

# Multidisciplinary quality improvement project reduced hypothermia in NICU babies during and after surgery, study finds

July 13 2023

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The percentage of infants from the neonatal intensive care unit (NICU) experiencing hypothermia upon operating room (OR) arrival and at any

point during the operation decreased from 48.7% to 6.4% and 67.5% to 37.4%, respectively, after implementation of a multidisciplinary quality improvement project at Ann & Robert H. Lurie Children's Hospital of Chicago. The project and its success were featured in the journal *Pediatric Quality and Safety*.

About one-third of [infants](#) admitted to children's hospitals' NICUs require surgery and are at increased risk for intraoperative hypothermia due to environmental heat loss, anesthesia, and inconsistent temperature monitoring. Hypothermic infants are at risk for infection, excessive bleeding, increased oxygen consumption, the need for cardiorespiratory support, and mortality.

Upon return to the NICU, the percentage of infants experiencing postoperative hypothermia decreased from 5.8% to 2.1% while postoperative [hyperthermia](#) increased from 0.8% to 2.6%.

"Intraoperative hypothermia is more prevalent than postoperative hypothermia, yet the problem appears to be recognized less. Several improvement projects have addressed postoperative hypothermia, however, few have focused on reducing intraoperative hypothermia," said senior author Gustave Falciglia, MD, MSCI, MSHQPS, neonatologist at Lurie Children's and Assistant Professor of Pediatrics at Northwestern University Feinberg School of Medicine.

"The strengths of our project were the large cohort of infants and the use of continuous, secure and automated data to ensure normal temperature for infants before, during and after an operation. Using our current approach, however, further decreasing intraoperative and postoperative hypothermia may not be possible without further increasing postoperative hyperthermia."

Dr. Falciglia and colleagues from Lurie Children's Center for Quality

and Safety, anesthesiology, NICU and OR nursing, surgery, neonatology and Data Analytics and Reporting succeeded in reducing rates of intraoperative hypothermia by standardizing temperature monitoring, the transport process to the OR and intraoperative warming.

"In this project, we used improvement science methodology to understand the barriers to maintaining normal temperature in NICU infants before, during and after surgery, and then to design and implement solutions," said lead author Abbey Studer from the Center for Quality and Safety at Lurie Children's.

"We found variation in processes that contributed to intraoperative [hypothermia](#), so we focused on standardizing temperature monitoring and thermal support during the infant's transport and operation. Automated monitoring using a preoperatively placed continuous temperature probe enhanced providers' situational awareness of infant temperature and guided clinical adjustments."

For this improvement project, the hospital's Center for Quality and Safety coordinated care and resources between multiple departments. It achieved consensus and buy-in from providers despite competing factors such as perspiring surgeons and busy anesthesia providers transporting all infants to the OR. It identified key participants who were vested in revising processes and facilitated adoption with their colleagues, following up on missed opportunities and gaps in the processes identified through observation and surveys. The center provided data analysts who worked iteratively with providers to generate valid, actionable, and real-time data.

"Although medicine prizes specialization, our success relied upon individuals with various talents sharing their skills and knowledge," said Dr. Falciglia. "Working together we can continue to improve the care of infants in the NICU who need surgery."

**More information:** Abbey Studer et al, Reducing Intraoperative Hypothermia in Infants from the Neonatal Intensive Care Unit, *Pediatric Quality & Safety* (2023). [DOI: 10.1097/pq9.0000000000000665](https://doi.org/10.1097/pq9.0000000000000665)

Provided by Ann & Robert H. Lurie Children's Hospital of Chicago

Citation: Multidisciplinary quality improvement project reduced hypothermia in NICU babies during and after surgery, study finds (2023, July 13) retrieved 9 May 2024 from <https://medicalxpress.com/news/2023-07-multidisciplinary-quality-hypothermia-nicu-babies.html>

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