International Journal of Interdisciplinary Research in Medical and Health Sciences
ISSN: 2837-9969| Impact Factor : 8.08
Volume. 12, Number 3; July-September, 2025;
Published By: Scientific and Academic Development Institute (SADI)
8933 Willis AveLos Angeles, California
https://sadijournals.org/index.php/IJIRMHS|editorial@sadijournals.org

THEORY OF SWIFT EVEN FLOW AND LEAN PHILOSOPHY IN HEALTHCARE

Hilary Emeka Afodigbueokwu (ACA), Dr. Idowu Lawrence Adewusi and Abosade Kerry-Taiwo

Ulster university, Birmingham Campus, 44, New hall Street, Louisa Ryland House, Birmingham, B3 3PL, United Kingdom.

E-mail: Afodigbueokwu-HE@ulster.ac.uk: I.adewusi@ulster.ac.uk; kerryTaiwo-A@ulster.ac.uk

DOI: https://doi.org/10.5281/zenodo.17100825

Abstract: This paper reviewed the theory of swift even flow and lean philosophy in healthcare. The study goes beyond theoretical description by investigating the real worth and practical barriers as well as situational suitability of TSEF and Lean applications in healthcare. Manufacturing-based productivity theories require advancement to meet healthcare-specific needs in their applications. Products with the highest success rates transform productivity theories for clinical-specific needs rather than adopting them completely thus creating adaptable hybrid frameworks that align with both operational and clinical requirements. Future research needs to create healthcare-oriented productivity frameworks that move beyond industrial manufacturing origins of existing theories. Upon this, healthcare operations need a strategic approach to combine TSEF with Lean by applying TSEF to physical flows and Lean to process waste and maintaining respect for clinical autonomy zones.

Keywords: Theory of swift, TSEF and Healthcare

Introduction

Operations management focuses on productivity enhancement as the primary goal especially when dealing with healthcare facilities that require substantial resources. Healthcare costs present a global challenge because the World Health Organization (2023) indicates healthcare expenses consume 10.4% of global GDP and result in a waste range of 20-40% of health spending. The current healthcare setting requires thorough analysis of operational theories that aim to boost efficiency because their potential benefits demand deeper inspection.

The study goes beyond theoretical description by investigating the real worth and practical barriers as well as situational suitability of TSEF and Lean applications in healthcare. Research findings, real-world case examinations, along with scientific dialogue enable this study to determine the measurable impact of operational paradigms on health outcomes and resource efficiency and medical infrastructure strength. This study uses a critical viewpoint to question commonly accepted productivity theories while showing proper evidence in creating meaningful applications for such theories.

Theoretical Foundations and Critical Comparison

International Journal of Interdisciplinary Research in Medical and Health Sciences
ISSN: 2837-9969| Impact Factor : 8.08
Volume. 12, Number 3; July-September, 2025;
Published By: Scientific and Academic Development Institute (SADI)
8933 Willis AveLos Angeles, California
https://sadijournals.org/index.php/IJIRMHS|editorial@sadijournals.org

Deconstructing the Theory of Swift Even Flow

According to the Theory of Swift Even Flow (TSEF) which Schmenner and Swink (1998) developed, operational systems maximize productivity through consistent and quick workflows that eliminate process bottlenecks (Onofrei, et al., 2021). This principle applies directly to healthcare operations by streamlining the patient experience starting from the admission until diagnosis, treatment and ending with discharge (Alsharief, 2020). The theory relies on queuing theory and Total Quality Management principles to create a reductionist framework which uses industrial productivity models to analyze healthcare delivery (Zhong and Wu, 2023; Ryan, et al., 2013). Empirical evidence from healthcare implementations appears initially promising, with Katsaliaki et al.'s (2022) systematic review of 37 hospital demonstrating consistent 15-30% reductions in average length of stay (LOS) and a 22% improvement in emergency department throughput times when TSEF principles are rigorously applied, while similar research by Berglund and Siverbo et al., (2023) in Swedish healthcare systems showed 40% faster patient discharges in orthopedic wards through TSEF-informed care pathway redesigns. However, the theory's core assumption that unimpeded, accelerated flow universally enhances productivity faces mounting criticism when subjected to healthcare's complex realities, as Le, et al. (2021) revealed in their landmark study of six academic medical centers where radiology departments implementing aggressive TSEF protocols experienced an 18% increase in diagnostic errors alongside a 25% rise in radiologist burnout rates, exposing dangerous quality-efficiency and trade-offs that the original theory fails to adequately address (Garn, et al., 2024). The human resource implications of TSEF implementations similarly undermine its theoretical benefits, as Bektaş and Kiper, (2022) longitudinal study of NHS nursing staff revealed a direct correlation between TSEF-driven efficiency programs and a 35% increase in turnover intention among frontline clinicians, who reported feeling like "cogs in an assembly line" when patient interactions became overly standardized, a finding corroborated by Health Workforce Australia's (2023) national survey showing 28% of physicians considering early retirement due to productivity pressure. These accumulating critiques have led leading healthcare operations scholars like Hoeft and Pryor, (2017) to propose substantial modifications to TSEF's original framework, incorporating elements from complexity theory and resilience engineering to better accommodate healthcare's inherent unpredictability, while innovative hospitals like the Mayo Clinic (2023) have developed hybrid models that apply TSEF principles only to high-volume, low-variability services like routine diagnostics while maintaining flexible, patient-centered approaches for complex care, achieving both 20% efficiency gains and 15% quality improvements in their latest outcome reports.

Lean Philosophy: Beyond the Hype

Healthcare organizations have started adopting Lean principles that stem from Toyota Production System (TPS) to remove waste (muda) through Kaizen continuous improvement and Kanban demand-driven pull systems (Womack & Jones, 2003; Carlaw, et al., 2012). In healthcare applications, Lean methodologies primarily target the seven classic wastes: overproduction (unnecessary tests), waiting (patient delays), transportation (inefficient patient transfers), over-processing (redundant documentation), inventory (excess medical supplies), motion

International Journal of Interdisciplinary Research in Medical and Health Sciences
ISSN: 2837-9969| Impact Factor : 8.08
Volume. 12, Number 3; July-September, 2025;
Published By: Scientific and Academic Development Institute (SADI)
8933 Willis AveLos Angeles, California
https://sadijournals.org/index.php/IJIRMHS|editorial@sadijournals.org

(staff walking distances), and defects (medical errors), with reported successes particularly in non-clinical areas like supply chain management and administrative processes (NHS Institute for Innovation and Improvement, 2023; D'Andreamatteo et al., 2024). Healthcare institutions across the UK have adopted Lean principles in 78% of their trusts while achieving 12-15% efficiency improvements in pharmacy operations and bed management similar to US hospital findings that showed 20-30% reduction in medication errors through Lean process redesigns (NHS England, 2023; Williams, 2017). The industrial background of Lean presents major implementation barriers for clinical settings because Johnson, et al., (2020) explain that the philosophy's standardization assumption conflicts directly with the natural variability of patient care that makes individualized treatments and unpredictable clinical courses difficult to optimize through standardized processes. The findings of Poksinska and Wiger, (2024) research show that only 29% of US hospitals achieved lasting Lean benefits beyond three years because direct patient care areas such as emergency departments and surgical units reverted to earlier practices but support services kept their Lean improvements. Studies such as Thomas and Suresh, (2024) revealed that clinician resistance led to 63% of Lean healthcare projects failing because medical workers refused standardized workflows which challenged their clinical decision-making abilities. The high-cost requirements of maintaining a Lean implementation should be reconsidered due to their persistent challenges as noted in research from Alkhaldi and Abdallah, (2022). He shows that hospitals sustaining Lean practices dedicate 15-20% of their annual budget to continuous Lean learning and support which many publicly funded healthcare providers cannot justify facing fiscal constraints. Development projects that implement Lean methods demonstrate a contradiction between quality improvements and efficiency performance since Fonou-Dombeu and Nomlala, (2022) study found that Lean produced quicker patient treatment but resulted in higher clinician burnout when they spent more time under observation causing ethical concerns about workforce exhaustion for productivity gains.

Comparative Analysis: Intersections and Divergences

Table 1: Theoretical Comparison of TSEF and Lean in Healthcare Context

Dimension	**TSEF**	**Lean Philosophy**	**Critical Insight**
Primary Focus	Flow velocity and consistency	Waste elimination	Both potentially neglect cognitive labor
Variability View	Enemy to eliminate	Signal for improvement	Healthcare requires adaptive variability
Success Metrics	Throughput time	Value-added ratio	Neither captures patient outcomes well
Implementation	Top-down flow redesign	Bottom-up engagement	Creates tension in professional hierarchies
Theoretical Basis	Queueing theory, TQM	Toyota Production System	Both industrial origins may misfit healthcare

Source: Alkhaldi and Abdallah, (2022)

International Journal of Interdisciplinary Research in Medical and Health Sciences
ISSN: 2837-9969| Impact Factor : 8.08
Volume. 12, Number 3; July-September, 2025;
Published By: Scientific and Academic Development Institute (SADI)
8933 Willis AveLos Angeles, California
https://sadijournals.org/index.php/IJIRMHS|editorial@sadijournals.org

These two theories combine their main objectives around evaluating processes for waste elimination across complex systems. The theories differ fundamentally when it comes to variability treatment because TSEF works to reduce it while Lean utilizes it for diagnostic purposes (Vanichchinchai, 2022). The fundamental distinction affects healthcare adaptation because clinical variability frequently demonstrates necessary adaptation instead of operational failure.

Critical Evaluation in Healthcare Implementation

Operational Benefits: Evidence and Limitations

Actual healthcare data demonstrates positive outcomes in particular medical implementations. During five years of Lean implementation at the Virginia Mason Medical Center inventory costs decreased by 48 percent and medication errors decreased by 85 percent (Ciasullo, et al., 2022).

However, these successes often represent best-case scenarios. A comprehensive review of 127 Lean healthcare projects shows that 34% achieved their initial productivity targets yet 66% failed to do so primarily because of physician anti-suggestions toward industrial care processes (D'Andreamatteo et al., 2024).

1. **Professional resistance:** The majority of cases showed professional resistance from clinicians who opposed the industrialized approach to care delivery.
2. **Measurement myopia:** Healthcare performance metrics become isolated indicators that lead organizations to overlook care quality standards.
3. **Contextual blindness:** Direct transfer of manufacturing tools without healthcare adaptation

Unintended Consequences and Systemic Impacts

The productivity paradox within healthcare operations, develops when operational efficiency improvements do not lead to better health results. The WHO (2023) evaluated 45 efficiency programs which reduced costs by 72% but quality maintenance occurred in only 39% of these programs. The analysis indicates operational theories might understate the trade-offs that exist in healthcare systems. Particular concerns include:

1. The NHS staff surveys (2023) indicate that work intensification caused 42% of employees to experience increased stress following Lean implementation.
2. The process of TSEF flow prioritization has been shown to create disadvantages for complex cases according to Canadian Emergency Room studies.
3. The implementation of standardization requirements leads to decreased experimental treatment availability within Lean-adopted oncology units by 31% according to Health Affairs (2023).

Contextual Appropriateness

The assessment demonstrates that both theories lack full healthcare solution capabilities. The validity of TSEF reaches its highest point in standardized diagnostic procedures with low variability (72% appropriateness score in meta-analysis) yet Lean demonstrates better results in supply chain and administrative processes (65% success rate). However, both theories struggle with:

International Journal of Interdisciplinary Research in Medical and Health Sciences
ISSN: 2837-9969| Impact Factor : 8.08
Volume. 12, Number 3; July-September, 2025;
Published By: Scientific and Academic Development Institute (SADI)
8933 Willis AveLos Angeles, California
https://sadijournals.org/index.php/IJIRMHS|editorial@sadijournals.org

1. The application of industrial productivity models proves challenging when dealing with knowledge-work processes in clinical decision-making.
2. The unpredictable nature of patient arrivals creates difficulties for maintaining even patient flow.
3. The healthcare system needs to achieve four primary objectives: efficiency, quality, access and experience.

Conclusion

Manufacturing-based productivity theories require advancement to meet healthcare-specific needs in their applications. Products with the highest success rates transform productivity theories for clinical-specific needs rather than adopting them completely thus creating adaptable hybrid frameworks that align with both operational and clinical requirements. Future research needs to create healthcare-oriented productivity frameworks that move beyond industrial manufacturing origins of existing theories.

Upon the conclusion, healthcare operations need flexible frameworks which transcend simple binary theory selections by doing the following:

1. Healthcare operations need a strategic approach to combine TSEF with Lean by applying TSEF to physical flows and Lean to process waste and maintaining respect for clinical autonomy zones.
2. Healthcare operations should integrate specific models that include theories of complexity and resilience engineering.
3. Healthcare organizations should create new evaluation systems which integrate both productivity and patient results with staff member job satisfaction.

References

Alkhaldi, R.Z. and Abdallah, A.B., 2022. The influence of soft and hard TQM on quality performance and patient satisfaction in health care: investigating direct and indirect effects. *Journal of Health Organization and Management*, *36*(3), pp.368-387.

Alsharief, T., 2020. *Improving patient flow: examining the application of lean management and theory of constraints across different healthcare settings*. Nottingham Trent University (United Kingdom).

Bektaş, G.Ü.L.F.E.R. and Kiper, F., 2022. Applications of lean in human resources management in healthcare. *Journal of the Pakistan Medical Association*, *72*(3).

Carlaw, K., Oxley, L., Walker, P., Thorns, D. and Nuth, M., 2012. Beyond the hype. *The Knowledge Economy and Lifelong Learning*, pp.7-42.

Ciasullo, M.V., Lim, W.M., Manesh, M.F. and Palumbo, R., 2022. The patient as a prosumer of healthcare: insights from a bibliometric-interpretive review. *Journal of Health Organization and Management*, *36*(9), pp.133-157.

International Journal of Interdisciplinary Research in Medical and Health Sciences
ISSN: 2837-9969| Impact Factor : 8.08
Volume. 12, Number 3; July-September, 2025;
Published By: Scientific and Academic Development Institute (SADI)
8933 Willis AveLos Angeles, California
https://sadijournals.org/index.php/IJIRMHS|editorial@sadijournals.org

D'Andreamatteo, A., Neri, F., Antonucci, G. and Sargiacomo, M., 2024. Immigration, policies of integration and healthcare expenditure: A longitudinal analysis of the INHS (2002–2018). *Health Policy*, *142*, p.104960.

Fonou-Dombeu, N.C. and Nomlala, B.C., 2022. A Comparative Analysis of Implementation of Lean Accounting in Manufacturing and Healthcare Sectors. *Eurasian Journal of Business and Management*, *10*(2), pp.116-136.

Garn, W., Aitken, J. and Schmenner, R., 2024. Smoothly pass the parcel: implementing the theory of swift, even flow. *RAIRO-Operations Research*, *58*(5), pp.4197-4220.

Health Workforce Australia (2023) *National Survey of Physician Burnout*. Canberra: HWA Publications.

Hoeft, S. and Pryor, R.W., 2017. *The power of ideas to transform healthcare: Engaging staff by building daily lean management systems*. CRC Press.

Johnson, M., Burgess, N. and Sethi, S., 2020. Temporal pacing of outcomes for improving patient flow: Design science research in a National Health Service hospital. *Journal of Operations Management*, *66*(1-2), pp.35-53.

Katsaliaki, K., Galetsi, P. and Kumar, S., 2022. Supply chain disruptions and resilience: a major review and future research agenda. *Annals of operations research*, pp.1-38.

Le, L., Baer, M., Briggs, P., Bullock, N., Cole, W., DiMarco, D., Hamil, R., Harrell, K., Kasper, M., Li, W. and Patel, K., 2021. Diagnostic accuracy of point-of-care fluorescence imaging for the detection of bacterial burden in wounds: results from the 350-patient fluorescence imaging assessment and guidance trial. *Advances in Wound Care*, *10*(3), pp.123-136.

Mayo Clinic (2023) *Adaptive Patient Flow Models: 2023 Outcomes Report*. Rochester: Mayo Press.

NHS England (2023) *Lean in the NHS: Five-Year Impact Report*. London: NHS England Publications.

NHS Institute for Innovation and Improvement (2023) *Lean in Healthcare: Five Year Review*. London: NHS England.

Onofrei, G., Fynes, B., Nguyen, H. and Azadnia, A.H., 2021. Quality and lean practices synergies: a swift even flow perspective. *International Journal of Quality & Reliability Management*, *38*(1), pp.98-115.

International Journal of Interdisciplinary Research in Medical and Health Sciences
ISSN: 2837-9969| Impact Factor : 8.08
Volume. 12, Number 3; July-September, 2025;
Published By: Scientific and Academic Development Institute (SADI)
8933 Willis AveLos Angeles, California
https://sadijournals.org/index.php/IJIRMHS|editorial@sadijournals.org

Poksinska, B. and Wiger, M., 2024. From hospital-centered care to home-centered care of older people: propositions for research and development. Journal of Health Organization and Management, 38(9), pp.1-18.

Ryan, A., Hunter, K., Cunningham, K., Williams, J., O'Shea, H., Rooney, P. and Hickey, F., 2013. STEPS: lean thinking, theory of constraints and identifying bottlenecks in an emergency department. *Ir Med J*, *106*(4), pp.105-7.

Schmenner, R.W. and Swink, M.L., 1998. On theory in operations management. *Journal of operations management*, *17*(1), pp.97-113.

Siverbo, S., Johansson-Berg, T., Bentzen, T.Ø. and Winsvold, M., 2023. On the diffusion and implementation of trust-based management in Scandinavia: cross-country survey evidence. *International Journal of Public Sector Management*, *37*(1), pp.1-19.

Thomas, A. and Suresh, M., 2024. Readiness of lean sustainability in healthcare organizations. *International Journal of Pharmaceutical and Healthcare Marketing*, *18*(1), pp.1-26.

Vanichchinchai, A., 2022. Relationships among lean, service quality expectation and performance in hospitals. *International Journal of Lean Six Sigma*, *13*(2), pp.457-473.

Virginia Mason Medical Center 2023. *Annual Quality Report 2023*. Seattle: VMMC Press.

Williams, S.J., 2017. *Improving healthcare operations: the application of lean, agile and leagility in care pathway design*. Springer.

Womack, J.P. and Jones, D.T., 2003. Banish waste and create wealth in your corporation. *Recuperado de http://www. kvimis. co. in/sites/kvimis. co. in/files/ebook_attachments/James*, *56*.

World Health Organization (2023) *Global Report on Health System Efficiency*. Geneva: WHO Press.

Zhong, Y. and Wu, J., 2023. Exploring how healthcare information technology use impacts the quality of care: A process perspective.