# Reducing Necrotizing Enterocolitis: Quality Improvement

Jamie Rucker

Lakeview College of Nursing

Dr. Ariel Wright

June 17, 2022

## Reducing Necrotizing Enterocolitis: Quality Improvement

Healthcare involves many professionals in different roles, but very few are as essential as the nurse. A nurse provides all patient care from start to finish, so it makes sense that the nurse would be directly involved in quality improvement initiatives. Quality improvement is a method to bring about positive, cost-effective change related to improving the healthcare facility, patient care, and safety (QSEN Institute, 2020). Nurses in the Neonatal Intensive Care Unit (NICU) see their tiny patients' reoccurring problems, have firsthand knowledge to improve their care, the skills, and tools to evaluate the changes, and the attitudes to work as a team to improve care (QSEN Institute, 2020). Nurses can gather information and implement strategies to improve the health of premature babies, such as reducing the inflammatory intestinal disease known as necrotizing enterocolitis (NEC) (Houser, 2018). Premature babies and their families rely on nurses to utilize care that will promote health and proper development to get the babies home as soon as possible. Necrotizing enterocolitis (NEC) is a big problem in low-birth-weight neonates and often requires rigorous medical care, surgeries, and lengthened hospital stays (Rolnitsky et al., 2019). Nurses can utilize the quality improvement method to find ways to reduce NEC and provide a better outcome for these babies (Houser, 2018).

## Article Summary

When a neonatal intensive care unit in Canada recognizes a problem with the rate of necrotizing enterocolitis (NEC) increasing, they decide to initiate a quality improvement intervention to do something about it (Rolnitsky et al., 2019). In the article, "A Quality Improvement Intervention to Reduce Necrotizing Enterocolitis in premature infants with

Probiotic Supplementation," the setting is Sunnybrook Health Centre with a 42-bed neonatal intensive care unit with approximately 300 low-birth-weight babies per year (Rolnitsky et al., 2019, p. 2). The overall goal includes improving sepsis rates, feeding difficulties, the number of days a baby is without feedings, and death rates (Rolnitsky et al., 2019).

## Introduction

Many premature babies face surgeries, extended hospital stays, or death due to a severe inflammatory intestinal disease known as necrotizing enterocolitis (NEC) (Rolnitsky et al., 2019). It is essential to find ways to improve these neonates' health, safety, and care and decrease the length of stay and money spent on their hospitalization. In the article "A Quality Improvement Intervention to Reduce Necrotizing Enterocolitis in premature infants with Probiotic Supplementation," the authors are working to find a solution for improving gut health by reducing pathogenic bacteria and then deciding on strategies to implement the changes (Rolnitsky et al., 2019). They decided to put together a collaborative group of professionals, which includes: a nurse practitioner, neonatologist, pharmacist, dietician, parent, and safety manager who would utilize many methods of research to come up with evidence-based interventions that would be effective in reducing NEC within their NICU (Rolnitsky et al., 2019). They had discussions, researched, and reviewed articles, created charts, and analyzed the availability and likelihood of every intervention they found (Rolnitsky et al., 2019). They decided that the best intervention was to begin supplementing low-birth-weight infants under 33 weeks gestation with probiotics to reduce the rate of NEC in their NICU (Rolnitsky et al., 2019). This article recognizes the problem with the increased rate of NEC within their NICU and found a solution to decrease the incidence rate by 30% within 12 months (Rolnitsky et al., 2019).

## Overview

Premature babies are among the most fragile population. These babies have an increased risk of developing additional complications due to immature and undeveloped body systems (Rolnitsky et al., 2019). One of the most severe is necrotizing enterocolitis (NEC), with an unknown pathology likely resulting from several things such as infections, low perfusion, and an undeveloped gastrointestinal system (Rolnitsky et al., 2019). Necrotizing enterocolitis results in surgeries, sepsis, extended hospital stays, and potentially death (Rolnitsky et al., 2019). In the article "A Quality Improvement Intervention to Reduce Necrotizing Enterocolitis in premature infants with Probiotic Supplementation," the authors used an appropriate framework and quality improvement tools to display competence. They used this knowledge to recognize the increase of NEC cases within the neonatal population (QSEN Institute, 2020). They created a group of professionals to strategize, discuss and implement the skills necessary to fix the problem (QSEN Institute, 2020). They demonstrated teamwork through sharing their findings' results with others and implementing changes to improve patient safety and care, as well as an increased level of fulfillment with the nursing staff (QSEN Institute, 2020). The group found a cost-effective way to improve current practice and reduce the rate of necrotizing enterocolitis within their NICU (Rolnitsky et al., 2019).

## Quality Improvement

Probiotic supplementation will benefit patients and nurses in any hospital, neonatal intensive care unit, or facility caring for premature babies (Rolnitsky et al., 2019). The practice of feeding mom's milk, donor breast milk, or putting a baby on a nothing-by-mouth order is not enough to successfully reduce the risk of NEC in low-birth-weight premature babies (Rolnitsky et al., 2019). In the article, "The cost of necrotizing enterocolitis in premature infants," the authors

report an average cost of $100,752 for babies with NEC, an increase just under 1.5 times the cost of those without NEC (Mowitz et al., 2018). Patients requiring surgery, additional requirements to treat NEC, and extended hospital stays have an average cost of $318,259 (Mowitz et al., 2018). Implementing probiotic supplementation is a cost-effective way to prevent and treat NEC. The study reveals that treating one baby would take two bottles, and they have 42 babies in their unit, so their overall cost was CAD 100,000 (Rolnitsky et al., 2019, p. 6). This intervention improves patient satisfaction and safety by reducing the risk of NEC, eliminating surgeries, and reducing extended hospital, reducing the amount of money the family will spend on staying in the neonatal intensive care unit (Rolnitsky et al., 2019). The nursing staff will receive additional training, education, and tools to succeed with this new intervention, improving overall satisfaction and safe practices (Rolnitsky et al., 2019). During the pre-stage of implementation, the authors consulted with their hospital's infection prevention, risk management, and microbiology teams to ensure safety and compliance and the probiotic they would use (Rolnitsky et al., 2019, p. 6). Once everything was approved and ready to go, they got busy implementing the new standard of care policy and educating and training the staff on regular supplementation for all babies (Rolnitsky et al., 2019). Compliance checks must be part of the intra-implementation process to verify that all staff complies with the intervention. Staff re-education will occur to ensure compliance, safety, and satisfaction. Quality improvement audits will occur periodically during the post-implementation process to review and assess the policy’s effectiveness and determine if any modifications are needed (Houser, 2018).

## Application to Nursing

Nurses spend the most time with patients and are responsible for the early recognition of signs and symptoms in their patients. Performing regular assessments helps the nurse recognize changes or complications, so they can make an informed and accurate diagnosis, implement changes and strategies, and evaluate the overall outcome of a problem (Houser, 2018). Nurses can utilize the evidence-based practice steps to reduce NEC and provide a better outcome for these babies (Houser, 2018).

**Practice**

No medical professional spends as much time with the neonates as the nurse does. Nurses are the key to providing quality improvement measures to prevent complications, such as necrotizing enterocolitis. Current guidelines for preventing this complication include regular assessments, early recognition of signs and symptoms, and implementation of interventions (Rolnitsky et al., 2019). Regular assessments during each shift will allow the nurse to identify changes, early signs, and symptoms more easily such as feeding intolerance, abdominal tenderness, distention, or new onset of vomiting (Agnoni & Lazaros Amendola, 2017). Recognition of NEC symptoms allows for early testing, diagnosis, and intervention measures to help prevent NEC entirely or prevent additional complications by implementing treatment immediately (Agnoni & Lazaros Amendola, 2017). Feeding neonates mom's breast milk or donor breast milk is the best practice in the NICU for optimal health and immunity; the breast milk contains IgA, protective bacteria, and cytokines (Agnoni & Lazaros Amendola, 2017). Antibiotic and antacid use increases the risk of NEC due to the limitation of bacterial variation caused by antibiotics and a nonacidic environment as a result of antacid use; therefore, best practice is to limit the use of antibiotics and antacids to reduce the risk of NEC (Agnoni & Lazaros Amendola, 2017). Newer developments include the implementation of probiotics which has shown a significant reduction

in NEC cases, the severity of NEC cases, accelerated feedings, and reduced length of time in the hospital (Agnoni & Lazaros Amendola, 2017).

**Education**

This student searched for articles that would provide specific standardized methods to educate healthcare professionals about the prevention of NEC, but the search yielded no results; therefore, this student can deduce that there is not a required method of education. Prevention of necrotizing enterocolitis in neonates requires educating the healthcare team on the current guidelines and implementation of probiotic supplementation. A clearly defined policy should be written and used to train current and new staff (Rolnitsky et al., 2019). Training within the unit begins with current staff and is broken down into groups to provide everyone with proper training (Rolnitsky et al., 2019). Education includes using charts, screensavers, handouts for visual reminders, and an update to the admission sheet to promote compliance (Rolnitsky et al., 2019). This policy includes the continuation of feeding human breastmilk as the standard of evidence-based practice to provide optimal overall health for neonates (Rolnitsky et al., 2019). Routine and random audits aid in compliance and utilization of the knowledge and skills provided to implement probiotic supplementation effectively, increasing safety for the nursing staff and the patients (QSEN Institute, 2020).

**Research**

Necrotizing enterocolitis is the most common severe intestinal disease with an unclear etiology; that has been an immense problem in neonates for years (Rolnitskey et al., 2020). Human breastmilk has been the standard feeding practice for neonates since it contains antibodies and protective bacteria to provide optimal health (Agnoni & Lazaros Amendola,

2017). However, mothers who have premature babies are not always able to produce breastmilk right away; therefore, additional research should ensue to find ways to induce and increase milk production (Agnoni & Lazaros Amendola, 2017). Neonatal intensive care units in the United States are not utilizing probiotic supplementation to prevent NEC as they could be, simply because it has not been approved or regulated by the Federal Drug Administration yet (Agnoni & Lazaros Amendola, 2017). The findings of this study indicate that further research is needed to provide learning opportunities and increase the knowledge of healthcare workers and governmental regulatory agencies; so that more neonatal units will start utilizing probiotic supplementation to improve the safety and outcome of premature babies.

## Conclusion

Policies, procedures, and standard of care measures are utilized in hospitals to prevent additional complications such as necrotizing enterocolitis. However, the rate of 7-13% of NEC cases is still too high, and the mortality rate upwards of 35% is tragically high (Agnoni & Lazaros Amendola, 2017). These babies with NEC face additional testing, surgeries, days without feedings, sepsis, and mortality (Rolnitsky et al., 2020). The solution is to implement quality improvement, which is the process utilized to improve patient care and safety (QSEN Institute, 2020). Neonatal nurses spend the most time with these tiny patients, specializing in knowing what works and what does not work for this unique patient population. These nurses have the knowledge and experience to formulate interventions, the tools, and skills to implement them, and the attitude to work as a team with their coworkers to evaluate the effectiveness of improving patient safety and outcome (QSEN Institute 2020). Utilizing quality improvement strategies will increase nurse and patient satisfaction by reducing complications, minimizing the

length of stay, decreasing the mortality rate of these fragile patients, and initiating safer policies and procedures within the unit.

## References

Agnoni, A., & Lazaros Amendola, C. (2017). Necrotizing enterocolitis. *Journal of the American Academy of Physician Assistants*, *30*(8), 16–21. https://doi.org/10.1097/01.jaa.0000521131.85173.f9

Houser, J. (2018). *Nursing research: Reading, using, and creating evidence*. Jones & Bartlett Learning.

Mowitz, M. E., Dukhovny, D., & Zupancic, J. A. F. (2018). The cost of necrotizing enterocolitis in premature infants. *Seminars in Fetal and Neonatal Medicine*, *23*(6), 416–419. https://doi.org/10.1016/j.siny.2018.08.004

QSEN Institute (2020). *QSEN competencies*. https://qsen.org/competencies/pre-licensure-ksas/#quality_improvement

Rolnitsky, A., Ng, E., Asztalos, E., Shama, Y., Karol, D., Findlater, C., Garsch, M., & Dunn, M. (2019). A quality improvement intervention to reduce necrotizing enterocolitis in premature infants with probiotic supplementation. *Pediatric Quality & Safety*, *4*(5). https://doi.org/10.1097/pq9.0000000000000201