

**Access to Diagnostic Technologies and Surgical
Care in Ontario Acute Care Hospitals:
Preliminary System Snapshot, 2006**

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TABLE OF CONTENTS

Executive Summary	1
Introduction	2
Background and Project Rationale	2
Methods.....	3
Findings.....	4
A. Access to Diagnostic Technology in Ontario Acute Care Hospitals.....	4
B. Management of the Waiting Process	6
Recommendations and Future Directions	9
Appendix	10
References.....	11

Figures

Figure 1: Access and Organizational Sustainability	3
Figure 2: Hours of Operation for CT and MRI Diagnostic Technologies.....	5

Tables

Table 1: Availability of CT and MRI Diagnostic Technologies.....	5
Table 2: Employment of Processes for Most (75% or more) Patients Waiting for Select Procedures.....	8

EXECUTIVE SUMMARY

Building on provincial initiatives, in 2005, the Hospital Report Research Collaborative chose to explore the development and implementation of a set of indicators to monitor how hospitals perform in the area of access to care. This process was designed to supplement access-related research initiatives already underway in the province. At its broadest level, measuring access captures the degree to which those seeking care receive health services in a timely and equitable fashion. Access measurement serves strategic goals of performance improvement and also fulfills important equity objectives. Using established *Hospital Report* processes and keeping in mind the reporting processes being pursued at the provincial level, new access indicators were identified that focused on structural and management indicators associated with more timely access to priority clinical services and diagnostic technologies. Analysis of the results of the SIC survey revealed significant interpretation issues. Although there are no access indicators reported in the 2006 *Acute Care Report*, the findings from this investigation should be of interest to investigators researching issues of access to care more broadly and are therefore discussed in this report in a summary fashion.

INTRODUCTION

Background and Project Rationale

Waiting for care continues to be a management challenge facing the Canadian acute care hospital sector (Statistics Canada, 2006). In the Health Services Access Survey administered by Statistics Canada in 2005, almost 29 per cent of Canadians reported in 2005 that the wait time for specialist visits was unacceptable, and almost 24 per cent of Canadians said the same of waits for diagnostic tests.

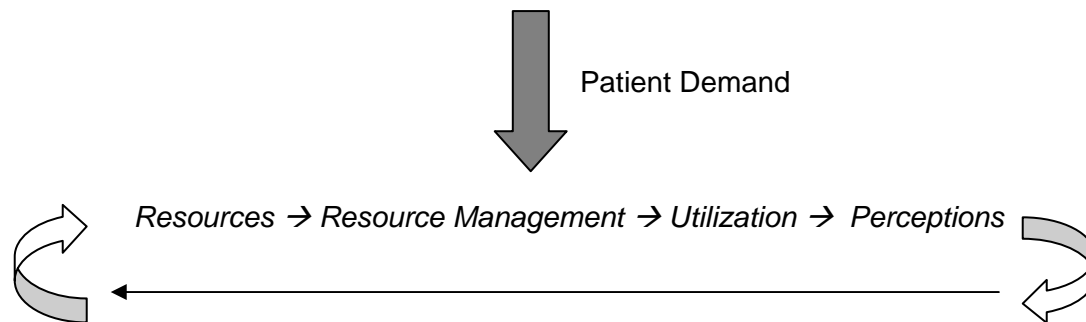
Every province in Canada has its own plan to improve access, and much of the focus is on helping the hospital sector increase capacity to deal with wait times. Many provinces now have Web sites to show median wait times for specific procedures, and, in Ontario, what these times are for different regions and hospitals. In Ontario, the province's Health Quality Council is studying how to improve access to different health services. In response to high public and stakeholder demand for greater accountability and for shorter waiting times, the Ontario Wait Times Strategy has successfully begun to measure and investigate the length of waits for priority services, the numbers of people waiting for priority services, and performance rates within reasonable wait times.

Since *Hospital Report* has played a significant role in developing a robust set of widely used indicators to measure Ontario hospital performance across four domains – system integration and change (SIC), financial performance and condition, clinical utilization and outcomes, and patient satisfaction – researchers with the Hospital Report Research Collaborative (HRRC) set forth in 2005 to develop and analyze new measures of access to acute care hospital services that could help contextualize more established measures of hospital performance. In so doing, *Hospital Report* aimed to supplement access-related research initiatives already underway in the province and accordingly, chose to focus on structural and management (or SIC) indicators associated with more timely access to priority clinical services and diagnostic technologies.

Throughout this process, the HRRC was sensitive to provincial priorities in facilitating more timely access to healthcare. Priority services for the provincial government include timely access to diagnostic tests, hip and knee replacements, cardiac surgery, cancer care, cataract and general surgery, and primary care. Currently, the Ontario Wait Times Strategy, in conjunction with the Ministry of Health and Long-Term Care, is in the process of developing the *Wait Time Information System* to facilitate increased public access to wait times reporting in these priority areas. So as to be consistent with these provincial priorities, the HRRC chose to highlight through its indicator-generation process strategic, management drivers of hospital wait times related to the following areas of care: cardiac care, hip and knee replacement, general surgery, cataract surgery, and diagnostic technologies (with particular emphasis on magnetic resonance imaging and computed tomography, or CT scanning).

To encourage acute care hospital managers to develop strategies to improve access, *Hospital Report* therefore set forth to assess the strategies that different hospitals employ to advance access. A conceptual map describing the high-level factors that affect access to acute hospital care assisted us in framing our project goals.

Figure 1: Access and Organizational Sustainability



Regional resources — e.g., physician and nursing supply, MRIs and computer tomography (CT) scanners per capita — provide the resource tools with which managers can allocate, prioritize, and strategize to deliver quality care. Patients (and their families) seeking care then impose stresses on the system by demanding that resources be allocated to address their specific needs. Exogenous shocks to the system — e.g. including infectious outbreaks such as SARS and other public health emergencies — also impose tensions on the organization. Together, these factors drive a multiplicity of perceptions of access — i.e., government, manager, media, provider, stakeholder, opinion-leader, and client perceptions — all of which work to direct the level of resources that should and do get infused into the system at the regional and provincial level. One of the organization's driving goals is one of sustainability, or one of holding the access loop strong so that it does not snap under pressure from demand overload. Viewed in this light, our research initiative looked at the techniques that organizations use to keep the access loop strong, such as hospital practices to better manage the order of patients waiting for care and treatment, and the speed at which patients move through the system.

Methods

Consistent with all other indicator development associated with the *Hospital Report* project, this initiative included a substantial literature review, an expert nomination and panel process, and indicator feasibility testing. HRRC indicators were finalized by an expert panel using a modified Delphi approach (HRRC, 2005). This technique involved exercises completed on a single day by an expert panel following significant advance analysis and preparation. First, HRRC researchers extracted potential indicators from the literature; expert panels were then identified through a nomination process involving hospital CEOs applying criteria determinative of the potential panel members' content expertise in the understanding of access to acute hospital care. Although members were selected in part to reflect a diverse representation of hospital type (i.e., size and location), the primary determinant of panel composition was expertise.

During the panel process, proposed indicators were compiled into a questionnaire that panelists were asked to complete, followed by group discussion of the results to achieve consensus. In the questionnaire, panelists were asked to rate the indicators on a 7-point Likert scale according to three criteria which together represent a distillation of the HRRC "First Principles" associated with quality indicators (Baker and Pink, 1995):

- 1) the indicator is associated with care quality according to available evidence;

- 2) *actionability: the organization and delivery of care could be modified if found lacking according to the indicator; and,*
- 3) *the majority of providers would find comparative data on this indicator of value for benchmarking purposes.*

Indicators requiring further assessment were included in a second questionnaire. Again, the panelists were asked to review the results in order to reach consensus. Finally, panelists were asked to prioritize indicators selected from the first and second rounds. Indicators selected by panels then underwent feasibility assessment. This involved refining indicator definitions, then identifying data sources from which the indicators could be measured.

FINDINGS

A. Access to Diagnostic Technology in Ontario Acute Care Hospitals

Recent research has documented the rapid rise in the use of diagnostic technologies across the Canadian health care system (CIHI, 2005). On the Ministry website (http://www.health.gov.on.ca/transformation/wait_times/wait_mn.html#), the Ontario Wait Times Strategy reports median wait times (in one's area, specific hospital, or at a provincial level) for magnetic resonance imaging (MRI) and computed tomography (CT). At a hospital-specific level, data surrounding management processes to enable access to these technologies are less readily available. As suggested by our panel's indicator selection process and by later feasibility testing, access to diagnostics constituted three questions in the system integration and change survey that was completed by acute care hospital managers in October-November, 2005. A survey method was utilized to collect these data since they were not otherwise available from existing administrative datasets. Researchers from the Canadian Institute for Health Information (CIHI), working in collaboration with HRRC researchers, distributed the survey and conducted follow-up. In total, 109 acute care hospitals completed the survey; however, due to data quality problems associated with certain elements of the access-related questions (discussed further on in this analysis), the sample size for individual question elements was occasionally lower than 109. Questions under this domain sought to determine usage patterns and processes specific to key diagnostic technologies at Ontario's acute care hospitals, in particular magnetic resonance imaging and computed tomography.

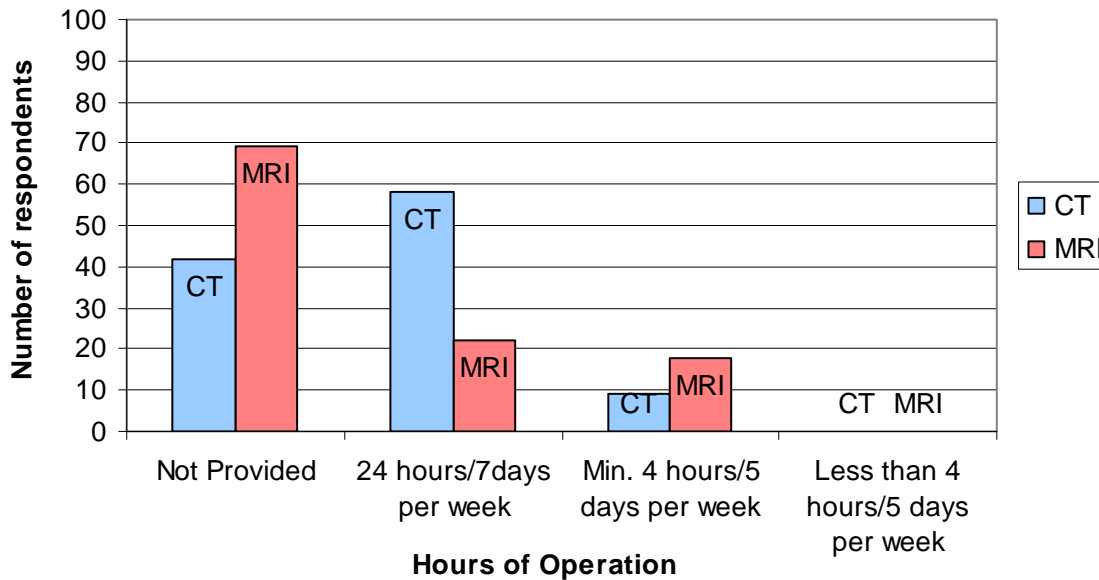
The first question asked about the frequency that each diagnostic technology is utilized. Response options included the following: Service is not provided; available for public use 24 hours/7 days a week; available for a minimum of 4 hours per day for 5 days per week; or available less than 4 hours per day for 5 days per week. A second question asked respondents for the number of hours an MRI/CT was in operation over the year at their hospital. The hospital-specific responses to this question are not reported as a large number of hospitals had difficulty answering this question with a reliable numeric value. A third question asked for the number of cancelled bookings or the proportion of cases cancelled for CT/MRI during the last fiscal year. This latter question was included to capture the intensity of CT/MRI use in separate hospitals.

It is not simply the availability of equipment that is germane to how the public gains access to diagnostic technologies. This is only one dimension of access. Even if physically available, machines may be under-used for many reasons, notably because of constraints on human resources. Personnel shortages and labour resource issues

potentially impede patient access to CT and MRIs. This is why we chose to look at the intensity and variation of usage rather than the mere physical presence of the machines. Among hospitals with the equipment onsite, most are running their CT and MRI machines intensively with little slack. We discovered that some hospitals technically operate on a 24/7 basis with respect to these and other technologies (endoscopy, cystoscopy), but only staff them by using an on-call system after hours for emergencies; since this “on-call” response option was not included in the survey, this is a potential limitation on the data quality of our findings.

Table 1: Availability of CT and MRI Diagnostic Technologies	
Variable	Percent of Respondents
Availability of CT Scanner n = 109	
Service NOT provided	38.5%
24 Hours/7 Days a Week	53.2%
At least 4 hrs a Day/5 Days a Week	8.3%
Less than 4 hrs a Day/5 Days a Week	0.0%
Availability of MRI n = 109	
Service NOT provided	63.3%
24 Hours/7 Days a Week	20.2%
Minimum 4 hrs a Day/5 Days a Week	16.5%
Less than 4 hrs daily/5 Days a Week	0.0%

Figure 2: Hours of Operation for CT and MRI Diagnostic Technologies



Hospitals that have MRI and CT scanners are running them intensively, as demonstrated in the above figure. This finding is consistent with national findings, showing that, although Canada has fewer machines than both the United States and

England, Canada uses its MRI scanners more intensively (CIHI, 2005). (In 2004–2005 the number of MRI exams per scanner was almost 40 per cent higher in Canada than in the U.S. or England). Research completed last year by the Canadian Institute for Health Information found that, of those hospitals that had an MRI machine, 20% used the machine 24 hours a day for 7 days per week. The 2005 CIHI results confirmed those from the *Hospital Report* SIC survey, which found that for the hospitals that provide MRI services, 20.2% of the hospitals use MRI machines 24 hours per day for 7 days a week.

As Table 1 illustrates, questions around the frequency of MRI or CT use cannot be reliably built into a *Hospital Report* performance indicator this year since insufficient numbers of Ontario hospitals maintain these technologies (and, according to our First Principles of indicator selection, broad applicability is a key criterion); accordingly, it was deemed inadvisable to create a performance indicator that makes use of this question element. Also, as noted, data quality was not as strong as it could have been since the possible survey response options were not sufficiently exhaustive.

B. Management of the Waiting Process

The effective management of the waiting process can potentially play a significant role in enabling access to hospital care in Ontario. For this reason, HRRC researchers – after receiving panel input and support for a new indicator to capture wait times management – identified a new indicator: the use of wait list management processes. The potential new indicator was designed to consist of three indicator components. These included:

1. The use of triage according to formal priority criteria
2. The use of priority rating
3. The periodic re-assessment of health status of patients on waiting list

We were interested in determining whether hospitals were moving toward standardizing and formalizing their wait management processes, since this is a potential process improvement tool to facilitate better access to care. We speculated that, despite the intensity of public attention to wait times, there are many hospitals in Ontario in which triage processes are governed by individual physician waitlists only.

To gather the above information, two questions concerning the management of wait times were included on the SIC survey. The first question asked which of the aforementioned wait management processes are regularly employed for most (i.e., 75% or more) patients waiting for the following procedures:

- cardiac surgery
- joint replacement
- prostatectomy
- cholecystectomy
- gynecologic surgery
- cataract surgery
- general surgery

A second question asked about the organization of the triage process, or the extent to which the wait is triaged according to formal criteria. For all of the listed procedures, a minority of hospitals record priority rating scores. More frequently, hospitals triage

according to formal priority criteria and periodically re-assess the health status of patients waiting for surgery. For the top three surgical procedures offered, hospitals triage patients waiting in the queue as follows:

- **General Surgery:** 40.6% of those hospitals that perform general surgery periodically re-assess the health status of those on a waiting list; 34.4% that perform general surgery triage according to formal priority criteria and 22.9% record priority rating scores.
- **Cholecystectomy:** 39.0% conduct periodical re-assessments; 34.7% follow formal priority criteria and only 20.0% record priority ratings.
- **Gynecologic Surgery:** 42.1% of hospitals that perform gynecologic surgeries periodically re-assess the health status of those on the waiting list; 37.5% triage according to formal priority criteria and 20.5% record priority rating information

The above data suggest that there is room for improvement in the degree to which acute care hospitals formalize queuing processes. A handful of comments written on the survey support these findings, and reveal that physicians and surgeons triage their own wait lists, but ¹not according to formal criteria. Further, the survey comments reflect that, in some cases, only some procedures are triaged according to formal criteria and sometimes only urgent cases are triaged.

Results from the survey demonstrate that the majority of surgical wait lists are kept by individual doctors (61.5%). Only 11.9% of hospitals organize their triage process such that wait information is shared across physician lists within the same service areas. The lack of information-sharing may have a significant impact on patients' access to selected procedures since it may affect the capacity of decision-makers to ensure that patients are moved on to the shortest list and that sicker patients are consistently cared for more quickly. According to these data, the organization of the triage process across physician lists is an under-used tool to improve the coordination of care and, by extension, the quality of that care. For this reason, consolidating lists and coordinating care is a potential mechanism to more rationally allocate operating room time.

There are caveats that must be placed on the interpretation of these findings. Most importantly, some hospitals had difficulty understanding the differences between the different response options, in particular the difference between recording priority ratings and triaging according to formal priority criteria. Despite these interpretation issues relating to the differentiation among these different processes, a significant minority of acute care hospitals (23.9%, or 26/109) are not, according to survey responses, following *any* triage processes with respect to the listed services.

¹ Most hospitals in Ontario perform general surgery and is generally considered general surgery so these categories are not necessarily mutually exclusive

Table 2: Employment of Processes for Most (75% or more) Patients Waiting for Select Procedures

<i>Variable</i>	<i>Percent of Respondents</i>
General Surgery	n = 96 for those providing the service
Service NOT provided	11.9%
Triage according to formal Priority Criteria	34.4%
Priority Rating is Recorded	22.9%
Periodically re-assess health status of patients on waiting list	40.6%
Cholecystectomy	n = 95 for those providing the service
Service NOT provided	12.8%
Triage according to formal Priority Criteria	34.7%
Priority Rating is Recorded	20.0%
Periodically re-assess health status of patients on waiting list	38.9%
Gynecologic Surgery	n = 88 for those providing the service
Service NOT provided	19.3%
Triage according to formal Priority Criteria	37.5%
Priority Rating is Recorded	20.5%
Periodically re-assess health status of patients on waiting list	42.1%
Cataract Surgery	n = 68 for those providing the service
Service NOT provided	37.6%
Triage according to formal Priority Criteria	47.1%
Priority Rating is Recorded	29.4%
Periodically re-assess health status of patients on waiting list	35.3%
Prostatectomy	n = 62 for those providing the service
Service NOT provided	43.1%
Triage according to formal Priority Criteria	37.1%
Priority Rating is Recorded	19.4%
Periodically re-assess health status of patients on waiting list	32.3%
Joint Replacement	n = 55 for those providing the service
Service NOT provided	49.5%
Triage according to formal Priority Criteria	32.7%
Priority Rating is Recorded	27.3%
Periodically re-assess health status of patients on waiting list	30.9%
Cardiac Surgery	n = 15 for those providing the service
Service NOT provided	86.2%
Triage according to formal Priority Criteria	86.7%
Priority Rating is Recorded	60.0%
Periodically re-assess health status of patients on waiting list	60.0%

RECOMMENDATIONS AND FUTURE DIRECTIONS

Future work in the evaluation and creation of management performance indicators will need, as we have done, to rely on primary data collection techniques. To make this process as effective as possible, definitions must be clear and understandable to survey respondents. The SIC survey questions will need to be revised to improve interpretation regarding the processes that hospitals have in place to manage patient waits. Extensive pilot testing with a variety of hospital types is recommended.

Analytical work needs to be done to determine the extent to which there may be statistically significant access strategies that improve outcome indicators. Our early investigation indicates that the use of formal queuing criteria is not positively statistically correlated with other existing input indicators that are currently measured in *Hospital Report* (i.e., SIC management indicators), such as the use of standardized protocols. However, it is worth investigating whether hospitals that apply formal triage strategies are more likely to outperform their peers on measures of patient satisfaction or clinical outcomes in terms of access to care. This is a research step that needs to take place. Up to this point, the wisdom of the strategies under examination has been based on a literature review and expert panel process. We now have a preliminary research base to begin to determine whether there is empirical support for these underlying hypotheses.

APPENDIX – OUTCOME OF INDICATORS PROPOSED BY PANEL

Indicator	Outcome
Rate of cancelled OR or diagnostic procedures (by condition or procedure) per hospital or region	Incorporated into SIC survey. After reviewing results of survey, indicators were not included.
Proportion of hospitals or regions with formal wait list procedures and policies, including	
Number of regular hours of operation of CT and MRI per machine	
Mean turnover time between consecutive procedures (by condition or procedure)	Reviewed with CIHI. Not feasible.
Proportion of ED patients waiting transfer to another point of care	
Ratio of staffed beds to budgeted bed	Poor data quality.
Mean wait time from referral to consult by condition or procedure	Potential domain of Ontario Wait Time Strategy.
Median waiting time from request for procedure to time procedure reported as having been completed	
LHIN: Median waiting time for referral to consult (by condition or procedure) by age, sex, primary language spoken at home, postal code (rurality) and First Nations status	
Proportion of procedures (by type) by ambulatory clinic, day surgery and inpatient care	Difficult to report in ambulatory care (data reporting issues). Day Surgery is already incorporated into Hospital Report.
Proportion of hospitals or regions that regularly carry out quality improvement initiatives for efficiency, scheduling, and waiting time	Internal and shared protocols, and referral arrangements already used in Acute and ED Hospital Reports.

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