

Decreasing Prolonged Waiting Times for Chemotherapy Administration for Patients with Cancer

Mervat Mahrous^{1,2}, Emad El Shaer³, Lamia Rezik³, Samar Taha³, Ahmed Yosef³

¹Department of Oncology, King Fahad Hospital, Medina Munawara, Kingdom of Saudi Arabia, ²Minia University Hospital, Minia, Egypt, ³Department of Quality and Pharmacy, King Fahad Hospital, Medina Munawara, Kingdom of Saudi Arabia

Abstract

Background: On the basis of our patient satisfaction survey, we initiated a quality improvement project at our institution to decrease waiting times for patients scheduled for chemotherapy. The mean waiting time until a patient started his or her session was 183.5 min. Our aim was to reduce the waiting time by 50% (<90 min) over a 6-month period and to sustain it. **Materials and Methods:** We used a multidisciplinary approach to identify the root causes and contributing factors of prolonged waiting times for patients in the chemotherapy unit. We implemented three Plan–Do–Study–Act cycles over a 10-month period (February to December 2016). First, we redesigned the nursing triage process, treatment process, and nursing awareness programs. Second, we improved nursing documentation to ensure accurate tracking of patients who declined their appointment or were overbooked. Third, pharmacy forms and chemotherapy preparation were accomplished with the help of an electronic system. We implemented a department-wide standard of care to provide an early assessment of the patient on arrival, and we activated a specific chemotherapy clinic for patient booking and laboratory tests, which were supervised by a trained qualified oncologist. **Results:** Median time to chemotherapy administration was reduced by 40% in the first 3 months, 64% in 6 months, and 51% in 18 months. We checked every 2 weeks for sustained action and tracked the time from when the patient checked in until he or she received treatment, guided by electronic pharmacy confirmation. The mean waiting time continued to improve and no complaints were reported during the last 6 months of the post-intervention period. **Conclusion:** Our project resulted in a 40%–64% reduction in waiting times for patients in the chemotherapy unit over an 18-month period. Our plan is to sustain this improvement by continually monitoring waiting times and addressing any emerging issues.

Keywords: Patient dissatisfaction, chemotherapy, prolonged waiting time

PROBLEM

The incidence of cancer is rising annually worldwide.^[1] Chemotherapy is generally administered by infusion in the ambulatory setting, and multiple policies are available in the established centers to ensure the quality and safety of chemotherapy prescriptions and administration.^[2] In general, manual prescriptions take longer to process and have a higher risk for error than electronic prescriptions.

Long waiting time usually translates to frustration for both patients and treatment providers.^[3,4] It was shown to be associated with increased incidence of anticipatory nausea^[5,6] and may adversely affect patient adherence to scheduled appointments and recommended oncology treatment schedules.^[7,8]

We aimed to implement a quality improvement project to improve waiting time for chemotherapy administration without sacrificing essential quality and safety procedures.

BACKGROUND

At King Fahad Hospital, Medina Munawara, Kingdom of Saudi Arabia, we deal with an increasing number of patients who require chemotherapy, with the escalating

Address for correspondence: Dr. Mervat Mahrous,
Department of Oncology, King Fahad Hospital,
Medina Munawara, Kingdom of Saudi Arabia.
E-mail: mervat_mahrous@yahoo.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Mahrous M, El Shaer E, Rezik L, Taha S, Yosef A. Decreasing prolonged waiting times for chemotherapy administration for patients with cancer. *Glob J Qual Saf Healthc* 2018;1:44-8.

Access this article online

Quick Response Code:



Website:
www.jqsh.org

DOI:
10.4103/JQSH.JQSH_8_18

use of second-line, third-line, and additional treatments for many types of cancers. As a result, there is a growing pressure on the chemotherapy unit to deliver treatment quickly, efficiently, and safely.

In May 2015, we conducted a patient survey to measure patient satisfaction on our new chemotherapy unit and their perception of care improvement. We found that most patients were dissatisfied. The main complaint was about long waiting time to receive chemotherapy. Mean waiting time was 183.5 min for patients scheduled to receive infusion chemotherapy. Notes were available from our hospital's patient relations department about the same issue. Prolonged waiting time for chemotherapy administration also led to increased length of chemotherapy clinic stay. A multidisciplinary team of key stakeholders, including oncologists, nurses, clinic assistants, and pharmacists, determined the underlying issues of prolonged waiting time for chemotherapy. Separate sessions were held every 2 weeks to brainstorm for solutions. The aim was to reduce the waiting time for chemotherapy administration by 50% (<90 min) over a 6-month period and to sustain it.

MATERIALS AND METHODS

Pre-intervention assessment

At the planning stage, there were several issues in the workflow that needed change, and team members had to ensure the implementation would not be hindered because of lack of staff awareness, frequent rotation of staff, and shortage of manpower. Current operational and clinical processes were identified, and the workflow was examined after registration and sign in the triage area [Figure 1]. Before the intervention, chemotherapy orders were submitted to the pharmacy and patients waited while the drugs were prepared. Often, chemotherapy prescriptions had not yet been written, so nurses had to contact assigned physicians to manually write the chemotherapy order and approve it before processing could begin. The process of tracking the physicians, writing orders, or amendments, especially in the morning with busy morning meetings, ward rounds, and ongoing busy clinics, was often challenging. Chemotherapy orders were prescribed only on the morning of treatment after the morning rounds were complete. Even after the drugs arrived at the unit, it took approximately 30 min before the treatment started. This was due to competing patient-care activities taking place at the same time. Once the treatment was completed, patients spent another 30 min waiting to be discharged from the unit while take-home medications were prepared.

All possible causes of long waiting times for chemotherapy were considered. The causes were classified under four main categories: first, patient factors such as missed or late appointments; second, physician factors such as illegible handwriting, manual chemotherapy orders, or late submission of prescriptions; third, resource limitations

such as lack of staff, lack of available chemotherapy chairs, and sharing of treatments chair with nonchemotherapy-related treatments, such as blood transfusions and blood products transfusions; and fourth, competition with inpatient chemotherapy orders. The most common cause for prolonged waiting time was pharmacy delay [Figure 2].

Baseline measurements

For this project, the following baseline measurements were included and monitored for 3 months:

1. Time to treatment delivery (time from arrival of patient until the start of infusion chemotherapy)
2. Time of chemotherapy prescription
3. Time of arrival of chemotherapy drugs at the chemotherapy unit
4. Time of commencement of chemotherapy
5. Time of completion of chemotherapy and to discharge from the chemotherapy unit

Data for all scheduled adult patients for chemotherapy were captured once the patients signed in at the unit. We excluded walk-in patients and those who signed in for flushing ports or chemotherapy teaching visits.

Interventions

On the basis of the gaps identified, the team decided to work on changing some practices and switching from a manual chemotherapy order form to an electronic order form [Figure 3]. Our current software was adapted and updated with chemotherapy protocols.

We engaged the physicians by asking them to order the necessary laboratory tests during clinic consultation session a few days before scheduled admission. Results of blood tests that fall within normal ranges are valid for 1 week for chemotherapy orders unless patients become unwell during that time. Chemotherapy prescriptions could then be completed by the primary physician at least 24h before the scheduled admission date to the hospital. We collaborated with the clinic specialist and pharmacists to ensure the electronic chemotherapy orders were transmitted timely to the pharmacy. This facilitated the workflow for the pharmacists to prepare the necessary documents immediately. We also worked with the porters to streamline their workflow for drug delivery to the chemotherapy unit and to minimize batching that may cause further delay.

Another important stakeholder was the nurses in the chemotherapy unit. Nurses at all levels were engaged to work on setting priorities for timely chemotherapy administration, and an agreement was sought to review current internal workflow. Early commencement of patient education and initiation of discharge planning were strongly emphasized to achieve smooth transition of care for the patients from the chemotherapy unit

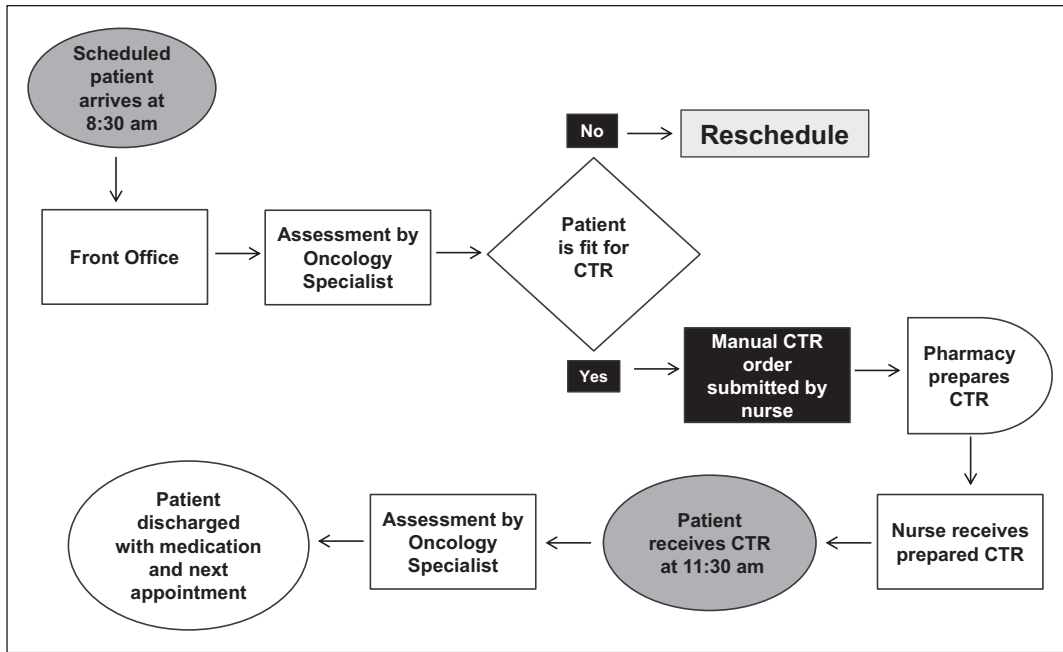


Figure 1: Flowchart displays the chemotherapy (CTR) process before the intervention.

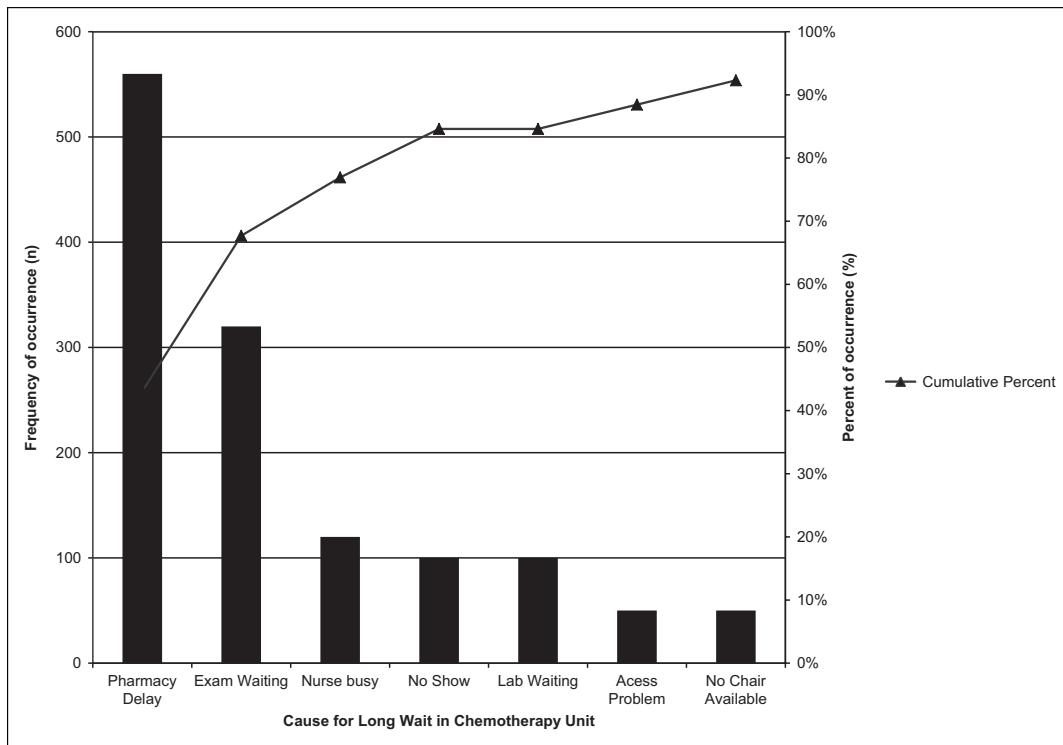


Figure 2: Pareto chart and finding main cause for long wait times in the chemotherapy unit.

to home. A standardized discharge plan with specific instructions for frequency of blood checks, clinic consultations, and the next appointment was also implemented to ease the workflow for nurses and administrative staff.

We implemented three Plan–Do–Study–Act (PDSA) cycles over a 10-month period (February to December 2016).

PDSA Cycle 1: We added chemotherapy clinic to the hospital electronic system to prioritize delivery of laboratory results and notify team members and caregivers about the patient throughout the workflow process. Posters in the clinic rooms were used to remind doctors not to use manual forms but to submit electronic chemotherapy orders. Clinic assistants were in charge

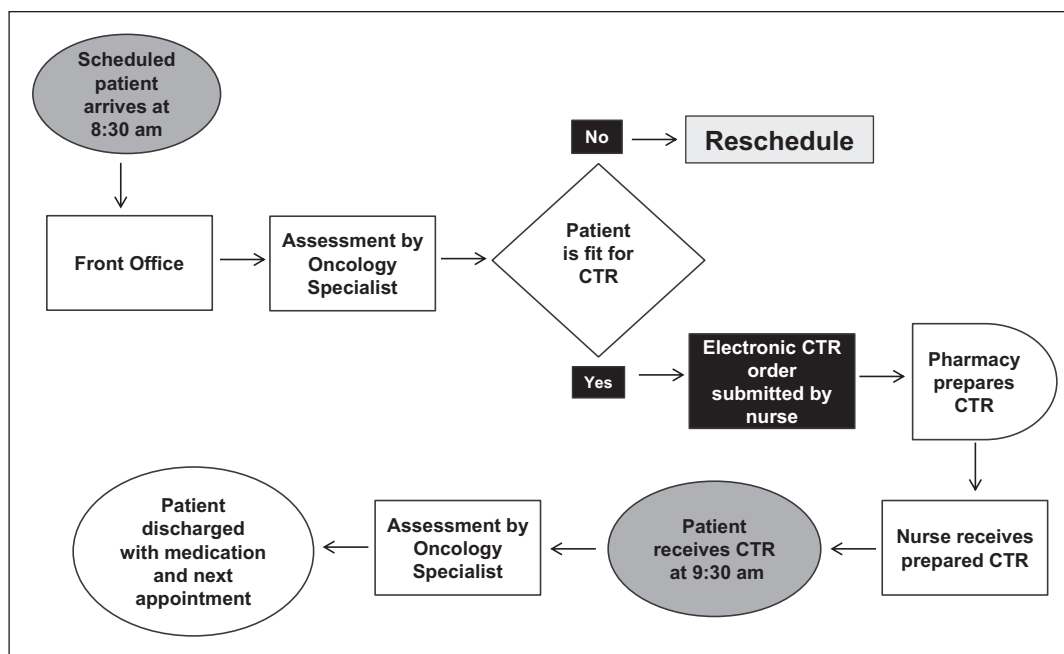


Figure 3: Flowchart displays the chemotherapy (CTR) process after the intervention.

of printing out chemotherapy order forms and making them available. Physicians and pharmacists received an electronic notification when the patient signed in along with a copy of the chemotherapy order. The physician would complete the prescription and the pharmacist would complete the order. Porters reinforced timeliness in drug delivery whereas the nurses were tasked to follow-up on chemotherapy orders and commence chemotherapy as soon as the drugs arrived in the chemotherapy unit. Medical and nursing teams were reminded to initiate patient education and discharge from the chemotherapy unit.

PDSA Cycle 2: A preliminary assessment of interventions implemented in PDSA Cycle 1 revealed several incidents of patients being overbooked in the chemotherapy clinic. To address this issue, short infusions, such as bisphosphonate infusion, were scheduled early morning or late afternoon to avoid patient overload in the clinic.

PDSA Cycle 3: A new group of nurses and two pharmacists joined the chemotherapy unit and received training and educational courses to increase awareness about improving waiting times for patients. A list of chemotherapy regimens was subdivided into two groups, one with high-volume usage and another with infrequent usage and uncommon types. We thought this will save time and be more applicable.

RESULTS

Three months into the implementation of the new workflow, the preliminary analysis showed favorable results. The mean waiting time was reduced from 183.5 to 110min (40%) [Figure 4A and B]. Physicians were able to prescribe the chemotherapy orders on time because the laboratory results

were available. Patients were able to go home immediately on completion of treatment because the discharge medications and follow-up appointments were already prepared.

Six months after the intervention, the mean time to chemotherapy administration was reduced to 66min (64%) [Figure 4C]. We checked every 2 weeks for sustained improvement and tracked the time from when the patient checked in until he or she received treatment, guided by pharmacy electronic confirmation.

Eighteen months after the intervention, the mean waiting time was approximately 90min (51% decrease from baseline) [Figure 4D]. Waiting time for chemotherapy has continued to improve and we are monitoring it.

In addition, no complaints were reported in the last 6 months of the intervention period.

LESSONS AND LIMITATIONS

The effects of changing the workflow have brought about several positive outcomes in addition to those measured. Pharmacists were able to plan ahead and prioritize (avoiding peak hours) processing of chemotherapy orders electronically instead of manually. It was observed that nurses became more efficient in their work and chemotherapy administration, ensuring fewer competing patient-care activities when the drugs arrive at the chemotherapy unit.

In terms of patient safety, electronic forms are safer and clearer than the manual forms. There were also challenges faced by the multidisciplinary team members, including constant reminders for physicians to write the chemotherapy order once a patient is signed in and fit for treatment. The most important lesson learned from this

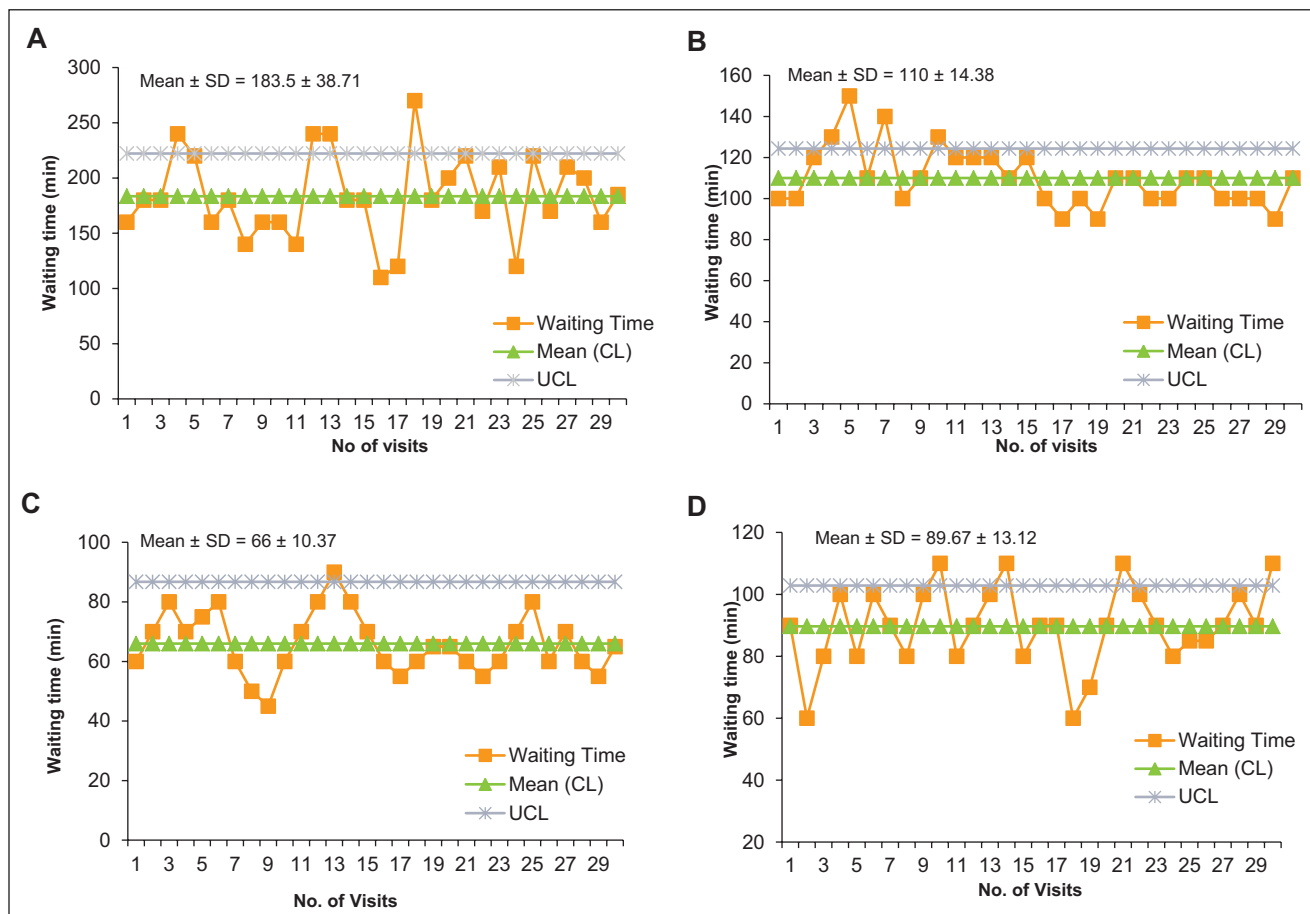


Figure 4: Control charts at baseline (A), 3 months (B), 6 months (C), and 18 months (D) show sustained improvement in patients' waiting time for chemotherapy. CL = control limit, SD = standard deviation, UCL = upper control limit.

project was that effective communication at all levels was the key in making this improvement project a success.

CONCLUSION

This quality improvement project achieved a 40%–64% reduction in the waiting time for the patients scheduled for chemotherapy infusion during an 18-month period. A great effort with a multidisciplinary collaboration made a difference in patients' overall experience and improvements in the efficiency of quality care. Teamwork, communication, and involvement of all stakeholders played an important role for this project to be successful and sustainable for a long term. Sustaining this success is possible as we have reengineered the whole infusion process, and we will ensure that through constant monitoring and interventions as needed.

Financial support and sponsorship

The authors disclosed no funding related to this article.

Conflicts of interest

The authors disclosed no conflicts of interest related to this article.

REFERENCES

1. Ferlay J, Soerjomataram I, Ervik M, et al. GLOBOCAN 2012, v1. Cancer incidence and mortality worldwide: IARC CancerBase No 11. Lyon, France: International Agency of Research on Cancer, 2013.
2. Assidy-Smith TN, Baumann BM, Boudreaux ED. The disconfirmation paradigm: Throughput times and emergency department patient satisfaction. *J Emerg Med* 2007;32: 7–13.
3. Leddy KM, Kaldenberg DO, Becker BW. Timeliness in ambulatory care treatment. An examination of patient satisfaction and wait times in medical practices and outpatient test and treatment facilities. *J Ambul Care Manage* 2003;26: 138–149.
4. Anderson RT, Camacho FT, Balkrishnan R. Willing to wait?: The influence of patient wait time on satisfaction with primary care. *BMC Health Serv Res* 2007;7:31.
5. Feddock CA, Hoellein AR, Griffith CH 3rd, et al. Can physicians improve patient satisfaction with long waiting times? *Eval Health Prof* 2005;28:40–52.
6. Lis CG, Rodeghier M, Gupta D. Distribution and determinants of patient satisfaction in oncology: A review of the literature. *Patient Prefer Adherence* 2009;3:287–304.
7. Gourjji I, McVey L, Loiselle C. Patients' satisfaction and importance ratings of quality in an outpatient oncology center. *J Nurs Care Qual* 2003;18:43–55.
8. Sandoval GA, Brown AD, Sullivan T, et al. Factors that influence cancer patients' overall perceptions of the quality of care. *Int J Qual Health Care* 2006;18:266–274.