Rapid Implementation of the Virtual Clinic Concept in an Oncology Department to Minimize the Exposure of Patients with Cancer to COVID-19

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ABSTRACT

Introduction: The global pandemic was an emerging challenge that significantly impacted healthcare systems and the delivery of care. Prompt actions and adaptive techniques, such as the virtual clinic, were implemented to ensure the quality and continuity of the care provided. The aim of this quality improvement project was to ensure the smooth implementation and effectiveness of the virtual clinic during the COVID-19 crisis. **Methods:** A specialized team of multidisciplinary healthcare providers was established to systematically ensure the implementation of the virtual clinic within the Department of Oncology. The team used multiple Plan-Do-Study-Act (PDSA) cycles of the quality improvement model to achieve the final goal and facilitate the transition to the virtual clinic. **Results:** A total of 29 weekly virtual clinic sessions were conducted, covering various oncology services. From March to December 2020, 81% of the scheduled patients (3888) responded to virtual clinic calls. Physicians initiated 234 unplanned virtual clinic calls to follow up on a patient's condition. In addition, 916 medications were shipped to patients as needed. A patient satisfaction survey in May 2020 indicated an overall satisfaction rate of 92% with the virtual clinic process. Staff satisfaction was also high (91%), and 88% of the physicians believed that the virtual clinic would continue beyond the pandemic. **Conclusion:** Implementing the virtual clinic is achievable through following systematic steps and effectively addressing emerging challenges as required. The concept of the virtual clinic was well accepted by patients and staff.

Keywords: virtual, clinic, oncology, cancer, COVID-19

INTRODUCTION

In early 2020, the World Health Organization (WHO) declared the outbreak of COVID-19.[1] Later that year, it was declared a global pandemic.[2] This led to social restraints and changes in norms aimed at containing and slowing down the spread.[3] Hospitals were severely affected by the multiple waves of the pandemic on various levels, which was reflected in the high bed occupancy and overwhelmed medical staff. The pandemic brought about significant changes in hospital services, including reducing the number of patients in outpatient

clinics, minimizing unnecessary or elective procedures, discharging patients from inpatient services as quickly as possible, and implementing extra protective measures for those who must visit the hospital. In addition, new technologies such as virtual medicine were introduced.[4,5] The reasons underpinning these changes include the following: (1) to build the hospital's capacity to accommodate the surge of COVID-19 cases, and (2) to protect both patients and healthcare providers.

Patients with cancer were significantly affected by these changes as they often require more frequent visits to the hospital compared with individuals with other chronic diseases. For example, patients with cancer typically see their treating physicians several times during each cycle of chemotherapy treatment, with most visiting the chemotherapy unit every 2 to 4 weeks. Cancer-directed therapy involves visits to other hospital services, including laboratory services, radiology imaging, interventional radiology (less frequently), social services, psychological services, and various other disciplines.

During the pandemic there were many factors supporting the reduction of hospital visits, including the healthcare providers' decisions, patient concerns, or an overwhelmed healthcare system.[4] Oncologists and oncology centers faced a challenging situation in balancing the provision of high-quality, unfragmented cancer care while minimizing the patients' presence at the hospital.[6]

To support patients with cancer in navigating this crisis, using distance communication technology has proven to be a successful strategy. It ensures the continuity of care while implementing the necessary protective measures to contain the spread of COVID-19.[4,5,7] The pandemic necessitated a rapid redesign of outpatient services.[8] One form of distance communication is the virtual clinic (VC), a type of telemedicine that allows healthcare professionals and patients to communicate without meeting face-to-face.[9] VC has already been used and studied in other medical disciplines such as cardiology, respiratory medicine, and neurology.[7] VC is already a known practice in oncology,[10] and reputable cancer institutes have issued guidelines to regulate its use in oncology settings.[7,11,12] Because of its flexibility and ability to meet healthcare demands,[10,11] Oncology patients have accepted VC with a high level of satisfaction as it assists in the reduction of the risk of infection, and saves time and visit costs.[11] It also contributes to better resource management by allowing more time to be allocated to patients who require face-to-face visits, thus reducing their waiting time in the hospital[13] and lowering their risk of infection or disease transmission within the hospital.

As part of our department's efforts to ensure continuous and integrated care during the pandemic, the use of video conferencing as a primary method to provide care became necessary. Introducing this new technology to patients and physicians may pose challenges and generate resistance, as occurs frequently with change. In addition, the rapid implementation to adapt to the pandemic may result in less favorable experiences for caregivers and patients.[7] To address these concerns, a systematic approach was adopted, relying on the Plan-Do-Study-Act (PDSA) quality improvement model, ensuring a smoother transition and better outcomes.

METHODS

Study Design

In response to the strategic need and the transformation to VC, the Departmental Quality Leadership Committee convened to discuss the method of adaptation to this new approach. The decision was to use the PDSA model as a rapid improvement cycle to systematically implement VC at the Department of Adult Medical Oncology in King Abdulaziz Medical City. This quality improvement project was approved by the Oncology Department and was exempt from institutional review board approval.

The team adhered to the Standards for QUality Improvement Reporting Excellence (SQUIRE) guidelines in reporting and publishing the findings. These guidelines provide a framework for transparent and comprehensive documentation of our project's outcomes.[14]

Intervention Strategy

To implement and evaluate this new change, a multidisciplinary team used the rapid cycle of improvement PDSA. The team included a medical oncologist, represented by the chairman of the department, and medical oncologists representing the different sections within the department. There was also a pharmacist, director of nursing, a representative from the Clinical Information Management Systems, a quality specialist, a patient educator, a research coordinator, and a representative from the Transportation Department. The goal was to minimize the patients' visits to the hospital without affecting patient care and prognosis.

The team executed three PDSA cycles. These cycles were conducted as required and supported the project's development. The first cycle started in March 2020, and the last in May 2020, followed by a satisfaction survey for the healthcare professionals and patients to assess their satisfaction level with the new VC process.

To measure the impact of implementing the VC, the team identified the following process and outcome measures to be monitored.

Outcome measures included: (1) the number of patients seen in VC, (2) patient satisfaction with VC, and (3) staff satisfaction with VC. Process measures included: (1) the number of patients booked in the VC, (2) the number of established VCs, and (3) the number of medications shipped for VC patients.

PDSA 1

Plan:

- To ensure the appropriateness of the VC implementation process and the availability of equipment, it is
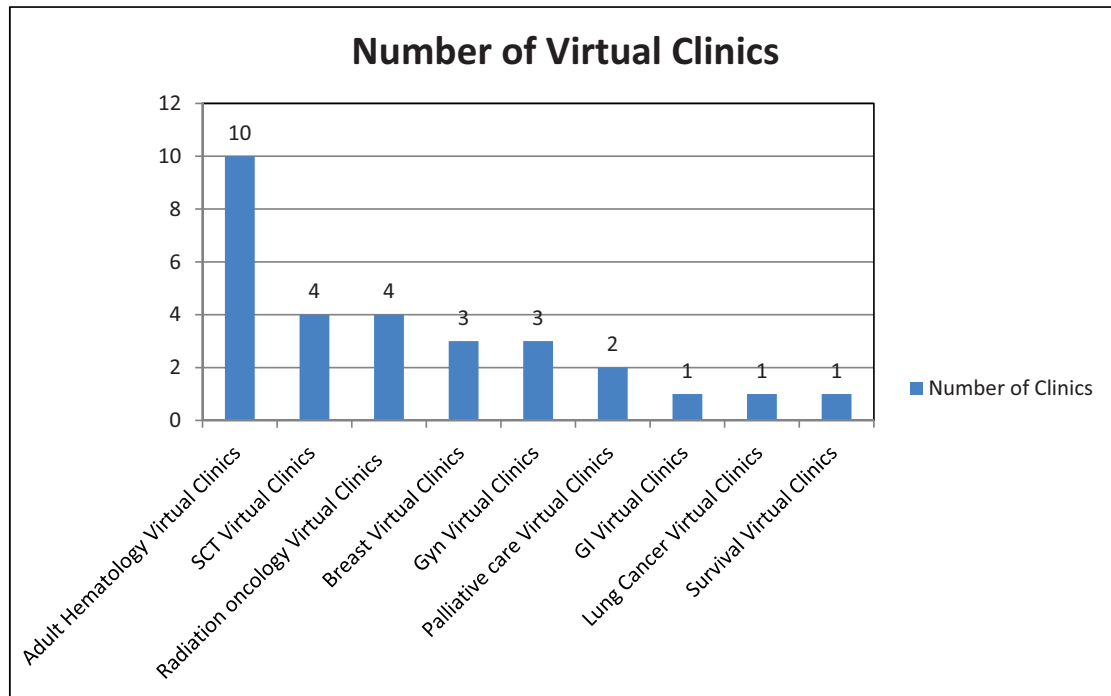
Figure 1. Virtual clinics number of sessions per week. GI, gastrointestinal; Gyn, gynecological; SCT, stem cell transplant.

crucial to obtain the support and involvement of Information Technology (IT) before initiating the VC project.

- The VC project was implemented gradually, starting with six clinics, including breast cancer, gynecology clinic, gastrointestinal cancer, and lung cancer.

Do:

- A specially designed software application created by the IT team was integrated with hospital systems to serve as the platform for the VC. The software was downloaded on desktop computers in the clinic and on portable iPads for use by all healthcare professionals. The IT team tested the application and confirmed its ease of use for healthcare professionals in the oncology clinic.
- The core team provided educational materials to all staff regarding how to properly and efficiently use the VC application (Eiadaty).
- Each physician was instructed to review the list of their booked patients 1 day before the clinic and update the clinic coordinator about the suitable patients who could be seen in the VC. The coordinators did the booking in the VC and informed the patients about this arrangement.

Study:

- A total of 29 clinic sessions per week were established for various oncology services (Fig. 1).
- There were issues with the Wi-Fi connection in the hospital. The IT team was contacted to correct the internet service in the clinic. To address any connection problems, the team decided to use phone calls and document them in the patients' electronic medical records (EMRs).
- There was no specific form in the EMR to document a note of the VC.

Act:

- The team decided to use the clinic phone to call patients during the VC if there were any connection issues.
- All the calls were documented in the patient's EMR by the physician, including the time, occurrence of the call, and the treatment plan.
- The nursing team in the clinic was responsible for promptly reporting any problems with the Wi-Fi connection to the IT team.
- Progress notes for the documentation of the VC were designed and uploaded in the patient's EMR to be used by the physicians.
- After resolving all the previous issues, the team decided to expand the implementation of the VC to include all other specialties.

PDSA 2

Plan:

- To start shipping the medication to all patients seen in the VC without requiring a physical visit to the hospital.
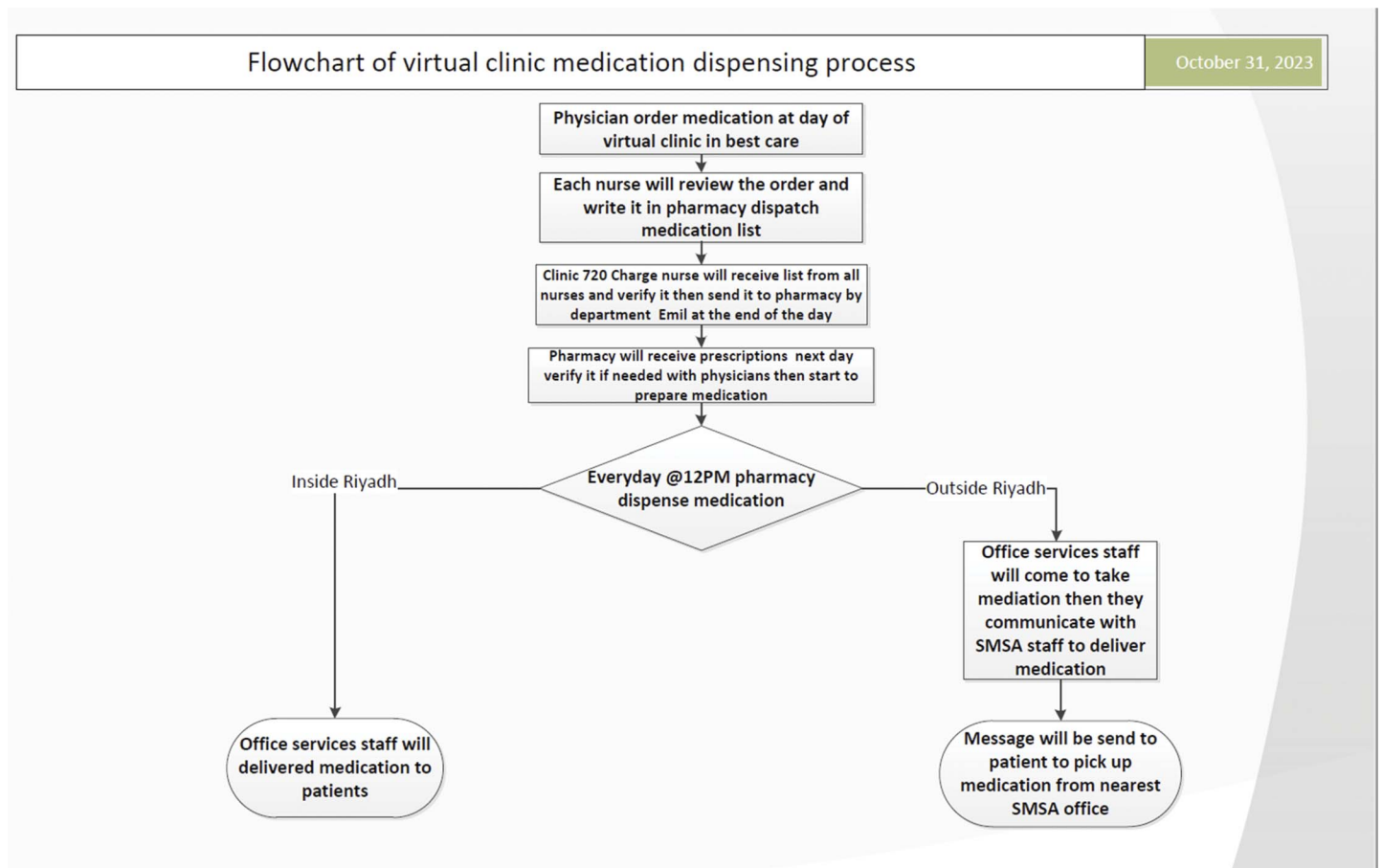
Figure 2. Process map of medication shipment. SMSA, courier service company.

Do:

- Each physician reviewed the list of patients booked in their clinic 24 hours before the VC day and identified patients eligible for the VC.
- Subsequently, they send the list of patients with their medications to the pharmacy to determine the safety of shipping these medications.
- The team mapped out the process of medication shipment to patients to minimize the time from shipment to the patients receiving their medications (Fig. 2). At the end of each VC, an email was sent to the pharmacy containing a list of the patients with their contact numbers and addresses.
- The pharmacy prepared the medications after reviewing the physician's orders for the following day.

Study:

- A total of 916 medications were shipped to patients as planned (Supplemental Fig. S1, available online).
- The pharmacy faced some difficulties in preparing the shipments and coordinating the pick-up time with the delivery services.
- Some medication orders contained restricted medications (such as narcotics) that cannot be shipped,

and patients or their relatives had to come in person to receive them.

Act:

- The medication shipment process map was shared with all involved healthcare providers, and the patients were also informed about this process. This was done to support a better understanding of the process, minimizing the time from shipment to when the patient received the medication.
- To standardize the process, all the medication packages were ready before 12 pm to save time.
- If the patient's list of medications contained any restricted medication requiring a physical collection, all their medications were removed from the delivery package and delivered to them during the visit. This is important to ensure compliance with regulations and to avoid splitting the patient's medications.

PDSA 3

Plan:

- The core team decided to conduct a survey to evaluate the level of satisfaction of patients and healthcare
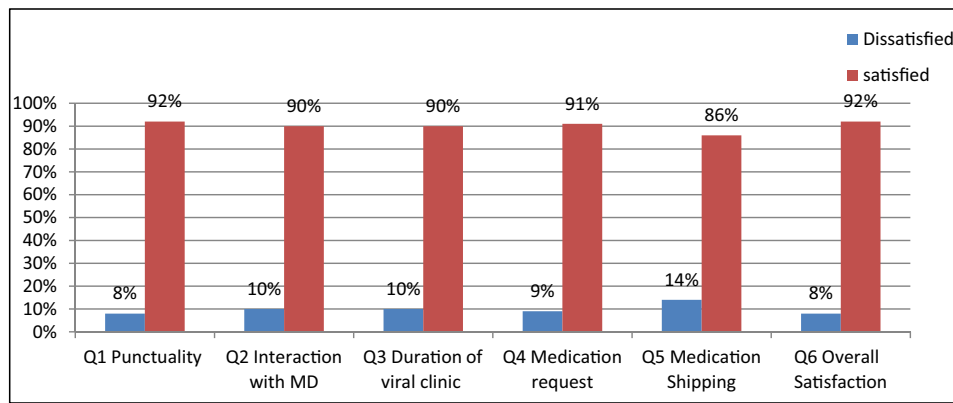
Figure 3. Patient satisfaction survey (*N* = 149).

providers regarding the new process of VC during the COVID-19 pandemic.

Do:

• The core team generated a list of questions about satisfaction levels. One survey targeted healthcare providers, and the other targeted patients. The questionnaire contained questions related to patient satisfaction with the following items:

  1. Punctuality in the VC
  2. Interaction with treating physician
  3. Duration of VC
  4. Medication request process
  5. Medication shipping
  6. Overall satisfaction

Study:

• A total of 149 patients and 188 healthcare providers participated in the satisfaction survey. Generally, there was a high rate of satisfaction (Fig. 3, Supplemental Fig. S2, available online). More details about the satisfaction levels are available in the results section.

Act:

• Most physicians faced challenges with a poor internet connection and raised their concerns to the IT team. The team will continue to educate staff and monitor the VC process.

RESULTS AND DISCUSSION

A total of 29 clinic sessions per week were established for the different oncology services (Fig. 1). From March 2020 to December 2020, of 4789 scheduled patients for the VC, 3888 (81%) answered the call, although 872 (19%) did not respond to physicians' calls, and additional appointments were scheduled (Figs. 4A and B show additional details). There were 234 unplanned VC calls requested by physicians to communicate with patients whose conditions required

monitoring and care. Throughout the project's implementation, the VC reduced the number of patients attending physically by 15% to 62% (Supplemental Fig. S3, available online). As reflected in Figures 3A and B, the VC became an integral part of the services provided and continued throughout the monitoring phase, providing patients with more convenient options to receive their treatment.

In May 2020, a total of 149 patients were surveyed. The results showed that their overall satisfaction with the VC process was 92% (Fig. 3). Specifically, the domain about physician interaction received a satisfaction rating of 90%, the duration of the visit was rated at 90%, medication requesting received a satisfaction rating of 91%, and medication shipping was rated at 86%.

Staff satisfaction surveys were also conducted simultaneously with the patient satisfaction survey. Of the 188 staff members involved (74 physicians, 25 nurses, 7 coordinators, and 12 others), the overall satisfaction with the booking process was 91%. The physicians believed that the patients were satisfied with the VC experience, with 75% expected to continue with the VC beyond the pandemic (Supplemental Fig. S2).

Limitations

Most of the challenges faced by the team involved having a poor internet connection in the clinic, which was resolved by using phone calls to communicate with patients. However, the patients living outside Riyadh encountered issues with laboratory tests, as they did not have facilities nearby to perform the tests. Last, it was prohibited to ship any narcotic medication to patients in accordance with Saudi law and the hospital policy, necessitating that patients come to collect the medication.

CONCLUSION

The VC project demonstrated that the rapid implementation of VC can be achieved in response to the COVID-19 pandemic. The successful implementation of VCs required a dedicated multidisciplinary team with expertise in operational management,
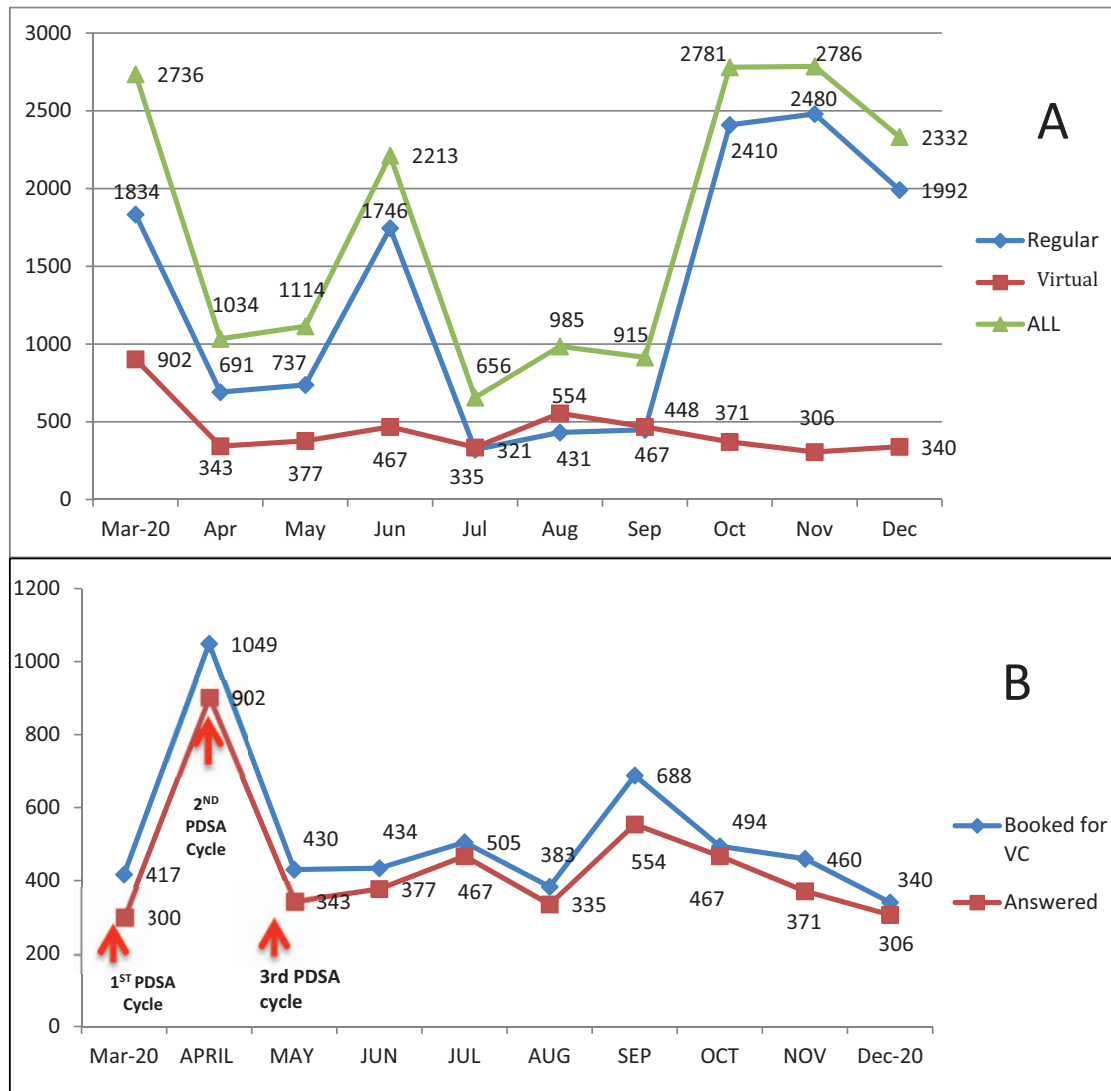
Figure 4. (A) The total number of patients who physically attend regular clinic and virtual clinic (VC) and (B) the number of those who respond to the VC call. PDSA, Plan-Do-Study-Act.

quality improvement, clinical care, and data analysis. The transition to VC was well accepted by both patients and clinicians. Optimizing the video communication tool and streamlining the process of conducting pre-visit laboratory and radiology tests closer to patients' homes, as well as shipping medications, are essential for enhancing the VC's function. Physicians believed that patients were satisfied with the experience and expected to continue using VC beyond the pandemic.

We established a well-prepared system and operations to be used in case of any emergency that could necessitate the medical team to conduct VC.

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Supplemental Material

Supplemental materials are available online with the article.

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