

Optimizing Emergency Department Operations at the National Institute of Oncology: A Quality Control Circle Approach to Alleviate Overcrowding and Reduce Waiting Times

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Abstract

This study took place at the National Institute of Oncology (NIO) from October 2022 to February 2023. NIO is a reference center in Morocco for oncology. However, patient overcrowding in the emergency department (ED) and the relatively long waiting time for an emergency consultation remain the major problems hampering the smooth running of the ED. The purpose of this study is to limit overcrowding and waiting times. For this, we have adopted the method of resolution by the application of a *quality control circle* (QCC) in the emergency department (ED) as a new effective tool for managing overcrowding. Eight meetings were held, during which we succeeded in identifying the problem through brainstorming, followed by an analysis of the problem (1st/2nd level process flowchart, Ishikawa diagram). We then drew up a data collection and hypothesis verification plan, followed by the selection of results and the implementation of a QCC monitoring plan. The proposed solutions include the creation of a triage unit and the assignment of a triage team managed by a care team led by a doctor and a triage nurse. As well as assuring communication with the doctors and head nurses of the departments involved. The Waiting time has been cut from 80 to 19 minutes. ED overcrowding was cut by two-thirds (from 105 to 38 patients). The introduction of a quality cycle in INO's ED has helped create a climate of trust between patients and healthcare staff. Other cycles have followed the success of the first one.

Keywords: National Institute of Oncology, Reduce Waiting Times, Quality Control Circle Approach.

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1. Introduction

ED overcrowding is a major public health problem [1-2]. This flow diverts a significant proportion of staff energy and time, which could be more usefully devoted to treating urgent patients [3-4]. In addition, overcrowding has an impact on the quality of care offered, and on the optimal use of resources [5-6]. As a result, this situation leads to staff dissatisfaction [7-8]. Aggression on the part of service users towards healthcare staff and towards one other [9-10]. Overcrowding is the result of several factors, both internal and external to the hospital [11]. For some, it is the result of insufficient access to hospital beds and a shortage of nursing and medical staff in the ED [12-13]. Overcrowding can lead to poor patient outcomes and increased length of stay [14]. The

damage suffered by emergency patients waiting for care is numerous: treatment errors, adverse events, increased waiting times, lack of patient satisfaction [11], conflicts between patients and healthcare staff, and ultimately increased morbidity and mortality [15-18]. The study took place at NIO in Rabat. NIO is the leading oncology center in Morocco (in operation since 1985), recruiting more than 7000 new cancer patients annually. With a bed capacity of over 270, it is part of the tertiary level of high-level specialized care and complements a healthcare network [19]. NIO's mission is to provide screening and diagnosis, treatment and monitoring of cancer patients, teaching, and research in the fight against cancer, and epidemiological studies. It is part of the National Quality Assurance Program (NQAP).

The NQAP considers the quality of care to be the correct performance of interventions in accordance with pre-established standards and procedures, with the aim of satisfying the clients of the Moroccan healthcare system and maximizing results without generating health risks or unnecessary costs [20-21]. The NIO is a national reference center for quality management. Nevertheless, some departments suffer from shortcomings, including the ED. The ED receives more than 32,325 patients for emergency care every year. With a median of 105 patients per day. Patients come to us mainly due to complications related to their state of health. The ED suffers from a lack of caregivers (two doctors and three nurses during the day and one doctor and one nurse during the night), absence of work organization, the non-urgent consultations referred to the ED by other departments, and the high number of people accompanying patients [22]. As a result, patient overcrowding and the long waiting time (80 minutes) to see an emergency doctor remain the department's major problems. Overcrowding is broadly defined as "the situation in which the functioning of the ED is hampered principally by the excessive number of patients awaiting consultation, assessment, treatment, or awaiting discharge, in relation to physical or staff capacity" [23]. In oncology, to improve the quality of services provided to cancer patients 15, the ED is committed to improving its care services by reducing overcrowding in the department and by improving waiting times for patients. With this in mind, we have introduced a quality cycle to reduce congestion and waiting times in the oncology ED [24].

2. Materials and methods

To solve the problem of overcrowding in the ED, hospital management has undertaken to introduce a QCC. Prior to the launch of our quality circle, all ED Medical and nursing staff received ongoing training in the basics of quality management, setting up quality circles, quality of care, quality of reception, project management, conflict management, and interpersonal communication.

2.1. Design

The study lasted five months (October 2022 to February 2023). To give the circle a good start, we have put together a volunteer team of six nurses, three doctors, and a team manager who will work together to complete the circle. We also Appointed a rapporteur and monitor and established the team's values. Before starting our quality cycle, we had to establish the team values that would help create a good working climate, namely: Communication, exchange, responsibility, respect, having fun, and Trust [25]. Meetings with minutes were scheduled for consultation, progress, and continuity of the circle. Eight meetings were held, during which we succeeded in identifying the problem through brainstorming, followed by an analysis of the problem (1st/2nd level process flowchart, Ishikawa diagram). We then drew up a data collection and hypothesis verification plan, followed by the selection of results and the implementation of a QCC monitoring plan [26].

2.2. Strategy

2.2.1. Step 1: Problem identification

The first meeting was devoted to identifying the most relevant problems by adopting a "brainstorming" approach, Elkhalloufi et al., 2024

with everyone making suggestions spontaneously. The problems cited were unsuitable structure, inadequate support staff (duty officer, security officer), overcrowding, long waiting times, inadequate interpersonal communication, lack of task definition and absence of forms and procedures within the department, inadequate traceability of care, and lack of triage. Group members selected the following problems: Overcrowding of the ED by patients, very long waiting times, inadequate interpersonal communication, and inadequate traceability of care [27].

2.2.1.1. Selection criteria

The prioritization matrix (Table 1) shows that the problem with the highest score is: «Overcrowding of the ED by patients ».

2.2.2. Step 2

Figure 1 shows the process for managing a patient in the emergency department. The cause-effect diagram is used to search, through the potential causes listed, the real causes of the problem identified. These hypotheses are examined by the five reasons and classified according to the following categories of causes: Suppliers, Organization, Beneficiary (Figure 2).

2.2.3. Step 3: The choice of solutions

During our fifth meeting, we held a round-table discussion to select the best solutions.

2.2.3.1. Designing solutions

- **Cause 1:** Disorientation of patients from other units shared with the same facility.
- **Solution 1:** Place a security guard at the main entrance to the facility to ensure the initial reception and orientation of patients.
- **Cause 2:** Non-urgent services referred to the ED by other departments.
- **Solution 2:** Contact the doctors and head nurses of the departments involved in the problem and inform them of the urgent services to be referred to the department.
- **Cause 3:** Inadequate triage.
- **Solution 3:** Creation of a triage unit (Table 2).

2.2.3.2. List of solutions

The solutions are prioritized as follows:

- Creation of the triage unit.
 - Contacting the doctors and head nurses of the departments involved in the problem and informing them of the urgent services to be referred to the department.
 - Putting a security guard and a receptionist at the entrance to the facility.
- List of solutions (Table 3).

3. Results and Discussions

3.1. Results

The solutions derived from the quality circle led to the creation of the triage unit at the entrance to the ED. A doctor and a nurse manage this unit.

Their role is to select urgent/non-urgent patients, register them using a computerized system and monitor patients in the waiting room. This has made it possible to absorb the overcrowding in the ED (Table 4). Regarding overcrowding, our research has enabled us to reduce space requirements by almost two-thirds. At the same time, for waiting times, this solution has made it possible to reduce waiting times from 80 minutes to a median of 19 minutes.

3.2. Discussion

The results obtained show that the reorganization of triage has reduced congestion and waiting times. Overcrowding was the major problem in ED, as in other healthcare establishments [17-18]. This is in line with the research conducted by Burstroet et al., (2016); the reorganization of triage and the allocation of a triage healthcare team makes it possible to absorb the overcrowding in ED [28-29]. The triage unit makes it possible to identify urgent and non-urgent patients and to direct the patient according to the degree of seriousness [30-32]. Many studies have shown that the presence of a healthcare team at reception can improve the efficiency and quality of care because patient examination and diagnostic measures are initiated earlier. [33-34]. On the other hand, several studies have confirmed that waiting times are reduced in hospitals that use triage criteria to determine the order in which patients are seen, and the severity of their condition [35-36]. Improving the wait time to triage is important because it contributes to reducing overall wait times, ED overcrowding, and a better patient experience [37]. This is parallel to a research paper by

Yasemin Özhanlı et al., (2020) which showed a high satisfaction rate linked to good triage. In addition, good triage leads to high-quality patient care [38]. This solution is consolidated by the installation of a security guard and a receptionist at the main entrance as facility to ensure an initial welcome for patients, guarantee patient safety, limit access to overcrowding, and assure a better patient experience for disorientated patients. Patient safety is one of the cornerstones of quality care [39]. Patient safety is intrinsic to all healthcare workers. Patient safety can be a systemic approach when patients see measures adopted and practiced that create a safe and healthy environment [40]. Patient safety is about ensuring that patients are not exposed to risks and litigation arising from malpractice, systemic complexities, fraud, and administrative abuse [41]. One month after the creation of the triage unit in the ED, overcrowding has fallen from 105 patients per day to less than 38 patients per day. Another solution that has helped in limiting overcrowding is allowing only one accompanying person for each patient to access the department. Hosein Babatabar et al., (2020) also indicated that the high number of accompanying family members in the ED was a major factor in congestion and explained the lack of patient safety [42].

4. Limitations

In this study, we were limited to working with the day care team, since most patients come during the day, and the night care teams did not complain about the problem of overcrowding. In addition, the triage unit does not operate at night, given the shortage in staff.

Table 1: Prioritization matrix.

	P1: Overcrowding of the ED by patients	P2: waiting times	P3: lack of interpersonal communication	P4: Insufficient traceability of care
C1	4+4+3+4+4	3+2+4+3+2	1+1+1+1+3	2+3+2+2+1
C2	4+4+3+4+4	2+3+4+2+2	1+1+1+1+3	3+2+2+3+1
C3	3+4+1+4+4	2+3+4+2+2	4+3+3+1+3	1+1+4+3+1
TOTAL	54	27	28	31

Table 2: Designing solutions.

	1-Post a security guard at the entrance to the ED	2- Contact the doctors and head nurses of the departments involved in the problem	3- Creation of the triage unit
C1- Feasibility	1+2+1+2	2+1+2+1	3+3+3+3
C2- Impact	1+1+2+1	2+3+1+3	3+2+3+2
C3-Vulnerability	1+3+1+1	2+1+2+3	3+2+3+2
Score	17	23	32

Table 3: Solutions monitoring and evaluation plan.

Problem	Solutions	Objectives	Evaluation indicators	Necessary information	Numerator	Denominator	Collection method	Collection tools
Overcrowding of the ED oncology	S1: Creation of the triage unit	Ensure good patient care within the department	Waiting time	The number of patients treated in ED	The waiting time before the triage unit is set up	The waiting time after the triage unit is set up	Check-in	Evaluation grids
	S2: Contact with the doctors and head nurses of the departments involved in the problem.	Limit the number of patients referred to ED by other departments	The number of patients referred to ED by other departments	The number of patients referred to ED by other departments	The number of patients referred to ED by other departments before the head nurses were contacted.	The number of patients referred to ED by other departments after contact with head nurses	Check-in	Grille
	S3: recruitment of a security guard at the entrance ED	-Ensuring an initial welcome for patients -Limit access to the ED for disoriented patients -Direct patients to the appropriate services	The number of patients registered at the triage unit	The number of patients attending the triage unit before and after the implementation of the solution	The number of patients attending the triage unit after the implementation of the solution	The number of patients who frequent the triage unit before the solution is implemented.	Check-in	Register

Table 4: Overcrowding and waiting time before and after the creation of the triage unit.

	Waiting time before the creation of the triage unit (min)	Waiting time after the creation of the triage unit (min)	The number of patients before the creation of the triage unit	The number of patients after the creation of the triage unit
Median	80	19	105	38
Minimum	26	4	53	15
Maximum	212	98	157	73

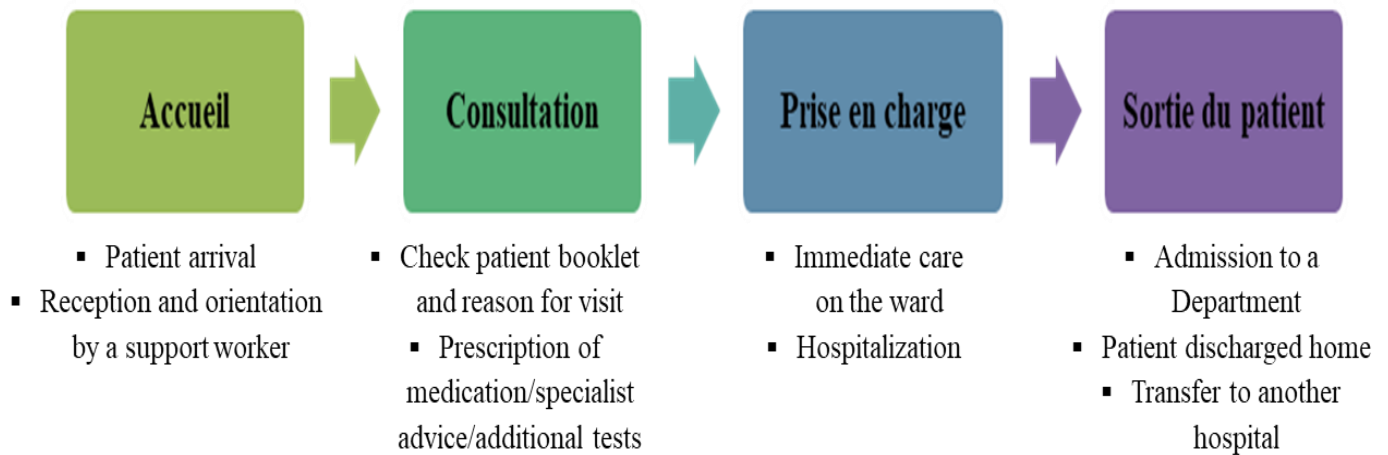


Figure 1: Shows the process for managing a patient in the emergency department.

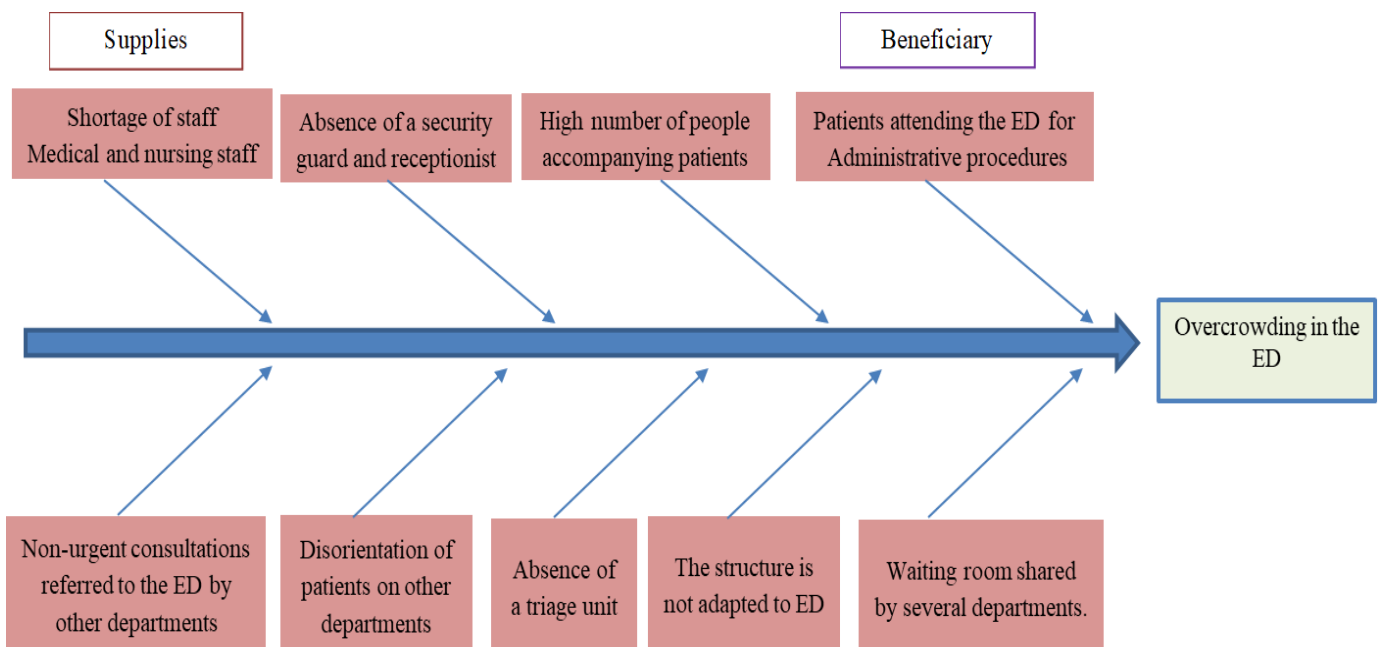


Figure 2: Ishikawa diagram.

5. Conclusions

The introduction of the quality cycle makes it possible to find optimal solutions and identify areas for improvement. The results of this process in INO's ED have helped in reducing overcrowding and waiting times for emergency consultations. It has even helped in creating a climate of trust between patients and healthcare staff. Other cycles have been created following the success of the first circle. It is therefore recommended that managers of EDs apply this participative management method in their work.

Acknowledgments

The authors would like to acknowledge the following: Lalla Salma cancer prevention and treatment foundation, Dr Belahcen Mohamed Jaoud (medical director), and Elmahoti Mohamed (quality management trainer).

Contributors

Kaoutar Matrab contributed to the design and writing of this quality improvement report. Younes Azemmour, Hassan Bada and El Ouardi Abdelghani both contributed to the data collection of this study. Nmari Anass, and Zaroual Aziz were involved in editing the report for clarity and details. Elkhalloufi Fahd submitted the report and takes responsibility for the overall content.

Funding

This study has not received any funding.

Declaration of interests

Nothing to declare.

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