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The Availability of Medical Technology in Canada:
An International Comparative Study

by David Harriman MD, William McArthur MD, and Martin Zelder, PhD
with Jared Alexander

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Executive Summary

An important component of health care in advanced countries is the availability of medical technology and the new procedures made possible by that technology. In recent years there has been growing evidence of a decline in the quality and quantity of health care available to Canadians. Excessive waiting lists for specialist treatment have been documented for nearly a decade and they are getting longer. Public opinion polls reveal growing discontent with the lack of prompt access to quality care. Efforts to define the nature and cause of these problems have pointed to the possibility that one contributing factor is a lack of access to high-technology equipment and procedures in Canada. This study was conducted to measure the extent of technology access.

Canada's stock of medical technology was assessed by comparing Canada with the other countries of the Organisation for Economic Co-operation and Development (OECD) and by comparing British Columbia with the states of Washington and Oregon.

Although Canada is the fifth highest among OECD countries in terms of total spending on health (as a percentage of GDP), it is generally among the bottom third of OECD countries in availability of technology. For instance, Canada is twenty-first out of 28 OECD nations in making available computed tomography (CT) scanners, nineteenth out of 22 in availability of lithotriptors, and nineteenth out of 27 in availability of magnetic resonance imagers (MRIs). Its only favourable position is in the availability of radiation equipment, where it ranks sixth out of 17.

The local comparison is equally unfavourable. CT scanners, nuclear medicine facilities, MRIs, lithotriptors, positron emission tomography (PET), specialized intensive-care facilities, and cardiac catheter labs are all less likely to be found at a community hospital in British Columbia than at a similar hospital in Washington or Oregon. Angioplasty and transplant facilities are mainly restricted to the University teaching hospitals in British Columbia, while they are more widely dispersed in the two American states.

Furthermore, the trend is worsening in some categories. For example, the data reveal that Canada's deficit in the availability of MRIs became worse between 1986 and 1995 relative to other leading OECD countries including Australia, France, and the Netherlands, not to mention the United States.

This pervasive technology deficit points to the need for a serious re-evaluation of the way in which health care is funded and provided in Canada.

Introduction

Modern medicine is highly dependent upon scientific advances such as the development of new drugs. Indeed, much of the increase in life expectancy that has occurred in the past century is the result of vaccines, antibiotics, and other drugs that have controlled and, in some cases, even eradicated diseases that previously afflicted humans. In addition to the benefits of new drugs, in recent years a significant portion of the advance in medical science has been a result of the development of medical technology.

Measuring the effect of technology on health-care outcomes is difficult. In particular, it is often a challenge to distinguish improvements that stem from advances in technology from those that result from simple changes that are not technologically oriented. For example, in recent years perinatal mortality has decreased in most of the technologically advanced countries. There is a temptation to believe that this is primarily a result of advances in technology. The reality is that this reduction in death stems mainly from simple improvements in social and preventive factors.[1] Better nutrition, avoidance of alcohol, weight control, monitoring of blood pressure, and the promotion of similar measures appear to account for most of the improvements. Similarly, for adults, recent changes encouraging post-operative patients to become mobile much sooner after surgery have resulted in reduced morbidity and mortality. These are simple non-technological changes that stem from an improved understanding of disease.

Nevertheless, technology has also been shown to be important in improving basic health outcomes. Indeed, modern emergency departments and operating rooms are supported by an array of equipment, much of which was unavailable as recently as ten years ago and which permit operative and diagnostic procedures that were previously impossible.

The beneficial effects of improvements in technology are reflected in two recent papers. Hunink et al.[2] estimated that 43 percent of the decline in mortality due to coronary artery disease between 1980 and 1990 was the result of acute treatment, including 'high' (sophisticated) and 'low' (simple) technologies. Braunwald[3] concluded that both low-tech and high-tech innovations contributed to improved cardiac outcomes in the 1980s and 1990s. Indeed, part of the decline in cardiovascular mortality in western countries over the past 40 years (figure 1) is due to technological advances as well as lifestyle changes and new medications.

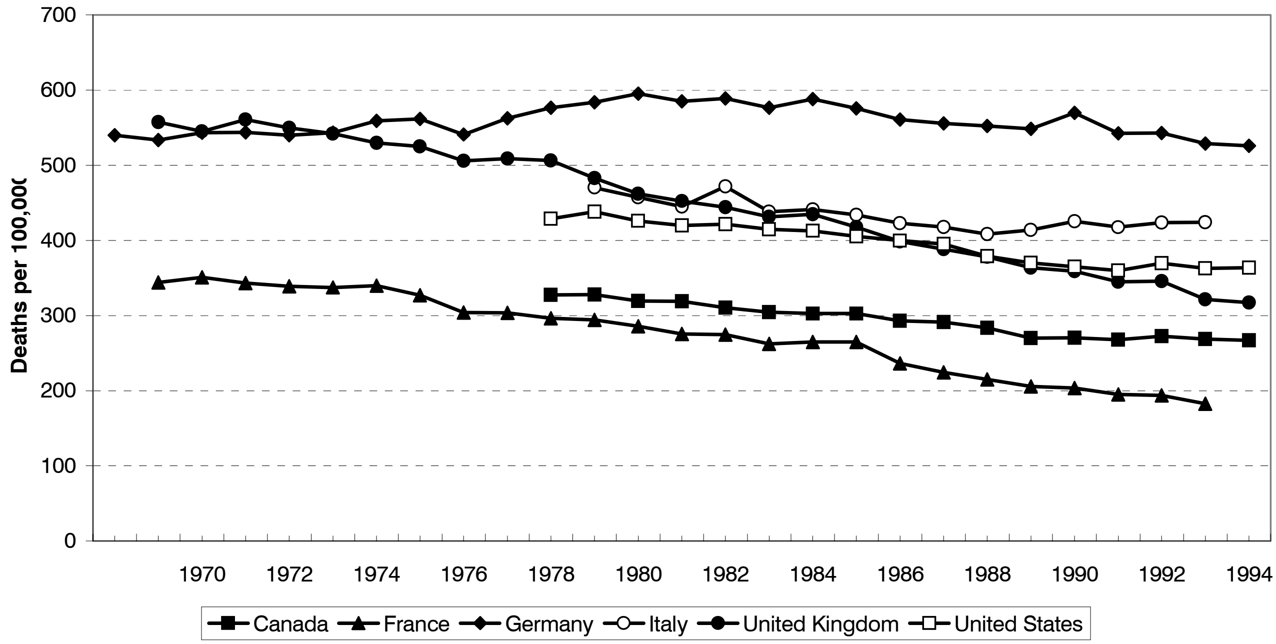
Reduced incidence of coronary artery disease may be due to a variety of factors but the accurate diagnosis depends upon sophisticated new radiological and nuclear-medicine scanning techniques. Indeed, the potential for treatment depends upon more advanced investigation using scanning equipment not available only a few years ago.

1 Swyer, P.R. Organisation of perinatal/neonatal care. *Acta Paediatrica. Supplement*. 385 (January 1993): 1–18.

2 Hunink, Maria, Lee Goldman, Anna Tosteson, Murray Mittleman, Paula Goldman, Lawrence Williams, Joel Tsevat, and Milton Weinstein. The Recent Decline in Mortality from Coronary Heart Disease, 1980-1990. *Journal of the American Medical Association* 277, 7 (19 February 1997): 535–42.

3 Braunwald, Eugene. Cardiovascular Medicine at the Turn of the Millennium: Triumphs, Concerns, and Opportunities (Shattuck Lecture). *New England Journal of Medicine* 337, 19 (6 November 1997): 1360–69.

Figure 1: Cardiovascular Mortality, 1968–1996



Source: OECD Health Data 98.

New technologies may be used by the cardiovascular surgeon performing the operation, by the anaesthetist giving the anaesthetic, or by the intensivist whose task it is to ensure the survival of the patient during the post-operative period in intensive care. Where such technology is unavailable, people who are otherwise operable may be rejected for treatment because of the operative risk or surgical outcomes may be worse than could have been achieved had the technology been available.

Coronary artery disease is but one example of an illness that often requires very sophisticated, up-to-date, equipment to obtain an optimum therapeutic result. Individuals suffering from advanced kidney disease, those in need of surgery to the brain, people with treatable cancer, and victims of motor-vehicle accidents are all potential beneficiaries of technology availability. Without appropriate technology, there are increases in patient suffering, illness, and death.

Shortages of technology impede exact diagnosis and inhibit treatment of high quality. However, there is an additional dimension to this problem: even when a particular technology is available, all too often it is outdated. Out-dated equipment is subject to frequent breakdown and, even when operational, its performance is often slow and the results of poor quality. In this paper, no attempt has been made to measure the technology gap resulting from outmoded equipment, although this is an important topic that deserves more research.

Expanding access to technology in Canada is difficult under the existing system. Administrators of acute-care hospitals receive their budgets from provincial health ministries. They have very little leeway in spending, as up to 85 percent of their budgets are consumed by union wages that are largely out of their control. Of the remaining 15 to 20 percent left in their budgets, much is consumed by overhead and maintenance, leaving a

minuscule amount for capital spending. The likelihood of any hospital having a substantial residual left to purchase advanced new equipment is remote. Moreover, even when a publicly funded hospital has raised funds to purchase equipment, it is not permitted to charge patients in order to recover operating costs and often the government refuses to pay these. The result is that decisions regarding the purchase and operation of high technology equipment are not in the hands of competent medical authority or of those who administer the hospitals. Instead, remote government bureaucrats and politicians make the decisions.

Conversely, the private sector is largely excluded from purchasing and operating high-technology equipment because the government-funded and government-controlled payment schemes prevent most private entrepreneurs from billing for services provided. In spite of this, there have been a few innovative entrepreneurs who have managed to purchase and operate high-technology equipment in very specialised circumstances. The Gimbel Eye Centre in Calgary and the Cambie Surgery Centre in Vancouver are two examples.

Given these obstacles to the acquisition of technology in Canada, this study was prompted by the concern that Canada might be falling behind its partners in the Organisation for Economic Co-operation and Development (OECD) in this important area of health care. An attempt has been made to measure and quantify the Canada's position with respect to the other OECD countries. It must be noted that there are other countries, such as Singapore and Israel, that maintain very high standards in health-care technology but, since they are not within the OECD, they are not included in the evaluation reviewed in this report.

Methodology

Canada's stock of medical technology was assessed by comparing Canada with the other countries in the OECD and by comparing British Columbia with the American states, Washington and Oregon. Data on medical technology was gathered from several sources to make these comparisons.

International comparisons were made using statistical data collected by the OECD[4] from the ministries of Health and statistical bodies of the 29 countries that are members of the OECD. For the comparative analysis of British Columbia, Oregon, and Washington, community and regional hospitals were surveyed to assess the availability of technology and services. Hospitals were selected by matching those with similar numbers of beds and admissions. Data from the American Hospital Association (AHA) annual survey[5] was compared with data extracted from Canadian sources[6] and from the British Columbia Ministry of Health. Technologies examined include diagnostic imaging, advanced technology equipment, cardiac and transplant procedures, and intensive care services. These are areas of rapid growth in hospitals and are responsible for significant capital expenditures. Questions pertaining to technology and services from the AHA survey were then posed to regional health directors in British Columbia and to the British Columbia Ministry of Health. Data on utilization of medical technology and summary data for British Columbia was obtained from British Columbia's Health Planning Database.[7]

The technologies assessed came from responses to a question posed to 400 physicians practising in the province of British Columbia. They were asked to identify technologies that were unavailable or in limited availability to them. The availability of these technologies (as of March 31, 1998) was determined by phone interviews with departmental directors, biotechnology engineering and administrative personnel, the Canadian Council of Health Technology Assessment, and The Office of Technology Assessment. Data from Statistics Canada and The Canadian Institute for Health Information were also collected to describe health-care expenditures and the utilization of services.

4 Organisation of Economic Cooperation and Development. *OECD Health Data 98: A Comparative Analysis of 29 Countries.* CD-ROM. Paris: CREDES, 1998.

5 *1997 AHA Guide to the Healthcare Field*. Chicago, IL: Healthcare InfoSource, 1997.

6 *Guide to Canadian Healthcare Facilities 1997*. Ottawa, ON: Canadian Healthcare Association, 1997.

7 *Health Planning Database Data Directory.* Victoria, BC: Health Planning Database, Ministry of Health and Ministry Responsible for Seniors, 1998.

Canada Compared with the OECD

In terms of technology per capita, Canada is clearly not a world leader (see table 1), despite the fact that it is the fifth highest among OECD countries in terms of its spending on health (as a percentage of GDP). The data show that most OECD nations provide greater accessibility than Canada to a number of important technologies: computed tomography (CT) scanners, radiation equipment, lithotriptors, and magnetic resonance imagers (MRIs). At the same time, most countries also spend a smaller proportion of their national income on health care (see table 2).

Specific technologies: CT, radiation, lithotriptors, MRIs

The CT scanner is one of the best known and most useful diagnostic tools available to physicians. By combining the use of a computer and X-rays, cross-sectional images of the body are taken. This technology has been very useful in the diagnosis and treatment of cancer, head injuries, and strokes. The diffusion of CT scanners has been widespread, reaching all OECD nations. The diffusion has, however, been far from even (see table 3). The average accessibility in the OECD is 12.9 CT scanners per million persons, well above the comparable figure for Canada, 8.1 scanners per million persons. Indeed, 20 of the 28 OECD nations provide easier access than Canada does.[8]

A second technology that the OECD measures is the number of radiation machines dedicated to the treatment of cancer (see table 4). This category includes resources such as cobalt-60 centres and linear accelerators. It is the only category where Canada's accessibility rate is above the OECD average of 4.8 per million persons. With 5.3 units of radiation equipment per million persons, Canada finishes sixth among the 16 nations that record such data.

Lithotriptors provide physicians with a non-invasive method for removing stones lodged in the kidney or ureter. A lithotriptor bombards a stone with shock waves and breaks the stone down into finer particles, which the body then can excrete naturally. The procedure dramatically decreases pain and suffering compared to surgery or waiting for the patient to excrete the smaller stones spontaneously. Unfortunately, Canada has only 0.4 lithotriptors per million persons (see table 5). The OECD average is 1.4 per million, more than three times the Canadian level. Italy, for example, now has more than ten times the number of lithotriptors per capita as Canada although it spends a smaller share of its GDP on health care than Canada does.

A magnetic resonance imager (MRI) is an imaging device that provides cross-sectional and three-dimensional views of tissues that have high fat or water content. This technology was developed to image the brain and spinal cord, but has also subsequently been useful in diagnosing orthopedic conditions. In the early 1980s, Canada had a high stock of MRIs relative to other developed nations. However, since that time

8 There are currently 29 countries that are members of the OECD. The sample size for these comparisons is never larger than 27 because some nations do not report statistics on medical technology and because Iceland and Luxembourg have populations well below one million, which may bias per-capita measures in their favour.

Canada's position has slipped: 18 countries now have more MRIs per capita than Canada (see table 6). At 1.7 MRIs per million persons, Canada is well below the OECD average of 3.9 per million. The lack of MRIs in Canada is delaying the diagnosis of many conditions and causing some patients to undergo surgery without a properly defined diagnosis.

Table 1: Canadian Medical Technology and Health Spending Relative to the OECD, 1997[a]

Technology	Canadian Value[b]	OECD Average	Canadian Rank	Sample Size
CT Scanners	8.1	12.9	21	28
Radiation Equipment	5.3	4.2	6	17
Lithotriptors	0.4	1.4	19	22
MRIs	1.7	3.9	19	27
National Health Expenditure 1997	9.3% of GDP	7.7% of GDP	5	29

[a] Not all countries reported 1997 figures for all categories. Country-specific dates are included in Tables 2–6.
[b] Number per million population, except where noted (last row of table).
Source: *OECD Health Data 98*. Paris: OECD, 1998.

Table 2: Total Health Care Expenditure as Percent of GDP, 1997

Rank	Country	% of GDP	Rank	Country	% of GDP
1	United States	13.6	16	Denmark	7.4
2	Germany	0.4	17	Spain	7.4
3	Switzerland	10.1	18	Japan	7.3
4	France	9.6	19	Finland	7.2
5	**Canada**	**9.0**	20	Greece	7.1
6	Sweden	8.6	21	Luxembourg	7.1
7	Netherlands	8.5	22	Czech Republic	7.0
8	Australia	8.4	23	Ireland	7.0
9	Portugal	8.2	24	United Kingdom	6.7
10	Iceland	8.0	25	Hungary	6.5
11	Austria	7.9	26	Poland	5.2
12	New Zealand	7.7	27	Mexico	4.7
13	Belgium	7.6	28	Korea	4.0
14	Italy	7.6	29	Turkey (1996)	3.8
15	Norway	7.5	**Average for OECD**		**7.7**

Source: *OECD Health Data 98*. Paris: OECD, 1998.

Table 3: CT Scanners per Million Population

Rank	Country	Scanners	Health Spending (% of GDP)
1	Japan (1996)	69.7	7.2
2	United States (1993)	26.9	14.1
3	Austria (1997)	24.8	7.9
4	Australia (1994)	18.4	8.5
5	Switzerland (1993)	17.7	9.4
6	Italy (1995)	17.5	7.7
7	Korea (1997)	17.4	4.0
8	Belgium (1994)	16.7	8.0
9	Germany (1996)	16.4	10.5
10	Luxembourg (1990)	15.7	6.6
11	Iceland (1997)	14.8	8.0
12	Sweden (1993)	13.7	8.9
13	Portugal (1990)	12.0	6.5
14	Norway (1990)	11.6	7.8
15	France (1996)	9.4	9.7
16	New Zealand (1997)	9.2	7.6
17	Finland (1990)	9.0	8.0
18	Netherlands (1993)	9.0	9.0
19	Spain (1996)	9.0	7.4
20	Czech Republic (1997)	8.3	7.0
21	**Canada (1997)**	**8.1**	**9.3**
22	United Kingdom (1993)	6.3	6.9
23	Greece (1990)	6.1	4.2
24	Denmark (1990)	5.8	8.2
25	Hungary (1996)	5.1	6.7
26	Ireland (1990)	4.3	6.7
27	Mexico (1990)	2.1	3.6
28	Turkey (1990)	1.6	3.6
OECD average		**13.1**	**7.5**

Source: *OECD Health Data 98*. Paris: OECD, 1998.

Table 4: Radiation Treatment Equipment per Million Population

Rank	Country	Radiation Treatment Equipment	Health Spending (% of GDP)
1	Iceland (1997)	14.8	8.0
2	New Zealand (1997)	8.2	7.6
3	France (1996)	7.6	9.7
4	Greece (1994)	6.5	5.4
5	Czech Republic (1997)	6.4	7.0
6	**Canada (1997)**	**5.3**	**9.3**
7	Finland (1988)	4.9	7.3
8	Germany (1996)	4.7	10.5
9	Australia (1992)	3.8	8.6
10	Korea (1997)	3.8	4.0
11	United States (1992)	3.8	13.9
12	Austria (1997)	3.7	7.9
13	Hungary (1996)	3.3	6.7
14	Spain (1996)	3.3	7.4
15	Sweden (1993)	0.8	8.9
16	Portugal (1996)	0.5	8.3
17	Poland (1993)	0.1	4.9
OECD average		**4.8**	**8.0**

Source: *OECD Health Data 98*. Paris: OECD, 1998.

Table 5: Lithotriptors per Million Population

Rank	Country	Lithotriptors	Health spending (% of GDP)
1	Italy (1995)	4.6	7.7
2	Iceland (1997)	3.7	8.0
3	Korea (1997)	3.4	4.0
4	Greece (1994)	3.3	5.4
5	Czech Republic (1997)	3.0	7.0
6	Japan (1990)	2.5	6.0
7	Spain (1996)	1.8	7.4
8	Germany (1996)	1.7	10.5
9	Austria (1997)	1.6	7.9
10	Belgium (1992)	1.6	8.0
11	United States (1990)	1.5	12.6
12	Portugal (1996)	1.2	8.3
13	Australia (1994)	1.0	8.5
14	France (1996)	0.8	9.7
15	Ireland (1988)	0.8	7.0
16	Netherlands (1990)	0.8	8.3
17	Hungary (1996)	0.7	6.7
18	New Zealand (1996)	0.5	7.3
19	**Canada (1995)**	**0.4**	**9.3**
20	Sweden (1993)	0.3	8.9
21	Finland (1988)	0.2	7.3
22	Mexico (1990)	0.2	3.6
OECD average		**1.7**	**7.9**

Source: *OECD Health Data 98*. Paris: OECD, 1998.

Table 6: MRIs per million Population

Rank	Country	MRI	Health Spending (% of GDP)
1	Japan (1996)	18.8	7.2
2	United States (1995)	16.0	14.1
3	Austria (1997)	8.4	7.9
4	Switzerland (1993)	7.4	9.4
5	Sweden (1995)	6.8	8.5
6	Germany (1996)	5.7	10.5
7	Korea (1997)	5.1	4.0
8	Netherlands (1995)	3.9	8.8
9	Italy (1995)	3.5	7.7
10	United Kingdom (1995)	3.4	6.9
11	Belgium (1995)	3.3	7.9
12	Spain (1996)	3.2	7.4
13	Australia (1995)	2.9	8.4
14	Portugal (1996)	2.8	8.3
15	New Zealand (1997)	2.7	7.6
16	Denmark (1990)	2.5	8.2
17	Finland (1990)	2.4	8.0
18	France (1997)	2.4	9.9
19	**Canada (1997)**	**1.7**	**9.3**
20	Hungary (1996)	1.4	6.7
21	Czech Republic (1997)	1.3	7.0
22	Greece (1994)	1.2	5.4
23	Norway (1990)	0.7	7.8
24	Ireland (1990)	0.3	6.7
25	Turkey (1990)	0.3	3.6
26	Mexico (1990)	0.2	3.6
27	Poland (1993)	0.1	4.9
OECD average		**4.2**	**7.9**

Source: *OECD Health Data 98*. Paris: OECD, 1998.

Diffusion of MRIs over time

Data from previous years on the availability of MRIs was also analyzed to provide a time-series depicting the rate of diffusion of MRIs. Technological diffusion over time is an indicator of the restrictions regulatory bodies and funding agencies place on a technology. Data from the OECD compares the availability of MRI scanners in the first five years of their general availability with their spread over the next five years (see figures 2 and 3). Diffusion of MRIs in other countries has been much more rapid than in Canada. In France, the increase of MRI equipment per capita occurred more rapidly in private hospitals than public hospitals.[9] In the United States, rapid diffusion of MRIs occurred in clinics not connected to hospitals. Some countries with faster diffusion also have improved the design, developing, for example, "open" MRI scanners that do not require complete enclosure of the patient. This reduces the occurrence of claustrophobia, which causes up to 10 percent of examinations to be aborted due to a panic reaction by the patient.[10]

9 *Healthcare Technology and Its Assessment in Eight Countries*. Washington, DC: Office of Technology Assessment, Congress of the United States, 1995: chapter 10, 1337. Available as a digital document at http://www.wws.princeton.edu/cgi-bin/byteserv.prl/~ota/disk1/1995/9562/9562.PDF.

10 Precise measurement of the failure rate could not be found but this figure was the estimate of specialists working in the field.

Figure 2: MRI Early Diffusion, 1986–1991

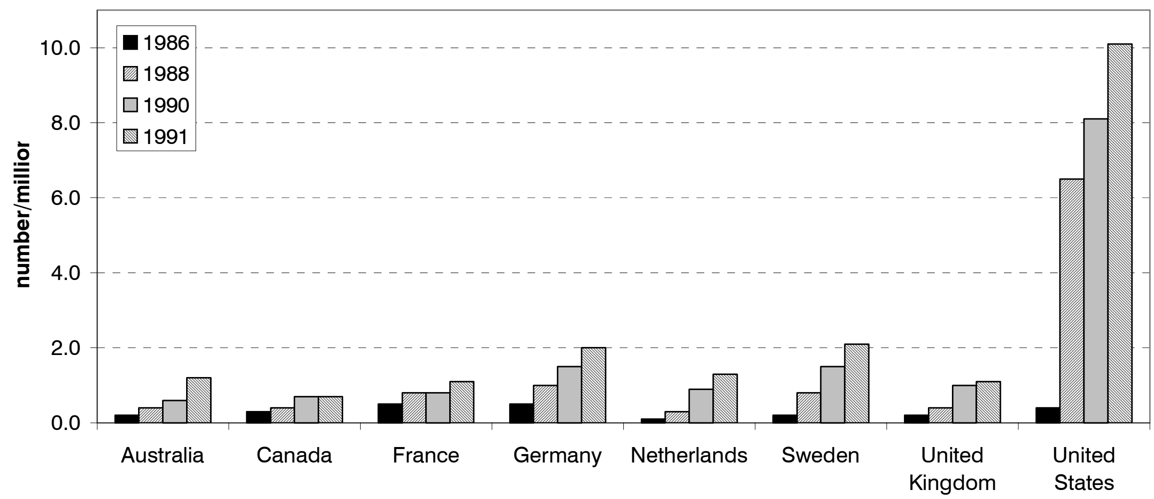
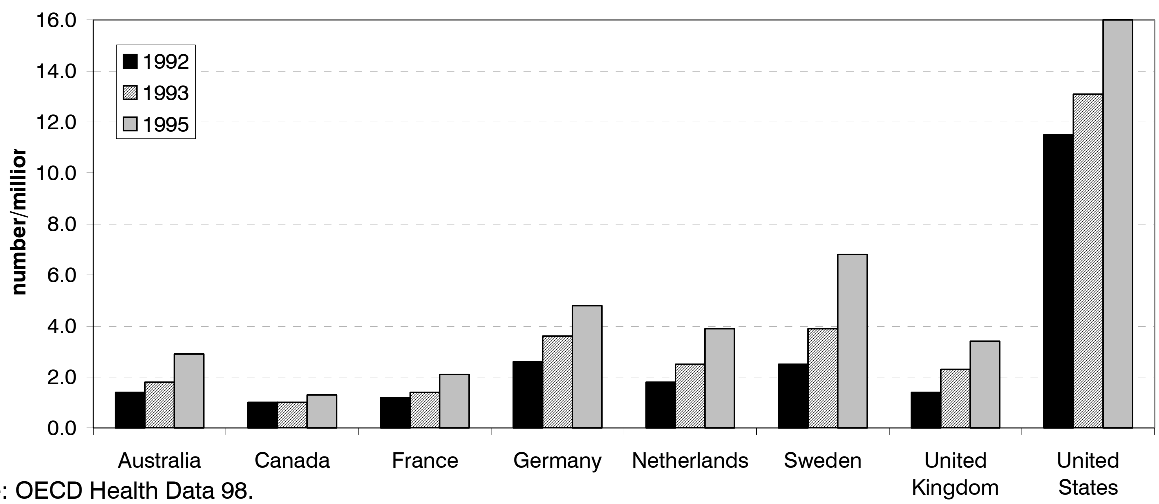


Figure 3: MRI Late Diffusion, 1992–1995



Source: OECD Health Data 98.

British Columbia Compared with Washington and Oregon

Comparison of High-tech University Hospitals

University teaching hospitals are among the best-equipped health care institutions because they have a leading role in research and in training the physicians of the future. Therefore, university teaching hospitals in Oregon and Washington were surveyed to find which leading-edge medical technologies they possessed. Then, the hospitals at the University of British columbia (UBC) were asked whether they possessed those technologies. The comparison reveals that the UBC hospital system is technologically deficient. Table 7 enumerates which technologies were *entirely absent* in British Columbia at the time of the survey but were found in the Washington and Oregon systems. Furthermore, none of the technologies absent from the UBC system was available at any other institution in British Columbia.

Comparison of Community and Regional Hospitals[11]

Community and regional hospitals are not often equipped with leading-edge technology to the same extent university hospitals are. Ten community and regional hospitals were surveyed to assess the availability of standard technology and services. Hospitals were selected by matching facilities by numbers of beds and admissions. Data from the American Hospital Association's annual survey[12] was compared to data extracted from Canadian sources[13] and the British Columbia Ministry of Health. Areas examined include diagnostic imaging, advanced technological equipment, cardiac and transplant procedures, and intensive care services. These represent areas of technological growth in the hospital setting and are responsible for a majority of capital expenditures. The comparison of diagnostic imaging and other high-tech equipment (see figures 4 and 5) found that hospitals in British Columbia, Washington, and Oregon were similarly equipped with CT scanners, ultrasound machines, and nuclear-medicine services but that there was a large deficit in the availability of MRIs and lithotripters in British Columbia.

Hospitals in Oregon and Washington also provide specialized services not often found in the equivalent facilities in British Columbia (figure 6). Angio-plasty to dilate obstructed coronary arteries was only available at one regional hospital in British Columbia, while it was widely available in facilities in Washington and Oregon. Cardiac catheterization facilities to assess the degree of blockage of coronary arteries were available at only 20 percent of the matched hospitals in British Columbia but at 80 percent of facilities in the United States. There was also a significant difference between the specialized intensive-care services available at regional and community hospitals in British Columbia and those available in the United States (figure 7). While intensive-care facilities were available at all hospitals in the matched groupings in both countries, units dedicated to cardiac, pediatric, and neonatal care were available at a lower rate in British Columbia. While these types of

11 The comparison between availability in British Columbia, Washington, and Oregon was conducted as of March 31, 1998.
12 *1997 AHA Guide to the Healthcare field*. Chicago, IL: Healthcare InfoSource, 1997.
13 *Guide to Canadian Healthcare Facilities 1997*. Ottawa, ON: Canadian Healthcare Association, 1997.

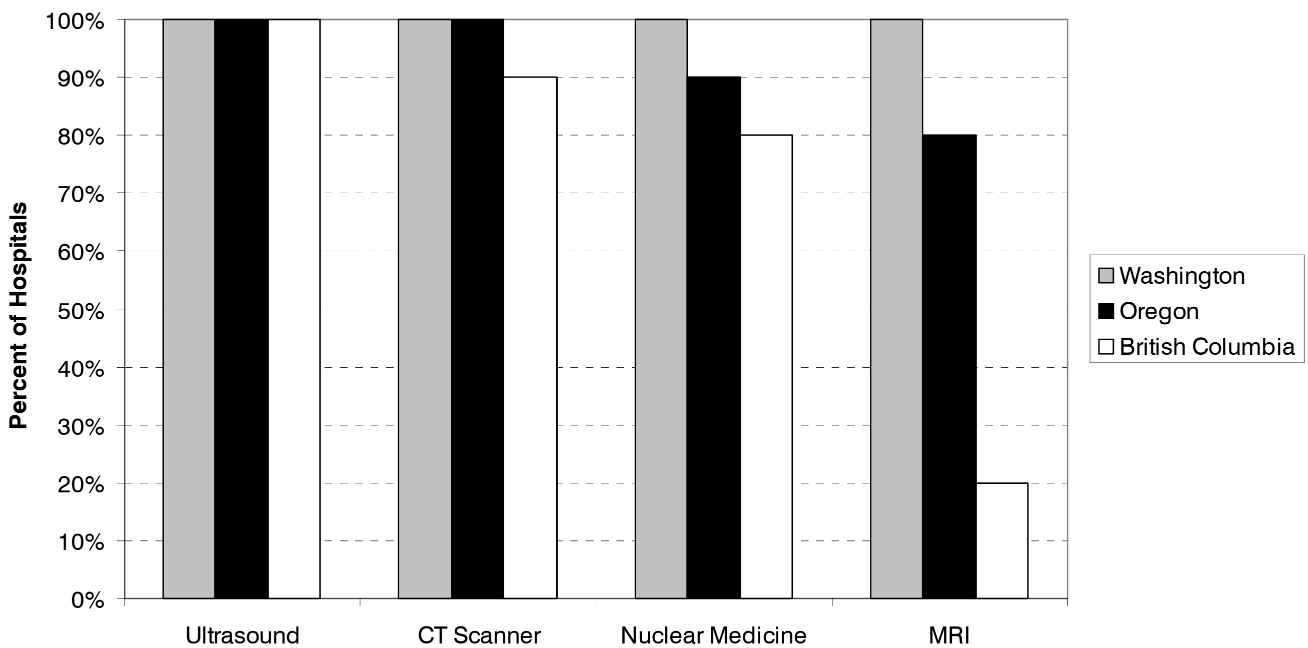
patients may be adequately treated in a general intensive-care unit, the services and technology provided in specialized centres are superior. A specialized unit providing pediatric and cardiac care would have more specially trained personnel and a much wider spectrum of specialty equipment to monitor and manage these particular groups of patients.

Table 7: Leading-Edge Technologies Unavailable in British Columbia, Available in Washington and Oregon (as of March 31, 1998)

Specialty	Technology
Anesthesia	Intraoperative transesophageal echocardiography
Cardiology	Echocardiography with Harmonic Imaging Radioactive Balloon Angioplasty
Emergency Medicine	Emergency room dedicated ultrasound
Gastroenterology	GI Endoscopic Ultrasound GI Endoscopic laser
General Surgery	Minilaparoscopy (3mm)
Neurosurgery	Frameless Stereotaxy
Opthamology	Foldable intraocular lens for cataract surgery
Obstetrics/Gynecology	Laparoscopic Laser Ablation of the Endometrium
Otolaryngology	3D image guided sinus surgery
Radiology	Intraoperative CT scans Open type MRI MRI breast coil PET scan for clinical use
Vascular Surgery	Laser angioplasty
Urology	Brachytherapy Laser Prostatectomy

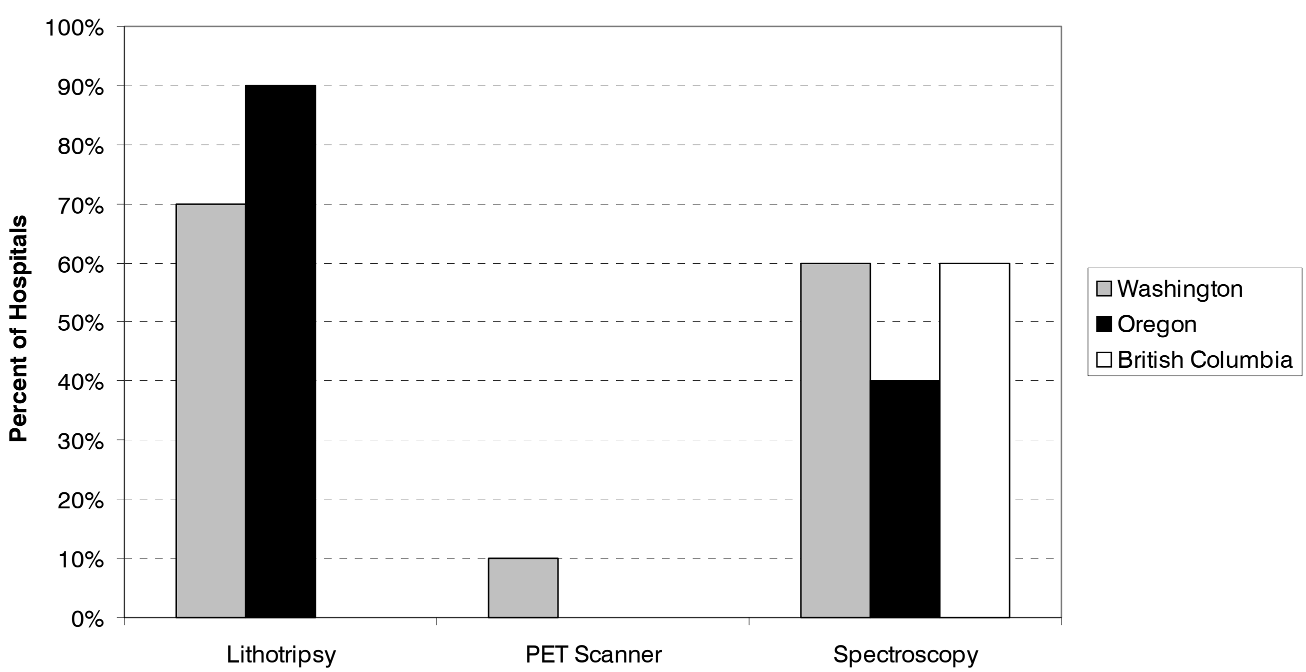
Source: *Health Planning Database Directory (1998)*. Victoria: Health Planning Database, Ministry of Health and Ministry Responsible for Seniors.

Figure 4: Diagnostic Imaging, 1997/1998



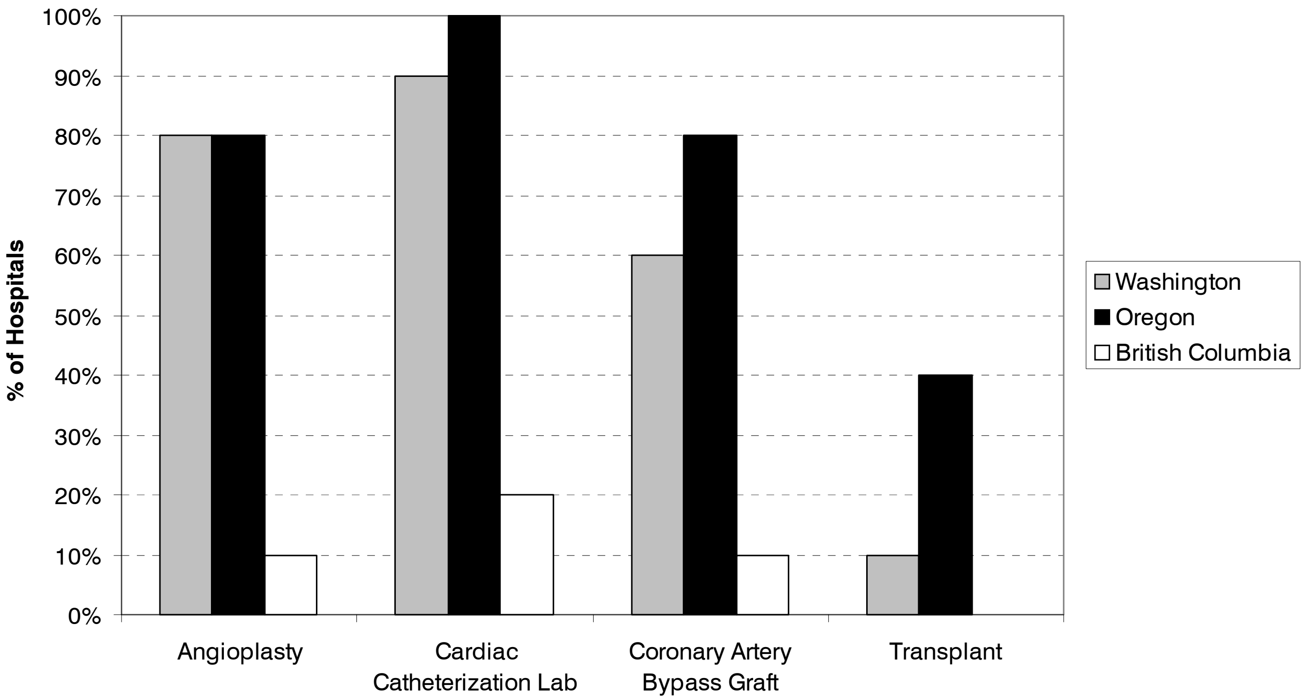
Source: 1997 AHA Guide to the Healthcare Field. Healthcare InfoSource, Chicago, 1997; Guide to Canadian Healthcare Facilities, Canadian Healthcare Association, Ottawa, 1997.

Figure 5: High-Tech Equipment, 1997/1998



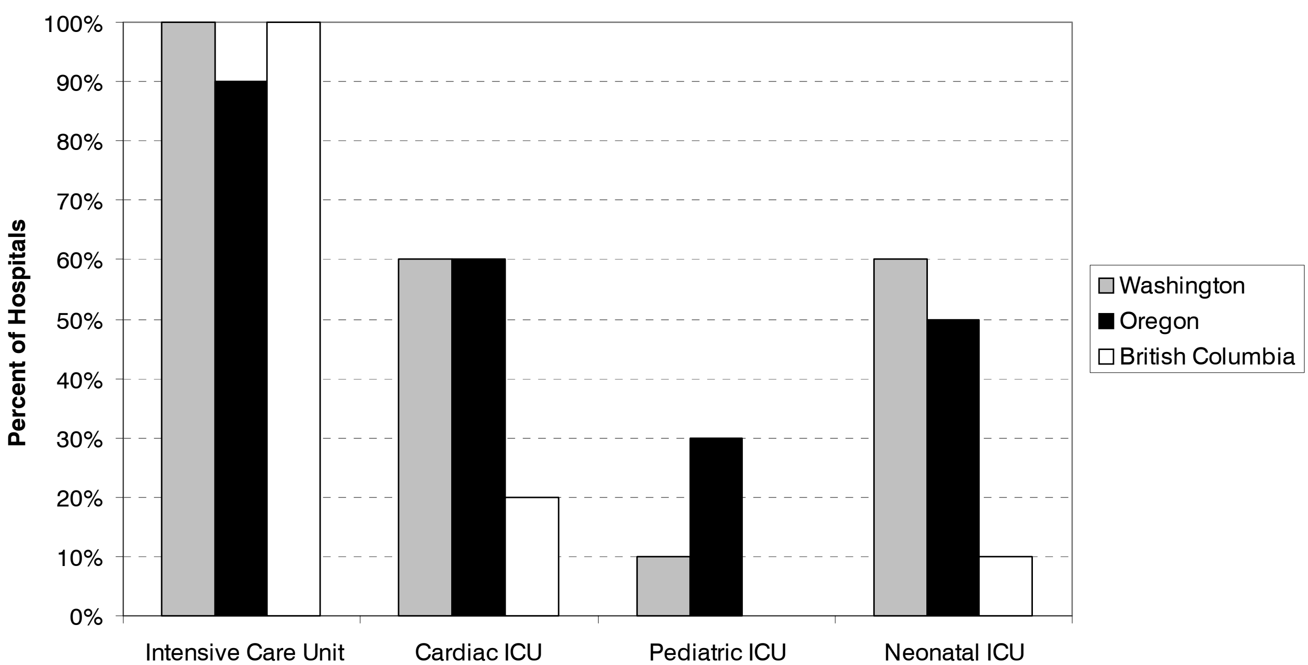
Source: 1997 AHA Guide to the Healthcare Field. Healthcare InfoSource, Chicago, 1997; Guide to Canadian Healthcare Facilities, Canadian Healthcare Association, Ottawa, 1997.

Figure 6: Cardiac and Transplant Procedures, 1997/1998



Source: 1997 AHA Guide to the Healthcare Field. Healthcare InfoSource, Chicago, 1997; Guide to Canadian Healthcare Facilities, Canadian Healthcare Association, Ottawa, 1997.

Figure 7: Intensive Care Services, 1997/1998



Source: 1997 AHA Guide to the Healthcare Field. Healthcare InfoSource, Chicago, 1997; Guide to Canadian Healthcare Facilities, Canadian Healthcare Association, Ottawa, 1997.

Summary

Objective evidence reveals that Canada lags behind most of the OECD countries in the availability of advanced medical technology. It is twenty-first out of 28 in CT scanner availability, nineteenth out of 22 in lithotriptor availability, and nineteenth out of 27 in MRI availability. The only bright spot is radiation equipment, where Canada is sixth out of 17. This general nationwide technological deficit is also reflected at the provincial level. At the provincial and state level, it was revealed that British Columbia markedly lags Washington and Oregon in making available many categories of technology. This study also reveals that while Canada currently lags behind many other advanced countries, as time passes, the gap between it and other countries has become worse.

These constraints upon the availability of high technology do not reflect a lack of demand. Across the country, there are waiting lists of weeks to months for most of the procedures described. The central problem appears to be that the supply of equipment is insufficient. This most likely stems from deficiencies in the system itself, and the way in which purchasing decisions are made, authorized, and funded. These deficiencies and the factors causing them require more extensive evaluation.

About the Authors

Jared Alexander worked as an undergraduate student intern at The Fraser Institute in the summer of 1998, where he collected much of the data and assisted in the writing of this publication.

David Harriman is a physician and a Board-Certified Specialist in Emergency Medicine. He was the principle investigator in this project that he completed as a UBC MBA intern at The Fraser Institute.

William McArthur is a physician and Senior Fellow in Health Policy at The Fraser Institute. He was the project supervisor.

Martin Zelder is an economist and Director of Health Policy Research at The Fraser Institute. He assisted in the compilation and editing of the document.

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