events and trends
- Once per year complete back to basics PALS practice

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Education Days: Education Stations- Targeting Real-Time Gaps

Responsive to unit trends and safety data

- Rise in medication errors → annual medication test
- Trend in independent double check practice inconsistency → simulated independent double checks
- Initiation of holding protocol for intubated critical patients → simulation created with RT and PT

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Ongoing Education and Development

- Implemented:
  - Mock codes on both shifts
  - “Pulse Point” lecture series
  - CPR coach training
  - CVOR observation opportunities
  - CCRN preparation resources
  - USGIV training

- In Development:
  - Structured educator check ins at 2, 4, and 6 months post orientation
  - Lecture series embedded in education days

Key Takeaways

- Predictable scheduling and protected education time improves staff satisfaction and compliance
- Clear expectations decreases staff frustration
- Multidisciplinary collaboration strengthens clinical competence
- Scalable education models are essential for rapid unit growth

Evolution of the Orientation/Training Program

2019-2025: Task Oriented Learning

- Method: On-the-Job training (OJT) supplemented by a basic skills checklist with no CCU specific requirements.
- Outcome: Training was highly variable depending on which preceptor a nurse was paired with. It focused on “doing” rather than “understanding,” leaving new nurses without a standardized theoretical foundation.

2025–Present: Phased Orientation Model

- **Method:** A formalized **4-Phase Resident Program** built on inter-departmental collaboration.
- **Goal:** To eliminate the silos of the previous years by using shared best practices to ensure every nurse meets a high-acuity competency ceiling before flying solo.

Bedside Safety Nets

- Free charge nurses in each unit (CCU and Stepdown)
- Dedicated resource nurse/OR nurses are used as resources till cases come out.
- RN Practice Specialist
- APP involvement with critical cases
- Prevention Checklist for Rounding (i.e. CAP, Trach, CKRT)
- Standardized shift handoff & safety checks
- Standardized report sheets
- Shift huddles with current updates
- Heart Smarts and Pulse points lectures for CHD learning

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Orientation Mission & Goals

Core Objective: Standardizing clinical practice and ensure incoming team member begins their journey with an expected foundation.

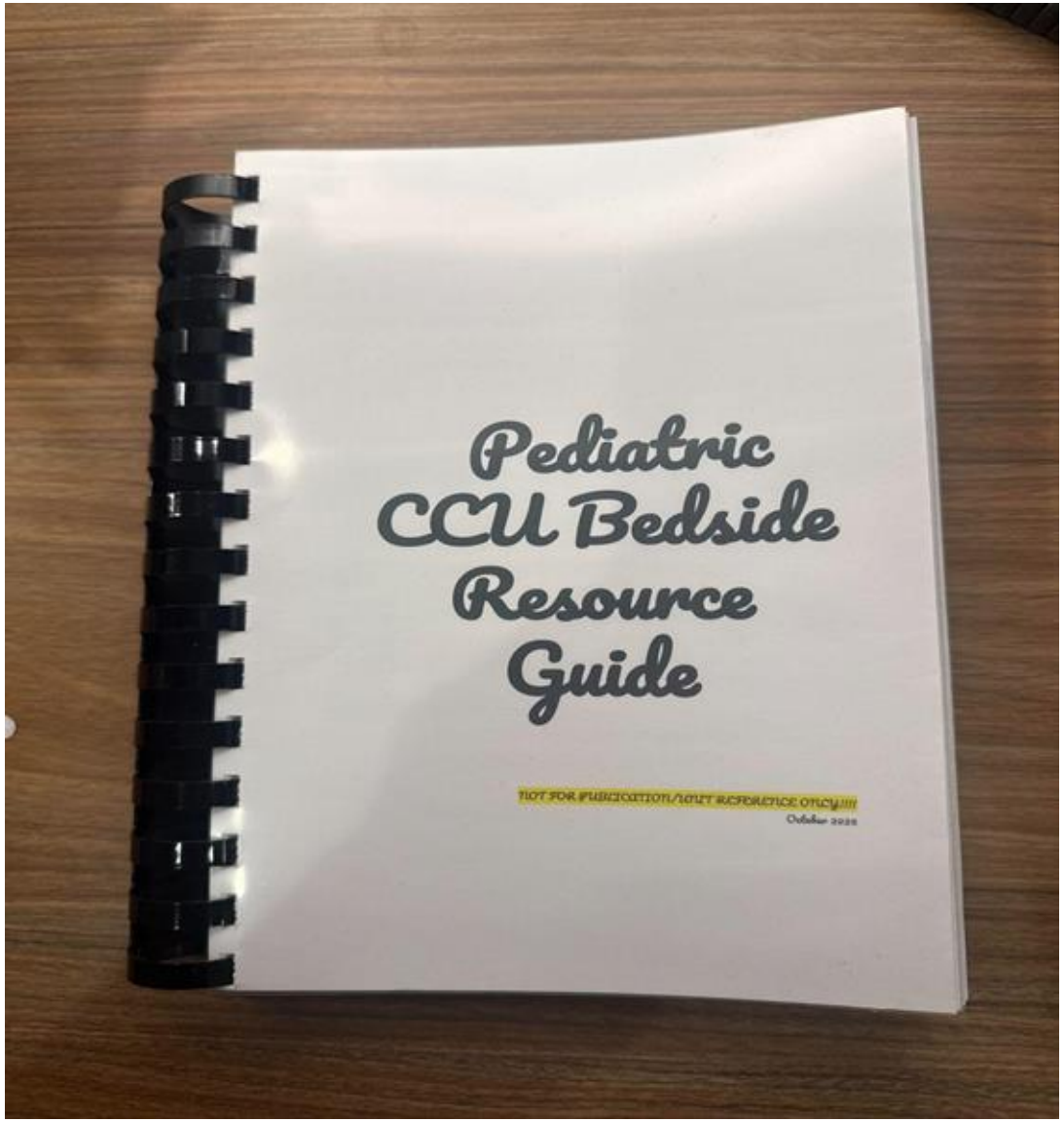
Key Pillars to Meeting the Objective

- Bridge the Knowledge Gap: Identify and fill the voids for all incoming staff.
- Elevate Baseline Competency: Increase the fundamental knowledge level of all learners by the conclusion of the orientation period.
- Standardize Practice: Align clinical workflows from day one to ensure consistent, high quality care across the unit.
- Empower Independence: Transition new hires from guided orientation to confident, independent practice with a robust clinical toolkit.

Bridging the Bedside Knowledge Gap

The Challenge: Clinical Time Constraints

- High Acuity Shifts leave minimal time for deep research.
- New staff need immediate, reliable answers to maintain patient safety.



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Elevate Baseline Competency

- Leadership team met and discussed desired knowledge topics that should be obtained during each phase.

- Divided the learning into:
  - Phase 1 - Foundations & Fundamentals
  - Phase 2 - Intermediate Critical Care Skills
  - Phase 3 - Advanced Integration
  - Phase 4 - Autonomy

Standardize Practice

Syllabus for Residents= 18 weeks with 2 weeks with a resource nurse. Includes four phases

Syllabus for Fellows = 8 weeks with 2 weeks with a resource nurse. Includes two phases.

Syllabus for Experienced Hires = has to be fluid and complimentary to what kind of experience the nurse has coming to our unit. The RN receives a book, Skills checklist, core CCU competencies and pre- and post- orientation test.

The Syllabus

Phase Training CCU Syllabus

It is expected that preceptors demonstrate a skill once, and the orientee will perform that skill as it is needed throughout the rest of orientation.

NOT FOR PUBLICATION/UNIT REFERENCE ONLY!!!!
January 2026

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Week 1 (Phase 1)	
Classroom & Lecture	1. Unit Orientation - see Orientation Checklist 2. Phone etiquette and Chart management and 12 hour checks 3. COMPASS/CERNER unit charting and expectations 4. Using the Intranet 5. Infection Prevention 6. Pain Assessment Number, Pain, FLACC (pre- and post- protocol) 7. Physical Therapy Patient ergonomics 8. Age Appropriate Care 9. Assessment - per body system 10. Bedside Report, DAR, SBAR and MD notify 11. DRAW in phlebotomy 12. CARDIAC A&P - Fetal and newborn blood flow 13. Medication Test #1
Didactic	1. Apex 1 2. Open Pediatrics - Module 1 - Cardiac Embryonology a. Lesson 1 - Cardiac Development b. Lesson 2 - Fetal Circulation 3. Open Pediatrics - Module 7 - Cardiac Rhythms and Arrhythmias a. Lesson 1 - Arrhythmias: Disturbances of AV Conduction
Cardiac A&P	1. Fetal to Newborn Circulation 2. Normal Anatomy of the Heart
Orientee Expectations	1. Complete all tasks as assigned 2. Complete a Scavenger Hunt 3. Pass the Math Test #1

Improved Checklist

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Dell Children's Medical Center of Central Texas
Registered Nurse Orientation Checklist &
CCU Specific RN Orientation Checklist

Name: _____ Hire Date: _____

Unit/Department:_____

It is very important that each of the Performance Skills marked with an asterisk be scored as Independent (I) by the end of your orientation.*

1. Your preceptor will place the date and his/her initials in the "date/preceptor initials" box.
2. Your preceptor will then evaluate and mark your progress in the "score" column with the level the task was completed based on the scale below.

PROGRESS DEFINITIONS:

FP--Full Prompting; Performs at the beginner level with maximum supervision	MP--Minimal Prompting; Performs at the advanced beginner level with moderate supervision.	I-Independent; Performs competently with minimal or no supervision.	E--No opportunity to complete a task. To be completed with Educator using alternative

NOTE: On any item in the checklist that is an overview or review, or that there was no opportunity available it will be completed with an by the Educator

FULL PROMPTING:	MINIMAL PROMPTING:	INDEPENDENT:
Beginner level defined as unable or unskilled, inefficient use of time and resources, lacks coordination, needs continuous verbal and/or physical	Advanced Beginner defined as mostly safe and accurate, needs occasional verbal and/or physical direction.	Competent defined as safe and accurate, proficient, coordinated, confident, and expedient use of time.

Methods of Validation:	CS: Case Study/Scenario	O: Observation	RD: Return Demonstration	
	*SM: Simulation (By Educator)	V: Verbalized Understanding	E : Exemplar	
Color Codes for Phase:	Phase 1(4weeks)	Phase 2(6weeks)	Phase3(6weeks)	Phase4(4weeks)
	Basic RN skills - assessment,charting,med. admin & time management	3 wks in stepdown-2N high acuity to be introduced to critical care concepts	Cont'd increase in critical care concepts then last 2 weeks pair assignments w/semi-autonomy	Four weeks w/ Pairs and a resource

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Empower Independence

- Communicated heavy workload expectancy from the first day
- BLS, PALS, ACLS, STABLE required during the first phase of orientation
- Math tests along with an independent double check skills check off
- Lecture slides for cardiac anomalies and critical care concepts for each week
- Quizzes developed for each week from previous week's information
- Phase tests: must pass to move forward
- CVL/Ventilator Check-off before clearance from orientation
- Remediation Plan in place if needed for areas of opportunity for the orientee

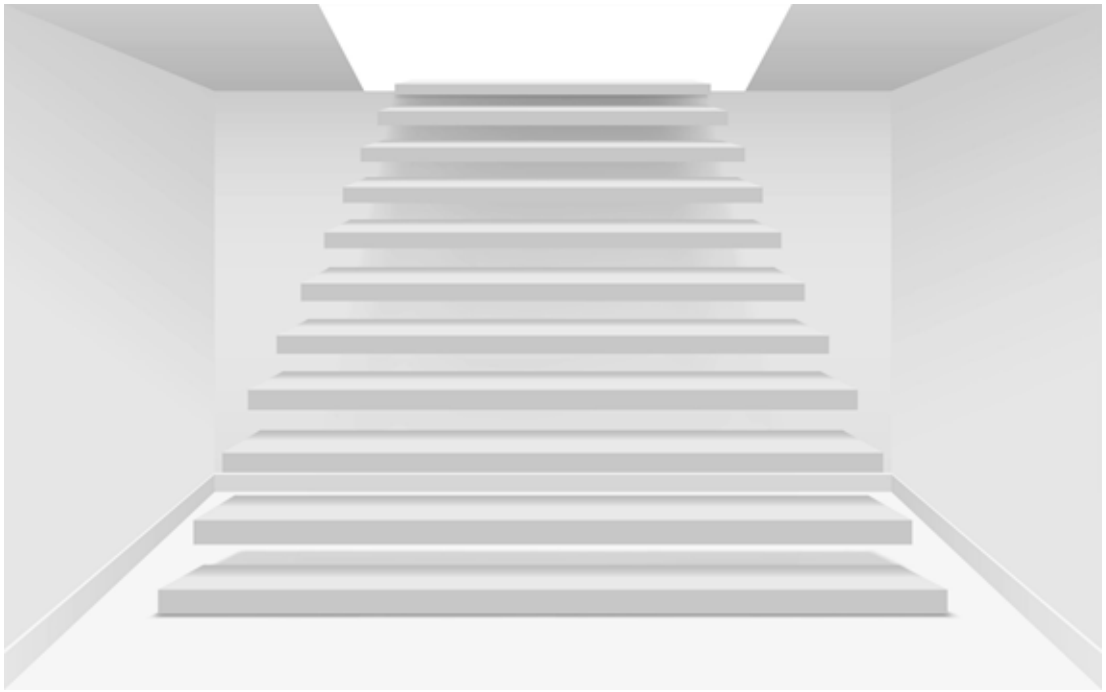
Pillars to Success

- Flexibility
- Multiple Check Ins
- Didactic and Classroom

Next Steps

Preceptor Standardization

- Uniform Language
- Checklist vs. Competency



Continuous Improvement and Flexibility

- Weekly meetings with the nursing leadership and education teams
- Updates to the orientation program after each cohort
- Staff-driven education planning
- Continued collaboration with multidisciplinary teams

Flexibility and humility are key

Thank You!

PC^4 Database Committee
during lunch 1:30 to 2:00 in Room
301 on the 3rd floor

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