Hospital Report 2005: Acute Care

Clinical Utilization and Outcomes Technical Summary

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Clinical Utilization and Outcomes

Overview

Hospital Report 2005: Acute Care has undergone significant changes from previous years. The Clinical Utilization and Outcomes quadrant has been completely redeveloped and contains information on eleven new measures used in both hospital-specific comparisons and at the provincial level. The Clinical Utilization and Outcomes quadrant includes a number of new indicators, as well as some aggregated results for indicators used in previous years. Some of these indicators are presented in the report at a hospital-specific level, while others are only presented at a peer-group, regional, or provincial level (although hospital-specific results are available in the e-scorecard). The publicly reported hospital-specific level indicators in this year's report were previously reported at the provincial level. This *Technical Summary* provides a detailed explanation of the methods used to select and calculate these indicators and to group hospitals into categories of relative performance.

In addition, as in previous Acute Care reports, a Women's Health section is integrated into *Hospital Report 2005: Acute Care*. This section includes all indicators in the Clinical Utilization and Outcomes quadrant stratified by sex[1]. Sex-stratified data and analyses are provided at a provincial level in the Executive Report, and at a hospital and aggregate levels (i.e. peer group, regional and provincial) in the E-Scorecard. The inclusion of core Clinical Utilization and Outcomes indicators (by sex) in the women's health section of *Hospital Report 2005: Acute Care* is in addition to a series of new and revised women's health-specific clinical indicators in the areas of Labour and Delivery, Gynecological Conditions & Hysterectomy, Cardiac Care. These women's health-specific indicators are further described in a separate technical summary (Hospital Report 2005: Acute Care Women's Health Technical Summary).

For quality improvement and public reporting, it helps to focus on specific, well-defined patient groups. This year's report uses methodologies similar to previous reports in the *Hospital Report: Acute Care* series; however, in some cases patients are no longer grouped according to specific clinical conditions. Rather, three broad patient groups, defined based on Case Mix Groups (CMG™), categorize patients as Medical, Surgical or Major Surgical groupings. (see Appendix A for a listing of the specific CMGs that make up each group). These CMG-based groups capture a broader range of patients than the condition-specific groupings used in the past, and establish a larger sample from which indicator results can be drawn. This helps

[1] Sex is biological maleness and femaleness. Gender is made up of multiple dimensions, and reflects the interaction of sex with other economic, cultural, environmental, social characteristics (e.g., age, income, ethnicity, social support), as well as roles ascribed to the sexes, and relations between the sexes. Because of the limited availability of other gender-related variables in routinely collected hospital data, the analysis is limited to sex. Pursuing gender-based analysis is an important long-term goal.

ensure confidence in the results since some of the new indicators capture conditions that are rare. These groupings were selected by researchers from the University of Toronto on the advice of advisory panels composed of physicians, nurses, therapists, and health information experts.

Once the new patient groups were selected, researchers defined 11 indicators of adverse events, readmissions and appropriateness for hospital level and/or province-wide analysis. These new indicators were selected based on the results of a comprehensive literature review and the advice of expert panels, and are distributed as follows:

Patient Group	Adverse Events		Readmissions		Appropriateness	
	Nurse-Sensitive Adverse Events	Medical Specific Adverse Events	All-cause Readmissions	Specific-cause Readmissions	% Surgeries Done Open vs Laparoscopic	Average Operative Time
Selected Medical Conditions	✓			H		
Selected Surgical	✓			H	✓ H*	✓
Overall Medical Conditions		✓	✓			
Overall Surgical				✓		
Overall Major Surgical				✓		

*Only % Cholecystectomy performed open is reported at the hospital-level.

✓ = province-wide

H = hospital-level

The Adverse Events and Major/All Surgical Readmissions province wide indicators are aggregates of several specific clinical conditions, which can be found in the numerator tables in the Indicator Definitions section of this *Technical Summary.* The rates for the individual conditions within these aggregate indicators are reported in the e-scorecard. The e-scorecard is available for download (for participating Ontario hospitals only) from the Hospital Report website, www.hospitalreport.ca.

All of these measures should be used as screening tests. Screening tests – such as Pap smears or mammograms – are often used in medicine. Screening tests can produce both false positives (individuals with positive test results who do not have cancer) and false negatives (individuals with cancer whose test results are negative). The same is true for measures of comparative hospital performance. An effort has been made to minimize false positives, but they cannot be totally eliminated. In medicine, screening tests do not provide a final diagnosis, but can help to identify cases that need follow-up. Likewise, the measures of clinical performance in this report should not be taken as a definitive assessment of access, efficiency, or quality. Rather, they are a first step in a quality assessment and improvement process that should involve more detailed analysis.

Although they are screening tests, the Clinical Utilization and Outcomes measures should help health care providers, administrators, and the public to better

understand the clinical performance of their institutions and of the hospital system as a whole. Clinical care is the core process of the hospital and information on clinical performance can be used to support quality improvement as well as for accountability purposes.

The results presented in *Hospital Report 2005: Acute Care* describe a portion of hospital care provided during fiscal 2002/2003 and 2003/2004. They also describe a system undergoing continual and substantial change. They do not necessarily reflect the system of today and should not be used to identify the best hospital(s) in the province or to guide choices around personal care.

Methodology

What's new for Clinical Utilization and Outcomes 2005?

The Clinical Utilization and Outcomes quadrant has undergone significant redevelopment for *Hospital Report 2005: Acute Care*. Changes and methodological enhancements include:

- Use of Case Mix Groups (CMGs™) to assign patients into Medical, Surgical and Major Surgical groups;
- Four new indicators of Adverse Events and Readmissions using the three broad patient groups:
    - in-hospital adverse events for medical patients
    - rates of all-cause medical readmissions
    - rates of specific-cause major surgical readmissions
    - rates of specific-cause all surgical readmissions

  Note that these new indicators are presented in the report at a province-wide, regional, and peer group level only, but hospital-specific results are available in the e-scorecard.
- Two Appropriateness indicators for selected procedures (cholecystectomy, partial and total oophorectomy):
    - laparoscopic vs. open rate for selected elective procedures in Ontario
    - average length of operative time for selected elective procedures in Ontario

  Note that these new indicators are presented in the report at a province-wide, regional, and peer group level only, but hospital-specific results are available in the e-scorecard. The laparoscopic vs. open rate for cholecystectomy will be presented in the report at a hospital-level. This indicator is an extension of the Cholecystectomy as Day-Surgery indicator which was reported at a province-wide level from last year's report. Given the high rates for cholecystectomy, we are looking at new ways to look at access to minimally invasive procedures, therefore, this year we are looking at oophorectomy at the provincial level.

- Two indicators that were reported at a provincial level in last year's report are now reported at a hospital level:
    - readmission rates for AMI, heart failure, asthma, GI bleed, and stroke;
    - readmission rates for cholecystectomy, hysterectomy, and prostatectomy;

  Note that these indicators are aggregated in a different way than previous years.
- New coding classification system (ICD-10-CA and CCI) implemented in Ontario, starting in 2002. In *Hospital Report 2003: Acute Care*, the coding classification system used was ICD-9 and CCI.
- New transfer criteria:
    - If the patient is admitted within 24 hours of discharge, and either of the institutions has coded it as a transfer, the case is considered as a transfer.
    - If the patient is admitted more than 24 hours following discharge, it is not considered a transfer and is treated as a new episode.

  As the result of a review from a CIHI Data Quality investigation, the Transfer To/From fields are highly reliable to use, therefore, the transfer criteria was enhanced to include the use of the Transfer To/From fields in combination with a transfer time window;
- Use of NACRS (National Ambulatory Care Reporting System) for fiscal 2003 day surgery data. This included the application of a qualifying day procedure screen to enable the most consistent comparisons of results across years.
- All possible 25 diagnoses and 20 procedure codes are included in the analysis for the CUO indicators.

For province-wide and hospital-specific results presented in the report, two fiscal years of data have been used: fiscal 2002-2003 and fiscal 2003-2004.

Data Sources

All the clinical utilization and outcome measures were derived from Canadian Institute for Health Information (CIHI) data that have been collected under consistent guidelines, by trained abstractors, in all acute care hospitals in Ontario. These data have been used extensively in previous reports on health care performance, and form the basis for many journal articles. The data undergo extensive edit checks to improve accuracy, but all errors cannot be eliminated. It is important to recognize the limitations of the measures of utilization and outcomes; they will only be as accurate as the data sources on which they are based. However, using these data to produce comparative performance information should lead to refinements and improvements in data quality over time.

The indicators presented at the hospital-specific level in this report were previously reported at the province-wide level in *Hospital Report 2003: Acute Care*, using ICD-9 and CCP codes. Starting in fiscal 2002-2003, the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Canada* (ICD-10-CA) and the new *Canadian Classification of Health Interventions* (CCI) were implemented in Ontario. As a result of the change between the classification systems, the diagnoses and procedure codes were converted from ICD-9 and CCP

to ICD-10-CA and CCI. Classification experts at CIHI facilitated this process, however it should be noted that the mapping of codes between the two classification systems might not be perfect.

As a result of a recent re-abstraction study by an auditing group at CIHI, data quality concerns have emerged with the coding of pneumonia. There were new coding standards regarding pneumonia and chronic obstructive pulmonary disease (COPD) due to the change in classification systems from ICD-9 to ICD-10-CA. As a result, a decision was made to exclude any pneumonia patient groups or codes in our methodology for this year's report, however, we will review these data quality concerns and may include pneumonia patient groups and codes again in the future.

Although wound infection is an important indicator of post-procedure clinical quality, we are not including this diagnosis in these indicators as recent analysis at CIHI has indicated that there are significant data quality concerns regarding the use of the code T81.4 'Infection following a procedure, not elsewhere classified'. This analysis and subsequent chart audits show that the code has a high false-positive rate. CIHI has been conducting educational workshops for coders to address this issue and we anticipate that the data quality concerns will improve for future reporting.

Coding variations in Type 2 diagnoses have improved. Examples of changes undertaken to help reduce coding variations include the development of a revised grade list grouper as well as clarifying CIHI's Diagnosis Typing Coding Standards and circulating this to all Canadian hospitals. For further details on the *Coding Variations in CIHI Discharge Abstract Database (DAD) Data* project, please visit CIHI's website at http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=GR_1002_E.

Since April 1 2003, all Ontario day surgery abstracts have been submitted to the National Ambulatory Care Reporting System (NACRS) (prior to this they were submitted to the Discharge Abstract Database (DAD)). The NACRS database includes data from day surgery units, emergency departments, and other ambulatory care clinics. It uses a different approach for identifying day surgery cases than the DAD. Based on internal analysis and advice from Ontario hospitals, a methodology for capturing "day surgery" cases from NACRS was developed – for more information see the "Same Day Surgery Data in Ontario and use of a Qualifying Day Procedure Screen" sidebar below.

The record layout of the NACRS database is substantially different than the DAD. However, comprehensive analysis and re-formatting of the NACRS data was performed by CIHI to enable consistent analysis based on the two databases. NACRS same day surgery data was mapped to the DAD layout then joined with the DAD inpatient data to enable consistent analysis. Note that for many fields, imperfect 'mappings' were required to translate the NACRS data to the DAD layout. This may impede Ontario hospitals' ability to replicate results that include day surgery cases.

Same Day Surgery Data in Ontario and use of a Qualifying Day Procedure Screen

Effective April 1, 2003, all Ontario hospitals were mandated to report all ambulatory care data to the National Ambulatory Care Reporting System (NACRS) at CIHI. NACRS includes data acquisition and reporting standards intended for hospital- and community-based private and public ambulatory care activity that occurs in clinics, emergency departments, and day surgical units. These data are intended to support: management and operational decision making at the facility level; resource allocation decisions at a global and facility level; provincial and national comparisons; and the effective analysis of ambulatory care services.

Day surgery cases in NACRS are identified based on the MIS functional centres mandated by the Ontario Ministry of Health and Long Term Care (MOHLTC) for 'surgical day/night care'. As a result of investigations performed by CIHI and consultations with several hospitals in Ontario, it was determined that the results based on these criteria were not an accurate reflection of total day surgery activity. Therefore, the following approach for identifying day surgery cases in Ontario hospitals has been developed for the purposes of *Hospital Report 2005: Acute Care*.

Step 1: Identify all *potential* day surgery cases

Table 1: Potential day surgery cases

	Criteria	Codes
Include	All NACRS Records	
Exclude	All unscheduled ER visits	Functional centre codes 71310, 72310, 73310 where the 'Scheduled ED Visit Indicator' = 'N'

Step 2: Exclude any non-qualifying same day surgery cases

Table 2: Qualifying same day surgery screen

	Criteria	Codes
Exclude	Stillbirths	CMG 997 or Entry code = S
	Obstetrics and gynaecological cases	CMG: 601-604, 606-611, 625-648
	Minor Spinal Procedures Major Spinal Procedures Nerve Injections Myelogram Minor Cardiac Procedures Major Cardiac Procedures Cardioversion Angiography Skin procedures Transfusions Chemotherapy Peritoneal dialysis Hemodialysis Procedure Cancelled Miscellaneous Ungroupable	DPG Code: 02 03 04 05 21 22 23 25 53 71 72 74 75 97 98 99

Note: NACRS data was grouped to CMGs and DPGs for the purpose of this report. In future years it is intended that the qualifying day surgery screen will be based on CACS groups to simplify validation of results by hospitals.

Selection of Patient Categories and Eligible Cases

In order to make performance information meaningful to the public and useful for quality improvement, medical and surgical patient groups were examined separately. The selection of the patient groups relied on diagnostic, procedural, and demographic information contained in hospital discharge abstracts submitted to CIHI.

Both patient groups share a set of general exclusions. These general exclusions were designed to remove from the analysis potential data quality problems, patients who could not be linked from hospital to hospital, or patients who would require specific or unusual management. The general exclusion criteria are:

General Exclusions

	Criteria	Codes
Exclude:	Patients with a diagnosis of cancer listed on the discharge abstract	ICD-10-CA C00-C43, C45-C96, D00-D09, D37-D48, Z51.0, Z51.1
	Patients with a diagnosis of AIDS/HIV listed on the discharge abstract	ICD-10-CA B24, Z21
	Patients with a diagnosis of violent trauma listed on the discharge abstract	ICD-10-CA V01-V99, W03, W06-W09, W11-W17, W20-W45, W49-W60, W64-W77, W81, W83-W94, W99, X00 -X19, X30-X39, X52, X58-X99, Y00-Y09, Y35.^, Y36.^
	Patients without an Ontario residence	Postal Code that does not begin with: K, L, M, N, P
	Patients without a valid health insurance number (HIN)	HIN equal to 'Zs' (hospitals can check records with an invalid HIN from their CIHI default report)
	Patients less than 15 or greater than 84 years of age	

Re-assigning Medical/Surgical Status for Cases with a Significant Post-Admission Comorbidity

It is possible that a patient was originally admitted for a medical condition, but due to an adverse event received surgical treatment that changed the CMG assignment from a medical CMG to a surgical CMG. For example, a patient is admitted for a heart attack, but later falls and breaks their hip, which leads to a hip replacement in the same hospitalization. In cases like this the patient is 'repatriated' to a medical CMG based on the following criteria:

1. Initial medical/surgical status is assigned based on CMGs (see Appendix A for CMG lists).
2. All cases that have a type 2 diagnosis that is also coded as the case's most responsible diagnosis (type M) are identified.
3. For each case with a type M diagnosis that is also a type 2, each procedure listed on the abstract is compared to a list of non-operative interventions that cannot drive a patient into a surgical CMG. This list, derived from the 2003 CMG/Plx Directory, is available upon request from the Hospital Reports department at CIHI.
4. If the case has an intervention included on the abstract that is NOT on the non-operative intervention list, and the date for this procedure is less than 2 days from their admission date, the case is classified as SURGICAL. If all interventions listed on the abstract are non-operative, OR there is an operative procedure but the procedure date is greater than two days from the admission date, the case is classified as MEDICAL.

CMG Methodology Overview

Case Mix Groups, or CMG™, are the foundation of acute inpatient grouping, length of stay and resource intensity weight methodologies. The patient's Most Responsible Diagnosis (MRDx) is used to assign the case to one of 25 Major Clinical Categories (MCC). Within each MCC, based on the presence or absence of an operative procedure, the case is directed towards a surgical or medical partition. Case Mix Groups are ordered within the Major Clinical Categories which identify either a body system, e.g. Respiratory System, or other specific types of clinical problems, e.g. Mental Disorders, Neonates or Burns.

Surgical Case Mix Groups are determined by the presence of a procedure. The grouping methodology loops through all procedures recorded to find one that is in the same MCC as the MRDx. If it finds more than one procedure in this category the case is assigned to the CMG highest on the hierarchy. The surgical hierarchy, a decision rule that generally orders from most to least resource intensive procedure, is defined by clinical judgement and expected resource consumption.

If there are no procedures used for CMG assignment recorded on the abstract, the case is assigned to the medical partition of the MCC. The medical partition consists of groupings of similar diagnoses defined clinically and/or by homogeneity of length of stay. The MRDx is used to assign medical CMGs.

Source: 2003 CMG™/PIx™ Directory, CIHI.

Linking Cases Across Hospitals

The research report draws on data for all of Ontario's acute care hospitals. Transferring patients from one hospital to another is an important facet of health care in Ontario. Although transfers are relatively rare for surgical patients, they occur more frequently in medical patients. In order to avoid analyzing transfers as two separate hospitalizations, the basic unit of analysis studied in *Hospital Report 2005: Acute Care* is the episode of care. An episode includes all continuous hospitalizations in acute care hospitals, and can include transfers from one acute care hospital to another. The rules for transfers are as follows:

1. If the patient is admitted within 24 hours of discharge, and either of the institutions has coded it as a transfer, the case is considered as a transfer.
2. If the patient is admitted more than 24 hours following discharge, it is not considered a transfer and is treated as a new episode.

Unique patients are tracked from one hospital to another based on scrambled health card numbers.

Occasionally, when a patient is transferred from one facility to another, the discharge date/time from the first hospital may be later than the admission date/time from the second hospital. Similarly, some patients are transferred to a day-surgery facility while they are inpatients at another facility; while they receive the day-surgery, their bed at the inpatient facility stays open, waiting for their return. The methodology behind the episode building accounts for these kinds of transfers. In cases with a multi-hospital episode of care, LOS is calculated as follows:

(Last hospitalization discharge date - first hospital admission date) - ALC days in last hospitalization

For the broad medical, surgical, and major surgical patient groups an episode is assigned to one of the patient groups on the basis of the CMG listed on the abstract of the first hospitalization in the episode.

Replication of Results by Ontario Hospitals

As part of the verification process for the Clinical Utilization and Outcomes results, many participating hospitals go through a detailed validation of the values that underlie their performance allocations. This is an important step in ensuring the accuracy of the results, and helps to build confidence in the values presented in *Hospital Report: Acute Care*. However, for many of the indicators it is not possible to exactly replicate the results. This is due to the fact that the unit of analysis for the CUO quadrant is an "episode of care", which can potentially span more than one acute care facility. As such, outcomes are attributed in specific ways for each indicator.

A special advisory panel of hospital chief executive officers and other stakeholders helped to develop rules for assigning outcomes to episodes of care involving more than one hospital. In each case, the rules were based on the principle that the hospital with the most control over the outcome should be assigned that outcome. However, the fact that so many hospitals are involved in the care of a single patient emphasizes the inter-linked nature of the hospital system. The following list explains how each outcome indicator is allocated, and to what extent hospitals can expect to replicate the results:

- **Readmissions** are attributed to the last hospital in the episode. For example, if an episode spans two hospitals – i.e. first they are admitted to Hospital A, then transferred to Hospital B, then discharged (marking the end of this episode of care) – then they are admitted to another hospital, Hospital C, within 28 days (or other specified time as per the indicator definition) with a condition related to their original diagnosis in Hospital A, then Hospital B is assigned the readmission outcome for this patient. Because the readmission can be to any hospital in Ontario, hospitals will not likely be able to replicate the numerator for any readmission indicators. They should be able to replicate some of the denominator, and a subset of the actual numerator (since they can count cases readmitted to their own facility).

- **Adverse Events** (Nurse-Sensitive Adverse Events for Select Medical and Surgical Patients, and Adverse Events for Medical Patients) are attributed to the hospital treating the patient when the adverse event diagnosis developed. For example, if an episode spans three hospitals – i.e. first they are admitted to Hospital A, then transferred to Hospital B, then transferred to Hospital C, then discharged (marking the end of this episode of care) – and the patient has a valid adverse event in Hospital C, then only Hospital C will be assigned the adverse event outcome. Hospitals A and B will not have an adverse event assigned to them. Hospitals should be able to replicate most of the denominator – the inpatient cases - and a subset of the actual numerator. The denominator consists of both inpatient and day-surgery cases where the day-surgery case must have started as an inpatient in the episode of care. However, a hospital may not be able to replicate the entire numerator because a LOS cut-off (used as a screen to identify cases where the adverse event likely impacted the patient's overall LOS) is compared to the episode LOS that cannot be calculated if the episode of care spans across different hospitals.

- **Appropriateness indicators** (Average Operative Time for Selected Elective Procedures, Laparoscopic vs. Open Rates for Selected Elective Procedures) are attributed to the hospital where the procedure was performed. For example, if an episode spans three hospitals – i.e. first they are admitted to Hospital A, then transferred to Hospital B, then transferred to Hospital C, then discharged (marking the end of this episode of care) – and the patient had the specified procedure in Hospital B, then the procedure will only affect the rate for Hospital B. The rates for hospital A and C will not change. Therefore, hospitals should be able to replicate results for these indicators.

Understanding the rules for attributing episodes to hospitals is important to interpreting hospital-specific results. If care for a specific patient group in a hospital rarely involves a transfer, then the number of episodes assigned to that hospital for the calculation of adverse events, readmission rates, and appropriateness should be very similar. However, if care for a specific patient group in a hospital frequently involves transfers, then the number of episodes assigned to the hospital for calculation of adverse events, readmission rates, and appropriateness may be substantially different.

Indicator Definitions

Adverse Events - Medical

This indicator is presented at a system-wide level only in the 2005 summary report.

Proportion of non-surgical patients who experience in-hospital adverse effects.

A case was defined as having an adverse event if all three of the following criteria were met:

1. The discharge abstract had a diagnosis that was coded as a type 2 diagnosis (i.e. the diagnosis developed after admission and had an impact on patient management or patient length of stay);
2. the diagnostic code for that type 2 diagnosis was for one of the diagnoses that an expert panel had defined as attributed to in-hospital adverse events ; and,
3. the patient had an episode length of stay that was longer than the Ontario-specific length of stay for the first hospitalization within the episode, or the patient died.

Note:

- For multi-hospital episodes of care, adverse events were attributed to the hospital that was treating the patient when the adverse event occurred.
- Ontario-specific length of stay is calculated by taking the average length of stay of each CMG by three age groups (0-17,18-69,70+), for all cases within Ontario that are flagged as "typical" according to the RIW complexity exclusion variable in the DAD. These tables are available upon request by contacting the Hospital Reports department.
- Day-surgery cases may be included in the denominator if they began as an inpatient admission.
- For the Drug or anaesthetic-related in-hospital adverse event criteria of 'Any Type 2 code with Type 9 Y40-Y59, it is possible that we are including cases where the Type 9 code is not necessarily in reference to the Type 2 code. While it is recommended that codes should be organized in a sequence and diagnosis type assigned so that it is possible to identify multiple codes used to describe one condition and to understand the chronology of events pertaining to the patient's encounter, there is no edit check available in DAD to confirm that a Type 9 code that follows a Type 2 code means that the Type 9 code is in reference to the code it directly follows. The only edit check available is to ensure that a range of codes (e.g. S00-T98) must have a Type 9 code on the abstract.

Episodes (Numerator)		
	Criteria	**ICD-10-CA Codes**
Include:	Cases within denominator with:	
	Drug or anaesthetic-related in-hospital adverse event	Type 2 T88.2, T88.3, T88.5, T88.6, T88.7 **or** Any Type 2 code with Type 9 Y40-Y59
	Patient falls (in-hospital hip and limb fractures)	Type 2 S42.^, S52.^, S62.^, S72.^, S82.^, S92.^, T02.2-T02.6, T10.^, T12.^
	Pressure ulcers	Type 2 L89.^
	Post-admission urinary tract infections	Type 2 N39.0
	Paralytic ileus	Type 2 K56.0

Episodes (Numerator)		
	Post-admission development of Methicillin-Resistant Staphylococcus Aureus (MRSA) or Vancomycin-Resistant Enterococci (VRE)	Type 2 A41.0, A41.1, A41.2 **and** Type 3 U00.0, U00.1
	Post-admission bacteraemia*	Type 2 A40.^, A41.^, A49.9
	Post-admission phlebitis and venous thromboembolism	Type 2 I80.^, T80.1, I26.^
	Post-admission AMI, CHF, stroke, TIA or shock†	Type 2 I21.^, I22.^ (AMI) I50.0 (CHF), I60-I64 (stroke), G45.^ (TIA), A41.9, R57.^, T78.0, T78.2, T79.4, T80.2, T80.5, T81.1, T88.2, T88.6 (shock)
	Post-admission delirium	Type 2 F05.^
AND	Episode LOS is greater than Ontario-specific LOS for first hospitalization within the episode, or the patient died.	
Exclude:	Cases that are coded as both Type 1 and Type 2	

* A41.0, A41.1, A41.2 are also being captured by the post admission development of MRSA or VRE condition.
† A41.9 is also being captured by the post-admission bacteraemia condition. T88.2 and T88.6 are also being captured by the drug or anaesthetic-related in-hospital adverse event.

Cases (Denominator)		
	Criteria	**Codes**
Include:	Medical patients* (includes inpatient and day-surgery cases)	See Appendix A for list of Medical CMGs
Exclude:	General Exclusion Criteria	(see the Methodology section of this report)

* Denominator cases must have started as a Medical CMG. For example, if a patient started as Surgical CMG and then was transferred to a Medical CMG, that case is not included in the denominator. Hospitals would not be able to validate these cases if the transfer occurred from another hospital. Cases must have also started as an inpatient admission to be included in the medical denominator. It is still possible for day surgery cases to be included if a transfer occurred from an acute to a day surgery facility.

Adverse Events – Nurse-sensitive

This indicator is presented at a system-wide level only in the 2005 summary report.

This year, the nursing-related indicators are aggregated in a new way by combining the nurse-sensitive adverse events - UTI Following Specific Surgical Procedures, Pressure Ulcers, and Fractures from Falls Following Admission to Hospital.

Sum of nurse-sensitive adverse events for AMI, heart failure, asthma, GI bleed, and stroke

This indicator identifies selected medical patient groups that had:

- post-admission pressure ulcers
- post-admission fractures from falls (hip and limb fractures)

Note: Medical cases must start as an inpatient case.

Episodes (Numerator)		
	Criteria	**Codes**
Include:	**Type 2 diagnosis** of any of the following conditions:	
	Decubitus ulcer	L89.^
	Fracture of shoulder and upper arm	S42.^
	Fracture of forearm	S52.^
	Fracture at wrist and hand level	S62.^
	Fracture of femur	S72.^
	Fracture of lower leg, including ankle Includes: malleolus	S82.^
	Fracture of foot, except ankle	S92.^
	Fractures involving multiple regions of one upper limb	T02.2^
	Fractures involving multiple regions of one lower limb	T02.3^
	Fractures involving multiple regions of both upper limbs	T02.4^
	Fractures involving multiple regions of both lower limbs	T02.5^
	Fractures involving multiple regions of upper limb(s)	T02.6^
	Fracture of upper limb, level unspecified	T10.^
	Fracture of lower limb, level unspecified	T12.^

Cases (Denominator)		
	Criteria	**Codes**
Include:	AMI*	I21.^, I22.^
	Heart failure*	I50.^, I26.0, I27.9
	Asthma*	J45.^
	GI Bleed*	K92.0, K92.1, K92.2, K25.0, K25.2, K25.4, K25.6, K26.0, K26.2, K26.4, K26.6, K27.0, K27.2, K27.4, K27.6, K28.0, K28.2, K28.4, K28.6
	Stroke*	I60.^, I61.^, I62.^, I63.^, I64
Exclude:	General Exclusion Criteria	(see the Methodology section of this report)
	AMI:	
	Bypass, coronary arteries	1.IJ.76.^^
	Dilation, coronary arteries	1.IJ.50.^^, 1.IJ.57.^^
	Pharmacotherapy (local), vessels of heart	I.IJ.50.^^, 1.IL.35.^^, 1.IJ.57.^^
	Implantation of internal device, heart NEC	1.HZ.53.^^
	Implantation of internal device, epicardium	1.HB.53.^^
	Implantation of internal device, endocardium	1.HD.53.^^
	Management of internal device, epicardium	1.HB.54.^^
	Management of internal device, endocardium	1.HD.54.^^
	Management of internal device, heart NEC	1.HZ.54.^^

*Patients were included in the diagnostically defined groups if the diagnosis of interest was coded as a type M diagnosis. However, since the goal was to identify conditions that developed before hospital admissions, if the M-diagnosis was also listed on the discharge abstract as a type 2 diagnosis, indicating that the most responsible condition developed after admission, the patient was excluded from the analysis. In order to identify patients who might have been admitted with the diagnosis of interest, but who had developed another most responsible diagnosis after admission, patients were also included if another diagnosis was coded as a type M *and* a type 2 (indicating that the M-diagnosis developed after admission) and the diagnosis of interest was coded as a type 1.

Sum of nurse-sensitive adverse events for cholecystectomy, hysterectomy, and prostatectomy

This indicator identifies selected surgical patient groups that had:

- post-admission urinary tract infections
- post-admission pressure ulcers
- post-admission fractures from falls (hip and limb fractures)

Note: For surgical patient groups, results do not include cancelled or previous procedures. CCI does not allow for coding of cancelled interventions and previous procedures are no longer recorded.

Episodes (Numerator)		
	Criteria	**Codes**
Include:	**Type 2 diagnosis** of any of the following conditions:	
	Urinary tract infection, site not specified	N39.0
	Decubitus ulcer	L89.^
	Fracture of shoulder and upper arm	S42.^
	Fracture of forearm	S52.^
	Fracture at wrist and hand level	S62.^
	Fracture of femur	S72.^
	Fracture of lower leg, including ankle Includes: malleolus	S82.^
	Fracture of foot, except ankle	S92.^
	Fractures involving multiple regions of one upper limb	T02.2^
	Fractures involving multiple regions of one lower limb	T02.3^
	Fractures involving multiple regions of both upper limbs	T02.4^
	Fractures involving multiple regions of both lower limbs	T02.5^
	Fractures involving multiple regions of upper limb(s)	T02.6^
	Fracture of upper limb, level unspecified	T10.^
	Fracture of lower limb, level unspecified	T12.^

Cases (Denominator)		
	Criteria	**Codes**
Include:	Cholecystectomy	1.OD.89.^^
	Hysterectomy	1.RM.89.^^, 1.RM.91.^^
	Prostatectomy	1.QT.59.^^, 1.QT.87.^^
Exclude:		
	General Exclusion Criteria	(see the Methodology section of this report)
	Cholecystectomy:	
	Transplant, liver	1.OA.85.^^
	Excision partial, abdominal aorta	1.KA.87.^^
	Bypass, abdominal aorta	1.KA.76.^^
	Drainage, liver	1.OA.52.^^
	Excision partial, liver	1.OA.87.^^
	Destruction, liver	1.OA.59.^^

Cases (Denominator)		
	Excision partial, large intestine	1.NM.87.DF, 1.NM.87.DE, 1.NM.87.DN, 1.NM.87.DX, 1.NM.87.DY, 1.NM.87.RN, 1.NM.87.RD, 1.NM.87.RE, 1.NM.87.TF, 1.NM.87.TG
	Excision total, large intestine	1.NM.89.^^
	Excision partial, pancreas with duodenum	1.OK.87.^^
	Excision radical, pancreas with duodenum	1.OK.91.^^
	Excision partial, stomach	1.NF.87.RP, 1.NF.87.DG, 1.NF.87.RH, 1.NF.87.RJ, 1.NF.87.RK, 1.NF.87.DG, 1.NF.87.DH, 1.NF.87.DQ, 1.NF.87.GX, 1.NF.87.DJ, 1.NF.87.DL, 1.NF.87.RG
	Excision total, stomach	1.NF.89.^^
	Excision total with reconstruction, stomach	1.NF.90.^^
	Excision radical, stomach	1.NF.91.^^
	Excision radical with reconstruction, stomach	1.NF.92.^^
	Hysterectomy:	
	Drainage, large intestine	1.NM.52.DA, 1.NM.52.LA, 1.NM.52.LA-TS
	Procurement, large intestine	1.NM.58.^^
	Destruction, large intestine	1.NM.59.^^
	Bypass, large intestine	1.NM.76.^^
	Excision partial, large intestine	1.NM.87.^^
	Excision total, large intestine	1.NM.89.^^
	Excision radical, large intestine	1.NM.91.^^
	Drainage, small intestine	1.NK.52.DA, 1.NK.52.LA
	Removal of device, small intestine of jejunal tube [e.g. drainage, feeding] inserted using open approach	1.NK.55.LA-TS
	Removal of foreign body, small intestine	1.NK.56.DA, 1.NK.56.LA
	Procurement, small intestine	1.NK.58.^^
	Bypass, small intestine	1.NK.76.DN, 1.NK.76.DP, 1.NK.76.RE, 1.NK.76.RF
	Excision partial, small intestine	1.NK.87.^^
	Dilation, small intestine	1.NK.50.^^
	Implantation of internal device, small intestine	1.NK.53.DA-TS, 1.NK.53.LA-TS, 1.NK.53.LA-QB
	Fixation, small intestine	1.NK.74.^^
	Bypass with exteriorization, small intestine	1.NK.77.^^

Cases (Denominator)		
	Repair, small intestine	1.NK.80.DA, 1.NK.80.DA-W2, 1.NK.80.DA-W3, 1.NK.80.LA, 1.NK.80.LA-W2, 1.NK.80.LA-W3
	Reattachment, small intestine	1.NK.82.^^
	Construction or reconstruction, small intestine	1.NK.84.^^
	Transplant, small intestine	1.NK.85.^^
	Dilation, large intestine	1.NM.50.^^
	Removal of device, large intestine	1.NM.55.DA-TS, 1.NM.55.LA-TS
	Removal of foreign body, large intestine	1.NM.56.DA, 1.NM.56.LA
	Fixation, large intestine	1.NM.74.^^
	Bypass with exteriorization, large intestine	1.NM.77.^^
	Repair, large intestine	1.NM.80.^^
	Reattachment, large intestine	1.NM.82.^^
	Perfusion, small with large intestine	1.NP.16.^^
	Reduction, small with large intestine	1.NP.73.LA
	Transplant, small with large intestine	1.NP.85.^^
	Closure of fistula, small with large intestine	1.NP.86.^^
	Excision total, appendix	1.NV.89.^^
	Drainage, appendix	1.NV.52.^^
	Drainage, rectum	1.NQ.52.HA, 1.NQ.52.LA, 1.NQ.52.LA-TS
	Removal of foreign body, rectum	1.NQ.56.DA, 1.NQ.56.LA
	Destruction, rectum	1.NQ.59.^^
	Release, rectum	1.NQ.72.^^
	Fixation, rectum	1.NQ.74.^^
	Repair, rectum	1.NQ.80.^^
	Closure of fistula, rectum	1.NQ.86.MB, 1.NQ.86.MB-XX-E, 1.NQ.86.MB-XX-F, 1.NQ.86.ME, 1.NQ.86.ME-XX-E, 1.NQ.86.ME-XX-F
	Excision partial, rectum	1.NQ.87.^^
	Excision total, rectum	1.NQ.89.^^
	Excision total with reconstruction, rectum	1.NQ.90.LA-XX-G
	Construction or reconstruction, anus	1.NT.84.PB, 1.NT.84.PF
	Control of bleeding, anus	1.NT.13.^^
	Drainage, anus	1.NT.52.^^
	Implantation of internal device, anus	1.NT.53.^^
	Removal of device, anus	1.NT.55.^^
	Removal of foreign body, anus - open approach	1.NT.56.LA
	Destruction, anus	1.NT.59.^^
	Release, anus	1.NT.72.^^
	Reduction, anus	1.NT.73.^^
	Repair, anus	1.NT.80.^^

Cases (Denominator)		
	Construction or reconstruction, anus	1.NT.84.LF
	Closure of fistula, anus	1.NT.86.^^
	Excision partial, anus	1.NT.87.^^
	Excision partial, stomach	1.NF.87.RP, 1.NF.87.DG
	Bypass, stomach - gastroenterostomy [diversion around distal stomach]	1.NF.76.DQ, 1.NF.76.RJ
	Endometriosis of pelvic peritoneum	N80.3
	Endometriosis of rectovaginal septum and vagina	N80.4
	Endometriosis of intestine	N80.5
	Repair, bladder neck	1.PL.74.CA, 1.PL.74.DA, 1.PL.74.PK, 1.PL.74.PK-NW
	Pharmacotherapy (local), bladder neck	1.PL.35.BA-W2, 1.PL.35.BA-W8, 1.PL.35.HA-W2, 1.PL.35.HA-W8
	Repair, bladder neck	1.PL.74.AF-FF, 1.PL.74.AF-XX-A, 1.PL.74.AF-XX-L, 1.PL.74.AF-XX-N, 1.PL.74.AL-FF, 1.PL.74.AF-XX-Q, 1.PL.74.CA-XX-K
	Female urethrocele	N81.0
	Cystocele	N81.1
	Rectocele	N81.6
	Uterovaginal prolapse, unspecified	N81.4
	Incomplete uterovaginal prolapse	N81.2
	Complete uterovaginal prolapse	N81.3
	Vaginal enterocele	N81.5
	Other female genital prolapse	N81.8
	Female genital prolapse, unspecified	N81.9
	In situ neoplasms	D00-D09
	Neoplasms of uncertain or unknown behaviour	D37-D48

Other Notes:

- All possible 20 procedures on the discharge abstract are included in the analysis.

Readmissions (Province-wide)

These indicators are presented at a system-wide level only in the 2005 summary report.

Rate of all-cause readmissions within 72 hours of discharge (Medical Patients)

Readmissions are defined using information from both the initial episode and the subsequent hospitalization. An episode of care is counted as having a readmission (in either the same or another Ontario acute care hospital) if all of the following criteria are met:

1. The initial episode did not end with the patient signing him/herself out against medical advice (or died);
2. if the patient is admitted more than 24 hours following discharge, it is not considered a transfer and is treated as a new episode (See 'Linking Cases Across Hospitals' in the Methodology section of this report); and,
3. if the subsequent admission was not defined as being as elective.

Note:

- For multi-hospital episodes of care, readmissions were attributed to the last hospital from which the patient was discharged before the readmission.
- For the Denominator, cases were selected if they were the last case in the episode of care and the episode started as a Medical CMG.

As diagnosis typing is not an available field in NACRS, for all fiscal year 2003 day surgery records, the first diagnosis is assumed to be Type M and any subsequent diagnoses is assumed to be Type 1.

Episodes (Numerator)		
	Criteria	**Codes**
Include:	Readmission occurred within 72 hours of discharge	
Exclude:	Elective admissions	Admission Category not equal to "L"

Cases (Denominator)		
	Criteria	**Codes**
Include:	Medical Patients	See Appendix A for list of Medical CMGs
Exclude:	Readmissions that followed a discharge where the patient signed him/herself out or the patient died	Discharge Disposition Code not equal to 6 (sign out), 7 (death), or 9 (stillbirth)
	General Exclusion Criteria	(see the Methodology section of this report)

Rate of unplanned readmissions within 7 days of discharge with specified conditions (Major Surgical Patients)

Readmissions are defined using information from both the initial episode and the subsequent hospitalization. An episode of care is counted as having a readmission (in either the same or another Ontario acute care hospital) if all of the following criteria are met:

1. The subsequent hospitalization was for a diagnosis or procedure that was defined by an expert panel as relevant to the initial surgery;
2. the initial episode did not end with the patient signing him/herself out against medical advice (or died);
3. if the patient is admitted more than 24 hours following discharge, it is not considered a transfer and is treated as a new episode (See 'Linking Cases Across Hospitals' in the Methodology section of this report); and,
4. if the subsequent admission was not defined as being as elective.

Note:

- For multi-hospital episodes of care, readmissions were attributed to the last hospital from which the patient was discharged before the readmission.
- For the Denominator, cases were selected if they were the last case in the episode of care that started as a Major Surgical CMG.

The numerator is the readmission category and the denominator is the surgical category.

As diagnosis typing is not an available field in NACRS, for all fiscal year 2003 day surgery records, the first diagnosis is assumed to be Type M and any subsequent diagnoses is assumed to be Type 1.

For surgical patient groups, results do not include cancelled or previous procedures. CCI does not allow for coding of cancelled interventions and previous procedures are no longer recorded.

Episodes (Numerator)		
	Criteria	**ICD-10-CA Codes**
Include:	Cases within denominator with:	
	Gastrointestinal haemorrhage or ulceration following non-gastrointestinal surgery	Type M K25.^, K26.^, K27.^, K62.5, K63.3, K66.1, K91.40, K91.43, K91.60, K92.2 with Type 9 Y83.^ **or** Type M T81.0 and Type 9 Y83.^ with a section 1 CCI code with an Anatomy Site of NA-NV or OA-OZ and intervention number greater than 50.
	Decubitus ulcer	Type M L89.^
	Reopening of surgical site/wound dehiscence	Type M T81.3
	Mechanical complication due to device, implant or graft other than from organ transplantation	Type M T82.0-T82.5, T83.0-T83.4, T84.0-

Episodes (Numerator)		
		T84.4, T85.0-T85.6
	Post procedural-related perforations or lacerations	Type M T81.2
	Foreign body left in during procedure	Type M T81.5
	Pneumothorax	Type M J95.80
	Readmission occurred within 168 hours (7 days) of discharge	
Exclude:	Elective admissions	Admission Category not equal to "L"

Cases (Denominator)		
	Criteria	**Codes**
Include:	Major Surgical Patients	See Appendix A for list of Major Surgical CMGs*
Exclude:	Readmissions that followed a discharge where the patient signed him/herself out or the patient died	Discharge Disposition Code not equal to 6 (sign out), 7 (death), or 9 (still
	General Exclusion Criteria	(see the Methodology section of this report)

*Case Mix Group™

Rate of unplanned readmissions within 7 days of discharge with specified conditions (All Surgical Patients)

Readmissions are defined using information from both the initial episode and the subsequent hospitalization. An episode of care is counted as having a readmission (in either the same or another Ontario acute care hospital) if all of the following criteria are met:

1. The subsequent hospitalization was for a diagnosis or procedure that was defined by an expert panel as relevant to the initial surgery;
2. the initial episode did not end with the patient signing him/herself out against medical advice (or died);
3. if the patient is admitted more than 24 hours following discharge, it is not considered a transfer and is treated as a new episode (See 'Linking Cases Across Hospitals' in the Methodology section of this report); and,
4. if the subsequent admission was not defined as being as elective.

Note:

- For multi-hospital episodes of care, readmissions were attributed to the last hospital from which the patient was discharged before the readmission.

- For the Denominator, cases were selected if they were the last case in the episode of care that started as a Surgical CMG.

The numerator is the readmission category and the denominator is the surgical category.

As diagnosis typing is not an available field in NACRS, for all fiscal year 2003 day surgery records, the first diagnosis is assumed to be Type M and any subsequent diagnoses is assumed to be Type 1.

For surgical patient groups, results do not include cancelled or previous procedures. CCI does not allow for coding of cancelled interventions and previous procedures are no longer recorded.

Episodes (Numerator)		
	Criteria	**ICD-10-CA Codes**
Include:	Cases within denominator with:	
	Gastrointestinal haemorrhage or ulceration following non-gastrointestinal surgery	Type M K25.^, K26.^, K27.^, K62.5, K63.3, K66.1, K91.40, K91.43, K91.60, K92.2 with Type 9 Y83.^ **or** Type M T81.0 and Type 9 Y83.^ with a section 1 CCI code with an Anatomy Site of NA-NV or OA-OZ and intervention number greater than 50.
	Decubitus ulcer	Type M L89.^
	Reopening of surgical site/wound dehiscence	Type M T81.3
	Mechanical complication due to device, implant or graft other than from organ transplantation	Type M T82.0-T82.5, T83.0-T83.4, T84.0-T84.4, T85.0-T85.6
	Post procedural-related perforations or lacerations	Type M T81.2
	Foreign body left in during procedure	Type M T81.5
	Pneumothorax	Type M J95.80
	Readmission occurred within 168 hours (7 days) of discharge	
Exclude:	Elective admissions	Admission Category not equal to "L"

Cases (Denominator)		
	Criteria	**Codes**
Include:	Surgical Patients	See Appendix A for list of Surgical CMGs*
Exclude:	Readmissions that followed a discharge where the patient signed him/herself out or the patient died	Discharge Disposition Code not equal to 6 (sign out), 7 (death), or 9 (still
	General Exclusion Criteria	(see the Methodology section of this report)

*Case Mix Group™

Readmissions (Hospital-level)

These indicators are presented at a hospital-specific level in the 2005 summary report.

Sum of readmission rates for AMI, heart failure, asthma, GI bleed, and stroke (medical)

Readmissions are defined using information from both the initial episode and the subsequent hospitalization. An episode of care is counted as having a readmission (in either the same or another Ontario acute care hospital) if all of the following criteria are met:

1. The subsequent hospitalization was for a diagnosis or procedure that was defined by an expert panel as relevant to the initial surgery;
2. the initial episode did not end with the patient signing him/herself out against medical advice (or died);
3. if the patient is admitted more than 24 hours following discharge, it is not considered a transfer and is treated as a new episode. (See 'Linking Cases Across Hospitals' in the Methodology section of this report); and,
4. if the subsequent admission was not defined as being as elective.

Readmissions are excluded if they are for procedures that constitute part of the expected care following a specific type of hospitalization, for example readmission for coronary angioplasty following an initial hospitalization for AMI.

Note: For multi-hospital episodes of care, readmissions were attributed to the last hospital from which the patient was discharged before the readmission.

As diagnosis typing is not an available field in NACRS, for all fiscal year 2003 day surgery records, the first diagnosis is assumed to be Type M and any subsequent diagnoses is assumed to be Type 1.

For surgical patient groups, results do not include cancelled or previous procedures. CCI does not allow for coding of cancelled interventions and previous procedures are no longer recorded.

Episodes (Numerator)		
	Criteria	**Codes**
Include:	***AMI:***	
	AMI	I21.^, I22.^
	Other acute and subacute forms of ischemic heart disease	I20.0, I24.^
	Old myocardial infarction	I25.2
	Angina pectoris	I20.^
	Other forms of chronic ischemic heart disease	I25.^
	Conduction disorders	I44.^, I45.^
	Cardiac Dysrhythmias	I46.0, I46.9, I47.^, I48.^, I49.^
	Functional disturbances following cardiac surgery	I97.0, I97.1, I97.8, I97.9
	Urinary tract infection	N39.0
	Readmission occurred within 28 days of discharge	
	Asthma:	
	Asthma	J45.^
	Empyema	J86.^
	Pulmonary collapse	J98.1
	Respiratory arrest	J96.^, R09.2
	Respiratory complications resulting from a procedure	J95.4, J95.8, J95.9
	Readmission occurred within 28 days of discharge	
	Heart failure:	
	Acute myocardial infarction	I21.^
	Subsequent myocardial infarction	I22.^
	Other acute ischaemic heart diseases	I24.^
	Old myocardial infarction	I25.2
	Angina pectoris	I20.^
	Atherosclerotic heart disease	I25.1^
	Aneurysm of heart	I25.3
	Coronary artery aneurysm	I25.4
	Ischaemic cardiomyopathy	I25.5
	Silent myocardial ischaemia	I25.6
	Other forms of chronic ischaemic heart disease	I25.8
	Chronic ischaemic heart disease, unspecified	I25.9
	Atrioventricular and left bundle-branch block	I44.^
	Other conduction disorders	I45.^
	Paroxysmal tachycardia	I47.^
	Atrial fibrillation and flutter	I48.^
	Ventricular fibrillation and flutter	I49.0^
	Atrial premature depolarization	I49.1
	Junctional premature depolarization	I49.2
	Ventricular premature depolarization	I49.3
	Other and unspecified premature depolarization	I49.4
	Sick sinus syndrome	I49.5
	Other specified cardiac arrhythmias	I49.8

Episodes (Numerator)		
	Cardiac arrhythmia, unspecified	I49.9
	Cardiac arrest with successful resuscitation	I46.0
	Cardiac arrest, unspecified	I46.9
	Acute bronchitis	J20.^
	Acute bronchiolitis	J21.^
	Readmission occurred within 28 days of discharge	
	GI bleed:	
	Gastric ulcer, acute with haemorrhage	K25.0
	Gastric ulcer, acute with both haemorrhage and perforation	K25.2
	Gastric ulcer, chronic or unspecified with haemorrhage	K25.4
	Gastric ulcer, chronic or unspecified with both haemorrhage and perforation	K25.6
	Duodenal ulcer, acute with haemorrhage	K26.0
	Duodenal ulcer, acute with both haemorrhage and perforation	K26.2
	Duodenal ulcer, chronic or unspecified with haemorrhage	K26.4
	Duodenal ulcer, chronic or unspecified with both haemorrhage and perforation	K26.6
	Peptic ulcer, acute with haemorrhage	K27.0
	Peptic ulcer, acute with both haemorrhage and perforation	K27.2
	Peptic ulcer, chronic or unspecified with haemorrhage	K27.4
	Peptic ulcer, chronic or unspecified with both haemorrhage and perforation	K27.6
	Gastrojejunal ulcer, acute with haemorrhage	K28.0
	Gastrojejunal ulcer, acute with both haemorrhage and perforation	K28.2
	Gastrojejunal ulcer, chronic or unspecified with haemorrhage	K28.4
	Gastrojejunal ulcer, chronic or unspecified with both haemorrhage and perforation	K28.6
	Haematemesis	K92.0
	Melaena	K92.1
	Gastrointestinal haemorrhage, unspecified	K92.2
	Readmission occurred within 7 days of discharge	
	Stroke:	
	Thrombophlebitis migrans	I82.1
	Embolism and thrombosis of vena cava	I82.2
	Embolism and thrombosis of renal vein	I82.3
	Embolism and thrombosis of other specified veins	I82.8
	Embolism and thrombosis of unspecified vein	I82.9
	Haematemesis	K92.0
	Melaena	K92.1

Episodes (Numerator)		
	Gastrointestinal haemorrhage, unspecified	K92.2
	Cardiac arrest with successful resuscitation	I46.0
	Cardiac arrest, unspecified	I46.9
	Respiratory failure, not elsewhere classified	J96.^
	Kwashiorkor	E40
	Marasmic kwashiorkor	E42
	Nutritional marasmus	E41
	Unspecified severe protein-energy malnutrition	E43
	Protein-energy malnutrition of moderate and mild degree	E44.^
	Retarded development following protein-energy malnutrition	E45
	Unspecified protein-energy malnutrition	E46
	Volume depletion	E86.^
	Acute renal failure	N17.^
	Malfunction of external stoma of urinary tract	N99.5^
	Other postprocedural disorders of genitourinary system	N99.8
	Postprocedural disorder of genitourinary system, unspecified	N99.9
	Postprocedural renal failure	N99.0
	Fever of unknown origin	R50.^
	Pneumonitis due to food and vomit	J69.0
	Pulmonary embolism without mention of acute cor pulmonale	I26.9
	Decubitus ulcer	L89.^
	Gangrene, not elsewhere classified	R02
	Urinary tract infection, site not specified	N39.0
	Convulsions, not elsewhere classified	R56.^
	Epidemic louse-borne typhus fever due to Rickettsia prowazekii	A75.0
	Recrudescent typhus [Brill's disease]	A75.1
	Typhus fever due to Rickettsia typhi	A75.2
	Typhus fever due to Rickettsia tsutsugamushi	A75.3
	Typhus fever, unspecified	A75.9
	Spotted fever [tick-borne rickettsioses]	A77.^
	Intracerebral haemorrhage	I61.^
	Cerebral infarction due to thrombosis of precerebral arteries	I63.0
	Cerebral infarction due to embolism of precerebral arteries	I63.1
	Cerebral infarction due to unspecified occlusion or stenosis of precerebral arteries	I63.2
	Occlusion and stenosis of precerebral arteries, not resulting in cerebral infarction	I65.^
	Occlusion and stenosis of cerebellar arteries	I66.3

Episodes (Numerator)		
	Cerebral infarction due to thrombosis of cerebral arteries	I63.3
	Cerebral infarction due to embolism of cerebral arteries	I63.4
	Cerebral infarction due to unspecified occlusion or stenosis of cerebral arteries	I63.5
	Other cerebral infarction	I63.8
	Cerebral infarction, unspecified	I63.9
	Occlusion and stenosis of middle cerebral artery	I66.0
	Occlusion and stenosis of anterior cerebral artery	I66.1
	Occlusion and stenosis of posterior cerebral artery	I66.2
	Occlusion and stenosis of multiple and bilateral cerebral arteries	I66.4
	Occlusion and stenosis of other cerebral artery	I66.8
	Occlusion and stenosis of unspecified cerebral artery	I66.9
	Stroke, not specified as haemorrhage or infarction	I64
	Readmission occurred within 28 days of discharge	
Exclude:	Elective admissions	Admission Category not equal to "L"
	AMI and heart failure:	
	Bypass, coronary arteries	1.IJ.76.^^
	Dilation, coronary arteries	1.IJ.50.^^
	Extraction, coronary arteries	1.IJ.57.GQ-^^
	Implantation of internal device, epicardium	1.HB.53.^^
	Management of internal device, epicardium	1.HB.54.^^
	Implantation of internal device, endocardium	1.HD.53.^^
	Management of internal device, endocardium	1.HD.54.^^
	Implantation of internal device, heart NEC	1.HZ.53.^^
	Management of internal device, heart NEC	1.HZ.54.^^
	Removal of device, heart NEC	1.HZ.55.^^
	Stroke:	
	Extraction, carotid artery	1.JE.57.^^

Cases (Denominator)		
	Criteria	**Codes**
Include:	AMI*	I21.^, I22.^
	Heart failure*	I50.^, I26.0, I27.9
	Asthma*	J45.^
	GI Bleed*	K92.0, K92.1, K92.2, K25.0, K25.2, K25.4, K25.6, K26.0, K26.2, K26.4, K26.6, K27.0, K27.2, K27.4, K27.6, K28.0, K28.2, K28.4, K28.6

Cases (Denominator)		
	Stroke*	I60.^, I61.^, I62.^, I63.^, I64
Exclude:	Readmissions that followed a discharge where the patient signed him/herself out or the patient died	Discharge Disposition Code not equal to 6 (sign out), 7 (death), or 9 (still
	General Exclusion Criteria	(see the Methodology section of this report)
	For AMI cases exclude: Discharged alive and had an episode LOS less than 3 days (to reduce impact of over coding)	

*Patients were included in the diagnostically defined groups if the diagnosis of interest was coded as a type M diagnosis. However, since the goal was to identify conditions that developed before hospital admissions, if the M-diagnosis was also listed on the discharge abstract as a type 2 diagnosis, indicating that the most responsible condition developed after admission, the patient was excluded from the analysis. In order to identify patients who might have been admitted with the diagnosis of interest, but who had developed another most responsible diagnosis after admission, patients were also included if another diagnosis was coded as a type M *and* a type 2 (indicating that the M-diagnosis developed after admission) and the diagnosis of interest was coded as a type 1.

Sum of readmission rates for cholecystectomy, hysterectomy, and prostatectomy (surgical)

Readmissions are defined using information from both the initial episode and the subsequent hospitalization. An episode of care is counted as having a readmission (in either the same or another Ontario acute care hospital) if all of the following criteria are met:

1. The subsequent hospitalization was for a diagnosis or procedure that was defined by an expert panel as relevant to the initial surgery;
2. the initial episode did not end with the patient signing him/herself out against medical advice (or died);
3. if the patient is admitted more than 24 hours following discharge, it is not considered a transfer and is treated as a new episode (See 'Linking Cases Across Hospitals' in the Methodology section of this report); and,
4. if the subsequent admission was not defined as being as elective.

Note: For multi-hospital episodes of care, readmissions were attributed to the last hospital from which the patient was discharged before the readmission.

As diagnosis typing is not an available field in NACRS, for all fiscal year 2003 day surgery records, the first diagnosis is assumed to be Type M and any subsequent diagnoses is assumed to be Type 1.

For surgical patient groups, results do not include cancelled or previous procedures. CCI does not allow for coding of cancelled interventions and previous procedures are no longer recorded.

Episodes (Numerator)		
	Criteria	**Codes**
Include:	***Cholecystectomy:***	
	Haemorrhage and haematoma complicating a procedure, not elsewhere classified	T81.0
	Accidental puncture and laceration during a procedure, not elsewhere classified	T81.2
	Emphysema (subcutaneous) resulting from a procedure	T81.81
	Other complications of procedures, not elsewhere classified	T81.88
	Other postprocedural disorders of circulatory system, not elsewhere classified	I97.8
	Postprocedural disorder of circulatory system, unspecified	I97.9
	Other functional disturbances following cardiac surgery	I97.1
	Mendelson's syndrome	J95.4
	Other postprocedural respiratory disorders	J95.8^
	Postprocedural respiratory disorder, unspecified	J95.9
	Postoperative intestinal obstruction	K91.3
	Gastrostomy complications	K91.6^
	Other postprocedural disorders of digestive system, not elsewhere classified	K91.8
	Postprocedural disorder of digestive system, unspecified	K91.9
	Paralytic ileus	K56.0
	Drainage, gallbladder	1.OD.52.^^
	Extraction, gallbladder	1.OD.57.^^
	Bypass, gallbladder	1.OD.76.^^
	Repair, gallbladder	1.OD.80.^^
	Closure of fistula, gallbladder	1.OD.86.^^
	Excision total, gallbladder	1.OD.89.^^
	Installation of external appliance, bile ducts	1.OE.37.^^
	Management of external appliance, bile ducts	1.OE.38.^^
	Dilation, bile ducts	1.OE.50.^^
	Drainage, bile ducts	1.OE.52.^^
	Management of internal device, bile ducts	1.OE.54.BA-TS
	Extraction, bile ducts	1.OE.57.^^
	Destruction, bile ducts	1.OE.59.BA-AS
	Bypass, bile ducts	1.OE.76.^^
	Repair, bile ducts	1.OE.80.^^
	Construction or reconstruction, bile ducts	1.OE.84.^^
	Closure of fistula, bile ducts	1.OE.86.^^
	Excision partial, bile ducts	1.OE.87.^^
	Excision total, bile ducts	1.OE.89.^^
	Readmission occurred within 28 days of discharge	

Episodes (Numerator)		
	Hysterectomy:	
	Acute post-hemorrhagic anemia - 28 days	D62
	Paralytic ileus - 28 days	K56.0, K56.7
	Cardiac complications during or resulting from a procedure - 28 days	I97.8, I97.9
	Respiratory complications resulting from a procedure - 28 days	J95.4, J95.8, J95.9
	Urinary tract infection, site not specified - 7 days	N39.0
	Retention of urine - 7 days	R33, R39.12
	Prostatectomy:	
	Operations on the Ureter	1.PE.50.^^, 1.PE.52.^^, 1.PE.54.^^, 1.PE.55.^^, 1.PE.56.^^, 1.PE.57.^^, 1.PE.59.^^, 1.PE.76.^^, 1.PE.77.^^, 1.PE.80.^^, 1.PE.82.^^, 1.PE.87.^^, 1.PE.89.^^, 1.PG.50.^^, 1.PG.52.^^, 1.PG.54.^^, 1.PG.55.^^, 1.PG.56.^^, 1.PG.57.^^, 1.PG.59.^^, 1.PG.72.^^, 1.PG.74.^^, 1.PG.76.^^, 1.PG.77.^^, 1.PG.80.^^, 1.PG.82.^^, 1.PG.86.^^, 1.PG.87.^^, 1.PG.89.^^
	Operations on the urinary bladder	1.PL.50.^^, 1.PL.53.^^, 1.PL.54.^^, 1.PL.55.^^, 1.PL.59.^^, 1.PL.72.^^, 1.PL.74.^^, 1.PL.80.^^, 1.PL.87.^^, 1.PM.50.^^, 1.PM.52.^^, 1.PM.54.^^, 1.PM.55.^^, 1.PM.56.^^, 1.PM.57.^^, 1.PM.58.^^, 1.PM.59.^^, 1.PM.72.^^, 1.PM.77.^^, 1.PM.80.^^, 1.PM.82.^^, 1.PM.84.^^, 1.PM.86.^^, 1.PM.87.^^, 1.PM.89.^^, 1.PM.90.^^, 1.PM.91.^^, 1.PM.92.^^
	Operations on the urethra	1.PQ.50.^^, 1.PQ.52.^^, 1.PQ.53.^^, 1.PQ.54.^^, 1.PQ.55.^^, 1.PQ.56.^^, 1.PQ.57.^^, 1.PQ.59.^^, 1.PQ.72.^^, 1.PQ.77.^^, 1.PQ.78.^^, 1.PQ.80.^^, 1.PQ.82.^^, 1.PQ.86.^^, 1.PQ.87.^^, 1.PQ.89.^^

Episodes (Numerator)		
	Operations on the urinary tract	1.PV.50.^^, 1.PV.57.^^, 1.PV.59.^^, 1.PZ.94.^^
	Operations on the prostate and seminal vesicles	1.QQ.52.^^, 1.QQ.87.^^, 1.QQ.89.^^, 1.QT.59.^^, 1.QT.87.^^, 1.QT.91.^^, 1.QZ.94.^^
	Intestinal infections, other specified bacteria	A04.5, A04.6, A04.7, A04.8
	Urinary tract infection, site not specified	N39.0
	Hematuria	N02.^, R31.^
	Prostatic hypertrophy	N40
	Retention of urine	R33, R39.12
	Cardiac complications during or resulting from a procedure	I97.8, I97.9
	Respiratory complications resulting from a procedure	J95.4, J95.8, J95.9
	Readmission occurred within 28 days of discharge	
Exclude:	Elective admissions	Admission Category not equal to "L"

Cases (Denominator)		
	Criteria	**Codes**
Include:	Cholecystectomy	1.OD.89.^^
	Hysterectomy	1.RM.89.^^, 1.RM.91.^^
	Prostatectomy	1.QT.59.^^, 1.QT.87.^^
Exclude:	Readmissions that followed a discharge where the patient signed him/herself out or the patient died	Discharge Disposition Code not equal to 6 (sign out), 7 (death), or 9 (still
	General Exclusion Criteria	(see the Methodology section of this report)
	For Hysterectomy cases ONLY:	1.RM.89.^^, 1.RM.91.^^ **with**
	Pelvic exenteration	CMG 575
	Major procedures in pregnancy or childbirth	CMG 600
	In situ cancers or neoplasms of uncertain behavior	ICD-10 D00-D09, D37-D38
	For Prostatectomy cases ONLY:	1.QT.59.^^, 1.QT.87.^^ **with**
	Radical prostatectomy	1.QT.91.^^

Other Notes:

- All possible 20 procedures on the discharge abstract are included in the analysis for this indicator.

Appropriateness

These indicators are presented at a system-wide level in the 2005 summary report with the exception of cholecystectomy performed laparoscopically vs. open, which is presented at a hospital-specific level in the 2005 summary report.

Percentage of selected elective procedures performed laparoscopically vs open

Rates for selected elective procedures that could be done using laparoscopic or open approaches were calculated for both fiscal year 2002 and 2003. Only the principal procedure on the abstract was used in the rate calculation. For the future, we plan to look at other minimally invasive surgeries to include in this indicator.

Note:

a. Only procedures that could be performed both laparoscopically and open were selected.
b. As Admission Category is not an available field in NACRS, all fiscal year 2003 day surgery records are assumed to be elective.
c. CMG criteria was added so that we are only including cases where the selected procedures are the most complex procedures performed during that hospitalization.

Procedure # 1: Cholecystectomy – Open Approach

Episodes (Numerator)			
	Criteria	**Approach**	**Codes**
Include:	Cases within denominator with:		
	Excision total, gallbladder	Open	1.OD.89.LA 1.OD.89.SM-AG 1.OD.89.SM-AM 1.OD.89.SM-AS 1.OD.89.SM-BD 1.OD.89.SM-GX 1.OD.89.TP
	CMG for Cholecystectomy		315

Cases (Denominator)			
	Criteria	**Approach**	**Codes**
Include :	Excision total, gallbladder	Open	1.OD.89.LA 1.OD.89.SM-AG 1.OD.89.SM-AM 1.OD.89.SM-AS 1.OD.89.SM-BD 1.OD.89.SM-GX 1.OD.89.TP
		Laparoscopic	1.OD.89.DA 1.OD.89.DT-GX 1.OD.89.EC 1.OD.89.DT-AM 1.OD.89.DT-AG 1.OD.89.DT-AS 1.OD.89.DT-BD
	CMG for Cholecystectomy and Laparoscopic Cholecystectomy		315, 317
	Elective Procedures		Admission code = 'L'
Exclude:	General Exclusion Criteria		(see the Methodology section of this report)

Procedure # 1: Cholecystectomy – Laparoscopic Approach

Episodes (Numerator)			
	Criteria	**Approach**	**Codes**
Include:	Cases within denominator with:		
	Excision total, gallbladder	Laparoscopic	1.OD.89.DA 1.OD.89.DT-GX 1.OD.89.EC 1.OD.89.DT-AM 1.OD.89.DT-AG 1.OD.89.DT-AS 1.OD.89.DT-BD
	CMG for Laparoscopic Cholecystectomy		317

Cases (Denominator)			
	Criteria	**Approach**	**Codes**
Include :	Excision total, gallbladder	Open	1.OD.89.LA 1.OD.89.SM-AG 1.OD.89.SM-AM 1.OD.89.SM-AS 1.OD.89.SM-BD 1.OD.89.SM-GX 1.OD.89.TP
		Laparoscopic	1.OD.89.DA 1.OD.89.DT-GX 1.OD.89.EC 1.OD.89.DT-AM 1.OD.89.DT-AG 1.OD.89.DT-AS 1.OD.89.DT-BD
	CMG for Cholecystectomy and Laparoscopic Cholecystectomy		315, 317
	Elective Procedures		Admission code = 'L'
Exclude:	General Exclusion Criteria		(see the Methodology section of this report)

Procedure # 2: Partial Oophorectomy - Open Approach

Episodes (Numerator)			
	Criteria	**Approach**	**Codes**
Include:	Cases within denominator with:		
	Excision partial, ovary NEC	Open	1.RB.87.LA

Cases (Denominator)			
	Criteria	**Approach**	**Codes**
Include :	Excision partial, ovary NEC	Open	1.RB.87.LA
		Laparoscopic	1.RB.87.DA
	CMG for: Major Uterine and Adnexal Procedures without Malignancy, Non-extensive Procedures for Injury or Complication of Treatment		579, 804
	Elective Procedures		Admission code = 'L'
Exclude:	General Exclusion Criteria		(see the Methodology section of this report)

Procedure # 2: Partial Oophorectomy - Laparoscopic Approach

Episodes (Numerator)			
	Criteria	**Approach**	**Codes**
Include:	Cases within denominator with:		
	Excision partial, ovary NEC	Laparoscopic	1.RB.87.DA

Cases (Denominator)			
	Criteria	**Approach**	**Codes**
Include :	Excision partial, ovary NEC	Open	1.RB.87.LA
		Laparoscopic	1.RB.87.DA
	CMG for: Major Uterine and Adnexal Procedures without Malignancy, Non-extensive Procedures for Injury or Complication of Treatment		579, 804
	Elective Procedures		Admission code = 'L'
Exclude:	General Exclusion Criteria		(see the Methodology section of this report)

Procedure # 3: Total Oophorectomy – Open Approach

Episodes (Numerator)			
	Criteria	**Approach**	**Codes**
Include:	Cases within denominator with:		
	Excision total, ovary NEC	Open	1.RB.89.LA

Cases (Denominator)			
	Criteria	**Approach**	**Codes**
Include :	Excision total, ovary NEC	Open	1.RB.89.LA
		Laparoscopic	1.RB.89.DA
	CMG for: Major Uterine and Adnexal Procedures without Malignancy, Non-extensive Procedures for Injury or Complication of Treatment		579, 804
	Elective Procedures		Admission code = 'L'
Exclude:	General Exclusion Criteria		(see the Methodology section of this report)

Procedure # 3: Total Oophorectomy – Laparoscopic Approach

Episodes (Numerator)			
	Criteria	**Approach**	**Codes**
Include:	Cases within denominator with:		
	Excision total, ovary NEC	Laparoscopic	1.RB.89.DA

Cases (Denominator)			
	Criteria	**Approach**	**Codes**
Include :	Excision total, ovary NEC	Open	1.RB.89.LA
		Laparoscopic	1.RB.89.DA
	CMG for: Major Uterine and Adnexal Procedures without Malignancy, Non-extensive Procedures for Injury or Complication of Treatment		579, 804
	Elective Procedures		Admission code = 'L'
Exclude:	General Exclusion Criteria		(see the Methodology section of this report)

Average length of operative time for selected elective procedures

The average length of operative time for selected elective procedures was calculated for both fiscal year 2002 and 2003. Only the principal procedure on the abstract was used in the calculation of the average operative time.

Note :

a. Intervention time is not a mandatory field in DAD nor NACRS. The definition of intervention time in NACRS may also vary for each hospital. The recording of this field across hospitals is inconsistent but it seems that hospitals will either record this field the majority of the time or they will not record it at all. This indicator is being reported at a province-wide level for this year's report and it is anticipated that this will encourage more hospitals to record this field in DAD and NACRS in the future.
b. The average and total operative time are based on cases where the Intervention Time field in DAD and Duration of Ambulatory Care Intervention field in NACRS were recorded.

Procedure # 1 – Cholecystectomy – Open Approach

Total Operative Time (Numerator)			
	Criteria	**Approach**	**Codes**
Include:	Intervention time from cases within denominator with Intervention Time recorded		Intervention Time >0

Cases (Denominator)			
	Criteria	**Approach**	**Codes**
Include :	Excision total, gallbladder	Open	1.OD.89.LA 1.OD.89.SM-AG 1.OD.89.SM-AM 1.OD.89.SM-AS 1.OD.89.SM-BD 1.OD.89.SM-GX 1.OD.89.TP
	CMG for Cholecystectomy		315
	Elective Procedures		Admission code = 'L'
Exclude:	General Exclusion Criteria		(see the Methodology section of this report)

Procedure # 1 – Cholecystectomy – Laparoscopic Approach

Total Operative Time (Numerator)			
	Criteria	**Approach**	**Codes**
Include:	Intervention time from cases within denominator with Intervention Time recorded		Intervention Time > 0

Cases (Denominator)			
	Criteria	**Approach**	**Codes**
Include:	Excision total, gallbladder	Laparoscopic	1.OD.89.DA 1.OD.89.DT-GX 1.OD.89.EC 1.OD.89.DT-AM 1.OD.89.DT-AG 1.OD.89.DT-AS 1.OD.89.DT-BD
	CMG for Laparoscopic Cholecystectomy		317
	Elective Procedures		Admission code = 'L'
Exclude:	General Exclusion Criteria		(see the Methodology section of this report)

Procedure # 2: Partial Oophorectomy - Open Approach

Total Operative Time (Numerator)			
	Criteria	**Approach**	**Codes**
Include:	Intervention time from cases within denominator with Intervention Time recorded		Intervention Time > 0

Cases (Denominator)			
	Criteria	**Approach**	**Codes**
Include:	Excision partial, ovary NEC	Open	1.RB.87.LA
	CMG for: Major Uterine and Adnexal Procedures without Malignancy, Non-extensive Procedures for Injury or Complication of Treatment		579, 804
	Elective Procedures		Admission code = 'L'
Exclude:	General Exclusion Criteria		(see the Methodology section of this report)

Procedure # 2: Partial Oophorectomy - Laparoscopic Approach

Total Operative Time (Numerator)			
	Criteria	**Approach**	**Codes**
Include:	Intervention time from cases within denominator with Intervention Time recorded		Intervention Time > 0

Cases (Denominator)			
	Criteria	**Approach**	**Codes**
Include :	Excision partial, ovary NEC	Laparoscopic	1.RB.87.DA
	CMG for: Major Uterine and Adnexal Procedures without Malignancy, Non-extensive Procedures for Injury or Complication of Treatment		579, 804
	Elective Procedures		Admission code = 'L'
Exclude:	General Exclusion Criteria		(see the Methodology section of this report)

Procedure # 3: Total Oophorectomy – Open Approach

Total Operative Time (Numerator)			
	Criteria	**Approach**	**Codes**
Include:	Intervention time from cases within denominator with Intervention Time recorded		Intervention Time > 0

Cases (Denominator)			
	Criteria	**Approach**	**Codes**
Include:	Excision total, ovary NEC	Open	1.RB.89.LA
	CMG for: Major Uterine and Adnexal Procedures without Malignancy, Non-extensive Procedures for Injury or Complication of Treatment		579, 804
	Elective Procedures		Admission code = 'L'
Exclude:	General Exclusion Criteria		(see the Methodology section of this report)

Procedure # 3: Total Oophorectomy – Laparoscopic Approach

Total Operative Time (Numerator)			
	Criteria	**Approach**	**Codes**
Include:	Intervention time from cases within denominator with Intervention Time recorded		Intervention Time > 0

Cases (Denominator)			
	Criteria	**Approach**	**Codes**
Include:	Excision total, ovary NEC	Laparoscopic	1.RB.89.DA
	CMG for: Major Uterine and Adnexal Procedures without Malignancy, Non-extensive Procedures for Injury or Complication of Treatment		579, 804
	Elective Procedures		Admission code = 'L'
Exclude:	General Exclusion Criteria		(see the Methodology section of this report)

Performance Rating

In *Hospital Report 2005*: *Acute Care*, a shaded cell designates a hospital's performance in each indicator into categories of 'above average', 'provincial average', or 'below average'. These performance allocations are assigned using a 99% confidence interval (see figure 1 below).

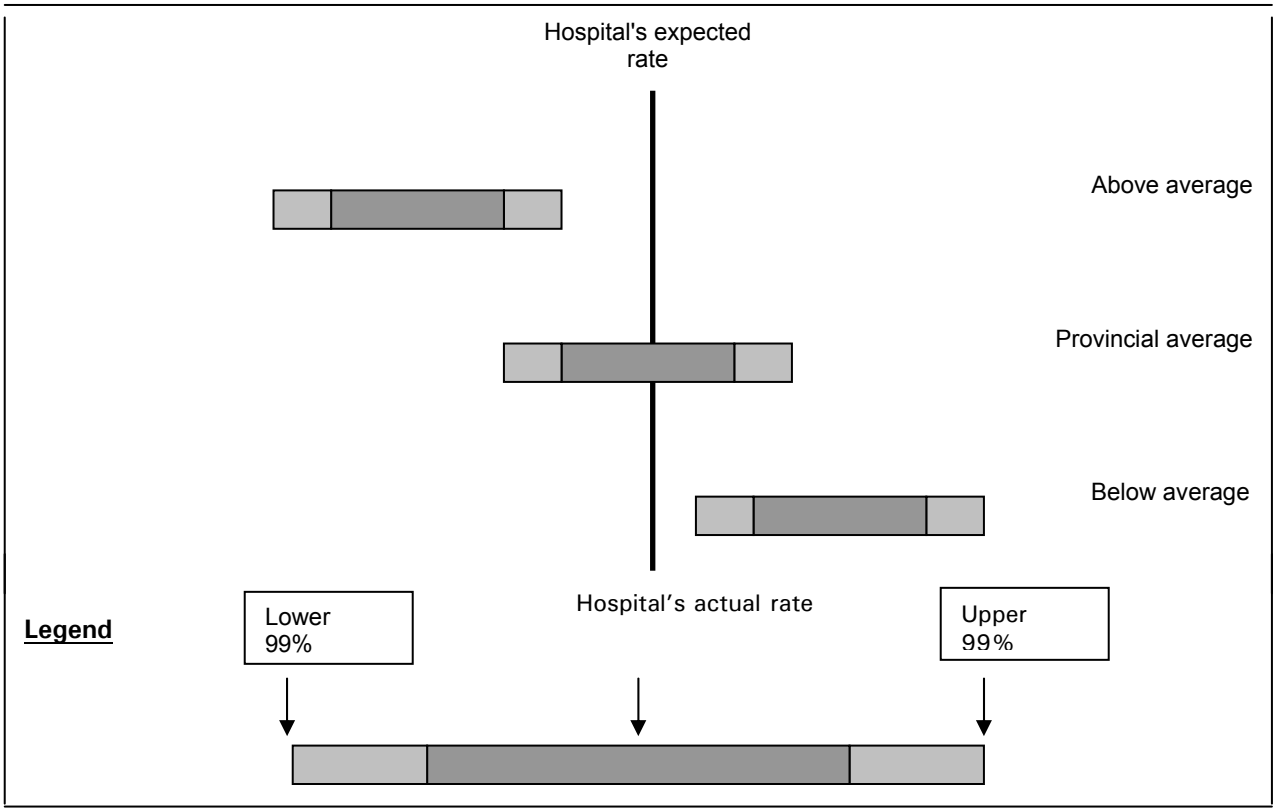
For the *appropriateness of care - open cholecystectomy*, *medical readmissions*, and *surgical readmission* indicators, a lower value indicates better performance. However, no single set of measures should be taken as representative of overall hospital performance. For these two measures, outcomes are assigned as follows:

- If the lower bound of the 99% confidence interval for the observed performance is above the risk-adjusted expected value, that hospital is classified as having *below average performance*.

- If the upper and lower bounds of the 99% confidence interval for the observed performance surround the risk-adjusted expected value, the hospital receives an allocation of *provincial average.*

- If the upper bound of the 99% confidence interval for the observed performance is below the risk-adjusted expected value, that hospital is classified as having *above average performance.*

Figure 1: How Clinical Utilization and Outcome Performance is Assigned



For the first time, hospitals' actual numeric indicator values are presented, instead of performance symbols or value ranges, in the Executive Summary. These values will give the reader a more accurate indication of each hospital's actual performance than in previous years.

In some hospitals, the low volume of specific types of care may raise issues of confidentiality for patients or physicians, or may put the hospital in a position where a small number of adverse events could have a large impact on observed readmission or appropriateness of care rates. In the hospital-specific section of *Hospital Report 2005: Acute Care*, hospitals are assigned a score of not reportable ('NR') in the following cases:

- If case volumes were less than five for a given patient group.
- If there were fewer than two 'expected' cases (based on the risk-adjustment model for each indicator).
- For medical cases, if there were fewer than two 'most responsible physicians' providing care to patients within the patient group for the given indicator.
- For surgical cases, if there were fewer than two 'most responsible surgeons/physicians', AND fewer than five surgeons/anesthetists/physicians involved in the care of patients within the patient group for the given indicator.

Risk-Adjustment

In comparing hospital rates of utilization and outcomes, it is important to take into account differences in patient characteristics that may vary systematically among hospitals. In clinical research this is called risk-adjustment, where patient scores are adjusted to remove pre-existing influences. This issue is particularly important because patients with certain characteristics are less likely to receive some specific treatments or to have positive clinical outcomes than other groups. If a hospital tends to serve a disproportionate number of such patients, it may be unfairly reported as having higher rates of undesirable events, when in fact, these rates may be comparable to another hospital with lower instances that simply serves a different population. Therefore, to improve hospital comparability, logistic regression techniques were used to adjust the data.

It is important to emphasize that risk-adjustment attempts to control for, but cannot entirely eliminate, the impact of differences in patients' pre-admission health status on performance. There are two key caveats to risk-adjustment. First, the expected performance is a relative measure. It describes the expected level of performance at an institution based on how well all institutions perform. Second, risk-adjustment only *reduces* the effect of differences in the patient population across hospitals; it cannot eliminate the effect of these differences completely. As a result, hospitals with the sickest patients may tend to score more poorly than other institutions, even after risk-adjustment. Likewise, hospitals that treat rare or highly specialized groups of patients may tend to score poorly, even after risk-adjustment. It is important to keep these caveats in mind when comparing hospital performance.

Only the hospital-specific indicators were risk-adjusted. This includes the medical readmissions indicator, the surgical readmissions indicator, and the appropriateness (open vs. laparoscopic cholecystectomy) indicators. Although the nurse-sensitive adverse events indicators were previously reported at a province-wide level, we are not reporting them at a hospital-specific level in this year's report. Therefore, these indicators were not risk-adjusted. The number of reported events were so few that it was not reasonable to expect to find any serviceable risk-adjustment models.

For the medical readmissions and surgical readmissions indicators, each indicator component (e.g. AMI, asthma, cholecystectomy, etc.) was risk-adjusted separately. For each hospital, the resulting expected counts of these components are added together to yield their overall expected count of medical readmissions and surgical readmissions. Performance allocations for each hospital are based on comparisons between the expected readmissions and the observed readmissions.

Each indicator or indicator component was risk-adjusted by age. Age was used as a categorical variable. The age groups were roughly broken into quintiles, the cutpoints depending on the distribution of ages within the indicator component. With the exception of hysterectomy and prostatectomy, all indicator components were risk-adjusted for gender. The cholecystectomy component belonging to the surgical readmissions indicator and the appropriateness indicator were both risk-

adjusted for the presence of cholecystitis. Within the readmission indicators, components with a sufficient number of readmissions were also risk-adjusted for the presence of many conditions belonging to the list of Charlson Comorbidities. The Charlson Comorbidity Index is a tool that was developed to classify and measure the severity of comorbid conditions that can attribute to the risk of mortality[1]. The AMI and Heart Failure components were risk-adjusted for several of these comorbidities (see details in the modeling tables below). The Charlson Comorbidity Index, originally adapted for use with ICD-9-CM administrative databases[2], has since been updated for use with ICD-10-CA administrative data following the publication of an ICD-10-AM (Australian modification) version[3].

Models for Medical Readmissions		
Indicator Component	**Variable or Pre-Existing Condition**	**ICD-10-CA and Other Codes**
Acute Myocardial Infarction	Age	0-49, 50-59, 60-69, 70-79, 80+
	Sex	Male, Female
	Congestive Heart Failure	I50.0
	Peripheral Vascular Disease	I70.^, I71.^, I73.1, I73.9, I77.1, I79.0, R02, Z95.8, Z95.9
	Cerebrovascular Disease	G45.^, G46.^, H34.0, I60-I69
	Dementia	F00.^, F01.^, F02.^, F03, F05.1
	COPD / Other Respiratory Disease	J40, J41.^, J42, J43.^, J44.^, J45, J47, J60, J61, J62.^, J63.^, J64, J65, J66.^, J68.4, J84.^
	Rheumatologic Disease	M05.^, M06.^, M07.^, M08.^, M09.^, M30.^, M31.^, M32.^, M33.^, M34.^, M35.^, M36.^
	Digestive Ulcer	K25.^, K26.^, K27.^, K28.^
	Mild Liver Disease	K70.2, K70.3, K73.^, K74.3, K74.4, K74.5, K74.6
	Diabetes	E10.1^, E10.5.^, E10.6.^, E10.9.^, E11.0.^, E11.1.^, E11.5.^, E11.6.^, E11.9.^, E13.0.^, E13.1.^, E13.5.^, E13.6.^, E13.9.^, E14.0.^, E14.^1, E14.5.^, E14.6.^, E14.9.^
	Diabetes w/ Chronic Complication	E10.^, E11.^, E13.^, E14.^
	Hemi or Paraplegia	G04.1, G81, G82
	Renal Disease	N01.^, N03.^, N05.^, N07.^, N18.^, N19, N25.^

Indicator Component	Variable or Pre-Existing Condition	ICD-10-CA and Other Codes
Heart Failure	Age	0-64, 65-69, 70-74, 75-79, 80+
	Sex	Male, Female
	Acute Myocardial Infarction	I21.^, I22.^, I25.2
	Peripheral Vascular Disease	I70.^, I71.^, I73.1, I73.9, I77.1, I79.0, R02, Z95.8, Z95.9
	Cerebrovascular Disease	G45.^, G46.^, H34.0, I60-I69
	Dementia	F00.^, F01.^, F02.^, F03, F05.1
	COPD / Other Respiratory Disease	J40, J41.^, J42, J43.^, J44.^, J45, J47, J60, J61, J62.^, J63.^, J64, J65, J66.^, J68.4, J84.^
	Rheumatologic Disease	M05.^, M06.^, M07.^, M08.^, M09.^, M30.^, M31.^, M32.^, M33.^, M34.^, M35.^, M36.^
	Digestive Ulcer	K25.^, K26.^, K27.^, K28.^
	Mild Liver Disease	K70.2, K70.3, K73.^, K74.3, K74.4, K74.5, K74.6
	Diabetes	E10.1^, E10.5^, E10.6.^, E10.9.^, E11.0.^, E11.1.^, E11.5.^, E11.6.^, E11.9.^, E13.0.^, E13.1.^, E13.5.^, E13.6.^, E13.9.^, E14.0.^, E14.1.^, E14.5.^, E14.6.^, E14.9.^
	Diabetes w/ Chronic Complication	E10.^, E11.^, E13.^, E14.^
	Hemi or Paraplegia	G04.1, G81, G82
	Renal Disease	N01.^, N03.^, N05.^, N07.^, N18.^, N19, N25.^
	Moderate/Severe Liver Disease	I85.0, K70.4, K72.1, K72.9, K76.6, K76.7, K77.8, I85.9, I98.2
Asthma	Age	0-29, 30-39, 40-49, 50-59, 60+
	Sex	Male, Female
GI Bleed	Age	0-54, 55-64, 65-74, 75-79, 80+
	Sex	Male, Female
Stroke	Age	0-74, 75+
	Sex	Male, Female

Models for Surgical Readmissions		
Indicator Component	**Variables of Pre-Existing Condition**	**ICD-10-CA and Other Codes**
Cholecystectomy	Age	0-34, 35-44, 45-54, 55-64, 65+
	Sex	Male, Female
	Cholecystitis	K81.^, K80.00, K80.01, K80.10, K80.11, K80.40, K80.41
Hysterectomy	Age	0-39, 40-44, 45-49, 50-54, 55+
Prostatectomy	Age	0-59, 60-69, 70-74, 75-79, 80+

Models for Appropriateness: Open vs. Laparoscopic Cholecystectomy		
Indicator Component	**Variables of Pre-Existing Condition**	**ICD-10 and Other Codes**
	Age	0-34, 35-44, 45-54, 55-64, 65+
	Sex	Male, Female
	Cholecystitis	K81.^, K80.00, K80.01, K80.10, K80.11, K80.40, K80.41

Reporting Results (by sex) for Women's Health

Provincial-level means for the hospital-specific indicators (stratified by sex) described in this summary were included in the women's health section of the Executive Report. In addition, the Report included an analysis of the rates for women and men, the values of the differences between women and men on mean rates and the statistical significance of these differences at a provincial level. The indicator quantifying the difference between rates for women and men [i.e. (F-M)/F] is the value of the difference between women and men attributable to sex - or a value for "equity". At initial release, the E-scorecard included hospital-level risk-adjusted means and components by sex for each indicator. As the E-scorecard is updated, it will include the sex difference values [(F-M)/F] for each indicator and an indication of the direction (i.e. F>M or M>F) and the statistical significance of these values at a hospital level. In the interim, participating hospitals will be able to access their own and other hospitals' difference values and the direction (i.e. F>M or M>F) and statistical significance of these differences for each indicator on a password-protected database at http://www.hospitalreport.ca/participants.html (see Women's Health - Acute Care 2005).

The interpretation of these data and notes about suppression will accompany this database. In terms of interpretation, if this value [i.e. (F-M)/F] is negative (i.e. it may be the full range of negative values to infinity), males have higher rates than females; if this value is positive (i.e. it may be positive up to a value of 1), females have higher rates than males. A value of "0" is used as the benchmark as it represents true equity between women and men. Furthermore, if a hospital's 95% confidence interval around their specific value of the difference between women and men for a given indicator includes zero, then the hospital is said to have no statistically significant sex difference for that indicator (which is preferred). If a hospital's 95% confidence interval around their specific value of the difference between women and men for a given indicator does not include zero and is negative, then the hospital is said to have unequal (i.e. M>F) performance or a statistically significant sex difference, in which males have a higher rates than females. If a hospital's 95% confidence interval around their specific value of the difference between women and men for a given indicator does not include zero and is positive, then the hospital is said to have unequal (F>M) performance or a statistically significant sex difference, in which females have a significantly higher rate than males.

The Executive Report also indicated whether high performing hospitals have statistically significant sex differences across indicators, including those in the Clinical Utilization and Outcomes quadrant.

References

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Appendix A – CMG Lists

Medical CMG List
010–022, 028, 029, 060, 062, 063, 100–102, 104, 107–109, 113–116, 135–147, 200, 205–208, 212, 213, 219, 220, 222, 225, 226, 229, 232–235, 237, 240, 242, 279, 281, 285, 286, 289, 290, 294, 297, 323–326, 329, 391–394, 397–399, 401, 402, 404, 407, 409, 411, 413, 414, 439, 440, 443, 446, 447, 452, 454, 483, 485, 487–489, 520–522, 524, 525–527, 529, 530, 532, 534–536, 538, 560, 561–563, 592, 594–596, 674–696, 704, 709, 710, 726, 730, 735–737, 751, 756, 757, 761, 763, 811, 813, 818, 823, 831, 834, 841, 842, 846, 847, 849, 850–852, 860–868, 895, 898, 910, 997, 999

Surgical CMG List
001, 003–007, 040, 050–055, 057, 075–078, 081–093, 125–129, 175–179, 181–186, 188, 189, 191, 193, 194, 201–204, 210, 211, 215–218, 250–253, 255, 258, 260–262, 264–266, 269, 271, 310–315, 317, 320, 350–352, 354–356, 358–363, 365, 367–369, 372, 374–386, 425, 427–429, 432, 434, 435–438, 476–480, 482, 500–510, 512, 514, 550–552, 554, 555, 575–579, 581–587, 650–670, 700, 701, 703, 725, 728, 733, 734, 750, 803–805, 830, 832, 833, 840, 880–885, 887, 890–893, 900–902, 906, 908

Major Surgery CMG List
The following Case Mix Groups are a subset of the surgical CMG list, and only include CMG linked to major surgical procedures:

001, 003, 004, 075, 076, 126, 175–179, 181, 182, 184, 250–253, 255, 310–312, 350–352, 356, 363, 367, 383–385, 476, 500–502, 504, 550, 575–577, 650–659, 661, 664, 665, 701, 803, 830, 885, 890, 900

Appendix B – Clinical Utilization and Outcomes Advisory Panel

Charles Adamson	Winchester District Memorial Hospital
Christopher Allan	St. Joseph's Healthcare, Hamilton
Dimitri Anastakis	University Health Network
Kenneth Babey	North Wellington Health Care
Madonna Benoit	Halton Healthcare Services Corporation
Gordon Bierbrier	Chatham-Kent Health Alliance
Douglas Bignell	Sault Area Hospitals
Jennifer Blake	Sunnybrook & Women's College Health Sciences Centre
John Bohnen	St. Michael's Hospital
Joe Borre	Lakeridge Health Corporation
Larry Brownscombe	London Health Sciences Centre
Paul Carter	Woodstock General Hospital
Margaret Catt	Temiskaming Hospital
Niteesh Choudhry	Brigham and Women's Hospital
J. Crosby	University of Toronto
Betty Deschenes	Lakeridge Health Corporation
Doris Doidge	Lakeridge Health Corporation
Susan Downing	Joseph Brant Memorial Hospital
Lloyd Duchesne	The University of Ottawa Heart Institute
Allan Forster	Ottawa Hospital/L'Hopital d'Ottawa
Jeremy Friedman	Hospital for Sick Children
Brian Gamble	Chatham-Kent Health Alliance
Larry Grossman	Scarborough Hospital
Beverley Hall	West Parry Sound Health Centre
Ian Herrick	London Health Sciences Centre
Ronald Holliday	London Health Sciences Centre
David Hollomby	London Health Sciences Centre
Debra Hunt	Rouge Valley Health System
Beverley John	Joseph Brant Memorial Hospital
Stephen Kaladeen	Quinte Health Care
Sandra Keating	St. Joseph's Health Care London
Brian Kelly	St. Mary's General Hospital
John Kraulis	Chatham-Kent Health Alliance
Nancy Labelle	Toronto East General Hospital
Suann Laurent	Sunrise Health Region Emergency Services
Kerry MacCon	York Central Hospital
Annette Marcuzzi	University Health Network
John Marshall	Kingston General Hospital—SEOHSC
Robert Masih	Hôpital Régional de Sudbury Regional Hospital Corporation
Karin McIntosh	Thunder Bay Regional Hospital

Nancy McKee	Mount Sinai Hospital
Susan McNair	St. Joseph's Health Centre (Toronto)
Dale Mercer	Hotel Dieu Hospital—SEOHSC
Rajiv Midha	Sunnybrook & Women's College Health Sciences Centre
Morley Mossing	Sault Area Hospitals
Carol Mulder	University Health Network
Joan Murphy	University Health Network
Terry O'Driscoll	Sioux Lookout Meno Ya Win Health Centre (Sioux Lookout District Health Centre)
Brenda Perkins-Meingast	Workplace Safety & Insurance Board
Lucille Perreault	Hôpital Montfort
Ronald Sears	Ross Memorial Hospital
Annwyl Shewchuk	Red Lake Margaret Cochenour
Bill Sibbald	London Health Sciences Centre
Reta Sproule	Grey Bruce Health Centre
Bryce Taylor	University Health Network
Art Van Walraven	Huron Perth Hospitals Partnership
Susan Wagner	University of Saskatchewan, College of Nursing
Linda Wasko-Lacey	Heartland Health Region
John Wegener	St. Michael's Hospital
Anthony Weinberg	The Ottawa Hospital
Carolyn Zacharuk	Deep River and District Hospital