



The Cost of Hospital Stays:

Why Costs Vary



Canadian Institute
for Health Information

Institut canadien
d'information sur la santé

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About the Canadian Institute for Health Information

The Canadian Institute for Health Information (CIHI) collects and analyzes information on health and health care in Canada and makes it publicly available. Canada's federal, provincial and territorial governments created CIHI as a not-for-profit, independent organization dedicated to forging a common approach to Canadian health information. CIHI's goal: to provide timely, accurate and comparable information. CIHI's data and reports inform health policies, support the effective delivery of health services and raise awareness among Canadians of the factors that contribute to good health.

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Please note that the analyses and conclusions in this report do not necessarily reflect those of the individual members of the Expert Advisory Group or their affiliated organizations.

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Executive Summary

Health care spending in Canada has increased steadily since the mid-1990s, outpacing the overall economic growth rate. Many factors—including population growth, inflation and increases in public- and private-sector spending—account for rising health expenditures. Hospitals are a vital part of the health care system. In 2007, they accounted for about 28% of total health spending (forecast to be 10.6% of the gross domestic product [GDP]). However, while hospital spending has grown in recent years, it actually represents a shrinking part of an expanding pie. In 1975, for example, spending on hospitals accounted for roughly 45% of overall health expenditures.

Although understanding the big picture of how health care dollars are spent is important, it is also valuable to know how these monies are allocated at the hospital level. Hospital expenditures involve the provision of various services such as acute care, outpatient care, day surgery, emergency department services and other types of care. Overall, acute inpatient care tends to account for the majority of hospital costs—the focus of this report.

This report provides information about average acute care hospitalization costs for typical patientsⁱ for several conditions and/or procedures using a newly redeveloped case mix grouping methodology known as CMG+. Using this tool and CIHI data, we are able to determine why hospitalization costs can vary. Sometimes it can depend on the type of disease or condition being treated and how

ⁱ Typical patients refer to those who have undergone a normal and expected course of treatment. They exclude cases involving transfers between acute care facilities, deaths, sign-outs and long-stay cases.

many interventions are used during a patient's hospital stay. In other cases, the differences may be due to how and where a patient is treated, the type of patient (that is, age, number of illnesses) and the length of hospital stay. For example:

- A pregnant patient and a heart attack patient most likely will incur different hospitalization costs. However, costs can also vary by the types of procedures used on *similar* patients. For instance, the hospitalization costⁱⁱ for pregnancy and childbirth tends to differ by type of delivery—a vaginal delivery without any other interventions tends to be less costly on average (\$2,104 per delivery) than delivery by (primary) Caesarean section (\$4,108 per delivery).
- When we compare bypass surgery patients who had one intervention to those who had two during a single hospital admission, the costⁱⁱ nearly doubled; that is, \$11,561 compared to \$22,168.

- In the case of treating patients with Parkinson's disease, it tends to be more costly to treat older patients compared to younger ones. For adults aged 18 to 59, on average, it costⁱⁱ hospitals \$4,603, compared to \$8,397 for patients 80 years and older. The differences in hospitalization costs may be due to similar conditions requiring different types of services and tests and the time needed to heal or recover from treatments.

These are a few examples highlighted in this report. We hope that this information may be used to inform a variety of financial decisions, including those related to effective case and resource management, budgeting, program planning, restructuring, care planning, hospital funding and others.

For More Information on Acute Care Hospital Costs

This report provides information about how certain factors can affect average acute care costs for typical patients only (excludes patients who transfer between acute care facilities, die in hospital, sign out of hospital before completing recommended course of care and stay in hospital longer than those who have a similar condition and/or procedure).

For those who are interested in learning more about total costs by medical condition, the effects of the number of hospital stays and the magnitude of unit costs (that is, the average cost per stay for all patients) on total health expenditures should refer to *The Cost of Acute Care Hospital Stays by Medical Condition in Canada, 2004-2005*, available on the our website at www.cihi.ca.

ii Costs include typical cases only.



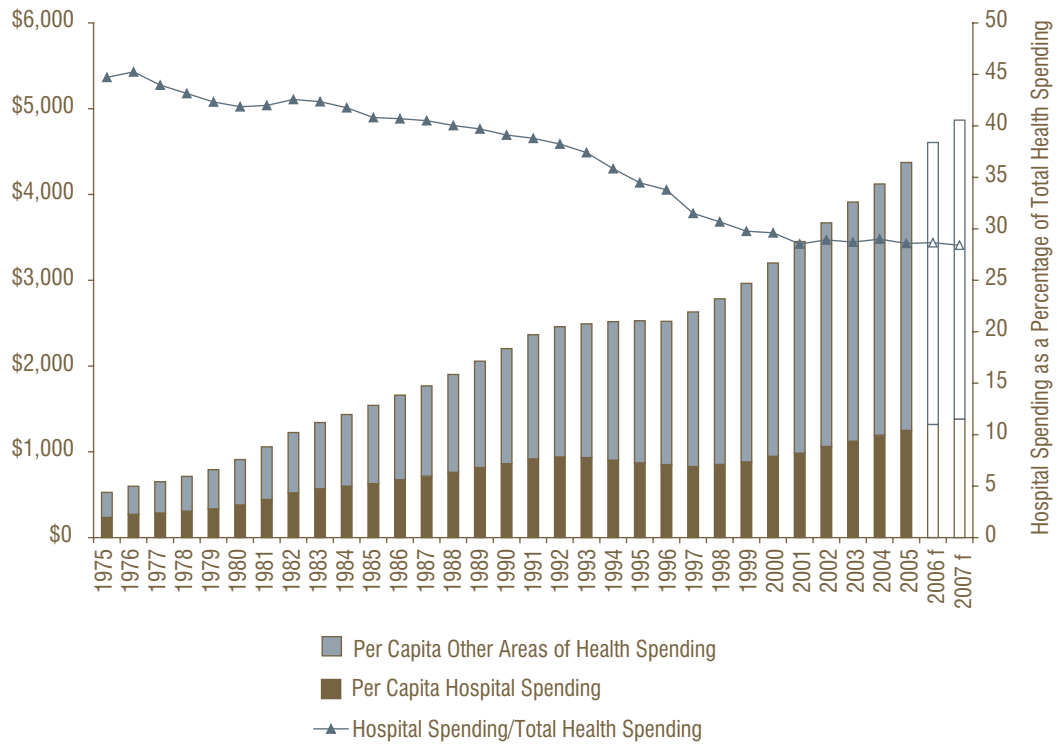
1.0 Overview of Hospital Spending in Canada

Understanding how much Canada spends on health care and how these dollars are allocated are important to those making funding and/or financial decisions. Health care expenditures include monies spent on hospital care, physician services, retail drugs, dental care, eye care, continuing care and mental health services, among others.

Hospitals have traditionally accounted for the largest single share of health expenditures in Canada. In 2007, Canada spent an estimated \$160 billion on health care (forecast to be 10.6% of the GDP). About \$45 billion of that total was spent on hospitals; however, spending on hospitals accounts for a shrinking share of the overall health care budget. For example, in 1975, spending on hospitals made up about 45% of total health expenditures, compared to 28% in 2007. In contrast, other areas of health expenditures have grown more rapidly. Spending on retail drugs (prescribed and unprescribed), for example, rose from less than 9% of total expenditures to 17% between 1975 and 2007.

1 Hospital and Other Health Spending in Canada

Hospital spending continues to rise, but other major areas of health care expenditure are growing more quickly. As a result, hospitals account for a smaller proportion of total health spending now than in the past. Note that the following results are not adjusted for inflation and data for 2006 and 2007 are forecasts.



Source: National Health Expenditure Database, Canadian Institute for Health Information.

Who Pays for Hospital Care?

As in many other Organisation for Economic Co-operation and Development (OECD) countries, Canada's health care system is financed by both the public and private sectors. Under the provisions of the *Canada Health Act*, Canadians are insured for medically necessary hospital services according to provincial and territorial health plans. In Canada, the public sector accounted for 91% of hospital spending in 2005. Public-sector financing for hospital services in other OECD countries ranged from 57% to 99% over this same year.¹

Canadian hospitals received about \$3.9 billion from non-public sources in 2005—up from \$2.4 billion a decade earlier. In 2005, almost half of that amount (\$1.7 billion) was paid for by individuals and private insurance firms to cover charges for private rooms and other preferred accommodation, care for non-residents, chronic care and uninsured services. Hospitals may also receive private-sector payments for some over-the-counter drugs and personal health supplies, ancillary fees (such as those for parking and food services), donations and investment income.

Where Does the Money Go?

Health care is not only about people who need care but also about those who provide it and the way it is delivered. The bulk of hospital spending goes toward operating costs, such as salaries and benefits for hospital staff. In 2005-2006, inpatient nursing services (37%) and diagnostic and therapeutic services (21%) accounted for over half of all hospital spending on compensation.ⁱ Operating rooms, and emergency and ambulatory care, respectively, accounted for an additional 4% and 13% of compensation-related expenditures.ⁱ Another 18% was spent on compensation for administration and support services staff.ⁱ

i Percentages do not include data from Quebec and Nunavut.

2 Spending on Compensation in Canadian Hospitals

Hospital spending varies across departments. The table below shows how much was spent in Canada's hospitals, outside Quebec and Nunavut, on staff compensation in 2005–2006 by various areas of the hospital.

	Non-Physician Compensation*	Physician Compensation ^{††*}
Area	2005-2006 Spending [†] (\$'000,000)	2005-2006 Spending [†] (\$'000,000)
Administration and Support [‡]	4,150.0	85.6
Inpatient Nursing Services [§]	7,749.3	639.2
Operating Room ^{**}	811.2	30.9
Emergency	966.5	142.0
Ambulatory Care Services	1,638.2	277.0
Diagnostic and Therapeutic	4,027.1	789.2
Research and Education	502.6	157.6
All Other	965.1	19.8
Total	20,810.0	2,141.3

Notes: All numbers are rounded to the nearest million.

* Compensation figures include salaries and benefits.

† Does not include data from Quebec and Nunavut.

‡ Includes spending in such areas as human resources, communications and finance. Support includes materiel management, housekeeping services, plant maintenance and operation, among other services.

§ Includes ambulatory care clients for facilities without ambulatory care functional centres and expenses for physicians contracted in specific inpatient nursing units.

** Units used for surgical interventions, including post-anesthetic recovery rooms.

†† Physician compensation does not include fee-for-service payments.

Source: Canadian MIS Database, Canadian Institute for Health Information.

Medical imaging is another area in which spending has grown. In 2005–2006, Canadian hospitals reported having spent an estimated \$2.2 billion—or just about 5% of their budgets—to buy and operate medical imaging equipment. This includes spending on salaries for the professionals who operate and maintain the imaging equipment and capital costs related to the equipment itself. The bulk of that amount (61%) went to pay physicians and other staff; supplies accounted for another 22%.

Breaking Down Hospital Spending

Hospital expenditures reflect the provision of acute care, outpatient care, day surgery, emergency department services and other types of care. Overall, acute inpatient care

tends to account for the majority of hospital costs.² The rest of this report will focus on average costs associated with acute inpatient care. In the following section, CIHI's redeveloped patient grouping methodology (CMG+) is introduced, illustrating how to calculate average inpatient costs for specific patient/Case Mix Groups (CMGs) in Canadian hospitals. The final section further elaborates on this methodology and shows how certain factors can affect the cost of treating typical acute care patients admitted to hospital for various conditions and/or procedures. At the end of the report you will find an appendix of tables that provides the average inpatient acute care costs for typical cases for many different procedures and/or conditions, organized by major clinical categories.



2.0 Measuring Average Acute In-Hospital Costs

So far this report has examined hospital spending through a wide lens—looking at how much Canada spends on hospitals and how hospital spending is broken down by functional centre and type of hospital service.

This section introduces a newly redeveloped tool that allows for the calculation of average inpatient costs for specific patient/Case Mix Groups. This methodology (CMG+) can be used to calculate the average acute care inpatient hospital costs and may be valuable for comparing costs across programs and across hospitals. The components of this methodology and how it is used are described below.

What Is CMG+?

The CMG+ methodology is used to create distinct patient groupings that are clinically similar and/or homogenous with respect to hospital resources used. By linking patient groups to resources used in their treatment, CMG+ provides a tool for analyzing resource utilization and costs.

The case mix grouping methodology was revised to make use of the most recent Canadian classification systems for diseases and related health problems and interventions. The CMG+ methodology assigns patient records to major clinical categories (MCCs) and Case Mix Groups (CMGs). Both MCCs and CMGs are based on either a diagnosis or condition described as being most responsible for the patient's stay in hospital—in clinical terms, the “most responsible diagnosis” (MRDx)—or based on an intervention that significantly affects the pattern of care and resources consumed by a patient.

What's New About CMG+: The Five Factors

CMG+ introduces five factors to account for variations in patient resource consumption. The first two factors—Age Category and Comorbidity Level—are similar to ones found in CIHI's previous case mix methodology (CMG/Plx). The remaining three factors—Flagged Intervention, Intervention Event and Out-of-Hospital (OOH) Intervention—allow for the use of interventions in differentiating how resources are consumed. The five factors allow for a greater level of specificity and therefore CMG+ provides more accurate information about resource utilization. A brief description of each of these factors is provided below:

- **Age Category:** Hospital stays for older patients tend to cost more than those for younger patients with similar health problems. This may result from the cost of related in-hospital services and tests, as well as the duration of hospitalization (length of stay). Depending on the severity of a disease and its progression, older patients may require more and/or costlier types of services and tests than younger patients. They may also take a longer time to heal and/or recover from treatments.
- **Comorbidity Level:** Comorbidity refers to other illnesses a patient has beyond the most responsible reason for hospitalization. The presence of other illnesses may require more complex care and/or increase the length of treatment, as well as the length of time spent waiting for treatment. This, in turn, may result in higher hospital costs.
- **Flagged Intervention:** Certain hospital procedures, such as radiotherapy and tracheostomy, are “flagged” because they tend to be associated with higher resource consumption. Care for patients who receive “flagged” interventions typically costs more than care for similar patients who do not, even though the interventions themselves may not be costly.

There are currently 14 flagged intervention categories used in the CMG+ methodology. These are:

- | | |
|---------------------------|---|
| 1. Feeding tubes (PEG) | 9. Dialysis |
| 2. Vascular access device | 10. Radiotherapy |
| 3. Tracheostomy | 11. Mechanical ventilation
no less than 96 hours |
| 4. Chemotherapy | 12. Mechanical ventilation
less than 96 hours |
| 5. Paracentesis | 13. Cell saver |
| 6. Heart resuscitation | 14. Parenteral nutrition |
| 7. Cardioversion | |
| 8. Pleurocentesis | |

- **Intervention Event:** Each individual visit (or “occurrence”) by a patient to an operating room or procedure suite during a single hospital admission that involves an intervention is called an “intervention event.” Cases with multiple intervention events are usually more costly than those involving only one.
- **Out-of-Hospital (OOH) Intervention:** OOH Interventions are selective interventions carried out in a health care facility other than the treating/admitting facility. As a result, the facility where the patient is eventually admitted and/or treated does not incur the cost of the intervention itself. In most of these cases, therefore, the presence of an OOH Intervention indicates a lower cost for the admitting facility.

For more information on CMG+, please visit www.cihi.ca.



Using CMG+ and Other Tools to Calculate Average Costs

By introducing five factors to account for variations in patient resource consumption, the CMG+ refines the methodology used to measure Resource Intensity Weights (RIWs). The RIWs are one of the two main components needed to calculate average case costs. The other component is Cost per Weighted Case (CPWC).

Resource Intensity Weights

An RIW is an indicator representing the relative resources used by a patient. Specifically, RIWs are relative values that describe the expected resource consumption of an “average” patient within a Case Mix Group.

In the CMG+ methodology, RIWs are adjusted for five factors known to affect hospital costs. For example, patients who differ with respect to age, the presence of additional illnesses and/or type and number of interventions, may consume different resources. On average, older patients with more health problems who tend to consume more resources would have a higher RIW than their counterparts with fewer health problems.

RIWs are calculated and updated annually based on data from the Discharge Abstract Database (DAD) and from case-cost data provided by hospitals in British Columbia, Alberta and Ontario. Calculated RIW values found in the DAD represent relative resource consumption of different patient cases. The sum of all the RIWs in a health service or program is referred to as the “weighted cases” for that service or program.

Cost per Weighted Case

The CPWC provides a measure of the average financial cost a facility incurs to treat a single inpatient. It is calculated by dividing the net total inpatient cost for a facility by the total weighted cases in that facility.

The CPWC is calculated and updated annually from CIHI’s Canadian MIS Database (CMDB), based on data from all hospitals in Canada that report data to the CMDB and the DAD. The CMDB contains financial and statistical information from hospitals and regional health authorities across Canada that can potentially be used to evaluate the cost of activities in health service organizations, among other purposes.

The average inpatient CPWC is calculated by dividing the total net inpatient cost by the total weighted cases for the same period.

$$\text{Cost per Weighted Case} = \frac{\text{Net Total Inpatient Cost}}{\text{Total Weighted Cases}}$$

For example, if a hospital has 5,000 RIW weighted cases during a period and a net total inpatient cost of \$10 million, the average inpatient CPWC is \$2,000.

$$\text{\$2,000} = \frac{\text{\$10,000,000}}{5,000}$$

Note: Net total inpatient cost excludes physician compensation.

How to Estimate Total Costs

Once the average CPWC has been calculated, the average cost can be applied to the total weighted case volume for any service or program.

$$\text{Estimate of Total Costs} = \text{CPWC} \times \text{Total Weighted Cases}$$

As in the above example, if the same hospital has 250 weighted cases of a certain disease with an average inpatient CPWC of \$2,000, the approximate average total cost to the hospital treating these patients is \$500,000.

$$\text{\$500,000} = \text{\$2,000} \times 250$$

The RIW and the CPWC together provide a simple way of estimating average patient and program costs. This cost information can be used to inform a variety of financial decisions, including those related to effective case and resource management, budgeting, program planning, restructuring, care planning or hospital funding.

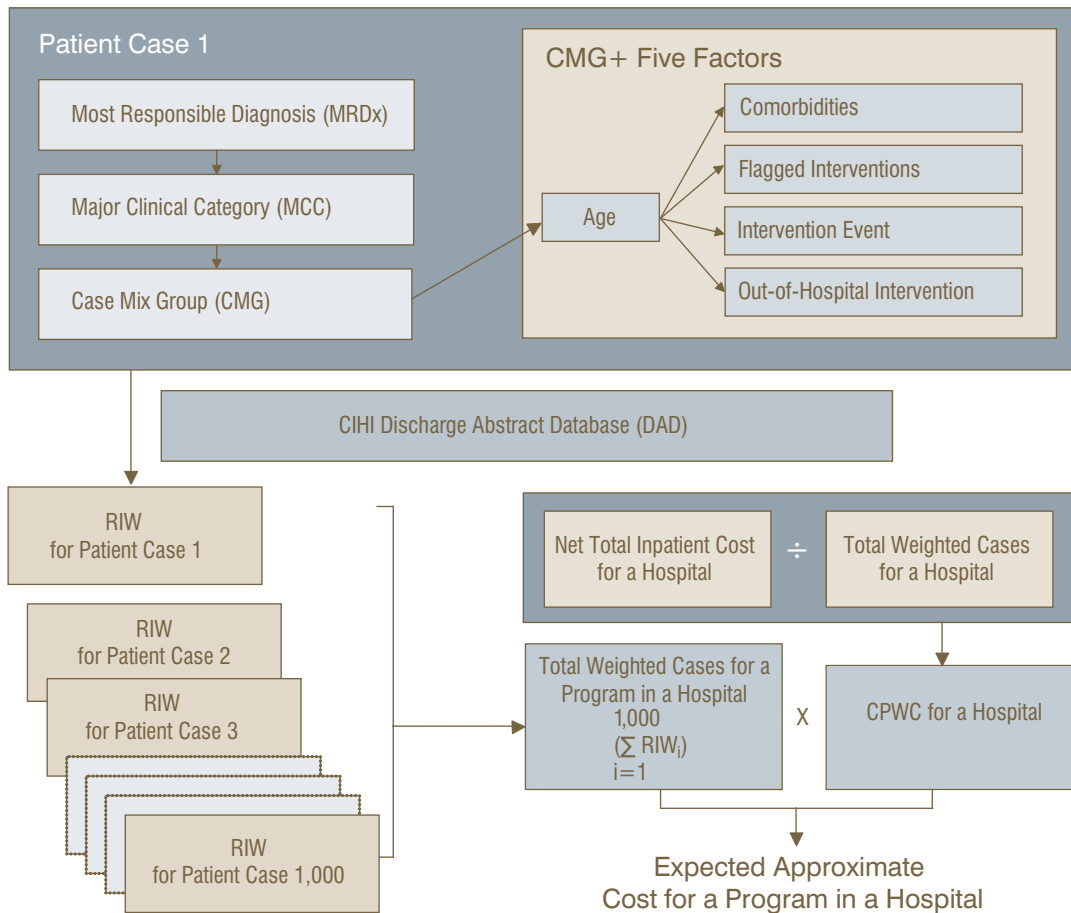
How Hospital Cost Information Can Be Used in Evidence-Based Decision-Making

Hospital-based health services managers and decision-makers can use costing information to inform decisions regarding strategic planning, program efficiency evaluation, resource management, proposal making, care planning, budgeting and hospital funding. Below are some examples of how hospital cost information can be applied to evidence-based decision-making:

- **Strategic Planning:** Hospital cost reports can be used to help assess the potential financial effects of strategic decisions. For example, if a hospital is considering the addition of a new program or physician, or proposing to expand a hospital's facility, the cost reports can be useful in estimating the potential financial effects of these changes. Furthermore, comparing the costs of programs or services may produce unexpected results. For example, the results may show that the proposed inpatient budget allocations are not consistent with planned areas of emphasis.
- **Evaluating Program Efficiency:** For those hospitals that have systems in place to measure the actual costs, the *overall CPWC* of the hospital can be compared to the *actual CPWC* case for each program. If the actual CPWC for a program is less, then the program can be considered to be less expensive than the hospital average.
- **Care Planning:** By using case-costing information, health care providers may be able to compare and identify the cost-effective models or practices of patient care.
- **Evaluating Emerging Technologies:** Case-cost data can be used to inform evaluation that takes into account both clinical volumes and financial performance.

3 Estimating Average Inpatient Costs

The following chart illustrates how average inpatient costs are calculated. In this example, 1,000 inpatient cases are treated in a clinical program in a hospital. To estimate average costs, CMG+ first assigns each patient case to an MCC and a CMG based on the MRDx and other information. After this, the RIW value is calculated for each case by adjusting the basic weight assigned to a CMG according to the patient's age and the rest of the five factors. By summing up all RIWs in that program, total weighted cases can be obtained for the program. In the same way, total weighted cases are calculated for all cases in that hospital by adding weighted cases for all the programs. The CPWC is then calculated by dividing the net total inpatient cost by the total weighted cases in that hospital. Finally, the expected approximate cost for that program in that hospital is calculated by multiplying the total weighted cases by the CPWC.





3.0 Looking Into Hospital Costs: Selected Examples

Earlier, this report illustrated the CMG+ methodology and how inpatient hospital costs can be calculated using average CPWC and RIWs. This section provides examples of how the CMG+ methodology is used to calculate average acute care hospitalization costs for typical patients.ⁱ Specifically, it focuses on factors that affect the cost of hospital stays for typical patients. It also provides examples of hospitalization costs for atypical patients (that is, costs for patients who are transferred from one hospital to another, patients who die and patients who sign themselves out before their full course of treatment is completed).

What Is a Typical Patient?

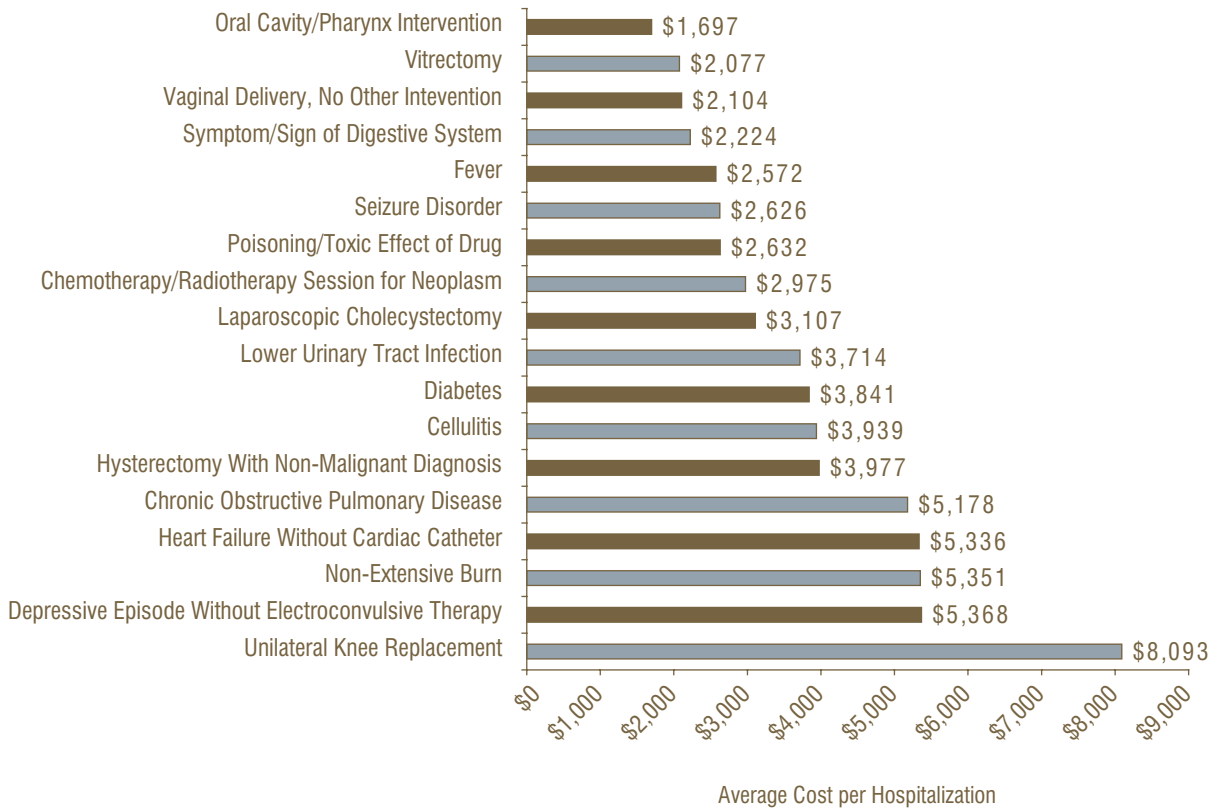
Typical patients are those who have undergone a normal and expected course of treatment. They exclude cases involving transfers between acute care facilities, deaths, sign-outs and long-stay cases.

While patients admitted for different conditions—for example, a pregnant patient compared with a heart attack patient—may incur different hospitalization costs, so can the types of procedures used on *similar* patients. The cost for pregnancy and childbirth for typical patients, for example, may differ by type of delivery—a vaginal deliveryⁱⁱ (\$2,104 per delivery) tends to be less costly on average than delivery by Caesarean sectionⁱⁱⁱ (\$4,108 per delivery).

ⁱ All cost data presented in this section are calculated using Cost per Weighted Case, which exclude physician compensation.

4 Average Costs for Typical inpatients With the Most Common Health Conditions

This figure shows the average hospital cost (2005–2006) for typical inpatients with the most common health conditions and/or treatments in each patient group from acute care facilities. Long-stay cases, deaths, sign-outs and cases involving transfers to or from acute care facilities were excluded.



Notes: Comparable data were not available from Quebec. Costs do not include physician compensation.

Sources: Canadian MIS Database and Discharge Abstract Database, Canadian Institute for Health Information.

Hospitalization costs can vary for other reasons, including how and where a patient is treated, the type of patient and the length

of hospital stay. There are many factors that can affect hospitalization costs beyond the type of procedure being performed.

ii Vaginal delivery refers to vaginal delivery with no other intervention.

iii Caesarean section refers to primary Caesarean section.

Factors Affecting Hospital Costs

Many factors affect the cost of treating a patient admitted to hospital. This is true even for patients with the same condition requiring the same or similar treatments. In this section we look at how the five factors described in Chapter 2—Age Category, Comorbidity Level, Flagged Intervention, Intervention Event and Out-of-Hospital Intervention—influence costs among typical patients being treated in hospital for similar conditions. It is important to note that where higher costs are associated with these factors, it does not imply that patients received unnecessary or inappropriate treatments or procedures.

Age Category

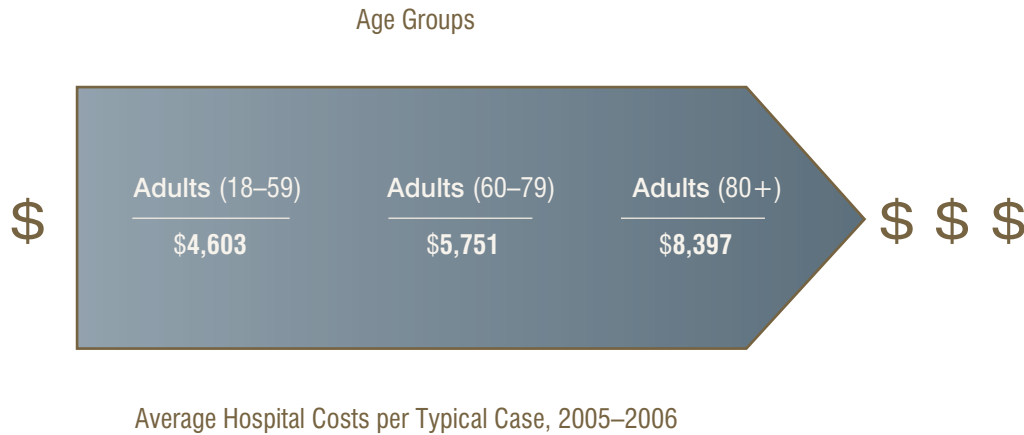
There may be sizable variations in hospitalization costs for patients in different age groups. These variations may result from the cost of in-hospital services

and tests as well as duration of admission. Depending on the type and severity of disease and its progression, patients in various age groups may require different types of services and tests and may take a longer or shorter time to heal or recover from treatments. Consider adult cases involving unilateral hip replacement among patients diagnosed with no other recorded illnesses who received similar treatments. The average cost per hospitalization for those (typical) patients aged 18 to 59 years was \$8,581; for those aged 60 to 79 years, \$8,777; and for those aged 80 years and older, \$9,661.

Another example involves patients who received no surgical interventions and who were generally similar except for differences in age. The average cost per typical case for hospitalizations for Parkinson's disease was almost double for patients aged 80 years and older compared to those aged 18 to 59 years.

5 Patients Admitted for Parkinson's Disease

The differences in hospitalization costs for typical patients by age group can be seen in the figure/diagram below. It shows that the average cost of hospitalization for treating Parkinson's disease increases as the age increases. In this case, care for older patients tends to cost more than for younger patients.



Notes: Comparable data were not available for Quebec. Costs do not include physician compensation.

Sources: Canadian MIS Database and Discharge Abstract Database, Canadian Institute for Health Information.

Comorbidity Level

Treating a patient for a condition when the patient suffers from additional illnesses (other than the most responsible diagnosis^{iv}) may cost more than treating a patient with the same condition *without* the additional illnesses. For example, the cost of treating typical patients aged 60 to

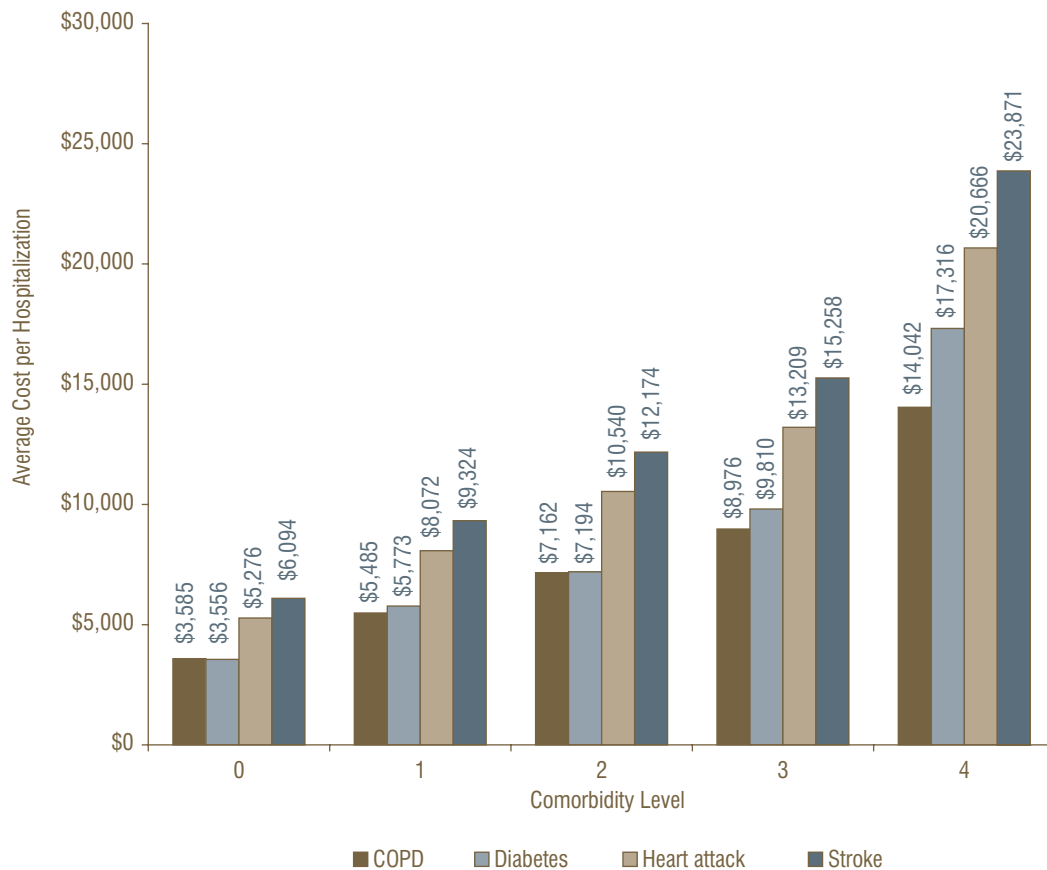
79 years who had a gallbladder^v removed was higher for those patients who had additional illnesses beyond why they were admitted into hospital; that is, the average cost of hospitalization was \$3,234 for a patient who had no additional illnesses compared to \$4,900 for patients with other illnesses.

iv The diagnosis that describes the most significant condition that is responsible for a patient's stay in the hospital.

v Laparoscopic cholecystectomy.

6 Hospital Costs Rise as the Number of Illnesses Rise

The graph below shows how hospitalization costs rise with increases in comorbidities (that is, illnesses other than the most responsible diagnosis) for four common conditions—diabetes, stroke, chronic obstructive pulmonary disease (COPD) and heart attack—for 2005–2006. In some cases the average cost of treating typical patients aged 60 to 79 years in hospital with a comorbidity level of 4 (higher comorbidity levels indicate higher resource consumption relating to the presence of other illnesses) is five times higher than treating similar patients with no comorbidities in hospital.



Notes: Comparable data were not available for Quebec. The CMG+ defines comorbidity levels as ranging from 0 to 4. Level 0 is for cases with no observed comorbidities from the comorbidity list. Levels 1 to 4 are defined by the observed cost effect of one or more comorbid conditions found on the comorbidity list. Cases in level 1 are evidenced as having a 25% to 49% increase in cost while comorbidity level 4 reflects an increase in cost of 125% or more. Costs do not include physician compensation.

Sources: Canadian MIS Database and Discharge Abstract Database, Canadian Institute for Health Information.

Different Procedures for Similar Patients May Result in Considerably Different Hospitalization Costs

In 2005–2006, the average cost per hospitalization for treating typical patients with diseases and disorders of the circulatory system was \$6,553. These groups of patients include those with heart transplants, cardiac valve replacement, bypass surgeries, angioplasty, myocardial infarction, arrhythmia, angina and other conditions. As a result of differences in diagnoses and treatments, some of these hospitalizations were less expensive than others. For example, typical patients treated for stable angina or chest pain without needing a catheter cost \$1,956, on average, compared to heart transplant patients, whose average cost per hospitalization for typical cases was almost \$74,576.

Similar patient groups are sometimes treated with different procedures. For example, bypass surgery and/or angioplasty are common methods of treating coronary artery disease or cardiovascular disease patients. A host of factors may be involved in deciding which procedure to use, including (but not limited to) patients' clinical conditions, physicians' practice patterns and patients' treatment preferences. Hospitalization costs may differ depending on the decisions made. Hospitalizations involving bypass surgery are, on average, more expensive than those for angioplasty. In 2005–2006, the average cost per hospitalization for typical bypass surgery cases was \$17,869 while that for typical angioplasty cases was \$7,829. However, the volume of angioplasty cases (n=18,295) was almost double that of bypass surgery (n=9,585).

Flagged Intervention

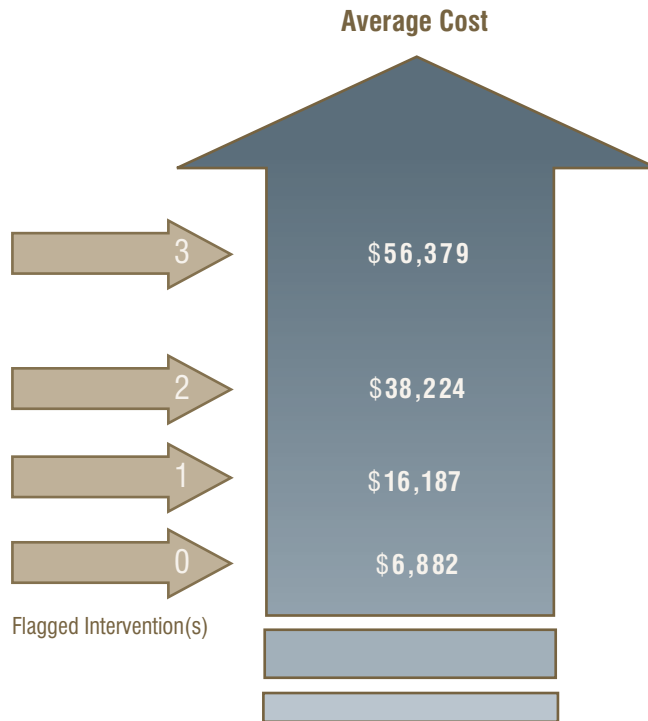
Some procedures, such as radiotherapy, chemotherapy, dialysis and others, tend to indicate that a patient's treatment in hospital will cost more. For example, the data show that for typical patients aged 60 to 79 years who were hospitalized for respiratory failure, the average cost per hospitalization was \$6,882 for cases with no Flagged

Intervention versus more than \$16,187 for cases with one or more Flagged Intervention(s) after removing the effect of the other factors. For patients aged 18 to 59 years with admissions involving pneumonia,^{vi} the average cost per case for those without a Flagged Intervention was \$3,056 versus \$16,753 for those with two Flagged Interventions.

vi Viral or unspecified pneumonia.

7 Flagged Procedure(s) for Respiratory Failure Patients

Hospital care for typical patients who undergo flagged procedures costs more on average than for those that do not. This is illustrated in the figure below for seniors (60 to 79 years) treated for respiratory failure in 2005–2006. The figure also shows that there is a significant change in average cost as the *number of flagged procedures* increases.



Notes: Comparable data were not available for Quebec. Costs do not include physician compensation.

Sources: Canadian MIS Database and Discharge Abstract Database, Canadian Institute for Health Information.

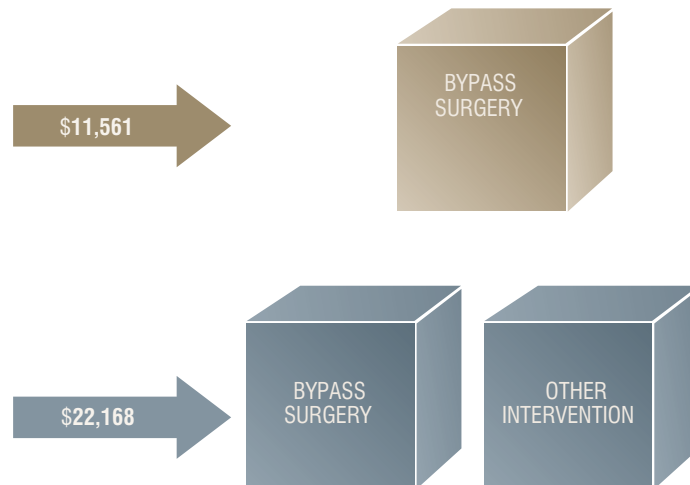
Intervention Event

Not all hospital admissions involve surgeries or visits to the operating room (74% in 2005–2006). Just over 1% involved two or more interventions. In general, the greater the number of surgeries or operating room visits,

the more costly the hospitalization. For example, hospitalizations of patients aged 60 to 79 years who underwent a colostomy or enterostomy cost almost double per case on average if patients had two interventions during a single admission.

8 More Procedures, Higher Cost?

It may cost more to treat patients who visit the operating room more than once during their hospital stay. For example, when we compare typical bypass surgery patients who had one intervention to those who had two during a single hospital admission, the average hospitalization cost nearly doubled (2005–2006).



Notes: Comparable data were not available for Quebec. Costs do not include physician compensation.

Sources: Canadian MIS Database and Discharge Abstract Database, Canadian Institute for Health Information.

Out-of-Hospital Intervention

Certain interventions that are carried out in a health care facility other than the treating/admitting facility are referred to as OOH Interventions.^{vii} These occur in less than 1% of all patient cases. When they do occur, they may result in a lower average case cost for the admitting hospital. For example, hospitalizations of patients aged 80 years and older admitted for a pacemaker implantation or removal who underwent an OOH Intervention cost, on average, \$6,385 per typical case. However, the hospitalizations for those who had the intervention performed at the admitting/

treating facility cost, on average, about twice as much. Although the cost of an OOH Intervention may be lower to the admitting facility, the total cost of hospitalization shared between two facilities may be higher.

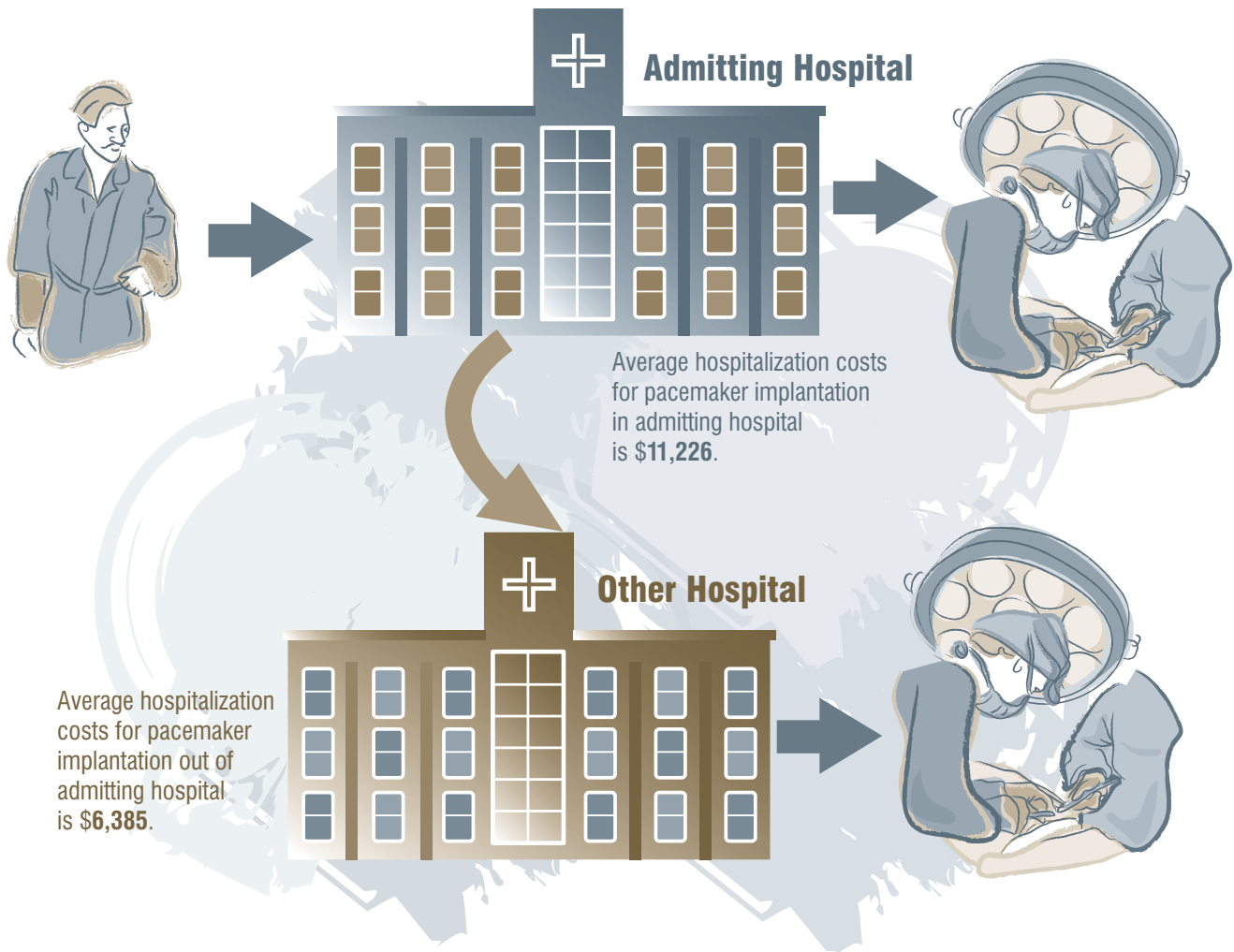
Also, the average hospitalization cost per typical case for 60-to-79-year-old heart attack patients who underwent angioplasty and had an OOH Intervention was almost half as much as the average hospital cost per typical case for similar patients treated in the admitting hospital.^{viii}

vii Patients who are sent to another facility for an OOH Intervention are not considered transfer patients because these patients are returned to the admitting hospital after the intervention has been performed in the other facility.

viii These patients did not have any other recorded illnesses or Flagged Intervention(s).

9 The Difference in Cost of a Pacemaker Implantation Performed in an Admitting Hospital Versus out of Hospital

The figure below illustrates the difference in average hospitalization cost for typical patients who received a pacemaker implantation in the admitting hospital versus receiving it out of the admitting hospital (2005–2006). The hospitalization cost was almost twice as much when the procedure was done in the admitting hospital than when performed in another facility.



Notes: Comparable data were not available for Quebec. Costs do not include physician compensation.

Sources: Canadian MIS Database and Discharge Abstract Database, Canadian Institute for Health Information.

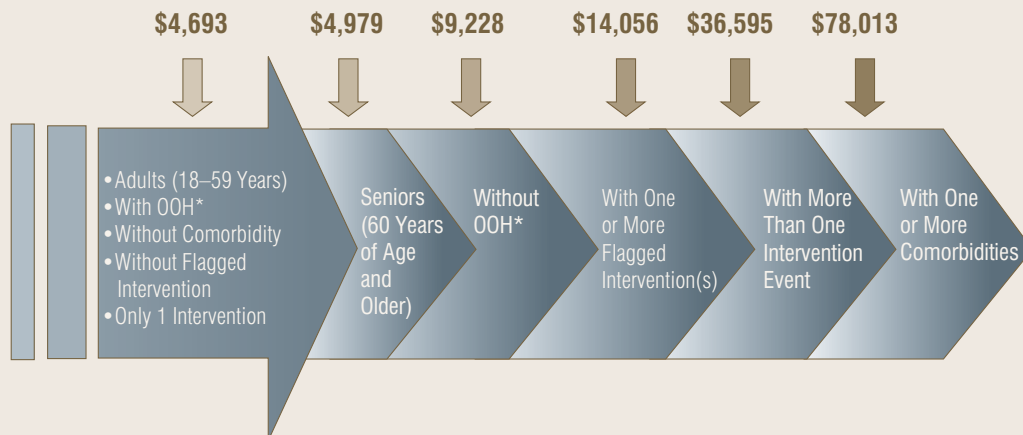
How Do the Five Adjustment Factors Affect Hospital Costs?

The CMG+ methodology makes use of five factors (Age Category, Comorbidity Level, Flagged Intervention, Intervention Events and Out-of-Hospital Intervention) to determine the RIW. As the weights vary, so do the average hospitalization costs.

The figure below provides an example of how these five factors could cumulatively affect the cost of treating typical inpatients who had an angioplasty after a heart attack. The overall average cost per hospitalization for these patients was \$10,553. However, the cost of hospital stays ranged from \$4,693 to \$78,013 after adjusting for the various factors.

10 How Costs Are Affected by the Factors

The figure below shows the cumulative effect of factors on hospitalization costs for 2005–2006. The average cost per hospitalization continues to rise as more factors come into play. For example, hospitalizations for typical patients 60 years and older who had an angioplasty performed in the admitting hospital (that is, did not have Out-of-Hospital Intervention), requiring one or more Flagged Intervention(s), who also had two or more interventions in a single hospital admission and had one or more other illnesses (beyond having a heart attack) cost almost 17 times more on average than hospitalizations involving younger typical patients (18 to 59 years of age) who had the procedure outside the admitting facility and had no other factors.



Notes: Comparable data were not available for Quebec. Costs do not include physician compensation.

*OOH=Out-of-Hospital Intervention.

Sources: Canadian MIS Database and Discharge Abstract Database, Canadian Institute for Health Information.

Cost of Treating Atypical and Long-Stay Patients

Looking at typical acute in-hospital costs only tells part of the story. In acute care settings there are patients that are “atypical,” that is, those who do not receive the normal or predicted course of treatment associated with inpatients in a specific Case Mix Group. This occurs because the patient arrived at, or left, the facility due to certain circumstances that made his or her total length of stay or costs less predictable. These patients include: those who die, those who transfer to and/or from other acute care institutions and those who sign out before completing their recommended course of care. They account for 15% of all hospital cases. Since these patients are likely to consume resources differently, the costs of their care

may be different from those of “typical” patients. In some cases, atypical cases may cost more, in others, less.

Those patients who die while in hospital or sign themselves out of hospital before their treatment is completed may cost more or less, depending on their overall length of stay and resource consumption. For example, patients who sign themselves out of hospital before they receive their full course of treatment may have lower average costs than those who stay until their treatment is completed because their length of stay is shorter and they may use fewer resources.

A patient may also be atypical if transferred from the admitting hospital to another facility for treatment, possibly because the admitting hospital did not have the resources to perform the treatment. Transfers can also result from



complications during a patient's hospital stay or other factors. Some acute care facilities, such as teaching hospitals, may handle more transfer patients and other atypical cases than other facilities. This may be, in part, due to the level of specialization, size and location of such hospitals. A complete picture of the cost of transfer patients can be constructed by building episodes of care that allow us to follow these patients through the health system. For example, the average cost per hospitalization for heart attack patients

who were not transferred during their episode of care^{ix} was \$6,910, versus \$8,300 per episode for transferred patients.^x

Patients who stay longer in hospital than others with similar conditions also tend to cost more. Longer hospitalizations can result from complications due to the types of conditions or treatments, the need for more or different interventions or tests and the need for longer post-surgery care, among other factors.

Other Factors Affecting Overall Hospital Costs

There are other factors associated with hospital costs that cannot be accounted for by the CMG+ methodology. These can include (but are not limited to) micro- and macro-factors within hospital infrastructure and certain patient or population characteristics. For instance, the severity of illness (above and beyond the patient's comorbidities) at the time of the hospitalization may affect the overall length of stay of the patient and costs.³

ix Typical cases.

x Transfer costs and other costs not used in the calculations of the RIWs were not included.

Information Gaps

What We Know

- How health and hospital spending vary across Canada and over time.
- How much Canada and other OECD countries spend publicly and privately on health care in general, and hospital care in particular.
- How certain factors such as age and where a patient is treated can affect average acute care costs for typical patients.
- How to calculate average inpatient costs using patient-specific Resource Intensity Weights (RIWs) and hospital-specific Cost per Weighted Case (CPWC) data.

What We Don't Know

- How do differences in the financing of hospital, physician and drug expenditures influence outcomes and cost efficiencies?
- How do different combinations of public and private financing and service delivery affect costs, access, quality, outcomes and satisfaction?
- To what extent do certain factors (for example, differences in staffing or practice patterns, the organization of hospital services and the availability and use of services outside of hospital) explain variations in hospital spending across the country?

What's Happening

- Starting with the first quarter data submission for 2007–2008, CIHI provided its clients with new and modified DAD reports (such as the Electronic Comparison of Hospital Activity Program, or eCHAP, and the Electronic Hospital Specific Report, or eHSR) that will provide detailed, comparative information on CMG+ factors, including Comorbidity Levels, Intervention Events, Flagged Interventions and Out-of-Hospital Interventions.
- CIHI will provide provincial/territorial ministries of health, regional health authorities and individual facilities with regrouped DAD data to reflect the new CMG+ methodology and associated indicators. Historical data files were provided in the fall of 2007.
- *Hospital Report 2007: Acute Care*, developed by CIHI in collaboration with the Hospital Report Research Collaborative, with the support of the Ontario Hospital Association and the Ministry of Health and Long-Term Care, provides updated data on financial performance and condition-specific indicators of hospitals that provide acute care inpatient services in Ontario.
- CIHI now provides an e-learning course, *Introduction to CMG+*, and a workshop, *An Advanced Look at CMG+*. The course and workshop will provide an overview of the CMG+ methodological changes to the grouping methodology and provide a clear understanding of how CMG+ may affect ongoing analyses at various institutions.

References

1. Organisation for Economic Co-operation and Development, *OECD Health Data, 2007 (CD-ROM)* (OECD, 2007).
2. J. Paul, N. Seeman, A. Gagliardi, S. Mahindra, P. Blackstein-Hirsch and A. D. Brown, *New Measures of Ambulatory Care Performance in Ontario: Preliminary System Snapshot, 2006* (Hospital Report Research Collaborative, 2006).
3. E. Yuen, "Severity of Illness and Ambulatory Care Sensitive Conditions," *Medical Care Research Review* 61, 3 (2004): pp. 376–391.





Appendix: Case Mix Groups by Major Clinical Categories

How to Use These Tables

This report provides information on the cost of providing health care to Canadians and specifically focuses on acute hospital care. The report highlights the use of the CMG+ methodology, which aggregates acute care inpatients into major clinical categories (MCCs) and assigns patients with similar clinical and resource utilization characteristics into Case Mix Groups (CMGs). The tables in the appendix show the average hospitalization costs for typical patients admitted into acute care facilities categorized into CMGs by MCCs. They also show the case distribution of “typical” and “atypical” cases for all CMGs. Technical notes regarding these data can be found at the end of this appendix.

MCC 01 Diseases and Disorders of the Nervous System

CMG Code	CMG Description	Total Volume	Typical Cases Average Cost (\$)		Cases Distribution (Percent)				
			Mean	Median	Typical Cases	Atypical Cases Transfers	Sign-Outs	Deaths	Long-Stay Outliers
001	Intracranial Vessel Intervention Except Extraction, Open Approach	777	28,122	14,098	62.7	23.8	0.3	9.5	3.7
002	Intracranial Vessel Intervention Except Extraction, Percutaneous Approach	487	11,129	9,272	67.6	23.6	0.2	5.3	3.3
003	Other Vascular Intervention With Nervous System Diagnosis	978	8,165	6,089	87.3	5.9	0.1	1.5	5.1
004	Craniotomy for Drainage	235	20,627	8,863	41.3	40.4	0.0	13.2	5.1

CMG code and description refer to the illnesses or conditions used in classifying similar patients into a group, which is assigned a specific code.

Total volume refers to the total number of typical, atypical and long-stay outlier cases in the respective CMGs.

The average (mean and median) cost of typical acute care cases is calculated using data from the Discharge Abstract Database and the Canadian MIS Database, and applying the RIWs and the CPWC to the respective CMGs. Data do not include physician compensation.

Cases in the DAD used here are classified as typical, atypical and long-stay outliers, and their distribution is given as percentages of the total volume of cases. Atypical cases are further subdivided into patient transfers, sign-outs and deaths.

MCC 01 Diseases and Disorders of the Nervous System

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
001	Intracranial Vessel Intervention Except Extraction, Open Approach	777	28,122	14,098	62.7	23.8	0.3	9.5	3.7
002	Intracranial Vessel Intervention Except Extraction, Percutaneous Approach	487	11,129	9,272	67.6	23.6	0.2	5.3	3.3
003	Other Vascular Intervention With Nervous System Diagnosis	978	8,165	6,089	87.3	5.9	0.1	1.5	5.1
004	Craniotomy for Drainage	235	20,627	8,863	41.3	40.4	0.0	13.2	5.1
005	Insertion of Shunt/Brain Monitor	1,472	25,127	11,162	64.7	18.5	0.3	12.6	3.9
006	Cranium Intervention	785	16,051	10,961	81.9	12.9	0.1	2.2	2.9
007	Thoracic/Major Intervention on Spine/Spinal Canal/Vertebra	1,019	12,832	9,238	86.1	9.5	0.1	0.8	3.5
008	Other Site/Non-Major Intervention on Spine/Spinal Canal/Vertebra	1,493	8,192	7,309	92.7	4.8	0.0	0.8	1.7
009	Excision/Repair of Brain	2,764	12,447	10,138	79.8	13.9	0.2	2.3	3.8
010	Drainage/Release of Brain	1,393	7,459	5,816	71.8	21.8	0.1	3.3	2.9
011	Management of Nervous System Device/Other Minor Intervention	931	6,801	5,608	77.1	14.6	0.2	2.7	5.4
012	Open Carotid Endarterectomy	2,542	6,324	5,530	92.1	2.5	0.2	0.4	4.8
013	Major Nerve Intervention or Intervention on Other Site	613	5,991	4,974	91.2	1.3	0.0	0.0	7.5
014	Non-Major Intervention on Nerve	262	2,868	2,549	92.7	0.4	0.4	0.4	6.1
023	Parkinson's Disease/Other Parkinsonian Disorder	1,360	8,903	8,397	77.8	7.5	0.4	5.4	8.9
024	Other Degenerative Disease of Nervous System	1,217	7,059	4,826	74.5	8.2	0.5	10.4	6.4
025	Hemorrhagic Event of Central Nervous System	5,273	10,143	6,300	40.2	24.1	0.5	32.2	3.1
026	Ischemic Event of Central Nervous System	12,500	8,829	6,094	67.3	13.2	0.4	13.7	5.5
027	Cerebrovascular Disorder	1,774	5,654	4,675	71.6	14.7	0.6	8.1	5.0
028	Unspecified Stroke	10,114	6,080	4,743	67.5	10.2	0.7	16.3	5.3
029	Transient Ischemic Attack	6,925	2,629	2,410	90.3	4.4	0.9	0.2	4.2
030	Viral Meningitis	767	2,233	2,071	91.0	5.5	1.3	0.0	2.2
031	Meningitis Except Viral	885	8,242	6,182	73.9	20.0	0.7	3.7	1.7
032	Infection/Inflammation of Central Nervous System Except Meningitis	1,096	10,080	6,574	60.9	26.1	1.4	6.7	5.0
033	Neuropathy/Polyneuropathy	957	8,083	5,136	76.8	16.7	0.6	2.3	3.6
034	Other Disorder of Nerve	1,544	3,896	2,880	86.7	7.6	0.6	0.8	4.3
035	Neuromuscular Disorder	604	8,945	7,182	78.6	14.9	0.2	3.0	3.3
036	Multiple Sclerosis/Demyelinating Disorder	1,437	5,866	4,099	83.5	9.5	1.0	1.0	5.1

MCC 01 Diseases and Disorders of the Nervous System (continued)

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$)		Typical Cases	Atypical Cases			Long-Stay Outliers
Mean	Median	Transfers	Sign-Outs	Deaths					
037	Other Dysfunction of Central Nervous System	5,053	5,136	4,332	82.1	7.8	1.7	2.4	6.0
038	Neoplasm of Central Nervous System	3,850	6,313	5,166	56.9	24.2	0.5	13.2	5.2
039	Status Epilepticus	1,130	6,134	3,570	78.8	14.4	2.0	2.0	2.7
040	Seizure Disorder	13,832	2,626	2,259	86.0	6.2	3.0	0.5	4.3
041	Migraine/Other Headache	3,618	1,950	1,782	88.9	6.2	1.3	0.1	3.6
042	Other Disorder of Central Nervous System	2,947	5,590	3,274	59.9	17.3	1.1	17.8	3.9
901	MCC 01 Unrelated Intervention	1,498	18,947	10,836	69.1	11.8	0.2	12.9	6.0

MCC 02 Diseases and Disorders of the Eye

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$)		Typical Cases	Atypical Cases			Long-Stay Outliers
Mean	Median	Transfers	Sign-Outs	Deaths					
050	Orbit/Eyeball Intervention	605	6,349	5,763	88.4	7.4	0.2	0.0	4.0
051	Lens Extraction/Insertion	833	2,729	2,674	94.5	1.2	0.0	0.0	4.3
052	Vitrectomy	2,875	2,077	2,074	96.7	0.7	0.0	0.0	2.7
053	Extraocular Intervention Except Lacrimal System	510	1,811	1,799	90.6	2.0	0.4	0.0	7.1
054	Sclera/Choroid/Retina Intervention Without Vitrectomy	719	1,612	1,590	97.6	0.4	0.0	0.0	1.9
055	Lacrimal System Intervention	139	1,365	1,378	92.8	1.4	0.0	0.0	5.8
056	Other Ophthalmic Intervention	654	2,111	2,064	91.9	2.9	0.5	0.0	4.7
063	Inflammation of Orbit	670	2,308	2,361	88.4	8.1	0.6	0.0	3.0
064	Major Ophthalmology Disorder	496	3,893	3,619	86.7	10.7	0.8	0.2	1.6
065	Other Ophthalmology Disorder	1,135	2,014	1,800	85.8	8.3	1.1	0.0	4.8
902	MCC 02 Unrelated Intervention	51	8,436	5,614	88.2	9.8	0.0	2.0	0.0

MCC 03 Diseases and Disorders of the Ear, Nose, Mouth and Throat

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$)		Typical Cases	Atypical Cases			Long-Stay Outliers
			Mean	Median		Transfers	Sign-Outs	Deaths	
070	Cochlear Implant	330	27,137	24,611	98.5	0.3	0.0	0.0	1.2
071	Radical Excision of Head and Neck	530	38,693	37,435	89.2	6.2	0.2	1.9	2.5
072	Temporomandibular Joint Implant	34	15,799	14,735	100.0	0.0	0.0	0.0	0.0
073	Oropharynx Excision	146	10,214	6,542	93.8	1.4	0.0	2.1	2.7
074	Lymphatic Intervention With Ear/Nose/Throat Diagnosis	640	11,427	5,900	93.9	1.7	0.2	1.1	3.1
075	Larynx/Trachea Intervention With Ear/Nose/Throat Diagnosis	363	9,593	3,895	86.5	8.8	0.6	0.3	3.9
076	Artery Occlusion for Epistaxis	99	6,452	4,777	83.8	11.1	0.0	0.0	5.1
077	Partial Excision Musculoskeletal Tissue of Head	271	4,378	3,258	91.1	1.1	0.0	0.0	7.7
078	Other Musculoskeletal Intervention on Head	4,241	4,808	4,526	97.3	0.3	0.0	0.0	2.3
079	External Ear Intervention	266	4,443	4,092	98.1	0.8	0.0	0.0	1.1
080	Other Ear Intervention	1,115	1,805	1,758	97.0	0.2	0.0	0.0	2.9
081	Hard/Soft Palate/Gingiva Intervention	832	3,528	3,356	96.6	0.2	0.2	0.0	2.9
082	Mastoid Intervention	837	3,281	3,155	94.3	0.5	0.1	0.0	5.1
083	Ear/Nose/Throat Gland Intervention	1,526	3,203	2,863	95.6	0.3	0.0	0.1	4.1
084	Sinus Intervention	1,713	2,210	2,175	96.1	0.2	0.0	0.0	3.7
085	Glottis Intervention	355	2,970	2,105	90.1	1.4	0.3	0.0	8.2
086	Oral Cavity/Pharynx Intervention	11,191	1,697	1,659	96.8	0.4	0.2	0.0	2.5
087	Nose/Nasal Cartilage Intervention	1,864	1,929	1,813	97.0	0.4	0.2	0.0	2.4
088	Skin Intervention With Ear/Nose/Throat Diagnosis	375	3,281	3,247	95.5	1.1	0.3	0.0	3.2
094	Ear/Nose/Throat Malignancy	1,199	9,248	5,244	67.4	12.2	1.0	13.3	6.2
095	Sleep Apnea	1,530	2,287	1,767	93.1	1.7	0.3	0.0	4.9
096	Epiglottitis	349	3,294	2,615	86.5	11.7	0.6	0.3	0.9
097	Influenza/Acute Upper Respiratory Infection	3,743	2,145	1,765	93.1	3.4	0.5	0.2	2.8
098	Dysequilibrium/Hearing Loss	6,450	2,137	2,062	93.6	1.8	0.7	0.1	3.8
099	Epistaxis	1,945	1,952	1,876	87.9	7.5	0.7	0.7	3.1
100	Sinusitis	626	2,267	2,017	93.5	3.7	1.4	0.0	1.4
101	Disease of Oral Cavity/Salivary Gland/Jaw	1,986	2,480	2,121	92.8	3.7	0.8	0.3	2.4
102	Otitis Media With/Without Ventilation Tube	885	1,986	1,733	94.8	2.6	1.0	0.0	1.6
103	Tonsillitis/Pharyngitis	4,739	1,231	938	94.2	2.4	1.1	0.0	2.3
104	Croup	2,424	1,013	956	94.3	2.3	0.5	0.0	3.0
105	Miscellaneous Ear/Nose/Throat Disorder	2,753	2,488	1,983	88.6	5.7	0.9	0.3	4.5
903	MCC 03 Unrelated Intervention	181	11,886	4,923	77.3	7.2	0.0	6.1	9.4

MCC 04 Diseases and Disorders of the Respiratory System

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$)		Typical Cases	Atypical Cases			Long-Stay Outliers
			Mean	Median		Transfers	Sign-Outs	Deaths	
110	Lung Transplant	78	93,985	52,921	78.2	6.4	0.0	10.3	5.1
111	Open Intrapericardial Lung Resection	91	16,036	12,253	80.2	4.4	0.0	7.7	7.7
112	Open Thoracic Lung Resection	3,867	13,716	10,146	90.3	4.0	0.2	2.3	3.2
113	Pleurectomy	837	12,863	8,553	70.1	24.6	0.1	2.3	2.9
114	Endoscopic Lung Resection	1,019	7,353	6,085	90.2	6.2	0.1	0.9	2.6
115	Respiratory Biopsy/Inspection	1,416	9,431	4,739	81.5	9.6	0.1	5.8	3.0
116	Pleurodesis	140	7,113	6,328	81.4	7.1	0.0	7.1	4.3
117	Other Respiratory Intervention	1,729	13,303	6,597	71.3	15.6	0.3	9.5	3.2
118	Bone Intervention With Respiratory Diagnosis	174	11,802	7,051	84.5	6.3	0.0	2.9	6.3
119	Lymph Node Excision/Biopsy With Respiratory Diagnosis	389	4,427	3,440	82.5	9.5	0.3	4.4	3.3
120	Other Intervention With Respiratory Diagnosis	443	32,982	14,685	58.2	17.8	0.7	16.7	6.5
130	Respiratory Failure	3,888	25,827	11,104	40.9	18.0	0.7	37.7	2.7
131	Failure/Rejection Lung Transplant	43	9,876	7,802	81.4	7.0	0.0	9.3	2.3
132	Malignant Neoplasm of Respiratory System	11,319	7,074	5,225	55.5	11.0	0.4	29.3	4.0
133	Infectious/Parasitic Disease of Respiratory System	216	14,549	7,140	69.4	17.6	0.9	9.7	2.3
134	Respiratory Tuberculosis	500	10,122	8,272	72.6	15.8	3.4	4.4	3.8
135	Aspiration Pneumonia	4,931	11,004	6,239	62.8	6.8	1.0	25.9	3.6
136	Bacterial Pneumonia	2,987	8,868	5,254	72.9	9.7	1.5	12.1	3.8
137	Bacterial Disease of Respiratory System	203	9,204	5,550	77.8	14.3	1.0	5.9	1.0
138	Viral/Unspecified Pneumonia	45,173	4,327	3,958	82.0	5.5	1.2	7.9	3.4
139	Chronic Obstructive Pulmonary Disease	52,296	5,178	3,816	84.5	3.9	1.0	6.6	4.0
140	Bronchiectasis	692	5,469	4,403	90.0	3.2	0.4	3.3	3.0
141	Upper/Lower Respiratory Infection	10,888	2,740	2,527	91.7	4.9	0.6	0.2	2.5
142	Other Lung Disease	5,323	7,588	4,773	64.9	15.1	0.9	16.0	3.1
143	Disease of Pleura	3,378	5,126	4,154	74.5	14.9	1.4	5.9	3.4
144	Pneumothorax	1,701	2,734	2,138	75.7	18.6	0.6	2.4	2.7
145	Postprocedural Respiratory Disorder	1,532	3,311	2,269	82.2	11.2	0.6	2.6	3.5
146	Burn of Respiratory Tract	39	8,087	.	74.4	17.9	2.6	2.6	2.6
147	Asthma	17,140	1,918	1,779	93.8	2.7	1.4	0.1	1.9
148	Other Respiratory Disorder	2,750	3,923	2,795	77.7	11.9	0.8	3.2	6.4
149	Symptom/Sign of Respiratory System	5,270	2,727	2,592	85.4	8.0	1.7	2.2	2.7
904	MCC 04 Unrelated Intervention	2,112	33,811	15,844	59.4	13.7	0.3	22.1	4.5

MCC 05 Diseases and Disorders of the Circulatory System

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$)	Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths
160	Heart Transplant	143	74,576	56,255	62.9	17.5	0.0	13.3	6.3
161	Implantation of Cardioverter/Defibrillator	1,946	30,274	24,553	73.2	23.9	0.1	0.3	2.6
162	Cardiac Valve Replacement	5,069	23,341	20,386	72.5	18.8	0.1	5.1	3.6
163	Major Cardiothoracic Intervention With Pump	820	24,184	18,226	80.9	10.0	0.1	5.4	3.7
164	Major Cardiothoracic Intervention Without Pump	761	21,334	14,431	74.4	13.0	0.3	7.9	4.5
165	Cardiac Valve Repair Except Percutaneous Transluminal Approach	1,239	20,506	17,175	74.7	18.3	0.2	4.4	2.3
166	Coronary Artery Bypass Graft With Cardiac Catheter With MI/Shock/Arrest With Pump	1,389	30,608	27,153	54.0	37.6	0.0	6.7	1.7
167	Coronary Artery Bypass Graft With Cardiac Catheter With MI/Shock/Arrest Without Pump	160	31,443	29,282	70.6	23.8	0.0	3.1	2.5
168	Coronary Artery Bypass Graft With Cardiac Catheter Without MI/Shock/Arrest With Pump	1,592	22,331	20,795	57.9	38.7	0.1	1.8	1.6
169	Coronary Artery Bypass Graft With Cardiac Catheter Without MI/Shock/Arrest Without Pump	177	24,267	23,179	81.4	15.8	0.6	1.1	1.1
170	Coronary Artery Bypass Graft Without Cardiac Catheter With MI/Shock/Arrest With Pump	1,245	24,900	22,302	32.7	59.7	0.1	5.6	1.9
171	Coronary Artery Bypass Graft Without Cardiac Catheter With MI/Shock/Arrest Without Pump	165	26,206	24,334	30.9	67.3	0.0	1.8	0.0
172	Coronary Artery Bypass Graft Without Cardiac Catheter Without MI/Shock/Arrest With/Without Pump	9,789	15,173	15,910	73.5	21.1	0.1	0.7	4.6
173	Minor Cardiothoracic Intervention	379	13,959	10,143	68.6	20.3	0.3	7.4	3.4
174	Pacemaker Implantation/Removal Except Cardioverter/Defibrillator Implant	9,967	12,120	10,116	77.9	17.3	0.1	2.2	2.5
175	Percutaneous Coronary Intervention With MI/Shock/Arrest/Heart Failure	12,397	10,553	9,061	62.8	32.2	0.4	2.4	2.2
176	Percutaneous Coronary Intervention Without MI/Shock/Arrest/Heart Failure	15,442	5,810	5,901	68.0	28.3	0.2	0.1	3.4
177	Management of Pacemaker/Epicardial Lead	939	8,503	7,377	91.2	5.1	0.1	0.3	3.3
178	Percutaneous Transluminal Cardiothoracic Intervention Except Percutaneous Coronary Intervention	1,253	8,613	7,511	76.6	10.9	0.2	8.1	4.2
179	Cardiac Conduction System Intervention	2,110	4,061	3,583	85.3	4.5	0.2	0.0	10.0

MCC 05 Diseases and Disorders of the Circulatory System (continued)

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$)		Typical Cases	Atypical Cases			Long-Stay Outliers
			Mean	Median		Transfers	Sign-Outs	Deaths	
180	Amputation of Limb Except Hand/Foot	1,198	19,600	14,490	62.9	23.6	0.5	10.4	2.6
181	Abdominal Aorta Intervention	4,461	17,613	13,369	83.5	6.9	0.2	6.6	2.8
182	Bypass/Extraction of Vein/Artery of Limb	4,328	9,995	7,900	84.5	9.2	0.2	3.5	2.6
183	Amputation of Hand/Foot	328	7,674	5,943	83.5	11.6	0.3	2.4	2.1
184	Vein Ligation/Stripping	635	1,948	1,980	98.4	0.3	0.0	0.0	1.3
185	Other/Miscellaneous Vascular Intervention	3,232	8,631	5,835	86.9	7.6	0.4	2.6	2.5
193	Myocardial Infarction/Shock/Arrest With Cardiac Catheter	7,401	7,622	6,382	58.0	37.3	0.6	2.0	2.1
194	Myocardial Infarction/Shock/Arrest Without Cardiac Catheter	28,446	6,910	5,276	51.3	29.4	1.0	15.0	3.2
195	Heart Failure With Cardiac Catheter	1,396	9,319	7,434	71.4	22.9	0.4	2.7	2.7
196	Heart Failure Without Cardiac Catheter	39,617	5,336	4,553	79.0	6.0	0.7	10.0	4.2
197	Hypertensive Disease Except Benign Hypertension	893	5,914	4,802	85.0	8.1	0.7	3.1	3.1
198	Congenital Cardiac Disorder	362	5,438	4,822	72.1	18.8	0.3	1.7	7.2
199	Cardiac Valve Disease	2,375	7,511	5,079	53.7	33.7	3.5	6.7	2.4
200	Pulmonary Embolism	5,192	4,935	4,060	83.0	7.8	0.5	5.9	2.8
201	Arrhythmia With Cardiac Catheter	933	7,389	6,394	74.5	22.7	0.5	0.2	2.0
202	Arrhythmia Without Cardiac Catheter	29,216	3,358	2,928	85.6	8.7	0.8	1.7	3.2
203	Unstable Angina/Atherosclerotic Heart Disease With Cardiac Catheter	9,218	4,543	4,261	61.7	35.8	0.5	0.4	1.6
204	Unstable Angina/Atherosclerotic Heart Disease Without Cardiac Catheter	23,304	3,247	2,941	66.4	25.6	1.8	1.6	4.6
205	Syncope	9,889	2,579	2,462	90.8	3.4	1.4	0.4	4.0
206	Benign Hypertension	4,168	2,581	2,489	92.2	2.9	1.1	0.2	3.6
207	Angina (Except Unstable)/Chest Pain With Cardiac Catheter	4,893	3,839	4,007	82.3	16.0	0.3	0.1	1.3
208	Angina (Except Unstable)/Chest Pain Without Cardiac Catheter	29,458	1,956	2,028	90.2	3.6	2.0	0.1	4.1
209	Other/Miscellaneous Cardiac Disorder	11,309	4,382	3,602	76.5	14.6	1.1	3.9	3.8
210	Embolism/Thrombosis Except Deep Vein Thrombophlebitis	678	5,700	5,133	75.8	16.1	0.7	4.4	2.9
211	Deep Vein Thrombophlebitis	2,443	4,217	3,677	87.4	6.6	0.9	1.9	3.3
212	Peripheral Vascular Disease	1,052	3,962	3,321	65.9	19.5	0.9	8.6	5.2
213	Other/Miscellaneous Vascular Disease	3,698	4,835	3,986	67.3	17.9	0.9	11.3	2.5
905	MCC 05 Unrelated Intervention	2,286	13,282	9,969	70.4	11.6	0.6	13.8	3.6

MCC 06 Diseases and Disorders of the Digestive System

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
220	Major Upper Gastrointestinal Reconstruction/Excision	989	20,531	11,986	79.1	8.9	0.3	7.8	3.9
221	Colostomy/Enterostomy	8,430	18,000	10,908	79.8	8.4	0.2	7.7	3.9
222	Open Large Intestine/Rectum Resection Without Colostomy, Unplanned	5,341	15,823	8,872	84.6	7.4	0.2	5.2	2.6
223	Open Large Intestine/Rectum Resection Without Colostomy, Planned	11,809	10,312	7,860	93.0	2.9	0.1	1.3	2.8
224	Major Intervention on Esophagus	421	31,576	21,260	82.4	6.4	0.2	6.4	4.5
225	Non-Major Excision/Repair of Upper Gastrointestinal Tract, Unplanned	4,330	13,703	8,841	80.6	8.6	0.4	7.2	3.1
226	Non-Major Excision/Repair of Upper Gastrointestinal Tract, Planned	5,435	7,900	6,219	93.4	3.5	0.2	1.0	2.0
227	Endoscopic Large Intestine/Rectum Resection Without Colostomy	1,931	7,844	6,820	94.9	1.9	0.1	1.1	2.1
228	Complex Hernia Repair	8,218	3,583	3,129	96.8	1.2	0.2	0.1	1.7
229	Non-Complex Hernia Repair	13,784	2,903	2,735	96.5	0.9	0.5	0.1	2.0
230	Repair/Fixation and Other Moderate Intervention on Lower Gastrointestinal Tract	689	5,520	5,133	93.9	2.5	0.1	1.0	2.5
231	Minor Upper Gastrointestinal Intervention	4,072	5,418	3,725	80.9	10.8	1.1	4.1	3.2
232	Minor Lower Gastrointestinal Intervention	5,818	3,521	3,165	91.5	3.7	0.3	1.3	3.1
233	Complicated Appendectomy	5,636	4,640	3,893	94.0	4.4	0.2	0.1	1.3
234	Simple Appendectomy	15,511	2,619	2,535	95.5	2.2	0.2	0.0	2.0
235	Intervention on Anus Excluding Reconstruction	2,448	2,166	2,003	95.1	0.9	0.4	0.1	3.4
236	Simple Removal of Upper Gastrointestinal Foreign Body	628	1,251	1,158	86.8	4.8	0.5	0.5	7.5
237	Other Intervention With Gastrointestinal Diagnosis	5,429	7,104	5,354	88.4	5.0	0.3	4.0	2.3
248	Severe Enteritis	5,547	5,166	3,989	81.1	5.7	0.3	9.3	3.6
249	Enteritis	26,084	1,953	1,794	93.7	2.3	0.9	0.4	2.8
250	Digestive Malignancy	5,962	6,235	5,199	62.0	10.4	0.3	22.3	4.9
251	Complicated Ulcer	1,027	4,281	3,161	78.4	12.4	2.1	3.2	3.9
252	Uncomplicated Ulcer	1,498	2,901	2,779	90.6	4.8	1.2	0.5	2.9
253	Inflammatory Bowel Disease	6,596	3,892	3,032	90.1	5.5	2.0	0.3	2.0
254	Gastrointestinal Hemorrhage	18,159	3,270	2,748	82.5	8.5	1.6	3.9	3.5

MCC 06 Diseases and Disorders of the Digestive System (continued)

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
255	Gastrointestinal Obstruction	17,943	3,004	2,580	84.4	9.2	1.0	2.8	2.6
256	Esophagitis/Gastritis/Miscellaneous Digestive Disease	19,994	2,861	2,776	91.7	3.8	1.2	0.7	2.6
257	Symptom/Sign of Digestive System	36,074	2,224	1,723	89.0	5.0	2.0	0.7	3.4
258	Other Gastrointestinal Disorder	10,093	3,434	2,785	78.6	14.4	0.8	3.0	3.2
906	MCC 06 Unrelated Intervention	1,964	8,188	5,932	82.1	9.0	0.3	5.2	3.4

MCC 07 Diseases and Disorders of the Hepatobiliary System and Pancreas

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
270	Liver/Pancreas/Duodenum Transplant	292	54,187	34,534	67.8	19.2	0.0	7.9	5.1
271	Excision Pancreas With Duodenum	464	27,703	21,124	82.8	9.5	0.0	5.4	2.4
272	Drainage/Biopsy of Pancreas	232	22,960	15,733	69.4	19.4	0.9	8.2	2.2
273	Bypass/Excision of Pancreas	260	30,705	19,029	80.8	10.8	0.8	5.0	2.7
274	Major Hepatobiliary Intervention	1,542	15,109	11,125	86.3	6.5	0.1	3.3	3.8
275	Non-Major Hepatobiliary Intervention	1,167	6,026	4,827	85.5	5.8	0.4	4.3	3.9
276	Open Cholecystectomy With Common Bile Duct Exploration	372	11,304	7,672	87.6	7.5	0.5	2.4	1.9
277	Open Cholecystectomy Without Common Bile Duct Exploration	2,494	8,173	6,405	89.7	6.1	0.1	1.6	2.5
278	Laparoscopic Cholecystectomy With/Without Common Bile Duct Exploration	15,423	3,107	2,755	95.0	2.1	0.2	0.1	2.5
279	Hepatobiliary Drainage	107	12,306	7,773	78.5	11.2	0.0	7.5	2.8
280	Dilation/Drainage of Common Bile Duct	1,634	6,282	4,894	83.7	9.1	0.2	4.7	2.4
281	Extraction/Destruction of Calculus Common Bile Duct	3,599	4,731	3,940	90.1	6.1	0.6	0.7	2.4
282	Other Intervention Related to Hepatobiliary System	1,057	5,430	4,232	80.6	6.9	0.9	6.9	4.7
283	Failure/Rejection of Liver/Pancreas/Duodenum Transplant	92	6,519	5,075	80.4	10.9	1.1	5.4	2.2
284	Hepatobiliary/Pancreatic Malignancy	4,677	5,897	4,644	57.2	9.0	0.4	29.5	3.9
285	Cirrhosis/Alcoholic Hepatitis	6,599	5,513	4,353	67.4	9.6	2.8	16.6	3.6
286	Liver Disease Except Cirrhosis/Malignancy	2,534	4,406	3,183	76.0	12.7	1.8	6.3	3.2
287	Disorder of Pancreas Except Malignancy	11,656	3,672	2,478	86.2	7.1	2.9	1.6	2.2
288	Disorder of Biliary Tract	10,397	2,913	2,927	83.9	11.6	1.1	1.1	2.3
907	MCC 07 Unrelated Intervention	591	12,330	6,101	71.4	9.8	0.2	15.2	3.4

MCC 08 Diseases and Disorders of the Musculoskeletal System and Connective Tissue

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
300	Joint Replacement With Malignant Neoplasm	111	24,040	15,937	68.5	23.4	0.0	6.3	1.8
301	Back/Neck Intervention With Malignant Neoplasm	328	20,006	12,451	69.5	22.3	0.0	4.9	3.4
302	Lower Limb Intervention With Flap/Graft With Malignant Neoplasm	176	12,557	9,134	92.0	5.7	0.0	1.1	1.1
303	Fixation of Lower Limb With Malignant Neoplasm	117	13,756	9,422	66.7	20.5	0.0	9.4	3.4
304	Other Lower Limb Intervention With Malignant Neoplasm	187	8,073	6,212	91.4	4.3	0.0	1.1	3.2
305	Craniofacial Bone Intervention With Malignant Neoplasm	80	18,742	7,652	91.3	2.5	0.0	0.0	6.3
306	Upper Limb Intervention With Flap/Graft With Malignant Neoplasm	79	8,951	7,683	93.7	3.8	0.0	0.0	2.5
307	Other Upper Limb Intervention With Malignant Neoplasm	59	6,654	5,718	88.1	5.1	0.0	1.7	5.1
308	Other Musculoskeletal Intervention With Malignant Neoplasm	244	8,903	5,998	92.2	2.5	0.0	1.2	4.1
312	C1/C2/Thoracic Spine Intervention	907	21,064	14,676	87.8	6.4	0.3	0.4	5.1
313	Spinal Vertebrae Intervention	8,089	8,516	7,588	91.9	3.8	0.2	0.1	4.0
314	Other Intervention on Back/Neck	4,855	4,218	3,921	94.2	2.1	0.2	0.1	3.4
315	Bilateral Hip/Knee Replacement	1,146	12,332	11,359	95.5	2.0	0.1	0.6	1.7
316	Revised Hip Replacement With Infection	524	19,455	12,497	72.9	22.5	0.0	1.9	2.7
317	Revised Hip Replacement Without Infection	2,783	11,830	10,305	84.4	11.4	0.0	0.6	3.6
318	Revised Knee Replacement With Infection	551	16,610	11,145	81.3	15.1	0.4	0.4	2.9
319	Revised Knee Replacement Without Infection	1,727	10,264	9,394	92.4	4.5	0.2	0.1	2.9
320	Unilateral Hip Replacement	19,567	9,122	8,777	91.1	5.0	0.1	0.2	3.7
321	Unilateral Knee Replacement	31,080	8,093	7,806	94.6	3.4	0.1	0.1	1.8
322	Open Knee Intervention Except Fixation With Infection	250	10,775	9,200	86.0	10.4	0.4	1.6	1.6
323	Open Knee Intervention Except Fixation Without Infection	1,174	3,557	3,203	95.6	2.0	0.0	0.0	2.4
324	Closed Knee Intervention Except Fixation With Infection	272	9,999	6,239	80.5	15.4	1.1	0.4	2.6
325	Closed Knee Intervention Except Fixation Without Infection	3,135	2,895	2,848	96.1	0.3	0.2	0.0	3.3

MCC 08 Diseases and Disorders of the Musculoskeletal System and Connective Tissue (continued)

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
326	Shoulder Replacement	1,297	7,789	7,431	95.3	1.9	0.2	0.2	2.5
327	Other Joint Replacement	620	6,803	6,185	96.6	1.0	0.2	0.0	2.3
328	Resection/Amputation of Pelvis/Leg With Infection	585	12,707	10,002	76.9	16.1	1.0	2.2	3.8
329	Resection/Amputation of Pelvis/Leg Without Infection	886	6,004	4,939	84.4	9.3	0.3	1.4	4.6
330	Fixation of Lower Limb Except Ankle/Foot	1,785	7,308	5,494	86.2	9.6	0.1	1.5	2.7
331	Osteotomy of Lower Limb Except Foot	1,469	5,597	4,966	96.8	1.6	0.1	0.0	1.6
332	Other Repair Bone of Leg Except Ankle/Foot	948	3,986	3,214	91.1	4.1	0.6	0.2	3.9
333	Major Foot Intervention Except Soft Tissue With Infection	395	6,867	4,423	87.3	6.8	1.0	0.8	4.1
334	Major Foot Intervention Except Soft Tissue Without Infection	2,653	3,770	3,549	94.5	1.2	0.0	0.1	4.1
335	Other Foot Intervention, Except Soft Tissue	1,504	2,008	1,874	95.7	0.3	0.0	0.0	3.9
336	Resection/Amputation/Fixation of Upper Limb Except Shoulder/Hand	1,167	4,249	3,564	92.8	1.5	0.3	0.1	5.4
337	Hand Intervention	1,382	2,973	2,707	92.3	0.8	0.4	0.0	6.4
338	Osteotomy of Upper Limb Except Hand	273	2,976	2,870	97.1	0.4	0.0	0.4	2.2
339	Other Upper Limb Intervention Except Hand	152	2,481	2,331	96.7	0.7	0.0	0.0	2.6
340	Elbow Intervention	431	3,755	3,028	92.6	1.2	0.5	0.0	5.8
341	Shoulder/Rotator Cuff Intervention	4,596	2,738	2,605	96.2	0.2	0.1	0.1	3.4
342	Biopsy/Invasive Inspection of Bone	509	3,958	3,353	87.8	1.8	0.6	0.2	9.6
343	Other Musculoskeletal Intervention Except Soft Tissue	222	3,866	3,028	93.7	1.8	0.5	0.0	4.1
344	Soft Tissue Intervention of Upper Limb	389	4,007	3,009	93.6	2.8	1.3	0.5	1.8
345	Soft Tissue Intervention of Lower Limb	2,709	3,135	2,667	93.3	2.0	0.1	0.3	4.2
346	Other Musculoskeletal Soft Tissue Intervention	289	7,657	4,838	84.8	9.7	0.7	2.8	2.1
347	Craniofacial Bone Intervention With Musculoskeletal Diagnosis	882	6,574	4,371	93.2	1.1	0.6	0.2	4.9
348	Skin Intervention With Musculoskeletal Diagnosis	469	8,202	5,158	86.4	8.3	0.9	0.2	4.3
349	Nerve Intervention With Musculoskeletal Diagnosis	475	4,700	3,565	92.0	0.8	0.0	0.4	6.7
357	Musculoskeletal Malignant Neoplasm	2,354	8,829	6,659	60.6	19.3	0.7	16.0	3.4

MCC 08 Diseases and Disorders of the Musculoskeletal System and Connective Tissue (continued)

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
358	Pathological Fracture	2,160	9,280	7,215	79.6	10.6	0.5	3.9	5.4
359	Osteomyelitis/Septic Arthritis	1,823	8,240	5,633	69.4	20.3	4.2	2.0	4.1
360	Vertebral/Disc Disease	4,491	4,328	4,141	85.5	8.9	1.0	0.8	3.8
361	Systemic Connective Tissue Disorder	1,734	5,327	3,875	83.4	9.0	0.8	2.2	4.6
362	Arthritis	4,619	4,442	3,867	90.7	4.1	0.5	0.5	4.2
363	Other Soft Tissue Disorder	1,532	4,986	4,288	81.8	9.1	2.9	2.0	4.2
364	Back Pain/Strain	5,516	2,961	3,043	90.8	3.9	1.8	0.5	2.9
365	Pain/Stiffness, Except Back	2,235	3,005	2,975	88.0	5.8	1.3	0.9	4.1
366	Other Musculoskeletal Disorder	1,096	7,276	5,799	72.4	17.7	0.8	4.5	4.6
367	Other Syndrome/Deformity	430	7,922	7,703	79.8	14.0	0.5	1.4	4.4
368	Orthopedic Aftercare	2,225	3,719	3,294	71.0	22.6	1.1	1.5	3.9
369	Strain/Sprain/Joint/Tendon Disorder	2,342	2,610	2,649	89.3	5.1	1.3	0.1	4.2
908	MCC 08 Unrelated Intervention	685	14,983	6,853	77.2	8.8	0.4	5.4	8.2
999	Ungroupable	2	–	–	0.0	0.0	0.0	0.0	0.0

MCC 09 Diseases and Disorders of the Skin, Subcutaneous Tissue and Breast

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
380	Major Bone/Joint Intervention With Skin Diagnosis	603	18,777	12,855	72.3	14.9	1.2	6.3	5.3
381	Minor Bone/Joint Intervention With Skin Diagnosis	650	10,503	5,063	86.8	7.2	1.4	0.9	3.7
382	Muscle/Tendon/Soft Tissue Intervention With Skin Diagnosis	2,334	6,209	4,745	89.3	4.9	1.9	1.0	2.8
383	Other Non-Skin Intervention With Skin Graft	320	10,689	6,996	86.9	9.1	0.3	0.9	2.8
384	Other Non-Skin Intervention Without Skin Graft	709	6,252	5,117	91.0	2.4	0.6	0.8	5.2
385	Repair/Reconstruction of Breast	1,557	6,307	5,964	99.0	0.1	0.1	0.1	0.8
386	Bilateral Total/Radical Excision of Breast	288	5,348	5,262	96.9	0.3	0.0	0.0	2.8
387	Unilateral Total/Radical Excision of Breast	5,868	3,903	3,767	95.8	0.6	0.0	0.1	3.5
388	Partial Excision Breast With Malignant Breast Diagnosis	4,108	3,444	3,337	96.0	0.1	0.0	0.0	3.8
389	Partial Excision Breast Without Malignant Breast Diagnosis	849	2,690	2,621	96.7	0.2	0.1	0.0	2.9
390	Other Breast Intervention	4,941	3,043	2,928	97.6	0.3	0.0	0.0	2.1
391	Lymphatic System Intervention With Skin Diagnosis	319	2,741	2,516	95.9	0.6	0.0	0.3	3.1
392	Other Skin/Subcutaneous Tissue Intervention	3,553	4,111	3,532	93.1	1.8	0.5	0.1	4.5
401	Decubitus Ulcer/Ulcer of Lower Limb NEC	1,370	11,153	8,254	77.2	11.1	2.3	4.1	5.3
402	Diabetes With Foot Ulcer	1,439	7,226	5,918	77.3	13.1	2.8	3.1	3.6
403	Malignant Neoplasm of Skin	244	5,922	4,642	58.2	6.1	0.8	26.6	8.2
404	Malignant Neoplasm of Breast	916	8,019	5,536	52.4	9.8	0.4	33.1	4.3
405	Cellulitis	12,563	3,939	3,719	88.1	4.8	2.7	0.8	3.6
406	Abscess	1,214	3,499	2,605	82.1	7.7	7.2	0.2	2.7
407	Other Disease/Disorder of Skin/Subcutaneous Tissue	4,185	3,216	2,543	89.7	4.9	1.5	0.8	3.0
408	Trauma of Skin/Subcutaneous Tissue/Breast	1,859	2,682	3,278	89.2	3.3	2.2	0.4	4.9
409	Non-Malignant Breast Disorder	245	2,228	1,951	90.6	2.9	1.6	0.4	4.5
909	MCC 09 Unrelated Intervention	347	10,638	6,308	84.1	6.6	0.9	4.0	4.3
999	Ungroupable	4	–	–	0.0	0.0	0.0	0.0	0.0

MCC 10 Diseases and Disorders of the Endocrine System, Nutrition and Metabolism

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
110	Lung Transplant	35	65,216	–	65.7	20.0	0.0	8.6	5.7
270	Liver/Pancreas/Duodenum Transplant	37	31,638	27,054	97.3	2.7	0.0	0.0	0.0
271	Excision Pancreas With Duodenum	3	–	–	66.7	33.3	0.0	0.0	0.0
273	Bypass/Excision of Pancreas	58	22,206	17,905	100.0	0.0	0.0	0.0	0.0
420	Pituitary/Pineal Gland Intervention	510	10,279	7,696	93.3	3.3	0.2	0.4	2.7
421	Adrenal Gland Intervention	369	8,268	6,666	95.1	1.4	0.5	0.3	2.7
422	Reduction Gastroplasty/Stomach Bypass With Obesity	703	8,961	7,287	98.3	0.1	0.0	0.6	1.0
423	Size Reduction of Skin/Soft Tissue	1,154	3,469	3,321	97.0	0.2	0.0	0.0	2.9
424	Thyroid/Parathyroid/Thymus Gland Intervention	9,040	3,412	3,214	95.9	0.1	0.0	0.1	3.9
425	Other Intervention With Endocrine System Diagnosis	86	19,854	9,209	74.4	9.3	1.2	12.8	2.3
432	Cystic Fibrosis	1,038	12,533	8,944	89.4	6.7	1.3	1.4	1.2
433	Disorder Related to Nutrition	2,235	6,958	5,417	82.7	9.2	1.4	3.8	3.0
434	Disease/Disorder of Adrenal/Pituitary Gland	1,141	4,862	4,222	86.0	8.6	1.0	2.1	2.4
435	Disorder of Metabolism	1,312	5,396	4,732	84.2	8.3	0.9	3.7	2.9
436	Disorder of Fluid/Electrolyte Balance	7,324	3,403	2,722	87.6	4.3	1.7	2.5	3.9
437	Diabetes	20,010	3,841	2,536	84.8	6.4	3.0	2.1	3.8
438	Dehydration	5,629	3,409	2,775	87.7	2.8	0.9	4.6	4.1
439	Disease/Disorder of Pancreas	941	2,871	2,140	87.5	5.2	2.4	1.5	3.4
440	Disease/Disorder of Thyroid/Parathyroid Gland	1,074	2,699	1,683	85.6	5.4	0.8	2.6	5.6
910	MCC 10 Unrelated Intervention	3,637	11,456	6,430	76.4	13.5	0.6	5.4	4.1

MCC 11 Diseases and Disorders of the Kidney, Urinary Tract and Male Reproductive System

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
450	Kidney Transplant	752	21,609	14,668	95.6	2.4	0.1	0.3	1.6
451	Kidney Donor	384	7,031	6,873	99.5	0.3	0.0	0.0	0.3
452	Radical Excision/Reconstruction of Bladder	925	19,492	13,067	91.4	4.3	0.1	1.9	2.3
453	Exteriorization of Upper Urinary Tract	107	15,768	12,404	87.9	7.5	0.9	1.9	1.9
454	Major Intervention on Upper Urinary Tract	4,562	8,512	7,100	95.3	1.6	0.1	0.8	2.2
455	Minor Intervention on Upper Urinary Tract, Percutaneous Endoscopic Approach	3,026	6,461	4,745	92.1	3.6	0.3	1.0	2.9
456	Minor Intervention on Upper Urinary Tract, External/per Orifice Approach	7,985	2,628	2,287	90.5	4.9	0.2	0.2	4.1
457	Major Intervention on Lower Urinary Tract	705	7,684	5,936	94.3	2.3	0.3	1.3	1.8
458	Non-Major Intervention on Lower Urinary Tract, Unplanned	1,660	4,153	2,947	90.7	3.4	0.2	1.6	4.0
459	Non-Major Intervention on Lower Urinary Tract, Planned	7,025	2,305	2,229	94.5	1.4	0.1	0.1	3.9
460	Major Intervention on Male Reproductive System	1,750	3,212	2,768	91.0	2.6	0.3	0.3	5.8
461	Non-Major Intervention on Male Reproductive System	1,027	1,775	1,915	92.6	0.9	0.1	0.0	6.4
462	Radical Excision of Prostate	5,961	6,846	6,544	97.9	0.3	0.0	0.1	1.6
463	Partial Excision of Prostate, Open Approach	248	5,257	4,791	94.8	1.6	0.0	0.0	3.6
464	Partial Excision/Destruction of Prostate, Closed Approach	15,601	2,980	2,770	95.1	1.3	0.1	0.2	3.4
465	Intervention Related to Dialysis, Unplanned Admission	179	16,740	14,006	83.8	5.0	0.0	6.7	4.5
466	Intervention Related to Dialysis, Planned Admission	682	3,485	2,572	90.5	3.2	0.3	0.7	5.3
467	Other Intervention With Urinary System Diagnosis	788	8,841	5,500	86.5	7.0	0.1	3.9	2.4
477	Renal Failure	10,589	6,592	4,484	63.6	16.5	1.0	14.7	4.1
478	Malignant Neoplasm of Urinary System	1,507	5,863	4,860	60.7	12.9	0.1	20.2	6.1
479	Malignant Neoplasm of Male Reproductive System	1,224	5,117	4,311	61.6	11.1	0.3	21.2	5.8
480	Kidney Disease	2,011	4,999	3,379	73.9	16.3	1.0	3.9	4.9
481	Other Disorder of Urinary System	1,407	3,122	2,741	84.6	8.9	0.6	1.2	4.6

MCC 11 Diseases and Disorders of the Kidney, Urinary Tract and Male Reproductive System (continued)

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
482	Other Disorder of Kidney/Ureter	379	3,163	2,806	80.7	11.1	0.5	1.8	5.8
483	Disease/Disorder of Male Reproductive System	1,400	2,322	1,923	90.9	4.6	1.3	0.2	3.1
484	Symptom/Sign of Urinary System	4,248	2,265	2,057	87.7	7.2	0.5	0.7	3.9
485	Urinary Obstruction With Percutaneous Drainage	274	4,215	3,447	86.5	7.3	0.4	2.6	3.3
486	Urinary Obstruction Without Percutaneous Drainage	8,237	1,370	1,218	87.0	8.2	1.1	0.1	3.6
487	Lower Urinary Tract Infection	17,729	3,714	3,254	88.8	3.0	0.6	2.6	5.0
488	Upper Urinary Tract Infection	6,160	2,768	2,238	91.9	3.8	1.3	0.5	2.6
911	MCC 11 Unrelated Intervention	828	14,320	9,613	69.3	15.7	0.2	11.2	3.5

MCC 12 Diseases and Disorders of the Female Reproductive System

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$)		Typical Cases	Atypical Cases			Long-Stay Outliers
			Mean	Median		Transfers	Sign-Outs	Deaths	
500	Radical Gynecological Intervention	553	8,036	6,642	96.2	1.6	0.0	0.4	1.8
501	Hysterectomy With Malignancy	3,675	6,499	6,010	95.6	1.1	0.1	0.3	3.0
502	Hysterectomy With Non-Malignant Diagnosis	31,847	3,977	3,800	98.4	0.2	0.1	0.0	1.4
503	Fixation/Occlusion/Removal Intervention on Female Reproductive System Except Tube/Ovary	4,246	4,306	4,312	98.0	0.1	0.0	0.0	1.9
504	Ovarian/Fallopian Tube Intervention With Malignancy Except Endoscopic Approach	539	7,138	6,281	92.6	3.5	0.0	1.3	2.6
505	Ovarian/Fallopian Tube Intervention With Non-Malignant Diagnosis Except Endoscopic Approach	5,200	4,046	3,728	97.0	0.8	0.3	0.1	1.9
506	Bladder Fixation	4,643	3,174	2,981	98.5	0.3	0.0	0.1	1.1
507	Repair/Brachytherapy/Other Intervention on Female Reproductive System Except Tube/Ovary	3,961	2,734	2,865	97.8	0.3	0.1	0.0	1.8
508	Other Intervention With Female Reproductive System Diagnosis	886	5,694	4,603	92.4	2.7	0.5	1.8	2.6
509	Therapeutic Intervention on Female Reproductive System, Laparoscopic Approach	3,511	2,595	2,467	94.7	0.7	0.2	0.0	4.4
510	Diagnostic Laparoscopy With/Without Biopsy	400	2,514	2,179	91.3	3.3	1.5	0.0	4.0
511	Vulva/Perineum Intervention	919	1,567	1,447	94.1	0.7	0.3	0.0	4.9
512	Dilation and Curettage/Other Minor Intervention on Uterus	1,097	1,538	1,434	92.3	1.6	0.2	0.1	5.8
520	Malignant Neoplasm of Female Reproductive System	1,773	4,956	3,432	67.1	10.9	0.3	16.8	4.9
521	Fibroid/Prolapse/Fistula/Other Disorder	1,090	2,363	2,267	94.0	2.3	0.3	0.1	3.3
522	Inflammatory Disorder of Female Reproductive System	1,525	2,280	2,060	89.5	4.5	3.3	0.0	2.7
523	Disorder of Fertility	130	2,744	2,017	96.2	1.5	0.0	0.0	2.3
524	Disorder of Menstruation/Endometriosis/Non-Inflammatory Disorder of Female Reproductive System	2,672	1,304	1,253	89.2	5.4	1.1	0.0	4.3
912	MCC 12 Unrelated Intervention	167	7,889	3,738	76.6	9.6	0.6	10.2	3.0

MCC 13 Pregnancy and Childbirth

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$)		Typical Cases	Atypical Cases		Long-Stay Outliers	
Mean	Median	Transfers	Sign-Outs	Deaths					
530	Major Intervention Related to Obstetric Diagnosis	103	11,053	9,363	84.5	10.7	0.0	0.0	4.9
531	Major Intervention Not Related to Obstetric Diagnosis	66	13,954	11,072	81.8	16.7	0.0	0.0	1.5
532	Fetal Intervention	38	4,424	3,671	92.1	5.3	0.0	0.0	2.6
536	Repeat Caesarean Section	28,014	3,064	2,931	96.2	1.2	0.1	0.0	2.5
537	Primary Caesarean Section	44,386	4,108	3,657	93.9	2.7	0.1	0.0	3.2
538	Vaginal Birth After Caesarean With Forceps/Vacuum Delivery and Other Non-Major Intervention	154	2,315	2,272	98.7	0.0	0.0	0.0	1.3
539	Vaginal Birth After Caesarean With Forceps/Vacuum Delivery, No Other Intervention	897	2,370	2,299	95.7	1.3	0.2	0.0	2.8
540	Vaginal Birth After Caesarean Without Instrumentation, With Non-Major Intervention	275	2,532	2,436	94.9	1.5	0.7	0.0	2.9
541	Vaginal Birth After Caesarean Without Instrumentation, No Other Intervention	4,674	2,172	2,091	96.2	1.5	0.2	0.0	2.1
542	Forceps/Vacuum Delivery With Non-Major Intervention	3,267	3,113	2,889	97.6	1.0	0.1	0.0	1.3
543	Forceps/Vacuum Delivery, No Other Intervention	24,021	2,785	2,609	97.0	1.0	0.1	0.0	1.9
544	Vaginal Delivery With Non-Major Intervention	5,124	2,705	2,552	96.2	1.2	0.1	0.0	2.5
545	Vaginal Delivery, No Other Intervention	154,689	2,104	2,007	96.5	1.1	0.1	0.0	2.3
546	Ectopic Pregnancy Treated Surgically/ Non-Major Intervention	2,552	2,720	2,694	95.2	2.9	0.3	0.0	1.6
547	Ectopic Pregnancy Treated Medically	578	776	755	82.0	10.6	1.9	0.0	5.5
548	Abortion for Fetal Anomaly Treated Surgically/Non-Major Intervention	113	2,490	2,490	92.0	0.0	0.9	0.0	7.1
549	Abortion for Fetal Anomaly Treated Medically	570	2,558	2,557	97.4	0.9	0.4	0.0	1.4
550	Abortion Diagnosis Treated Surgically/Non-Major Intervention	6,235	976	975	95.4	2.2	0.3	0.0	2.1

MCC 13 Pregnancy and Childbirth (continued)

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
551	Abortion Diagnosis Treated Medically	3,219	1,436	1,439	86.9	6.6	1.8	0.0	4.8
552	Postpartum Disorder Treated Surgically/Non-Major Intervention	1,355	1,791	1,651	89.2	6.3	0.7	0.1	3.8
553	Postpartum Disorder Treated Medically	3,753	1,837	1,497	72.6	23.5	0.8	0.0	3.1
554	Post Abortion Disorder Treated Surgically/Non-Major Intervention	100	2,196	2,165	96.0	3.0	0.0	0.0	1.0
555	Post Abortion Disorder Treated Medically	319	1,236	1,221	93.7	3.8	1.9	0.0	0.6
556	Antepartum Disorder Treated Surgically/Non-Major Intervention	325	3,261	2,950	89.5	7.1	0.9	0.0	2.5
557	Antepartum Disorder Treated Medically	31,794	1,256	1,049	81.2	12.3	1.8	0.0	4.7

MCC 14 Newborns and Neonates With Conditions Originating in the Perinatal Period

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
570	Newborn/Neonate 1500+ Grams With Major Gastrointestinal/Diaphragm Intervention	347	26,433	18,835	31.7	59.4	0.0	4.3	4.6
571	Newborn/Neonate 1500+ Grams With Major Cardiovascular Intervention	409	66,223	40,478	11.0	76.0	0.0	4.6	8.3
572	Newborn/Neonate 1500+ Grams With Major Neurological Intervention	72	38,721	–	31.9	62.5	0.0	4.2	1.4
576	Normal Newborn, Singleton Vaginal Delivery	156,726	643	642	98.0	0.1	0.1	0.0	1.7
577	Normal Newborn Multiple/Caesarean Delivery	51,920	1,160	1,160	98.5	0.3	0.0	0.0	1.1
578	Newborn/Neonate <750 Grams	978	117,054	113,720	7.7	25.5	0.0	66.0	0.9
579	Newborn/Neonate 750–999 Grams, Gestational Age <29 Weeks	412	92,795	84,447	25.5	60.0	0.0	13.3	1.2
580	Newborn/Neonate 750–999 Grams, Gestational Age 29+ Weeks	387	98,095	77,973	14.2	71.6	0.0	11.6	2.6
581	Newborn/Neonate 1000–1499 Grams, Gestational Age <29 Weeks	389	66,802	51,573	34.2	58.6	0.0	6.7	0.3
582	Newborn/Neonate 1000–1499 Grams, Gestational Age 29+ Weeks	2,008	42,067	34,488	28.4	67.9	0.0	2.9	0.7
583	Newborn/Neonate 1500–1999 Grams, Gestational Age <32 Weeks	626	34,712	29,390	40.9	56.1	0.2	2.1	0.8
584	Newborn/Neonate 1500–1999 Grams, Gestational Age 32–34 Weeks	1,486	20,726	22,753	68.4	30.3	0.1	0.5	0.7
585	Newborn/Neonate 1500–1999 Grams, Gestational Age 35+ Weeks	2,556	14,658	13,029	36.4	59.5	0.1	1.2	2.8
586	Newborn/Neonate 2000–2499 Grams, Gestational Age <35 Weeks	2,199	16,016	14,643	74.0	24.0	0.0	0.8	1.2
587	Newborn/Neonate 2000–2499 Grams, Gestational Age 35–36 Weeks	2,995	5,224	3,455	91.3	6.1	0.2	0.4	2.1
588	Newborn/Neonate 2000–2499 Grams, Gestational Age 37+ Weeks	5,488	3,767	2,489	69.6	17.9	0.1	0.6	11.8
589	Newborn/Neonate 2500+ Grams, Major Respiratory Complication	1,520	9,117	5,025	63.5	33.6	0.2	0.2	2.6
590	Newborn/Neonate 2500+ Grams, Aspiration Syndrome/Fetal Asphyxia	2,076	4,357	2,105	76.1	19.2	0.0	2.1	2.6
591	Newborn/Neonate 2500+ Grams, Other Respiratory Problem	10,421	2,459	1,815	88.5	8.4	0.0	0.0	3.1
592	Newborn/Neonate 2500+ Grams, Septicemia/Other Neonatal Infection	1,585	5,474	3,972	85.0	11.0	0.1	0.5	3.4

MCC 14 Newborns and Neonates With Conditions Originating in the Perinatal Period (continued)

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
593	Newborn/Neonate 2500+ Grams, Short Gestation/Low Birthweight	5,786	3,278	1,682	87.6	8.3	0.1	0.1	4.0
594	Newborn/Neonate 2500+ Grams, Jaundice	9,404	1,748	1,781	95.0	1.8	0.1	0.0	3.1
595	Newborn/Neonate 2500+ Grams, Anomaly of Nervous/Respiratory/Digestive System	624	4,222	2,919	54.3	38.9	0.0	1.9	4.8
596	Newborn/Neonate 2500+ Grams, Chromosomal/Multiple Anomaly	314	8,233	2,284	55.4	34.4	0.0	2.9	7.3
597	Newborn/Neonate 2500+ Grams, Cardiovascular Anomaly	848	2,735	1,834	55.3	39.3	0.0	1.7	3.8
598	Newborn/Neonate 2500+ Grams, Other Congenital Anomaly	2,175	1,304	1,143	88.2	7.7	0.0	0.7	3.3
599	Newborn/Neonate 2500+ Grams, Other Major Problem	215	13,548	10,846	50.2	46.0	0.0	3.3	0.5
600	Newborn/Neonate 2500+ Grams, Other Moderate Problem	3,441	4,427	2,795	77.0	17.2	0.0	0.4	5.3
601	Newborn/Neonate 2500+ Grams, Other Minor Problem	19,967	1,596	1,298	90.3	5.6	0.1	0.1	3.7
999	Ungroupable	36	–	–	0.0	0.0	0.0	0.0	0.0

MCC 15 Diseases and Disorders of the Blood and Lymphatic System

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
610	Bone Marrow/Stem Cell Transplant	1,042	27,496	22,452	90.2	3.8	0.2	3.3	2.5
611	Thymectomy	88	11,482	6,904	96.6	1.1	0.0	0.0	2.3
612	Splenectomy	574	9,434	6,657	91.3	4.0	0.0	2.6	2.1
613	Intervention With Leukemia	259	49,803	25,030	74.1	10.4	0.0	13.5	1.9
614	Intervention With Multiple Myeloma	151	17,044	10,110	69.5	13.9	0.0	11.3	5.3
615	Intervention With Lymphoma	2,545	8,523	5,406	86.3	6.0	0.0	4.4	3.3
616	Intervention With Neoplasm of Other Site	863	9,533	6,133	87.0	5.7	0.1	5.7	1.5
617	Intervention With Blood/Lymphatic System Diagnosis Except Neoplasm	1,717	8,307	4,456	88.9	5.0	0.2	2.6	3.3
624	Acute Myeloid Leukemia	1,505	20,135	12,523	59.7	16.7	0.2	21.0	2.4
625	Acute Leukemia Except Myeloid	677	21,242	16,062	61.4	23.0	0.0	13.6	1.9
626	Other Leukemia	1,708	6,177	4,388	68.3	9.0	0.6	16.9	5.1
627	Multiple Myeloma	1,192	8,602	5,997	59.8	15.0	0.2	20.5	4.5
628	Lymphoma	3,495	9,472	7,316	63.2	15.4	0.3	17.9	3.3
629	Aplastic Anemia	859	6,572	4,478	80.8	11.2	0.9	4.4	2.7
630	Malignant Neoplasm of Other Site	1,179	7,868	5,299	49.8	10.7	0.3	34.4	4.8
631	Non-Malignant Neoplasm of Other Site	136	5,589	3,612	74.3	17.6	0.0	5.1	2.9
632	Coagulation Defect	806	4,810	3,698	85.0	6.9	0.2	4.2	3.6
633	Agranulocytosis	5,271	4,894	3,727	90.1	5.0	0.5	1.9	2.5
634	Hemoglobinopathy	1,192	3,913	3,034	92.0	2.9	3.2	0.2	1.7
635	Other Anemia	9,687	3,309	2,765	87.3	5.1	0.9	2.5	4.3
636	Purpura/Other Hemorrhagic Disorder	1,763	2,501	2,352	86.2	8.7	0.7	1.4	3.1
637	Other Disease/Disorder of Blood/Lymphatic System	1,209	3,978	3,043	85.6	9.3	0.6	1.7	2.9
638	Chemotherapy/Radiotherapy Session for Neoplasm	9,974	2,975	2,437	91.3	4.2	0.2	0.3	4.0
639	Other Chemotherapy	370	1,714	1,731	91.4	4.6	0.3	0.0	3.8
640	Acute Lymphadenitis	378	2,947	2,897	89.2	9.3	0.3	0.3	1.1

MCC 16 Multisystemic or Unspecified Site Infections

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
650	Multisystemic/Unspecified Site Infection With Intervention	1,708	25,688	15,404	57.1	15.3	0.8	23.4	3.4
653	Septicemia Due to Staphylococcus Aureus/Pseudomonas/Enterococcus	1,266	12,796	8,222	57.3	15.3	2.4	22.9	2.1
654	Other/Unspecified Septicemia	8,499	9,177	5,260	59.2	10.9	0.9	25.7	3.3
655	HIV With Major Complication/Manifestation Except Respiratory	392	17,648	9,383	52.8	12.8	14.8	17.6	2.0
656	HIV With General Symptom/Infection/GI/Hepatobiliary/Ophthalmic Disorder	355	7,400	5,176	68.5	5.4	14.4	7.9	3.9
657	HIV With Major Respiratory Complication/Manifestation	694	8,930	5,849	67.7	7.1	14.0	7.6	3.6
658	HIV With Other/Miscellaneous Diagnosis	262	6,930	4,672	62.6	6.9	16.8	10.7	3.1
659	Chickenpox/Herpes Zoster/Cytomegaloviral Disease	498	4,061	3,114	87.3	6.0	0.8	1.6	4.2
660	Other Infectious/Parasitic Disease	1,866	5,751	3,933	79.8	10.9	2.1	4.4	2.7
661	Other/Unspecified Viral Illness	4,018	1,862	1,728	94.4	3.1	0.6	0.1	1.8
662	Fever	4,889	2,572	2,166	88.8	6.0	1.9	0.3	3.0

MCC 17 Mental Diseases and Disorders

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$)		Typical Cases	Atypical Cases			Long-Stay Outliers
			Mean	Median		Transfers	Sign-Outs	Deaths	
670	Dementia	8,472	11,609	10,214	78.7	7.2	0.5	5.9	7.8
671	Organic Mental Disorder	4,544	10,382	9,228	80.5	8.5	1.6	3.7	5.7
672	Miscellaneous Mental Disorder	1,382	6,326	5,793	80.0	4.3	4.8	5.0	5.8
673	Eating Disorder	1,290	16,139	16,831	83.1	8.8	5.7	0.3	2.1
674	Puerperal Disorder	359	4,905	4,706	84.1	5.3	6.7	0.0	3.9
675	Other Behavioural Syndrome	99	5,934	4,899	87.9	3.0	6.1	0.0	3.0
676	Schizophrenia With ECT	126	25,055	22,439	84.9	9.5	1.6	0.0	4.0
677	Schizophrenia Without ECT	12,722	8,506	7,803	81.4	10.3	5.9	0.1	2.3
678	Schizotypal/Delusional Disorder	7,167	6,805	5,796	79.2	12.5	6.4	0.1	1.8
679	Schizoaffective Disorder With ECT	226	22,145	20,898	85.0	7.1	1.8	0.0	6.2
680	Schizoaffective Disorder Without ECT	5,297	9,292	8,539	82.4	10.6	4.9	0.1	2.0
681	Gender Identity/Sexual Preference Disorder	21	5,674	–	95.2	4.8	0.0	0.0	0.0
682	Habit/Impulse Disorder	181	3,884	3,384	85.6	6.6	3.9	0.6	3.3
683	Disorder of Adult Personality Behaviour	3,837	3,127	2,844	83.9	5.0	8.5	0.0	2.5
684	Obsessive Compulsive Disorder	431	8,586	6,477	83.1	9.3	5.6	0.0	2.1
685	Somatiform/Dissociative Disorder	1,046	4,548	3,940	84.1	9.1	3.2	0.1	3.5
686	Anxiety Disorder	3,933	3,441	2,703	89.9	3.4	4.1	0.0	2.7
687	Stress Reaction/Adjustment Disorder	9,428	2,607	2,354	87.2	4.5	5.4	0.0	2.9
688	Bipolar Disorder With ECT	203	22,207	13,618	90.1	5.9	1.0	0.0	3.0
689	Bipolar Disorder Without ECT	11,894	7,900	6,851	80.5	11.1	6.3	0.1	2.0
690	Bipolar Disorder, Severe Depression With ECT	249	16,959	13,330	87.1	8.0	0.8	0.8	3.2
691	Bipolar Disorder, Severe Depression Without ECT	1,680	7,892	6,846	84.5	9.4	2.8	0.2	3.2
692	Depressive Episode With ECT	1,605	17,081	12,946	90.9	5.3	1.3	0.7	1.8
693	Depressive Episode Without ECT	26,874	5,368	4,388	85.7	7.8	4.5	0.1	1.9
694	Mood [Affective] Disorder	1,025	5,757	4,802	84.7	8.6	5.6	0.0	1.2
695	Mental Retardation/Disorder of Development	624	7,489	7,320	89.3	5.6	0.8	0.2	4.2
696	Childhood/Adolescence Disorder	1,964	7,219	6,228	90.8	5.4	2.5	0.0	1.3
697	Mixed Disorder of Conduct/Emotion	435	3,387	2,848	88.5	4.8	3.4	0.0	3.2
698	Psychoactive Substance Use, Acute Intoxication	2,897	1,815	1,688	82.7	2.0	9.4	0.2	5.7
699	Psychoactive Substance Use, Harmful Use	4,074	2,898	2,641	79.8	3.9	14.2	0.0	2.1

MCC 17 Mental Diseases and Disorders (continued)

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
700	Psychoactive Substance Use, Dependence Syndrome	6,135	3,374	2,920	80.2	3.1	14.0	0.1	2.5
701	Psychoactive Substance Use, Withdrawal State	3,795	3,119	2,728	83.5	2.7	11.2	0.1	2.5
702	Psychoactive Substance Use, Withdrawal/Delirium	1,304	5,052	3,881	84.0	4.2	8.5	0.5	2.8
703	Psychoactive Substance Use, Residual/Late-Onset/ Psychotic Disorder	2,502	5,261	3,914	83.0	5.7	8.3	0.1	2.9
704	Psychoactive Substance Use, Amnesic/Other/Unspecified	905	5,678	3,963	81.5	5.1	8.1	0.4	4.9

MCC 18 Burns

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
710	Extensive Burn With Skin Graft	145	109,393	67,739	60.0	30.3	0.7	7.6	1.4
711	Non-Extensive Burn With Skin Graft	481	17,841	12,195	79.0	15.6	0.8	1.2	3.3
712	Burn Intervention Without Skin Graft	11	12,401	–	63.6	27.3	0.0	9.1	0.0
717	Extensive Burn	1	–	–	0.0	100.0	0.0	0.0	0.0
718	Non-Extensive Burn	1,252	5,351	3,915	78.8	16.0	1.3	2.0	1.9
918	MCC 18 Unrelated Intervention	12	32,289	–	75.0	8.3	0.0	8.3	8.3

MCC 19 Significant Trauma, Injury, Poisoning and Toxic Effects of Drugs

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
725	Organ Transplant With Trauma/ Complication of Treatment	29	75,582	–	89.7	0.0	0.0	10.3	0.0
726	Hip Replacement With Trauma/ Complication of Treatment	7,111	13,003	10,978	63.9	25.5	0.0	5.1	5.5
727	Fixation/Repair Hip/Femur	14,784	11,028	9,314	65.6	24.3	0.2	4.1	5.8
728	Other Intervention on Hip/ Lower Limb With Trauma/ Complication of Treatment	1,002	5,749	4,042	85.9	9.4	0.7	0.4	3.6
729	Replacement/Fixation/Repair of Tibia/Fibula/Knee	7,645	5,415	4,594	85.3	10.8	0.4	0.3	3.3
730	Other Major Bone Intervention With Trauma/Complication of Treatment	1,320	17,052	9,413	63.8	29.7	0.8	2.9	2.8
731	Spinal Intervention With Trauma/ Complication of Treatment	1,579	25,649	10,910	64.5	28.8	0.7	2.9	3.2
732	Intracranial Intervention With Trauma/ Complication of Treatment	1,637	23,044	9,041	54.3	26.5	0.7	15.1	3.4
733	Major Thoraco-Abdominal/Vascular Intervention With Trauma/Complication of Treatment	2,853	21,648	11,145	71.0	16.1	0.9	9.1	2.9
734	Other Thoraco-Abdominal Intervention With Trauma/Complication of Treatment	2,906	8,682	5,301	80.9	11.5	1.1	4.5	2.0
735	Skull Intervention With Trauma/ Complication of Treatment	120	11,663	6,549	82.5	14.2	0.8	0.0	2.5
736	Skin/Soft Tissue Intervention With Trauma With Flap/Graft	1,184	10,309	6,146	82.2	14.2	0.6	0.5	2.5
737	Skin/Soft Tissue Intervention With Trauma Without Flap/Graft	2,531	4,497	3,437	86.9	8.6	0.8	0.3	3.4
738	Fixation/Repair of Shoulder Joint	740	5,477	4,671	88.4	8.8	0.4	0.5	1.9
739	Reduction/Fixation/Repair Upper Body/Limb Except Fixation/Repair of Shoulder	11,278	2,927	2,831	90.3	4.6	0.3	0.1	4.6
740	Internal Fixation of Facial Bone	2,260	5,614	4,366	88.8	8.0	0.9	0.0	2.3
741	Other Intervention on Facial Bone With Trauma/Complication of Treatment	189	2,383	2,316	94.2	4.2	0.0	0.0	1.6
742	Ear/Nose/Throat Intervention With Trauma/Complication of Treatment	448	3,749	3,335	89.7	4.0	0.9	0.7	4.7
743	Other Intervention on Bone of Upper Body With Trauma/Complication of Treatment	1,606	3,814	3,118	88.4	6.2	0.2	0.1	5.2
744	Muscle/Tendon/Minor Joint Intervention With Trauma/Complication of Treatment, Lower Limb	705	3,504	3,002	88.2	5.8	0.0	0.0	6.0
745	Nerve Intervention With Trauma	1,349	3,388	2,944	86.5	6.2	0.6	0.0	6.7
746	Reduction Lower Limb Except Ankle/Foot	66	3,693	3,409	71.2	18.2	0.0	1.5	9.1

MCC 19 Significant Trauma, Injury, Poisoning and Toxic Effects of Drugs (continued)

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$) Mean	Median	Typical Cases	Transfers	Atypical Cases Sign-Outs	Deaths	Long-Stay Outliers
747	Reduction/Fixation/Repair of Ankle/Foot	9,387	3,639	3,287	88.2	6.6	0.3	0.1	4.9
748	Other Intervention for Trauma/ Complication of Treatment	924	2,904	2,436	89.4	5.5	0.4	1.0	3.7
749	Eye Intervention With Trauma/ Complication of Treatment	212	4,241	3,595	88.2	8.0	0.5	0.9	2.4
750	Muscle/Tendon/Minor Joint Intervention With Trauma/Complication of Treatment, Upper Limb	681	2,264	2,256	91.9	1.9	0.3	0.0	5.9
751	Removal Foreign Body Skin/Soft Tissue	196	2,297	1,996	91.8	3.1	1.0	0.5	3.6
760	Significant Injury/Exposure to Element	426	7,162	4,327	63.6	15.7	2.8	16.2	1.6
761	Fracture/Dislocation/Rupture of Pelvis/Sacrum/Coccyx	3,859	7,200	6,197	76.7	15.1	0.6	2.5	5.1
762	Complication of Transplanted Organ	497	7,253	4,748	83.3	8.5	0.6	2.8	4.8
763	Intracranial Injury With Injury to Other Organ	321	19,997	11,796	44.5	26.2	0.3	24.9	4.0
764	Multiple Intracranial Injury	782	11,437	8,916	52.8	19.3	1.7	22.9	3.3
765	Single Intracranial Injury	3,394	4,554	3,119	62.8	19.9	2.3	11.2	3.8
766	Fracture of Femur	4,089	6,098	5,576	37.0	54.5	0.3	6.6	1.7
767	Other Fracture Dislocation of Leg	2,837	2,079	1,760	66.5	27.0	1.0	0.5	5.1
768	Fracture of Patella/Upper Tibia/Fibula	945	4,434	2,778	67.8	25.9	0.8	0.5	4.9
769	Fracture of Shoulder/Upper Humerus	1,843	4,568	2,844	76.4	14.8	1.0	2.0	5.9
770	Other Fracture/Dislocation of Arm/Shoulder	3,921	1,658	1,397	78.4	12.7	0.7	0.6	7.7
771	Spinal Injury	4,467	5,319	4,587	74.1	20.2	0.9	1.9	2.9
772	Rib Fracture/Flail Chest	2,247	5,039	4,067	84.6	8.4	1.9	2.0	3.0
773	Multiple Injuries to Internal Organ	613	8,884	4,868	80.1	15.2	1.3	2.0	1.5
774	Single Injury to Internal Organ	2,949	4,026	3,156	82.3	11.9	2.0	1.4	2.3
775	Fracture of Skull/Facial Bone	2,399	2,495	2,212	77.0	15.0	3.1	1.2	3.7
776	Open Wound/Other/Unspecified Minor Injury	9,811	2,088	1,619	84.7	7.5	2.8	0.9	4.0
777	Other/Unspecified Fracture/Dislocation	378	3,536	3,283	83.9	11.6	0.5	0.5	3.4
778	Poisoning/Toxic Effect of Drug	14,389	2,632	1,989	79.7	8.5	6.6	1.1	4.0
779	Concussion	2,206	1,710	1,610	87.9	5.7	2.0	0.1	4.3
780	Post-Operative Complication Except Hemorrhage	7,339	4,252	3,536	82.8	12.4	0.7	1.0	3.1
781	Other/Unspecified Complication of Treatment	4,294	2,173	1,737	89.3	4.6	0.8	0.7	4.6
782	Post-Operative Hemorrhage	4,456	1,790	1,635	90.0	5.7	0.3	0.3	3.6
783	Fracture/Dislocation of Wrist/Hand/Ankle/Foot	970	1,855	1,534	77.1	15.4	2.0	0.1	5.5

MCC 20 Other Reasons for Hospitalization

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$)		Typical Cases	Atypical Cases			Long-Stay Outliers
			Mean	Median		Transfers	Sign-Outs	Deaths	
800	Other Admission With Major Intervention	1,950	45,044	52,080	82.5	10.3	0.2	2.9	4.2
801	Other Admission With Non-Major Intervention	3,100	16,050	5,591	75.4	10.2	0.1	6.7	7.6
805	Rehabilitation	8,631	18,796	13,875	45.4	49.2	0.4	1.9	3.1
806	Convalescence	20,356	2,678	2,554	31.5	53.9	0.6	1.6	12.4
807	Prematurity and Growth Restriction, Age >28 Days	646	26,449	18,220	5.1	92.9	0.0	0.3	1.7
808	Multiple/Unspecified Congenital Anomaly	60	7,934	7,087	76.7	15.0	1.7	3.3	3.3
809	Awaiting Placement	3,454	5,763	5,719	65.1	23.6	0.5	3.4	7.4
810	Palliative Care	16,894	7,984	6,714	27.6	4.3	0.2	63.0	4.9
811	General Symptom/Sign	13,430	4,847	4,133	82.5	5.7	1.9	3.5	6.4
812	Other Factor Causing Hospitalization	4,536	3,738	3,356	75.6	14.3	1.1	4.5	4.7
813	Follow-up Treatment/Examination	14,436	1,260	1,263	82.6	9.5	0.3	0.1	7.5
814	Observation/Evaluation	909	948	880	88.1	5.2	2.0	0.0	4.7
815	Cancelled Intervention	7,238	280	240	97.4	1.5	0.6	0.0	0.4

MCC 99 Miscellaneous CMG and Ungroupable Data

CMG Code	CMG Description	Total Volume	Typical Cases		Cases Distribution (Percent)				
			Average Cost (\$)		Typical Cases	Atypical Cases			Long-Stay Outliers
			Mean	Median		Transfers	Sign-Outs	Deaths	
991	Cadaver Donor	17	–	–	0.0	0.0	0.0	0.0	0.0
992	Stillbirth	2,027	–	–	0.0	0.0	0.0	0.0	0.0
993	Diagnosis Not Generally Hospitalized	2,257	–	–	0.0	0.0	0.0	0.0	0.0
994	Invalid Obstetric Diagnosis	230	–	–	0.0	0.0	0.0	0.0	0.0
999	Ungroupable	116	–	–	0.0	0.0	0.0	0.0	0.0

Technical Notes

1. The data presented in these tables are from the Discharge Abstract Database (DAD) and the Canadian MIS Database (CMDB), for fiscal year 2005–2006. Analyses in the tables include only acute care inpatient data. Cost data do not include physician compensation.
2. The patient groups in the tables are based on CIHI's CMG+ methodology, which aggregates acute care inpatients into major clinical categories (MCCs) and assigns patients with similar clinical and resource utilization characteristics into Case Mix Groups (CMGs).
3. Some CMGs listed in the tables may be assigned to more than one MCC. The MCCs presented in the tables for these types of CMGs are "Home" MCCs, which refer to the body systems in which the interventions are more often performed. For example:

CMG Code	CMG Description	Home MCC	Other MCC
110	Lung Transplant	4	10
270	Liver/Pancreas/Duodenum Transplant	7	10
271	Excision Pancreas With Duodenum	7	10
272	Drainage/Biopsy of Pancreas	7	10
273	Bypass/Excision of Pancreas	7	10
999	Ungroupable	99	8, 9, 14

4. Average cost analyses in the tables include only "typical cases" (that is, stillbirths, transfers, sign-outs, deaths and patients who stay longer than the expected length of stay are excluded). Costs are assigned to patient groups using patient-specific Resource Intensity Weights (RIWs) and Cost per Weighted Case (CPWC) data.
5. For CMGs of typical cases with fewer than five records, mean and median cost data are not provided. For CMGs with greater than or equal to 5 but fewer than 30 records, median cost data are not provided. The rationale is based on the fact that the distribution of RIWs may not be well established and the mean or median data may not accurately reflect the true population mean or median. The mean or median data that are suppressed due to small cell sizes are represented with a symbol (–).
6. The atypical status of a case in the table is assigned according to the following hierarchy: death, sign-out and transfer. For example, a patient who was transferred into a facility and subsequently died would be coded as a death case; a patient who was transferred into a facility and subsequently signed out would be coded as a sign-out case. If a patient stayed longer than the expected length of stay, then the case was coded as a long-stay outlier, regardless of whether the patient died, voluntarily signed out or got transferred.

