



# Innovation and Access to Cancer Care Services in Ontario

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Time stands still between diagnosis and surgery. That waiting time is awful. Three weeks seems like an eternity.

– Cancer patient, Canadian Cancer Society's *Talking about Cancer* (Canadian Cancer Society 2004b)

Canada's first ministers were wrong to focus on wait list times in five key areas during the recent health care summit, says Roy Romanow, the former Saskatchewan premier who led a landmark royal commission on the state of Medicare. By focusing on reducing wait times for cardiac, cancer, joint replacement, cataract and diagnostics, all other medical services may not get the attention they so deserve.

– *Toronto Star*, October 1, 2004

THE FAILURE TO PROVIDE TIMELY ACCESS to healthcare services is a growing problem in many countries and remains a concern in the Ontario cancer system. Wait times for services is a political problem for governments, and reducing these times is a complex task, requiring action on multiple fronts. Reducing wait times for cancer services is challenging for two important reasons. First, the cancer journey is complex, involving multiple diagnostic and staging tests and various treatment modalities; there are many points at which patients must wait for different treatments and

services. Second, the demand for cancer services is substantial and will continue to grow because of the aging of the population and an increase in some risk factors. Without concerted action to reduce waiting times, the problem will only worsen.

Current efforts to address the access problem in Canada appear to be based on several key assumptions. First, it is assumed that the growing demand for services and limited resources will inevitably limit access and create waits for patients. Second, it is also assumed that the most direct way of improving access is to provide additional

resources to target specific gaps in diagnostic and therapeutic services, as well as to improve the allocation of current resources by ensuring that patients with the greatest need are offered care first. Implicit in these two assumptions is a third tenet: that current service-delivery patterns are largely effective, and that service delays are a result of growing demand, not the way that services are currently provided.

This paper outlines the nature of the access problem for cancer services in Ontario, and reviews current approaches to reducing wait times in Canada and abroad. Canadian efforts to improve services have focused largely on creating wait lists that aim to prioritize patients and to use resources more effectively. Investments in services are also being made in areas where current demand outstrips the supply of available services. Internationally, other approaches have been taken that have great potential for Canada.

In the UK, substantial and continuing investments in the National Health Service (NHS) have been linked to

efforts to update and streamline service delivery and improve coordination between agencies and providers. Efforts in system redesign have proven successful for addressing some access problems. A number of healthcare organizations in the United States are using ideas from operations research and supply chain management to redesign services and reduce waits, often with little additional resources. In Canada, such efforts are uncommon but could greatly improve access to care.

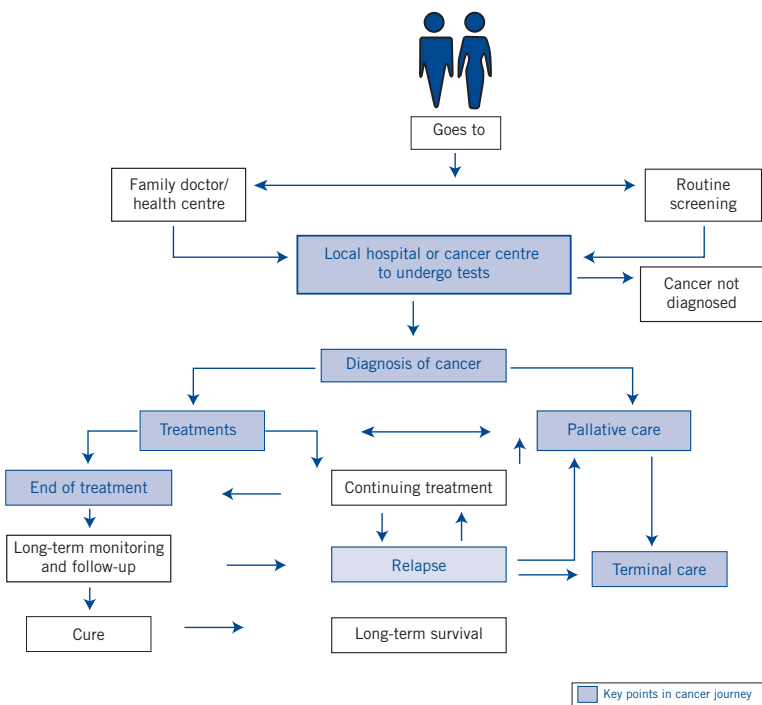
Following a description of the problem, we suggest critical steps in redesigning the diagnosis and treatment systems that will improve access and reduce waiting times. Although our principal focus in this paper is on cancer diagnosis and treatment, the methods described are applicable to all types of healthcare.

**WAIT TIME FOR CANCER CARE: THE PATIENT JOURNEY**

Although the cancer patient journey is complex, and no two patients have the same experience, there are common steps that patients take as they make their way through the system. Figure 1 illustrates the complex journey that patients take in general, beginning with screening or a visit to a family physician, continuing with various treatment modalities and ending with long-term survival or terminal care.

The cancer journey varies depending on tumour type and disease stage. For example, a breast cancer patient may begin with routine breast screening. If the screen is abnormal, she may then undergo a variety of diagnostic tests, including a diagnostic mammogram, CT scan, MRI and/or others (Canadian Cancer Society 2004a). She is also likely to undergo a biopsy, where cells or tissue are removed and examined under a microscope. Following confirmation of a cancer

**Figure 1.**  
**The cancer patient journey**



Source: Fitch, 2003.

**Waiting for cancer services may cause anxiety, frustration and possibly poorer outcomes.**

diagnosis, she undergoes surgery, either a lumpectomy or a mastectomy, along with the removal of lymph nodes to check if the cancer has spread and determine the stage of the cancer. After a lumpectomy, she may have radiation therapy on her breast and regional lymph nodes. Chemotherapy or hormonal therapy may also be indicated to reduce the likelihood of recurrence.

Each stage in the journey entails multiple steps. For example, to receive radiation therapy, a patient first has a consultation with a radiation oncologist to determine if radiation therapy is appropriate. The radiation oncologist may require additional tests, and the

opinions of other specialists, such as a medical oncologist. If radiation therapy is indicated, the radiation oncologist must plan the treatment, map the area to be treated and determine the dose to be administered. The treatment must then be booked for multiple sessions.

Patients often wait at each of these steps in the journey. Waiting for cancer services may cause anxiety, frustration and possibly poorer outcomes. Patient accounts of waiting in Ontario demonstrate the problems created. One breast cancer survivor and advocate describes “cancer rage” (DeKoning n.d.), which she terms “an appropriate phrase to describe the current scenario in

Ontario regarding healthcare for cancer patients.” She states, “having been through the system twice myself, once in 1993, when I was diagnosed with breast cancer, and a second time in 2000 with a recurrence, I have witnessed a decline in the timeliness and quality of care.” The patient journey illustrates the complexity of the cancer system and the problems posed by waiting for care at numerous points. The complexity of the system is a major challenge to reducing wait times. Solutions to wait times must be system-wide to have an effect (Institute for Healthcare Improvement 2003).

The growing cancer incidence adds additional urgency and complexity to the need to reduce wait times (Schwartz et al. 2004). Driven largely by population aging and growth, the number of new cancer cases in Ontario is expected to grow by two-thirds by 2020 and double by 2028 (Schwartz et al. 2004). At present, there are approximately half a million people who have survived or are living with cancer in Ontario (Schwartz et al. 2004). Both the growing incidence and prevalence of cancer drive the need for cancer services. Incident cases compel the need for one-time services, such as radiotherapy and cancer surgery, while prevalent cases contribute to continuing needs for diagnostic services including laboratory and imaging services, systemic therapy and supportive care. Because of the growth in the number of patients requiring treatment, demand for cancer services will certainly increase over time.

In addition to the growing number of cases of cancer, advances in cancer diagnostics and treatment, as well as new indications for treatment, have raised the demand for and cost of cancer services. The direct cost of cancer in Ontario was estimated at \$2 billion in 2004, and the indirect costs

were approximately \$5.5 billion, including costs associated with premature mortality and short- and long-term disability. Costs will continue to rise as the incidence and prevalence of cancer grow and new, more expensive cancer treatments are developed.

### ADDRESSING WAIT TIMES: THREE APPROACHES

There are three approaches that have been implemented in various jurisdictions to address wait times and improve access to care:

1. measuring and monitoring wait times
2. improving and expanding selected services
3. system redesign

#### Measuring and Monitoring Wait Times

From a traditional economics perspective, a healthcare system with no wait for care might be viewed as operating with excess capacity, wasting resources that might be better utilized elsewhere in the system. Economists have identified “optimal” waiting times, which refer to the point at which the costs of waiting, such as health outcomes and anxiety, equal the benefits of waiting, which are generally economic (Hurst and Siciliani 2003). However, this view does not take into account the fact that some outcomes of waiting for treatment are difficult to quantify, and evidence on the impact of waiting may be incomplete. Still, without accurate measures of waiting in the system, it is

difficult to determine whether individuals are experiencing excessive waits. Reviews of the literature on wait times have identified a variety of ways to measure and define waiting and various data sources (McDonald et al. 1998).

*Waiting Lists and Waiting Times for Health Care in Canada: More Management!! More Money??* (McDonald et al. 1998), a 1998 Canadian report on wait times, emphasized the importance of measuring wait times as a key first step in dealing with the problem. The authors gathered information through comprehensive surveys of governments, hospitals, regional health authorities, providers, administrators and consumer groups, and reported a comprehensive literature review. They concluded that without improved information and management systems, any policies dealing with wait lists would be ineffective. The report concluded that until “more management” is available, “more money” would not help the wait list problem.

Additional information is also needed to determine what “acceptable” waits are. There is limited evidence on the relationship between waiting and health outcomes, some of which is conflicting. It is also difficult to properly weigh the different perspectives of patients, providers, administrators, the public and others. Some jurisdictions have nonetheless established maximum wait times that are based on limited empirical evidence (Banchy et al. 2000). Without evidence-

**Knowledge about wait lists and wait times can help to improve patient flow through the system.**

based targets for receiving care in a timely manner, it is difficult to set guidelines for wait times.

Accurate wait time measurement is essential to understanding system performance. Knowing where waiting occurs and its effects on patients is necessary to shape interventions that reduce wait times and evaluate when interventions are effective. Knowledge about wait lists and wait times can help to improve patient flow through the system.

Cancer Care Ontario (CCO) has measured waiting for radiation therapy for over a decade. This activity serves several purposes. Radiation therapy measurement allows for the monitoring of wait time trends and patterns. Measurement also provides information on the accountability of caregivers in cancer centres, which can have organizational, political and legal implications. Another example of this type of initiative is the development of a central registry for cardiac bypass surgery patients by the Ontario Cardiac Care Network that has helped to improve access to cardiac surgery (Saulnier et al. 2004).

Another measurement strategy focuses on prioritizing access to care. Patients on wait lists often have different needs, so wait lists may use evidence to set priorities. The Western Canada Wait List Project (WCWL) has developed tools to aid in the prioritization of patients on wait lists (Noseworthy et al. 2001). Although these tools alone do not reduce wait lists, they help ensure that patients' clinical needs influence their wait times. The WCWL has not addressed the prioritization of cancer specifically, but it has developed MRI scanning and general surgery tools, which are both relevant for some cancer patients.

Though useful and important, the measurement of wait times alone has

limited impact on the reduction of wait times. Measurement of waits can help to identify the sites where wait times are shorter and, assuming patients agree, enables the transfer of patients to shorter queues. However, measurement alone does not create access improvements, and although measurement is needed to gauge the extent of wait times and monitor the impact of improvement efforts, it is no substitute for broader action.

### **Implementing Improvements in Selected Care-Delivery Elements**

Focused efforts to reduce bottlenecks in care or add new resources are important strategies for improving access. Changing selected care-delivery elements assumes that the system is generally functioning well, but that wait times are caused by limited capacity in one or two key steps in the patient journey. For example, limited access to CT or MRI diagnostic scanning can affect access to other steps of care. Lack of operating theatre time can also reduce access to surgery. In such cases, increasing the supply of resources is a common solution used to address wait times. Many of the wait time policies that have been implemented over the past several decades across various jurisdictions have focused on such "steps in the system." Increasing capacity at selected points, improving efficiency and improving local coordination are all useful tactics to reduce wait times when the waiting is caused by a few elements of care.

There have been a number of these solutions implemented in the Ontario cancer system. *Gaining Access to Appropriate Cancer Services: A Four-Point Strategy to Reduce Waiting Times in Ontario* (Schwartz et al. 2004) outlines strategies to reduce wait times in Ontario. New capital projects, including the Grand River, Northwestern

Ontario and Hamilton Regional Cancer Centres, were completed in 2004. Regional Cancer Centres in Peel, Durham and Hamilton are currently in development. Capacity in existing cancer centres is also being expanded (Cancer Care Ontario 2004). The Ministry of Health and Long-Term Care has allocated \$26.3 million in 2004 to address wait times and improve access to cancer services. This funding will increase cancer surgery, radiation therapy and pay for the replacement and extended operation of CT and MRI scanners (Ministry of Health and Long-Term Care 2004). New efforts have also been made to reduce demand for cancer services through smoking cessation campaigns, breast cancer screening and a fecal occult blood testing pilot for colorectal screening.

Another example of solutions that fall under this category is maximum-care guarantees used in the UK (Hurst and Siciliani 2003) and now championed by some advocates in Canada (Kirby 2002). Care guarantees promise patients certain treatments within a set period of time. Ontario does not currently employ this technique to address wait times in cancer care, although the use of Ontario funding to send patients out of province for cancer care and other services implies some implicit use of this strategy.

Taking steps within the system can provide short-term relief for excessive wait times through immediate solutions. Such steps often deal with wait times now, shortening wait times for at least some of the individuals currently in the system. However, shortening the waits for some individuals in the system often happens at the expense of other patients. For example, a UK initiative to decrease the wait lists for varicose vein surgery was successful in decreasing the proportion of patients

waiting for surgery from 65 to 40%. However, the proportion of patients waiting for hernia surgery increased from 10.4 to 15% during the same period (McDonald et al. 1998).

In addition, short-term solutions rely on the larger system working effectively. In situations where there are broader problems in the coordination of services or the organization of care in local settings, implementing improvements in local delivery elements is insufficient to reduce wait times. For example, attempts to improve the flow of patients through emergency departments often require changes outside the department itself, since flow problems are frequently caused by backups in transferring patients out of hospital beds. Experiences in both the US (Institute for Healthcare Improvement n.d.a) and Canada (Ontario Hospital Association 1998) have shown that improving local delivery elements alone may not reduce wait times. Adding new resources can help fix visible problems, but it often exposes other bottlenecks.

### System Redesign

System redesign addresses problems in health-delivery systems resulting from poor coordination and integration within the system. Donald Berwick, CEO of the Institute for Healthcare Improvement (IHI), notes: "Every system is perfectly designed to achieve the results it achieves" (Berwick 1996). But most care-delivery systems were never "designed." Instead, they evolved gradually, incorporating new technologies and new types of care without changing basic operations and processes that were developed much earlier. System redesign strategy calls for analyzing the current performance of care-delivery systems using tools developed for assessing patient flow and then improving performance by

removing bottlenecks or creating new models of care.

Some of the changes that result from analyzing and improving system design may incorporate measurements or innovations used by other approaches mentioned above. Redesigning the system can improve the processes that are used within specific units to provide care or redesign how capacity is planned, provided and booked. But the scale of the change is greater, and the focus includes not only interventions in individual clinics or centres but also improvements coordinating the delivery of care across providers, clinics and organizations.

System redesign initiatives often start with mapping the patient journey, identifying every step along the way, and then redesigning the pathway to eliminate unnecessary complexity or time-consuming steps (Garvey et al. 2003). Teams in local centres document the patient journey through clinics and hospitals, mapping the steps and identifying bottlenecks, duplicated work and unnecessary waits. Explicit attention to the steps of care often results in insights about opportunities to improve flow. Teams also can share the lessons learned and best practices between sites and between services. Other types of system redesign have included reviewing how care capacity is used and redesigning the way that capacity is planned and added to the system (Silvester et al. 2005).

System redesign efforts require expert assistance from operations managers and patient flow consultants. Such consultants facilitate local insight, provided by frontline caregivers and managers, who help to identify changes. Changes are tested first by implementing them at the local level and then applying them to the entire system. Implementing change at

the local level enables the planning and testing of solutions in real work settings, without the commitment to redesign the entire system at once. A list of best practices and critical ideas for improving flow can be shared between sites and teams. The opportunity to redesign the system at the local level allows for more innovation, which in turn promotes new examples of system redesign. However, a challenge inherent to such grassroots change is the transition from local system redesign to system-wide changes. There are several Ontario examples of redesign in the cancer system, but most of these have remained local. It is the combination of local innovation with central support for spreading the change that enables the success of system-wide system redesign.

One Ontario example of system redesign is the current Diagnostic Assessment Unit (DAU) pilot in development at the Ottawa Regional Cancer Centre. A DAU is a one-stop ambulatory diagnostic clinic with multi-disciplinary consultative expertise, patient information resources and psychosocial supports. These centres appear to decrease the time to diagnosis of benign or malignant lesions. In one pilot study, waiting was reduced from 119 to 63 patients on the waitlist (Gagliardi et al 2004). Two months after the pilot study ended, the waitlist was back up to 108 patients. The majority of the patients in the pilot study reported satisfaction with the clinic and their care.

The Ottawa pilot includes a multi-disciplinary team of nurses, social workers and medical specialists. Close linkages are also established with family physicians, community hospitals, the Community Care Access Centre and physicians providing palliative care (DeGrasse 2004).

Other examples where system redesign may provide for improved access and faster service delivery include new Ontario initiatives in express line chemotherapy and rapid access radiation therapy, but these local initiatives have not yet been spread beyond initial sites. Clearly, the challenge for system redesign is to expand successful local efforts into broader system redesign. The UK experience in the last few years demonstrates that such changes can be spread within a larger system.

### **THE MODERN NHS: SYSTEM REDESIGN FOR IMPROVED ACCESS**

The NHS in the UK experienced problems with unacceptable wait times since the 1970s and tried numerous strategies to reduce wait times, including improved measurement, added capacity and maximum guarantees (McDonald et al. 1998). Despite these solutions, long delays for treatment continued to be a problem, especially in cancer care (Spurgeon et al. 2003).

The need to reduce wait times effectively was recognized in the NHS Plan (National Health Service 2000a), which was released in July 2000, followed soon after by the NHS Cancer Plan (National Health Service 2000b). Both plans identified the need for system redesign in the NHS, calling for an overhaul of healthcare delivery systems (Garvey et al. 2003). With the help of the Cancer Services Collaborative (CSC), formed in 1999, the plan for system redesign was developed, based on four key strategies:

1. a flexible improvement model for testing, adapting and implementing changes
2. small-scale testing to create momentum for making big changes to the system
3. effective use of data for learning

4. collaboration with other teams and experts in the subject matter

Consistent with the tenets of system redesign, the NHS strategies called for multidisciplinary grassroots initiatives tested at the local level and then spread through the system. The NHS Plan established a £500 million performance fund to support healthcare performance improvement at the local level (National Health Service 2000a).

The major vehicle for system redesign in cancer was the CSC, which was rolled out as a three-phase program, starting in nine pilot cancer networks, working in five key cancer areas. The pilot networks implemented various system redesign projects in these five tumour groups, evaluating the innovations and collaborating with the other pilot networks. Phase II was launched in April 2001, expanding to include all 34 cancer networks and several more cancer sites, promoting innovation across the NHS cancer system through the continued use of system redesign and collaboration with other cancer networks.

The third and final phase of the CSC began in April 2003 and is expected to run until March 2006. This phase will focus on implementing lessons already learned at the network level across the cancer system and aligning local priorities and strategies with national requirements. Currently, these improvements are reaching over 40% of cancer patients and contributing to significant reductions in wait times for diagnosis and treatment (National Health Service 2004).

A few examples of local improvements demonstrate how system redesign has shortened wait times and improved quality of care. The King's College Hospital in the South East London Cancer Network reduced wait times for all breast-screening referrals to two weeks. The hospital had previ-

ously experienced increasing wait times for routine breast screening referrals (three to four weeks), with urgent referrals seen within two weeks (Cancer Services Collaborative 2001a). Upon reviewing the capacity of both clinics, the hospital determined that the urgent clinic had approximately 30 slots set aside per week with only 10 being used, while the routine clinic had 24 slots set aside and was developing backlogs. Moving away from this "carve out" model of care (where some appointments are reserved for specific types of patients), the clinics were combined, yielding 54 slots for all patients. Several extra slots were added to work down the backlog of appointments, and wait times for all referrals were reduced to two weeks. By redesigning the system according to common need, rather than urgency, and identifying capacity usage and needs, the team was able to reduce wait times for all patients.

At the Central Middlesex Hospital in the West London and Environs Cancer Network, the average lung cancer patient required 45 days from referral to first definitive treatment. This time was reduced by 50% to 22 days (Cancer Services Collaborative 2001b). By designing pathways of care for common patient needs, ensuring patients were on the right pathways for care and improving communication among care providers across the patient journey, the clinic was able to reduce wait times. Quality was also improved, with less duplication of tests, more access to supportive care and increased patient certainty in the diagnostic and referral process.

At the University Hospitals of Leicester in the Leicestershire Cancer Network, system redesign around an improved patient experience resulted in lowered wait time and increased patient satisfaction rates to twice the

previous levels (Cancer Services Collaborative 2001b). Patients returning to the hospital for their first follow-up appointment were booked with the surgical team and oncologist later in the day. Although this proved beneficial for patients since they did not have to return for multiple appointments, it forced them to wait in the hospital all day. The hospital purchased two pagers for patients so that the clinical coordinator could page the patients in time to return for their appointments.

There are numerous other examples of similar system redesign initiatives throughout the NHS. As local initiatives prove successful, the final phase of the CSC will continue to allow for collaboration across networks to spread local successes to other networks.

## CRITICAL SUCCESS FACTORS IN SYSTEM REDESIGN

### Focusing on Optimizing Patient Flow

Waits and delays are common in healthcare, leading many to believe that waiting is unavoidable. Efforts to apply knowledge of system design, management science and quality-improvement techniques, such as those used in the NHS, have demonstrated that improvements are possible without substantial increases in resources. Improvements are achieved by careful analysis of the system, understanding the nature and sources of variation, and deliberate attempts to match capacity to predictable variations in demand.

### Mapping the Patient Journey

Mapping the patient journey through the system and through individual departments can reveal key areas for system redesign. Mapping the system structure and flow can indicate where bottlenecks exist, and mapping all the

specific steps can explain why there are bottlenecks. This exercise often reveals that some steps along the patient journey are unnecessary but have rarely been questioned. For example, in one NHS network, the patient mapping exercise revealed that there were over 50 steps involved in booking a routine gastrointestinal endoscopy (Garvey et al. 2003), many of which were unnecessary. Such process mapping can also reveal directly where slowdowns in the system occur, such as delayed chart transfer between departments. Detailed maps of patient flow help guide the redesign of diagnostic and treatment patterns to reduce the numbers of separate patient visits and enable caregivers to coordinate separate services in ways that often reduce time without adding costs.

The journey mapping exercise can also allow for an evaluation of the patient experience, revealing areas where small changes in the journey could increase quality of care and patient satisfaction, such as the example of the use of pagers.

### Managing and Reducing Variation

Variation is a natural phenomenon in healthcare delivery. Differences in the nature of patients (age, medical conditions), staff (skills, training, time off), supplies (differences in machines, room layout, supplies), and information (transcription, transport, applications) contribute to variation in the delivery of care (Silvester et al. 2003). Some variation (labelled “random” or “common cause” variation) cannot be eliminated, but can be predicted and managed. Other, non-random (“special cause”) variability can be greatly reduced or anticipated. For example, many operating rooms have heavier schedules on some days due to teaching responsibilities or preferences

of surgeons. Such variations lead to slowdown in patient flow and limitations of resource use. Understanding the nature and source of variation is useful knowledge to be used for redesigning systems to ensure that there are necessary staff and other resources available at times of greatest demand. Understanding patterns in demand can help smooth the wait times for services, an insight that has contributed to improvements in the operation of emergency rooms in several US hospitals.

Even when healthcare managers recognize the need to plan for variability, they often fall into the trap of planning for the average patient demand. Such strategies fail to take into account the variation in demand, leading to a failure to match demand with the necessary resources (Institute for Healthcare Improvement 2003). Consider this example:

The *mean* elective surgical volume for two hospitals for one week may be 125 patient cases each. Hospital A has a steady flow of surgical cases throughout the week, allowing for optimal scheduling and predictable demand for staffing and patient beds. Hospital B, which also has a mean of 125 cases, schedules 50 percent of its cases on Mondays and Wednesdays, and 50 percent on the remaining days. Because the caseload is so high on Mondays and Wednesdays, there is no room for the seemingly random but historically predictable surgical complications and added cases. The demand for staff, beds, and equipment is at a maximum. Any added volume or decrease in capacity is felt quickly as waits, delays, and cancellations. (Institute for Healthcare Improvement 2003)

Some of this variation is random and cannot be controlled – mostly the variation caused by patient factors. However, some of this variation can be predicted, controlled and often eliminated. Much variation in healthcare can be reduced or eliminated. By reducing variation, capacity and demand will match more often, and the remaining variation can be predicted and matched to plan capacity needs.

### UNDERSTANDING AND MATCHING CAPACITY AND DEMAND

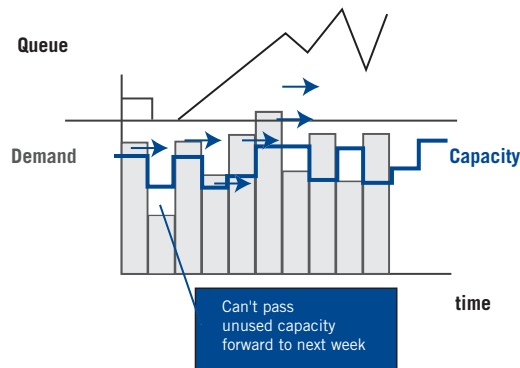
Based on the idea that variation is a significant cause of backlogs and wait times, variation in demand and capacity should be measured, and capacity should be flexed to meet demand as required. Richard Steyn, a thoracic surgeon and expert on improving patient flow, has developed a number of models to illustrate the importance of these concepts. He notes that unless capacity is matched to demand for service that clinics can experience the development of queues while under-utilizing available resource on some days (see Figure 2).

To avoid these problems, managers need to analyze their capacity and demand analysis to predict appropriate staffing and other resources needs using queuing methods or similar tools. Queuing methods produce computer models that enable predictions of resource requirements generally mapped against time and changing demand (Hall 1990). These methods can indicate whether available capacity will be sufficient for anticipated demand and thus provide a basis for understanding how to improve patient flow.

Understanding that systems can be redesigned is important to reducing delays in accessing care. However, consultants and senior managers

**Figure 2.**

**Variation mismatch leads to waits**

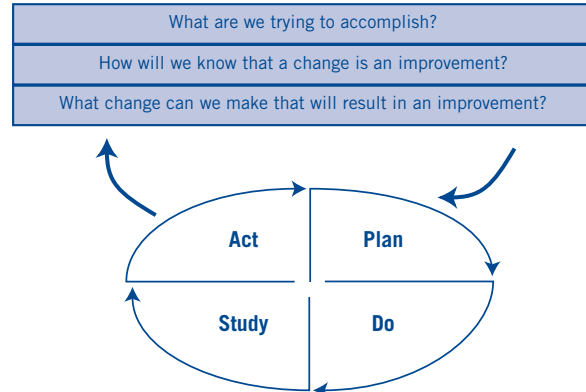


**NHS**  
Modernization Agency

Source: www.steyn.org.uk

**Figure 3.**

**Model for improvement**



Source: Berwick, 1996.

cannot understand all the factors necessary for successful implementation of these ideas. A method is needed to enable local teams to apply these ideas (with appropriate support from experts). The methods used in the NHS modernization efforts, and in a variety of improvement work in North America and elsewhere, are based on a simple model used for more than a decade by the IHI and others.

### Improvement Model

The IHI improvement model, based on the work of Thomas Nolan and others, has been used to test out specific changes to improve system performance to better serve patients and other customers, improve system flow and reduce costs (Murray and Berwick 2003). Adapted from Langley, Nolan and Nolan (Langley et al. 1992), this model has four key steps starting with three questions that help



teams to set aims, define measures and identify ideas for change. After these questions are answered, teams need to test these ideas in real work settings. The testing of change involves four steps: *Plan* the change; *Do* the change; *Study* the change; *Act* on the results. Plan-Do-Study-Act (the PDSA cycle) is the “Deming cycle,” which is widely used in quality-improvement efforts in healthcare and elsewhere (see Figure 3).

The IHI model consists of three questions and a cycle for testing innovations. The questions are devised to help an organization focus on areas for improvement and create change (Institute for Healthcare Improvement n.d.b). Together, the questions help identify improvement aims, measure the impact of changes and select the changes that are most likely to result in improvement.

For cancer wait times in Ontario, the three questions might be answered thus:

**What are we trying to accomplish?**

**Local improvements:**

- reduced wait times for cancer services
- increased patient satisfaction with access to cancer care

**System-wide improvements:**

- changes at local levels that can be implemented throughout the system
- greater coordination for patients accessing services in the cancer system
- reduced waste and improved utilization of services
- reduced variation in system-wide quality indicators

In addition to larger aims for system redesign, local teams set local aims that identify goals for their efforts. These aims specify the improvements desired in clinics to improve access and reduce wait times.

The second key question in the improvement model asks for measures to determine if the changes made lead

to improvements. The linkage of the improvement strategies to measures of performance enables local teams to assess their efforts in achieving their goals, and to gauge the impact of their efforts on a larger scale.

**How will we know that a change is an improvement?**

**Local measurements:**

- wait times
- patient satisfaction
- costs

**System-wide measurements:**

- wait times across the system
- number of improvements made in the system
- quality of care outcomes
- coordination among providers and organizations
- costs

The third question is focused on identifying the specific changes that teams might make to improve flow. These would include changes in booking processes, care delivery, communication and coordination, and staffing.

**What change can we make that will result in an improvement?**

**Local changes:**

- process mapping with elimination of unnecessary steps
- redesign of capacity to match demand
- local innovations

**System-wide changes:**

- coordination among providers, clinic, hospitals and community-based services
- better information about cancer care
- dissemination of successful change strategies to other jurisdictions to promote implementation of tested changes

The PDSA cycle provides a method for testing changes. This approach promotes the development and testing of solutions in real work settings and offers proven ideas for system-wide implementation. This cycle calls for planning the change as a first step, followed by actually doing the change

– on a small scale where possible – implementing it into a real work setting. After doing the change, local teams assess results, to study the impact of the change. Once an organization has planned, tested and studied a change, it can then act on the change, rejecting it, altering it to increase its impact or implementing it on a more widespread basis.

The improvement model, especially the PDSA cycle, promotes grassroots change with system-wide implementation of tested changes. This model is especially useful for system redesign and has already been widely utilized by healthcare organizations to implement organizational change. This model has great potential for enabling system changes in the Ontario cancer system to improve access and quality of care, as well as increasing the satisfaction of staff.

The IHI has been a leader in the area of system redesign and provides many resources for implementing change (Institute for Healthcare Improvement n.d.c). The experiences of the NHS efforts to improve access also offer important lessons in improving systems that have long been resistant to change. The modernization agency and CSC have produced many service-improvement guides to disseminate effective system redesign programs across cancer networks.

**IMPLICATIONS OF SYSTEM REDESIGN IN ONTARIO**

There are many opportunities to implement system redesign in the Ontario cancer system. The NHS experience has demonstrated the value of a grassroots strategy, where local centres work to analyze patient flow and redesign systems to improve performance, and central agencies help to support the spread of these improvements. In Ontario, individual

cancer centres could identify local innovations. Cancer Care Ontario could serve as the central agency supporting local projects, helping to disseminate innovations across the cancer system. The Ontario Cancer Plan (Cancer Care Ontario 2004) calls for regional cancer programs, which might support improvements to the coordination of care across the full spectrum of cancer services.

The 2004–2005 Ontario provincial budget allocated \$5 million to the “Access to Cancer Services Innovation Fund” to support innovative projects that will reduce wait times by testing and implementing new approaches. Through a selection process, the funding was allocated to 22 regional projects. Among the projects being funded are:

- the development of regional clinical pathways for lung cancer patients and their families in eastern Ontario, Ottawa
- using system redesign to improve access to leukemia treatment in the Toronto region
- nurse-led chemotherapy assessment clinics and rapid-response chemotherapy delivery in centralwest Kitchener
- the development of an integrated delivery and communication system for palliative care in southeast Kingston
- the development of a virtual communications centre in north Thunder Bay

These projects will begin shortly and provide knowledge about changes, which, if successful, could be more broadly implemented. Clinicians and managers in the Ontario cancer care system are beginning to adopt system redesign strategies for improving access to cancer care services, broadening previous attempts to increase

capacity and improve measurement.

Three critical steps are needed to help expand system redesign efforts in the Ontario cancer system:

1. Senior leaders from the Ontario system should engage experts and leaders from the UK and the US who have undertaken major system redesign efforts, as well as local experts who have used these ideas in other care areas. Their knowledge of the approaches, tools, useful resources and pitfalls will provide valuable input and assistance for Ontario efforts to redesign cancer care services.
2. A staged approach to this work should be planned, beginning with the innovation sites where existing clinical champions can help to guide improvements. Expertise and support need to be provided to these sites. Lessons learning in collaborative improvements in the US and the UK will help to ensure that these teams share their lessons learned.
3. Pilot work in one or more areas should be used to develop a set of local experts who can help support expansion of these initial efforts to new sites with a goal to expand the analysis and improvement of care-delivery processes over a three-to-five-year time frame.

Current efforts to develop better measures of wait times and prioritization strategies for patients will create useful tools. However, the experience of the NHS and various healthcare delivery organizations in the US (such as Kaiser Permanente) and Canada suggest that the greatest gains will come from addressing system redesign to improve the delivery and coordination of care. Such changes are necessary to provide high-quality cancer care services and to provide

timely access to growing numbers of cancer patients.

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