

Reducing Time-to-Treatment for Newly Diagnosed Cancer Patients

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The time from new diagnosis of cancer to initiating treatment — a period of anxiety and distress for patients — has increased to over 6 weeks in large academic United States centers. In 2014, Cleveland Clinic initiated a multidisciplinary program to reduce time-to-treatment and has accomplished a 33% reduction since that time. Our baseline rates for median days to treatment initiation for internally and externally diagnosed patients were 29 and 41 days, respectively. Our most recent median time-to-treatment for all cancers is 25 and 31 days for internally and externally diagnosed patients,

respectively.

Additionally, our baseline rates for proportion of outliers (defined as patients experiencing delays of over 45 days) across all cancer programs was 30%. There were more outliers among externally versus internally diagnosed patients: 47% among externally diagnosed versus 21% among internally diagnosed. But with the approaches outlined herein, we were able to surpass our initial goals and have reduced the proportion of all outliers from 30% to 14%, a 53% reduction.

KEY TAKEAWAYS

1. **Create a “team of teams.”** Creating multidisciplinary teams organized by sites of disease is critical to effect change, but it is equally important to share data, successes, failures, and best practices between disease groups for sustained improvement. Creating and supporting teams with data infrastructure, regular meetings, huddles, program managers, and patient navigators is vital.
2. **There is no “one thing” to fix.** Delays in time-to-treatment initiation are a result of multiple, seemingly small process issues that add up to several days’ worth of lost time. Continuous improvement processes and value-stream mapping can help identify inefficiencies. The goal should be to map across the patient’s entry into the health care system and not simply focus on one or two steps.

3. **Patient preferences need to be accounted for.** An unexpected finding was that some patients chose to delay treatment for varying reasons, including preference for a specific physician, work-related issues, or family commitments. In setting realistic goals for reductions in time-to-treatment, these preferences need to be anticipated.
4. **Change will occur.** Our work has led to a sustained reduction of 13 days in median time-to-treatment. We have also cut the number of patients experiencing delays of over 45 days in half, from 30% to 14%.

The Economic Case

We viewed this initiative as a quality improvement measure, which had no special budget and required little expenditure. As described below, we made use of existing statistical analysts we already employed and reprioritized the roles of staff so that they focused on time-to-treatment.

Since the time of initiative, we have also experienced a 33% increase in new cancer patients, along with an increase in revenues. However, the time-to-treatment initiative was part of a broader program we embarked on to realign multidisciplinary care. The same period also saw the construction of a new building into which the center moved in 2016. We also hired new faculty.

Hence, it may be inappropriate to attribute these developments to the time-to-treat initiative. However, part of the increase in patients may have been due to our willingness to see patients, and start treatment, before other providers.

The Challenge

The time from a new diagnosis of cancer to starting treatment is a period of anxiety and distress for patients and their families. Unfortunately, this time period has increased substantially over the past 2 decades for any type of cancer treatment — whether surgery, systemic therapy, or radiation therapy. In the most recent analyses, median time-to-treatment is over 6 weeks for large academic centers. In addition to the anxiety and distress inflicted on cancer patients, delays in time-to-treatment have potentially been associated with worsened survival in certain cancers, particularly in early stages, further adding to the urgency to address this health care delivery issue.

Notably, physicians often attempt to accelerate time-to-treatment when advocating for themselves, family, or friends. Health system logistical issues should not prevent this approach being extended to all patients in their time of distress.

The Goal

Our goal was to significantly reduce median time-to-treatment from our baseline of 39 days across all cancers to < 30 days. As we analyzed our data, we realized that a subgroup of patients experienced particularly prolonged delays (over 6 weeks) in time to initiating treatment. We defined this group of patients with a time-to-treatment of greater than 45 days as “outliers” and added a second goal of reducing the proportion of outliers across all cancers from 30% to < 20%.

The Execution

Creating Teams and a “Team of Teams”

The first step was to utilize multidisciplinary teams, or “Programs,” created around specific disease sites, such as the Breast Cancer Program and the Colorectal Cancer Program, each of which were among the first rolled out. Each Program had at least two leaders from different specialties, typically surgical oncology and medical oncology.

In 2014, we rolled out formal development of Programs starting with high-volume cancers (genitourinary, >50,000 unique patient visits/year; breast, >35,000/year; lung, >20,000/year; and gastrointestinal, >15,000/year) and extending to nearly all malignancies over a 2-year period.

We found that separately focusing on different disease entities was helpful because barriers to access and coordinated care were substantially different according to site of cancer. For instance, involvement of a plastic surgeon early in treatment planning was important in localized breast cancer but not required in rectal cancer, where the focus was on integrating care with the radiation therapy team.

However, we also realized early on that many barriers to reducing time-to-treatment were shared between disease sites (see below) and that discussion between groups could accelerate change. We therefore developed a reporting structure to the Cancer Executive Committee, led by coauthor Brian Bolwell, Chairman and CEO of the Taussig Cancer Institute, who provided funding for this initiative. This allowed for Programs to learn from one another's successes and failures and share best practices. For instance, the Breast Cancer Program identified lack of communication between schedulers for surgery and medical oncology as an issue delaying initiation of therapy. This Program then developed a weekly face-to-face huddle between schedulers from various disciplines. The success of this huddle led to its adoption by other Programs with similar interdisciplinary scheduling issues, such as the Colorectal Cancer Program.

Thus, this approach allowed for transparent reporting of data and accountability. The Cancer Executive Committee included department and institute chairs from other specialties involved in cancer, such as radiology, pathology, and genomics to streamline their processes (e.g., time to schedule staging scans or insertion of venous access devices). The Committee met twice a month and a major portion of its agenda was devoted to serial reporting, by Program, of time-to-treatment data. An example of a scorecard is provided in Figure 1.

Cancer Programming Overall Scorecard: 2015 - 2017

Goal: Optimize Access

Time to Treatment	Target	Target determined by each disease program					
		Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017
	Actual	35	30	31	29	29	28

Total median # of days (From date of first positive biopsy to date of first treatment) - includes internally and externally diagnosed patients

Time to Treatment -% of outliers (internal)	Target	Target = 10% or less					
		Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017
	Percent	15.8%	15.2%	15.8%	14.0%	13.5%	9.5%

Total % of outliers for cancer programs. An outlier is a patient whose TTT is 45 days or greater. This only includes internally diagnosed patients.

Source: Authors

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Figure 1. Click To Enlarge.

Identifying Sources of Delay

We utilized value-stream mapping methods (i.e., keeping track of referral sources) to identify the multiple access points via which patients entered the health care system for individual cancers and found these to be substantially different by site of cancer, as well. For instance, colorectal cancer patients were usually referred by gastroenterologists who had found a malignant lesion on colonoscopy, whereas pancreas cancer patients were more likely to be referred during inpatient stays where they had been admitted with the presenting symptom of jaundice.

The process consisted of mapping out every step of treatment from the first phone call until the patient comes to see us. We made huge white boards looking at every step to see if we could make specific changes to reduce time-to-treatment. The most complex charts were for rectal cancer or some types of breast cancer and involved 100 steps. The charts for nonprogressed breast cancer listed 25 steps.

One important strategy in reducing delay that is common among different forms of cancer is addressing the bread-and-butter activities of treatment, such as setting appointments and getting authorization for procedures from insurance companies. For example, getting approval for a scan may take 3 to 5 business days, while getting approval for a treatment such as chemotherapy may take another 3 to 5 business days for some insurance companies. Approval for surgery may also take 3 to 5 business days. All are separate processes.

An unexpected finding was that some patients chose to delay treatment for varying reasons, including preference for a specific physician, work-related issues, or family commitments. However, genomics was not an important source of delay, because it was not needed for some of the common first steps of treatment such as surgery. Neither was patient deliberation over forms of drug treatment, because that decision is usually made at the first visit with an oncologist.

When the referral came from outside our institution, it was more difficult to work on external sources of delay, because there were so many. Our question was how to move faster within our system once we got the first phone call to get the patient in.

Staffing and Data Infrastructure

We already possessed a majority of the data necessary to make the initiative a success, so to organize the data, we created a data infrastructure, partially utilizing tumor registry resources, to provide quarterly updates. We also created our own huddle software.

Our analyses made it apparent that additional staffing was necessary for coordination of Programs across various specialties. We created the position of program manager and hired individuals to fill this full-time role, each responsible for two to three Programs. We currently have five program managers responsible for supporting thirteen Programs. Their responsibilities include partnering with physician disease program leaders to identify priority work each year (in line with cancer center and enterprise priorities), managing

the disease Program agenda, and planning projects and metrics (e.g., time-to-treatment trends and improvements). This reduced the administrative burden on physicians. We further realized that we needed additional staff to coordinate patient access and follow-up between various specialties. Therefore, we staffed the major disease Programs with lay patient navigators, beginning in 2017 (Year 3). The cost of staffing was partially offset by philanthropic dollars directed at this effort.

Transparency and Accountability

Time-to-treatment was made a priority metric for all disease-oriented Programs and discussed at regular meetings of the Cancer Executive Committee. This allowed for transparency of results and accountability for program leaders. Additionally, some Programs chose to display time-to-treatment for individual patients during tumor boards that highlighted, in real time, days elapsed since diagnosis. Some Programs created huddles attended by physicians, schedulers, and nurse coordinators with the express goal of identifying barriers for individual patients. Finally, we created electronic tools that tracked patients in real time prior to starting treatment and alerted patient navigators of unanticipated delays.

One finding of this data-driven approach was an increased recognition of patient preferences in treatment initiation. In the Breast Cancer Program, for instance, 296 of 1,654 patients (17.9%) diagnosed with breast cancer in 2017–18 had a barrier/delay of patient preference including preference for specific dates, location, or physician.

Real-Time Navigation Dashboard



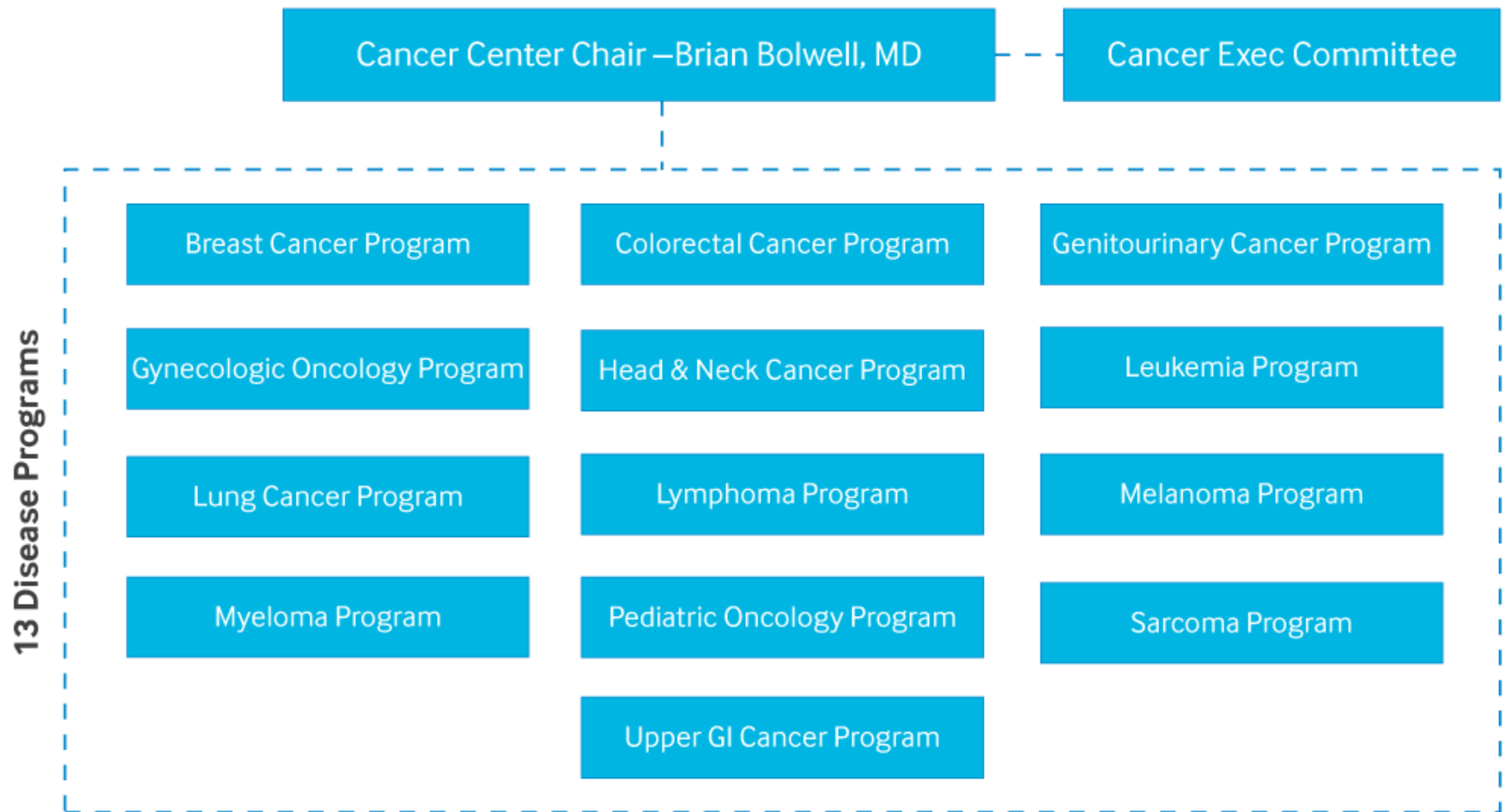
Figure 2. Click To Enlarge.

Each circle represents a patient. Each vertical array of circles represents an individual surgeon's patients. Huddles are focused on a specific surgeon's practice. Each surgeon's huddle takes place once per week, on a day when they are in multidisciplinary clinic in the cancer center. Huddle participants are breast surgeon, plastic surgeon, scheduling team, nursing, administrator, and patient navigator (who facilitates the huddle).

The Team

Our multidisciplinary teams comprised physicians from multiple specialties organized by diseases, program managers for each disease group, patient navigators, nursing coordinators, and leaders. These teams were supported by five statistical analysts who gathered and tracked data. The lead statistician has a Master of Public Health degree, while others have an information technology background. The team members reported to an executive committee that met regularly and transparently discussed metrics and challenges. An organizational chart is provided in Figure 3.

The Team: Organization Chart



Source: Authors

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Figure 3. Click To Enlarge.

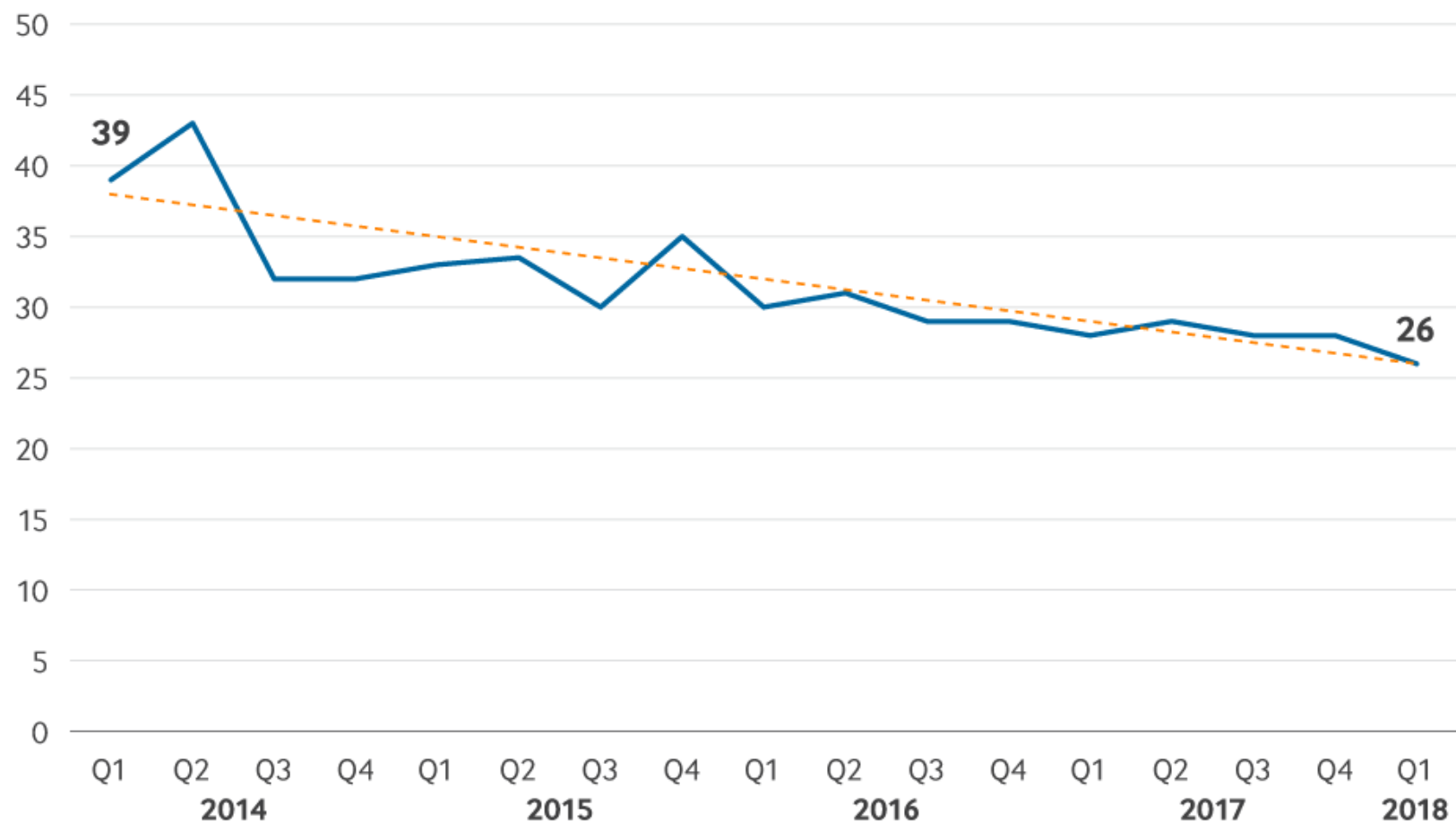
Metrics

Time-to-Treatment Initiation

Time-to-treatment initiation was defined as time from initial cancer diagnosis to earliest cancer-directed treatment, whether surgery, radiation therapy, or systemic therapy. The date of initial cancer diagnosis was originally defined as clinical suspicion or histologic diagnosis and subsequently amended to histologic diagnosis only for a more clearly defined time point. Our baseline median time-to-treatment for all cancer patients was 39 days for the first quarter of 2014.

Realizing that logistical barriers to accessing treatment differed for patients diagnosed internally at Cleveland Clinic versus those diagnosed outside and referred (approximately one-third of our patients), we studied time-to-treatment initiation separately for these two groups. Our baseline rates for median days to treatment initiation for internally and externally diagnosed patients were 29 and 41 days, respectively. With sustained efforts, we surpassed our original goal in 2016 and have sustained and further improved this metric since. Our most recent median time-to-treatment for all cancers is 26 days, a 33% reduction over baseline (median 31 and 25 days for externally and internally diagnosed patients, respectively) ($p < .01$ by Mann–Whitney U test).

Median Days to Initial Treatment for Newly Diagnosed Patients at Cleveland Clinic, 2014-2018



Source: Authors

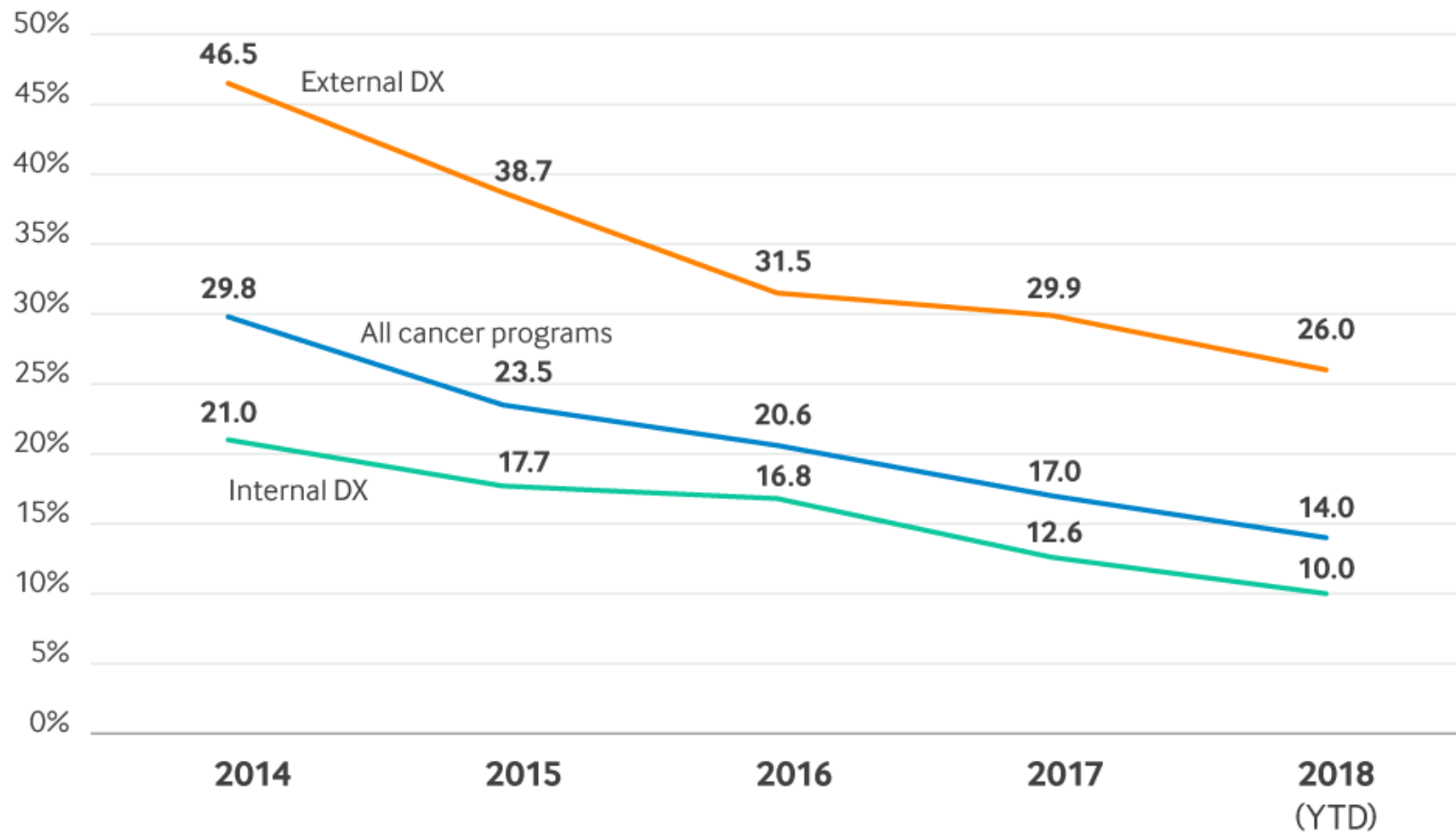
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Figure 4. Click To Enlarge.

Proportion of Outliers

We defined outliers as patients with particularly prolonged time-to-treatment (greater than 45 days). We specifically evaluated the proportion of patients defined as outliers for each disease Program and set goals for the reduction of such outliers. Our baseline rates (Quarter 1, 2014) for proportion of outliers across all cancer Programs was 30%; there were more outliers among externally versus internally diagnosed patients (47% vs. 21%, respectively). With the approaches outlined above, we were able to surpass our goals in 2016 and have further reduced this proportion to one-half of baseline (currently 14% of all cancers, a 53% reduction) ($p < .01$ by Z-test).

Percentage of New Patients Taking 45 Days or Greater to Initiate Cancer Treatment (Outliers)



Source: Authors

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Figure 5. Click To Enlarge.

Other Outcomes

We observed a 33% increase in new cancer patients during this time period accompanied by a nearly 7% compounded annual growth rate in revenues, although this is unlikely to be simply due to our time-to-treatment initiative. (Other factors including increased faculty members and opening of new facilities likely played a role.) In addition, software programs developed internally to better navigate patients and coordinate care have proven successful. We are currently exploring opportunities to commercialize this, which could add to revenue generation from this quality initiative.

Finally, we found additional value in the organizational development of the “team of teams” as it led to clinical alignment across a complex health care delivery system. Having stakeholders from geographically distant locations actively participate in Program efforts such as time-to-treatment has led to more physician engagement and to more uniform, higher-quality, and cost-effective clinical care.

Where to Start

To implement a similar approach to reducing time-to-treatment initiation in a cancer center or large cancer program, organizations must:

1. Understand current access points by which patients seek cancer care, both for internally diagnosed and externally diagnosed patients.

2. Organize multidisciplinary teams focusing on specific disease groups (e.g., breast, colorectal, head and neck) involving all specialties that interact with patients and all relevant stakeholders (including physicians, nurses, social workers, schedulers, and patient advocates).
3. Educate all health care providers including physicians, surgeons, mid-level practitioners, nurses, and schedulers on the importance of time-to-treatment, including anxiety/distress for patients and potential impact on outcomes.
4. Create and resource a data infrastructure that can support serial reporting of metrics and allow deep dives into specific issues.
5. Utilize existing committees or create a new committee (the “team of teams”) that includes the highest levels of cancer center leadership for regular reporting of data by various disease groups.

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