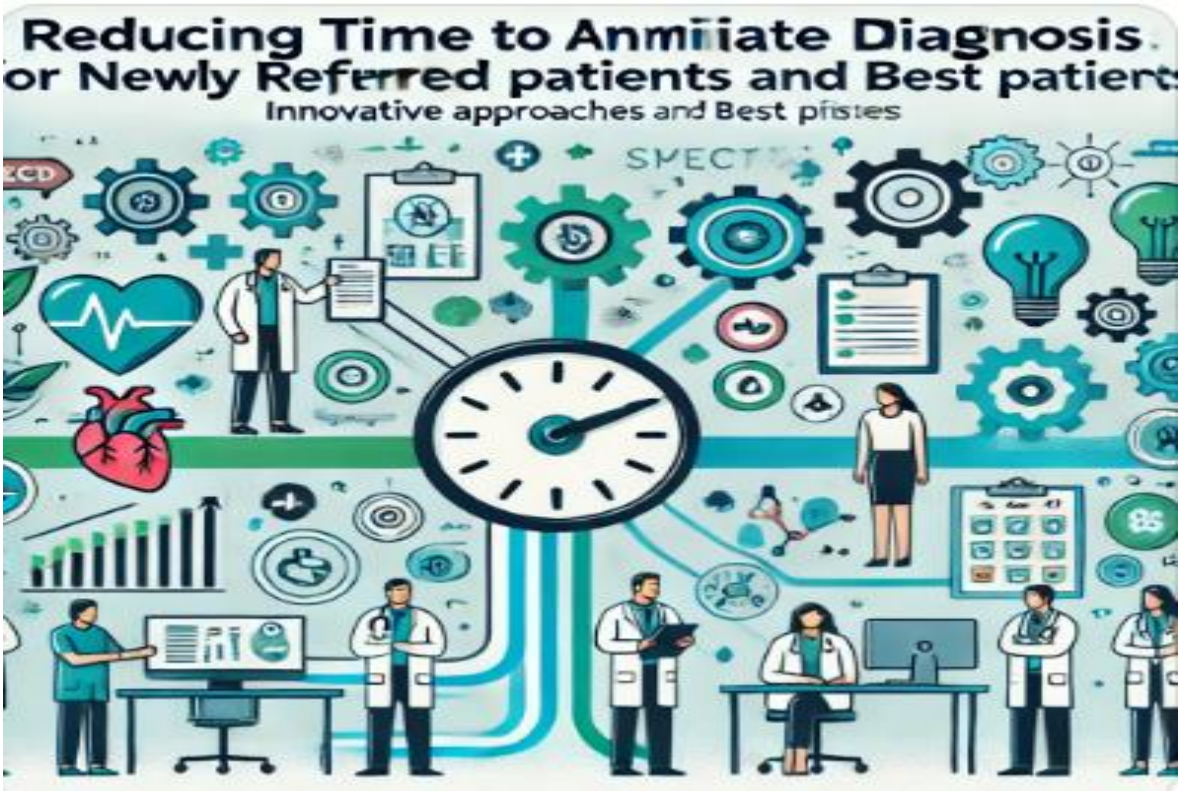
Chapter 10: Reducing Time to Initiate Diagnosis for Newly Referred Patients: Innovative Approaches and Best Practices



Authors:

Shinnona AlHarthy, Al Ameer Al Mashari, Wisal Al-Mahmoodi, Omar Ayaad, Rawan Ibrahim, Razzan Al Zadjali, Balaqis Al Faliti, Hind AlQamshouai,Abdulhamid A Turkomani, Khalid AlBaimani.

Sultan Qaboos Comprehensive Cancer Care and Research Centre (SQCCCRC) - University Medical City

Summary

Timely diagnosis and treatment initiation are essential in oncology, where delays can significantly impact patient outcomes. At the Sultan Qaboos Comprehensive Cancer Care and Research Centre (SQCCCRC) in Muscat, Oman, inefficiencies in the referral system caused delays in accepting new patients and scheduling their first appointments. This project aimed to enhance patient care by streamlining the referral process using technological enhancements, process optimizations, and patient engagement strategies. Utilizing the FOCUS PDCA (Find, Organize, Clarify, Understand, Select, Plan, Do, Check, Act) framework, the project achieved a significant reduction in the average days for patient acceptance from 4.3 to 1.3 days and a decrease in time from acceptance to the first appointment from 8.6 to 4 days. These statistically significant improvements demonstrate the effectiveness of a comprehensive, data-driven approach to optimizing patient care.

Key points

- Timely diagnosis and treatment are crucial in oncology, where delays can negatively impact patient outcomes, making a streamlined referral process essential.
- Inefficiencies in the referral system at SQCCCRC, such as delays in patient acceptance and appointment scheduling, were identified as key barriers to timely care, necessitating a comprehensive approach to improvement.
- The FOCUS PDCA framework was effectively utilized to implement technological enhancements, process optimizations, and patient engagement strategies, resulting in a significant reduction in patient acceptance time from 4.3 to 1.3 days and appointment scheduling time from 8.6 to 4 days.
- Technological upgrades, including a new referral management system and standardized policies, reduced administrative delays, ensured clear communication between entities, and enhanced overall efficiency in patient care.

Project Charter

Project Charter	Details
Project Title	Improving the Referral Process in Oncology at Sultan Qaboos Comprehensive Cancer Care and Research Centre (SQCCCRC)
Project Sponsor	Sultan Qaboos Comprehensive Cancer Care and Research Centre (SQCCCRC), University Medical City, Muscat, Oman
Project Start Date	3Q 2022
Project End Date	3Q 2023
Project Purpose	To enhance the efficiency and timeliness of the referral process at SQCCCRC by reducing delays in patient acceptance and scheduling of initial diagnostic appointments. The project aims to optimize patient care by streamlining the referral system through technological advancements, process standardization, policy updates, and patient engagement initiatives.
Problem Statement	Inefficiencies in the referral process at SQCCCRC have resulted in delays in patient acceptance and scheduling of initial diagnostic appointments, with an average time for patient acceptance of 4.3 days and a time from acceptance to the first appointment of 8.6 days. These delays negatively impact patient satisfaction, care quality, and outcomes, especially in oncology where timely diagnosis and treatment initiation are critical.
Project Goals and Objectives	1. Reduce the average time for patient acceptance from 4.3 days to less than 2 days. 2. Decrease the time from patient acceptance to the first appointment from 8.6 days to 4 days or less. 3. Implement a comprehensive referral system with enhanced accessibility and user-friendly orientation materials. 4. Standardize the referral process to ensure consistency, reduce variability, and improve coordination. 5. Engage patients in the referral process to improve satisfaction and trust.
Scope	Includes all aspects of the referral process for new patients at SQCCCRC, from external referrals to internal scheduling and acceptance procedures. The project focuses on reducing delays, optimizing communication, and improving patient engagement.
Key Stakeholders	Admission Discharge Transfer Office, Nursing Staff, Quality and Accreditation Department, Informatics and Cybersecurity Team, Physicians, Patients, Hospital Management
Resources Required	Budget for technology development, staff training, and patient education materials; personnel from relevant departments; IT infrastructure for the referral system; data analytics tools.
Risks and Assumptions	**Risks:** Resistance to new processes, limited resources for technology development and training, challenges in patient engagement. **Assumptions:** Full support from management, availability of necessary resources, active participation of all stakeholders, and effective communication across departments.
Success Criteria	Achieving a reduction in average patient acceptance time to less than 2 days and time to the first appointment to 4 days or less; successful

	implementation and utilization of the comprehensive referral system; improved patient satisfaction and streamlined processes as indicated by performance metrics.

Introduction

The referral process in healthcare is critical in determining how quickly patients can begin their diagnostic and treatment journeys. According to the World Health Organization (WHO), referral is a systematic process in which a healthcare provider seeks assistance from a more specialized facility due to limited resources or expertise (WHO, 2019). In oncology, this process is particularly important because cancer care often requires specialized, multidisciplinary teams and timely interventions to improve patient outcomes (Deandrea et al., 2018). A well-organized referral system ensures rapid access to specialized services, which is crucial for minimizing delays in diagnosis and treatment initiation (Majed et al., 2024).

At the Sultan Qaboos Comprehensive Cancer Care and Research Centre (SQCCCRC) in Muscat, Oman, inefficiencies in the referral system were identified as significant barriers to intiate timely patient care. Common delays in patient acceptance and scheduling of initial appointments led to increased anxiety for patients, potential deterioration in their condition, and overall dissatisfaction with the care process. This situation necessitated a comprehensive review and redesign of the referral system to align with best practices in healthcare delivery and quality management (Haroun et al., 2021).

The study utilized the FOCUS PDCA (Find, Organize, Clarify, Understand, Select, Plan, Do, Check, Act) framework, a proven model for continuous quality improvement in healthcare settings (Thornton et al., 2011). This approach combines a focused analysis of current processes with

iterative cycles of planning, implementing, and evaluating interventions, ensuring that changes are data-driven and effectively address identified inefficiencies (Majed et al., 2024).

Optimizing the referral process is crucial for several reasons. Firstly, it enhances patient satisfaction by reducing waiting times and improving communication with healthcare providers (WHO, 2019). Secondly, it prevents unnecessary duplication of tests and treatments, reducing healthcare costs and optimizing resource utilization. Thirdly, timely diagnosis and treatment initiation are associated with better clinical outcomes, especially in oncology, where early intervention can significantly impact survival rates (Haroun et al., 2021).

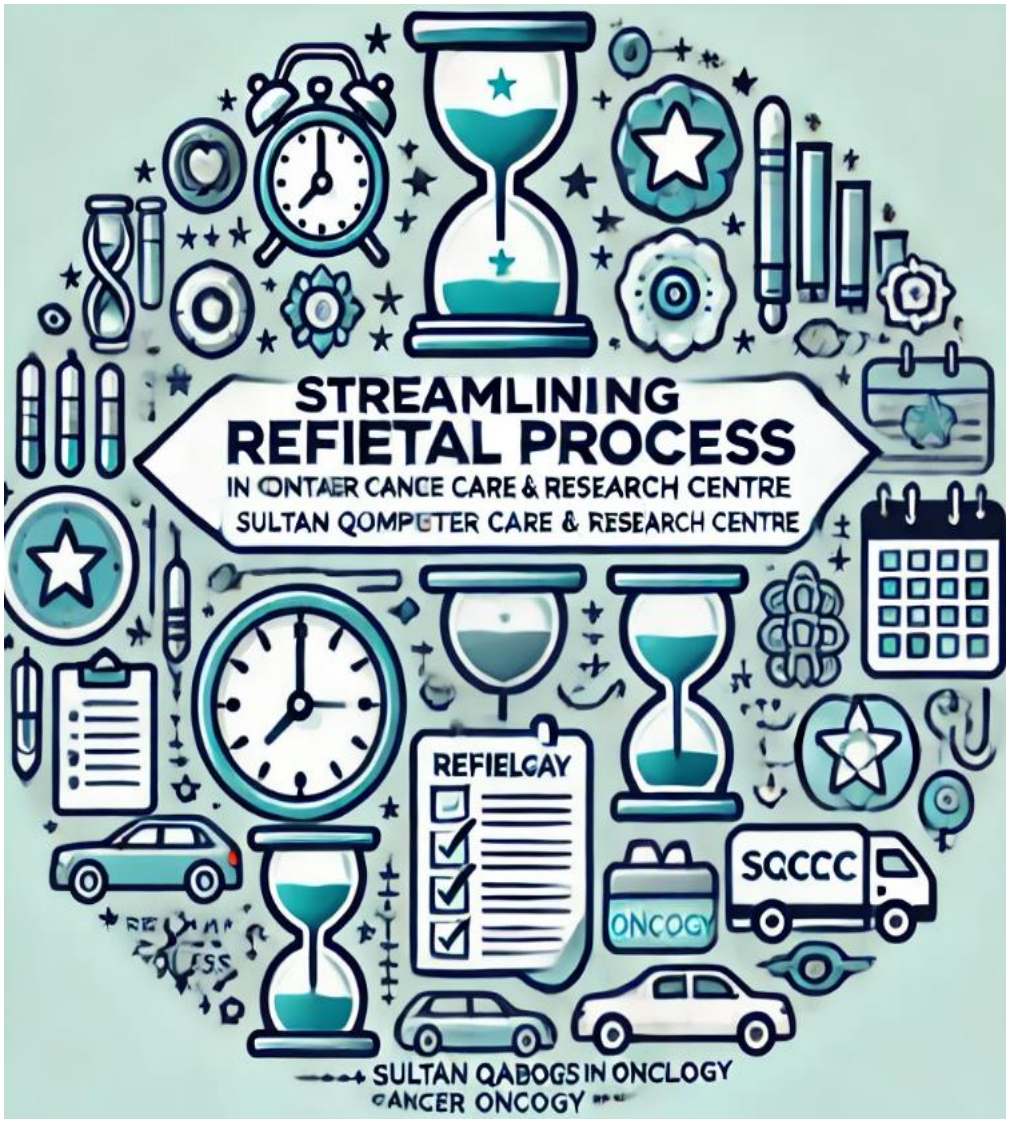
This study aimed to reduce the time required to start diagnosis for newly referred patients at SQCCCRC by implementing a comprehensive set of interventions, including technological upgrades, process optimization, and patient engagement initiatives. The objective was to streamline the referral system, minimize delays, and enhance overall patient care through a structured, evidence-based approach.

Problem Statement

Inefficiencies in the referral process at SQCCCRC resulted in prolonged delays in patient acceptance and scheduling of initial diagnostic appointments. The average time for patient acceptance was 4.3 days, and the time from acceptance to the first appointment was 8.6 days. These delays negatively affected patient satisfaction, outcomes, and overall care quality, especially in oncology setting, where timely diagnosis and treatment initiation are critical.

To address these challenges, a comprehensive approach was required to identify the root causes of delays and implement targeted interventions. The study's goal was to improve the efficiency of

the referral process, thereby reducing waiting times for newly referred patients and enhancing their overall care experience.



Methods

Setting: The study was conducted at the Sultan Qaboos Comprehensive Cancer Care and Research Centre (SQCCCRC) in Muscat, Oman, from the third quarter of 2022 to the third quarter of 2023.

Design: A one-group pretest-posttest quasi-experimental design was used to assess the impact of the interventions on key performance indicators within the oncology referral process. This design allowed for the evaluation of changes without a separate control group, focusing on the average days for patient acceptance and the time between acceptance and the first appointment. Data were collected from patient records and analyzed by the quality and accreditation department.

FOCUS PDCA Approach: The project followed the FOCUS PDCA methodology, which involves the following phases:

1. **Find Phase**: Identified key areas for improvement, such as reducing the average days for new patient acceptance (4.3 days) and the delay between acceptance and the first appointment (8.6 days).
2. **Organize Phase**: A multidisciplinary team was formed, including members from the patient flow office, nursing, quality and accreditation, informatics and cybersecurity, and physicians.
3. **Clarify Phase**: Developed a flowchart of the current referral process, identifying barriers and inefficiencies such as delays in registration and appointment scheduling (see Figure 1).

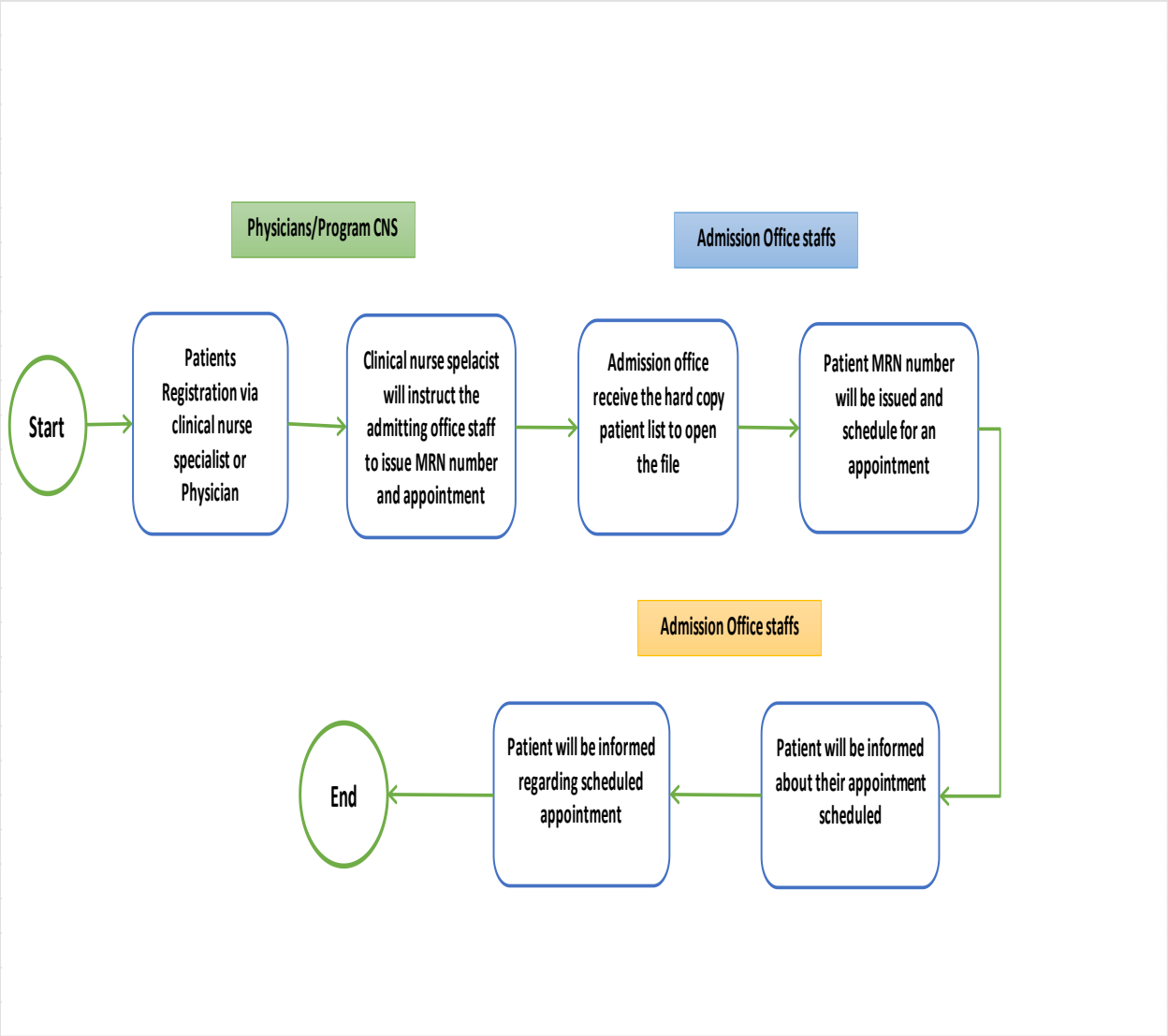


Figure 1: ***Previous Practice For New Patient Referral Appointment***

4. **Understand Phase**: Used Fishbone (Ishikawa) diagrams and brainstorming techniques to identify the root causes of these barriers (Figure 2).

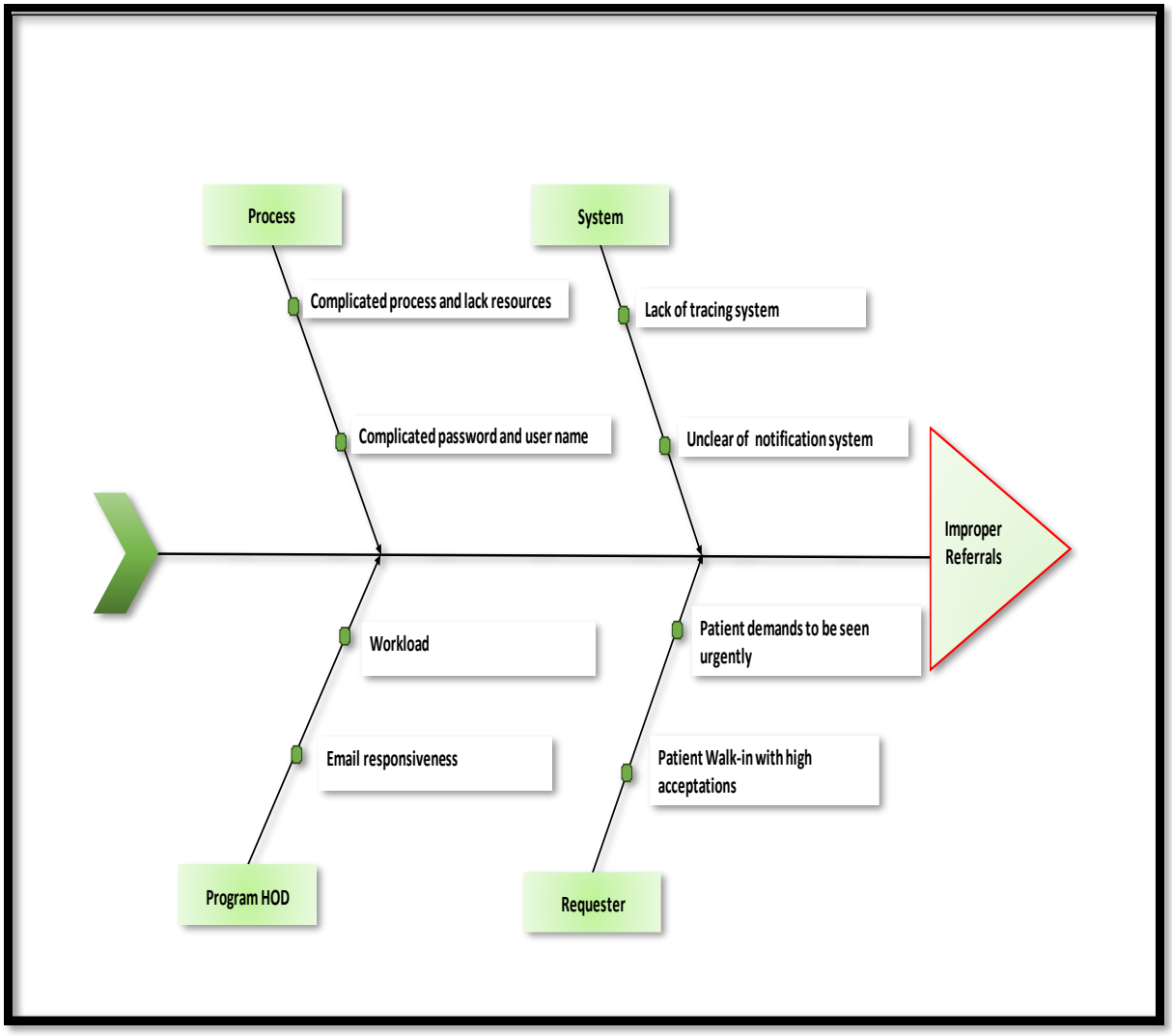


Figure 2: ***Cause-Effect Analysis For Improper Referral Appointments For New Patients***

5. **Select Phase**: Choose areas for improvement based on previous findings and literature, focusing on technology development, process and system modifications, and patient involvement.

PDCA Cycle Implementation: Operational plans were developed with leadership support and stakeholders. PDCA cycles were conducted from the fourth quarter of 2022 to the second quarter of 2023, with monthly follow-ups and discussions to monitor progress (Table 1).

Table 1: Improvement areas and Operational plans for the quality Improvement	
Main Area of Improvement	**Plans**
Technology	1. Technology Development: Creation of a comprehensive referral system addressing both external (referred organization) and internal (acceptance process) dimensions.
	2. Enhanced Accessibility: Publishing the referral system link across all relevant facilities and organization websites, ensuring convenient access for external parties.
	3. Orientation Materials: Development of informative and user-friendly orientation materials on the organization's website, providing clear guidance on navigating the referral system.
	4. Internal Training: Implementation of internal staff education initiatives to effectively educate and empower team members about utilizing the referral system adeptly.
Process	Standardize the profess of referral (internal and external process) Figure 3
System and policy management	1. Policy Formulation: Develop a comprehensive referral policy that outlines the objectives, scope, and principles guiding the acceptance process for patients.
	2. Criteria Definition: Define clear and specific criteria for patient acceptance based on the various programs and specialties offered. These criteria could include medical condition severity, treatment availability, and program suitability.
	3. Specialty Programs Criteria: Tailor the criteria for acceptance to the specific specialty programs available. Different programs may have unique requirements, ensuring that patients are directed to the most appropriate care setting.
Patient involvement	Develop awareness campaigns to educate patients about the referral process, including transportation options available to them.

Process Modifications: A new referral process was introduced, starting with an external link managed by the admission office and assigned to the appropriate program team for assessment. A continuous feedback loop was established to maintain communication and transparency among all parties (Figure 3).

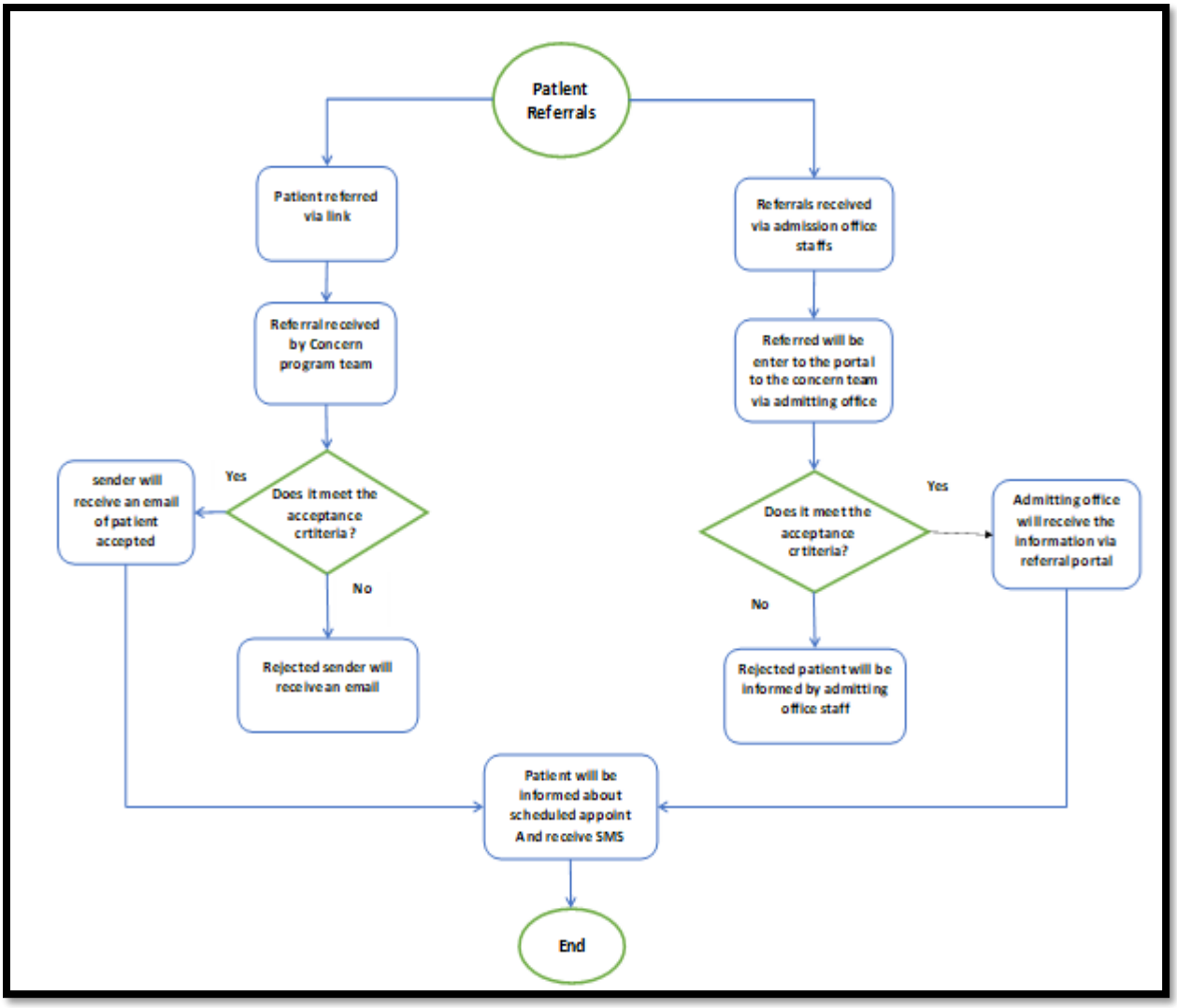


Figure 3: ***New Practice For New Patient Referral Appointment***

Referral Tracking System: A comprehensive system was developed to manage external and internal referrals, supported by training for internal staff and educational materials for external entities.

Policy Development and Acceptance Criteria: A standardized framework for referral acceptance and rejection was established, promoting fairness and consistency. Acceptance and rejection criteria were refined based on medical condition severity and treatment availability.

Data Analysis: Data were analyzed using SPSS version 23, with ANOVA and p-values calculated to assess the significance of observed changes.

Results

The intervention led to a significant reduction in the average days for new patient acceptance, from 4.3 days pre-intervention to between 1.3 and 1.6 days post-intervention. This improvement was statistically significant (F-value = 46.25, $p < .0001$). Additionally, the average time from patient acceptance to the first appointment decreased from 8.6 days to as low as 4 days, also showing significant improvement (F-value = 6.29, $p < .01$) (Table 2).

Table 2: ***Result Differences Pre and Post Interventions***

		Month	Mean	F	p value
Average number of days for the acceptance of new patients	Pre-data	Jul-22	4.3	46.25	0001.>
	Post intervention	Oct-22	1.3		
		Nov-22	1.3		
		Dec-22	1.6		
		Jan-23	1.6		
		Feb-23	1.4		
		Mar-23	1.3		
Average days between the patient acceptance and first visit appointment	Pre-data	Sep-22	8.6	6.29	0.002
	Post intervention	Oct-22	6.4		
		Nov-22	6.9		
		Dec-22	7		
		Jan-23	5		
		Feb-23	4		
		Mar-23	4		

Discussion

The findings of this study underscore the importance of a systematic approach to improving the referral process in oncology settings. By utilizing the FOCUS PDCA framework, the project was able to identify critical areas for improvement and implement targeted interventions that significantly reduced the time required for patient acceptance and the scheduling of initial appointments. This result is particularly significant in oncology, where delays in diagnosis and treatment can have profound effects on patient outcomes, including decreased survival rates and poorer quality of life (Deandrea et al., 2018).

The reduction in average days for patient acceptance from 4.3 to 1.3 days and in time to the first appointment from 8.6 to 4 days indicates that the interventions were highly effective in addressing the inefficiencies in the referral process. These improvements can be attributed to the comprehensive approach taken, which included technological enhancements, process optimization, policy updates, and patient engagement initiatives. The integration of technology, such as the development of a comprehensive referral system, played a crucial role in streamlining communication between referring entities and the receiving department, reducing administrative delays, and ensuring that critical information was readily available (Haroun et al., 2021).

Furthermore, policy updates and process standardization were essential in creating a consistent framework for managing referrals. Clear criteria for patient acceptance and rejection, tailored to specific specialty programs, ensured that all staff members were aligned in their understanding and execution of the referral process. This consistency reduced variability and errors, leading to faster decision-making and improved coordination across departments. The success of these strategies

is supported by previous research, which highlights the benefits of standardizing procedures to improve efficiency and reduce delays in healthcare settings (Majed et al., 2024).

Patient involvement was another key factor contributing to the success of the interventions. By educating patients about the referral process and available transportation options, the project empowered them to actively participate in their care, enhancing satisfaction and trust in the healthcare system. This aligns with studies showing that patient education and engagement are critical components in improving health outcomes and service delivery (Thornton et al., 2011).

Continuous monitoring and evaluation were critical to sustaining the improvements achieved. The use of data analytics to track performance allowed for timely identification of any emerging issues and enabled quick adjustments to the interventions as needed. This iterative process of assessment and modification is a core tenet of the PDCA methodology and is vital for ensuring that quality improvements are maintained over time (WHO, 2019).

Lastly, the study's focus on multidisciplinary collaboration was crucial for its success. By involving a range of stakeholders—from the patient flow office to nursing, quality management, informatics, and physicians—the project leveraged diverse expertise to develop well-rounded and practical solutions. This approach facilitated the identification of potential barriers and the creation of tailored interventions that addressed the specific needs of each department involved in the referral process (Haroun et al., 2021). The collaboration also fostered a culture of continuous improvement, where staff members were encouraged to contribute ideas and feedback, further enhancing the overall effectiveness of the initiative.

Conclusion

The results of this study highlight the effectiveness of a comprehensive, structured approach to improving the referral process in an oncology setting. The significant reduction in waiting times for newly referred patients demonstrates that the FOCUS PDCA framework, combined with technological enhancements, policy updates, and patient engagement initiatives, can lead to meaningful improvements in healthcare delivery. Moving forward, it is essential to continue monitoring these processes to ensure sustained gains and address any new challenges that may arise. The study provides a valuable model for other healthcare organizations seeking to optimize their referral systems and improve patient care outcomes.

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