

Shopping Around for Hospital Services

A Comparison of the United States and Canada

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Context.—Historical comparisons indicate that US hospitals are more expensive than Canadian hospitals, but health care system reform might have changed the relative costs and timeliness of health care in the 2 countries.

Objective.—To estimate the price and convenience of selected hospital services in the United States and Canada for patients in 1997 had they paid out-of-pocket.

Design.—Cross-sectional telephone survey conducted May 1996 to April 1997.

Participants.—The 2 largest acute care general hospitals from every city in the United States and Canada with a population greater than 500 000.

Measures.—Each hospital was telephoned and asked their price and waiting time for 7 services: magnetic resonance imaging of the head without gadolinium; a screening mammogram; a 12-lead electrocardiogram; a prothrombin time measurement; a session of hemodialysis; a screening colonoscopy; and a total knee replacement. Waiting times were measured in days until earliest appointment and charges were converted to American currency.

Results.—Overall, 48 US and 18 Canadian hospitals were surveyed. Median waiting times were significantly shorter in American hospitals for 4 services, particularly a magnetic resonance imaging of the head (3 days vs 150 days; $P < .001$). Median charges were significantly higher in American hospitals for 6 services, particularly for a total knee replacement (\$26 805 vs \$10 651; $P < .001$). Individual services showed no association between shorter waiting times and higher prices within each country, with the exception of a total knee replacement in the United States.

Conclusion.—US hospitals still provide higher prices and faster care than Canadian hospitals for patients who pay out-of-pocket.

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CANADA SERVES as a taunting reminder that a health care system can be much less expensive than that of the United States. Data on aggregate expenditures suggest a one-third higher cost per person in the United States than in Canada, equivalent to spending about

\$300 billion more each year.¹⁻⁵ Moreover, life expectancy at birth and at age 60 years are both lower in the United States than in Canada.^{6,7} Some specific diseases are better managed in the United States,⁸⁻¹³ whereas others are better managed in Canada.¹³⁻¹⁸ Regardless of clinical outcomes, aggregate projections of health care costs are less favorable for the United States than for Canada.¹⁹⁻²⁶

The American health care system has changed substantially in recent years, thereby calling into question historical comparisons. In the United States, widespread adoption of managed care has partially stabilized health care costs.²⁷ By contrast, Canadian governmental deficit reduction strategies have been less intense.²⁸ Perhaps the differences between the 2 countries are disappear-

ing. In this article, we provide an updated analysis on the price and convenience of selected hospital services in both countries. We take the perspective of an individual consumer who is seeking medical care in the late 1990s and willing to pay out-of-pocket.

METHODS

We identified cities in the United States and Canada in 1997 with a population of at least 500 000.^{29,30} In each city, we selected the 2 largest acute care general hospitals.^{31,32} For the United States, we excluded facilities that were classified as governmental or specialty service hospitals. For Canada, we excluded facilities that were long-term care or specialty care hospitals. Of note, Canadian hospitals tend to be owned by private nonprofit corporations that are dependent on public funds and approvals for their mandate.

See also p 1030.

We selected services satisfying the following criteria. First, the service could be plausibly sought on an elective basis. Second, the service was available in most hospitals. Third, the service was reasonably standardized so that different hospitals could be compared fairly. The final list included the following 7 diagnostic and therapeutic services: magnetic resonance imaging (MRI) of the head without gadolinium, a screening mammogram, a 12-lead electrocardiogram, a prothrombin time measurement, a session of hemodialysis, a screening colonoscopy, and a total knee replacement.

From May 1996 to April 1997, we surveyed each hospital by telephone and asked for the waiting time and total price for a patient willing to pay out-of-pocket for the designated service. If a particular hospital did not offer the designated

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Waiting Times and Charges for Selected Procedures

Procedures	United States	Canada
Median Waiting Times, d		
Magnetic resonance imaging of head*	3	150
Mammogram	7	16
Electrocardiogram	1	1
Prothrombin time	1	1
Hemodialysis session†	7	21
Screening colonoscopy*	14	28
Total knee replacement*	25	165
Median Charges in US Currency, \$		
Magnetic resonance imaging of head*	1218	888
Mammogram*	130	77
Electrocardiogram	97	23
Prothrombin time	25	8
Hemodialysis session†	326	402
Screening colonoscopy*	1736	606
Total knee replacement*	26805	10651

* $P < .001$.† $P < .05$.

service, an alternate local provider as specified by the index hospital was sought and subsequently contacted. To avoid inadvertently cueing individual respondents, each hospital was contacted about only 1 service at any 1 call with sufficient time between contacts to avoid carryover effects. Additionally, data were obtained directly from individuals in the responsible department whenever possible.

We constructed scenarios to justify our request. For example, data for hemodialysis were elicited by stating, "I'm planning a business meeting in your city and need to schedule a hemodialysis session. I will arrange the meeting around the earliest open spot. I need a 4-hour treatment with an F-80 filter and no erythropoietin. What is the total price and waiting time at your hospital?" Hospitals were informed that amounts would be paid by credit card and should include all taxes, technical charges, and professional fees. When asked, we commented that other hospitals were also being contacted. Prices were converted to American currency using a standard exchange (US \$1=Can \$1.35).

RESULTS

The study included 48 American and 18 Canadian hospitals in cities accounting for about 30.6 million Americans and 12.6 million Canadians. The hospitals had a similar median size (709 beds vs 799 beds; $P > .20$) and proportion with teaching status (74% vs 94%; $P > .20$). We contacted all selected hospitals or their designated alternate provider (100% response rate). We collected data on all services with no missing values (100% completion rate). No adverse reactions followed from our survey and no respondent made remarks to suggest they had detected our research.

Respondents varied in the precision of their schedule but none failed to state an expected waiting time. Overall, median waiting times were never longer and sometimes much shorter in American than in Canadian hospitals (Table). The largest difference was for a MRI of the head. The difference between American and Canadian hospitals for a total knee replacement might have been larger had it not been for the 3-week wait following autologous blood donation, which was more common in the United States. The smallest difference in median waiting times was for a 12-lead electrocardiogram and a single prothrombin time blood test.

Some hospitals reduced their prices when reminded that the patient would pay by credit card, and we used these smaller prices for analysis. The median price for every service was significantly different between hospitals in the 2 countries (Table). Only 1 service, a single session of hemodialysis, had a lower median price in the United States. The largest absolute difference in median price was for a total knee replacement and the largest relative difference in median price was for a 12-lead electrocardiogram.

In neither country did hospitals negotiate by bargaining about waiting times or charges. The strongest association between higher charges and shorter waiting times for American hospitals was found with a total knee replacement ($r = 0.44$; $P < .001$). For all other services, the association between charges and waiting times was small (absolute $r < 0.25$) and not statistically significant ($P > .05$). Canadian hospitals showed no statistically significant association between higher charges and shorter waiting times for any service. For one, a screening mammogram, the relationship was marginally significant and in the contrary direction.

COMMENT

We identified 7 well-defined services and surveyed the waiting times and prices at the 2 largest hospitals in every large city in North America for patients paying out-of-pocket. We found much longer waiting times for some services in Canada and much higher prices for some services in the United States. Overall, the relative differences in median prices were similar to the relative differences in median waiting times. We found no direct relationship between speed and price for any service in either country, with the exception of a total knee replacement surgery. We found no evidence that those who can pay always go to the front of the line.

Our data illustrate dramatic differences in prices for identical hospital services in the 2 countries. The most striking example was for total knee replacement

surgery, which amounted to about a \$15 000 higher price. We found no simple explanation why some charges were so much higher in the United States, or why the differences in charges were much greater than would be expected from aggregate differences in hospital expenditures.¹⁻⁵ Note, however, that hemodialysis is exceptional in the United States as a national health service where the government determines the charge and 1 patient can receive thousands of treatments.³³

Most previous reports comparing waiting times in the 2 countries have been limited in scope. The best data are for knee replacement surgery, which suggest that waiting times are much shorter in the United States than in Canada (3 weeks vs 8 weeks; $P < .05$) but still acceptable.^{34,35} Data for other services are generally not available, anecdotal, or incomplete.³⁶⁻⁴¹ One theory explaining the uniformly shorter waiting times in the United States is the greater availability of facilities, personnel, and flexible service hours.⁴² Reduced amounts of waiting in the United States can be an economic benefit if associated with gains in societal productivity.^{7,43}

Our study has several limitations but a few merit special emphasis. First, we tried to identify comparable services but there may be unmeasured differences in quality. However, we doubt that these differences are sufficient to account for the magnitude observed. Second, the sample size was small, may not apply to rural hospitals, was collected during a brief time interval, and relied on self-reported disclosure. Third, the analysis examined prices for individual purchasers but only about 1 in 7 patients in the United States is uninsured (from whom about 1 in 3 dollars of charges are eventually collected).⁴⁴⁻⁵⁰ Bulk purchasers may obtain lower prices, yet generally they do not disclose their data.

Are charges irrelevant? Health economists have claimed that charges are a poor measure of true societal costs.⁵¹ Typically, charges include excess profits due to market imperfections and monopoly conditions. One approach for reconciling costs with charges is to apply a standard "cost-to-charge" ratio that removes excess profits. We argue that such ratios are imprecise and often not necessary. First, the oversupply of many resources in the United States may increase competition and curtail excess profits. Second, charges are the ideal measure of opportunity cost for those who pay. Third, detailed accounting approaches almost always appeal to market prices to assess unit costs and thereby rely on the same assumptions about charges.⁵²

In accord with historical comparisons, we found that American hospitals are still more expensive than Canadian hospitals. We have shown this difference for well-specified services delivered to patients with the same severity of disease, comorbidity, and socioeconomic status. American hospitals also tend to provide faster service. In addition, the data indicate that aggregate analyses do not necessarily reflect the variation experienced by individual patients. We did not explore how the shorter waiting times might improve productivity in the American economy. Likewise, we did not explore whether high prices are associated with higher profits.

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References

- Redelmeier DA, Fuchs VR. Hospital expenditures in the United States and Canada. *N Engl J Med*. 1993;328:772-778.
- Newhouse JP, Anderson G, Roos LL. Hospital spending in the United States and Canada: a comparison. *Health Aff (Millwood)*. 1988;7:6-16.
- Evans RG. Split vision: interpreting cross-border differences in health spending. *Health Aff (Millwood)*. 1988;7:17-24.
- Hsiao WC. Comparing health care systems: what nations can learn from one another. *J Health Polit Policy Law*. 1992;17:613-636.
- Thorpe KE. The American states and Canada: a comparative analysis of health care spending. *J Health Polit Policy Law*. 1993;18:477-489.
- Schieber GJ, Poullier JP, Greenwald LM. Health care systems in twenty-four countries. *Health Aff (Millwood)*. 1991;10:22-38.
- Brody BA, Li RK. Methodological and conceptual issues in health care system comparisons: Canada, Norway, and the United States. *J Med Philos*. 1993;18:437-463.
- Cox JL, Lee E, Langer A, et al. Time to treatment with thrombolytic therapy: determinants and effect on short-term nonfatal outcomes of acute myocardial infarction. *Can Med Assoc J*. 1997;156:497-505.
- Rouleau JL, Moye LA, Pfeffer MA, et al. A comparison of management patterns after acute myocardial infarction in Canada and the United States. *N Engl J Med*. 1993;328:779-784.
- Mark DB, Naylor CD, Hlatky MA, et al. Use of medical resources and quality of life after acute myocardial infarction in Canada and the United States. *N Engl J Med*. 1994;331:1130-1135.
- Pilote L, Racine N, Hlatky MA. Differences in the treatment of myocardial infarction in the United States and Canada. *Arch Intern Med*. 1994;154:1090-1096.
- Gorey KM, Holowaty EJ, Fehringer G, et al. An international comparison of cancer survival. *Am J Public Health*. 1997;87:1156-63.
- Roos LL, Fisher ES, Sharp SM, et al. Postsurgical mortality in Manitoba and New England. *JAMA*. 1990;263:2453-2458.
- Churchill DN, Taylor W, Keshaviah PR, et al. Adequacy of dialysis and nutrition in continuous peritoneal dialysis: association with clinical outcomes. *J Am Soc Nephrol*. 1996;7:198-207.
- Kessler RC, Frank RG, Edlund E, et al. Differences in the use of psychiatric outpatient services between the United States and Ontario. *N Engl J Med*. 1997;336:551-557.
- Beiser M, Shore JH, Peters R, et al. Does community care for the mentally ill make a difference? a tale of two cities. *Am J Psychiatry*. 1985;142:1047-1052.
- Roos LL, Fisher ES, Brazauskas R, et al. Health and surgical outcomes in Canada and the United States. *Health Aff (Millwood)*. 1992;11:56-72.
- Tu JV, Pahos CL, Naylor CD, et al. Use of cardiac procedures and outcomes in elderly patients with myocardial infarction in the United States and Canada. *N Engl J Med*. 1997;336:1501-1505.
- Detsky AS, Stacey SR, Bombardier C. The effectiveness of a regulatory strategy in containing hospital costs: the Ontario experience, 1967-1981. *N Engl J Med*. 1983;309:151-159.
- Schieber GJ, Poullier JP. International health spending: issues and trends. *Health Aff (Millwood)*. 1991;10:106-116.
- Woolhandler S, Himmelstein DU. Costs of care and administration at for-profit and other hospitals in the United States. *N Engl J Med*. 1997;336:769-774.
- Woolhandler S, Himmelstein DU, Young Q. High noon for US health care reform. *Int J Health Serv*. 1993;23:193-211.
- Weil T. How do Canadian hospitals do it? a comparison of utilization and costs in the United States and Canada. *Hospital Topics*. 1995;73:10-22.
- Rovner J. Medicare trustees warn bankruptcy closer than ever. *Lancet*. 1996;347:1685.
- Schieber GJ, Poullier JP, Greenwald LM. Health spending, delivery, and outcomes in OECD countries. *Health Aff (Millwood)*. 1993;12:120-129.
- Altman SH, Shactman D. Should we worry about hospitals' high administrative costs? *N Engl J Med*. 1997;336:798-799.
- Rowland RS, Scully HE. Assuring the affordability of Canada's health care system. *Clin Invest Med*. 1994;17:328-333.
- US Bureau of the Census. *Statistical Abstract of the United States: 1996*. 116th ed. Washington, DC: US Bureau of the Census; 1996:44-46.
- Wood J, ed. *The Canada Yearbook 1994*. Ottawa, Ontario: Statistics Canada; 1995:84.
- American Hospital Association. *Guide to the Health Care Field*. 1995-1996 ed. Chicago, Ill: American Hospital Association; 1996:A184-A479.
- Canadian Hospital Association. *Guide to Canadian Health Care Facilities*. 1995-1996 ed. Ottawa, Ontario: Canadian Hospital Association Press; 1996:68-127.
- Rettig RA, Levinsky NG, eds. *Kidney Failure and the Federal Government*. Washington, DC: National Academy Press; 1991.
- Coyte PC, Wright JG, Hawker GA, et al. Waiting times for knee-replacement surgery in the United States and Ontario. *N Engl J Med*. 1994;331:1068-1071.
- Ho E, Coyte PC, Bombardier C, et al. Ontario patients' acceptance of waiting times for knee replacements. *J Rheumatol*. 1994;21:2101-2105.
- Gray C. MD crosses great divide when moving between practices in Canada, US. *Can Med Assoc J*. 1996;155:1599-1600.
- Levan NE. About those US fees. . . *Can Med Assoc J*. 1997;156:761.
- Harris RW. About those US fees. . . *Can Med Assoc J*. 1997;156:761.
- Buske L. MD fees much higher in US. *Can Med Assoc J*. 1997;156:960.
- Matas R. Wait for surgery in British Columbia defended as stable. *Globe and Mail*. November 4, 1997:A10.
- Ramsay C, Walker M. *Waiting Your Turn: Hospital Waiting Lists in Canada*. 7th ed. Vancouver, British Columbia: Fraser Institute; 1997.
- Ruble DA. Medical technology in Canada, Germany, and the United States: an update. *Health Aff (Millwood)*. 1994;13:113-117.
- Danzon PM. Hidden overhead costs: is Canada's system really less expensive? *Health Aff (Millwood)*. 1992;11:21-43.
- Kilpatrick KE, Miller MK, Dwyer JW, Nissen D. Uncompensated care provided by private physicians in Florida. *Health Serv Res*. 1991;26:277-302.
- Hahn B, Lefkowitz D. *Annual Expenses and Sources of Payment for Health Care Services*. Rockville, Md: US Dept of Health and Human Services, Agency for Health Care Policy and Research; 1992.
- Saywell RM, Nyhuis AW, Cordell WH, Crockett CR, Woods JR, Rodman GH. An analysis of reimbursement for outpatient medical care in an urban hospital emergency department. *Am J Emerg Med*. 1992;10:8-13.
- Saver BG, Peterfreund N. Insurance, income, and access to ambulatory care in King County, Washington. *Am J Public Health*. 1993;83:1583-1588.
- Weiner SJ. Assessing bad debt in New Hampshire and Vermont office-based practices. *Fam Pract Res J*. 1993;13:331-342.
- Linbeck G. Hospital and flight program reimbursement for patients transferred by helicopter. *Am J Emerg Med*. 1995;13:405-409.
- Helling TS, Watkins M, Robb CV. Improvement in cost recovery at an urban level 1 trauma center. *J Trauma*. 1995;39:980-983.
- Finkler SA. The distinction between costs and charges. *Ann Intern Med*. 1982;96:102-109.
- Gold RM, Seigel JE, Russel LB, Weinstein MC. *Cost Effectiveness in Health and Medicine*. New York, NY: Oxford University Press; 1996.