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I, , Stefanie Roberts-Newman, hereby submit this DNP project as part of the requirements for the degree of Doctor of Nursing Practice in Population Health Leadership.

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The Role of the Case Manager: An Evaluation of an Implemented Framework

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The Role of the Case Manager:

An Evaluation of an Implemented Framework

A scholarly project submitted to the Graduate School,

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in the College of Nursing

by

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Chapter 1

Introduction

In the United States (US), there were more than 33 million hospital admissions in 2020 (American Hospital Association [AHA], 2022). The most recent data shows that the average length of stay (LOS) for hospitalizations, for nonprofit institutions, is 5.3 days (National Center for Health Statistics, 2020-2021, AHA, 2022). Although the LOS has declined from a level of 7.7 in the 1980's, the cost of healthcare, nationwide, was reported at more than $1.2 trillion in 2020 (National Center for Health Statistics, 2020-2021, AHA, 2022).

Hospital administrators are being challenged to develop and implement strategies to control healthcare costs while maintaining the quality of care that yields the best possible outcomes (Hughes et al, 2021). Providing care to patients with complex problems can lead to longer LOS thereby increasing the financial pressures within an organization. Interdisciplinary teams, with varied backgrounds, specialties, and perspectives often play a role in care delays due to differing recommendations. Interdisciplinary dynamics that have the potential to affect efficiency of care being provided requires a professional case manager who can advocate for the patient while coordinating expertise of all stakeholders (Sortedahl, Mottern, & Campagna, 2018).

In this chapter, the essential components of case management departments and the pivotal role of case managers within these departments will be presented. In addition, the project's organizational context, problem statement, and purpose will be defined to set the stage for a thorough exploration of the topic. By examining the foundations of case management and the complexities of the case manager's responsibilities, valuable insights and solutions can be provided to enhance the effectiveness and efficiency of these vital nursing roles.

Background

Case Management

Case management is a dynamic process that involves assessing, planning, implementing, coordinating, monitoring, and evaluating healthcare services to enhance outcomes, patient experiences, and the overall value of care (American Case Management Association [ACMA] & Commission for Case Management Certification [CCMC], 2022). Since its inception in the 1960's, the role of case management has undergone significant development to meet the diverse needs of patients in various healthcare settings, including acute care hospitals, rehabilitation facilities, ambulatory care centers, and the community (Lukersmith, Millington, & Salvador-Carulla, 2016).

Case management is an essential component in an evolving healthcare system and can ultimately lead to better health outcomes and increased patient satisfaction. Over the years, various models of case management have been implemented. Practice variations were based on the needs of the population, the complexity of health conditions, sociocultural barriers, and available resources. Regardless of the model, effective case management requires collaboration among various stakeholders including interdisciplinary teams, patients, families, and members of the community. By working together, a comprehensive and patient-centered approach to care can be established.

Case Managers

The role of case managers, in the hospital environment, is important to ensuring optimal care as patients navigate through various aspects of the healthcare system. According to Reynolds (2013), case managers play an important role in overseeing patients' admission and transition to the appropriate level of care. They are responsible for developing and implementing

effective care plans and ensuring that patients receive the prescribed treatments necessary for their recovery. Moreover, case managers act as advocates for patients, ensuring they receive the necessary services and support during their hospital stay and even after discharge. By serving as liaisons between patients, healthcare providers, and healthcare systems, hospital case managers promote comprehensive, patient experiences. The dedication, understanding, and knowledge of case managers plays a crucial role in enhancing the effectiveness of the delivery of care in the hospital setting.

Hospital case management teams consist of health care professionals which may include social workers, registered nurses, and occupational therapists. In some organizations, the case management team may only have one discipline, and in others, more than one may work together as a multidisciplinary team (Lukersmith, Millington, & Salvador-Carulla, 2016).

In the acute care setting, multidisciplinary teams have a wealth of knowledge and experience that is invaluable when advocating in difficult situations. The expertise of case managers is crucial as care is being shifted from “hospital-centric” to “community-centric” where there is a need to integrate a patient’s psychosocial and clinical needs (Robbins & Birmingham, 2005). Case managers have a vital role in transitioning patients from hospital-to-community and ensuring the availability of resources post-discharge (Donelan, Chang, Berrett-Abebe, et al, 2019). Overall, collaborative case management is important for delivering high quality care. By valuing the contribution of all disciplines and encouraging effective communication and continuity of care, case managers can create a stronger healthcare system that enhances the overall patient experience and facilitates positive health outcomes.

Project Setting

The setting for this project takes place in southeast Michigan at a 191-bed acute care hospital. This hospital is one of five facilities within a larger hospital system. Established 12 years ago, it serves the North market. Based on their mission to improve people's lives through excellence in the science and art of healthcare and healing, the organization is committed to improving the lives of those with chronic illnesses, particularly those who have high readmission rates (OneHenry, 2022). The Population Health Division includes ambulatory case managers who collaborate with community partners to implement interventions aimed at bridging the divide between inpatient and outpatient care. They coordinate and facilitate access to community resources and create follow-up plans for individuals facing difficulties in managing their care after discharge.

Approximately 60% of the patient population falls within the age group of 65 years of age or older (OneHenry, 2023). The payer mix is 35% Medicare, 20% Medicare Advantage, 40% private insurance and approximately 5% Medicaid (OneHenry, 2023). Most readmissions within 30 days are 65 years old or older, Medicare recipients, and skilled nursing facility patients (OneHenry 2023).

In this acute care hospital, there is a multidisciplinary team that addresses complex, chronic care patients with a history of readmissions and those with protracted LOS. The organization uses EPIC documentation system and can generate reports for readmissions as well as LOS from EPIC to easily identify appropriate patients. Each day, a designated readmission nurse reviews a patient list in EPIC. That nurse identifies any new 30-day readmissions and investigates to determine the reason for the readmission. The LOS information is shared at progression rounds once a week. This process helps the healthcare team gain insights into the

factors contributing to readmissions and allows them to address the underlying issues to improve patient outcomes and reduce readmission rates.

The case management department is staffed by a team of 19.3 full time equivalents including Licensed Clinical Social Workers (LCSWs) and Registered Nurses (RNs). Certification or licensure is a requirement for these positions, ensuring a high standard of expertise and professionalism. The department is led by one supervisor and a director who are responsible in overseeing the delivery of effective care and coordination of services.

The project focuses on a 32-bed medical unit, with active participation from two assigned case managers who participated in the process changes. The project scope included Medicare patients discharged to home with or without home care or advanced home care and Medicare patients discharged to skilled nursing facilities (SNFs) with a diagnosis of congestive heart failure (CHF). Importantly, the project did not require any additional expenses other than time and commitment of the stakeholders including the Doctorate of Nuring Practice (DNP) project leader, a system population health transformation consultant, the director of case management, the supervisor of case management, and the Associate Chief Medical Officer (ACMO). The case managers involved in this project were predominantly female professionals, each with more than five years of experience in social work or nursing. Furthermore, they have considerable expertise in case management roles.

Statement of the Problem

The purpose of this project was to implement a standardized case management work flow and process to examine the effects on LOS for congestive heart failure patients on a medical unit within the selected health system. Although case management is commonplace in acute care hospitals, there is an ongoing variability across healthcare systems regarding expectations and requirements for the case manager role (Reynolds, 2013). There are no standardized roles, responsibilities, processes, or policies established for case managers working in acute care facilities in the US (Lukersmith, et al., 2016). Case managers, new to the role, often underestimate the level of accountability and the number of impromptu stressors that can occur, specifically role ambiguity and role conflict. Additionally, there may be unexpected ethical challenges that they have not experienced in the past (Smith & Larew, 2013).

The inconsistencies of case management models, within and across health systems, can negatively impact job satisfaction and job performance (Smith, 2011). As organizations increase the utilization of case managers, there is a significant need to develop and implement a model for case management that will bring clarity and standardization to the role. Case managers that understand their role, including multidisciplinary collaboration, and the utilization of organizational resources, have the potential to positively influence LOS and improve patient outcomes. Although there is a job description (Appendix A) within the selected facility that clearly defines the roles and responsibilities for case managers, the facility has not successfully enforced accountability or guaranteed compliance with established guidelines.

Statement of Purpose

The rising costs for healthcare, year over year, in the US presents an ongoing challenge to administrators in healthcare systems nationwide (National Center for Health Statistics, 2020-2021 & AHA, 2022). One of the strategies that has become increasingly prevalent in healthcare is the reliance on case management to oversee various aspects of patient care. This approach ensures that patients are admitted to the appropriate level of care, and smoothly transition between different care settings. Case managers play a critical role in developing effective care plans and ensuring patients receive the prescribed treatments necessary for their recovery. Additionally, they act as advocates for patients, ensuring they have access to necessary services and support during their hospital stay and even after discharge (Reynolds, 2013).

Smith (2011) provides support for the premise that an efficient case management framework, wherein case managers are fully aware of their role expectations, can have a positive influence on both job satisfaction and job performance. Case management teams, with a positive view of their roles, have the potential to be more efficient and effective. Case managers that understand their role are better prepared to align resources for patients transitioning from hospital-to-community and address concerns that could add unnecessary hospital days (Hospital Case Management, 2015).

The inconsistencies of case management models within and across healthcare systems is concerning (Reynolds, 2013). The lack of standardized roles, responsibilities, processes, and policies for case management roles (Lukersmith, et al., 2016) has impeded the path to improving the overall operations of healthcare systems and has contributed to longer hospital stays for patients. The implementation of a standardized case management framework was guided by the following specific aims:

- Standardize case management workflows and processes.
- Implement an open feedback system for team members.
- Provide adequate training and departmental resources.
- Monitor Key Performance Indicators.

Studies have shown that standardized case management workflows and processes have resulted in a lower LOS. A survey of case managers at a health system in southeast Michigan suggested that case managers desired a standardization of workflows and processes to enhance their efficiency in performing their duties. According to Brown (2022), case managers within the same health system perceived ambiguity and conflict regarding their roles and responsibilities.

Based on prior studies, the significance of this project is the potential to increase staff satisfaction thereby improving the quality, efficiency and outcomes of the care experienced by patients. Since case managers have been identified as having the potential to positively influence length of stay, this project is needed to examine the effects that a standardized case management model has on length of stay.

Chapter 2

Review of the Literature

A search of peer-reviewed articles and organizational websites exploring case management models was conducted. Key terms included case management, case management and role ambiguity, case management and role confusion, case management framework, and case management models.

The searches were conducted during the summer of 2022 using PubMed, CINAHL, the AHA website, and the CCMC website. Additional aggregated information regarding LOS was extracted from the electronic medical record database (EPIC) within the chosen facility.

The literature review explored case management's involvement in coordinating health and social care, the evolving role of case managers, and the ambiguity of the case management process. The roles and responsibilities for case management and the case manager adopted for this project are defined and compared to the various models being used by healthcare institutions nationwide.

The one significant influencing factor, standardization of the case manager role, will be discussed in reference to the efficiency and effectiveness to which case managers perform in their roles. Additionally, this review explains the association between the functions of case management and the overall outcomes of healthcare organizations, and the patients they serve, thereby clarifying the need for case management standardization.

In the current healthcare environment where resources are limited and the need for ongoing financial readjustments exists in a competitive market, case management has emerged as a key component of organizational strategic plans. The skills and knowledge of case managers, practicing within a defined case management framework, can help reduce financial

reimbursement risks by ensuring that value-based care goals are being met. Case management involvement in the various outcome measures that are directly associated with reimbursement risk is beneficial to organizations as they cope with the financial complexities of healthcare (Tahan, Kurland & Baker, 2020).

Evolving Case Manager Roles

Healthcare systems depend on their case management teams to ensure the goals of value-based care are being met. The accountability, responsibility, coordination of care, and transitions correlate with the quality, safety, and costs that significantly impact institutions (Tahan, Kurland & Baker, 2020). As such, healthcare systems have constructed frameworks that are as diverse as the demographics and their locations necessitate.

Case managers functioning within case management frameworks can come from a variety of professional backgrounds. Professional case managers have been known to include social workers, physical therapists, occupational therapists, pharmacists, and nurses. Although case managers may include those with diverse backgrounds, nursing has been identified as the dominant discipline followed by social workers in most facilities. The differences in professional backgrounds have prompted the development of differing job titles (Tahan, Kurland & Baker, 2020).

To address the differences of titles and backgrounds, the CCMC offers a Certified Case Manager credential to ensure that case managers are able to practice competently (CCMC, 2022). However, certification does not ensure that the model for case management has consistent roles and functions for case managers across healthcare systems.

For example, the ACMA & CCMC (2022), states that case managers are responsible for assessing, planning, implementing, coordinating, monitoring, and evaluating to improve

outcomes, experiences, and value. However, the extent to which case managers should function to fulfill their responsibilities is unclear.

Case Management Ambiguity

A study conducted by Joo & Huber (2018), identified five themes that were barriers to efficiency and effectiveness in which case managers functioned. The five themes identified included: unclear scope of practice, diverse and complex case management activities, insufficient training, poor collaboration with other healthcare providers, and patient relationship challenges. Collectively, these themes illuminate the ambiguity in case manager roles due to variations in the understanding of boundaries and limitations of the role (Joo & Huber, 2018).

Vague and unclear job descriptions have contributed to feelings of practicing without structured plans of care (Kolind, Vanderplasschen, & De Maeyer, 2009). The multiple tasks that case managers must perform to meet the complex needs of patients become extremely challenging when roles are unfamiliar, and the margins are unclear (Joo & Huber, 2018).

Additionally, studies have found that case managers often thought their training, primarily focused on meeting qualifications and didactic presentations, was insufficient for the demands of the role (Eack et al., 2009; Moise & Mulhall, 2016). Deficiencies in collaboration with other healthcare providers may be the result of misunderstandings among professions regarding the role of the case manager. Case managers have experienced poor communication that pertain to patient discharges thereby diminishing opportunities to coordinate services and resources (Joo & Huber, 2018). Also, the relationship with patients is known to be challenging. Unclear boundaries and limitations can potentially forge relationships that are too close. This tends to create undue stress for the case manager and can place the patient in a dependent position (Joo & Huber, 2018).

Based on the challenges identified, the implementation of a standardized case management framework should be considered. The implementation of a standardized framework, whereby the role and functions of the case manager is well defined and understood within the multidisciplinary realm, can potentially influence positive outcomes.

Benefits of a Standardized Model

Case management is an important component along the healthcare continuum. The efficiency and effectiveness in which case managers function within a case management framework can positively or negatively affect overall outcomes in acute care hospitals. Case managers that understand the organization's case management framework and their role and responsibilities within that framework, are able to ensure that patients have a safe, high-quality hospital LOS.

The challenges that patients experience, especially those with complex problems, can present barriers to care. The everchanging sociopolitical, regulatory, legislative, and economic forces have prompted acute care hospitals to establish case management frameworks that are equipped to navigate the evolution of healthcare (Tahan, Kurland & Baker, 2020).

As part of the multidisciplinary team, case managers are on the frontlines of ensuring positive outcomes in an environment of value-based care (Tahan, Kurland & Baker, 2020). The case manager's knowledge, skill, and ability to navigate through the continuum of care provides patients with the tools that they need to sidestep challenges and improve outcomes (Yin, Wang, Jiang, & Long, 2020).

The advancements in technology have expanded the options patients have regarding their care. Although having more options can be desirable, it also can increase the level of difficulty when decisions must be made. In situations where decisions are based on quality versus quantity

of life and the financial feasibility based on resources, case managers are crucial to the support of patients and families. The information-seeking and education components of their role is invaluable when patients and families need to make informed decisions (Sortedahl, Mottern, & Campagna, 2018).

Additionally, case managers are important to interdisciplinary teams as they coordinate care based on assessments that provide information pertinent to meeting health care goals. Care coordination, by case managers, is essential to implementing a plan of care and the assurance that patients can safely transition from one care setting to the next (Sortedahl, Mottern, & Campagna, 2018).

Research by Thomas (2008), suggests that case managers working within a well-defined role, will have a positive impact on patient LOS. These benefits have been identified across clinical specialties and in different levels of care. Additionally, Thomas (2008), found that organizations that implemented improvements related to structure, processes, and expectations within a standardized delivery framework, were able to decrease LOS. Kim & Soeken (2005), found that case managers for patients with heart failure were effective in reducing LOS.

There is support in the literature for the value case managers can add to healthcare organizations. Correlations have been shown between improved outcomes and case management departments working within a well-defined framework. The literature review supports the potential value of case managers in meeting the demands encountered by healthcare organizations. Given their ability to influence outcomes, case management departments may benefit from developing a standardized model that could provide more impactful and competent case managers (Tahan, Kurland & Baker, 2020).

Chapter 3

Methods

The implementation of this project involved standardizing the case management model to provide consistency in the expectations and responsibilities of the case manager role. This chapter identifies the specific aims of this project, discusses the process of change, defines key terms, and addresses the process of implementing a standardized case management framework. The standardization of the case management framework includes the following:

1. Initiating a template, within EPIC, for standardized case manager documentation.
2. Use of the case handoff column in EPIC to improve communication.
3. Establishing a consistent process for the management of referrals and authorizations.

Based on prior studies (Thomas, 2008; Thomas, 2009), the significance of this project is the potential to improve the quality, efficiency, and outcomes of the care experienced by patients. Since case managers have been identified as having the potential to positively influence LOS, this project was needed to examine the effects that a standardized case management model has on LOS. Lastly, the plan to evaluate the implemented framework through data analysis was explored. The following specific AIMs will be implemented to standardize the case managers' work as well as create efficiencies.

- Standardize case management workflows and processes.
- Implement an open feedback system for team members.
- Provide adequate training and departmental resources.
- Monitor Key Performance Indicators.

Lewin's Change Theory

Change within healthcare organizations can be a complex process. The competitive and ever-changing environment of healthcare requires organizations to respond to changes in order to survive. Although the complexity of change can vary among disciplines (Wojciechowski, Pearsall, Murphy, & French, 2016), successful change initiatives often use a change theory to implement organizational shifts (Shirey, 2013). Theories provide direction and predictable results when used for organizational change (Michie & Johnson, 2012).

Kurt Lewin (1951) developed a change theory that involves three necessary phases to successfully complete a process change: unfreezing, change, and refreezing. This theory is most effective when formal leaders drive and support the change (Shanley, 2007). Lewin's change theory, as one of the oldest, is versatile, practical, easy to understand and use (Shirey, 2013).

Elements

Unfreezing is the first phase and involves getting ready for change. In this phase, individuals are made aware of problems to make it possible to release old behaviors and undo current processes. This can be accomplished through education and challenging the status quo (Lewin, 1951; Wojciechowski et al., 2016).

Change is the second phase. Lewin's theory looks at change as a process rather than an event (Shirey, 2013). During this phase, alternatives are sought, benefits of change are demonstrated and forces that negatively affect change are reduced. Contributing factors to this phase include brainstorming, role modeling new ways, coaching and training (Lewin, 1951; Wojciechowski et al., 2016).

Refreezing is the third phase of change that encompasses the integration and stabilization of the changes so that it becomes embedded into the culture, policies, and practices (Lewin,

1951; Shirey, 2013). Facilitation of the refreezing process may include celebrating successes, retraining, and monitoring Key Performance Indicators (Wojciechowski et al., 2016).

A review of the literature highlights the value of using Lewin's change theory as a strategic resource to mobilize change. The robust evidence of its efficacy (Burnes & Cooke, 2012) supports the use for change initiatives in a top-down approach and when there is time to produce change. Therefore, Lewin's change theory will be used for this project.

Definitions

The following key terms will be used for this project:

- **Case management:** "a dynamic process that assesses, plans, implements, coordinates, monitors, and evaluates to improve outcomes, experiences, and value" (ACMA & CCMC, 2022).
- **Outcome:** a specific measurable metric arrived at as the result of an intervention (Reynolds, 2013).
- **Job description:** a document that outlines the tasks, duties, function and responsibilities of a position (Reynolds, 2013).
- **Process:** a series of actions or steps taken to achieve a particular end (Oxford Dictionary, 2010).

Key Performance Indicator/Operational Definition

- **Key Performance Indicator:** Average length of hospital stay.

Operational Definition:

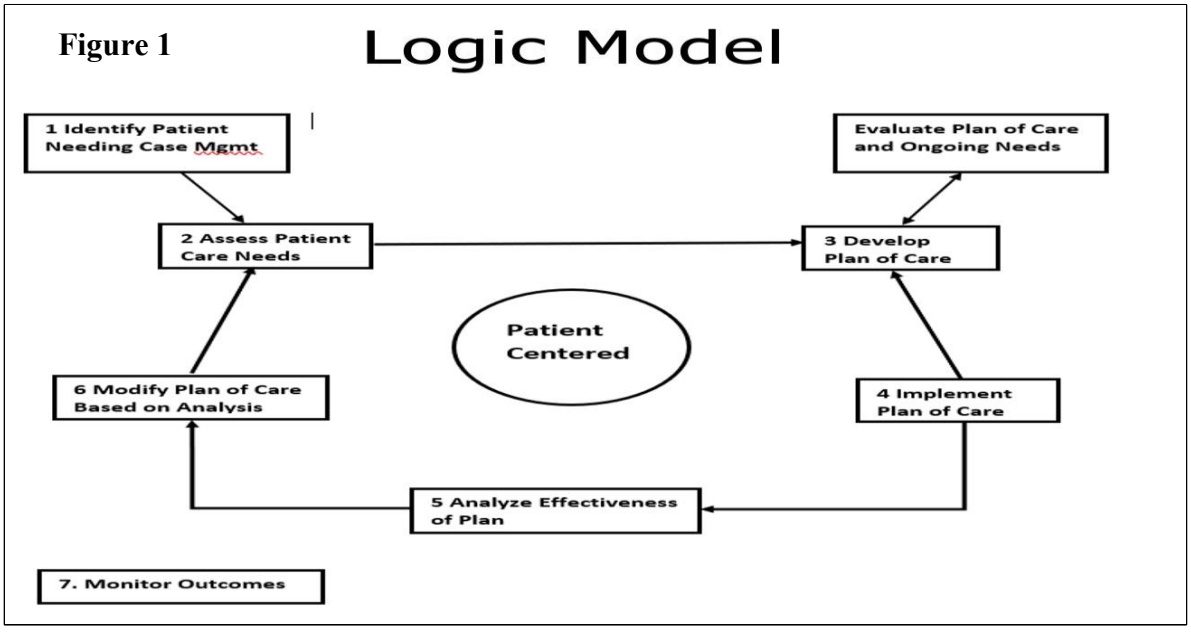
- Calculation: The total inpatient days (numerator)/total inpatient discharges (denominator) = average LOS monthly.

Case Management Framework

The case management framework, used for this project, was adapted from the framework established by the The Commission for Case Management Certification. The case management framework (Figure 1) has seven essential domains (CCMC, 2022):

- Case management concepts.
- Principles of practice.
- Healthcare management and delivery.
- Healthcare reimbursement.
- Psychosocial aspects of care.
- Rehabilitation, professional development.
- Advancement of case management. knowledge and practice.

Figure 1



Additionally, there are nine major phases in the case management process, screening, assessing, stratifying risk, planning, implementing (care coordination), follow-up, transitioning (transitional care), communicating post transition, and evaluating (CCMC, 2022). Although the nine phases are listed in order, there may be phases that are revisited until patient needs are met.

Implementation

The implementation plan was initiated by the principal investigator and transformation consultant employed by the facility. The first phase, according to Lewin's change theory, in the process implementing the change to a standardized case management framework, is to unfreeze the current modes of operation. In this phase of the change process, gaps in the current daily workflows and processes were identified. Based on the identified gaps (i.e., inconsistencies for the role), the principal investigator communicated the reason why a change was needed and the vision for the change. During this unfreezing phase, the concerns of team members were addressed.

In the "change" phase, the principal investigator led the team in implementing a standardized framework, starting with re-educating tenured members. This included a review of the job description for a uniform understanding and to introduce evidence-based processes. The case manager director provided coaching to address concerns and ensure focus on the objective. Following the indoctrination of the job description, the principal investigator introduced the standardized evidence-based processes and procedures to be used by the case management department. To address concerns regarding the change, and ensure the focus remained on the goal, the director of case management provided coaching and ongoing communication throughout the transition to a standardized framework.

In the last phase of the change, refreezing, the new standardized framework will became imbedded into the case management culture, policies, and practices. During this phase the principal investigator used a force field analysis (FFA) to assess factors and forces that could influence the stabilization of the new framework. The FFA, was developed by Lewin (1997), to identify specific forces that were driving or restraining movement toward a goal. The FFA was utilized to identify forces that promote change and mitigate forces that may impede change. The refreezing phase is important to the sustainability of the change over time.

Evaluation of Model

Evaluation of a case management framework is essential to ensure that the case managers are meeting the goals and adding value as a member of the interdisciplinary team. This project evaluated the use of a standardized case management framework by analyzing the LOS data for the organization, the medical unit, and the CHF patients on a medical floor. LOS for the organization, the unit, and CHF patients was plotted on three different run charts. CHF patients were chosen because the literature suggests case management can have an impact on this patient population. The analysis of LOS data provided insight into the use of a standardized case management framework.

According to Terra (2007), effective case management can decrease the LOS through the efficient use of services and adherence to evidenced-based standards of care. The process of evaluating the standardized case management framework included monitoring the LOS reports weekly using EPIC. Furthermore, to guarantee the consistent application of the standardized framework, random audits of the workflow and processes were initiated in the second month of the project by the Director for Case Management (see Appendix A).

Fluctuations in LOS is an expected occurrence for this project. However, fluctuations were accounted for by using statistical process control (SPC) methods for the organization, the medical unit, and CHF patients on the medical floor for 12 weeks post implementation as the defining metric. The efficiency and effectiveness of the framework was based on the average weekly LOS for the organization, the medical unit, and CHF patients. A lower LOS provides support for the use of a standardized case management model. In contrast, a rise in the LOS would indicate that a more in-depth investigation is needed into the efficient use of services, adherence to evidence-based standards of care, and the ways in which health outcomes are being affected.

Data was collected using the hospital EPIC database. This database collects information regarding patient's date of admission and discharge. Reports generated in EPIC provided data pertaining to hospital LOS, unit LOS, as well as LOS for patients with a diagnosis of CHF. Data obtained for this project was evaluated using run charts to analyze and interpret data. By using run charts, LOS data can be monitored over time to detect trends, shifts, or cycles.

Current LOS data was collected weekly and recorded on three separate run charts. The post-intervention data (12 weeks) for the hospital, unit and CHF patients was compared to evaluate the effectiveness of the intervention by highlighting the outcomes of the project. The vertical axis on the run chart is the representation of the outcome being measured (LOS), and the horizontal axis represents the units of time by which the measurements are made.

The centerline on the run chart is the median of the data collected. The median is calculated by using the formula (n +1)/2 where n equals the number of data points. The median for this project will be calculated using data recorded weekly (n = 24 data points) therefore, (24 +1)/2 = 25/2 = 12.5 = median position.

The analysis of the run chart followed the four rules used by the Institute for Healthcare Improvement (IHI) (Lloyd, 2019). The relevant rules are as follows:

- Rule 1: A shift in data.
- Rule 2: A trend in the data.
- Rule 3: Too many or too few runs in the data.
- Rule 4: An astronomical data point.

Shift in Data

Shifts in data are considered when there is a run of six or more consecutive data points on either side of the median. A run is defined as one or more data points on the same side of the median (Lloyd, 2010). The probability of six or more data points on one side of the median representing change when no change has occurred is less than 5% (Provost & Murray, 2011).

Trend in Data

Trending data can be identified by using the IHI definition. The consecutive upturn or downturn of five or more data points is defined as trending data. It should be noted that the median is not a factor in determining whether a trend exists. If a data point falls on the median, it will be considered part of the trend (Provost & Murray, 2011).

Too Many or too Few Runs

Rule three is determining the number of "useful observations" in the data. This is done by subtracting the number of data points on the median from the total number of data points. Once the number of useful observations are determined, the table developed by Swed and Eisenhart (Lloyd, 2019) will be used to determine the appropriate minimum and maximum number of runs for this project (Lloyd, 2019). Runs identified as being outside of the established minimum or maximum range indicates a non-random pattern within the data (Lloyd, 2019).

Astronomical Data

An astronomical data point is the one point that far exceeds all other data points on the run chart (Lloyd, 2019). When an astronomical data point exists, there should be an investigation into the possible causes. One possible reason for an astronomical data point is that there may have been variability in the data collection process. In this case, the team may need to analyze the data to determine cause and develop a plan to avoid a reoccurrence (Lloyd, 2019).

Annotating the Run Chart

Annotation of the run chart was necessary to move from data to information. Annotated items will include:

- The baseline period.
- The point at which the intervention was initiated.
- Annotation of shifts and/or trends.

Annotation of the run chart provided the information that was key to evaluating the effectiveness of the implementation of a standardized case management framework. The proposed timeline for this project is listed in Table 1

Table 1

Timeline

Case Management DNP Scholary Project	2023 - 2024												
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
DNP Chapters 1-3 and Proposal Defense			3rd										
Institutional Review Board (IRB) submission to Henry Ford Health				X									
Institutional Review Board (IRB) submission to Xavier University (To follow approval from HFH)				X									
Team Meeting - Unfreezing Phase The Why and Input					X								
Begin process/documentation changes for case managers on 1GPU						X							
Team Meeting to discuss progression, use of electronic tools and process changes (Weekly look at LOS plot on Run Chart)							X						
Meeting to look at run chart of LOS changes needed?								X					
Team meeting to begin process of refreezing - Anchoring the process and ensuring methods of accountability in place, feedback from CM									X				
Team meeting Interpret run chart										X			
Scholarly project paper finalized and submitted for approval											X		
DNP scholarly project defense											X		

Chapter 4

Results

In healthcare settings, an important performance metric is the patient's LOS. The primary aim of this project was to implement a standardized case management framework to reduce LOS in an acute care hospital environment. The LOS for inpatients was compiled in an aggregated format within the EPIC electronic medical record software. This aggregated LOS data was maintained within a utilization management repository, enabling the generation of customized reports. The analysis of data derived from these customized reports, presented in a run chart format, is discussed in this chapter.

Weekly audits were conducted over a period of 12 weeks to monitor the LOS data after the intervention was implemented. The results were recorded on a run chart to track changes over time. During these weekly audits, the LOS data was compared to the previous week’s data set to identify any notable shifts or trends.

The data analysis was conducted by applying the four rules (data shift, data trend, number of runs, and astronomical data point) outlined by the IHI (Lloyd, 2019). At the start of this project, on 12/10/2023, the average LOS for the areas examined were as follows:

- The average overall hospital LOS for all identified Diagnosis-Related Group (DRG) codes stood at 4.22 days.
- The average LOS for all DRG codes on the general practice unit 3B was 4.45 days.
- The average LOS for patients with a CHF DRG code on the general practice unit 3B was 5.57 days.

Integrating a standardized case management framework into the department did not lead to a significant decrease in the LOS for hospitalized patients. While the framework did reduce

workflow duplication, enhance communication and collaboration, and improved accountability and responsibility among team members, the expected outcome was not met across the tracked metrics.

The 12-week average overall hospital LOS findings for all DRG-coded patients are presented on the run chart in Figure 2. Analysis of the raw data used for this run chart (see Appendix B) reveals 3 runs with a median of 4.35, and 3.57 (2/25/24) is highlighted as an outlier. A shift was also observed between 12/31 and 2/11. The 3B general practice unit, comprising all DRG patients, is illustrated in Figure 3. Examination of the raw data (see Appendix C) used for this run chart reveals 5 runs with a median of 4.76 and an Astronomical data point of 2.93 on 2/25/24. Further analysis of the raw data (see Appendix D) used for the run chart in Figure 4, specifically focusing on patients with a CHF DRG code, indicates 8 runs with a median of 5.12 and two Astronomical data points of 11 (12/31/23) and 1.67 (2/25/24). Although a trend was not identified, a shift was noted in Figure 2 which is an indication that there may have been conditions present that had more of an effect on the process globally than on the one specific general practice unit. There were no shifts or trends observed in the documented data on the run charts in Figure 3 and 4. Signals of change, as evidenced by too few runs, too many runs, or crossings of the median were not identified on any of the three run charts. All the findings indicate the patterns are random (Lloyd, 2019).

Figure 2

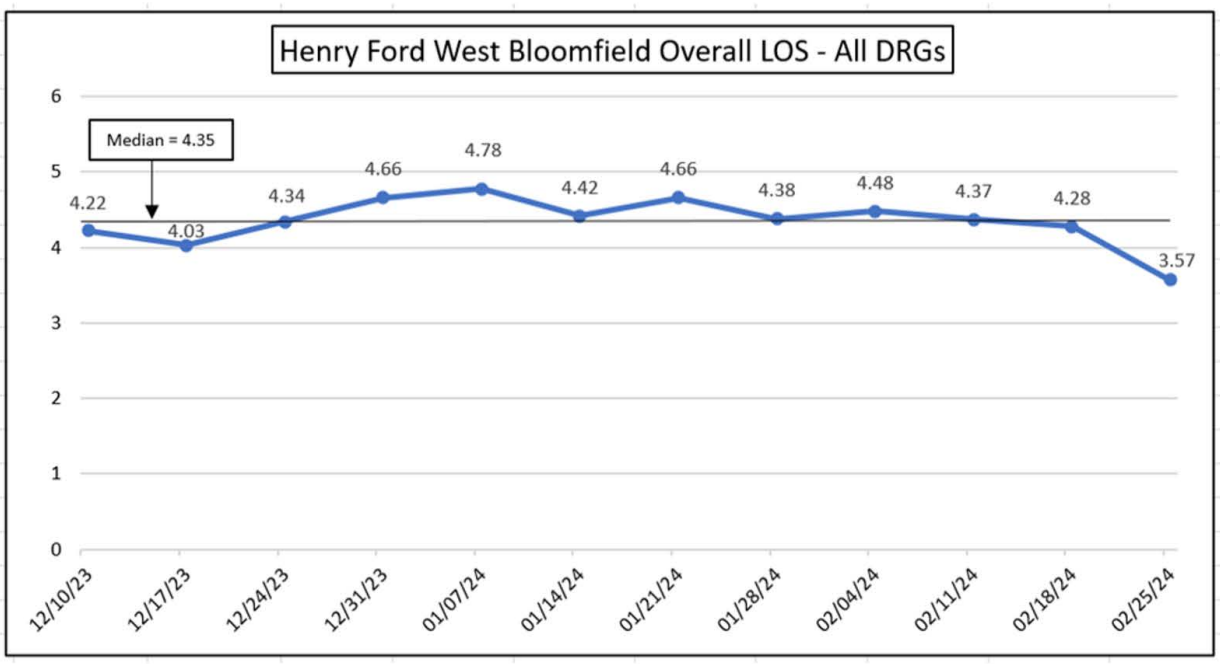


Figure 3

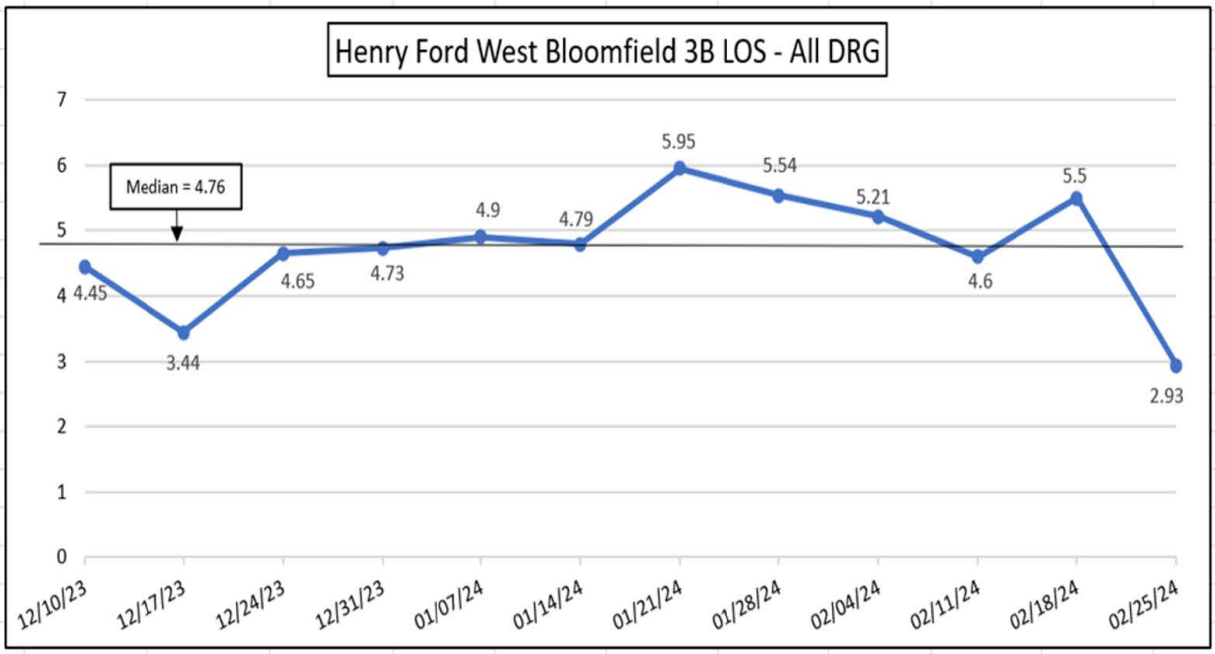
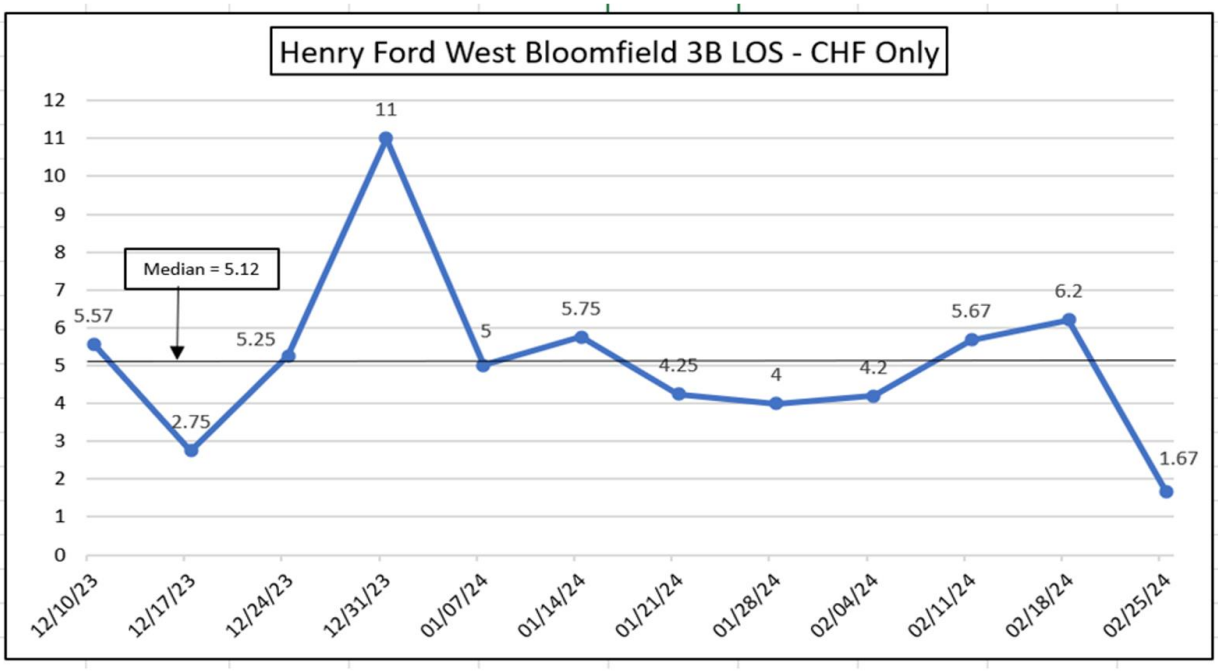


Figure 4


Henry Ford West Bloomfield 3B LOS - CHF Only
Median = 5.12
5.57
2.75
5.25
11
5
5.75
4.25
4
4.2
5.67
6.2
1.67
12/10/23
12/17/23
12/24/23
12/31/23
01/07/24
01/14/24
01/21/24
01/28/24
02/04/24
02/11/24
02/18/24
02/25/24

Chapter 5

Discussion

Observations of the case management department following the implementation of a standardized framework suggest an improvement in communication among case managers, increased job satisfaction, and demonstrated a decrease in redundant processes. Prior to the adoption of the standardized framework, there was ambiguity surrounding role boundaries and expectations associated with the case manager role. Following the framework implementation, case managers were more prepared to approach their care planning for patients with intention and awareness.

While the implementation of a standardized case management framework facilitated the identification of opportunities to enhance processes for improving the efficiency of patient flow within the system, there were no notable reductions observed in the overall length of hospital stays for patients, regardless of DRG code. Similarly, there were no notable decreases in the length of stay on the 3B general practice unit or for the specific CHF DRG code population on that unit.

Limitations

Consistent with all research, this project has limitations that must be acknowledged. While this project analyzed the LOS for comprehensive DRG codes among hospitalized patients, it also explored the overall DRG codes for patients admitted to a specific general practice unit and those with a specific DRG code in a designated general practice unit. However, no metrics examined for the CHF DRG code in other general practice units, which hinders the identification of potential confounders that could impact the LOS. CHF patients with a stay in the ICU should have been excluded.

Further limitations for this project include missed opportunities for data collection. While the case managers noted enhanced understanding of their role expectations and an increase in job satisfaction, no quantitative measurements were acquired. There is a need to look at the results longitudinally to ensure changes have been hard wired.

Implications

Previous studies involving case management workflows and processes usually focus on a singular unit of care or patients with a specific DRG code. This project analyzed the comprehensive DRG codes for hospitalized patients, the overall DRG codes for patients admitted to a specific general practice unit, and patients with a specific DRG code on a designated general practice unit. While the introduction of a standardized case management framework did not lead to a notable decrease in LOS across all levels studied, case managers reported enhanced understanding of their role, improved departmental collaboration and communication, and increased job satisfaction.

This project supports the potential for realizing financial benefits. Research (Smith & Larew, 2013) indicates that organizations witness reduced turnover rates when employees understand the expectations of their role and derive satisfaction from their work. Moreover, enhanced collaboration and communication may result in additional process enhancements that have the potential to reduce LOS, ultimately reducing costs for the hospital.

Recommendation for Future Projects

To enhance understanding of the standardized case management framework, it is recommended to replicate this project across various general practice units, utilizing different DRG codes. Moreover, forthcoming projects should incorporate surveys to assess case managers' knowledge of their roles and job satisfaction.

Conclusion

This project suggests that case managers working in collaborative environments with well-defined role expectations and job satisfaction have the potential to improve processes that can affect the LOS for hospitalized patients. Although the project did not achieve the anticipated reduction in LOS for the DRGs studied, there were no notable increases observed in the LOS. Since there were no notable negative or positive LOS outcomes observed, it is recommended to replicate this project within the same organization later. This replication should aim to investigate the impact of a collaborative environment with clearly defined role expectations and job satisfaction on LOS.

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Appendix A

Diagnosis		Admission Date	Admission Day	Trigger	Date of Initial CM Assessment	Turn Around Time (hours)	Date of Trigger	Discharge Date
Acute congestive h	I50.9	2/20/24	Tuesday	RA/RA Risk Score	2/26/24	6	2/26/24	2/28/24
Acute on chronic c	I50.9	2/23/24	Friday	CHF	2/27/24	4	2/27/24	2/27/24
CHF due to valvular	I50.9, I	2/24/24	Saturday	CHF	2/28/24	4	2/28/24	3/3/24
Acute on chronic sy	I50.23	2/25/24	Sunday	PT/OT Recommendation	2/29/24	4	2/29/24	3/1/24
Acute on chronic c	I50.9	2/26/24	Monday	CHF	2/28/24	2	2/28/24	2/29/24
Acute on chronic h	I50.33	2/26/24	Monday	CHF	2/28/24	2	2/28/24	2/28/24
Congestive heart fa	I50.9	2/26/24	Monday	CHF	Followed by Hospice	#VALUE!	d by Hospice	2/29/24
Acute on chronic c	I50.43	2/26/24	Monday	CHF	2/27/24	1	2/27/24	3/8/24
Acute on chronic h	I50.43	2/27/24	Tuesday	CHF	2/28/24	1	2/28/24	3/11/24
CHF (congestive he	I50.43	2/27/24	Tuesday	CHF	2/28/24	1	2/28/24	3/2/24
Congestive heart fa	I50.9	2/28/24	Wednesday	CHF	2/28/24	0	2/28/24	2/29/24
CHF exacerbation (	I50.9	2/29/24	Thursday	RA Risk Score	3/4/24	4	3/4/24	3/5/24
Acute on chronic d	I50.33	3/1/24	Friday	RA Risk Score	3/1/24	0	3/1/24	3/14/24
Heart failure (CMS-	I50.9	3/1/24	Friday	CHF	3/6/24	5	3/6/24	3/6/24
Acute on chronic H	I50.23	3/1/24	Friday	CM Consult	3/4/24	3	3/4/24	3/7/24
Acute on chronic h	I50.33	3/3/24	Sunday	Readmission	**Not Opened**	#VALUE!	**Not Opened**	3/6/24
Congestive heart failure wi		3/3/24	Sunday	CHF	3/5/24	2	3/5/24	3/13/24
Acute combined sy	I50.41	3/4/24	Monday	CHF	3/6/24	2	3/6/24	3/15/24
Acute on chronic d	I50.33	3/5/24	Tuesday	PT/OT Recommendation	3/7/24	2	3/7/24	3/10/24
Congestive heart fa	I50.9	3/5/24	Tuesday	ALF Return	3/6/24	1	3/6/24	3/7/24
Congestive heart failure (CI		3/5/24	Tuesday	CHF	3/6/24	1	3/6/24	3/8/24
Acute systolic and (	I50.9	3/5/24	Tuesday	MD Request	3/7/24	2	3/7/24	3/7/24
		3/6/24	Wednesday	CHF	3/7/24	1	3/7/24	3/8/24
Acute diastolic con	I50.31	3/7/24	Thursday	CHF	3/8/24	1	3/8/24	3/12/24
Chronic diastolic (congesti		3/7/24	Thursday	CHF	3/8/24	1	3/8/24	3/9/24
Acute on chronic d	I50.33	3/7/24	Thursday	CHF	3/8/24	1	3/8/24	3/9/24
Acute congestive h	I50.9	3/7/24	Thursday	RA Risk Score	3/7/24	0	3/7/24	3/23/24
Acute on chronic diastolic		3/8/24	Friday	CHF	3/12/24	4	3/12/24	3/14/24
Chronic diastolic c	I50.32	3/9/24	Saturday	None	**Not Opened**	#VALUE!	**Not Opened**	3/11/24
CHF exacerbation (	I50.9	3/9/24	Saturday	CHF	3/12/24	3	3/12/24	3/15/24
Acute on chronic d	I50.33	3/9/24	Saturday	CHF	3/12/24	3	3/12/24	3/20/24
Congestive heart fa	I50.9	3/11/24	Monday	CM Consult	3/12/24	1	3/12/24	3/15/24

CHF (congestive he	I50.43	3/13/24	Wednesday	CHF	3/14/24	1	3/14/24	3/23/24
Acute on chronic H	I50.23	3/14/24	Thursday	CHF	3/15/24	1	3/15/24	3/20/24
Acute on chronic d	I50.33	3/15/24	Friday	CHF	3/18/24	3	3/18/24	3/19/24
Congestive heart fa	I50.9	3/16/24	Saturday	BPCI	3/18/24	2	3/18/24	3/18/24
CHF (congestive he	I50.43	3/16/24	Saturday	Readmission	3/18/24	2	3/18/24	3/23/24
		3/16/24	Saturday	CHF	3/19/24	3	3/19/24	3/23/24
CHF (congestive he	I50.43	3/17/24	Sunday	BPCI	3/18/24	1	3/18/24	3/21/24
Acute systolic CHF	I50.21	3/17/24	Sunday	CHF	3/19/24	2	3/19/24	3/20/24
Chronic combined	I50.42	3/18/24	Monday	RA Risk Score	3/18/24	0	3/18/24	3/22/24
Chronic systolic co	I50.22	3/19/24	Tuesday	CM Consult	3/21/24	2	3/21/24	3/25/24
Acute systolic cong	I50.21	3/20/24	Wednesday	CHF	3/22/24	2	3/22/24	3/27/24
		3/20/24	Wednesday	CHF	3/26/24	6	3/26/24	3/26/24
Acute on chronic h	I50.33	3/21/24	Thursday	CHF	3/22/24	1	3/22/24	3/25/24
Acute exacerbation of CHF		3/22/24	Friday	CHF	3/22/24	0	3/22/24	3/28/24
Chronic diastolic H	I50.32	3/2/24	Saturday	RA Risk Score	3/4/24	2	3/4/24	
Chronic diastolic c	I50.32	3/7/24	Thursday	CHF	3/8/24	1	3/8/24	4/3/24
Acute on chronic d	I50.33	3/8/24	Friday	CHF	3/8/24	0	3/8/24	
Acute on chronic h	I50.33	3/12/24	Tuesday	CHF	3/13/24	1	3/13/24	
Acute HFrEF (heart	I50.21	3/16/24	Saturday	RA Risk Score	3/19/24	3	3/19/24	
Acute on chronic h	I50.9	3/25/24	Monday	CHF	3/26/24	1	3/26/24	
Acute on chronic c	I50.9	3/26/24	Tuesday	CHF	3/26/24	0	3/26/24	4/1/24
Chronic diastolic h	I50.32	3/30/24	Saturday	CM Consult	3/31/24	1	3/30/24	4/2/24
Chronic diastolic c	I50.32	3/29/24	Friday	None				
Acute on chronic sy	I50.23	4/2/24	Tuesday	None				
CHF (congestive he	I50.43	3/28/24	Thursday	None				
Acute on chronic H	I50.23	4/2/24	Tuesday	None				

Appendix B

HFWB CM Project

LOS Summary – All Units All DRGs

<Week 12/10/2023 – 3/10/2024, Data 100% Coded>

patientclass	Inpatient
Coded	All
Exclude DRG	N

	Column Labels					
	2023	2023 Total	2024			2024 Total
	Dec		Jan	Feb	Mar	
Location						
HFWB WEST BLOOMFIELD HOSPITAL						
ALOS	4.19	4.19	4.63	4.19	3.98	4.32
AArithMeanLOS	4.64	4.64	4.83	4.77	4.66	4.77
AGMLOS	3.57	3.57	3.70	3.66	3.60	3.67
CMI	1.57	1.57	1.59	1.64	1.55	1.60
OPP Days per patient	0.62	0.62	0.92	0.53	1.26	0.84
Total OPP Days	500.4	500.4	1016.2	612.9	753.7	2382.8
Discharges	809	809	1100	1154	598	2852
Sum of inpatientlengthofstayindays	3387	3387	5091	4840	2381	12312

HENRY FORD HEALTH

Appendix C

HFWB CM Project
3B – ALL DRG LOS
<Week 12/10/2023 – 3/10/2024, Data 100% Coded>

patientclass	Inpatient
yearmonth	(Multiple Items)
Coded	All
Exclude DRG	N
departmentname	WBH WB3 CARD MEDSURG
drg code	All

		weekstartdate													
hospitallocation	Values	12/10/2023	12/17/2023	12/24/2023	12/31/2023	1/7/2024	1/14/2024	1/21/2024	1/28/2024	2/4/2024	2/11/2024	2/18/2024	2/25/2024	3/3/2024	3/10/2024	TOTAL
HFWB WEST BLOOMFIELD HOSPITAL	ALOS	4.45	3.44	4.65	4.73	4.9	4.79	5.95	5.54	5.21	4.6	5.5	2.93	4.35	5.19	4.68
	AArithmeticMeansLOS	5.12	4.41	5.09	5.13	4.61	4.95	6.03	6.18	5.45	5.15	5.19	4.76	4.75	5.04	5.13
	AGMLOS	3.84	3.37	3.89	3.9	3.54	3.79	4.58	4.71	4.1	3.83	3.94	3.61	3.7	3.82	3.9
	CMI	1.42	1.19	1.42	1.48	1.29	1.51	1.81	1.83	1.82	1.37	1.37	1.31	1.281	1.318	1.47
	OPP Days per Pt	0.6	0.07	0.76	0.83	1.36	1	1.37	0.83	1.11	0.77	1.56	-0.68	0.65	4.28	0.97
	Total OPP Days	18	2	15	22	29	29	29	20	31	12	37	-20	13	90	325
	Discharges	29	27	20	26	21	29	21	24	28	15	24	30	20	21	335

HENRY FORD HEALTH

Appendix D

HFWB CM Project – CHF Focus

3B – ONLY CHF LOS (DRG 291-293)

<Week 12/10/2023 – 3/10/2024, Data 100% Coded>

patientclass	Inpatient
yearmonth	(Multiple Items)
Coded	All
Exclude DRG	N
departmentname	WBH WB3 CARD MEDSURG
drg code	(Multiple Items)

		weekstartdate													
hospitallocation	Values	12/10/2023	12/17/2023	12/24/2023	12/31/2023	1/7/2024	1/14/2024	1/21/2024	1/28/2024	2/4/2024	2/11/2024	2/18/2024	2/25/2024	3/3/2024	3/10/2024	TOTAL
HFWB WEST BLOOMFIELD HOSPITAL	ALOS	5.57	2.75	5.25	11	5	5.75	4.25	4	4.2	5.67	6.2	2	5.8	9	4.75
	AArithmeticMeansLOS	4.76	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	4.93	5.1	5.1	5.04
	AGMLOS	3.64	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.77	3.9	3.9	3.86
	CMI	1.16	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.22	1.28	1.28	1.26
	OPP Days per Pt	1.93	-1.15	1.35	7.1	1.1	1.85	0.35	0.1	0.3	1.77	2.3	-1.77	1.9	5.1	0.9
	Total OPP Days	14	-9	5	7	2	7	1	0	2	5	12	-12	10	10	54
	Discharges	7	8	4	1	2	4	4	3	5	3	5	7	5	2	60

HENRY FORD HEALTH