



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Service Improvement Report Of
**QUALITY FAILURE IN
NEONATAL CARE –
COUNTRESS OF CHESTER
HOSPITAL**



Student Name: Omit Hasan
Student Number: 2509984

Lecturer's Name: Oluwadamilola Tayo

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SERVICE IMPROVEMENT REPORT (COMPONENT 2) 2

CASE STUDY: QUALITY FAILURE IN NEONATAL CARE – COUNTESS OF CHESTER HOSPITAL 2

1. INTRODUCTION	2
2. MAIN BODY	3
2.1 UNDERSTANDING QUALITY IN HEALTHCARE	3
2.2 ROOT CAUSE ANALYSIS USING THEORETICAL FRAMEWORKS.....	5
2.2.1 FISHBONE DIAGRAM (CAUSE-AND-EFFECT ANALYSIS).....	5
2.2.2 5 WHYS ANALYSIS.....	6
2.3 APPLICATION OF THE DONABEDIAN MODEL	6
STRUCTURE	6
PROCESS	7
OUTCOMES	7
2.4 STRATEGIC ANALYSIS USING SWOT	7
STRENGTHS	7
WEAKNESSES	7
OPPORTUNITIES.....	7
THREATS.....	8
2.5 CRITICAL EVALUATION OF QUALITY IMPROVEMENT APPROACHES	8
LEAN APPROACH	8
SIX SIGMA.....	8
PDSA (PLAN-DO-STUDY-ACT).....	8
2.6 ORGANISATIONAL CULTURE AND LEADERSHIP	9
2.7 SYSTEMS THINKING IN HEALTHCARE IMPROVEMENT.....	9
2.8 SYNTHESIS OF FINDINGS	9

.....	10
3. RECOMMENDATIONS.....	10
3.1 STRENGTHENING WORKFORCE CAPACITY AND SKILL MIX.....	10
3.2 GOVERNANCE REFORM AND STRENGTHENING ACCOUNTABILITY	10
3.3 IMPLEMENTATION OF PDSA CYCLES FOR CONTINUOUS IMPROVEMENT	11
3.4 LEAN APPROACH TO PROCESS IMPROVEMENT	11
3.5 APPLICATION OF SIX SIGMA FOR QUALITY CONTROL	12
3.6 IMPROVING ENVIRONMENTAL AND INFRASTRUCTURE SAFETY	12
3.7 DIGITAL HEALTH AND EARLY WARNING SYSTEMS	12
3.8 POLICY-LEVEL AND SYSTEM-WIDE IMPROVEMENTS	13
3.9 OVERALL IMPLEMENTATION STRATEGY	13
SUMMARY OF RECOMMENDATIONS	14
4. CONCLUSION	14

REFERENCE LIST 16

Case Study: Quality Failure in Neonatal Care – Countess of Chester Hospital

1. Introduction

Patient safety is a fundamental dimension of healthcare quality, yet repeated failures within healthcare systems continue to result in preventable harm. The case of neonatal care failures at the Countess of Chester Hospital represents one of the most significant healthcare quality breakdowns in recent UK history. Between 2015 and 2016, multiple infant deaths occurred under circumstances later linked to systemic organisational failures, including poor governance, inadequate staffing, and unsafe clinical environments (Care Quality Commission, 2016; RCPCH, 2016).

Evidence from the Care Quality Commission (2016) and the Royal College of Paediatrics and Child Health (RCPCH, 2016) highlighted serious concerns within the neonatal unit, including contaminated water systems, sewage leaks, and insufficient consultant presence. Despite repeated warnings from staff, organisational leadership failed to take timely action, demonstrating critical weaknesses in governance and safety culture (Francis, 2013).

From a public health perspective, this case illustrates how failures in healthcare systems can lead not only to individual harm but also to wider consequences such as loss of public trust, increased healthcare costs, and long-term psychological impacts on families. According to the National Quality Board (2016), safe staffing, effective leadership, and responsive governance are essential for maintaining healthcare quality. However, in this case, these elements were significantly compromised.

Furthermore, this incident reflects broader systemic challenges within the NHS, including workforce shortages, increasing service demand, and limitations in resource allocation (NHS England, 2022). The World Health Organization (2021) emphasises that unsafe care is a leading cause of avoidable morbidity and mortality globally, with millions of patients affected each year. In high-risk settings such as neonatal intensive care, even minor lapses in safety systems can have catastrophic consequences. Additionally, a weak organisational culture—

where staff concerns are ignored or dismissed—has been identified as a key contributor to major healthcare failures, as seen in previous inquiries such as Mid Staffordshire (Francis, 2013). These factors highlight the importance of adopting a systems-based approach to quality improvement rather than attributing blame to individuals.

Moreover, effective quality assurance in healthcare requires continuous monitoring, transparent reporting systems, and strong clinical leadership to ensure that early warning signs are identified and acted upon promptly (Walshe and Smith, 2016). In the absence of these mechanisms, risks can accumulate over time, leading to significant patient safety incidents. The Countess of Chester case demonstrates how failures in communication, accountability, and organisational learning can interact and escalate into critical adverse events. This reinforces the need for integrated quality improvement strategies that combine clinical governance, workforce planning, and patient-centred care approaches to ensure sustainable improvements in healthcare delivery.

This report builds upon the Component 1 analysis by further examining the quality concerns within the neonatal service, focusing specifically on systemic failures that contributed to preventable deaths. The aim is to critically analyse the root causes of these failures using established frameworks such as the Fishbone Diagram, 5 Whys, and the Donabedian Model. Additionally, a SWOT analysis will be applied to evaluate organisational strengths and weaknesses in addressing quality issues.

The report will also critically evaluate relevant theories of quality management and improvement, including Lean, Six Sigma, and PDSA approaches, supported by peer-reviewed literature. Finally, evidence-based recommendations will be proposed, outlining practical strategies for improving service delivery and preventing similar failures in the future.

2. Main Body

2.1 Understanding Quality in Healthcare

Quality in healthcare is a multidimensional concept encompassing safety, effectiveness, patient-centredness, timeliness, efficiency, and equity (Institute of Medicine, 2001). These dimensions are essential in ensuring that healthcare services not only meet clinical standards but also respond to patient needs and expectations. In high-risk areas such as neonatal care,

maintaining quality is particularly critical due to the vulnerability of patients and the potential severity of adverse outcomes.

One of the most widely used frameworks to assess healthcare quality is the **Donabedian Model**, which evaluates care through three interrelated components: structure, process, and outcomes (Donabedian, 1988). This model provides a useful lens for analysing the failures observed in the Countess of Chester Hospital case. It enables a systematic examination of how organisational inputs influence care delivery and patient outcomes.

In this case, structural deficiencies such as inadequate staffing levels, lack of specialist consultants, and poor infrastructure directly influenced clinical processes, including delayed escalation of deteriorating infants and ineffective communication among healthcare professionals. These process failures ultimately resulted in adverse outcomes, including preventable neonatal deaths. This demonstrates the interconnected nature of healthcare systems, where weaknesses in one domain can cascade into failures across the entire system (Walshe and Smith, 2016).

Furthermore, the concept of quality is closely linked to patient safety, which the World Health Organization identifies as a global priority (WHO, 2021). Unsafe care contributes significantly to morbidity and mortality, particularly in complex healthcare environments. In the Countess of Chester case, the failure to maintain safe standards reflects not only organisational shortcomings but also broader systemic challenges within the NHS, including workforce shortages and increasing demand for services (NHS England, 2022).

However, some scholars argue that the Donabedian Model is overly simplistic and linear, failing to capture the complexity of modern healthcare systems, which are dynamic and influenced by multiple interacting factors (Lilford et al., 2004). Critics suggest that it does not adequately consider contextual elements such as organisational culture, leadership, and external policy pressures. Despite these limitations, the model remains a valuable starting point for analysing healthcare quality issues when used alongside other frameworks.

2.2 Root Cause Analysis Using Theoretical Frameworks

2.2.1 Fishbone Diagram (Cause-and-Effect Analysis)

The Fishbone Diagram, developed by Ishikawa (1985), is a widely used tool for identifying potential causes of a problem across multiple categories. It is particularly useful in healthcare settings where issues are rarely caused by a single factor. In the context of the Countess of Chester Hospital case, the diagram reveals a complex interplay of contributing factors:

- **People:** Chronic understaffing, lack of experienced neonatal nurses, insufficient consultant presence
- **Processes:** Delayed escalation of clinical deterioration, repeated failed intubations, inadequate monitoring
- **Environment:** Contaminated water systems, sewage leaks, outdated facilities
- **Management:** Failure to act on risk warnings, defensive organisational culture
- **Capacity:** Lack of tertiary neonatal cots, limited transport services

This analysis strongly supports the argument that the failures were systemic rather than individual. The alignment of these factors reflects the **Swiss Cheese Model** proposed by Reason (2000), where adverse events occur when multiple layers of defence fail simultaneously. In this case, weaknesses in governance, staffing, and infrastructure created conditions where harm became increasingly likely.

Additionally, the Fishbone Diagram highlights how environmental and organisational factors can interact with clinical processes to increase risk. For example, inadequate staffing not only reduces capacity but also contributes to fatigue, errors, and delayed decision-making.

Despite its usefulness, the Fishbone Diagram has limitations. It does not prioritise causes or quantify their impact, which may limit its effectiveness in guiding resource allocation (Serrat, 2017). Moreover, it relies heavily on subjective judgement, which may introduce bias. Therefore, it should be used in conjunction with other analytical methods to provide a more comprehensive understanding.

2.2.2 5 Whys Analysis

The **5 Whys technique** is a simple yet effective method for identifying the root causes of a problem by repeatedly asking “why” (Serrat, 2017). When applied to this case:

- Why did adverse outcomes occur? → Poor clinical care
- Why poor clinical care? → Delayed escalation and inadequate monitoring
- Why delays? → Staff shortages and lack of expertise
- Why shortages? → Ineffective workforce planning
- Why ineffective planning? → Weak governance and leadership failures

This analysis reveals that governance failure lies at the core of the problem. It also demonstrates that clinical errors are often symptoms of deeper organisational issues rather than isolated incidents. The inability of leadership to respond to staff concerns and risk warnings reflects a breakdown in accountability and decision-making processes.

However, the 5 Whys approach has been criticised for oversimplifying complex problems and potentially leading to linear conclusions that overlook the interconnected nature of healthcare systems (Kaplan and Norton, 2008). In reality, multiple causal pathways often exist simultaneously. Therefore, while the method is useful for identifying underlying issues, it should be complemented by broader system-based approaches.

2.3 Application of the Donabedian Model

The Donabedian Model provides a structured framework to examine how failures occurred across different levels of the healthcare system.

Structure

Structural issues were evident in staffing shortages, lack of consultant neonatologists, and inadequate facilities. Reports identified environmental hazards such as contaminated taps and sewage leaks, which increased infection risks (Care Quality Commission, 2016). Additionally, national workforce shortages further exacerbated these challenges (NHS England, 2022). These deficiencies created an unsafe foundation for care delivery.

Process

Process failures included delayed recognition of patient deterioration, ineffective communication, and failure to escalate concerns. These issues were compounded by inadequate training and lack of clear clinical protocols. Poor communication between multidisciplinary teams further hindered timely decision-making.

Outcomes

The consequences of these failures were severe, including preventable neonatal deaths, long-term harm to patients, and loss of public trust. The organisation also faced reputational damage and increased regulatory scrutiny. These outcomes highlight the critical importance of maintaining high standards of care.

While the Donabedian Model effectively illustrates the relationship between structure, process, and outcomes, it does not fully account for external influences such as policy constraints and socio-economic factors (Walshe, 2007). This limitation suggests the need for integrating additional frameworks to capture the full complexity of healthcare systems.

2.4 Strategic Analysis Using SWOT

A **SWOT analysis** provides insight into internal and external factors affecting organisational performance (Helms and Nixon, 2010).

Strengths

- Established NHS governance frameworks
- Availability of national clinical guidelines
- Skilled healthcare workforce

Weaknesses

- Poor safety culture
- Ineffective leadership and governance
- Staffing shortages and skill gaps

Opportunities

- Digital health innovations
- Workforce development programmes
- Policy reforms and increased funding

Threats

- Rising demand for neonatal services
- National workforce shortages
- Financial and resource constraints

SWOT analysis highlights both the capabilities and limitations of the organisation. However, it has been criticised for being overly descriptive and lacking analytical depth (Hill and Westbrook, 1997). Without prioritisation, it may fail to provide clear strategic direction. Therefore, it should be combined with other analytical tools.

2.5 Critical Evaluation of Quality Improvement Approaches

Lean Approach

Lean focuses on eliminating waste and improving efficiency (Toussaint and Berry, 2013). In this case, Lean could streamline escalation processes and reduce delays. However, critics argue that Lean may prioritise efficiency over patient-centred care and may not fully address clinical complexity (Waring and Bishop, 2010).

Six Sigma

Six Sigma aims to reduce variation and improve consistency (Antony et al., 2016). It is particularly useful for standardising clinical procedures. However, its implementation requires significant resources and expertise, which may be challenging in constrained healthcare settings.

PDSA (Plan-Do-Study-Act)

PDSA allows iterative testing of improvements (Deming, 1986). It is flexible and well-suited to healthcare environments. However, its success depends on strong leadership, data availability, and staff engagement.

2.6 Organisational Culture and Leadership

Organisational culture played a critical role in this case. A culture that discourages speaking up can lead to unreported risks and missed opportunities for improvement (Francis, 2013). The failure to act on staff concerns indicates a defensive and hierarchical culture.

Effective leadership is essential for promoting transparency, accountability, and continuous learning (West et al., 2015). In contrast, poor leadership can contribute to systemic failure, as demonstrated in this case.

2.7 Systems Thinking in Healthcare Improvement

Healthcare systems are complex and require a systems-based approach (Senge, 2006). Failures in staffing, governance, and infrastructure interacted to create a high-risk environment.

Systems thinking shifts focus from individual blame to organisational learning and improvement. This aligns with modern patient safety approaches (WHO, 2021).

2.8 Synthesis of Findings

The analysis demonstrates that the failures were multifactorial and systemic. Key issues include:

- Structural deficiencies
- Process failures
- Governance weaknesses
- Poor safety culture

No single framework fully explains the problem. A combined approach provides a more comprehensive understanding.

3. Recommendations

Based on the analysis of systemic failures within the Countess of Chester Hospital neonatal unit, it is evident that improving healthcare quality requires a **multi-level and integrated approach**. The recommendations presented below are directly informed by the identified root causes, including staffing shortages, weak governance, poor safety culture, and ineffective clinical processes. These strategies are supported by established quality improvement methodologies such as **PDSA, Lean, and Six Sigma**, ensuring both practical implementation and long-term sustainability.

3.1 Strengthening Workforce Capacity and Skill Mix

A critical priority is addressing workforce shortages and improving the skill mix within neonatal services. Evidence suggests that adequate staffing levels are directly associated with improved patient outcomes and reduced mortality rates (Griffiths et al., 2018). Therefore, healthcare organisations should:

- Increase recruitment of specialised neonatal nurses and consultants
- Ensure 24/7 consultant neonatologist coverage
- Implement retention strategies such as wellbeing programmes and career development opportunities

Additionally, continuous professional development and simulation-based training should be introduced to enhance clinical competencies, particularly in high-risk procedures such as neonatal intubation. While increasing staffing requires financial investment, it is a necessary step to ensure patient safety and service quality.

3.2 Governance Reform and Strengthening Accountability

The failure to act on risk warnings in this case highlights significant weaknesses in governance structures. To address this, organisations must implement robust governance frameworks that promote accountability and transparency.

Key actions include:

- Strengthening risk management systems, including regular review of risk registers
- Establishing clear escalation pathways for clinical concerns
- Enhancing leadership accountability through performance monitoring

The introduction of a “**Freedom to Speak Up**” culture is essential to ensure that staff feel safe raising concerns without fear of retaliation (Francis, 2013). However, cultural change is often difficult to achieve and requires sustained leadership commitment and organisational support.

3.3 Implementation of PDSA Cycles for Continuous Improvement

The **Plan-Do-Study-Act (PDSA)** cycle provides a structured approach for testing and implementing changes in healthcare settings (Deming, 1986). In this case, PDSA can be applied to improve clinical processes such as escalation protocols.

- **Plan:** Develop standardised escalation guidelines for deteriorating infants
- **Do:** Pilot the guidelines within the neonatal unit
- **Study:** Monitor outcomes such as response times and adverse events
- **Act:** Refine and scale the intervention across the organisation

The iterative nature of PDSA allows organisations to adapt interventions based on real-world feedback. However, its success depends on effective data collection and staff engagement.

3.4 Lean Approach to Process Improvement

Lean methodology focuses on eliminating waste and improving efficiency in healthcare processes (Toussaint and Berry, 2013). In the context of this case, Lean can be used to:

- Streamline referral and escalation processes

- Reduce delays in clinical decision-making
- Improve workflow and communication between multidisciplinary teams

For example, introducing standardised care pathways can reduce variability in clinical practice and enhance patient safety. However, it is important to ensure that efficiency improvements do not compromise patient-centred care.

3.5 Application of Six Sigma for Quality Control

Six Sigma can be used to reduce variation and improve consistency in clinical processes (Antony et al., 2016). In neonatal care, this could involve:

- Standardising procedures such as intubation and monitoring
- Using data-driven approaches to identify and reduce errors
- Establishing key performance indicators (KPIs) for quality monitoring

While Six Sigma offers significant benefits, its implementation requires training, resources, and organisational commitment, which may be challenging in resource-constrained settings.

3.6 Improving Environmental and Infrastructure Safety

The presence of contaminated water systems and poor physical infrastructure was a major contributor to the failures in this case. Therefore, organisations must prioritise environmental safety by:

- Upgrading facilities to meet infection control standards
- Conducting regular environmental risk assessments
- Ensuring timely maintenance and repair of infrastructure

Investment in infrastructure is essential for creating a safe clinical environment, particularly in high-risk areas such as neonatal units.

3.7 Digital Health and Early Warning Systems

The integration of digital health technologies can significantly enhance patient safety and service efficiency. Recommended interventions include:

- Implementation of electronic early warning systems to detect patient deterioration
- Use of real-time monitoring technologies
- Digital documentation systems to improve communication and data accuracy

Evidence suggests that digital tools can improve clinical decision-making and reduce delays in care (Topol, 2019). However, successful implementation requires staff training and adequate technological infrastructure.

3.8 Policy-Level and System-Wide Improvements

Finally, addressing systemic issues requires action at the policy level. National healthcare bodies should:

- Increase funding for neonatal services
- Expand neonatal intensive care capacity
- Improve workforce planning and training programmes

The NHS Long Term Plan emphasises the importance of investing in workforce and infrastructure to improve healthcare quality (NHS England, 2019). Without policy support, organisational-level improvements may not be sustainable.

3.9 Overall Implementation Strategy

To ensure successful implementation, a **combined approach** should be adopted, integrating PDSA, Lean, and Six Sigma methodologies. This approach allows organisations to:

- Test and refine interventions (PDSA)
- Improve efficiency (Lean)
- Ensure consistency and quality (Six Sigma)

Additionally, strong leadership, staff engagement, and continuous monitoring are essential for sustaining improvements over time.

Summary of Recommendations

The recommendations focus on:

- Workforce strengthening
- Governance reform
- Process improvement
- Environmental safety
- Digital innovation
- Policy support

Together, these strategies address both the **root causes and systemic issues** identified in the analysis, providing a comprehensive framework for improving healthcare quality and preventing future failures.

4. Conclusion

This report has critically examined the systemic quality failures within the neonatal unit at the Countess of Chester Hospital, highlighting how multiple organisational, clinical, and cultural factors converged to produce preventable harm. Through the application of analytical frameworks such as the Fishbone Diagram, 5 Whys, Donabedian Model, and SWOT analysis, it is evident that the failures were not isolated incidents but rather the result of deeply embedded structural and governance weaknesses.

The findings demonstrate that deficiencies in staffing, inadequate infrastructure, ineffective clinical processes, and poor leadership collectively contributed to adverse patient outcomes. The Donabedian Model effectively illustrated how structural limitations—such as workforce shortages and unsafe environments—led to process failures, including delayed escalation and poor communication, ultimately resulting in negative outcomes such as preventable neonatal deaths. Furthermore, root cause analysis identified weak governance and a dysfunctional safety culture as central issues, particularly the failure to respond to staff concerns and risk warnings.

Critically, the report highlights that healthcare quality cannot be improved through isolated interventions. Instead, a systems-based approach is required, recognising the complex interdependencies within healthcare organisations. The evaluation of quality improvement methodologies, including Lean, Six Sigma, and PDSA, demonstrated that each approach offers distinct advantages; however, their combined application provides a more comprehensive and sustainable strategy for service improvement.

The recommendations proposed emphasise the importance of workforce investment, governance reform, digital innovation, and environmental safety improvements. These strategies are not only reactive but also proactive, aiming to prevent recurrence through continuous monitoring, learning, and adaptation.

In conclusion, the Countess of Chester case serves as a critical reminder of the consequences of systemic failure within healthcare. To ensure patient safety and high-quality care, organisations must prioritise transparency, accountability, and a strong safety culture. By adopting integrated, evidence-based quality improvement approaches, healthcare systems can enhance resilience, rebuild public trust, and deliver safer and more effective services in the future.

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