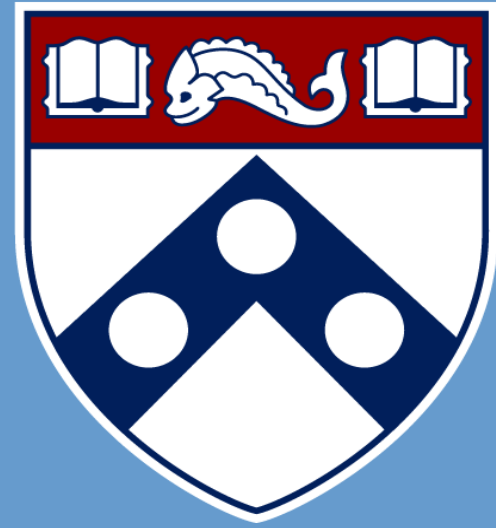




# Eye on the Line: A Surveillance Program to Reduce Risk in Neonates



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## BACKGROUND

Central lines are vital for nutrition, hydration, and medication delivery in Neonatal Intensive Care Units (NICUs). However, malpositioned central lines pose significant risks and can cause catastrophic events. Proactive surveillance and correction can help prevent these outcomes.

## AIM

Improve compliance for central line (PICC and UVC) tip position surveillance at both Hospital of the University of Pennsylvania (HUP) & The Children's Hospital of Philadelphia (CHOP) from baseline to a target goal of 80% by February 2025, regardless of race, ethnicity, gestational age or birthweight.

Increase days between catastrophic events related to central lines at both HUP & CHOP by 10% by February 2025, regardless of race, ethnicity, gestational age or birthweight.

## METHODS

Using a **quality improvement (QI) framework**, an interdisciplinary team employed multiple tools to design and test interventions, including: **Fishbone diagrams**, **Driver diagrams**, **Impact/Effort matrix**, **Iterative Plan-Do-Study-Act (PDSA) cycles**

This work was implemented across two sister units\*:

- **The Children's Hospital of Philadelphia (CHOP) NICU, Level IV**
- **Hospital of the University of Pennsylvania (HUP) Intensive Care Nursery, Level III**

\*Although the units share much of the same medical staff, they differ significantly in **nursing staff**, **Electronic Health Records (EHR) systems**, and **patient populations**. These differences were carefully considered when developing tailored PDSA cycles for each unit's workflow.

**Equity Assessment:** Baseline data stratified by **race, ethnicity, language, and gestational age** revealed **no significant disparities**.

## KEY INTERVENTIONS

- Development of **clinical care guidelines, job aids, and clinical care questions** to support consistent central line evaluation
- Enhancement of **team discussions** around central line positioning
- **Increased education and awareness** about catastrophic events through targeted discussions, training, and data sharing
- Training of **13 fellows** to perform dressing changes, reducing delays in correcting malpositioned lines (HUP)

*It takes a village to keep our patients safe, thus acknowledging the contributions of our Enterprise Improvement Advisors, Clinical Informaticists, and the ongoing surveillance and maintenance work of our NICU Vascular Access Team Nurses.*

## Days between catastrophic events

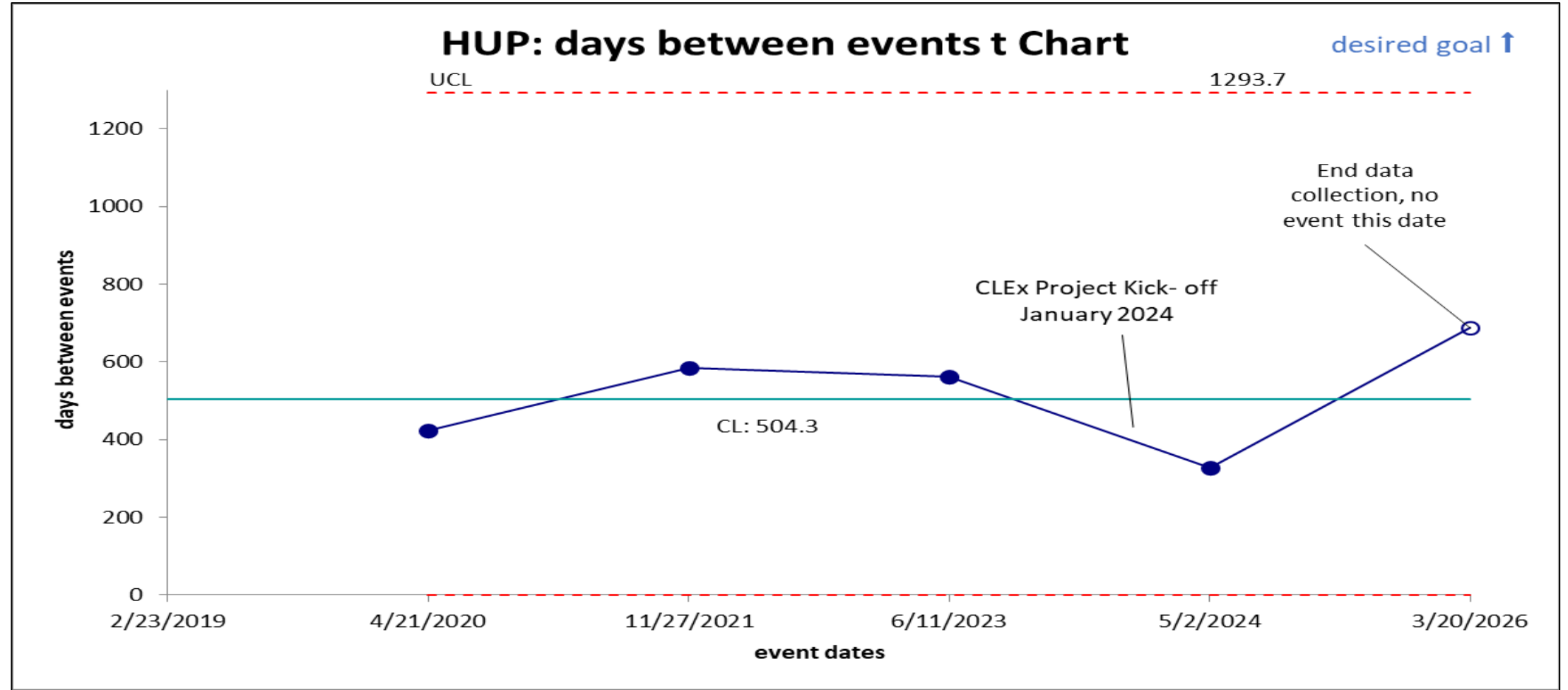


Figure 1

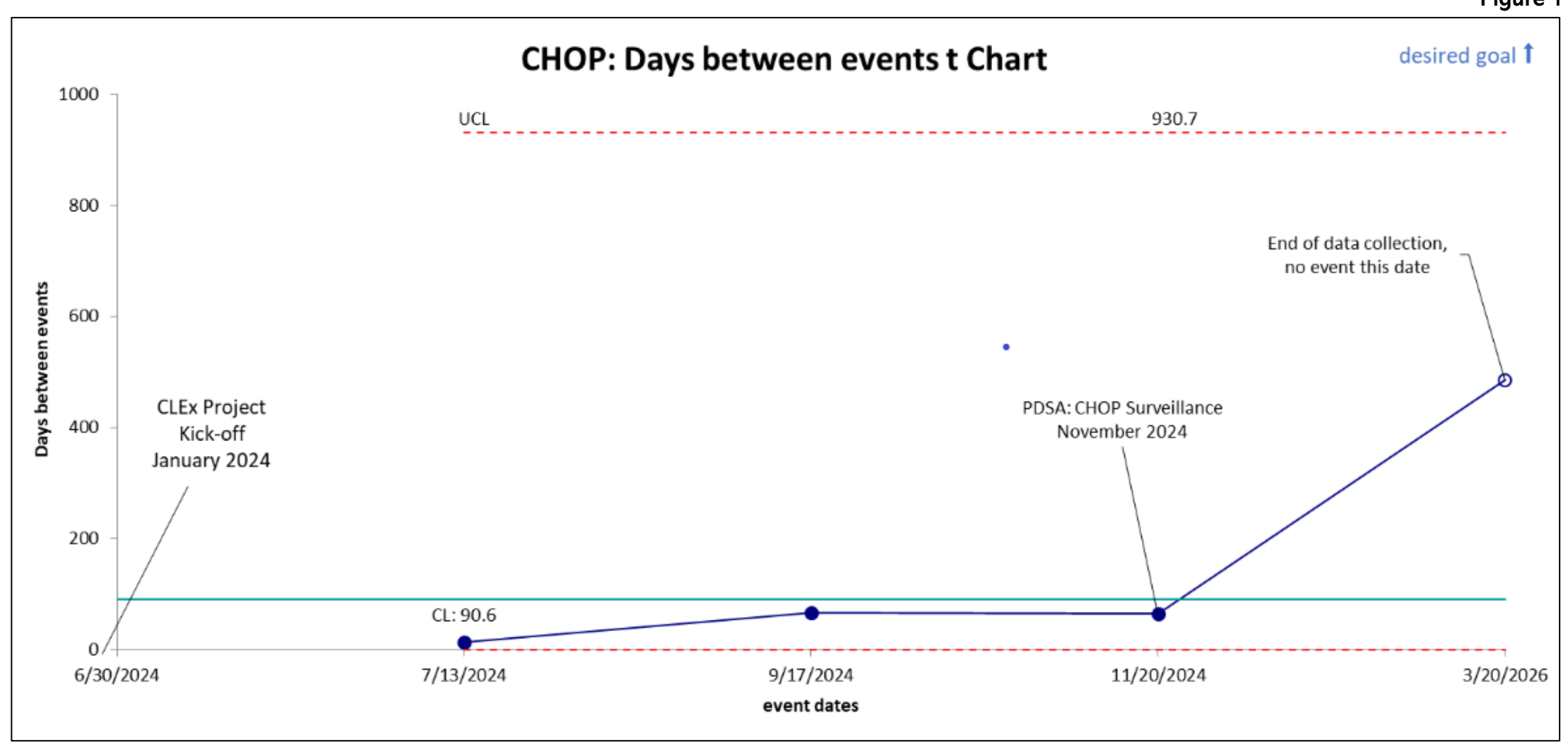


Figure 2

## LESSONS LEARNED

1. **Customize interventions to local workflows.** Differences in nursing staff, EHR systems, and patient populations required tailored PDSA cycles for each unit.
2. **Engage multidisciplinary teams early.** Involving nurses, fellows, APPs, and QI specialists improved feasibility, buy-in, and sustainability.
3. **Celebrate small wins to build momentum.** Early successes include creating job aids strengthened team engagement.
4. **Address resource barriers proactively.** Training fellows at HUP to perform dressing changes reduced delays in correcting malpositioned lines.
5. **Share data transparently.** Regular sharing of compliance data fostered accountability and motivated consistent improvements.
6. **Prioritize equity assessments.** Baseline analysis showed no disparities, but ongoing stratification ensures equitable improvements.

## Combined PICC & UVC Surveillance Compliance

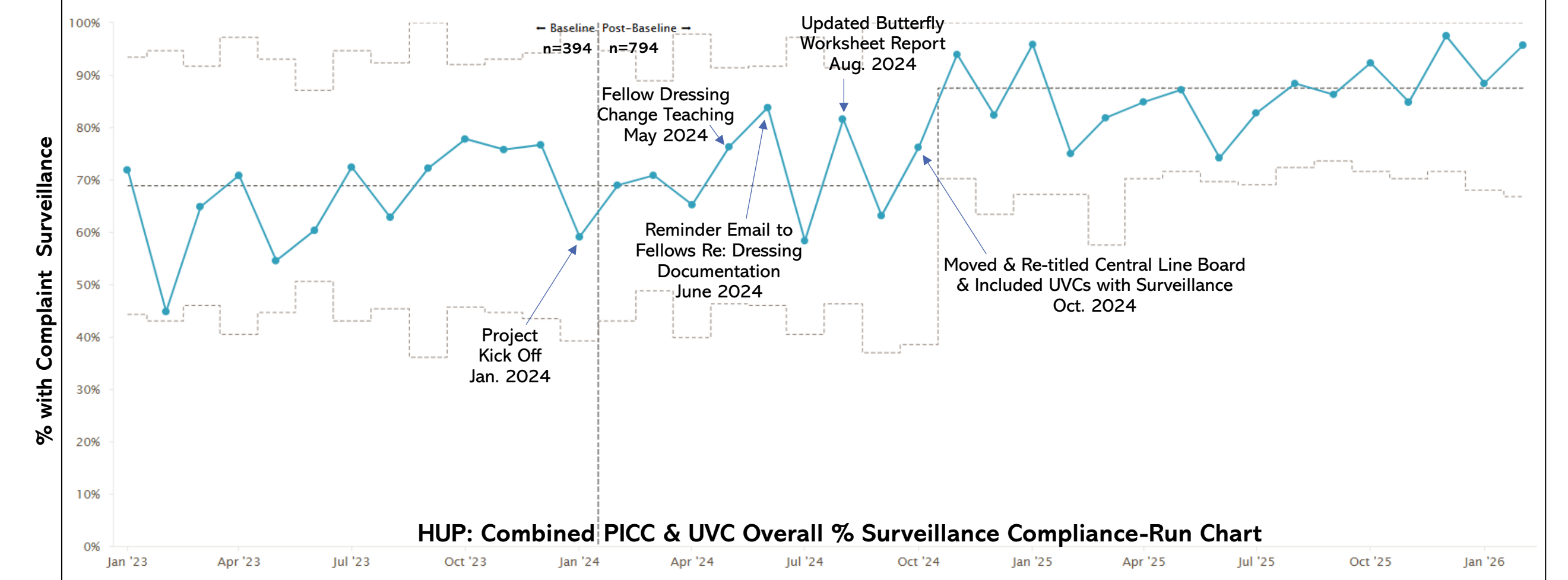


Figure 3

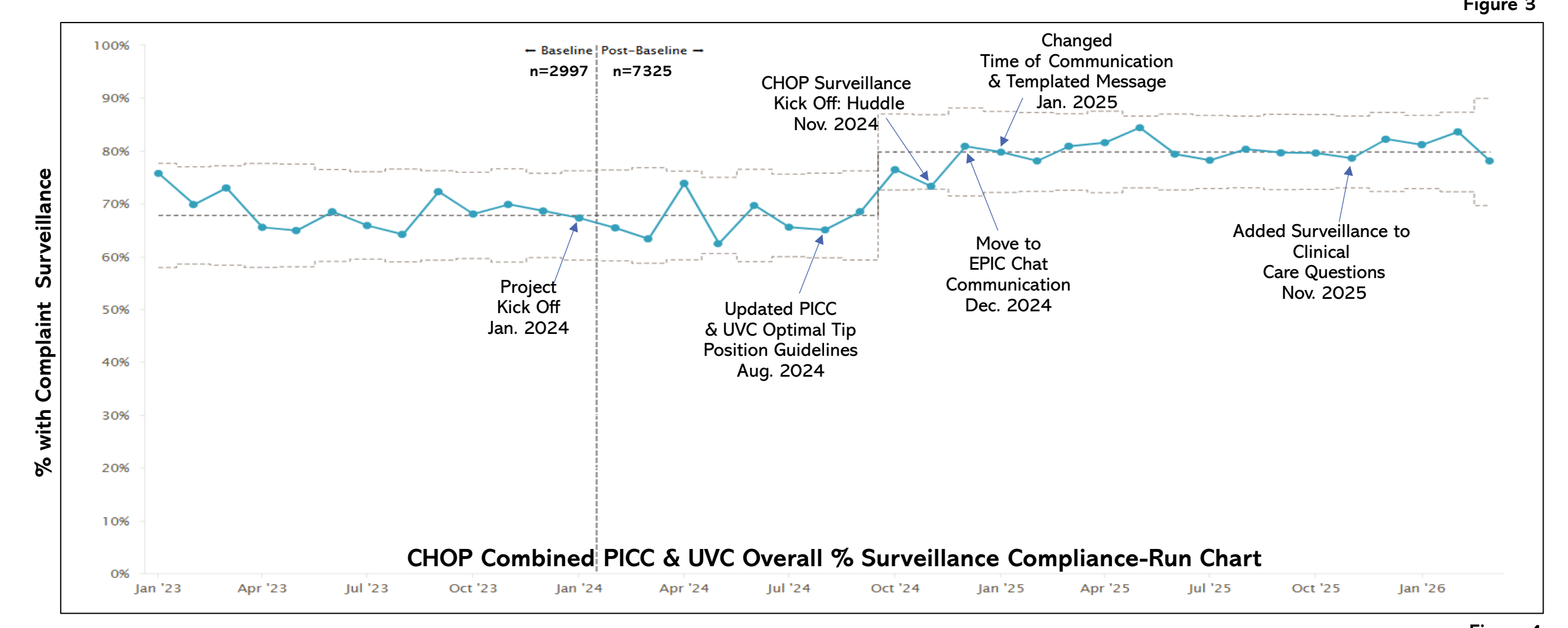


Figure 4

## OUTCOMES

- **Increased days between catastrophic events** by 10% by February 2025 (Figures 1 & 2)
- **Increased compliance** with central line surveillance protocols
  - Compliance above our baseline centerline for both HUP & CHOP since Oct. 2024
  - **HUP** continues to maintain a CL > 80% (Figure 3)
  - **CHOP** continues to maintain a CL at 80% (Figure 4)

Standardized, consistent surveillance protocols were successfully implemented, demonstrating improved outcomes and establishing a sustainable model for NICU safety. This initiative underscores the critical importance of vigilance and interdisciplinary collaboration in mitigating risks associated with central lines in neonates.

