

# Using Lean to Improve Wait Time Performance in Diagnostic Assessment for Lung Cancer

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## Abstract

**Cancer Care Ontario developed a diagnostic assessment program (DAP) to improve patients' experience in the diagnostic phase of their cancer journey and improve health system efficiency and effectiveness. The Stronach Regional Cancer Centre Lung DAP (at Southlake Regional Health Centre) used learnings from a Lean improvement event to increase capacity to meet patient demand for service and to achieve/improve upon the provincial wait time target from consultation to diagnosis for lung cancer patients (65% within 28 days), improving overall patient experience of care. Monthly patient volumes have increased by 65%, and wait time has improved by 60%.**

## Introduction

The provision of accurate and rapid cancer diagnosis is a necessary component of a high-quality cancer system (Brouwers et al. 2009). Prolonged time intervals between symptom onset and treatment initiation increase the risk of poor clinical outcomes and worse patient experience of care (Koo et al. 2015). Ensuring the delivery of effective (best practice) and integrated care is one of the six strategic goals of Ontario Cancer Plan 5 (Cancer Care Ontario 2019). Cancer Care Ontario (2014) has worked closely with regional partners to establish performance-management standards and programs to promote high-quality access to diagnostic services.

The mandate of a diagnostic assessment program (DAP) is to coordinate patient care from referral to definitive diagnosis. This coordination significantly improves access to quality healthcare. DAPs provide patients with a single point of contact and access to care that follows evidence-based clinical pathways. DAPs also facilitate care transitions and improve communication between healthcare providers during the diagnostic phase of the healthcare journey, delivering an integrated care solution.

Each of Ontario's regional cancer programs offers a DAP for lung cancer, with roughly 45% of lung cancer patients in Ontario now receiving their diagnosis through a DAP. The key metric used to evaluate the performance of lung DAPs across the province is that 65% of all patients are diagnosed within 28 days of referral. This wait time refers to the time between the referral to a DAP and a tissue diagnosis (cancer or no cancer).

The Lung DAP at Southlake Regional Health Centre (Southlake) had been unable to achieve this wait time target during the period of December 2014–April 2018. A number of strategies (beginning in 2015) were used by the team in an effort to reduce the diagnostic wait time for patients. It was noted that this patient population follows complicated diagnostic pathways with multiple healthcare providers, necessitating time-sensitive cross-program collaboration. Despite numerous attempts by the care teams, the small-scale changes implemented did not yield much

progress in reducing this diagnostic wait time for patients, resulting in a less-than-optimal patient experience.

This paper describes Southlake's use of Lean methodology to improve wait times in this patient group to meet the provincial target and ultimately improve the patient experience of care.

## Materials and Methods

In April 2018, the Stronach Regional Cancer Centre team enlisted the help of Integrated Health Solutions Consultants, Medtronic (Canada), to conduct a Lean improvement event. The primary objective of this improvement project was to provide coordinated, expedited care for all patients undergoing a possible lung cancer diagnosis. The specific goals were to (1) fully understand the Southlake DAP model and operations, (2) define root causes of the issues, (3) identify opportunities that could result in both additional patient capacity and reduction of diagnostic wait times and (4) develop an action plan to effect positive change.

The four-day Kaizen workshop included thoracic surgeons, medical oncologists, DAP nurse navigators, clerical staff, patients and family members, York Thoracic Surgery (YTS) office staff (home of the Regional Thoracic Program) and clinical and administrative leadership from Diagnostic Imaging, Surgery, Pathology and the cancer centre. The target patient population was those with suspected lung/thoracic cancer from the Central, North Simcoe Muskoka and Central West Local Health Integration Networks (LHINs), reflecting the broad population served by Southlake's Regional Cancer Centre, YTS and the Regional Thoracic Program.

A unit optimization plan was developed, which included the following activities:

- conducting a baseline assessment of Lung DAP performance (this included the care provided to patients within the hospital's local catchment area as well as those patients in the broader geographic catchment areas to the west and north);
- review of the patient pathway and identification of opportunities to reduce non-value-added activities;
- a return-on-investment forecast, which was designed to assist the project team in understanding the gains achieved in terms of implementation effort, skills and knowledge transfer, behaviour adaptations, business impact of the changes based on key performance measures and the overall return on investment for the project; and
- development of educational materials to better prepare patients and their families for their care journey.

Initial instruction in Lean methodology and data analysis was provided by the consultants to establish a baseline of

understanding within the group. A value stream mapping over two days – both of current and ideal pathways – was conducted, identifying waste, duplication, poor coordination between providers and unnecessary workflows that reduced timely patient access and satisfaction with care.

Metrics were developed to track the project progress against project goals:

- reduce wait time from referral to diagnosis to less than 28 days for 65% of the cases, from April 2018 to November 2018;
- increase capacity for additional referrals by 100%; and
- increase the percentage of image-guided biopsy testing (to facilitate more rapid diagnosis) from 59% to 65%, by November 2018.

A detailed implementation plan was developed to identify activities that could have a positive impact on improving performance. Baseline descriptive statistics were used for determining the number of patients within the wait time targets.

## Results

### Lean results analysis

Through the Lean event, batching (waste) was a major issue at a number of key touchpoints: (1) referral review at the YTS office, (2) nurse navigator calls to patients for intake assessments, (3) appointments for image-guided biopsy time within the diagnostic imaging (DI) interventional suite and (4) limited availability of clinics.

Duplication of effort to arrange patient appointments for diagnostic testing was a second factor in increasing wait times. Both the clerical staff in the YTS office and the clinic office managed this process; patients often became confused as to which office to contact if they had issues with appointments or questions regarding their testing.

Patients noted that they had limited knowledge of the roles of the healthcare team members, of their options for care and of their overall care journey before and after diagnosis. A lack of consistent education messaging from different team members was a major concern.

Poor coordination between healthcare providers along the patient pathway was a third factor within this labour-intensive process. Communication across the patient journey was fragmented, and this contributed to inefficiencies within the process, leading to a poor patient experience.

The solutions targeted four key areas for improvement.

### Referral review and intake assessment

A streamlined referral review and initial intake assessment led to an increased capacity in lung/thoracic referral volumes. A tracking system was developed to help the staff monitor the

number of days spent waiting for a newly referred patient. The nurse navigator role was clearly defined and allowed to function as intended, improving time to patient contact, reducing duplication of patient appointment calls and facilitating coordination of care between healthcare providers.

**System efficiencies**

The DI process was streamlined to meet and align with patient needs to enable multiple same-day procedures/testing to both reduce wait time and improve patient experience. Opportunities were identified to eliminate unnecessary patient hospital visits (for both face-to-face and virtual patient encounters). Tests and procedures were coordinated with the DI, surgical day care and other departments so that the number of trips a patient/family made was reduced whenever possible using a revised patient care pathway. For example, engagement of the DI department helped minimize delays by having patient baseline images available for the radiologist prior to the patient’s image-guided biopsy – improving wait time for care – and improved access to intraoperative reporting to expedite diagnosis was instituted.

**Patient engagement and education**

Educational materials, including a comprehensive lung cancer journey binder resource, were developed with patients, families and the team to provide patients and families with knowledge of the process and next steps. Patients described being “better informed,” taking ownership of their care journey, with less reliance on repeated phone messages to their care team. Improved collaboration between the healthcare team members facilitated this patient-centred approach to care, leading to increased patient and family satisfaction.

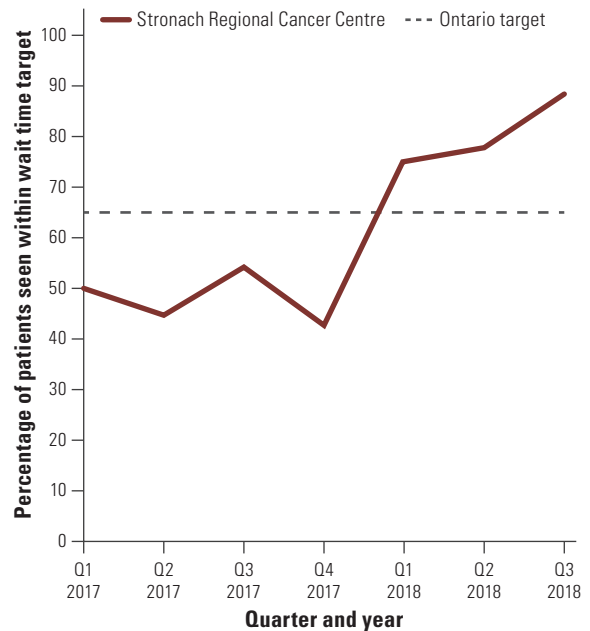
**Performance monitoring**

Process performance was monitored through a dashboard by all project participants on a daily basis for consistent oversight of the process components. The dashboard has been adopted by both Southlake and the YTS office to ensure that referral wait times and the need for additional resources and/or clinics are constantly re-evaluated on a daily basis.

**Outcome measurement**

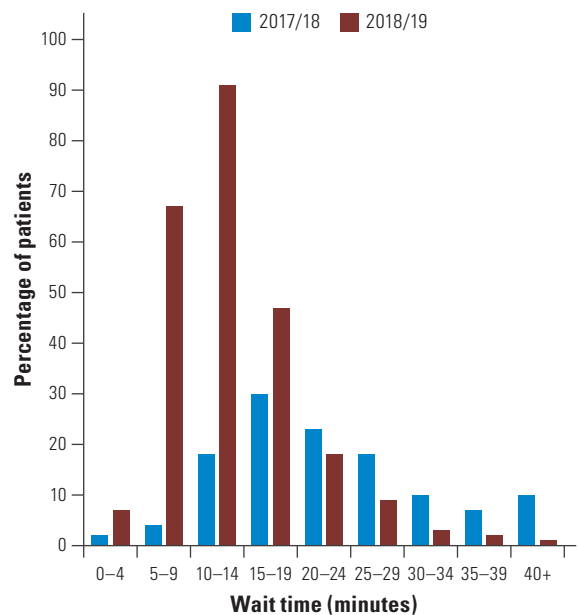
From July 2017 to March 2018, the percentage of patients meeting the target wait time (28 days for 65% of cases from referral to diagnosis) seen within the Southlake DAP was 47%. In that same time frame, the number of patients seen for consultation was, on average, 53 patients per quarter. Following the implementation, from April to December 2018, the percentage of patients meeting the target wait time was 88.4% (Figure 1), and the number of patients seen for consultation had doubled. The number of image-guided biopsies doubled, whereas the wait time for testing was drastically reduced (Figure 2).

**FIGURE 1.** The percentage of patients seen within wait time targets sharply increased as a result of a dedicated team that oversaw the patient from diagnosis to treatment (Q1 2017–2018 to Q3 2018–2019)



Source: Southlake Regional Health Centre Diagnostic Assessment Program Wait Time Database.

**FIGURE 2.** Wait time from request for biopsy to biopsy date



None: Despite the fact that the volume of patients requesting IGBX test doubled, wait time compliance was improved.

Source: Southlake Regional Health Centre Diagnostic Assessment Program Wait Time Database.

## Discussion

Through this project, the team learned that reducing wait time by a few hours (as opposed to looking for days at a time) could reduce the wait time to diagnosis. From March 2017 to August 2018, patient volumes rose from 75 to 124 patients per quarter, an improvement of 40%. In the same period, the percentage of patients meeting the provincial wait time target, from consultation to diagnosis, had risen from 47% to 75%.

Organized, centralized systems with multidisciplinary team membership are considered the optimal organization for the delivery of diagnostic cancer assessment services. In this particular construct, Morgan et al. (2019) noted that reducing a pathway early on by one day may result in a saving of more days subsequently, particularly when tests are scheduled as soon as these are required. The impact of the cumulative small key changes by the Southlake cross-program healthcare team members was surprising; the initial belief was that it would take large-scale changes to reduce wait times and find additional clinic capacity. The ability to identify and reach agreement on the overall goals; the opportunity to deepen the collective knowledge of the teams regarding the importance of contributions from patients, family members and cross-program staff to the process; and the willingness of all participants to remain open to conversation for change all played an important part in facilitating the turnaround in performance.

Many quality-improvement projects within healthcare facilities are conducted with in-house expertise. Although this is often the preferred option, the use of an external consultant within this project was particularly helpful given that previous attempts at process changes were not sustainable between departments and programs.

There are several workflow analysis methodologies we could have used to identify opportunities to improve patient experience and reduce costs, including Six Sigma and Lean. The focus of Six Sigma is to create a more predictable workflow by reducing variation in a process. The primary focus of Lean, however, is to reduce the number of processes by eliminating “waste” – processes that are not adding value to the beneficiaries of the process, who, in this case, were the patients. Lean is often associated with cost reduction, but this is secondary to the primary benefit of improving the process and patient experience, which is accomplished by reducing bottlenecks and ensuring that each step of the process occurs in a tight

sequence. Lean also has a strong change management focus. As a result, we opted to use the Lean workflow analysis methodology for this project and brought together all stakeholders, including care providers and patients. Working together, the team was able to develop a solution designed to improve patient outcomes and operational performance.

## Conclusion

This paper describes how a cross-program, multidisciplinary approach to quality improvement was used to improve patient volume, wait times and overall efficiencies for the patient and the cancer program within the Lung DAP at Southlake.

The initiative was successful in meeting the Ontario Cancer Plan 5 strategic goal of ensuring the delivery of effective and integrated care within this practice setting. The model was designed to be easily embraced by the internal team, optimizing the current complement of resources (clinical, administrative and decision support).

The authors believe that the adoption of quality-improvement methodology can be translated to other initiatives in which the goal is to eliminate waste and create the most efficient healthcare system possible.

To date, this work has been shared through cancer communities of practice across Ontario and at the 2019 Cancer Quality Council of Ontario Quality Awards presentation in Toronto, ON. **HQ**

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