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## Lowering Morbidity and Readmissions of Underserved Preterm Infants to Reduce Acute Care Hospital Spend

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# Walden University

College of Management and Human Potential

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Adaugo Amuta

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the review committee have been made.

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Lowering Morbidity and Readmissions of Underserved Preterm Infants to Reduce Acute  
Care Hospital Spend

by

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## **Abstract**

Neonatal readmissions remain a significant challenge in urban acute care hospitals serving indigent preterm infants. These readmissions impose substantial financial burdens, with high-cost conditions such as bronchopulmonary dysplasia, necrotizing enterocolitis, and retinopathy of prematurity driving recurring expenditures. This integrative review examined strategies that healthcare administrators can implement to reduce neonatal readmissions, improve care equity, and optimize healthcare spending in hospitals serving vulnerable populations in the Commonwealth of Virginia. A comprehensive literature search of empirical and non-empirical studies yielded 105 results for quality assessment using the Johns Hopkins appraisal tools. A total of 29 were included for thematic analysis. Five main themes with eight sub-themes emerged; strengthen leadership and systems through collaborative leadership and data-driven technology use; build a skilled, inclusive, and safety-oriented workforce; integrate care and address social determinants of health; advance health policy and access through Medicaid expansion and advocacy; and use data and resources to promote sustainable outcomes through benchmarking and efficient resource alignment. Healthcare systems should invest in advanced technologies, cultivate a culturally competent and safety-focused workforce, leverage data analytics, establish multidisciplinary post-discharge programs, and expand insurance coverage. Evidence consistently demonstrates that aligning organizational improvements with social determinants of health strengthens infant health, supports families, and advances community equity which can promote meaningful social change.

## Part 1: Practice-Based Problem

### **Problem of Interest**

The problem of interest that prompted this review is the need to reduce neonatal readmission rates among indigent preterm infants caused by morbidities, which may reduce spending in urban acute care hospitals. The burden of neonatal morbidities and hospital readmissions presents a critical challenge for urban acute care hospitals, especially within populations of indigent and preterm infants who are born before 36 weeks of gestation (Hannan, et al., 2020). Morbidities among these vulnerable groups lead to disproportionate consumption of healthcare resources due to their heightened risk for complications, prolonged hospital stays, and frequent returns to pediatric intensive care units, which collectively leads to increased readmissions (Hannan et al., 2020). Strategies aimed at reducing the occurrences of these morbidities and readmissions that increase operational costs and resource allocation can help healthcare leaders including chief nursing officers, chief executive officers, and chief operating officers cut related expenditures and enhance efficiency. Indigent infants born into environments marked by risk factors such as inadequate prenatal care, maternal education and nutritional deficiencies, and lack of social support have an increased likelihood of developing such complications and have higher chances of subsequent rehospitalizations (Hannan et al., 2020). These disparities are exacerbated in settings, where hospital systems frequently operate under financial strain and are tasked with serving large, diverse populations (Lorch et al., 2021). High readmission rates and preventable morbidity events often translate into unsustainable healthcare spending and systemic inefficiencies resulting in

expenditures of over \$3 million annually (Hebballi et al., 2023). To ascertain this, the study by Hebballi et al. (2023) affirmed that about half of infants with unplanned hospital visits account for 98% of the total costs incurred. These findings show the significant financial burden that hospital readmissions impose on healthcare systems, particularly in urban acute care hospitals serving high-risk neonatal populations including those in Commonwealth Virginia and highlight the urgent need for effective interventions to support sustainable healthcare delivery.

Low-quality neonatal care predisposes patients to complications which not only reduce their survival chances after discharge but also increase the likelihood of readmissions. The problem of high readmission rates is of great concern particularly for urban acute care hospitals with relatively limited access to community resources as this impacts the quality of care (Lorch et al. 2021). Currently, healthcare service organizations (HSOs) across the globe are working towards countering challenges such as increasing operating expenses, staffing costs, and slow rates of reimbursements (Amiri et al., 2020; Feister et al. 2024; Hebballi et al., 2023). Research on this healthcare problem may identify structural and process shortcomings in healthcare systems that fuel the disparate morbidities and readmissions among indigent preterm infants admitted in the Neonatal Intensive Care Units (NICUs) of acute care hospitals, leading to positive social change. The Problem of Interest resources can be found on Appendix A.

## **Healthcare Administration Problem**

### **Background**

The healthcare administration problem for this integrative review is the need to reduce disparities in readmission rates among preterm infants in urban acute care hospitals with 1,000 or more NICU admissions annually in the Commonwealth of Virginia, which will reduce hospital spending and enhance reputation.

Currently, there is an estimated 4 million births annually in the United States and neonatal intensive care unit admission rates have gradually increased, with approximately 8% of newborns requiring NICU care (Hebballi et al. 2023). In the Commonwealth of Virginia, for instance, 2023 data indicate that 8.4% of all infants require NICU admission for problems such as feeding, breathing, preterm births, and other infections with these patients at high risk of readmission after discharge (National Center for Health Statistics, 2025). These infants are at heightened risk for both acute and chronic health conditions, with 7% requiring readmission within 90 days of discharge and another 15-37% experiencing readmission within their first year of life (Hebballi et al., 2023). Families with limited means often face compounded difficulties, including insufficient insurance coverage and broader socioeconomic barriers such as poor prenatal care, poor maternal nutrition and education, and disadvantaged neighborhood conditions including unstable housing (Padula et al. 2020). While the Affordable Care Act (ACA) was enacted to expand healthcare coverage and reduce costs, many minority and low-income communities remain disproportionately underserved (Lorch et al. 2021). Although the economic impact of prematurity-related complications has been well documented, there

remains a gap in understanding effective interventions to reduce the cost and burden of readmissions. According to Lai and Lorch (2023), such costs emanate from major morbidities such as bronchopulmonary dysplasia (BPD), necrotizing enterocolitis (NEC), and retinopathy of prematurity (ROP). These morbidities not only drive-up initial hospitalization expenses but also increase the likelihood of future hospital readmissions. The Healthcare Administration Problem Background resources can be found on Appendix A.

### **Operational Problem**

Acute care hospitals serving indigent preterm infants face persistent and complex operational challenges due to high rates of major morbidities that may lead to hospital readmissions. Lai and Lorch (2023) found that severe morbidity cases among high-risk neonatal patients are the costliest amounting to median costs of \$430,860, \$413,825, and \$399,495 for NEC, ROP, and BPD respectively. Similar findings by Rolnitsky et al. (2023) supported this finding by affirming that the cost of preterm care increases with the rise in the complication rates for these morbidities. Offering a broader but different perspective, Rubinos et al. (2022) noted that various risk factors among families of preterm and high-risk neonatal patients like overreliance on public insurance tend to lead to extended hospital stays which can put a toll on healthcare expenditures further straining healthcare resources. Balancing patient outcomes and the expenditure to ensure quality care becomes a challenge for healthcare administrators. This integrative review seeks to inform healthcare administrators in the Commonwealth Virginia on the best practices to update their healthcare organizations' policies to improve the efficiency of

their operations. The Healthcare Administration Operational Problem resources can be found on Appendix A.

### **Ideal State of Operations**

Data indicate that the actual readmission rate for infants within 90 days of discharge from neonatal care units is 7% (Hebballi et al., 2023), significantly exceeding the federal benchmark which recommends a readmission rate of less than 1% (Bawazeer et al., 2021). This discrepancy signals a systemic challenge and a gap in healthcare administration especially in quality improvement and cost reduction. The Ideal State of Operations sources can be found on Appendix A.

### **Professional Practice Gap Statement**

A significant gap exists between current healthcare outcomes and established federal benchmarks regarding neonatal readmissions. While the federal goal is to ensure neonatal readmission rates remain below 1% (Bawazeer et al., 2021), data reveal that actual readmission rates may rise to 7% within 90 days of discharge from emergency department units of acute care NICU facilities (Hebballi et al., 2023). This disparity highlights a need for policy formulation to reduce the odds of readmissions and align with national quality standards.

### **Summary of Evidence**

In the United States, there are about 4 million births annually, and according to Hebballi et al. (2023), NICU admissions have risen steadily and currently comprise 8% of all newborns. In 2023, for example, 8.4% of all infants were admitted in NICUs in the Commonwealth of Virginia for reasons such as preterm birth, birth defects, feeding and

breathing problems, and other infections which shows a slightly higher admission rate (National Center for Health Statistics, 2025). These infants are susceptible to both acute and chronic health problems which predisposes them to readmissions. Hebballi et al. (2023) affirmed that about 7% of infants admitted in NICUs require readmission within 90 days of discharge and 15-37% of them face increased risk of readmission within their first year of life. Readmissions create a recurring cycle of rising costs that eventually burdens healthcare systems and infant families. Low-income and minority populations are especially affected and bear the biggest burden since they already face the significant barriers of social determinants of health (SDH). These barriers include inadequate insurance coverage, socio-economic barriers, lack of post-discharge support and care, housing instability and neighborhood disadvantages (Padula et al., 2020). This problem is still more pronounced despite the implementation of the ACA that aims to reduce cost of care. According to Lorch et al. (2021), inequities in care persist among minority and underserved communities as they are disproportionately affected by gaps in chronic disease management and access to quality care.

High-cost morbidities like BPD, NEC, and ROP which are common among preterm infants increase both initial hospitalization costs and recurrent readmissions, further straining health systems (Lai & Lorch, 2023). Despite robust documentation of the economic burden of prematurity, there remains a critical gap in the identification and implementation of effective and scalable interventions to reduce costly readmissions. This integrative review is anchored in the need for strategic, equity-driven healthcare solutions that not only help healthcare leaders to improve discharge transitions and long-

term outcomes for preterm infants but also align with broader goals of reduction of disparities in readmission rates which will promote cost containment through quality improvement and enhance health equity across hospital systems.

### **Purpose of the Integrative Review**

The purpose of this integrative review was to explore possible strategies that health administrators could use to reduce NICU readmission rates in urban acute care hospitals in the Commonwealth of Virginia. This review may inform healthcare administrators to update policies and procedures that may reduce acute care hospital spend and optimize hospital reputation. Potential strategies aimed at addressing the SDH such as poor access to prenatal care, poor maternal nutrition and education, inadequate insurance coverage, and lack of social support which are the major barriers impacting access to quality care can help in cutting readmissions and subsequent costs. These SDH factors contribute either directly or indirectly to increase in adverse neonatal outcomes that lead to rise in chances of readmissions which increase cost consumption in health systems.

### **Integrative Review Question**

This integrative review sought to answer the question “What strategies can NICU leaders implement to reduce readmission rates and optimize healthcare administrative spend in hospitals serving indigent preterm infants in the Commonwealth of Virginia?” The key elements of healthcare administration problem that this review aimed to address are high readmission rates which are linked to increased costs of care and low-quality care. The strategies that this review provides can inform healthcare administrators and

NICU leaders to reduce the readmission rates, ultimately optimizing healthcare administrative spend and impacting positive social change.

### **Theoretical and/or Conceptual Framework**

The Donabedian model offers a foundational framework for evaluating the quality of healthcare services. The model was introduced by Avedis Donabedian in 1966 as a model for assessing the quality of healthcare services based on three components which include structure, process, and outcomes (Donabedian, 1966). According to Lorch et al. (2021), the assessment of structures, personnel, equipment, and resources used in healthcare delivery, processes, actions and steps taken, and outcomes, results such as readmission rates, can help improve patient outcomes. Specifically, precise tracking and evaluation of healthcare structures, processes, and outcomes can be utilized to implement targeted interventions that help to reduce readmission rates of preterm infants in NICUs and improve hospital spending.

## Part 2: Literature Review, Quality Appraisal, and Analysis

### Literature Search Strategy

A literature search was conducted on sources published in 2020 and later. The search utilized online scholarly databases, websites of Non-Profit organizations, and government publications. Keywords ("NICU leadership" OR "neonatal intensive care unit management") AND "NICU readmissions" OR "neonatal readmission" OR "reducing hospital readmissions") AND ("healthcare administrative cost" OR "resource allocation" OR "hospital efficiency") AND ("indigent populations" OR "low-income families" OR "medically underserved") AND ("Commonwealth Virginia"). The target population of this integrative review was preterm infants and was considered in the inclusion criteria. Various types of studies including qualitative, quantitative, and mixed studies were included in the review. SDH factors such as healthcare access, education, neighborhood and social and community aspects were assessed in the inclusion criteria. Finally, general NICU outcomes including the readmission and morbidity rates of preterm infants were also analyzed and studies carrying such data were included in the review.

For the exclusion criteria, studies targeting different populations like older infants and those not admitted in the NICUs were excluded. Further, non-English articles, and those with low-quality levels of evidence were omitted in this review. Other studies that had no full-text availability or were not accessible from the library were left out, including those with no specific interventions to improve neonatal outcomes. A comprehensive inclusion and exclusion criteria used for this review is outlined in Table 1 below.

**Table 1***Inclusion and Exclusion Search Criteria*

Inclusion search criteria	Exclusion search criteria
<ul style="list-style-type: none"> <li>• Articles and journals dated 2020 and later.</li> <li>• Keywords: "NICU leadership" OR "neonatal intensive care unit management") AND "NICU readmissions" OR "neonatal readmission" OR "reducing hospital readmissions") AND ("healthcare administrative cost" OR "resource allocation" OR "hospital efficiency") AND ("indigent populations" OR "low-income families" OR "medically underserved") AND ("Virginia")</li> <li>• Studies that explicitly examine the SDH factors such as healthcare access, neighborhood, education, and social and community contexts.</li> <li>• General NICU outcomes including morbidities and readmissions rates of preterm infants in different regions and related data such as required nursing time.</li> </ul>	<ul style="list-style-type: none"> <li>• Studies involving different target populations other than preterm infants admitted to NICUs.</li> <li>• Non-English publications</li> <li>• Studies with low-quality evidence levels</li> <li>• Studies with no full-text availability were excluded from the review.</li> <li>• Studies with no specific interventions to improve outcomes like lowering morbidities and reduce hospital spend.</li> </ul>

A total of 105 records were identified through database searches and manual sources. After removing duplicates, 65 records were screened, with 22 excluded for irrelevance or insufficient data. Forty-three full-text articles were assessed for eligibility, of which 14 were excluded for not meeting inclusion criteria or lacking quality or outcome data. A total of 29 studies met the inclusion criteria, comprising 5 qualitative studies, 18 quantitative studies used in meta-analysis, and 6 mixed-methods studies included in the final synthesis. Eighteen studies were empirical mainly consisting of data from experiments and observations. Eleven studies were non-empirical comprising of data from conceptual papers, policy reports, commentaries, general reviews and theoretical works. The DHA Review Question sources can be found in Appendix B.

### **Quality Appraisal**

The review question is for this integrative review was “What strategies can NICU leaders implement to reduce readmission rates and optimize healthcare administrative spend in hospitals serving indigent preterm infants in Commonwealth Virginia?” To answer this question, 29 sources were appraised for quality using the Johns Hopkins Nursing Evidence-Based Practice Model for Nursing and Healthcare Professionals. A level five and level four ratings are non-research evidence. From the appraisal, six sources received a level 5 high-quality rating and five sources a level 5 good rating. One source received a level 4 high-quality rating and 3 sources rated level 4 good quality rating. Levels 3 sources were mainly research-based evidence and include non-experimental, systemic reviews of non-experimental, qualitative, and systemic reviews of qualitative studies. Nine sources scored a level 3 high-quality rating, and five scored level

3 good quality rating. No level 1 and 2 studies were included in this literature review.

Table 2 below illustrates a review of the levels of Johns Hopkins Evaluation. The DHA Quality Appraisal Results Log can be found in Appendix C.

**Table 2**

*John's Hopkins Nursing Evidence-Based Practice Model*

Level	Number of sources
Level 5 High-Quality	6
Level 5 Good-Quality	5
Level 4 High-Quality	1
Level 4 Good-Quality	3
Level 3 High-Quality	9
Level 3 Good-Quality	5
Level 2 High-Quality	0
Level 2 Good-Quality	0
Level 1 High-Quality	0
Level 1 Good-Quality	0

### **Thematic Analysis of Literature**

The reviewed literature includes both qualitative and quantitative studies featuring focus groups, surveys, cohort studies, program evaluations, policy reports, and systematic reviews. This variety ensures a comprehensive understanding of healthcare organizational factors impacting neonatal outcomes. The mix also supported triangulation of evidence to enhance reliability. Explored were strategies that can help improve quality of NICU care for preterm infants based on the experiences, challenges, and barriers they encounter

when seeking neonatal care in hospitals for most of which often led to readmissions. Interventions at the medical settings including streamlining the structures and processes of care to improve the quality of care and enhance outcome. The appraisal results examined the relevance, quality, and applicability of the selected articles in relation to the review question.

The literature review spanned from 2020 to 2025 to ensure inclusion of the latest evidence to capture the most recent trends in policy and technological advancements in neonatal care. This timeframe was appropriate so that current and evolving trends, practices, and emerging interventions were considered for the intervention and reduction of readmissions in neonatal care that will reduce avoidable hospital spending.

The appraisal revealed that all included studies focused on preterm infants, with particular emphasis on those from underserved or socioeconomically disadvantaged populations, underscoring the impact of SDH on neonatal outcomes. Twelve studies explored the perspectives of NICU staff, healthcare leaders, and parents, contributing valuable insights into the systemic factors influencing neonatal care delivery. Experimental studies were predominantly conducted in acute care hospitals with Level III and Level IV NICUs located in urban areas and academic health system settings known for managing complex neonatal cases and spearheading structural and process innovations. Notably, one study examined rural and community hospitals (Lorch et al., 2021), while another focused on safety-net hospitals (Padula et al., 2021) providing perspectives on the variability of resource availability across different healthcare environments.

Regarding relevance to the practice-based problem, the literature closely aligned with the practice-based problem of reducing neonatal readmissions while improving care quality and enhancing cost efficiency. Researchers addressed interventions, such as Electronic Health Record (EHR) and Decision Support Systems (DSS), tracking systems, team-based care models, social determinants screenings, workforce diversification, diversity, equity, and inclusion, and discharge planning protocols, among other aspects that potentially improve neonatal outcomes (Bell et al., 2023, Burriss & Parker, 2021, Hill et al., 2024). The Donabedian Structure-Process-Outcome model served as a guiding framework for this integrative review. The model specifically provided a lens for evaluating both structural and procedural changes that can impact neonatal outcomes such as readmission and morbidities.

Structural reforms on leadership and systems particularly aimed at reducing neonatal readmission rates among preterm infants encompass several critical domains which were highlighted in the review. Leadership support plays a pivotal role in identifying non-clinical determinants influencing care delivery, including the leadership styles employed (Fanelli et al., 2020), resource allocation and monitoring mechanisms (Deorari et al., 2022), the application of technology and remote monitoring systems (Bell et al., 2023), and the integration of decision support tools (Bhati, et al., 2023). Workforce-related modifications targeted at enhancing the skills and safety are critical. Staffing level aspects such as adherence to recommended nursing hours per patient day of 7.5 hours for critical level 3 acute care hospitals (Government of Western Australia, Department of Health, n.d.), alongside staff training and appropriate funding, constitute

the foundational elements of quality improvement initiatives (Karvonen et al., 2024, Nakai, et al., 2020; Padula et al., 2021).

Health policy and access-related changes, including Medicaid expansion and improved enrollment mechanisms, are critical for addressing structural inadequacies in healthcare delivery (Currie & Chorniy, 2021; Hannan, et al., 2020; Hill et al., 2024). Structural integration of care to address SDH, achieved through the establishment of interdisciplinary care teams, enhanced post-discharge support, provision of social support programs, and the promotion of diversity, equity, and inclusion, further contributes to healthcare quality improvement (Bell et al., 2023; Karvonen et al., 2024, Taylor, 2025).

The use of data-and resources to drive sustainable outcomes emerged as key factor in helping reduce readmissions. The use of data sharing and benchmarking and proper alignment of resources are essential interventions that could drive efficiency in healthcare operations reducing leakages and enhancing quality improvement (Bhati et al., 2023; Miner, 2025).

Table 3 below shows the total number themes derived from Appendix D.

**Table 3***Total Number of Themes and Subthemes from Appendix D*

Themes	Subthemes
Strengthen leadership and systems to improve quality and safety	Foster collaborative and transformative leadership styles Leverage technology (DSS and EHR) to drive data-informed decisions.
Build skilled, inclusive, and safety-oriented workforce.	Workforce development and management (staffing levels, training, and DEI).
Integrate care and address SDH	Establish post-discharge support teams for follow-up care. Establish integrated care teams
Advance health policy and expand access to care.	Championing for Medicaid Expansion and Advocacy.
Use data and resources to drive sustainable outcomes.	Use data sharing and benchmarking Promote efficiency in resource alignment.

Table 4 below shows the relationship of the Donabedian model with the integrative review themes and sub-themes in reducing NICU readmissions in HSOs.

**Table 4***Integrative Review Themes and Subthemes*

Themes and subthemes	Relationship to theory (Donabedian model)
<p>Strengthening leadership and systems to improve quality and safety</p> <ul style="list-style-type: none"> <li>➤ <i>Fostering collaborative and transformative leadership styles</i></li> <li>➤ <i>Leverage technology (use of decision support systems and electronic health records) to drive data-informed decisions through DSS.</i></li> </ul>	<p>The Donabedian model provides a solid foundation for developing structural changes in leadership to enhance organizational capacity and commitment to teamwork to improve processes of care for better outcomes. Technological changes represent structural changes that can enhance accuracy support evidence-based decision-making, and reduce errors in care which enhances the process aspect of the Donabedian model.</p>
<p>Building skilled, inclusive, and safety-oriented workforce.</p> <ul style="list-style-type: none"> <li>➤ <i>Workforce development and management (staffing levels, training, and DEI).</i></li> </ul>	<p>Donabedian model provides a clear structural pathway for building capable and inclusive workforce that clinical workforce can utilize to enhance processes of care and ability to deliver equitable and safe care to diverse patient populations.</p>
<p>Integrating care and addressing SDH</p> <ul style="list-style-type: none"> <li>➤ <i>Establish post-discharge support teams for follow-up care</i></li> <li>➤ <i>Establish integrated care teams</i></li> </ul>	<p>The Donabedian Model links integrated care and SDH-focused interventions to reduced readmissions by showing how structural investments in post-discharge and integrated care teams improve care processes, leading to better patient outcomes.</p>
<p>Advancing health policy and expanding access to care</p> <ul style="list-style-type: none"> <li>➤ <i>Championing for Medicaid Expansion and Advocacy</i></li> </ul>	<p>Through the Donabedian lens, advancing health policy mainly through Medicaid expansion improves structural capacity and care processes by shaping funding priorities, care accessibility and regulatory frameworks. This directly contributes to reducing NICU readmissions and promoting health equity.</p>
<ul style="list-style-type: none"> <li>• Use data and resources to drive sustainable outcomes <ul style="list-style-type: none"> <li>➤ <i>Use of data sharing and benchmarking</i></li> <li>➤ <i>Promote efficiency in resource alignment</i></li> </ul> </li> </ul>	<p>The model evaluates health care quality to understand how data-driven strategies can inform the reduction of NICU readmissions through structural elements of data sharing and benchmarking for easy comparison of data among HSOs. Such data-informed decision-making affects processes by guiding how resources, staffing, equipment, and follow-up services are allocated to meet patient needs.</p>

The limitations of the literature were examined and transparently acknowledged, as part of the appraisal process. Although the selected articles demonstrated varying strengths that warranted their inclusion, several important limitations were identified. For instance, the reviewed literature encompassed a diverse mix of experimental, observational, and qualitative studies, each employing different methodologies, sample sizes, and outcome measures. This heterogeneity posed challenges especially in drawing direct comparisons across studies and limited the ability to synthesize findings into a unified conclusion. Some studies lacked standardized approaches to measuring key variables like those beyond the control of hospitals such as unmet social needs after discharge and this may affect the consistency of results. Differences in geographic locations posed a limitation to the review's generalizability. Regional disparities in healthcare policies, access to services, and organizational structures may influence neonatal outcomes in ways not captured across all settings. Variability in healthcare infrastructure, including the availability of neonatal intensive care units, specialized personnel, and technological capacity, limits the applicability of the findings to facilities with differing levels of resources and capabilities. Variations in community demographics, such as socioeconomic status, cultural practices, and SDH, may influence the outcomes and effectiveness of care strategies, limiting the broader applicability of the results.

Despite these limitations, the literature collectively offered valuable insights that inform current trends in neonatal care. The inclusion of recent, peer-reviewed studies ensured that the review captured the most up-to-date evidence on strategies to reduce

readmission rates among preterm infants. Non-peer reviewed sources like the Government of Western Australia, Department of Health, and AHRQ provided up-to-date data on healthcare policies, neonatal readmission rates, and national nursing hours per patient days helping inform current nurse staffing levels. Peer-reviewed sources provided credible, evidence-based insights that are instrumental in analyzing current events related to healthcare delivery, especially within neonatal care systems like Medicaid expansion, Children's Health Insurance Program (CHIP), and evaluation of policy impact. From these sources, I found helpful current events like use of digital health innovations and remote monitoring, Diversity Equity, and Inclusion (DEI) initiatives, use of EHR, and Decision Support (DSS) tools to streamline healthcare operations and improve health outcomes of preterm infants. While acknowledging the methodological and contextual limitations, the evidence base remains robust enough to support meaningful conclusions and identify opportunities for future research and practice improvement.

### Part 3: Presentation of Results

The thematic analysis conducted on the 29 research and non-research sources yielded different findings which were classified into themes and subthemes.

Subsequently, codes were derived from the findings with a precise purpose of disentangling SDH embedded in the policies and practices of HSOs that impact quality of care leading to readmissions of indigent preterm infants. These readmissions directly impact healthcare spending and overall performance of health systems through financial penalties, reputational and accreditation impacts, and resource allocation challenges.

Five main themes and eight sub-themes were identified in the analysis as presented in Table 2. The themes reflect key strategies for improving quality, safety, and outcomes in healthcare settings. Theme 1 is Strengthening leadership and systems to improve quality and safety. Sub-themes that support theme one are fostering collaborative and transformative leadership styles and leveraging technology such as EHR and DSS, to drive data-informed decisions. Leaders who are transparent and share outcomes such as readmissions, length of stay, and timely charting in the EHR, to name a few, foster collaboration and teamwork. Theme 2 is build skilled, inclusive, and safety-oriented workforce. Sub-themes that support theme two are workforce development and management, which includes adequate staffing levels, clinical skills training that may better prepare staff to be culturally sensitive and apply DEI principles to each other and NICU infant families. Theme 3 is Integrate care and addressing SDH. The sub-themes that support Theme 3 include will require the organization to establish post-discharge support teams who understand the barriers and needs of certain geography, income, and

insurance coverage, to name three SDH and ensure a connection of the family to support services. The other sub-theme is to integrate care teams to work with community resources foster a strong continuum of care, follow-up of family status, and ultimately reduction in readmissions. Theme 4 is advance health policy and expand access to care through championing Medicaid expansion and advocacy. Finally, Theme 5 is use data and resources to drive sustainable outcomes. The sub-themes under this theme is the use of data sharing and benchmarking and efficiency in resource alignment. Together, these themes and sub-themes provide a comprehensive framework for enhancing healthcare performance and sustainability in reducing readmissions in NICUs. Table 5 is a representation of the themes and sub-themes from the analysis of literature.

**Table 5**

*Theme and Sub-themes from the Analysis*

Themes	Subthemes
Strengthen leadership and systems to improve quality and safety	Foster collaborative and transformative leadership styles Leverage technology (use of DSS and EHR to drive data-informed decisions.
Build skilled, inclusive, and safety-oriented workforce.	Improve workforce development and management through enhancing staffing levels, training, and DEI.
Integrate care and addressing SDH	Establish post-discharge support teams for follow-up care.
Advance health policy and expanding access to care.	Establish integrated care teams. Champion for Medicaid Expansion and Advocacy.
Use data and resources to drive sustainable outcomes	Use data sharing and benchmarking. Promote efficiency in resource alignment.

### **Thematic Concepts Map**

The Thematic Concepts Map, found in Appendix E, represents the connection between the themes and the application of the theoretical framework which encompasses the aspects of structure, process, and outcome. Each theme supports the other to illustrate the changes that need to occur to address not only what infants encounter in the NICUs but also what impacts the parent and the community when seeking care for their preterm infants in neonatal care units. These changes can help HSO leaders address structural and process shortcomings that impact infant outcomes. An analysis of the current literature resulted in the major themes and what changes need to be developed, implemented, and sustained so the HSO can meet the needs of the NICU infant, family, and staff in a culturally sensitive and cost-effective manner. The HSO leadership must look beyond their front door, out to the impact of the community, SDH, and access to care.

### **Presentation of the Findings**

The themes and sub-themes identified from literature are as follows:

#### **Strengthen Leadership and Systems to Improve Quality and Safety**

This includes sub-themes such as fostering collaborative and transformative leadership styles to inspire and motivate teams toward high performance by promoting shared vision, accountability, and continuous improvement (Fanelli et al., 2020). Further, leveraging technology such as decision support systems and electronic health records (EHRs) aid to support data-informed decision-making by enabling the identification of trends, monitoring of performance, and timely adaptation to changing conditions, ultimately enhancing quality and safety outcomes (Bhati et al., 2023).

**Build Skilled, Inclusive, and Safety-oriented Workforce.**

This theme includes the sub-theme of workforce development and management which encompasses aspects such as staffing levels, training, and DEI. These can help enhance skill development for safety and quality care among staff (Culbreth & Spratling, 2023; Deorari et al., 2022). These are ideal for strengthening effective workforce development through promoting equitable work environment and adequately preparing healthcare staff to deliver high quality care.

**Integrate Care and Address SDH**

Establishing structured post-discharge support teams is a critical strategy for improving care coordination and reducing fragmentation following NICU discharge. These teams can provide timely follow-up care, ensure clear communication between families and healthcare providers, and address medical and social needs that may arise after discharge, thereby supporting safer transitions of care (Bell et al., 2023). Alongside this, the establishment of integrated care teams promotes continuity of care by linking NICU services with outpatient providers, community health resources, and primary care systems. Such integration facilitates ongoing monitoring, enhances adherence to care plans, and supports early identification of complications beyond the NICU setting. Collectively, these approaches strengthen continuity of care and contribute to improved neonatal outcomes and reduced readmissions (Hannan et al., 2020).

**Advance Health policy and Expand Access to Care**

Championing Medicaid expansion and sustained advocacy efforts plays a critical role in eliminating barriers to accessing quality care, particularly those related to

insurance coverage and restrictive eligibility requirements. Expanding Medicaid improves continuity of coverage, reduces gaps in care, and enhances access to preventive and specialty services for vulnerable populations. These policy-level interventions contribute to more equitable healthcare access and improved health outcomes, as supported by Currie & Chorniy (2021)

### **Use Data and Resources to Drive Sustainable Outcomes**

Data sharing and benchmarking are essential tools for informing targeted quality improvement strategies by leveraging data analytics to identify performance gaps and best practices across care settings (Bhati et al., 2023; Miner, 2025). The systematic use of shared data enables organizations to monitor outcomes, compare performance, and implement evidence-based interventions to improve quality and safety. Additionally, efficient alignment of resources minimizes waste, maximizes value, and strengthens patient safety protocols, thereby supporting sustainable improvements in healthcare delivery (Hannan et al., 2020).

## **Discussion of the Findings**

### **Theme: Strengthen Leadership and Systems to Improve Quality and Safety**

Effective leadership is crucial in establishing strong governance protocols that guide clinical practice and ensure organizational accountability. Such leadership fosters better coordination among multidisciplinary teams, aligning behaviors and workflows to support safer, more consistent, and integrated care across the NICU and during transitions to the community (Deorari et al., 2022; Fanelli et al., 2020). By setting clear expectations and reinforcing adherence to evidence-based clinical guidelines, leaders help reduce unwarranted variability in care delivery, which is essential for improving neonatal outcomes (Fanelli et al., 2020). HSOs can strengthen leadership to improve quality and safety of care through fostering collaborative and transformative leadership and leveraging technology which are major sub-themes discussed below.

#### ***Foster Collaborative and Transformative Leadership Styles***

The adoption of effective leadership approaches, particularly transformational and collaborative styles, can inspire and motivate healthcare teams toward higher levels of performance (Fanelli et al., 2020). Findings show that leaders who actively listen to the perspectives of nursing staff and managers provide constructive and transparent feedback, encourage participation in decision-making, and offer consistent support contribute to stronger team performance (Fanelli et al., 2020). By fostering transparent communication, promoting interpersonal cooperation, and cultivating an inclusive organizational culture, healthcare leaders can reduce staff stress and enhance team cohesion (Bell et al., 2023).

### ***Leverage Technology (Use of DSS and EHR) to Drive Data-Informed Decisions***

Leveraging technology, such as DSS and EHR data, can improve the ability of the organization leaders to identify trends, both positive and negative, and make changes as needed to new and current programs (Bhati, et al., 2023). With the use of DSS tools, healthcare leaders can ensure effective strategic planning by addressing barriers such as staffing shortages, forecasting service demands, and conducting current and future cost analyses (Nakai, et al., 2020). These functions enhance resource allocation efficiency, contributing to streamlined workflows and more coordinated care delivery. Healthcare leadership can support the investment in technology and hospital infrastructure like the use of EHRs, remote monitoring tools to promote data tracking which helps in home transition planning and reduction of overcrowding in NICUs (AHRQ, 2020; Miner, 2025). The lack of standardized screening protocols for SDH by HSOs leads to inequitable care delivery and this contributes to increased morbidities (Burriss & Parker, 2021). Similarly, medical errors negatively impact patient safety and overall health outcomes as illustrated by Culbreth & Spratling (2023). EHR can be utilized to trend patient response to therapies, medications, and bonding activities with their parent can increase the quality of care (AHRQ, 2020)

### **Build a Skilled, Inclusive, and Safety-Oriented Workforce**

Effective workload management and staff skill development is crucial in promoting patient safety and quality of care (Culbreth and Spratling, 2023; Deorari et al., 2022). The nursing hours per patient day (NHPPD) metric serves as a standardized tool for benchmarking and evaluating the contribution of nursing staff to patient safety and

healthcare quality (Government of Western Australia, Department of Health, n.d.). This metric is calculated by dividing the number of productive hours worked by nursing staff by the total number of patient days (National Healthcare Safety Network, 2023). Under building skilled, inclusive and safety-oriented workforce, the sub-theme of staff development emerges as a sub-theme.

***Workforce Development and Management Through Enhancing Staffing Levels, Training, and DEI***

Workforce development initiatives that strengthen clinical competencies have been shown to reduce medical errors, which are often associated with prolonged neonatal length of stay and an elevated risk of rehospitalization (Culbreth & Spratling, 2023). Such training should be complemented by family empowerment strategies, which involve the intentional transfer of knowledge from healthcare providers to families, positioning them as active care partners through structured orientation, education, and supportive interventions. These practices enhance continuity of care during the transition to home (Bell et al., 2023; Karvonen et al., 2024). The development of a DEI competent workforce that reflects the demographic composition of the community as this is essential for promoting positive healthcare outcomes and this should be implemented as part of training programs (Karvonen et al., 2024).

***Integrate Care and Address SDH***

Poor coordination of care can lead to fragmented and inefficient service delivery (Bell et al., 2023). When communication between providers and patient families is limited or inconsistent, critical patient information may be overlooked, resulting in

delays, duplication of services, and gaps in follow-up care. In the NICU context, such fragmentation is especially harmful, as it increases the risk of unmet medical and social needs during the transition from hospital to home (Bell et al., 2023). This ultimately contributes to higher readmission rates and poorer infant health outcomes. The integration of care can be executed through establishing post-discharge support teams and creating integrated care teams.

### ***Establish Post-Discharge Support Teams for Follow-Up Care***

To address gaps in care coordination, post-discharge preparation programs that employ individualized approaches alongside the coordination of transportation services with local pediatric providers can significantly strengthen care continuity and integration (Burriss & Parker, 2021; Padula et al., 2020). Tailored discharge plans ensure that each family receives education, resources, and follow-up schedules that reflect their infant's specific medical needs and social circumstances (Hannan et al., 2020). The coordination of transportation eliminates a common barrier to attending pediatric appointments, especially for low-income families, which improves adherence to recommended follow-up care. Together, these strategies promote smoother transitions from the NICU to community care, reduce fragmentation, and help prevent avoidable readmissions.

### ***Establish Integrated Care Teams***

Post-discharge and follow-up care can be enhanced through integrated care teams composed of social workers, family support coordinators, coaches, and peer mentors. These multidisciplinary teams can be intentionally structured to reflect relevant patient demographic factors, including ethnicity and race, to strengthen trust and cultural

responsiveness (Vance et al., 2023). Such alignment helps improve the effectiveness, continuity, and overall impact of follow-up care for NICU graduates (Hannan et al., 2020).

### **Advance Health Policy and Expand Access to Care**

Numerous administrative barriers including new parental work requirements, lengthy paperwork, and reduced outreach are major contributing factors to limited children's access to quality care (Currie & Chorniy, 2021). These burdensome processes often delay or prevent families particularly those with low incomes or limited literacy from enrolling in or maintaining eligibility for essential health programs. As a result, children may experience gaps in insurance coverage, reduced access to preventive services, and delays in receiving timely medical care and with time, these barriers widen existing health disparities and place additional strain on families and healthcare systems. To reduce these barriers, there is need for HSOs to champion for Medicaid expansion and advocacy.

### ***Champion for Medicaid Expansion and Advocacy***

Disparities in insurance coverage is a barrier that has been noted to be a key driver of poor health outcomes, including exacerbation of chronic conditions and heightened morbidity (Currie & Chorniy, 2021). Jointly, these factors may hinder equitable access to care, posing substantial barriers for indigent families seeking high-quality NICU services for their preterm infants and strategies aimed at reducing these barriers can help advance health policy and expand access to care.

## **Use Data and Resources to Drive Sustainable Outcomes**

The use of data and resources strategically can help drive sustainable reductions in NICU readmissions, as it enables healthcare leaders to identify high-risk infants, forecast resource needs, and implement targeted interventions that improve care quality. Data analytics and benchmarking tools such as those embedded in EHR systems allow organizations to monitor performance trends, compare outcomes across facilities, and guide continuous quality improvement efforts (Hannan et al., 2020; Bhati et al., 2023). Efficient resource alignment, supported by predictive modeling and real-time dashboards, further enhances operational efficiency by minimizing waste, strengthening follow-up care processes, and ensuring that interventions are responsive to the social and clinical needs of vulnerable preterm infants (Parmigiani & Bevilacqua, 2022; Hilker et al., 2024). Data sharing and benchmarking and alignment of resources are major process-oriented strategies that can help drive sustainable outcomes.

### ***Use Data Sharing and Benchmarking***

Data sharing is crucial in care continuity, as it helps to reduce redundant tests, prevent interrupted medications, and other avoidable errors that could lead to readmissions (Miner, 2025). Data sharing goes along with benchmarking as the latter is significant in supporting advanced data analytics essential for informed decision-making and continuity of care across different healthcare settings (Bhati et al., 2023). Benchmarking tools and data dashboards help to evaluate key performance indicators facilitating the monitoring of quality metrics that inform targeted quality improvement initiatives (Bhati et al., 2023).

### ***Promote Efficiency in Resource Alignment***

HSOs must analyze data to identify specific risk factors that increase the likelihood of readmission, including lower gestational age, low birth weight, chronic lung disease, congenital anomalies, public insurance, and socio-economic disadvantage. Understanding these predictors allows organizations to tailor interventions to the unique needs of high-risk infants and their families (Hannan et al., 2020). This informed approach supports more effective resource allocation, helping maximize value, minimize waste, and strengthen patient safety through targeted follow-up care, home support, and ongoing monitoring (Hannan et al., 2020).

### **Interpretation of the Findings**

This section includes conclusions and summaries of the themes and sub-themes for this DHA-IR research project.

### **Strengthen Leadership and Systems to Improve Quality and Safety**

Strengthening leadership, technology integration, and data-driven decision-making is essential for achieving sustainable improvements in neonatal care. Transformational, collaborative, and inclusive leadership is a structural change that fosters a culture of transparency, teamwork, and continuous improvement, which enhances communication, staff engagement, and patient outcomes (Bell et al., 2023; Fanelli et al., 2020.). The investment in digital infrastructure such as DSSs and EHRs are process changes that enable predictive analytics, efficient resource allocation, and evidence-based decisions that reduce NICU readmissions and improve care quality (AHRQ, 2020; Bhati et al., 2023). From the findings, it can be noted that continuous staff

training ensures effective use of these technologies, while systematic screening for SDH and transparent error reporting further promote equity, safety, and accountability which within the Donabedian model enhance the efficiency of structures and processes of care (Culbreth & Spratling, 2023; Padula et al., 2021;). Collectively, these strategies align the structural, process, and outcome elements of the Donabedian framework, driving sustainable, equitable, and high-quality neonatal healthcare delivery.

### **Build Skilled, Inclusive, and Safety-Oriented Workforce**

Modifiable changes within the healthcare workforce play a central role in enhancing parental support, continuity of care, and post-discharge follow-up, ultimately improving neonatal outcomes. Guided by the Donabedian framework, building a skilled, inclusive, and safety-oriented workforce reflect critical process change as adequate staffing, targeted education, and inclusive workforce practices form the foundation for positive care outcomes. Effective workload management, continuous professional development, and workforce diversity strengthen the healthcare system's capacity to deliver equitable and safe neonatal care (Culbreth & Spratling, 2023; Deorari et al., 2022). Evidence has shown that maintaining optimal nurse-to-patient ratios and adhering to benchmarks such as NHPPD directly correlates with lower infant mortality and improved clinical performance (Amiri et al., 2020; Government of Western Australia Department of Health, n.d.). Beyond staffing adequacy, sustained investment in staff training enhances clinical competence, communication, and cultural responsiveness, reducing errors and strengthening team coordination (Bell et al., 2023; Burris & Parker, 2021). It can also be noted that embedding diversity, equity, and inclusion (DEI)

principles such as engaging families in care planning and addressing social determinants through health equity dashboards, promotes trust, shared decision-making, and culturally sensitive care (Karvonen et al., 2024; Padula et al., 2020). When integrated, these strategies build a skilled, inclusive, and safety-oriented workforce that operationalizes the Donabedian framework's structure-process-outcome pathway, driving sustainable improvements in care quality, patient safety, and health equity in neonatal settings.

### **Integrate Care and Address SDH**

Care integration in NICUs involves coordinated collaboration across systems, providers, and settings to ensure continuity of care for high-risk preterm infants, a process essential for improving post-discharge outcomes. Within the Donabedian framework, care integration functions as a core process element linking structural components such as staffing, resources, and data systems to improved outcomes like reduced readmissions and enhanced family satisfaction (Bell et al., 2023; Hebballi et al., 2023). Poorly coordinated care often leads to fragmentation and inefficiency, while integrated programs such as *Safe Babies Safe Moms* demonstrate how coordinated, multidisciplinary approaches addressing both medical and social needs can improve continuity and reduce healthcare costs (Taylor, 2025; Vance et al., 2023). Establishing integrated care teams and post-discharge support structures such as “medical homes” that assist with insurance, appointment scheduling, and family coaching strengthens care transitions and reduces preventable readmissions (Burris & Parker, 2021; Padula et al., 2020). For vulnerable families facing socioeconomic barriers, these programs ensure equitable access and ongoing support beyond the NICU, reflecting how effective process

coordination enhances structural efficiency and produces positive outcomes. Collectively, evidence underscores that integrated, family-centered, and administrator-supported coordination models operationalize the Donabedian framework by fostering seamless transitions, optimizing continuity of care, and improving long-term neonatal health outcomes (Bell et al., 2023; Hebballi et al., 2023; Vance et al., 2023).

### **Advance Health Policy and Expand Access to Care**

Strengthening health policies that enhance continuity of care, equitable access, and health equity is essential to reducing NICU readmissions among preterm infants. Administrative barriers such as complex enrollment procedures, parental work requirements, and limited outreach restrict access to timely care (Currie & Chorniy, 2021), while inadequate follow-up, fragmented coordination, and insufficient insurance coverage further heighten readmission risks (Hannan et al., 2020). Evidence has shown that infants born to uninsured mothers face more than double the mortality risk compared to those with adequate coverage (Hill et al., 2024), and Medicaid-insured NICU graduates are significantly more likely to be re-hospitalized within six months (Hannan et al., 2020). The expansion of Medicaid and CHIP eligibility, alongside the reduction of administrative hurdles, and improvement of data transparency can enhance access, continuity, and accountability in healthcare (Currie & Chorniy, 2021). Within the Donabedian framework, these policy reforms represent vital structural improvements that strengthen care processes such as coordinated follow-up and equitable access which ultimately lead to advanced neonatal health equity and reduced preventable readmissions.

### **Using Data and Resources to Drive Sustainable Outcomes**

The findings on this theme confirm that systematic data collection, analytics, and benchmarking play a crucial role in guiding evidence-based decisions that reduce NICU readmissions and enhance care quality. Data-driven decision-making allows healthcare organizations to identify population patterns, allocate resources efficiently, and monitor outcomes in real time (Burris & Parker, 2021; Bhati et al., 2023). Healthcare leaders need to effectively exchange data as it aids in strengthening care continuity, minimizing medical errors, and ensuring safe transitions across multidisciplinary teams (Miner, 2025). Benchmarking through internal and external performance comparisons fosters accountability, transparency, and continuous quality improvement, especially when adjusted for risk and sociodemographic factors to ensure equitable evaluations (Padula et al., 2021). Within the Donabedian framework, these practices can enhance both structural elements (robust data systems, information infrastructure) and processes (coordinated, data-informed care). Leveraging analytics supports efficient resource alignment by identifying high-risk groups, prioritizing preventive interventions, and guiding investments toward value-based care models that improve outcomes and financial sustainability (Hannan et al., 2020; Hebballi et al., 2023). Together, these strategies build a responsive, transparent, and equity-driven healthcare system that optimizes neonatal outcomes and reduces preventable readmissions.

### **Conclusions**

The findings of the themes and sub-themes of this IR review provide evidence that reducing NICU readmissions is possible. The improvement of neonatal outcomes

requires an integrated, systems-based approach grounded in strong leadership, workforce development, policy reform, and data-driven decision-making. Transformational and collaborative leadership fosters a culture of transparency, teamwork, and continuous improvement, while inclusive and well-trained healthcare teams ensure equitable, safe, and culturally responsive care (Bell et al., 2023; Culbreth & Spratling, 2023; Fanelli et al., 2020;). Strengthening structural elements such as digital infrastructure, staffing, and health policies enhances the processes of care coordination, parental engagement, and continuity across hospital and community settings (Bhati et al., 2023; Currie & Chorniy, 2021).

The integration of healthcare systems to address SDH can help ensure that vulnerable families receive holistic and sustainable support beyond the NICU (Burriss & Parker, 2021; Hebballi et al., 2023; Vance et al., 2023). Systematic data collection, benchmarking, and analytics further enable organizations to monitor equity gaps, guide preventive interventions, and align resources efficiently to achieve value-based, sustainable outcomes (Padula et al., 2021; Hannan et al., 2020). Jointly, these strategies operationalize the Donabedian framework's structure–process–outcome model, driving continuous improvement, advancing health equity, and fostering resilient, high-performing neonatal care systems capable of meeting the complex needs of infants and families.

#### Part 4: Recommendation for Professional Practice and Implications for Social Change

##### **Recommendations for Professional Practice**

Based on the analysis of the reviewed literature, this integrative review offers evidence-informed recommendations that healthcare leaders can implement within their HSOs to reduce NICU readmissions and foster positive social change. These recommendations aim at answering the review question “What strategies can NICU leaders implement to reduce readmission rates and optimize healthcare administrative spend in hospitals serving indigent preterm infants in the Commonwealth of Virginia?” The recommendations particularly emphasize improvements structural and process aspects of care delivery to drive sustainable outcomes. The guidance draws from the findings summarized in the literature review matrix (Appendix A, Section 5: Problem-Based Literature Review Matrix) and is based on the Donabedian framework. Recommendations for HSO leaders to consider are discussed in the following paragraphs.

##### **Donabedian Theoretical Framework Cycle**

Healthcare leaders play a pivotal role in fostering a culture that strengthens the interconnected cycle of structure, process, and outcome to ensure continuity of care for NICU infants and their families. A solid structural foundation involves integrating health system operations with community-based resources that support maternal and infant health from the prenatal stage through post-discharge (Bhati et al., 2023). This integration enables early identification of at-risk pregnancies, timely interventions, and coordinated follow-up care that extend beyond hospital walls. Process improvements require

embedding culturally sensitive and inclusive parent and staff education programs which aid in ensuring that families understand care plans and the influence of SDH on neonatal outcomes (Miner, 2025). Data-driven decision-making should underpin this cycle, allowing healthcare leaders to track outcomes, evaluate disparities, and refine interventions based on community needs and real-time performance metrics (Burriss & Parker, 2021). According to Hannan et al. (2020), aligning hospital initiatives with community supports, such as home visitation programs, transportation assistance, and social work outreach, reduces fragmentation and strengthens post-discharge continuity, subsequently lowering readmission risks. Within the Donabedian framework, this leadership-driven culture connects structural investments in data systems and partnerships, processes of inclusive education and care coordination, and outcomes of improved neonatal health and reduced inequities.

### **Transform Workforce and Integrate Care for Sustainable structural Improvements**

To achieve sustainable improvements in neonatal outcomes, healthcare leaders should adopt collaborative and transformational leadership approaches that foster a culture of safety, teamwork, and continuous learning. Such leadership promotes transparency, shared decision-making, and multidisciplinary collaboration, all of which are essential for reducing NICU readmissions and improving care quality (Bell et al., 2023; Fanelli et al., 2020). Guided by the Donabedian framework, leaders should strengthen structural components such as technological infrastructure, data systems, and workforce readiness to support efficient processes like care coordination and data-driven decision-making (Bhati et al., 2023; Hannan et al., 2020). Investments in advanced

technologies, including DSS, EHRs, and real-time dashboards, is a structural component that can enhance evidence-based governance and continuous quality improvement, and this will improve the structure of the organization (Hilker et al., 2024; Parmigiani & Bevilacqua, 2022). These alongside the creation of a skilled, inclusive, and safety-oriented workforce through DEI initiatives and ongoing professional development, can promote culturally competent, well-trained, and responsive staff to the SDH factors (Burriss & Parker, 2021; Karvonen et al., 2024). Collectively, these efforts align leadership practices, infrastructure, and human resources within the structure–process–outcome continuum of the Donabedian model, building resilient and high-performing neonatal care systems.

### **Use Data to Promote Policy Reforms and Align Resources**

Healthcare organizations should advance integrated care and health policy reforms that promote equitable access and continuity across the care continuum as a process change. HSOs can establish multidisciplinary care teams and structured post-discharge programs, including home visits and SDH screening as these strengthen transitions from the NICU to the community and reduces fragmentation of care (Bell et al., 2023; Vance et al., 2023). They can expand insurance uptake through Medicaid and CHIP eligibility programs, coupled with community partnerships and real-time tracking in EHRs, enhances care access, reduces administrative barriers, and mitigates financial strain on families (Currie & Chorniy, 2021; Hill et al., 2024). Leaders should leverage data analytics to audit, allocate, and align resources efficiently, using predictive modeling to forecast needs, prevent resource waste, and improve operational efficiency (Bhati et

al., 2023). By harmonizing structural investments in technology and policy, process innovations in care integration, and measurable outcomes such as reduced readmissions and improved equity, healthcare systems can operationalize the Donabedian framework to deliver sustainable, high-quality, and value-based neonatal care.

### **Implications for Social Change**

A reduction in the readmission rates of preterm infants in NICUs carries substantial social implications for families, healthcare systems, and communities. Viewed through the lens of the SDH, elevated readmission rates place considerable strain on healthcare expenditures, create financial burdens for affected families, and exacerbate inequities in resource distribution and access to care. The consequences of frequent readmissions extend beyond the clinical setting, contributing to prolonged hospital stays, delayed infant development, and diminished emotional and social well-being for parents and families. Findings from this review on strategies to reduce readmissions underscore far-reaching implications for fostering positive social change, particularly in advancing equity, strengthening family resilience, and promoting more sustainable healthcare delivery.

On promoting health equity, targeted interventions such as staff education, discharge planning, and consistent follow-up care promote equitable access to quality healthcare and help reduce disparities among vulnerable neonatal populations (Burriss & Parker, 2021; Hannan et al., 2020). The engagement of families as active partners through structured education and support enhances their confidence and competence in caregiving, improving continuity of care and strengthening family roles post-discharge

(Bell et al., 2023; Karvonen et al., 2024;). On cost savings, the reduction of preventable readmissions leads to significant savings that can be reinvested into community health programs and preventive services, fostering a more efficient and sustainable healthcare system (Hebballi et al., 2023). Training, diversification, and workload optimization within healthcare teams enhance staff competence, cultural responsiveness, and wellbeing, ultimately improving care quality and addressing SDH (Karvonen et al., 2024; Parmigiani & Bevilacqua, 2022). Economically, lowering NICU readmissions reduces hospital and family expenses, easing financial strain and enabling families to allocate resources toward other essential needs which improves economic and social stability (Rolnitsky et al., 2023). Finally, fewer readmissions improve infant development, parental mental health, and family functioning, contributing to stronger communities and long-term positive social outcomes (Karvonen et al., 2024).

### **Limitations**

This review is not without limitations, as it draws evidences from studies employing diverse research methodologies. The review includes experimental, observational, and qualitative studies, each with varying designs, sample sizes, and outcome measures which introduced heterogeneity that influence direct comparisons and limited the ability to synthesize findings into a cohesive conclusion. The complication of merging multiple methodologies may also reduce rigor compared to primary, hands-on research. Some of the studies lacked standardized approaches to measuring key variables, particularly those beyond the control of hospitals, such as unmet social needs after hospital discharge, and this can affect the uniformity of results. Differences in geographic

contexts potentially limit generalizability, as disparities in healthcare policies based on regions, access to services, and organizational structures are more likely to influence neonatal outcomes in multiple ways that may not be captured homogeneously.

Community-level factors such as socioeconomic statuses, cultural practices, and SDH may also affect outcomes and the effectiveness of care strategies, further restraining broader applicability of the results. Despite these limitations, the review provides timely and valuable insights into interventions aimed at reducing readmissions of preterm infants in NICUs.

### **Conclusion**

For this integrative review, I synthesized evidence on strategies to reduce NICU readmissions among preterm infants, highlighting the organizational and social dimensions of the problem. The findings demonstrate that interventions such as strengthening leadership through roles such as leveraging technology and use of proper leadership styles that drive performance can improve patient outcomes. Key interventions in the workforce such as improving the skills, inclusivity, and safety of staff and patients increase the chances of positive performance. Care integration through the establishment of follow-up teams and collaboration through the continuum of care for the NICU infant from conception, to birth, to discharge with supportive programs are critical. Similarly, health policy changes that promote insurance uptake can improve access to care. The use of data to analyze patient outcomes and comparison to benchmarks can further align outcomes and promote efficiency. Lower readmission rates may alleviate financial burdens on families, reduce healthcare expenditures, and promote equity by improving

access to care for vulnerable patient populations. While the review was limited by the heterogeneity of study designs and contextual variations across healthcare systems, the evidence collectively stresses the significance of aligning structural and process improvements with the broader SDH to improve health outcomes. The reduction of NICU readmissions by HSO leaders can strengthen infant health outcomes, support family well-being, and contribute to sustainable improvements in community health and social equity.

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## Appendix A: Problem-Based Literature Review Matrix

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
Agency for Healthcare Quality and Research (2020).	N/A	How do neonatal intensive care unit (NICU) readmission rates vary based on gestational age and other risk factors?	Quantitative Report	Strategies such as implementing measures that aid to identify high risk patients and vulnerable infants, linking administrative data with other crucial statistics for easy decision- making, and standardizing readmissions data through Electronic Health Recording	The report concludes that by effectively understandi ng, monitoring, and addressing the factors that drive readmission rates, healthcare leaders can ultimately excel in allocating resources	Future research should focus on investigating the effectiveness of post- discharge planning to identify practices that can aid reduce readmission of infants in NICUs.	For practice, healthcare leaders can leverage strategies such as efficient resource allocation to help promote the standardizati on in measuring readmission data, identification of high-risk patients, and	No.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
				systems for easy tracking and policy formulation can help cut unnecessary expenses.	needed to cut readmission rates in NICUs.		real-time linking of crucial statistics that guide decision-making.	
Amiri, Vehviläinen-Julkunen, Solankallio-Vahteri, and Tuomi, (2020).	Donabedian framework	What is the impact of nurse staffing levels on infant, neonatal, and perinatal mortality rates in OECD countries?	Quantitative study	The research found significant associations between higher nurse density and reduced mortality rates. Specifically, long-run elasticity indicated that a 1% increase in nurse density per 1,000 population corresponded to decreases of 0.98%, 0.97%,	There are significant associations between higher nurse density and reduced mortality rates. An increase in nurse staffing was linked to decreases in infant, neonatal, and	Future research should delve into the impacts of nurse competencies, resource allocations, and effective policy implementation on reducing mortalities in NICUs and other impacts.	Healthcare professionals need to consider the role of nurse staffing levels in their organizations and its role in impacting mortalities.	Yes

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				and 0.96% in infant, neonatal, and perinatal mortality rates, respectively.	perinatal mortality rates, underscorin g the critical role of adequate nursing staff in improving newborn health outcomes			
Bawazeer, M., Alsalamah, R. K., Almazrooa, D. R., Alanazi, S. K., Alsaif, N. S., Alsubayyil, R. S., ...	N/A	What is the rate of neonatal hospital readmission , and how are maternal and neonatal factors associated	Cross- sectional retrospective study	Neonatal readmission rate of 6.1%, with jaundice being the most common cause, followed by gastrointestinal issues and respiratory problems. The	Assessing drivers of readmission s including respiratory conditions, and providing post- discharge support can	Future research should evaluate long- term impact of follow-up services on reduction of readmissions in neonatal care.	There is need for implementati on of follow- up and support to reduce readmission rates of infants with vulnerable	Yes.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
and Mahmoud, A. F. (2021).		with (1) the age at readmission , (2) length of stay during readmission , and (3) readmission outcomes?		study also identified that shorter initial hospital stays, vaginal delivery, and exclusive breastfeeding were associated with higher readmission rates. These results highlight the importance of post- discharge follow-up, parental education, and early identification of at-risk infants to reduce preventable readmissions.	help lower readmission rates.		conditions that predispose them to readmissions .	

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
Bell, Rufrano, Traylor, Ohning, and Salas (2023).	N/A	What are the challenges of fluid teams in NICU and the opportunitie s to address these challenges to improve success?	Qualitative Study	The article identifies challenges such as communication breakdowns, role ambiguity, and variable team cohesion and the opportunities to resolve team challenges include standardized communication protocols, fostering team cohesion, and clarifying roles to improve productivity. These highlights the importance of structured	The authors recommend implementi ng strategies from team science, such as standardize d communicat ion protocols and inter- professional training programs. By adopting these practices, NICU teams can enhance collaboratio	Future research to enhance team effectiveness should focus on how to incorporate patient families, manage hierarchical dynamics, and facilitate effective patient handoffs.	Leadership style significantly influences communicati on, trust, job satisfaction, and overall team performance. Inclusive leadership is highlighted as a means to foster psychologica l safety, encouraging open communicati on and collaboration among team members.	No.

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				teams in promoting care outcome in NICUs and solving morbidity challenges.	n, improve patient outcomes, and better integrate into the fluid team environment.		This is the role that healthcare administrators can play to improve hospital productivity.	
Bhati, D., Deogade, M. S., and Kanyal, D. (2023).	N/A	How do various aspects of hospital administration—such as leadership, governance, data-driven strategies, and interdisciplinary collaboration—affect	Qualitative study	Data-Driven Measurement and Benchmarking: The authors emphasize the significance of utilizing data analytics and key performance indicators (KPIs) to assess hospital performance. This data-driven approach	The authors advocate for a holistic approach to hospital administration that integrates data analytics and technological advancements to	The article calls for comprehensive research into the integration of advanced technologies, effective leadership models, data analytics, and benchmarking practices within	Healthcare administrators need to consider the use of data analytics and key performance indicators (KPIs) to assess hospital performance and impact continuous	No.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
		patient outcomes, including safety, satisfaction, and overall well-being?		facilitates continuous improvement in patient care quality.	improve patient outcomes.	hospital administratio n to foster improved patient outcomes.	quality improvement in healthcare.	
Burris and Parker (2021)	Weatheri ng hypothesi s	What strategies can neonatal care providers use to reduce racial and ethnic disparities and increase access to quality care for preterm infants?	Systematic Review	The study revealed significant disparities in preterm birth outcomes among different racial and ethnic groups. Non- Hispanic Black and Hispanic preterm infants had a lower likelihood of dying before hospital discharge	The authors emphasize the urgent need for neonatal providers to recognize and address these inequities by implementi ng cultural sensitivity in healthcare and	Future research should focus on more targeted approaches to address implicit bias and communicatio n to achieve equity in healthcare.	Healthcare administrators are instrumental in implementin g policies and practices that promote equitable healthcare. By fostering an environment that prioritizes health	No.

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				<p>compared to non-Hispanic White preterm infants. After discharge, these same groups exhibited a higher risk of mortality within the first year of life. Non-Hispanic Black and Hispanic preterm infants were more likely to be readmitted to the hospital after discharge.</p>	<p>advocating for systemic changes to improve health outcomes for all infants.</p>		<p>equity, administrators can contribute to reducing infant mortality rates across diverse patients particularly facilitating cultural sensitivity training programs, ensuring Diversity, Equity, and Inclusion guidelines are adhered to and more.</p>	

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
Culbreth, R., and Spratling, R. (2023).	Reason's Swiss Cheese Model	What are the perceived factors contributing to medical errors in the neonatal intensive care unit (NICU)?	Qualitative study	Fear: A culture of fear within the NICU can deter staff from reporting errors or near misses, hindering opportunities for learning and improvement.	The article concludes by highlighting the importance of addressing multiple levels of influence to reduce medical errors in the NICU. Implementi ng strategies that foster a supportive culture, improve communicat ion, and	Future research should focus on developing and improving reporting systems and other systemic factors that reduce medical errors.	Healthcare administrator s should emphasize the creation of a culture that supports free reporting of errors to promote quality improvement strategies and interventions , reducing morbidityes.	Yes

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
					support staff well- being are essential steps toward enhancing patient safety in neonatal care.			
Currie and Chorniy (2021).	N/A	What are the benefits and impacts of Medicaid and the Children's Health Insurance Program (CHIP) on child health and poverty reduction in	Systematic review	Expansions in Medicaid and CHIP eligibility enhances children's access to healthcare, leading to reductions in preventable hospitalizations, chronic conditions, and mortality rates	The authors emphasize the importance of defending, restoring, and improving access to public health insurance	Future research should emphasize on analyzing the administrative burdens and barriers that may prevent eligible families from enrolling in or maintaining	Healthcare administrator s have a role to play in advocating for Medicaid and CHIP program stability, strategic resource allocation, and	No.

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		the United States?		among vulnerable children.	for children, especially in light of the economic challenges.	coverage through Medicaid and CHIP.	monitoring of policy developmen ts to ensure infant families enroll and access quality care to reduce mortality and readmission cases.	
Deorari, Kumar, Chawla, Thukral, Goel, Bajaj...and Gilbert et al (2022)	Point-of- Care Quality Improve ment (POCQI) methodol ogy framewor k	Can combining training in point-of- care quality improvement (POCQI) methods with a preterm newborn	Quantitative Study	The study found that combining a training package to improve the knowledge and skills of HCWs in managing sick and preterm neonates with point-of-care quality	The study concluded that combining professional training with continuous quality improvement methods,	For future research, there is need to dive deeper into examining the long-term sustainability of improved quality improvement	By actively promoting programs such as staff training and development , supportive supervision, policy implementation in the use	Yes.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
		health care package (PHCP), followed by remote mentoring and supportive supervision, improve health care practices and reduce neonatal mortality and morbidities in special neonatal care units?		improvement skills successfully reduced the unindicated use of oxygen, antibiotics, and phototherapy while increasing the use of enteral feeds. Despite a significant reduction in the use of two lifesaving medical interventions—oxygen and antibiotics—no increase in mortality or short-term adverse outcomes was	along with remote mentoring and supportive supervision, can effectively improve neonatal care. This approach not only enhances healthcare practices but also ensures the rational use of medical interventions, thereby improving overall	interventions in neonatal care.	of evidence-based care, and resource allocation, hospital administrators can impact quality of care delivered and significantly improve the overall hospital productivity.	

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				observed, indicating an overuse of these interventions in the pre- intervention period.	neonatal health outcomes including reducing morbidity and mortality.			
Fanelli, Bellù, Zangrandi, Gagliardi, and Zanini, (2020).	Managerei al assessme nt framewor k	What are the different managerial models in neonatal intensive care units (NICUs) and assess their impact on a range of neonatal outcomes?	Quantitative study	The findings revealed that NICUs operating under the collaborative model achieved better neonatal outcomes compared to the other models. Specifically, the collaborative model was associated with lower mortality rates and	This study concludes that collaborative management is more effective than traditional leadership model in reducing mortality and readmission	Future research should aim at exploring the longitudinal impact assessment of the managerial model to determine its sustainability.	For healthcare administrators, the results of the study underscore the importance of adopting a collaborative managerial approach in NICUs, which fosters teamwork and shared	Yes.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
				improved overall morbidity indicators. In contrast, the traditional model exhibited the poorest outcomes, while the individualistic model's results were intermediate but closely aligned with the traditional model.	rates in NICUs.		decision-making, can lead to enhanced neonatal health outcomes.	
Feister, Kan, Lee, and Sanders, (2024).	Social Determin ants of Health	What associations exist between sociodemog raphic factors,	Quantitative study	Key findings indicate that, beyond medical risk factors, certain sociodemographic elements	The study concludes that sociodemographic factors are the major	Future research directions should focus on evaluating the impacts of health literacy	Healthcare administrators can help reduce risks of readmissions by	Yes.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
		medical conditions, and the odds of readmission within 30 days post-NICU discharge for VLBW infants?		significantly increase the likelihood of readmission. Infants whose deliveries were covered by non-private insurance had a 25% higher adjusted odds of readmission compared to those with private insurance. Infants born to mothers with less than a high school education faced 19% higher adjusted odds of readmission.	drivers of readmissions and interventions such as the provision of social support and community partnership programs can help improve readmission rates.	on readmissions, policy implications of health insurance on post-discharge readmissions, and more targeted discharge interventions to reduce readmissions.	facilitating the implementation of strategies aimed at instigating post-discharge programs, providing support for discharge planning services, and organizing programs that improve the use of insurance by patients.	

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
Governme nt of Western Australia, Departmen t of Health. (n.d.).	N/A	An application and operational use of NHPPD across the WA health system.	Quantitative review	NHPPD (Nursing Hours per Patient Day) is a workload monitoring system used across WA public health since 2002, implemented under an industrial Exceptional Matters Order to manage safe nurse/midwife staffing based on patient care demand.	Established in early 2002 via an industrial order, NHPPD served as a bottom-up, ward-specifi c staffing model.	Future research should investigate how variations in Nursing Hours Per Patient Day (NHPPD) directly affect patient safety, quality of care, morbidity, and mortality rates across different clinical settings.	Healthcare administrator s can evaluate their NHPPD and compare with national requirement.	Yes.
Hannan, Hwang, and	N/A	What are the strategies to reduce re-	Qualitative Review	Preterm infants have a 3 to 4- fold increased risk of	Readmissio ns are a result of poor	Future research should focus	Healthcare administrator s can facilitate the	No.

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Bourque (2020).		hospitalizati on rates and improve the transition from hospital to home for these vulnerable infants?		readmission following discharge. Factors contributing to higher readmission rates include lack of proper insurance plans, lower gestational age at birth, presence of chronic medical conditions, and socioeconomic factors. The authors emphasize the need for targeted interventions to improve the transition from hospital to home	discharge planning, inadequate education of patient families, and lack of post- discharge support services.	on understanding the individual, hospital, and broader policy factors that may contribute to the disparities in the discharge process.	establishmen t of follow- up programs that enable the provision of continuous medical and development al care, family support programs and other comprehensi ve protocols that can prevent occurrence of readmissions .	

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
				and reduce the likelihood of readmission. By addressing these factors, healthcare providers and administrators can work towards reducing the frequency of hospital readmissions among NICU graduates, ultimately improving long-term health outcomes for these vulnerable infants.				
Hebballi, Avritscher,	N/A	What are the overall	Quantitative study	The findings revealed that	The authors concluded	Future research	Healthcare administrator	Yes.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
Garcia, Bain, Bartz- Kurycki, Tsao, and Austin, (2023).		and mean costs associated with unplanned hospital visits, including readmissions and emergency department (ED) visits, for infants within 90 days post-discharge from the neonatal intensive care unit (NICU)?		16% of the 414 discharged infants had unplanned hospital visits within 90 days. The total estimated cost of these visits was \$785,804, with a mean cost of \$1,898 per patient. Hospital readmissions accounted for 98% of the total costs, while ED visits comprised 2%. The mean cost per readmission was \$25,624, and the mean cost per	that unplanned hospital visits, particularly readmissions, within 90 days post-NICU discharge, impose a significant financial burden on the healthcare system. They suggest that targeted interventions aimed at reducing hospital	should focus on identifying specific risk factors for readmission and developing strategies to mitigate these risks, thereby improving outcomes and reducing costs associated with unplanned hospital visits among NICU graduates.	s can intervene by facilitating the implementation of programs aimed at providing educational initiatives to patient families through resource allocation, supporting programs aimed at post-discharge preparation, and ensuring adherence to	

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				stand-alone ED visit was \$475.	readmission s after NICU discharge could substantiall y decrease healthcare costs for this patient population like the implementat ion of Home Transition programs, initiatives aimed at promoting parental education, and programs		post- discharge protocols.	

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
						aimed at providing support for families can help cut unnecessary costs.		
Hilker, Mancho, Srivatsava, Raman, Mathias, S., Brewster and Britto, (2024).	Hub-and-Spokes framework	What are the operational characteristics and performance outcomes of implementing a 'Smart-NICU' model in low-resource settings?	Quantitative study	The use of technology along with hub-and-spoke model to enhance smart NICU care can facilitate remote patient care eliminating access barriers such as geographical issues, staffing problems, and information access. These improvements	Smart NICU technology is a low-cost model that promises to save lives, enhance neonatal care in resource-constrained hospitals. Along with strong staff training and	Future research should focus on the longitudinal study to determine the long-term health outcomes of infants care for under the new smart NICU care model.	Healthcare administrators seeking to overcome barriers such as geographical, staffing, and communication issues impacting the quality of neonatal care can utilize the smart NICU care	Yes.

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				tend to impact patient outcomes including mortality and readmissions.	use of high standards of care, smart NICU technology can reduce infant mortality and related costs.		model using the hub-and-spoke care technique to curb rising mortalities among indigent preterm infants in NICUs.	
Hill, Rao, Artiga, and Ranji (2024).	N/A	The report is based on the hypothesis that the persistent disparities in maternal and infant mortalities points to the need for efforts to	Descriptive Research Method	The results of the analysis indicate that infants born to indigent women with no insurance policies are twice more likely to die compared to those with good insurance cover	The report concludes that to address the disparities in infant and maternal health mortalities, efforts such as expanding	Future research should be targeted at exploring the strategies to social and economic factors that contribute to poor health outcomes and disparities in	By exerting significant influence on aspects such as expanding Medicaid coverage through policy advocacy and diversifying healthcare	No.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
		address racial discrimination within the healthcare system as part of increasing health equity.		(10.4 vs. 4.4 per 1000 respectively). The factors that drive these disparities include differences in health insurance coverage and unequal access to care fueled mainly by socio-economic factors. Other modifiable factors in the health care system such as provider availability, lack of access to linguistically and cultural	health insurance coverage, increasing access to services and providers that support infant and maternal health, diversifying healthcare workforce, and improved data collection and reporting for increased transparency.	infant and maternal health.	workforce, healthcare administrators can contribute to reducing disparities in infant health outcomes.	

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				appropriate and respectful care, low levels of literacy, and overall quality of care can help reduce the disparities in access to quality care, reducing mortalities.				
Karvonen, Smith, Chambers-Butcher, Afulani, Mathis-Perry, Rangwalla, and Rogers et al. (2024).	Critical Race Theory	What strategies can promote racial equity in NICUs?	Qualitative Study (focus groups)	The results of the study led to development of themes which can promote equitable NICU care for indigent patient groups. These include improving the decision-making power of staff and parents,	The mechanisms to address racial inequities in NICU care should center on involving the opinions of all parties involved include staff	Future work should aim at building on the evidence base to provide implementation and evaluation efforts on how these interventions can reduce	Strategies such as advocating for peer support (formalized peer mentor roles and monitoring), ensuring efficient resource allocation	Yes.

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				inclusivity in decision-making, respect for humanity, diversification of staff and reduction of workload, social support, and proper resource allocation.	and parents of patients involved. Strategies like inclusive workforce, peer support, social support, and effective resource allocation can help increase the quality of NICU care for indigent patients, reducing mortalities.	the rising mortalities.	and transforming space and staff to create an environment that promotes humanism in care can help healthcare administrators to impact positive change in enhancing health outcomes of all patients.	

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
Lai, and Lorch, (2023).	N/A	What are the healthcare costs attributed to major morbidity associated with prematurity, namely, bronchopul monary dysplasia (BPD), intra- ventricular hemorrhage, necrotizing enterocolitis (NEC), retinopathy of prematurity	Quantitative Study	The study found that lower gestational age, increased severity of morbidity, and a higher number of comorbidities were associated with higher healthcare costs. These findings underscore the significant financial burden of severe prematurity- related complications, particularly surgical NEC, severe BPD, and severe ROP.	Efforts must also be invested into ensuring efficient use of resources and improved care delivery that could alter patient outcomes and shorten lengths of stay, which ultimately would change the cost structure and resource use	The study underscore the need for further studies exploring the need for cost- effective preventive strategies for major morbidity that increase hospital spend and the need for resource allocation and policy development.	Healthcare administrators have the responsibilit y to direct resources towards preventive measures and early interventions to mitigate severity and occurrence of morbidity, inform spending for proper financial planning, and develop policies that potentially	Yes

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		(ROP), and nosocomial infections?			systematical ly to reduce unnecessary spend on readmission s and morbidityes.		reduces the costs of morbidityes.	
Lorch, Rogowski, Profit, and Phibbs, (2021).	Donabedi an Framewo rk and Anderson Aday Behavior al Model.	What is the importance of delivery hospitals on neonatal outcomes and the variations in quality in these facilities among high-risk infants and their mothers? What	Systematic Review	Factors such as patient level (predisposing, enabling, and need factors), state and local policies (insurance, and perinatal policies), and community and hospital factors (location, competition, and composition) cause disparities in healthcare	The modificatio n of the structures and processes of care (as detailed by the Donabedian Framework and Anderson Aday Behavioral model) can help	For future research, the article postulates that deeper research is required to vividly clarify the explicit solutions to the drivers of variations in care quality especially for high-risk care centers. Further	Healthcare administrator s can implement systemic changes specifically aimed at infrastructur e development and resource allocation by expanding services in areas with limited	No.

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		strategies are needed for policymakers to help improve quality and optimize care for high-risk patients?		quality. Measuring the quality of care at individual hospitals is crucial in enhancing quality maternal and infant care.	improve quality and outcome of NICUs serving socially disadvantaged and high-risk populations. These include community and hospital, and patient factors such as insurance, maternal health education, and structural	research on the impact of aspects such as government policies and geographical aspects.	access to NICU care and advocating for expansion of insurance coverage to enroll more patients. Programs such as partnering with regional healthcare administrators, and recruiting specialized NICU staff can help improve hospital productivity.	

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						factors such as nurse ratio and staffing and practice environmen t.		
Miner, B. (2025).	N/A	N/A	Guest Commentary source	The article highlights the financial burdens caused by health disparities (e.g., Deloitte's estimate of ~\$320 billion in avoidable costs) and argues that implementing accessible technologies and data-driven	Prioritizing health equity can reduce unnecessary spending while improving outcomes. Achieving a measurable return on investment requires strategic use	Future research should delve more on quantitative evaluation of health equity interventions.	Healthcare administrators can consider the role of accessible technology and interoperable data in enhancing health equity.	No.

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				business strategies can transform equity efforts into economic opportunities	of accessible technologie s to improve outcomes and lower costs, along with robust data collection and tracking to monitor progress.			
Nakai, K., Saito, I., and Osawa, K. (2020).	N/A	How much nursing care time is spent with healthy term newborns from birth to discharge in a mixed hospital ward with	Quantitative study	Over the course of their hospitalization, newborns receive an average of 533.8 minutes of nursing care, accounting for 6.5% of their	The article concludes by emphasizin g the importance of individualiz ed care and appropriate staffing to	Future research should focus on investigating how different nurse-to- patient ratios affect the quality of care for	For healthcare administrator s, nursing staff should be allocated based on the number of newborns in the ward, particularly	Yes.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
		an obstetrics department?		total hospital stay.	ensure the safety and well-being of newborns in a mixed hospital ward setting.	newborns could lead to optimal staffing models. This is particularly relevant in mixed wards where resources are shared among various patient groups	during the critical first 24 hours after birth, to ensure adequate care and prevent life- threatening events	
National Center for Health Statistics. (2025).	N/A.	N/A.	Non- experimental data from population- based analysis.	8.4% of infants are admitted in NICUs in Commonwealth Virginia for preterm birth problems, breathing issues, feeding, and infections.	There is need to improve access to prenatal care to reduce risk of preterm births.	Future research should focus on interventions to reduce chances of preterm births and related NICU admissions.	Healthcare leaders can implement the provision of early access to prenatal care to reduce NICU admissions.	No.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
National Healthcare Safety Network (2023).	N/A	Purpose is to provide a standardized measure (Nursing Hours per Patient Day) that facilities can use to assess nursing staffing in critical care units as a proxy for potential impacts on patient safety and care quality.	Quantitative	The total NHPPD is calculated by dividing the total number of productive hours worked by nursing staff by the total number of patient days.	The required NHPPD for nursing in hospitals depend on the level of emergency and available number of patients to be cared for.	Future research should focus on exploring staffing metrics against safety outcomes in patient care.	Healthcare administrators need to evaluate their internal requirement and benchmark against national NHPPD requirement.	Yes.
Padula, Shariff- Marco,	Social Determin	How can NICUs address the	Quantitative research	The modifiable factors that impact the	The article concludes by	Future work should examine the	Healthcare administrators can exert	No.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
Yang, Jain, Liu, Conroy, and Profit et al. (2021)	ants of Health	inequities in neonatal care quality?		quality NICU care for indigent families like the development of workforce that matches the needs of the community and investment in efforts targeting reduced readmissions of patients can help improve the quality of care and reduce mortalities.	introducing a novel dataset of social and built environmen t factors (support and feedback, diversity in workforce, and remote viewing) that can be modified to help eliminate barriers facing patients in indigent families to facilitate	independent and joint roles of multilevel maternal, infant, hospital, and neighborhood factors that drive inequities in NICU care.	influence on aspects such as facilitating social support programs, and ensure that the workforce is as diverse as possible to improve cultural sensitivity. Establishing outreach programs tailored to improve the quality of services provided to underserved	

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
					better quality and lower mortalities.		communities can help improve morbidity.	
Parmigiani, and Bevilacqua , (2022)	N/A	Can we reduce worldwide neonatal mortality?	Qualitative study	The article synthesizes existing knowledge to advocate for targeted actions to reduce neonatal mortality globally which include universal access to quality prenatal and postnatal care, Skilled healthcare professionals attending births and equipping NICUs with	The authors conclude that while reducing global neonatal mortality is challenging, it is achievable through concerted efforts tailored to the specific needs and contexts of individual healthcare providers.	Future research needs to focus on the role of healthcare infrastructure, including the availability of trained personnel and medical facilities, in affecting neonatal mortalities, and assess the effectiveness of policies aimed at	The article highlights the role of healthcare administrator s in implem t g policies targeting the reduction of neonatal mortalities in healthcare systems like investing in healthcare infrastructur e, training of personnel, and	No.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
				advanced neonatal intensive care unit facilities can help reduce possible readmissions and mortalities.		strengthening these systems.	facilitating health education.	
Rolnitsky Unger, Urbach, and Bell (2023).	N/A	What are the in-hospital costs associated with common morbidities related to preterm infants during NICU stays?	Quantitative study	The findings indicate that cost of preterm care for preterm infant is expensive and increases significantly with prematurity complications and morbidities and interventions to reduce such complications can promote	The study concludes that the cost of care for preterm infants is substantial and increases significantly with the occurrence of complications.	The study enlightens on the need for preventive strategies and their cost effectiveness and how variations in care practices impact outcome and cost.	The findings underscore the significant financial burden that complications of prematurity impose on healthcare systems. This highlights the role that healthcare	Yes.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
				resource allocation and better understanding of the needs of neonatal health services.			administrator s can play especially when facilitating preventive strategies, developing policies around resource allocation, and family support to reduce associated financial burdens.	
Rubinos, L. H., Foster, C. C., Machut, K. Z., Snyder, A.,	N/A	What are the risk factors associated with hospital	Retrospective Cohort Study	The findings show that data from 57,035 infants discharged after more than 14	The study observed significant variations in adjusted readmission	These findings highlight the importance of targeted interventions	The study reinforces the importance of proactive, coordinated	Yes.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
Simpser, E., Hall, M., ... and Berry (2022).		readmission among infants who experienced prolonged stays in the neonatal intensive care unit (NICU)?		days in the NICU between 2013 and 2016, showed a 10.7% readmission rate within 30 days post-discharge. Respiratory issues were the most common cause, accounting for 31% of readmissions.	rates across different hospitals ( $p$ $< 0.001$ ), suggesting that institutional practices and resources may influence outcomes.	for infants with complex medical needs and those from socioeconomi cally disadvantaged backgrounds to reduce readmission rates.	care strategies to reduce readmissions and improve financial outcomes in neonatal care	
Taylor M. (2025).	N/A	How can comprehens ive, integrated care programs effectively reduce maternal and infant	N/A	MedStar Health's Safe Babies Safe Moms (SBSM) program significantly improved maternal and neonatal outcomes,	The program's success underscores the importance of comprehens ive, community-	Given the program's success in reducing maternal and infant deaths, future research should focus on the	Healthcare administrator s play a crucial role in implementin g comprehensi ve, data- driven, and	No.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
		health disparities, particularly among Black populations ?		particularly among Black mothers in Washington, D.C. The program, launched in 2020 with a \$27 million grant and \$3 million investment, offers over 70 interventions addressing both medical and social needs of birthing individuals and their infants up to age 3.	centered care in overcoming systemic healthcare challenges.	program's long-term impact and sustainability.	community- focused programs to improve maternal and infant health outcomes and reduce disparities.	
Vance, Benjami, Hsu, and	Relationa l Coordina	What is the effectivenes s of care coordination	Systematic Review	The article evaluated care coordination programs for	The study concludes that care coordinatio	The study highlights the need for further	Healthcare administrator s have a key role in	No.

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
Berry, (2023).	tion model	programs for infants with complex conditions?		infants with complex medical conditions, focusing on their impact on healthcare costs and quality of care. The findings indicate that such programs can lead to cost reductions for health systems, families, and insurers, while also improving the quality of care provided.	n programs show promise in improving health outcomes and reducing healthcare utilization. Specifically , the authors highlight the importance of developing tailored intervention s that address the unique needs of this	exploration to increase the uptake and sustainability of these beneficial programs.	overseeing and ensuring care coordination programs follow required protocols, follow-up guidelines are adhered to, and communicati on channels are efficient and compliant with the guidelines like those set by the National Provider for Communicat	

Author/ Date	Theoretic al/ Conceptu al Framewo rk	Research Question(s)/ Hypotheses	Methodology	Analysis and Results	Conclusions	Implications for Future research	Implications For practice	Empiri cal Researc h (Yes or No)
					vulnerable population, emphasizin g the role of multidiscipl inary teams in delivering comprehens ive care.		ion Standards for optimum efficiency.	

## Appendix B: DHA Review Question(s) Search Log

Database or location name	Search terms	Results	Notes
Google Scholar (2020 to present)	Optimize neonatal care spend and cut morbidities NICU leaders and quality care Neonatal morbidity and Morbidity reduction Quality NICU care and lower Cost. Lower NICU readmission and morbidity	10	Several results. I had to narrow down the search phrases including publication dates from 2020 and later (last 5 years). I also filtered the results to remain with only sources that answer the review question by changing the Boolean operators including 'AND', 'OR' and 'NOT'
Pub Med (2020 to present)	Neonatal morbidity rates and readmissions Improve access and Quality NICU care and Cost Indigent preterm infants and neonatal care quality	12	Multiple search results emerged with new search terms like hospitalization, readmission, and hospital stays. I had to select sources targeting the reduction of readmission and morbidities.
Science Direct (2020 to present)	Preterm infants and quality improvement initiatives Morbidities and readmission reduction Improve quality and reduce hospital spend	7	More specific search results with more related terms such as workforce, cultural competence, and very low-birth weight infants giving my research new focus. Also had to filter using Boolean operators to remain with fewer

Database or location name	Search terms	Results	Notes
			sources that answer the review question.
Nature Portfolio	Quality NICU care and reduced cost Indigent preterm infants Readmission and morbidity rates	4	Most results yielded current trends in NICU care giving expanding my focus on aspects to consider in my research.
Federal Government Agency Databases such as Agency for Healthcare Research and U.S. Department of Health and Human Services (2020 to present)	Quality NICU care and readmission Infant morbidities and readmissions	9	Results on practice recommendations to reduce neonatal care readmissions and improve the quality of NICU care
National Institute of Health (NIS)	Lowering infant readmission and morbidity Cut hospital spend and improve outcome Readmission or Morbidity improvement in NICU care	8	Search yielded several results but had to filter to include sources containing specific interventions to reduce readmission of indigent preterm infants and cut cost.
News Publication websites (from 2020 onwards) like Becker's Hospital Review,	Quality Improvement in NICU Interventions to improve readmission and costs Indigent preterm infants	3	Results yielded appear to focus on workforce diversity and literacy levels further giving my study added insights.
Proceedings of the National Academy of Sciences (PNAS) articles dated 2020 to date.	Reduce infant morbidities and cost Reduce readmission rates and improve quality	3	New terms emerged like 'Concordance in care' which I found crucial to include in my review

Database or location name	Search terms	Results	Notes
American Academy of Pediatrics (AAP)—articles from 2020 to date.	Preterm infants NICU care morbidities Lower readmissions and cut costs	8	Numerous search results with more focused keywords. I had to alter the Boolean operators like ‘AND’, NOT’ and ‘OR’ to reduce the number of sources and remain with few resources to review.
JAMA Network	Indigent preterm infants and NICU care morbidities Cut hospital spend and reduce preterm infant readmission Improve NICU quality and cut morbidities Readmissions and morbidity reduction in NICU care	11	Mostly focused on new trends in neonatal care, safety (risk reduction), and quality of care improvement. I had to filter sources to remain with only those published in the last 5 years.
Frontiers	Hospital costs and morbidity Readmission rates and cost Cost of neonatal morbidities	7	More focused results though some texts were inaccessible and had to place in research and non-research excluded folder.

Appendix C: DHA Appraisal Results Log

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Agency for Healthcare Research and Quality. (2020). Neonatal Intensive Care All-Condition Readmissions with Gestational Age Reported.	Level 4 High Quality	Hospitals Quality Improvement High Readmission rates	Strategies such as implementing measures that aid to identify high risk patients and vulnerable infants, linking administrative data with other crucial statistics for easy decision-making, and standardizing readmissions data for easy tracking and policy formulation can help cut unnecessary expenses.	Readmission rates	Relies on administrative data and leaves out clinical but still usable for drawing conclusions.

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Amiri, Vehviläinen Julkunen, Solankallio-Vahteri, and Tuomi, (2020). Impact of nurse staffing on reducing infant, neonatal and perinatal mortality rates: evidence from panel data analysis in 35 OECD countries	Level 3 High Quality	Hospitals  Quality Improvement  High morbidity rates	An increase in nurse staffing tend to decrease infant, neonatal, and perinatal morbidity rates, underscoring the critical role of adequate nursing staff in improving morbidity rates.	Morbidity rates	Potential for Ecological Fallacy especially in drawing recommendations but still carries useful data.
Bawazeer, M., Alsalamah, R. K., Almazrooa, D. R., Alanazi, S. K., Alsaif, N. S., Alsubayyil, R. S., ... and Mahmoud, A. F. (2021). Neonatal	Level 3 Good Quality	Hospitals  Quality Improvement  High readmission rates	The findings revealed a neonatal readmission rate of 6.1%, with jaundice being the most common cause, followed by gastrointestinal issues and	Readmission rates	While it is a single-center study, it clearly investigates neonatal readmissions and associated cause contributing to useful data in reducing possible impacts and

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
hospital readmissions: Rate and associated causes			respiratory problems. The study also identified that shorter initial hospital stays, vaginal delivery, and exclusive breastfeeding were associated with higher readmission rates. These results highlight the importance of post-discharge follow-up, parental education, and early identification of at-risk infants to reduce preventable readmissions.		informing future healthcare delivery.

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Bell, Rufrano, Traylor, Ohning, and Salas (2023). Enhancing team success in the neonatal intensive care unit: challenges and opportunities for fluid teams	Level 5 Good Quality	Hospitals  Quality Improvement  Poor teamwork	Strategies from team science, such as standardized communication protocols, inter-professional training programs, and family-centered care approaches can help enhance collaboration, improve patient outcomes and reduce morbidities and readmissions	N/A	The source lacks empirical data and may suffer potential bias in selecting literature. However, it still carries context-specific findings on neonatal intensive care which are applicable in this study.

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
<p>Bhati, D., Deogade, M. S., and Kanyal, D. (2023). Improving Patient Outcomes Through Effective Hospital Administration: A Comprehensive Review.</p>	<p>Level 3 Good quality</p>	<p>Hospitals  Quality Improvement Patient safety and satisfaction</p>	<p>“Data analytics and decision support systems empower hospital administrators to make informed, data-driven decisions... Administrators should invest in robust data analytics infrastructure and foster a culture of data-driven decision-making within the organization.”</p> <p>“Benchmarking against national and regional benchmarks set by healthcare agencies and</p>	<p>N/A</p>	<p>Even though it lacks primary data which is key in drawing, the quality and scope of the included studies are good.</p>

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
			<p>organizations provides a broader perspective on hospital performance... Regular performance reviews and strategy sessions should be conducted to ensure that benchmarking data is used effectively to drive ongoing improvement efforts.”</p>		

<p>Burris, H. H., and Parker, M. G. (2021). Racial and ethnic disparities in preterm birth outcomes: a call to action for neonatal providers.</p>	<p>Level 5 Good Quality</p>	<p>Hospitals Quality Improvement Problem poor healthcare outcomes including morbidities and readmissions</p>	<p>Indigent preterm infants are more likely to die after discharge due to social determinants of health implying their high likelihood of readmission and morbidities which are caused by differences in interpersonal communication, lack of adequate measures to address implicit bias in care, and inadequate standards for screening for social determinants of health and poor referral of patients in NICUs.</p>	<p>Readmission ratios (Number of deaths per 1000)</p>	<p>No actionable insights to address the causes of disparities but is timely and policy relevant.</p>
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<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Culbreth, R., and Spratling, R. (2023). Drivers of medical errors in the neonatal intensive care unit (NICU): A qualitative analysis.	Level 5 High Quality	Hospitals Healthcare Quality Improvement  Medical Errors	By reducing fear within the NICU healthcare administrators can promote a culture of free error reporting or near misses, enhancing the opportunities for learning and quality improvement in neonatal care.	Themes	Possibility of response bias. The study relies on self-reported data which is prone to response bias but still provides in-depth perspectives from practitioners, allowing exploration of systemic, environmental, and human factors contributing to medical errors.

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Currie and Chorniy (2021). Medicaid and Child Health Insurance Program improve child health and reduce poverty but face threats.	Level 5 High Quality	Hospitals Quality Improvement  High infant rehospitalization rates	Expansions in Medicaid and CHIP eligibility enhances access to quality healthcare, leading to reductions in preventable hospitalizations, chronic conditions among vulnerable patients.	Rehospitalization rates	Since it is an observational study, it is more of descriptive rather than experimental. However, it carries data on two major U.S. health programs (CHIP and Medicaid) which are ideal for policy makers.

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Deorari, A. K., Kumar, P., Chawla, D., Thukral, A., Goel, S., Bajaj, R., Singh, M., Gilbert, C., Shukla, R., and Retinopathy of Prematurity- Quality Improvement India Study Group (2022). Improving the Quality of Health Care in Special Neonatal Care Units of India: A Before and After Intervention Study.	Level 3 Good Quality	Hospitals Quality Improvement  Morbidity rates	Professional training along with remote mentoring and other quality improvements through effective use of medical interventions can reduce possible morbidities.	Morbidity Rates.	Data quality and consistency may pose a challenge as they are sourced from different neonatal care units but is useful for quality improvement and cross-cultural applicability.

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
<p>Fanelli, Bellù, Zangrandi, Gagliardi, and Zanini, (2020). Managerial features and outcome in neonatal intensive care units: results from a cluster analysis.</p>	<p>Level 3 High Quality</p>	<p>NICUs of Hospitals Quality Improvement  morbidity</p>	<p>The use of collaborative model of management exhibit reduced rates of morbidity and morbidity indicators compared to other traditional models implying its importance for healthcare leaders seeking to reduce readmission and hospital spend.</p>	<p>Morbidity rates</p>	<p>The choice of a single model despite the existence of other models, it still supports holistic care improvements.</p>

<p>Feister, J., Kan, P., Lee, H. C., and Sanders, L. (2024). Readmission after neonatal intensive care unit discharge: the importance of social drivers of health.</p>	<p>Level 3 High Quality</p>	<p>Hospitals Healthcare quality improvement  High readmission rates</p>	<p>Beyond medical risk factors, certain sociodemographic elements significantly increase the likelihood of readmission. Infants whose deliveries were covered by non-private insurance had 25% higher adjusted odds of readmission compared to those with private insurance. Infants born to mothers with less than a high school education faced 19% higher adjusted odds of readmission.</p>	<p>Readmission rates</p>	<p>It identifies correlation between social and readmission with no causality but since it is a 2024 publication, it carries up-to-date data on NICU readmissions.</p>
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<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Government of Western Australia, Department of Health. (n.d.).	Level 4 Good quality	Hospitals Quality improvement Length of stays and nursing hours	NHPPD (Nursing Hours per Patient Day) is a workload monitoring system used across WA public health since 2002, implemented under an industrial Exceptional Matters Order to manage safe nurse/midwife staffing based on patient care demand.	Hours per patient days	It is a government guideline or informational document, which typically represents expert opinion or consensus rather than primary research or systematic review. However, it carries guidelines for healthcare practice.

<p>Hannan, K. E., Hwang, S. S., and Bourque, S. L. (2020). Readmissions among NICU graduates: who, when and why?</p>	<p>Level 5 High Quality</p>	<p>Hospitals Healthcare Quality Improvement</p> <p>Readmission rates</p>	<p>Preterm infants have a 3 to 4-fold increased risk of readmission following discharge. Factors contributing to higher readmission rates include lack of proper insurance plans, lower gestational age at birth, presence of chronic medical conditions, and socioeconomic factors. The authors emphasize the need for targeted interventions to improve the transition from hospital to home and reduce the likelihood of readmission. By</p>	<p>Readmission rates</p>	<p>Potential publication bias: it is more likely to report only the positive outcomes leaving out the negative and neutral perspectives, but still carries a comprehensive scope by addressing, who, when, and why making it applicable for use.</p>
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<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
			addressing these factors, healthcare providers and administrators can work towards reducing the frequency of hospital readmissions among NICU graduates, ultimately improving long-term health outcomes for these vulnerable infants.		

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
<p>Hebballi, N. B., Avritscher, E. B., Garcia, E., Bain, A., Bartz-Kurycki, M. A., Tsao, K., and Austin, M. T. (2023). Healthcare utilization among infants discharged from the neonatal intensive care unit: a descriptive cost analysis.</p>	<p>Level 3 Good Quality</p>	<p>Hospitals Quality Improvement</p> <p>High cost due to readmissions</p>	<p>Hospital readmissions accounted for 98% of the total costs, while ED visits comprised 2%. The mean cost per readmission was \$25,624, and the mean cost per stand-alone ED visit was \$475. This raises awareness on the importance of implementing effective strategic planning due to the financial impact of readmissions of neonates.</p>	<p>Costs of Readmission</p>	<p>Although the study was conducted in a single study area which in other cases may limit generalization, it carries in-depth data for use in strategic planning.</p>

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Hilker, Mancho, Srivatsava, Raman, Mathias, S., Brewster and Britto, (2024). A proof-of-concept model for implementing a “Smart-NICU” to improve infant mortality.	Level 3 High Quality	Hospitals Quality Improvement  High infant morbidities	The implementation of smart NICU care approach along with staff training, can help eliminate barriers to quality care access such as geographical issues, staff-related and information access problems, reducing infant morbidities through improved care.	Readmission rates	It lacks rigorous controls from randomized clinical trials limiting the ability to be used in drawing definitive conclusions. However, the technological-driven quality improvement of the model makes it ideal for scalability and use in many health settings.
Hill, L.,Rao, A. Artiga, S., and Ranji, U. (2024). Racial Disparities in Maternal and Infant Health:	Level 5 High Quality	Hospitals, Quality Improvement Disparities in access to quality infant and maternal health	Solving the disparities in health insurance coverage, social factors that tend to fuel	Preterm birth risk rates	Does not explain the cause-effect relationship for the disparities but carries policy and practice relevant data to address

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Current Status and Efforts to Address Them.		Infant morbidities	inequality and strategies such as provider education, provision of family support, and diversification of healthcare workforce can aid promote the quality of NICU care among minority patients, reducing readmission rates.		current challenges in NICU care.
Karvonen, Smith, Chambers-Butcher, Afulani, Mathis-Perry, Rangwalla, and Rogers et al. (2024). Parent	Level 3 High Quality	Hospitals Healthcare Equity Improvement  Quality of NICU care	Interventions such as NICU leaders factoring in the opinions of minority groups in policy-making can enhance inclusivity, workforce diversity,	Themes, Sub-themes and trends	Possibilities of selection bias since parents and staff with previous experiences of racism may have volunteered to participate in the study. However, it provides actionable themes from

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
<p>and staff focus groups to address NICU racial inequities: “There’s radical optimism in that we’re in a different time and we’re not doing it alone”</p>			<p>provision of social support, and allocation of resources to improve care for minority patients, reduction of workload among NICU staff and training them to practice humanistic approach in care can help address quality issues in NICUs of hospitals that put patients at risk of readmission.</p>		<p>lived experiences with rich narrative data.</p>

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Lai, K. C., and Lorch, S. A. (2023). Healthcare Costs of Major Morbidities Associated with Prematurity in US Children's Hospitals.	Level 3 High Quality	Hospitals Quality Improvement  Readmission rates	Efforts must be invested into ensuring efficient use of resources and improved care delivery that could alter patient outcomes and shorten lengths of stay, which ultimately would change the cost structure and resource use systematically to reduce unnecessary spend on readmissions and morbidities.	Readmission rates	The source utilizes the Pediatric Health Information System (PHIS) database, which primarily includes large children's hospitals, which even though it may limit the generalizability of the findings to other hospital settings it still provides strong statistical validity and ability to quantify cost burdens across settings.

<p>Lorch, S. A., Rogowski, J., Profit, J., and Phibbs, C. S. (2021). Access to risk-appropriate hospital care and disparities in neonatal outcomes in racial/ethnic groups and rural-urban populations.</p>	<p>Level 5 Good Quality</p>	<p>Healthcare Quality Improvement  Morbidity rates</p>	<p>When developing the strategies that will help improve access to risk-appropriate perinatal care for high-risk populations, policymakers need to develop evidence-based policy solutions that address the drivers of variations in access to quality NICU care. The modification of the structures and processes of care (as detailed by the Donabedian Framework and Anderson Aday Behavioral model) can help improve the quality of NICU care</p>	<p>Morbidity rates</p>	<p>Although the source uses observable design, it has policy and system-level implications ideal for making health policy interventions.</p>
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<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
			for socially disadvantaged and high-risk populations. These include state policy factors, community and hospital, and patient factors such as insurance policy uptake, maternal health education, and structural factors such as nurse ratio and staffing and practice environment. All these can be facilitated by healthcare administrators.		

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Miner, B. (2025). From Expensive Disparities to Economic Opportunities: The Business Case for Health Equity.	Level 5 Evidence	Healthcare Quality improvement Hospitals Data and information sharing	Implementation of data sharing and interoperability through technology	Percentages and costs	Since this is an expert opinion, it relies on secondary data with no empirical evidence to summarize existing literature but carries compelling economic framing on health equity.
Nakai, K., Saito, I., and Osawa, K. (2020). Nursing Care Time for Newborns during Hospitalization in a Mixed Hospital Ward with an Obstetrics Department.	Level 3 Good Quality	Healthcare Quality Improvement Length of stay	Appropriate allocation of nursing time for each patient ensures proper healthcare delivery indicating the role of adequate staffing levels which should always be based on number of patients.	Time of nursing	Limited sample size and single study site. Data sampled from only 17 newborns from a single private hospital but still applicable to resource-limited settings.

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
National Center for Health Statistics. (2025).	Level 4 Good Quality	Hospitals Healthcare Quality Improvement Admission rates	There is need to improve access to prenatal care to reduce NICU admissions.	Percentages	It lacks causal inferences but still provides tangible data to guide policy implementation.
National Healthcare Safety Network. (2023).	Level 4 Good quality	Hospitals Healthcare quality improvement Nursing hours	The NHSN Nurse Staffing Hours Indicator provides a standardized method for monitoring nurse staffing in neonatal intensive care settings, which is crucial for maintaining high-quality care and patient safety	Hours per patient days	It lacks direct outcome data but carries expert opinion ideal for guiding healthcare practice.

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
<p>Padula, A. M., Shariff-Marco, S., Yang, J., Jain, J., Liu, J., Conroy, S. M., ... and Profit, J. (2021). Multilevel social factors and NICU quality of care in California</p>	<p>Level 3 High Quality</p>	<p>Healthcare Quality Improvement  Readmissions</p>	<p>The development of workforce that matches the needs of the community and investment in efforts targeting reduced readmissions of patients can help increase access to quality care for minority patients, reducing readmissions and unnecessary healthcare expenditures.</p>	<p>Baby Monitor scores</p>	<p>Findings are restricted to a single study area—California. However, it carries multidisciplinary collaboration with robust data and well-rounded conclusions.</p>

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Parmigiani, S., and Bevilacqua, G. (2022). Can we reduce worldwide neonatal mortality	Level 5 Good Quality	Hospitals Quality Improvement  High neonatal readmission and mortality rates	Training to enhance the skills of healthcare professionals attending births, advanced neonatal intensive care units (NICUs), and robust health education programs for expectant mothers can help improve quality of care and subsequently reduce readmissions and mortality rates.	Neonatal readmission rates	The source lacks new empirical data, making generalization a problem but is still internationally relevant as it contains data applicable for diverse countries.

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Rolnitsky, A., Unger, S., Urbach, D., and Bell, C. M. (2023). The price of neonatal intensive care outcomes - in-hospital costs of morbidities related to preterm birth.	Level 3 High Quality	Hospitals High cost of morbidities  Quality Improvement	There is need to implement preventive strategies, develop policies around resource allocation, and family support to reduce associated financial burdens.	Morbidities and costs	The study analyzed data from the Ontario healthcare data service, which may limit the generalizability of the findings to other regions or healthcare systems. However, the findings are actionable for most healthcare providers.

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
<p>Rubinos, Foster, Machut, Snyder, Simpser, Hall, ... and Berry, (2022). Risk factors for hospital readmission among infants with prolonged neonatal intensive care stays.</p>	<p>Level 3 High-Quality</p>	<p>Hospitals Healthcare Quality Improvement  Readmission rates</p>	<p>The findings show that data from 57,035 infants discharged after more than 14 days in the NICU between 2013 and 2016, showed a 10.7% readmission rate within 30 days post-discharge. Respiratory issues were the most common cause, accounting for 31% of readmissions informing future initiatives to reduce readmissions.</p>	<p>Readmission rates</p>	<p>Since it is a retrospective observational study, it does not establish causal relationship. However, it utilizes large dataset that allows generalizability.</p>

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Taylor, M. (2025). MedStar's 'game changer' in closing maternal care gaps.	Level 5 Good quality	Hospitals Healthcare Quality Improvement  Infant morbidities	The Safe Babies Safe Moms program analysis shows its effectiveness in maternal and infant deaths among Black birthing individuals in Washington D.C. However, the program requires adequate investment for its implementation.	Morbidity rates.	While the program may appear to lack a comprehensive study design, data collection, and statistical analysis, it is a cutting-edge innovation presenting a novel approach for closing gaps in healthcare delivery.

<b>Author, date, and title</b>	<b>Evidence level and quality rating</b>	<b>Focus: HSO type, research domain, and specific problem being addressed</b>	<b>Findings that help answer the review question(s)</b>	<b>Metrics and measures if used</b>	<b>Source limitations</b>
Vance, Benjami, Hsu, and Berry, (2023). Care coordination programs for infants with complex conditions: a systematic review.	Level 5 High quality	Hospitals Healthcare quality improvement High morbidities High costs of care	Care coordination programs tend to reduce costs of care, cut readmission rates and emergency department visits, and improve patient satisfaction.	Readmission rates	While it lacks data on social determinants and family outcome, it has a good evidence-base with rigorous inclusion and exclusion criteria making the findings relevant for healthcare administrators and policy makers.

## Appendix D: DHA Thematic Analysis Results

<b>Author(s) and date</b>	<b>Findings with Initial Codes</b>	<b>Code List for Theme Development</b>
Agency for Healthcare Research and Quality (2020).	“Implementing measures to identify high-risk patients and vulnerable infants, integrating administrative data with key statistics for informed decision-making, and standardizing readmission data through Electronic Health Record systems for seamless tracking and policy development can help reduce unnecessary expenses.”	Importance of adequate funding for technological adoption and standardization to reduce mortalities and morbidities.
Amiri, Vehviläinen-Julkunen, Solankallio-Vahteri, and Tuomi, (2020).	“Long-run elasticity indicate that a 1% increase in nurse density per 1,000 population corresponds to decreases of 0.98%, 0.97%, and 0.96% in infant, neonatal, and perinatal mortality rates, respectively.”	Role of adequate staffing levels and impact on mortality rates and hospital reputation. Adherence to national nursing hour per patient day is key.
Bawazeer, M., Alsalamah, R. K., Almazrooa, D. R., Alanazi, S. K., Alsaif, N. S., Alsubayyil, R. S., ... and Mahmoud, A. F. (2021).	“Majority of the mothers of the readmitted neonates were multiparous 79.6%. This could be due to the neglect in raising awareness among multiparous mothers as opposed to primiparous, assuming they have prior knowledge and experience.”	Need for closer surveillance and post-discharge support for high-risk patients.

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Bell, E. A., Rufrano, G. A., Traylor, A. M., Ohning, B. L., and Salas, E. (2023).	<p>“Inclusive leadership has the ability to navigate the hierarchical nature of the NICU as well as influence team culture and performance”</p> <p>“Effective leaders in the NICU must navigate hierarchical structures while fostering an inclusive culture that encourages inter-professional cooperation. This approach is crucial for managing stress and preventing burnout, common issues in intensive care settings where the emotional toll can be significant.”</p>	Healthcare administrators’ role of leading and facilitating collaborative culture and training.
Bhati, D., Deogade, M. S., and Kanyal, D. (2023).	<p>“Data analytics and decision support systems empower hospital administrators to make informed, data-driven decisions... Administrators should invest in robust data analytics infrastructure and foster a culture of data-driven decision-making within the organization.”</p> <p>“Benchmarking against national and regional benchmarks set by healthcare agencies and organizations provides a broader perspective on hospital performance... Regular performance reviews and strategy sessions should be</p>	Data-driven decision making through analyzing readmission data—a key theme for healthcare administrators. Healthcare administrators can conduct benchmarking and continuous quality improvement strategies in other competing hospitals to help set care guidelines.

<b>Author(s) and date</b>	<b>Findings with Initial Codes</b>	<b>Code List for Theme Development</b>
	conducted to ensure that benchmarking data is used effectively to drive ongoing improvement efforts.”	
Burris and Parker (2021).	<p>“Standardized screening procedures are not used routinely in NICU settings on high-risk infants, and this drives inequitable care and instances of morbidities.”</p> <p>“Post-discharge support and comprehensive follow-up programs tailored to the needs of high-risk patients can help monitor and support infants, preventing possible readmissions and mortalities”</p> <p>“Greater emphasis should be placed on comprehensive discharge preparation programs to ensure a systematic and individualized approach for each family, including more consistent measurement, standardized discharge approaches, and the incorporation of quality improvement practices.”</p>	Healthcare administrators have the role of establishing proper discharge planning protocols and overseeing adherence to standard screening procedures of infants for social determinants of health factors to improve care delivery process and reduce quality issues.
Culbreth, R., and Spratling, R. (2023).	“Addressing fear and removing punishments for reporting medical errors were among the suggestions at both the organizational and	Healthcare administrators need to consider the establishment of Medical Error Reporting System and create a

<b>Author(s) and date</b>	<b>Findings with Initial Codes</b>	<b>Code List for Theme Development</b>
	individual levels. Anonymous reporting systems of medical errors can be used to reduce that fear”	non-punitive culture to encourage open reporting of errors.
Currie, J., and Chorniy, A. (2021).	<p>“Expansions of Medicaid and CHIP have had a tremendously positive impact on children and their families. Some attempt should be made to incorporate health insurance coverage into supplemental poverty measures so that the value of these expenditures can be better understood.”</p> <p>“Expansions in Medicaid and CHIP eligibility through minimization of administrative barriers can enhance children's access to healthcare, leading to reductions in preventable hospitalizations, chronic conditions, and mortality rates among vulnerable children”</p>	Medicaid expansion and eligibility programs through advocating for policy change i.e. collaborating with policymakers and health coalitions at state level to allow more indigent patients to be enrolled.
Deorari, A. K., Kumar, P., Chawla, D., Thukral, A., Goel, S., Bajaj, R., Singh, M., Gilbert, C., Shukla, R., and Retinopathy of Prematurity-Quality Improvement India Study Group (2022).	<p>“Establishment of the right governance protocols and adherence to evidence-based guidelines through staff training, advocacy for the availability of advanced equipment, and ensuring educational materials for parents can enhance the quality of care.”</p> <p>“A combined approach of professional training with continuous quality improvement practices</p>	Leadership role of driving quality improvement initiatives and monitoring resource utilization to reduce wastages and unnecessary spend.

<b>Author(s) and date</b>	<b>Findings with Initial Codes</b>	<b>Code List for Theme Development</b>
	<p>can help enhance neonatal care and improve patient outcome.”</p> <p>“Monitoring intervention use to prevent resource underuse and overuse help to cut wastages, reduce unnecessary spending and improve neonatal care.”</p>	
<p>Fanelli, S., Bellù, R., Zangrandi, A., Gagliardi, L., and Zanini, R. (2020).</p>	<p>“NICUs operating under the collaborative leadership model tend to achieve better neonatal outcomes compared to those operating under traditional models. The collaborative model is associated with lower mortality rates and improved overall morbidity indicators”</p>	<p>Collaborative leadership in healthcare administration drives engagement of diverse stakeholders, encourages open communication, and supports cross-functional teamwork.</p>
<p>Feister, J., Kan, P., Lee, H. C., and Sanders, L. (2024).</p>	<p>“For policy makers, we advocate for consideration of Medicaid reimbursement for interventions targeting prevention of readmission given that Medicaid coverage has now been consistently identified as a risk factor for readmission after NICU discharge in multiple studies and there are potentially significant cost savings from preventing readmissions”</p>	<p>Financial strategy and cost saving analysis like advocating for the reimbursement of preventive care programs and aligning NICU care with Medicaid reform goals.</p>

<b>Author(s) and date</b>	<b>Findings with Initial Codes</b>	<b>Code List for Theme Development</b>
Government of Western Australia, Department of Health. (n.d.).	“The NHPPD benchmarks are considered the minimum hours required to provide safe care for patients in that setting. Hours can be averaged over rosters to enable greater hours to be provided at times of higher acuity and fewer hours during times of lower acuity or activity”	Benchmark for NHPPD and requirement for adequate staffing in hospitals.
Hannan, K. E., Hwang, S. S., and Bourque, S. L. (2020).	<p>“Evaluation of newborn insurance and its association with readmission and healthcare utilization demonstrates that 33.8% of NICU infants insured by Medicaid experienced re-hospitalization. Compared to infants on Medicaid without a previous NICU hospitalization, those with a previous NICU stay were 70% more likely to experience re-hospitalization within 6 months.”</p> <p>“Factors contributing to higher readmission rates include lack of proper insurance plans, lower gestational age at birth, presence of chronic medical conditions, and socioeconomic factors. The authors emphasize the need for targeted interventions to improve the transition from hospital to home and reduce the likelihood of readmission.</p>	Promotion of insurance uptake among indigent families is crucial for healthcare administrators mainly through Medicaid Expansion programs.

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<p>Hebballi, N. B., Avritscher, E. B., Garcia, E., Bain, A., Bartz-Kurycki, M. A., Tsao, K., and Austin, M. T. (2023).</p>	<p>“Data reveal that 16% of the 414 discharged infants had unplanned hospital visits within 90 days. The total estimated cost of these visits was \$785,804, with a mean cost of \$1,898 per patient. Hospital readmissions accounted for 98% of the total costs, while ED visits comprised 2%. The mean cost per readmission was \$25,624, and the mean cost per stand-alone ED visit was \$475.”</p> <p>“Parents of preterm infants experience difficulty in transitioning from the NICU to home and need support beyond NICU facilities...implementing programs in order to decrease healthcare utilization including healthcare costs in both high-risk infants and children, for instance, implementing an enhanced medical home for high-risk children and significantly decreasing serious illnesses, ED visits, and hospitalizations.”</p>	<p>Healthcare administrators need to ensure proper alignment of resources, people, space, standards, and hospital infrastructure to improve cost utilization and prevent wastages through analyzing resource allocations.</p>
<p>Hilker, S., Mancho, A., Srivatsava, G., Raman, D.,</p>	<p>Investment in Smart NICU care model helps solve various inefficiencies in transportation, in-clinical monitoring, promote continuity of care,</p>	<p>Healthcare administrators should consider technology-driven Decision making for value-based programs like</p>

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Mathias, S., Brewster, R., and Britto, C. (2024).	and access to information on discharge planning and more.”	investment in telehealth for remote monitoring
Hill, Rao, Artiga, and Ranji, (2024).	<p>“Infants born to indigent women with no insurance policies are twice more likely to die compared to those with good insurance cover (10.4 vs. 4.4 per 1000 respectively).”</p> <p>“Healthcare system changes including healthcare provider insurance, access to culturally and linguistically appropriate care and overall quality of care impact mortality rates.”</p>	Advocating for health insurance uptake through embedding enrollment support in the care processes.
Karvonen, K. L., Smith, O., Chambers-Butcher, B., Afulani, P., Mathis-Perry, T., Rangwalla, K., ... and Rogers, E. E. (2024)	<p>“This study highlights the perspectives and input of staff, who emphasize systems level changes to promote humanism towards staff, such as reduced workload for staff. Addressing systemic issues to improve the workplace experience for healthcare workers may reduce fatigue and levels of burnout.”</p> <p>“Improving the decision-making power of staff and parents, inclusivity in decision-making, respect for humanity, diversification of staff and reduction of workload, social support, and</p>	Effective staffing and workload optimization specifically looking at the Nursing hours per patient day which is calculated by dividing the total number of hours worked by all nursing staff by the total number of patient days.

<b>Author(s) and date</b>	<b>Findings with Initial Codes</b>	<b>Code List for Theme Development</b>
	proper resource allocation can help improve patient outcomes and reduce mortalities.”	
Lai, K. C., and Lorch, S. A. (2023).	<p>“Total and daily costs are significantly higher among infants with lower gestational age, severe morbidities, and high comorbidities”</p> <p>“Increases in total costs are not merely associated with length of stay but to other aspects such as increased use of resources and efforts seeking to promote efficient use of resources and improved delivery of care can alter patient outcomes and reduce morbidities”</p>	Risk-based resource allocation role of healthcare administrators with the use of predictive analysis to identify cost estimates and audit high-cost procedures, preventing resource overuse and underuse.
Lorch, S. A., Rogowski, J., Profit, J., and Phibbs, C. S. (2021).	<p>“Public insurance and early receipt of prenatal care have been identified as key factors in determining where women initially opt to deliver. Data from California found that for highrisk deliveries, such as those with maternal chronic medical conditions or preterm labor, insurance coverage through public sources was associated with a greater likelihood of delivery at a hospital with worse outcomes and a lower likelihood of having a NICU.”</p>	<p>Role of proper insurance mix</p> <p>Importance of prenatal care in reducing morbidities</p>

<b>Author(s) and date</b>	<b>Findings with Initial Codes</b>	<b>Code List for Theme Development</b>
Miner, B. (2025).	<p>“Breakdowns in information sharing, especially with smaller facilities, impede care coordination and health equity. Over half of healthcare leaders report that challenges in accessing patient data have negatively impacted health equity.”</p> <p>“Prioritizing health equity can reduce unnecessary healthcare spending while improving health outcomes. Effective strategies include implementing accessible technologies and collecting data to track progress.”</p>	<p>Health equity Data sharing and tracking</p>
Nakai, K., Saito, I., and Osawa, K. (2020).	<p>“The average length of hospital stay for the newborns was 8231.3 minutes. The average nursing care time for the newborns was 533.8 minutes.”</p>	<p>Healthcare administrators have to maintain appropriate staffing and resource optimization specifically ensuring there is sufficient staff in neonatal care departments to meet the average nursing hour per patient day of 533.8 minutes per day (equivalent to 8 hours.)</p>
National Center for Health Statistics. (2025).	<p>Statistics show that 8.4% of all infants are admitted to NICUs in Commonwealth of Virginia.</p>	<p>Need for early access to prenatal care.</p>

<b>Author(s) and date</b>	<b>Findings with Initial Codes</b>	<b>Code List for Theme Development</b>
National Healthcare Safety Network. (2023).	“Nurse staffing as a nurse-sensitive process measure linked to patient outcome”	Patient safety and quality improvement Nurse staffing and benchmarking.
Padula, A. M., Shariff-Marco, S., Yang, J., Jain, J., Liu, J., Conroy, S. M., ... and Profit, J. (2021).	<p>“The development of a workforce that better matches the community with more opportunities to increase access to resources including quality health care can help reduce readmissions.”</p> <p>“Efforts to improve transportation for families to the hospital could be undertaken and remote viewing implemented to support parent bonding.”</p> <p>“Hospitals can work closely with communities to address social factors that impact access to health including adverse neighborhoods, lack of transportation and developing workforce that match the needs of patients.”</p>	<p>Healthcare administrators’ role in improving hospital infrastructure development for instance, integrating social determinants of health into quality improvement with the installation and use of health equity dashboards.</p> <p>Implementation of services such as medical interpretation and provision of transport assistance to reduce geographical barriers experienced by patients when accessing care will improve mortality rates</p>
Parmigiani, S., and Bevilacqua, G. (2022).	“Adequate structures, equipment, and skills are equally necessary. Education for personnel has to be ongoing as does the upgrading of equipment to ensure it is always state of the art.”	Healthcare administrators can prioritize investment in Healthcare Infrastructure along with funding of ongoing skill training programs for staff to improve patient outcome and improve resource utilization.

<b>Author(s) and date</b>	<b>Findings with Initial Codes</b>	<b>Code List for Theme Development</b>
<p>Rolnitsky, A., Unger, S., Urbach, D., and Bell, C. M. (2023).</p>	<p>“Significant increases in costs can be attributed to neonatal morbidities which occur commonly and often occur as compound morbidities”  “Skilled healthcare professionals attending births and equipping NICUs with advanced facilities can help reduce possible readmissions and mortalities.”</p>	<p>Importance of supporting investment in preventive strategies, proper equipment and training of staff to curb common morbidities through planning, pushing for reimbursement reforms, and coordinating care beyond hospital walls can help reduce morbidities</p>
<p>Rubinos, L. H., Foster, C. C., Machut, K. Z., Snyder, A., Simpser, E., Hall, M., ... and Berry, J. G. (2022).</p>	<p>“Patients relying on public insurance and indwelling medical have the highest rates of readmissions across hospitals with readmission rate of 10.7%”</p>	<p>Role of health insurance mix on reducing readmission rates.</p>
<p>Taylor, M. (2025).</p>	<p>“The Safe Babies Safe Moms program devotes equal attention to patients’ medical and social needs. The program, funded by a \$27 million grant and \$3 million investment from the hospital, launched in 2020. It consists of 70 interventions available to patients during pregnancy and until their child turns 3 years old.”</p>	<p>Data-Driven Outcomes: Black patients enrolled in SBSM are less likely to have babies with very low or low birth weights compared to those receiving prenatal care at other facilities showing the impact of administrator-led initiatives on improving neonatal health outcomes.</p>

<b>Author(s) and date</b>	<b>Findings with Initial Codes</b>	<b>Code List for Theme Development</b>
		Integration of services across departments ensures coordination of care which is a collaborative approach that healthcare administrators can consider to improve neonatal outcomes.
Vance, A. J., Benjamin, A., Hsu, J., and Berry, J. G. (2023).	<p>“For the programs serving an infant population, there were significant reductions in mortality and fewer life-threatening illnesses when enrolled in care coordination.”</p> <p>“Most programs reported improvements with satisfaction with care, increased interactions with healthcare teams, reductions in infant mortality, and in health service use.”</p> <p>“Care coordination programs demonstrate cost reductions for health systems, families, and insurers and improvement in quality of care. Efforts to increase the uptake and sustain these beneficial programs need further exploration.”</p>	Healthcare administrators can evaluate data to guide the funding and support of Care coordination programs.
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Appendix E: Thematic Map

