Preventing Hospital Acquired Infection (HAI) in the NICU

CPQCC's Inaugural Toolkit Release Webinar

November 3, 2022

12pm – 1:30pm

Meeting Logistics

- Participants are automatically muted upon entry
- Use the chat function to post comments/questions during the presentations
- Feel free to **unmute and ask questions** during the Q&A Panel Discussion
- The **slides and recording** will be posted to the CPQCC website following today's session
- Please send a private chat message to **Janine Bohnert** if you need technical assistance

Agenda

TIME	TOPIC	SPEAKER
12:00 – 12:05pm	Welcome & Introductions	Janine Bohnert, BS
12:05 – 12:20pm	Review of HAI NICU Data	Henry Lee, MD, MS
12:20 – 1:10pm	Introduction to the HAI Toolkit • Toolkit Overview • Hand Hygiene • NICU Quality Improvement and Culture • General Principles of HAI Prevention • Skin Considerations and HAI Prevention • Antibiotic Stewardship & Multi-Drug Resistant Organisms • Summary	Robin Clifton-Koeppel, DNP, CNS, CPNP Susan Bowles, DNP, APRN-CNS, RNC-NIC Rachelle Sey, PhD, APRN, CNS, RNC-NIC Nick Mickas, MD Robin Clifton-Koeppel, DNP, CNS, CPNP Carolyn Lund, MS, RN, FAAN Talal Seddik, MD Robin Clifton-Koeppel, DNP, CNS, CPNP
1:10 – 1:30pm	Q&A Panel Discussion Panel includes all presenters	Moderated by: Linda Lefrak, MSN Mindy Morris, DNP, NNP-BC, CNS, C-ELBW
1:30pm	Closing & CE Evaluation Link	Janine Bohnert, BS

Introductions

Planning Committee, Toolkit Authors, Presenters, and Facilitators

Malathi Balasundaram, MD, FAAP, Stanford University & QI Infrastructure Committee Chair

Janine Bohnert, BS, CPQCC

Susan Bowles, DNP, APRN-CNS, RNC-NIC, Florida Perinatal Quality Collaborative

Robin Clifton-Koeppel, DNP, CNS, CPNP, University of California, Irvine Medical Center

Henry Lee, MD, MS, CPQCC & UCSD Health

Linda Lefrak, MSN, QI Infrastructure Committee Member

Carolyn Lund, MS, RN, FAAN, UCSF Benioff Children's Hospital Oakland

Nick Mickas, MD, John Muir Health

Mindy Morris, DNP, NNP-BC, CNS, C-ELBW, Engage/Grow/Thrive, LLC & QI Infrastructure Committee Member

Talal Seddik, MD, Stanford University

Rachelle Sey, PhD, APRN, CNS, RNC-NIC, Sharp Mary Birch Hospital for Women & Newborns

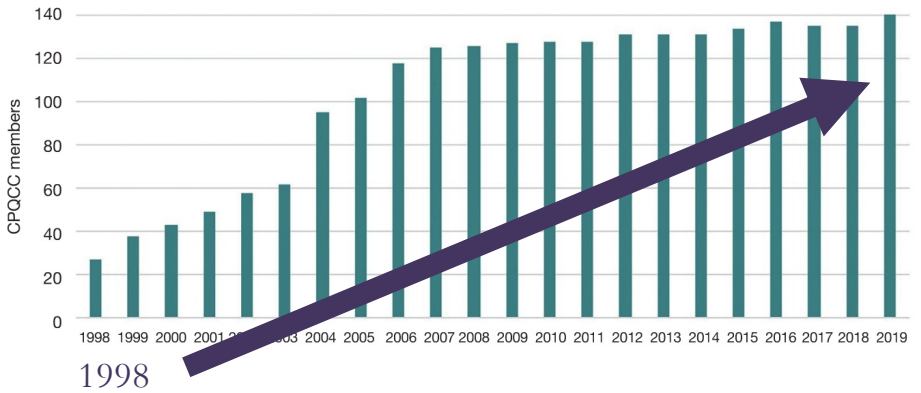
Preventing HAI in the NICU

Henry Lee, MD, MS

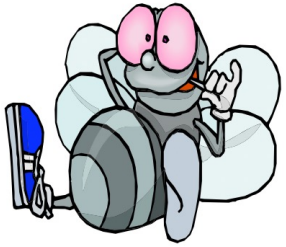
Reducing Nosocomial Infection in the NICU
CPQCC Toolkit 2003 and 2006

CPQCC membership

the first state perinatal (data driven) QI collaborative



CALIFORNIA PERINATAL QUALITY CARE COLLABORATIVE



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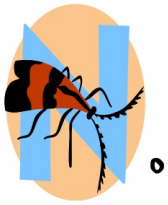


osocomial

nfection?

Neonatal Hospital-Acquired Infection Prevention

Susan Bowles, MSN, RNC, Janet Pettit, RN, NNP, MSN, Nick Mickas, MD, Courtney Nisbet, RN, MS, Teresa Proctor MSN, RN, David Wirtschafter, MD

on behalf of the Perinatal Quality Improvement Panel (PQIP), California Perinatal Quality Care Collaborative (CPQCC)

March 2007

PEDIATRICS
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Nosocomial Infection Reduction in VLBW Infants With a Statewide Quality-Improvement Model

David D. Wirtschafter, Richard J. Powers, Janet S. Pettit, Henry C. Lee, W. John Boscardin, Mohammad Ahmad Subeh and Jeffrey B. Gould

Pediatrics 2011;127;419; originally published online February 21, 2011;
DOI: 10.1542/peds.2010-1449

QI participation associated with reduction in nosocomial infection – OR 0.81

Year	Period	Study Data Flow	
2002	Baseline	All 54 NICUs (*N* = 2302 "nonparticipant" infants)	
2003–2004	Dissemination/ Implementation	Toolkit Availability Announced To All 54 NICUs	
		27 NICUs voluntarily participate in Toolkit Workshop(s)	27 NICUs chose not to participate in Toolkit Workshop(s)
		N = 3080 "participant" infants	*N* = 1916 "nonparticipant" infants
2005–2006	Evaluation	*N* = 3164 "participant" infants	*N* = 1783 "nonparticipant" infants

Journal of Perinatology (2010) 30, 170–181

www.nature.com/jp

ORIGINAL ARTICLE

A statewide quality improvement collaborative to reduce neonatal central line-associated blood stream infections

DD Wirtschafter[1], J Pettit[2], P Kurtin[3], M Dalsey[4], K Chance[4], HW Morrow[4], M Seid[5,12], TL Byczkowski[6,12], TP Huber[7], JM Milstein[8], SM Bowles[9], S Fichera[10] and S Kloman[11,13]

- Objective: …reduce CLABSIs among 13 regional NICUs by 25%
- 2006 - 2007

1) Leadership commitment
2) Potentially best practices
3) Collaborative processes
4) Audit and feedback tools
5) Quality improvement techniques

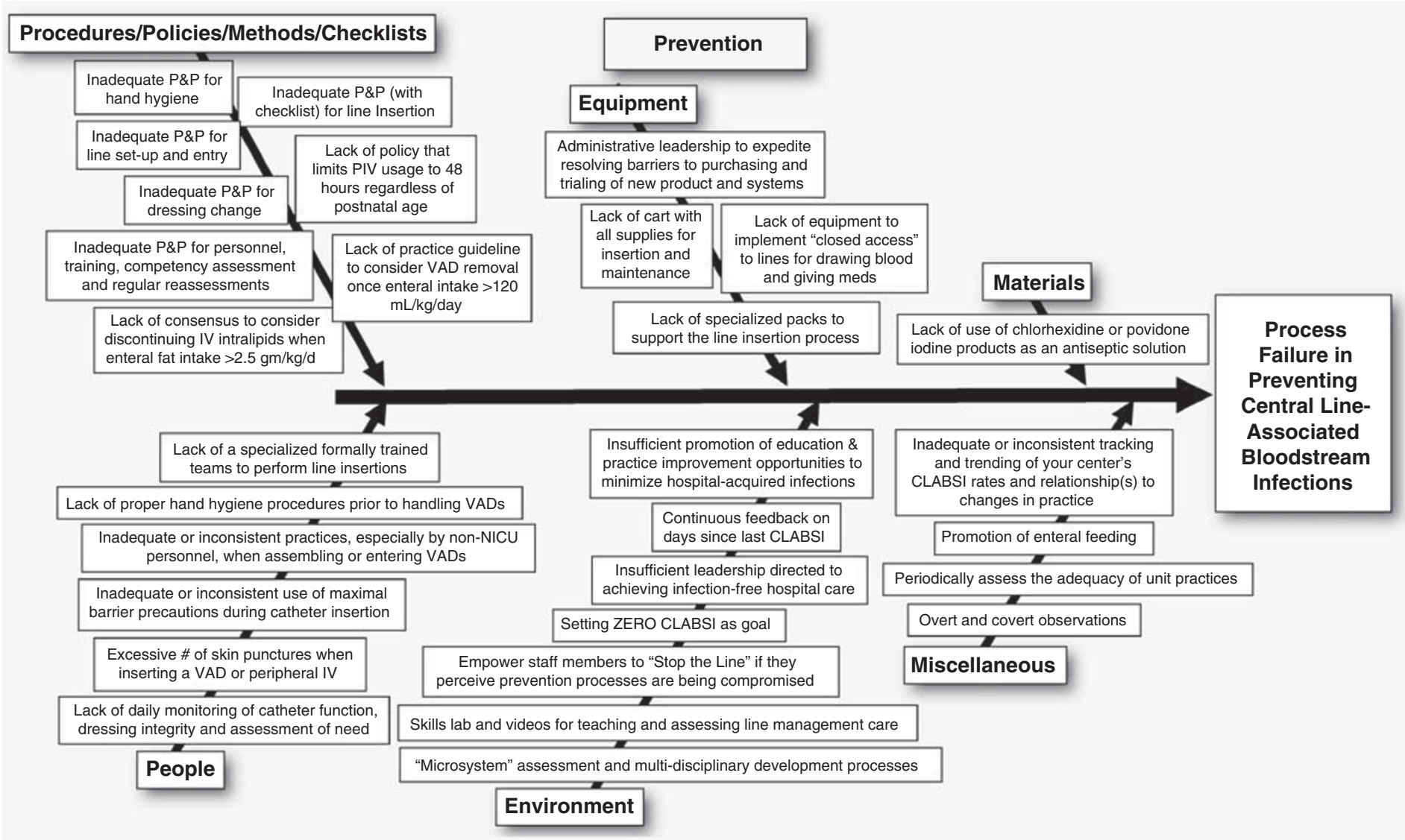
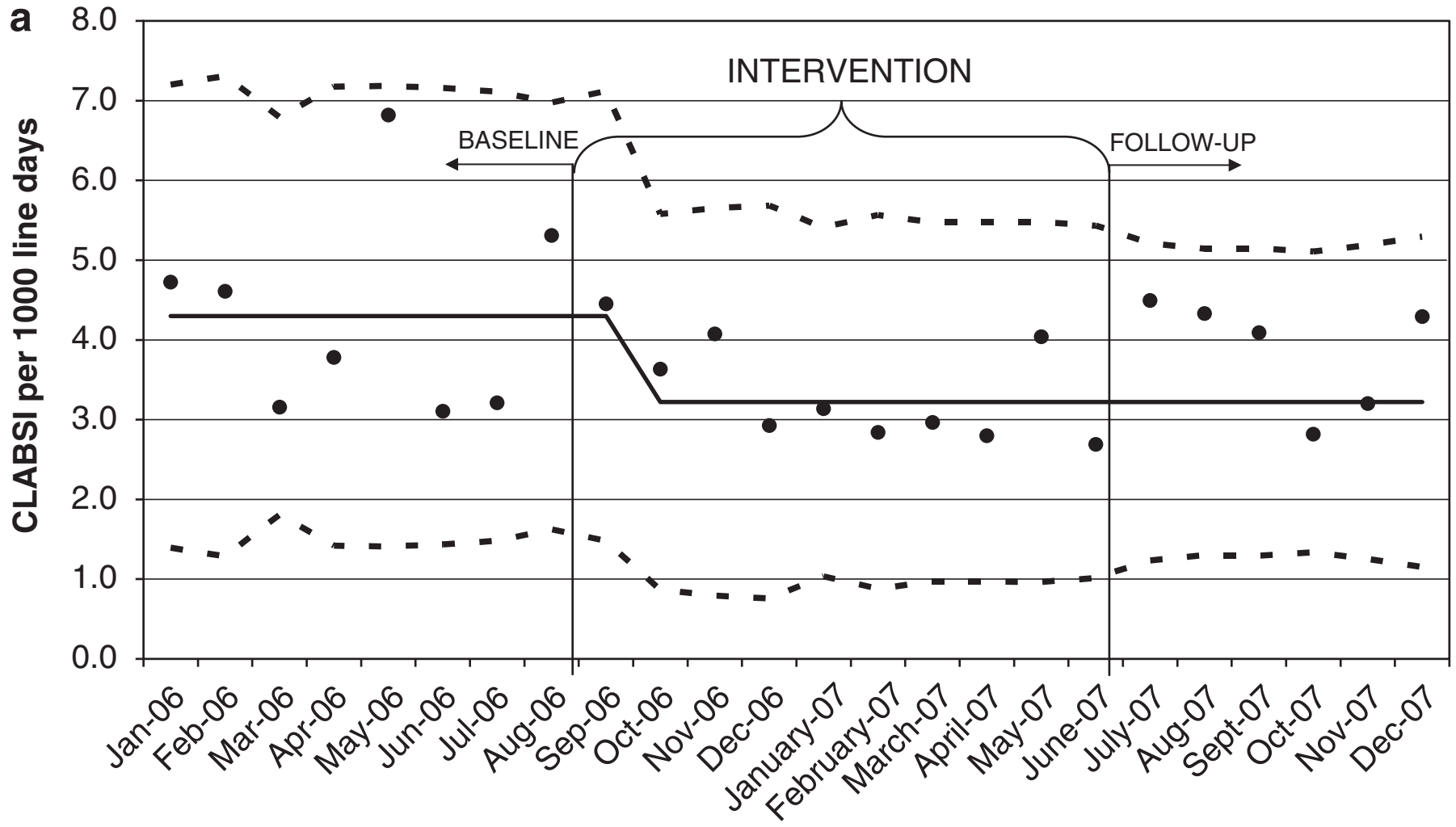


Figure 3 Ishikawa diagram of the central line-associated bloodstream infection process.


a
CLABSI per 1000 line days
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
INTERVENTION
BASELINE
FOLLOW-UP
Jan-06
Feb-06
Mar-06
Apr-06
May-06
Jun-06
Jul-06
Aug-06
Sep-06
Oct-06
Nov-06
Dec-06
January-07
February-07
March-07
April-07
May-07
June-07
July-07
Aug-07
Sept-07
Oct-07
Nov-07
Dec-07

PEDIATRICS®
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Effect of Catheter Dwell Time on Risk of Central Line–Associated Bloodstream Infection in Infants

Rachel G. Greenberg, Keith M. Cochran, P. Brian Smith, Barbara S. Edson, Joseph Schulman, Henry C. Lee, Balaji Govindaswami, Alfonso Pantoja, Doug Hardy, John Curran, Della Lin, Sheree Kuo, Akihiko Noguchi, Patricia Ittmann, Scott Duncan, Munish Gupta, Alan Picarillo, Padmani Karna, Morris Cohen, Michael Giuliano, Sheri Carroll, Brandi Page, Judith Guzman-Cottrill, M. Whit Walker, Jeff Garland, Janice K. Ancona, Dan L. Ellsbury, Matthew M. Laughon and Martin J. McCaffrey

Pediatrics 2015;136;1080; originally published online November 16, 2015;
DOI: 10.1542/peds.2015-0573

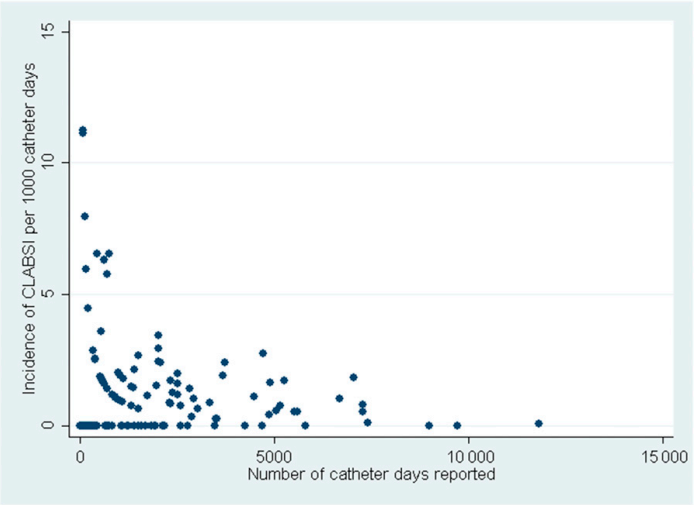


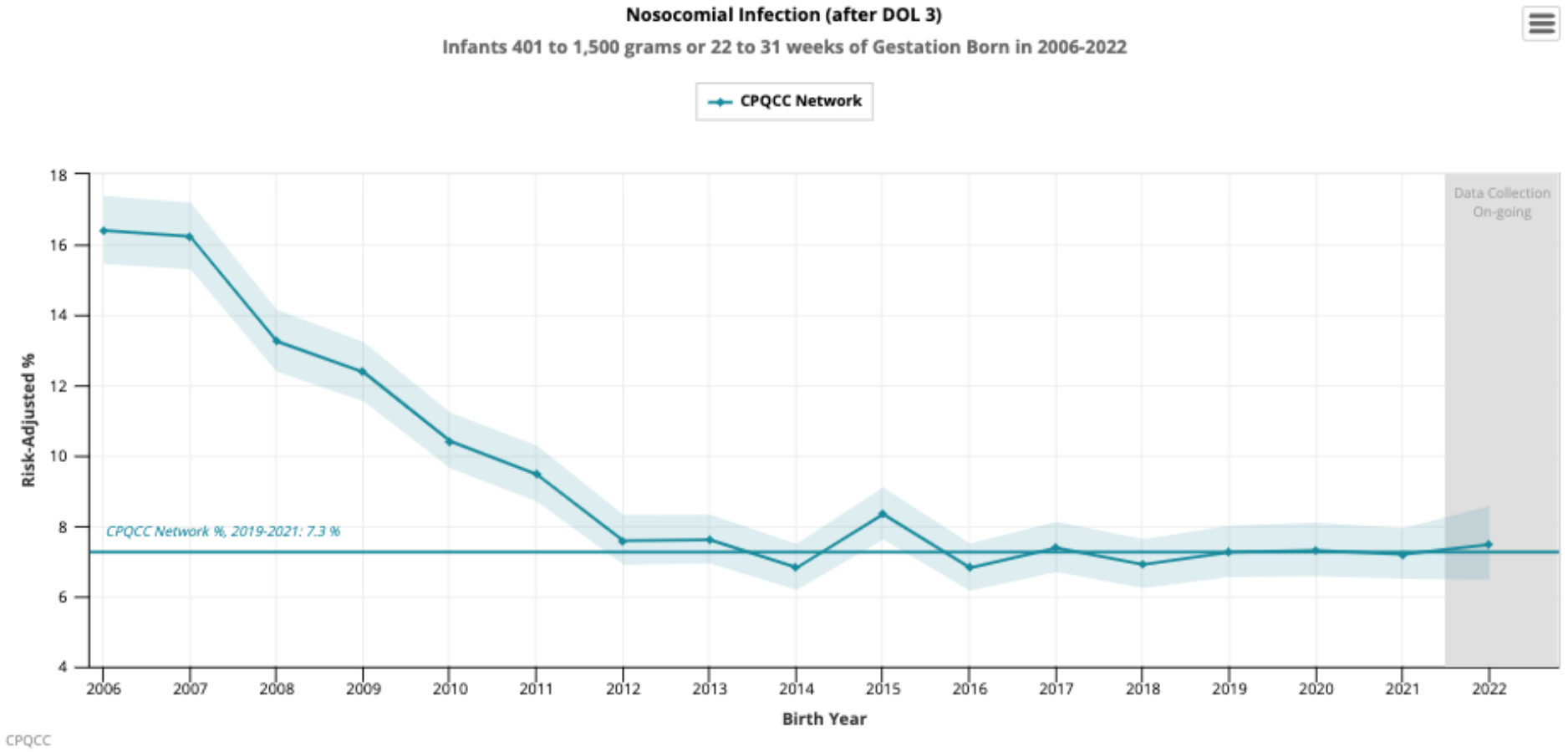
FIGURE 1
Incidence of CLABSI per 1000 catheter days by unit size (number of catheter days reported). Graph excludes 1 site with incidence of CLABSI of 60.6 per 1000 catheter days.

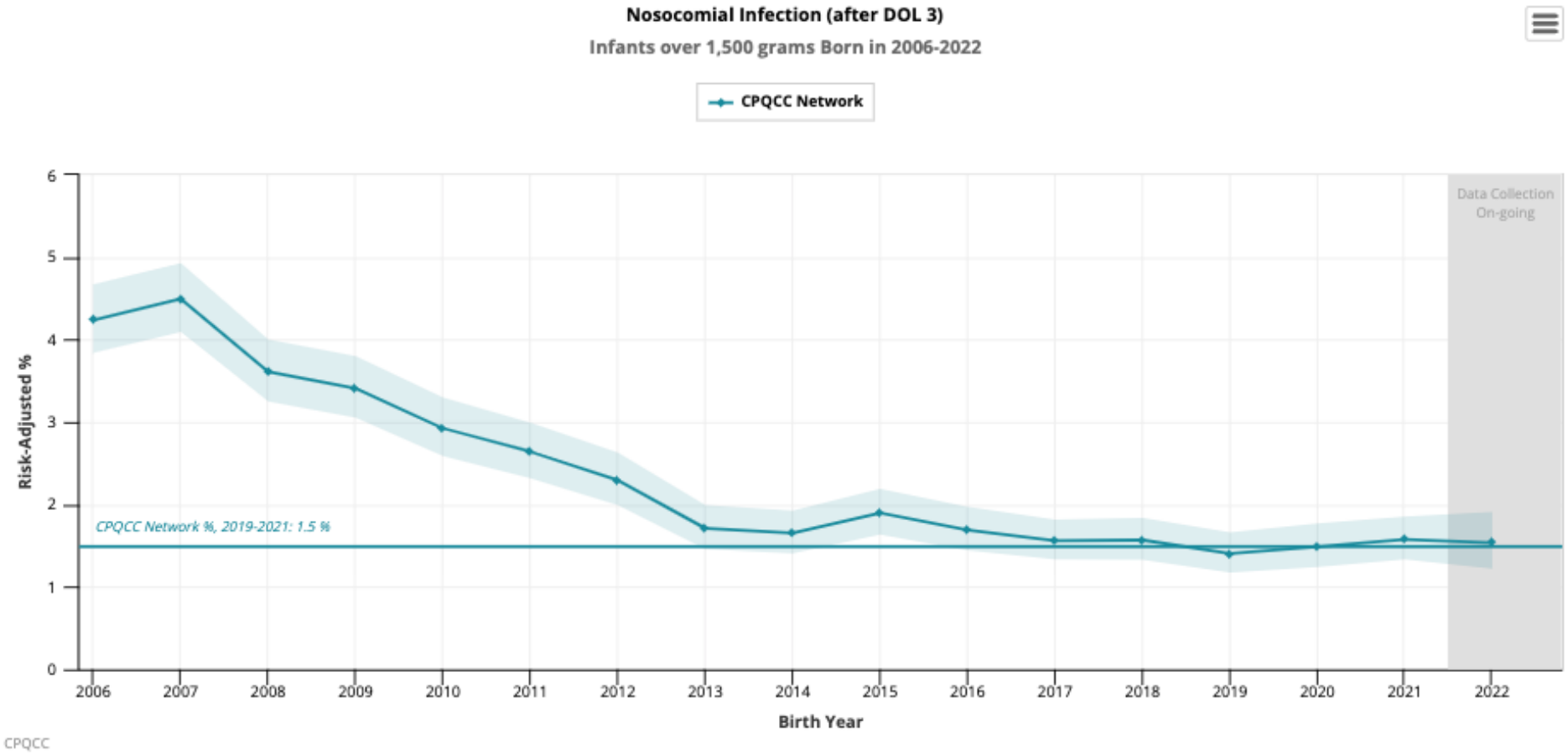
National CLABSI Prevention Project
– 13 state perinatal collaboratives
2011-2013

TABLE 2 Effect of Dwell Time on CLABSI

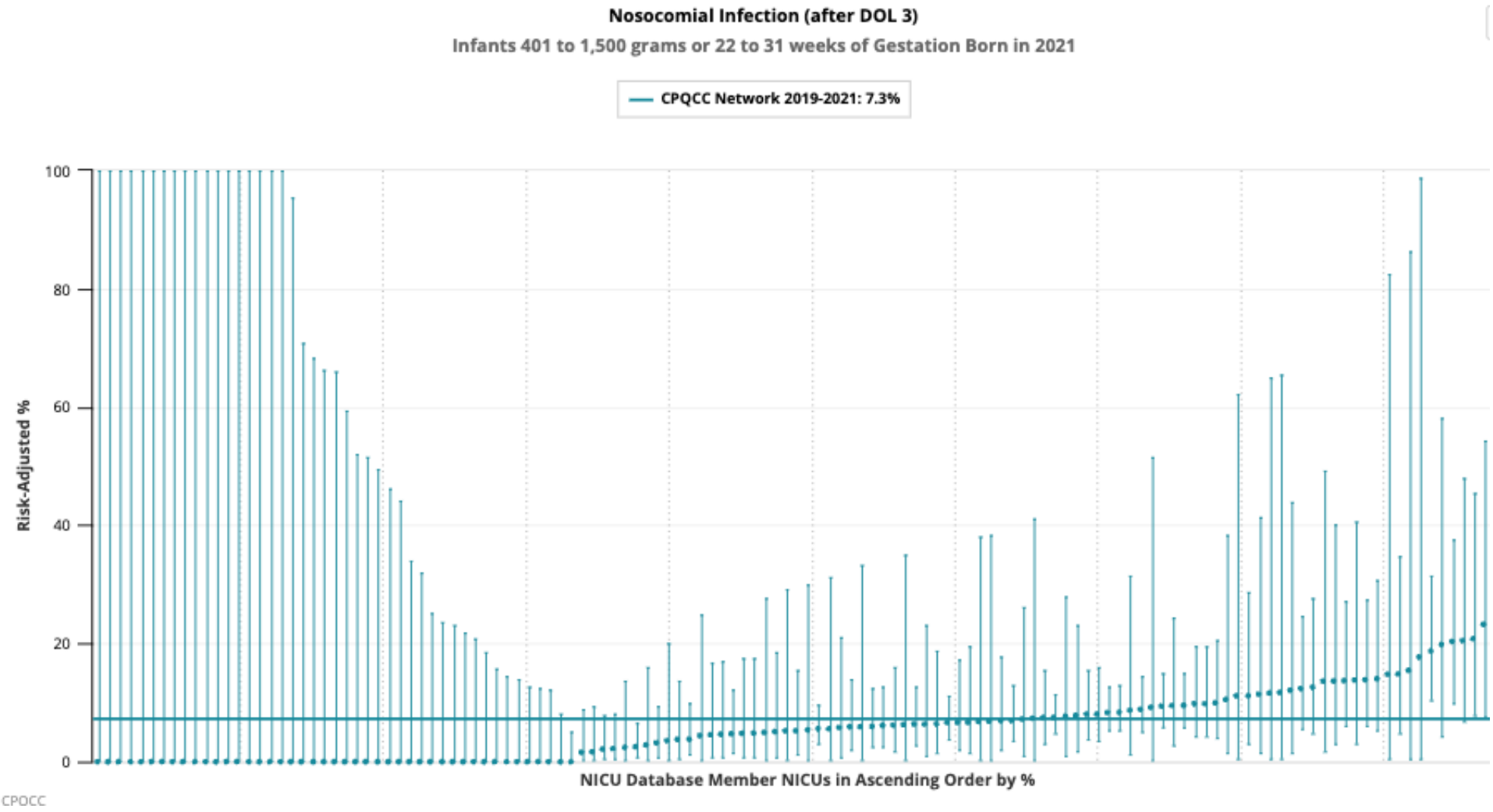
Week of Dwell Time	PICCs, *N*	CLABSI, *N* (%)	PICCs, HR[a] (95% CI)	Tunneled Catheters, *N*	CLABSI, *N* (%)	Tunneled Catheters, HR[a] (95% CI)
1	14 451	82 (0.6)	Reference	1116	5 (0.4)	Reference
2	8250	56 (0.7)	1.2 (0.9–1.7)	969	5 (0.5)	1.3 (0.4–4.4)
3	4061	31 (0.8)	1.3 (0.8–1.9)	748	3 (0.4)	1.0 (0.2–4.4)
4	2209	5 (0.2)	0.4 (0.1–0.9)	580	2 (0.3)	0.9 (0.2–4.7)
5	1290	7 (0.5)	0.9 (0.4–1.9)	452	3 (0.7)	1.8 (0.4–7.6)
6	765	7 (0.9)	1.5 (0.7–3.2)	355	4 (1.1)	3.2 (0.8–12.0)
7	453	4 (0.9)	1.4 (0.5–4.0)	280	4 (1.4)	4.0 (1.1–15.4)
8	278	3 (1.1)	1.6 (0.5–5.2)	228	1 (0.4)	1.3 (0.1–11.4)
9	183	2 (1.1)	1.5 (0.4–6.3)	178	3 (1.7)	4.7 (1.1–20.3)
10	125	0		151	1 (0.7)	2.0 (0.2–17.7)

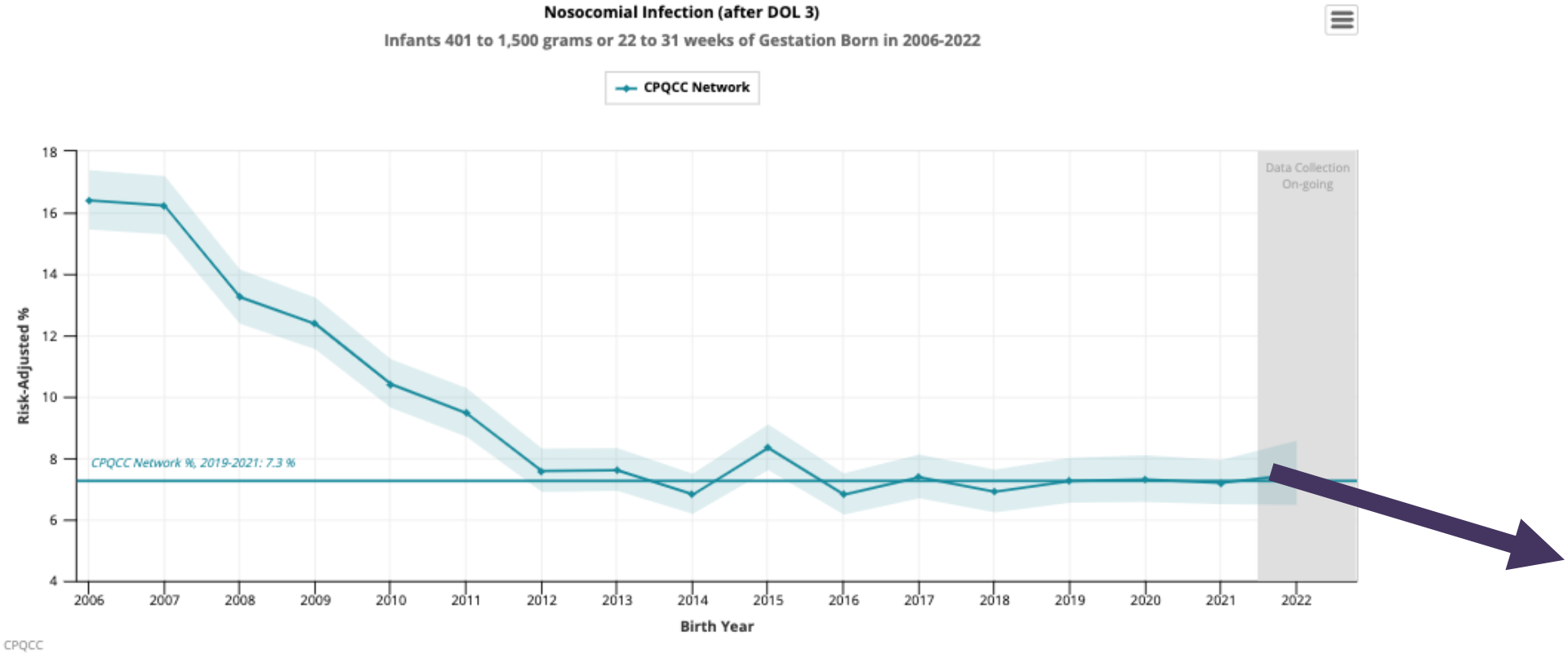
CI, confidence interval; HR, hazard ratio.
[a] HRs are adjusted for PMA, year of catheter insertion, and site.


Nosocomial Infection (after DOL 3)
Infants 401 to 1,500 grams or 22 to 31 weeks of Gestation Born in 2006-2022
CPQCC Network
Risk-Adjusted %
18
16
14
12
10
8
6
4
CPQCC Network %, 2019-2021: 7.3 %
Data Collection On-going
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Birth Year
CPQCC


Nosocomial Infection (after DOL 3)
Infants over 1,500 grams Born in 2006-2022
CPQCC Network
Risk-Adjusted %
0
1
2
3
4
5
6
CPQCC Network %, 2019-2021: 1.5 %
Data Collection On-going
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Birth Year

CPQCC


Nosocomial Infection (after DOL 3)
Infants 401 to 1,500 grams or 22 to 31 weeks of Gestation Born in 2021
CPQCC Network 2019-2021: 7.3%
100
80
60
40
20
0
Risk-Adjusted %
NICU Database Member NICUs in Ascending Order by %
CPOCC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CPQCC Network %, 2019-2021: 7.3 %
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2006
2007
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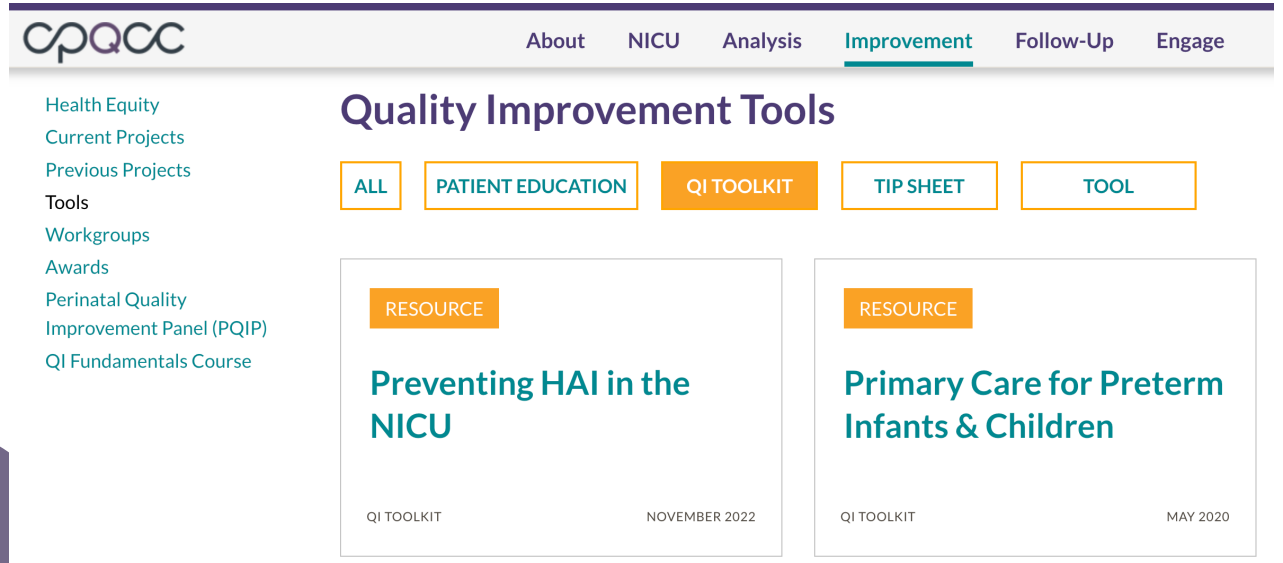
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Birth Year
CPQCC

Introduction to the HAI Toolkit

Robin Clifton-Koeppel, DNP, CNS, CPNP

Webinar Registration Info

- 90% respondents aware of CPQCC toolkits
- 10% respondents not aware of CPQCC toolkits



www.cpqcc.org/improvement/qi-tools

Preventing Hospital Acquired Infection (HAI) in the NICU Toolkit

2022 Toolkit Goals:

- Avoid duplication of other, evidence-based guidelines and consider widening the focus from Central Line Associated Blood Stream Infection (CLABSI) prevention to other potential sources of Hospital Acquired Infection (HAI) such as the skin and the gut.
- Provide tools and resources as examples of practical approaches to enhance HAI prevention efforts. **The toolkit provides 34 tools/resources!**
- Serve as a resource for NICUs seeking additional HAI prevention strategies to enhance existing practices

How the toolkit was developed

It **ALL** starts with basic principles of **hand hygiene** (HH); in the NICU, this task can be quite complex and is a good starting point despite high HH compliance

- **Quality Improvement (QI) NICU culture**, fostering a culture of safety and learning impacts HAI prevention and success
- **General Principles:** this section considers additional interventions NICUs may consider to further reduce HAI incidence
- **Skin Considerations:** not previously addressed in the first published toolkit, the skin is included in this revision as skin protection/integrity is an important consideration in HAI prevention
- **Antibiotic Stewardship & Multidrug Resistant Organisms (MDRO) Prevention:** another topic not addressed in the previous toolkit, both antibiotic and diagnostic stewardship actions and MDRO prevention is addressed

Thank You!

- Thank you to the NICU leaders and clinicians who were willing to share their unit-specific tools, checklist, and work processes that make this toolkit a practical resource
- **Thank you to all the section authors!** Your dedication, commitment, time, and effort created this important and practical HAI prevention resource.

Hand Hygiene

Susan Bowles, DNP, APRN-CNS, RNC-NIC

Rachelle Sey, PhD, APRN, CNS, RNC-NIC

Hand Hygiene: Background

- **Hand Hygiene (HH) is the single most effective strategy to reduce HAI** and serves as the foundation to all other intervention strategies.
- HAI prevention efforts should begin with a detailed review of all NICU HH practices, protocols, and staff education efforts.
- Modern NICU designs and environments add complexity in maintaining HH compliance.

Hand Hygiene: Approach

1

CDC Guidelines

CDC *MMWR Morbidity and Mortality Weekly Report.* Guideline for hand hygiene in health care settings.

2

Literature Review

Review of literature to identify potential innovative strategies for HH monitoring and compliance.

3

WHO Recommendations

5 Moments of Hand Hygiene

4

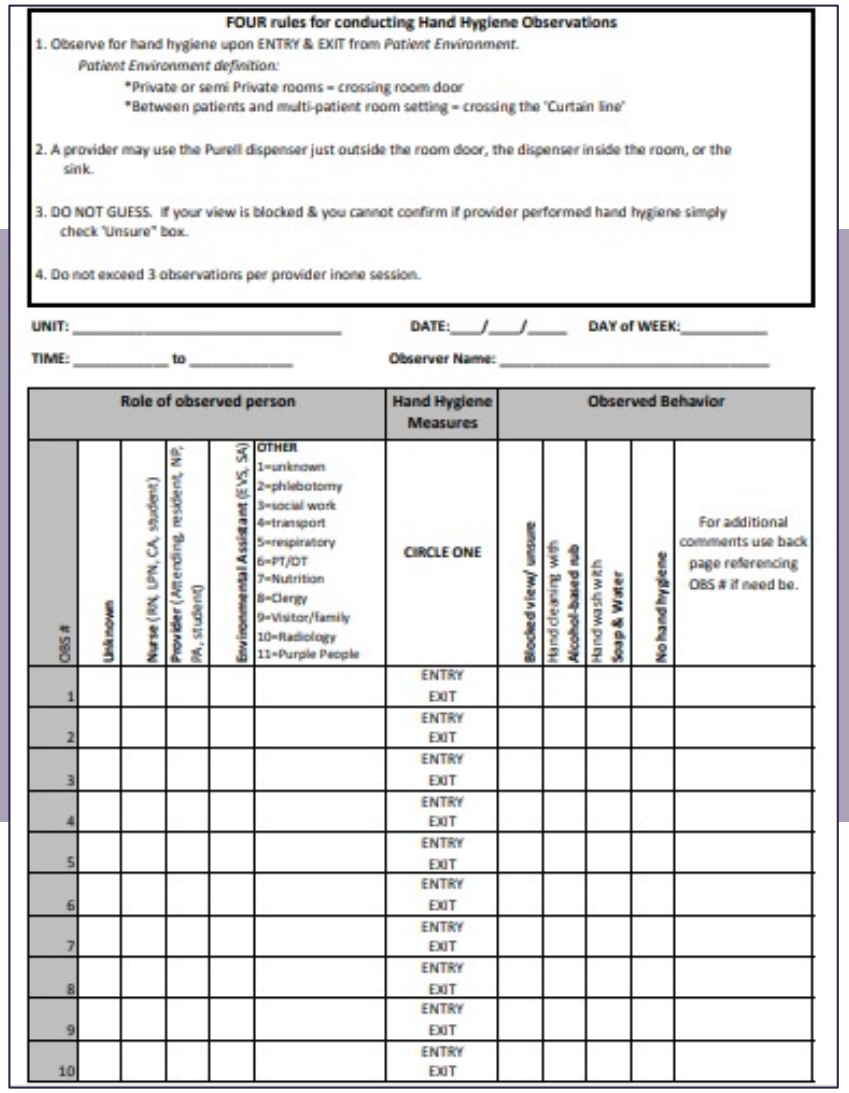
Review of Existing Tools

Many Hospitals and NICUs have developed successful tools and resources that were reviewed and are included within the toolkit.

Hand Hygiene

Potentially Best Practice

- PBP #1.1: Establish hand hygiene standards and compliance monitoring as an integral component of a robust hospital acquired infection reduction program.



FOUR rules for conducting Hand Hygiene Observations

1. Observe for hand hygiene upon ENTRY & EXIT from *Patient Environment*.
   Patient Environment definition:
   *Private or semi Private rooms = crossing room door
   *Between patients and multi-patient room setting = crossing the 'Curtain line'
2. A provider may use the Purell dispenser just outside the room door, the dispenser inside the room, or the sink.
3. DO NOT GUESS. If your view is blocked & you cannot confirm if provider performed hand hygiene simply check "Unsure" box.
4. Do not exceed 3 observations per provider inone session.

UNIT: _____ DATE:___/___/____ DAY of WEEK:_____

TIME: _____ to _____ Observer Name: _____

	Role of observed person					Hand Hygiene Measures	Observed Behavior				
OBS #	Unknown	Nurse (RN, LPN, CA, student)	Provider (Attending, resident, NP, PA, student)	Environmental Assistant (EVS, SA)	OTHER 1=unknown 2=phlebotomy 3=social work 4=transport 5=respiratory 6=PT/OT 7=Nutrition 8=Clergy 9=Visitor/family 10=Radiology 11=Purple People	CIRCLE ONE	Blocked view/ unsure	Hand cleaning with Alcohol-based rub	Hand wash with Soap & Water	No hand hygiene	For additional comments use back page referencing OBS # if need be.
1						ENTRY EXIT					
2						ENTRY EXIT					
3						ENTRY EXIT					
4						ENTRY EXIT					
5						ENTRY EXIT					
6						ENTRY EXIT					
7						ENTRY EXIT					
8						ENTRY EXIT					
9						ENTRY EXIT					
10						ENTRY EXIT					

Hand Hygiene Tools

Leader Guide
How to improve your HH Compliance
Unit/Service Leader Checklist

Use this checklist periodically to remind yourself of what you can do to improve hand hygiene on your unit/service

- ❑ I provide education pertaining to hand hygiene and healthcare associated infections to all who deliver care on my unit/service.
- ❑ I make sure that hand sanitizer dispensers are conveniently located and regularly refilled and in working order on my unit/service.
- ❑ I share my unit's hand hygiene data during each staff meeting.
- ❑ I post my unit's hand hygiene performance at a strategic location in faculty and staff meeting areas to enhance data visibility & encourage discussions on hand hygiene.
- ❑ I support and publicly recognize/reward members who remind other colleagues to clean hands.
- ❑ I have developed a hand hygiene self-monitoring plan on my unit, where members of my team perform hand hygiene observations 20 mins a week.
- ❑ I recognize/reward team members from all disciplines who demonstrate good hand hygiene practices.
- ❑ I inform my nursing director and department chair of healthcare team members that are repeatedly non-compliant with hand hygiene policy.
- ❑ I encourage my staff to report in Patient Safety Net any health team members who repeatedly fail to clean their hands and ignore reminders.
- ❑ I have a plan for addressing team members from all disciplines who are non-compliant with hand hygiene regularly.
- ❑ I provide timely, specific, and respectful feedback to team members who are not adherent to good hand hygiene practices.
- ❑ I send representatives from my unit/service to Hand Hygiene Task Force meetings to discuss best practices & learn from others.
- ❑ I collaborate with other discipline champions from physician, nursing, environmental services, etc. to provide feedback to faculty and staff who repeatedly fail to follow hand hygiene recommendations.
- ❑ I provide rewards/incentives for those healthcare workers or units who improve and sustain improved hand hygiene compliance.

- ❑ **For service leaders:** I review action plans developed by units with low HH compliance and provide them with support and resources.

Example Tool:

Hand Hygiene Tools

CDC Quick Observation Tools (QUOTs) for Infection Prevention

- The toolkit includes 9 PDF NICU specific check lists
  - Example:

Standard Precautions: Observation of Hand Hygiene
Provision of Supplies

NICU-2

Instructions: Observe patient care areas or areas outside of patient rooms. For each category, record the observation. In the column on the right, sum (across) the total number of "Yes" and the total number of observations ("Yes" + "No"). Sum all categories (down) for overall performance.

	Standard Precautions: Observation Categories	Room 1	Room 2	Room 3	Room 4	Room 5	Summary of Observations	
							Yes	Total Observed
1	Are functioning sinks readily accessible in the patient care area?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		
2	Are all handwashing supplies, such as soap and paper towels, available?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		
3	Is the sink area clean and dry?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		
4	Are any clean patient care supplies on the counter within a splash-zone of the sink?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		

https://www.cdc.gov/infectioncontrol/pdf/QUOTS/Neonatal-Intensive-Care-Unit-Suite-P.pdf

Hand Hygiene Tools

Your 5 Moments for Hand Hygiene in the NICU

WHY???
To protect the baby from harmful germs carried on your hands.

1 BEFORE TOUCHING the BABY

WHY???
To protect the baby from harmful germs, including the baby's own, from entering his/her body.

2 BEFORE CLEAN/ ASEPTIC PROCEDURE
Such as starting an IV, lab Draws, manipulating a Central line

3 AFTER BODY FLUID EXPOSURE RISK
Including diaper changes, breast milk, Suctioning, lab draws

WHY???
To protect yourself & the surrounding Environment from spreading harmful germs.

4 AFTER TOUCHING the BABY

WHY???
To protect yourself & the surrounding Environment from spreading harmful germs.

5 AFTER TOUCHING BABY'S SURROUNDINGS
Including isolette cover, monitors, computers, etc.

WHY???
To protect yourself & the surrounding Environment from spreading harmful germs.

Hand Hygiene

Barrier 1

Barrier: Skin dryness and irritation

Solution: Use today's innovative products that sanitize and moisturize hands and are formulated for high-frequency use

Barrier 2

Barrier: Lack of knowledge about guidelines, hand hygiene moments during patient care and risk of cross-contamination.

Solution: Provide education and training materials on facility protocols, cross-contamination risks and the right technique at the right moment.

Barrier 3

Barrier: Lack of awareness that hand hygiene compliance is low.

Solution: Provide performance data to caregivers so they know how they're doing.

https://www.medline.com/strategies/infection-prevention/factors-affecting-hand-hygiene-6-barriers-and-solutions-to-improving-compliance/?utm_source=google&utm_m

Hand Hygiene

Outcome, Balancing and Process Measures

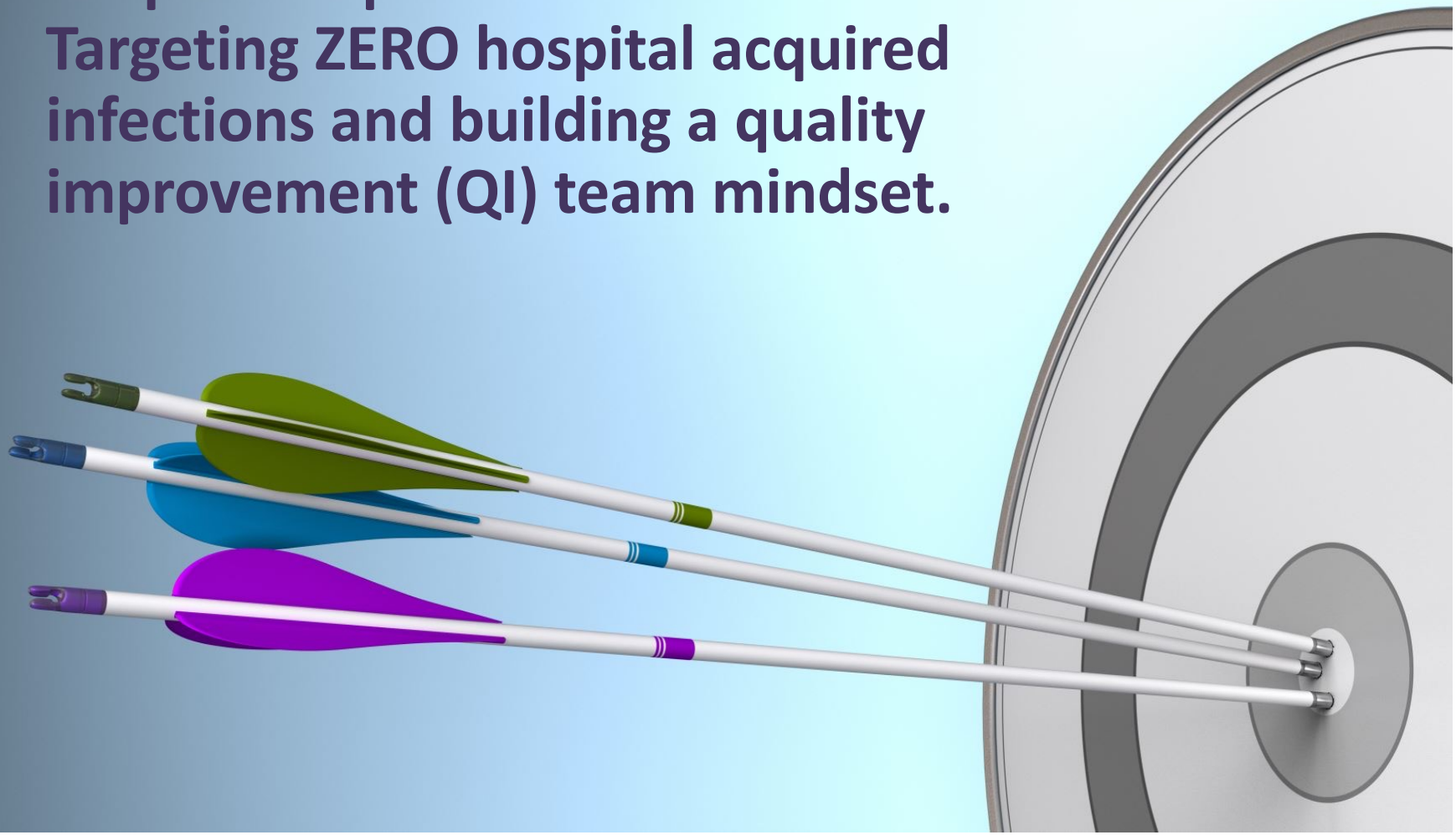
- Monitor and record adherence to overall hand hygiene
- Monitor and record adherence to hand hygiene by discipline
- Monitor the volume of alcohol-based sanitizers used per 1,000 patient days
- Monitor adherence to department policies related to nails, jewelry, bare below the elbows
- Track method of hand hygiene
- Monitor adherence to posted isolation precautions
- Provide feedback to healthcare workers on individual performance

NICU Quality Improvement and Culture

Rachelle Sey, PhD, APRN, CNS, RNC-NIC

Nick Mickas, MD

Building the foundation to prevent hospital acquired infection in the NICU: Targeting ZERO hospital acquired infections and building a quality improvement (QI) team mindset.



Approaches to Reducing HAI

1. **Comprehensive Unit-Based Safety Programs**
2. **High Reliability Methodologies**
3. **TeamSTEPPS**
4. **Bundles & Protocols**

Potentially Better Practices

2.1 - Target ZERO hospital acquired infections

2.2 - Foster a culture of safety and learning

2.3 - Become a Highly Reliable Organization (HRO)

2.4 - Understand the impact of human factors engineering and make it easier for healthcare providers to do the right thing

Recommended Guidelines

- Implement leadership rounding to assess reliability behaviors and challenges
- Standardize processes to build redundancy
- Align policies to practice
- Provide visual aids that illustrate expected workflow, supplies, and steps
- Use peer audits performed in real time- Random Safety Audits
- Survey frontline staff to identify barriers that often reduce compliance

Quality Improvement Tools

CPQCC QI Fundamentals: free self-paced, online QI course including supplementary content on building an anti-racism in the NICU

Available on the CPQCC website in 2023

IHI Quality Improvement Essential Toolkit: available free with registration with IHI

https://www.ihi.org/resources/Pages/Tools/Quality-Improvement-Essentials-Toolkit.aspx

Core CUSP Toolkit available at AHRQ

https://www.ahrq.gov/hai/cusp/modules/index.html

Outcome, Balancing and Process Measures

Monitor serious safety event rates

Monitor HAI events and publish "days since last infection" in the unit

Monitor error reporting as a proxy measure for speaking up

Utilize run charts to measure adherence to process and outcome measures

General Principles of HAI Prevention

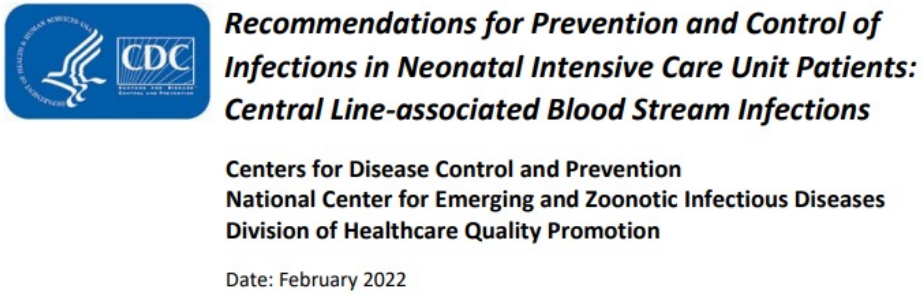
Robin Clifton-Koeppel, DNP, CNS, CPNP

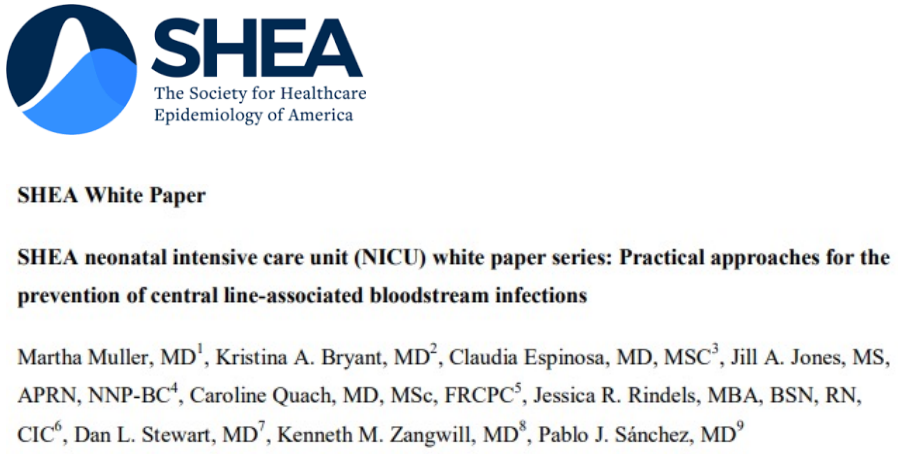
General Principles of HAI Prevention Approach

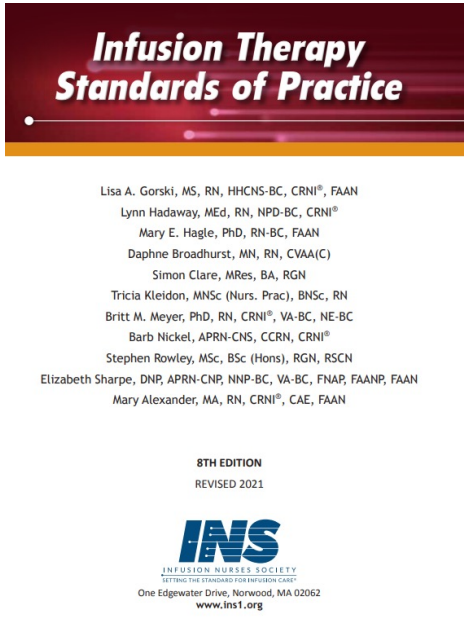
- **Avoid duplicating published national guidelines**; as this toolkit was being developed, multiple national guidelines were published with NICU-specific content regarding central line care practices.
- **Encourage a shift in thinking** from "CLABSI" to a larger focus using terms such as "hospital-acquired bacteremia" or "non-CLABSI bacteremia"; this shift in thinking may help NICUs focus more broadly on all aspects of HAI prevention, not just CLABSI-related events.
- With this shift in thinking, NICUs may develop new approaches to care that reduce overall HAI. Publishing these efforts begins to build new evidence as we all work to protect the most fragile NICU patient.
- **What are these potentially new approaches?**

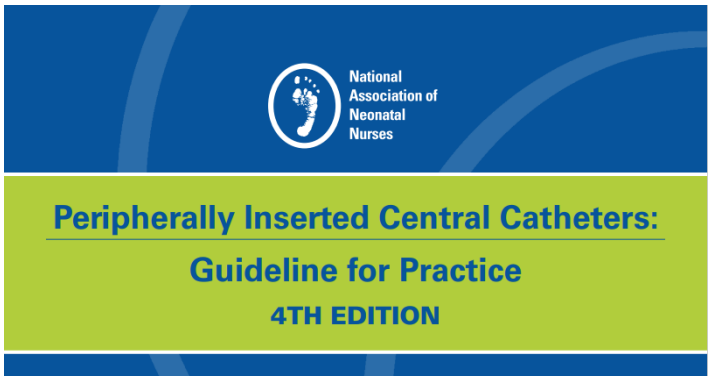
General Principles

- **Central Line Care Practices:** Review and compare current NICU practices with recently published, evidence-based guidelines related to central lines
- Standardization of all central line practices is key







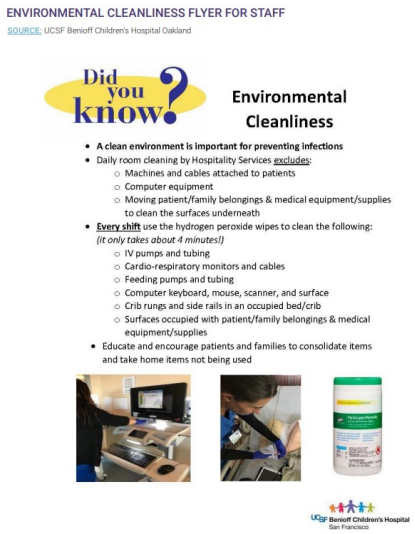


General Principles
Potentially Better Practices

- **Details matter!** Each NICU works with varying supplies, available equipment, and has its own challenges that impact central line care practices
- **Consider the GI tract** as a source of HAI; evaluate practices that may improve GI health and reduce bacterial translocation: all human milk diet
- **Use families as partners in HAI prevention**: reminders for HH, participating in audits
- **Consider the NICU environment** and its potential impact on HAI: reduce overall bioburden, consider "orphan equipment", high-touch cleaning opportunities
- **NICU Culture and Processes:** identification of highest risk patients, root cause analysis of ALL positive blood cultures, adequacy of RN staffing, unit organization, presence of support personnel (Quality of NICU environment)

Potentially Better Practices Highlight and Tool

- **Partnering with families in HAI Prevention**: there is not much published literature that details the effect of partnering with families and its effect on HAI prevention in the NICU. Families may be an underutilized resource for HAI prevention in the NICU. Pros and cons exist, the culture in the NICU is an important consideration along with active involvement with a Family/Parent Advisory Council
- We need more published studies, both research and QI to help us understand the details of how to get families involved in HAI prevention, how to navigate the staff/family interaction



ENVIRONMENTAL CLEANLINESS FLYER FOR STAFF

SOURCE: UCSF Benioff Children's Hospital Oakland

Did you know?

Environmental Cleanliness

- A clean environment is important for preventing infections
- Daily room cleaning by Hospitality Services excludes:
  - Machines and cables attached to patients
  - Computer equipment
  - Moving patient/family belongings & medical equipment/supplies to clean the surfaces underneath
- Every shift use the hydrogen peroxide wipes to clean the following: *(it only takes about 4 minutes!)*
  - IV pumps and tubing
  - Cardio-respiratory monitors and cables
  - Feeding pumps and tubing
  - Computer keyboard, mouse, scanner, and surface
  - Crib rungs and side rails in an occupied bed/crib
  - Surfaces occupied with patient/family belongings & medical equipment/supplies
- Educate and encourage patients and families to consolidate items and take home items not being used

UCSF Benioff Children's Hospital San Francisco

Family Advisory Council

A Message to Families from Families

Maintaining a clean environment for your child!

Hospitality cleans patient rooms daily...*but* can't move your child and family's belongings to clean the surfaces and floor in your room.

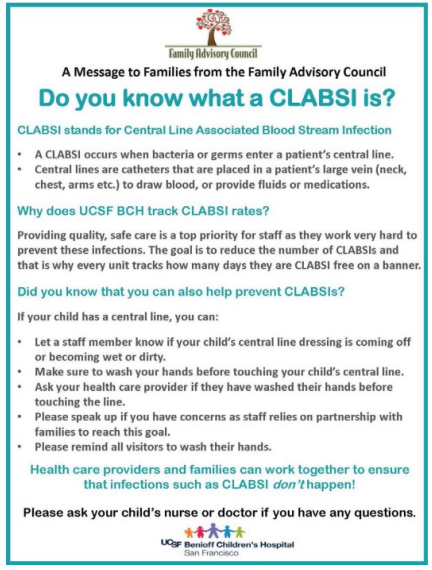
What can you do to help?

While Hospitality is cleaning your room...

- Consolidate personal items into bins, bags or a wagon.
- Store personal items in the drawers below the sleeper couch, tall cupboard and the locker cabinet.
- Return extra toys and craft supplies to the playroom.
- Remove items from surfaces while staff is cleaning.

UCSF Benioff Children's Hospital wants to protect your child and a clean environment is key for preventing infections!

UCSF Benioff Children's Hospital San Francisco



Family Advisory Council

A Message to Families from the Family Advisory Council

Do you know what a CLABSI is?

CLABSI stands for Central Line Associated Blood Stream Infection

- A CLABSI occurs when bacteria or germs enter a patient's central line.
- Central lines are catheters that are placed in a patient's large vein (neck, chest, arms etc.) to draw blood, or provide fluids or medications.

Why does UCSF BCH track CLABSI rates?

Providing quality, safe care is a top priority for staff as they work very hard to prevent these infections. The goal is to reduce the number of CLABSIs and that is why every unit tracks how many days they are CLABSI free on a banner.

Did you know that you can also help prevent CLABSIs?

If your child has a central line, you can:

- Let a staff member know if your child's central line dressing is coming off or becoming wet or dirty.
- Make sure to wash your hands before touching your child's central line.
- Ask your health care provider if they have washed their hands before touching the line.
- Please speak up if you have concerns as staff relies on partnership with families to reach this goal.
- Please remind all visitors to wash their hands.

Health care providers and families can work together to ensure that infections such as CLABSI *don't* happen!

Please ask your child's nurse or doctor if you have any questions.

UCSF Benioff Children's Hospital San Francisco

Outcome and Balancing Measures

- Track ALL hospital acquired bacteremia, not just CLABSI; perform root cause analysis to better understand patient risk
- Track rates of human milk at discharge from the NICU; consider evaluating NEC year rates
- Review clinical practice audit data over time, to determine the areas of practice that continue to need additional review

Skin Considerations and HAI Prevention

Carolyn Lund,
MS, RN, FAAN

Skin Considerations and HAI Prevention

Skin provides an important barrier to toxins and microorganisms. The skin of premature and full-term neonates has unique anatomic and functional differences that puts them at risk from skin disinfectants used to decontaminate skin prior to invasive procedures, and from medical adhesives used to secure intravenous devices.

Premature infants are particularly at risk for skin injuries from these products as they lack significant skin barrier function due to having far fewer layers of stratum corneum, the uppermost layer of the epidermis.

PBP#4.1: Disinfect skin surfaces prior to insertion of CVCs

Infections arising from insertion and dressing changes are considered an ***extraluminal*** source, and can be prevented by skin preparation with disinfectants

Infections from an ***intraluminal*** source can be prevented by adherence to aseptic techniques for catheter hubs, caps, connectors and IV tubing

Intraluminal sources are the more common cause for CLABSIs in the NICU

PBP#4.2: Select a disinfectant by evaluating risks/benefits

Products include:

CHG (chlorhexidine gluconate) either with 70% isopropyl alcohol (aqueous CHG is available in the US but not in single use packaging)

10% PI (povidone iodine)

70% IA (isopropyl alcohol)-- least effective disinfectant

CHG shown to reduce contaminated blood cultures in pediatric patients

CHG not shown to reduce CLABSI in NICU patients compared to PI

Both can be absorbed into the blood stream

- Concerns for thyroid toxicity from PI
- CHG is absorbed but systemic toxicity not yet reported

CHG can cause skin irritation, chemical burns especially for ELBW infants in first week of life

Chemical Burns from CHG

PBP#4.3: Standardize dressings that minimize catheter migration and extraluminal introduction of microorganisms

PICC dressing should be changed when dressing integrity is compromised

Two persons using sterile technique is recommended

If bleeding noted at insertion site okay to use a sterile hemostatic agent to assist with adherence. If bleeding obscures insertion site change dressing after 24 hours

Clear tissue adhesives (cyanoacrylates) can be applied to insertion site after initial placement and with dressing changes. Potential benefits from these products include prevention of catheter migration, infection barrier and hemostasis; studies done in adults and pediatric patients.

PBP#4.4: Use products and techniques that minimize risk of medical adhesive-related skin injury (MARSI)

MARSI includes skin stripping, blisters, tears and contact dermatitis

To prevent stripping using silicone containing products such as skin protectants and adhesive removers with transparent adhesive dressing

Avoid use of "tackifiers" such as tincture of benzoin, Mastisol

If contact dermatitis reactions occur switch to a different brand or formulation of transparent dressings

Contact Dermatitis from TADs

PBP#4.5: For ELBW infants with CVCs consider getting a skin culture if skin injury present

If culture contains pathogens consider sending a blood culture

Topical antibacterial and anti-fungal agents can be used on areas of breakdown; cover with silicone dressing

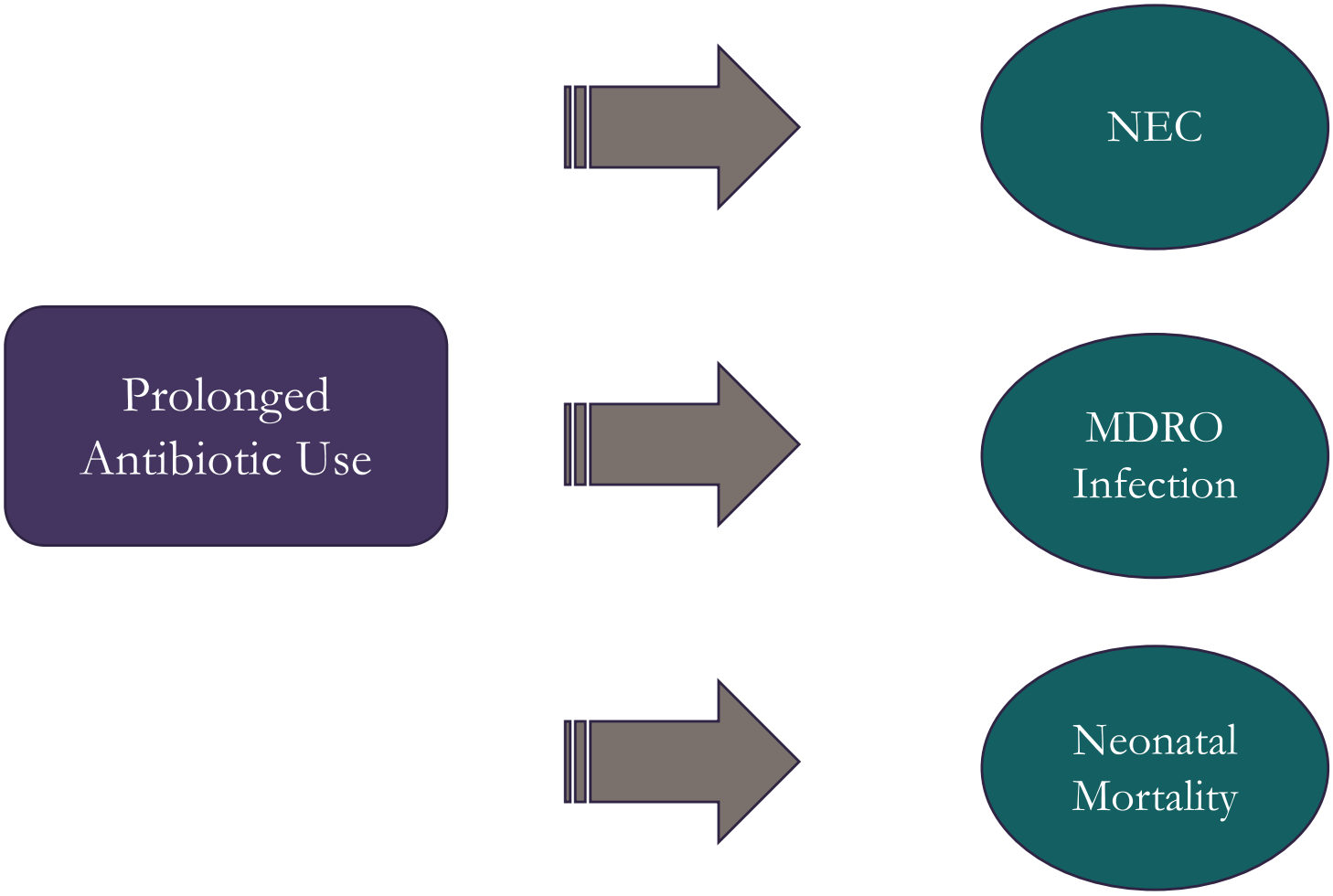
Medical grade honey and silver-containing dressings have been used for skin breakdown in premature infants (case reports)

If skin colonized with candida albicans consider systemic treatment

Antibiotic Stewardship & Multi-Drug Resistant Organisms

Talal Seddik, MD

Background


Prolonged Antibiotic Use
NEC
MDRO Infection
Neonatal Mortality

Background

Diagnostic Stewardship

Accurate Diagnosis

Accurate HAI reporting

Appropriate Antimicrobial

Antimicrobial Stewardship

Background

Approach/PBPs – Stewardship

1

Establish a multidisciplinary collaborative approach to diagnostic and antimicrobial stewardship

2

Measure the effectiveness of diagnostic and antimicrobial efforts in the NICU

3

Develop antimicrobial and diagnostic stewardship interventions

Develop clinical pathways and guidelines for common neonatal infections

Approach/PBPs – MDROs

- Implement Measures to Recognize and Prevent Staphylococcus Aureus Infection in the NICU, Including Methicillin Resistant Staphylococcus Aureus (MRSA)

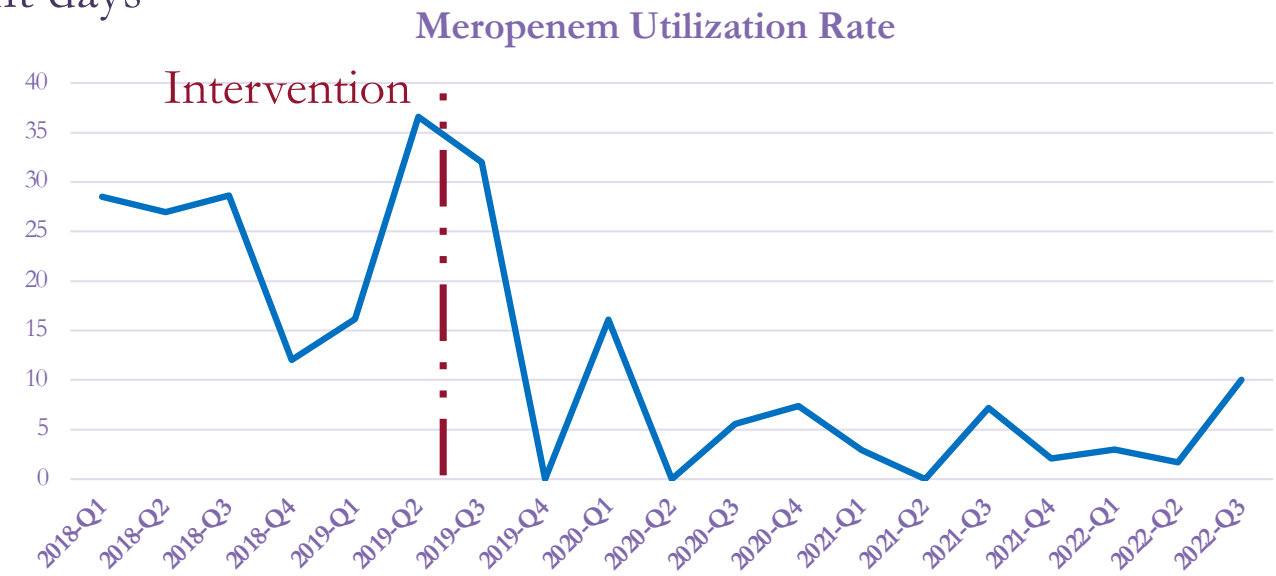
- Take Measures to Identify and Control Multidrug Resistant Gram-Negative Rods

Outcomes – Stewardship

- AUR: the total number of patient-days that infants were exposed to antimicrobials per 100 patient-days in the reporting NICU

- NAE: the number of newborns who received at least one dose of intravenous or intramuscular antibacterial or antifungal agents per 100 newborns

- DOT per 1000 patient days



Outcomes – MDROs

- Rate of MRSA colonization per admission
- NICU-specific MDRO policy that outlines care practices including isolation requirements, treatment guidelines, and family visitation rules
- Assure hospital systems are in place to identify and flag cultures that are positive for MDR-GNRs

Tools/Resources

Daily Antibiotic Time Out

Patient Name	Antibiotics Receiving/Dose/Frequency	Medical Plan for Antibiotics Guidelines Used	Interventions 1= clarifying indication for treatment 2= determining duration of treatment 3= enter future stop dates 4= de-escalate 5= dosage adjustment/drug levels

Tools/Resources

Daily Antibiotic Time Out

Patient Name	Antibiotics Receiving/Dose/Frequency	Medical Plan for Antibiotics Guidelines Used	Interventions 1= clarifying indication for treatment 2= determining duration of treatment 3= enter future stop dates 4= de-escalate 5= dosage adjustment/drug levels
Jane Doe	Amp/25mg/q8	Culture neg Sepsis	Stop date entered

Summary

Robin Clifton-Koeppel,
DNP, CNS, CPNP

Summary

- **HAI continues to burden NICU patients,** with the youngest and smallest patient at highest risk. We need additional safeguards, practice and approaches to protect these high-risk patients.
- **Hand Hygiene is the foundation for all HAI prevention efforts**; review compliance and consider innovative strategies to improve even if HH compliance rates are high
- NICU culture and capacity for QI is **VITAL** to reaching HAI goals; consider assessing the NICU staff culture using the benchmarked national surveys, leadership rounding, and error reporting.
- **Consider adopting hospital-acquired bacteremia as a broader quality of HAI** in the NICU, not just CLABSI. Assure CLABSI prevention efforts are in accordance with recently updated national guidelines. The GI tract and skin are additional sources of bacteremia with emerging practices to address both GI health and skin integrity.
- Antibiotic stewardship and strategies to reduce/prevent Multi-Drug Resistance Organisms should be considered **foundational** to all HAI prevention efforts.

Q&A Panel Discussion

Q&A Panel Discussion

Moderators:

Linda Lefrak, MSN

Mindy Morris, DNP, NNP-BC, CNS, C-ELBW

Panel:

Susan Bowles, DNP, APRN-CNS, RNC-NIC

Robin Clifton-Koeppel, DNP, CNS, CPNP

Henry Lee, MD, MS

Carolyn Lund, MS, RN, FAAN

Nick Mickas, MD

Talal Seddik, MD

Rachelle Sey, PhD, APRN, CNS, RNC-NIC

Closing Announcements

Janine Bohnert, BS

New Resource Coming Soon

CPQCC is replacing the 2016 Severe Hyperbilirubinemia Prevention with the updated AAP Guidelines and a brief summary of related QI work at Santa Clara Valley Medical Center

https://publications.aap.org/pediatrics/article/150/3/e2022058859/188726/Clinical-Practice-Guideline-Revision-Management-of

2016 toolkit will be archived

Severe Hyperbilirubinemia Prevention

Neonatal hyperbilirubinemia is a frequent and generally benign condition for which safe and effective treatments exist. When hyperbilirubinemia goes untested or unmonitored, otherwise healthy newborns are at risk for bilirubin neurotoxicity. The Severe Hyperbilirubinemia Prevention Toolkit reviews guidelines for the identification and follow-up of term and near-term infants (greater than 35 weeks gestation) at risk for hyperbilirubinemia.

Author:
Malathi Balasundaram
Vinod K. Bhutani

Resource Category:
QI Toolkit

Date:
October 2016

What's Ahead?

IP2022 Conversation Circle

Reducing Inequities for NICU Families with a Non-English Language of Preference (NELP)

January 31, 2023

12pm - 1:30pm PST

Improvement Palooza 2023

Restoration & Teamwork

March 3, 2023

8am – 4pm PST

Scan the QR code or visit

www.cpqcc.org/improvement-palooza

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- Educational webinars

Scan the QR code or visit www.cpqcc.org/engage/connect-us to sign up

QI Awards: Nominate Someone Today!

Do you know of an individual or team that has made exemplary contributions to the field of neonatal quality improvement? Nominate them for one of CPQCC's QI Awards!

Nominations are accepted throughout the year; winners for 2021 will be announced at CPQCC's Improvement Palooza 2022. Nominees do not have to meet all of the criteria for the award to be considered. We encourage you to consider nominating either a deserving team or an emerging leader in your unit. Read more about our awards and past recipients and view a sample nomination on our website.

Nominations open through
January 31st, 2023

Scan the QR code or visit www.cpqcc.org/improvement/quality-improvement-awards to submit a nomination

Closing

Big thanks to our speakers and moderators and thank you for attending this webinar!