

THE MANAGEMENT OF DRUG EXPENDITURES AT BRITISH COLUMBIA CORRECTIONAL CENTRES

by

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ABSTRACT

Total drug expenditures for BC Correctional Centres have increased significantly from 2002 to 2004. This rapid increase in drug expenditures was attributed to the increase in drug costs and utilization. BC Corrections' drug costs and utilization are affected by internal and external factors.

Pharmacy services for the BC Correctional Centres are currently provided by the PDC Pharmacy. An analysis of initiatives undertaken by this Pharmacy is performed to assess the cost effectiveness of the current pharmacy services. In the analysis, drug costs and dispensing fees of the PDC Pharmacy are compared to those of local retail pharmacies from ten BC regions. This analysis indicates that the PDC Pharmacy provides cost effective pharmacy services and should continue to provide services for the BC Correctional Centres. In addition, improvements on current cost saving programs and the development of new programs to manage the rapidly rising BC Corrections' drug expenditures are suggested.

DEDICATION

This project is dedicated to all of BC Corrections' health care professionals.

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1 DRUG EXPENDITURE OVERVIEW

1.1 Introduction

BC Correctional Centres, also known as BC provincial prisons, are operated by the Corrections Branch under the BC Ministry of Public Safety and Solicitor General. There are ten BC Correctional Centres with a maximum total capacity of 2,293 adult inmates¹. BC Corrections' drug expenditures are financed by the Corrections Branch, BC PharmaCare and the inmates themselves. In 2004, 78.81% of BC Corrections' total drug expenditures were financed by the Corrections Branch (Table 3). Drug expenditures financed by the Corrections Branch increased by over 13% annually from 2002 to 2004 (Table 3). The rapid increase in drug expenditures has resulted in a significant increase in BC Corrections' health care spending and has had a negative impact on other BC Corrections' health care programs. In order to protect and preserve BC Corrections' health care programs, better management of BC Corrections' drug expenditures is needed.

Many factors affect pharmaceutical drug expenditures. Some influences pertain to the general drug delivery system and, therefore, affect expenditures in the BC Corrections system. Other factors are specific to BC Correctional Centres. In order to fully understand the impact of all factors on BC Corrections' drug expenditures, each will be assessed and discussed in detail.

Pharmacy services for BC Correctional Centres have been provided by a centralized government pharmacy, as opposed to private sector retail pharmacies, for over ten years. To determine the cost effectiveness of current pharmacy services, drug costs and professional

¹ British Columbia Ministry of Public Safety and Solicitor General, "Correctional Facilities in British Columbia," [online].

dispensing fees in the public and private sectors will be compared. This analysis will generate results that could positively inform the Corrections Branch's development of policies and programs for managing rapidly rising drug expenditures.

1.2 Overview of drug expenditures in Canada

Drug expenditures, the second largest among major categories of total health care spending, are one of the fastest-growing components of Canadian health care spending. From 2002 to 2004, total drug expenditures increased from \$18.4 billion to \$21.8 billion, an 18.48% increase. In Canada, per capita drug expenditures increased from \$147 (1985) to \$587 (2002), and are expected to reach \$681 in 2004.²

² Canadian Institute for Health Information, *Drug Expenditure in Canada 1985 to 2004* (Ottawa: CIHI, 2005).

Table 1 Total Drug Expenditures per Capita for OECD Countries in 2002

OECD Country	Total Drug Expenditure per Capita
United States	\$801
France	\$678
Canada	\$577
Germany	\$485
Japan	\$468
Switzerland	\$421
Australia	\$414
Hungary	\$355
Netherlands	\$328
Korea	\$303
Denmark	\$301

Source: Table compiled by author. Data source, Canadian Institute for Health Information, "Drug Expenditure in Canada 1985 to 2004" (Ottawa: CIHI, 2005).

In a comparison of per capita drug expenditures among eleven Organization for Economic Cooperation and Development (OECD) countries in 2002, Canada ranked third at \$577 (Table 1).

In Canada, drug expenditures are both publicly financed and incurred in the private sector. In 2002, 37.6% of total expenditures were publicly financed. Funds for publicly financed drug expenditures are provided by the federal, provincial, and territorial governments and social security agencies. Public sector per capita drug expenditures increased by a factor of five (5) from 1985 (\$43.3) to 2002 (\$219.1). This increase was due to rising drug costs and increased drug utilization.

Privately financed drug expenditures are paid for by consumers, not eligible for public assistance, and private insurers. Canadian drug expenditures per capita in the private sector

increased by only two and a half times (2.5) from 1985 (\$103.8) to 2002 (\$367.6)³. Publicly funded expenditures clearly grew more rapidly than privately funded expenditures.

Based on drug indications, potency, toxicity, adverse effects, interactions, and abuse potential, drugs are classified as either “prescribed” or “non-prescribed” in Canada. Prescribed drugs have a higher potency, toxicity, abuse potential, produce more severe adverse effects and drug interactions, and require a higher level of monitoring than non-prescribed drugs. Because improper use of prescribed drugs could lead to severe harm or death, prescribed drugs must be ordered by medical practitioners and sold by pharmacists.

As non-prescribed drugs are usually less toxic with limited abuse potential they do not need to be ordered by medical practitioners. Non-prescribed drugs consist of over-the-counter drugs and personal health supplies. Over-the-counter drugs are therapeutic drug products that are used in the treatment of minor illness (e.g., Aspirin for headaches). Personal health supplies are items that are used to promote and maintain health (e.g., diabetic test strips for testing blood sugar).

Canada’s prescribed drug expenditures increased at an average annual rate of 10.9% between 1985 and 2002. In absolute terms, expenditures went from \$2.6 billion in 1985 to \$14.8 billion in 2002, and are expected to reach \$18 billion in 2004. Prescribed drug expenditures are expected to account for 82.5% of Canada’s total drug expenditures in 2004⁴.

1.3 Overview of expenditures on drugs in British Columbia

BC’s total drug expenditures increased from \$2.0 billion to \$2.3 billion, a 13.61% increase, from 2002 to 2004. BC’s drug expenditures per capita have increased from \$140.0 (1985) to \$486.5 (2002), and are expected to reach \$541.98 in 2004. Public sector drug

³ CIHI, pp. 3, 4, 32, 33, 58, 50.

⁴ CIHI, pp. 7, 8.

expenditures per capita increased four fold from 1985 (\$46.3) to 2002 (\$188.8). Private sector drug expenditures per capita increased by only three fold from 1985 (\$93.7) to 2002 (\$297.7). BC's publicly funded expenditures clearly grew at a more rapid rate than privately funded expenditures.

BC's prescribed drug expenditures increased from \$0.26 billion in 1985 to \$1.54 billion in 2002, and are expected to account for 77.7% of BC's total drug expenditure in 2004 ⁵.

The data provided by Table 2 show that BC ranked third in population and total drug expenditures, but had the lowest total drug expenditures per capita. The low per capita figure for BC reflects a stricter, more efficient provincial drug subsidy program.

Table 2 The Total Population, Total Drug Expenditures per Capita for Ten Canadian Provinces in 2002

Province	Population (thousands)	Total Drug Expenditures (millions)	Total Drug Expenditure per capita
Ontario	12,102.0	\$7,663.5	\$633.24
Quebec	7,445.7	\$4,575.6	\$614.53
British Columbia	4,115.4	\$2,001.9	\$486.44
Alberta	3,116.3	\$1,625.8	\$521.70
Manitoba	1,155.6	\$597.0	\$516.64
Saskatchewan	995.9	\$511.8	\$513.87
Nova Scotia	934.5	\$567.2	\$606.93
New Brunswick	750.3	\$454.5	\$605.77
Newfoundland and Labrador	519.4	\$292.9	\$563.93
Prince Edward Island	136.9	\$77.3	\$564.79

Sources: Table compiled by author. Data sources: Statistics Canada, population characteristics [online], 2004; CIHI, p. 13.

⁵ CIHI, pp. 98, 99, 101.

1.4 Overview of BC Corrections' expenditures on drugs

Total drug expenditures for BC Correctional Centres increased from \$1.218 million to \$1.518 million from 2002 to 2004, a 24.66% increase (Table 3). During the same time period, the growth rate of BC Corrections' total drug expenditures was twice the growth rate for the province as a whole. As cost per drug order decreased by 0.36% from 2002 to 2004 (Table 3), the significant increase in BC Corrections' total drug expenditures can be attributed to increased drug utilization.

BC Corrections' drug expenditures are financed by the Corrections Branch, BC PharmaCare and the inmates themselves. Almost all of the drugs consumed by BC Corrections inmates, with the exception of Methadone and canteen drugs (i.e. over-the-counter drugs purchased at a correctional institution's canteen), are financed by the Corrections Branch. The Corrections Branch is responsible for the drug costs and dispensing fees and financed 78.81% of BC Corrections' total drug expenditures in 2004 (Table 3).

Corrections Branch expenditures on drugs have increased 34.71%, from \$887,885 to \$1,196,066 between 2002 and 2004 (Table 3). The drug costs and dispensing fees for Methadone provided to BC Corrections inmates are covered by BC PharmaCare. The Methadone drug costs and dispensing fees have decreased by 2.31%, from \$316,417 to \$309,093 between 2002 and 2004 (Table 3).

Non-prescription or over-the-counter drugs are sold to inmates at the BC Corrections canteens. Canteen drug expenditures decreased from \$13,233 to \$12,564 from 2002 to 2004, a 5.06% decrease (Table 3).

The above data indicate that BC Corrections' drug expenditures financed by the Corrections Branch accounted for a large portion of BC Corrections' total drug expenditures and have increased at a very rapid rate. As drug expenditures are affected by drug costs and drug

utilization, any factors that change drug costs and/or drug utilization will affect drug expenditures.

Table 3 BC Corrections' Total Drug Expenditures in 2002, 2003, and 2004

	2002	2003	% Change 2002-2003	2004	% Change 2003-2004	% Change 2002-2004
BC Corrections' Drug Expenditures financed by Corrections Branch	\$887,885	\$1,007,237	13.44%	\$1,196,066	18.75%	34.71%
Total Number of Drug Orders	39,151	43,395	10.84%	52,931	21.97%	35.20%
Cost per Drug Order	\$22.68	\$23.21	2.35%	22.60	-2.65%	-0.36%
Canteen Drug Costs	\$13,233	\$11,551	-12.71%	\$12,563	8.77%	-5.06%
Methadone Drug Costs and Professional Dispensing Fees	\$316,417	\$297,653	-5.93%	\$309,093	3.84%	-2.31%
BC Corrections' Total Drug Expenditures	\$1,217,536	\$1,316,441	8.12%	\$1,517,723	15.29%	24.66%
% of BC Corrections' Total Drug Expenditures financed by the Corrections Branch.	72.92%	76.51%		78.81%		

Source: Table compiled by author. Data source: PDC Pharmacy, "Dispensing Data for the BC Correctional Centres," for the years 2002, 2003 and 2004.

1.4.1 Factors affecting BC Corrections' drug expenditures

In order to manage drug expenditures at BC Correctional Centres, the major factors affecting drug costs and drug utilization in the BC Correctional Centres must be identified and assessed. The factors that have strong influences on all drug costs in BC are BC PharmaCare policies and programs, patent policies, the discovery of new indications for existing drugs, professional dispensing fees, drug mark-ups, and new drug entry. Any changes in BC's drug costs could have a direct impact on BC Corrections' drug expenditures. As these factors are beyond the control of BC Corrections, they are considered as external factors affecting BC Correction's drug expenditures. The BC Corrections' health care system, drug cost issues, and drug expenditure control strategies are regarded as internal factors. The internal factors could be managed by BC Corrections to reduce drug expenditures.

1.5 External factors affecting drug expenditures

1.5.1 BC PharmaCare

BC PharmaCare, a provincial drug insurance program, provides financial assistance to BC residents for eligible prescription drugs and designated medical supplies. PharmaCare is provincially funded under the Ministry of Health, and has been in operation for 31 years⁶. In 2001, PharmaCare's total drug expenditures were \$656.7 million and accounted for 36.19% of BC's total drug expenditures (Table 4).

As PharmaCare financed over one-third of BC's total drug expenditures annually from 1997 to 2001 (Table 4), its policies and programs have a strong influence on BC's drug costs and professional dispensing fees.

Table 4 BC PharmaCare's Drug Expenditures, BC's Total Drug Expenditures and % of BC's Total Drug Expenditures financed by BC PharmaCare

Fiscal Year	PharmaCare's Total Drug Expenditure (million)	BC's Total Drug Expenditure (million)	% of BC's Total Drug Expenditure financed by PharmaCare
2000/01	\$656.7	\$1814.8	36.19%
1999/2000	\$566.9	\$1652.1	34.31%
1998/99	\$504.2	\$1489.0	33.86%
1997/98	\$468.1	\$1370.9	34.15%
1996/97	\$424.8	\$1235.2	34.39%

Sources: Table compiled by author. Data sources: CIHI, p. 99; BC Ministry of Health Services, "PharmaCare Trends 2002", (Victoria: BC Ministry of Health, 2002) p. 21.

1.5.1.1 BC PharmaCare policies and programs

BC PharmaCare's expenditures, which have increased by almost 14% annually for the last ten years, have the most rapid growth rate among BC government programs⁷. In order to protect and preserve the drug reimbursement program, BC PharmaCare has developed and implemented policies and programs to manage rapidly rising prescription costs and to promote

⁶ BC Ministry of Health Services, *PharmaCare Trends 2002*, (Victoria: BC Ministry of Health, 2002) p.5.

⁷ *PharmaCare Trends 2002*, p.4.

the use of cost effective drugs. The current policies and programs and their impacts on drug utilization and costs are discussed with emphasis on two programs, the Reference Drugs program and the Low Cost Alternatives program.

1.5.1.2 The Reference Drug Program

The Reference Drug program, which was developed by BC PharmaCare in 1996, is aimed at reducing drug expenditures. The program currently applies to five therapeutic categories: Histamine 2 receptor blockers, Non-Steroidal Anti-inflammatory drugs, Nitrates, Angiotensin Converting Enzyme Inhibitors and Dihydropyridine Calcium Channel Blockers. Generally, there are many drugs in a therapeutic category that produce similar therapeutic effects but vary greatly in price. Based on drug efficacy and cost, PharmaCare selects one or more drugs from the therapeutic category as the reference drug(s). The PharmaCare coverage for a therapeutic category is based on the cost of the reference drug(s) in that category⁸. Patients receive full coverage for the reference drug or may select a more expensive drug and pay the difference in price.

The Reference Drug program is effective in reducing drug costs by discouraging the use of more expensive new and patented drugs. As many patients are unwilling to pay the difference in price, many drug companies have lowered their drug prices to match the lowest reference drug price to gain or maintain market share. As a result, the Reference Drug program has reduced drug prices in BC and has become one of the most important programs in the management of drug costs. Importantly, BC Corrections has benefited because manufacturers' wholesale prices to PDC Pharmacy have been restrained.

The reference-based pricing concept is based on the assumption that medications with similar therapeutic effects will produce the same clinical response in most patients. However,

⁸ BC Ministry of Health, *PharmaCare Low Cost Alternative, Reference Drug Program Booklet*, Version 1.2 (Victoria: BC Ministry of Health, 2004).

variations in age, race, gender, health conditions, and concurrent medications will result in different patients having different clinical responses to a medication. A drug which produces good results for one individual may not produce the same results for another individual. According to a Canadian Society of Intestinal Research report, when 39,000 patients in the reference drug program were switched to the lower-cost proton pump inhibitors in July 2003, 9,600 of them had to stop taking the cheapest brand due to treatment failure. The treatment failure was caused by the side-effects and reduced efficacy of the lower-cost proton pump inhibitors. In addition, some of the patients required hospital and cardiologist care and consequently added extra costs to the health care system⁹. This incident suggests that errors in the selection of lower cost reference drugs could be costly and produce disastrous results.

1.5.1.3 The Low Cost Alternatives Program

Drugs that contain the same active ingredients are considered by PharmaCare as the same drug. In order to save on drug costs, PharmaCare only provides full coverage for the lowest priced product. Patients receive full coverage for the lower priced drugs or may select a more expensive drug and pay the difference in price¹⁰. For example, Motrin and Apo-Ibuprofen both contain the same active ingredient: ibuprofen. As Apo-Ibuprofen is the lower priced product, it is considered the low cost alternative and is fully covered by PharmaCare. A patient who decides to take Motrin is required to pay the difference in price for the more expensive drug.

The Low Cost Alternatives Program is effective in reducing the use of more expensive brand name drugs. The BC Corrections Drug Formulary, which promotes the use of cost effective drugs, is developed and implemented by the BC Corrections Pharmacy and Therapeutics Committee. The Committee relies on PharmaCare's identification of low cost alternatives when considering drugs to include and exclude from the Formulary.

⁹ Kathie Lynas, "Pulse News: Pharmacists, other stakeholders raise red flags about reference-based pricing for Ontario", *Canadian Pharmaceutical Journal*, Vol.138, No.3 (2005).

¹⁰ *PharmaCare Low Cost Alternative, Reference Drug Program Booklet.*

1.5.1.4 Patented drugs

New drugs are discovered and marketed by either biotechnology or drug companies. Once a new drug is discovered and registered by a company it becomes a patented drug and is under patent protection. The patent owner is given a twenty year exclusive right to manufacture the new drug. The patented drug is also known as the “brand name product.” The pharmaceutical industry currently spends over US\$30 billion annually in worldwide research and development of new drugs. In 2003, the pharmaceutical industry spent \$1,142 million in Canada (\$46.1 million in BC) on drug research and development¹¹. The research and development of new drugs requires innovative product strategy, highly skilled labour, and high cost marketing strategy; therefore, it usually costs a drug company US\$500 million to US\$900 million to discover and market a new drug successfully¹².

Most drug research companies provide high cost and highly differentiated brand name products. The bargaining power of patented drug suppliers can be strong because patented drugs are often considered necessary purchases and commonly there are no substitute products.

In addition, a drug patent lasts only twenty years in Canada and launching a new drug successfully in the market takes from ten to twelve years¹³. A drug company has less than eight to ten years to monopolize the production and sales of the new drug. In order to recover research and development expenses and generate sufficient profits, the drug company is required to set and maintain a high price for the new drug.

¹¹ Susan Ogilvie, "B.C. Liberals Promise to Push Forward with National PharmaCare Strategy", *The Tablet*, Volume 14, No 5 (2005), p. 5.

¹² Steven Pelech, "The Promise of Genomics and Proteomics in Personalized Health Care Delivery, Speakers' Notes, BCPhA Pharmacy Conference May 13 & 14, 2005. p.1.

¹³ Pelech, p. 1.

1.5.1.5 The discovery of new indications for existing drugs

In order to reduce research and development expenditures and the risk of failure, there are an increasing number of drug companies researching new therapeutic indications of existing products¹⁴. In both the U.S. and Canada, regulators require evidence that new drugs are both safe and effective. As existing drugs have satisfied both criteria when a new indication for an existing drug is found, the drug company needs only show efficacy because product safety has already been established. Existing drugs that have been approved by US Food and Drug Administration and Health Canada do not have to undergo time-consuming and expensive clinical trials to prove their safety. In addition, the newly discovered therapeutic indication of an existing drug provides an opportunity for the drug company to raise the selling price and expand the market share of the existing drug. Equally as important, when a new indication is established, the patent life can be extended. As a result, the newly approved therapeutic indications for existing drugs could lead to an increase in drug cost for consumers.

The launching of minoxidil as a hair growth stimulant illustrates the impact of a newly discovered drug indication on the drug's price. Minoxidil was first discovered and approved as an oral anti-hypertensive agent. Further research and development revealed that minoxidil can stimulate hair growth. When applied to the scalp, minoxidil topical solution stimulates hair growth in individuals with alopecia androgenetica (male pattern baldness). Minoxidil was launched and marketed as a hair growth product after its new therapeutic indication was approved. In the absence of competitive hair growth products in the current market, the marketers of minoxidil topical solution are able to set and maintain a high selling price.

1.5.1.6 Generic drugs

A generic drug, which is a copy of a brand name drug, contains an active ingredient that is chemically identical to its branded counterpart (buffering agents can differ). Regulations

¹⁴ Pelech, p. 1.

require that a generic drug must be a bioequivalent, pharmaceutical equivalent, have the same route of administration, and have the same conditions for use as the brand name product. A Notice of Compliance will be issued to the generic manufacturer by Health Canada once the generic drug has met all of the requirements and is approved by Health Canada¹⁵.

In order to distinguish the generic drug from an original brand name product, the generic drug manufacturer is required to assign a different brand name to the generic product. For example, Motrin 200 mg tablet and Apo-Ibuprofen 200 mg tablet both contain 200 mg of ibuprofen per tablet. Motrin is the original brand name product manufactured by Upjohn Company and Apo-Ibuprofen is the generic product manufactured by Apotex Company. Apo-Ibuprofen is interchangeable with Motrin in the treatment of pain and headache because Apo-Ibuprofen is both a bioequivalent and a pharmaceutical equivalent and has the same route of administration and conditions for use as Motrin.

As high research and development capital are not required in the production of generic drugs, there are usually several generic drug manufacturers producing the same drugs once the original patents expire. This is especially true for widely used products. In order to gain and retain market share, generic drug manufacturers are required to maintain low and competitive drug prices.

1.5.2 Professional dispensing fees

A prescription, which is a medical practitioner's order for a prescribed drug, is dispensed by a pharmacist in Canada. The professional dispensing process consists of: checking for drug allergy, dosage, and interaction; updating the patient's medication profile; printing the prescription label; selecting and packaging the drug; and providing patient counselling. The

¹⁵ College of Pharmacists, "Drug Interchangeability Update", Information for Pharmacists, Vol. 3., No. 1, (2004) pp 1-2.

professional dispensing fee is the fee charged by the pharmacist for providing the dispensing service.

The total cost of a prescription is the combination of the professional dispensing fee and drug cost. BC PharmaCare plays an important role in the determination of prescription drug costs and dispensing fees in BC. In 2001, BC PharmaCare was responsible for 47.85% of BC's prescribed drug expenditures^{16 17}. BC PharmaCare has established a maximum drug cost for each prescription drug through its reference drug and lower cost alternatives program. PharmaCare does not reimburse any amounts that exceed its ceilings. McKesson Pharmaceutical Wholesales has matched its drug prices closely to PharmaCare's maximum drug costs; therefore, the BC retail pharmacies that purchase drugs from McKesson are unable to mark-up their prescription drugs. As most of the BC retail pharmacies purchase their drugs from McKesson, pharmacy revenues from filling prescriptions come mainly from professional dispensing fees.

The current maximum dispensing fee reimbursed by BC PharmaCare is \$8.60 per prescription. In order to receive a maximum fee reimbursement from PharmaCare, most pharmacies in BC set their dispensing fees close to \$8.60 per prescription. Based on PharmaCare dispensing fee statistics in March 2005, the average dispensing fee charged by pharmacies in BC was \$8.39 per prescription. Approximately 77% of pharmacies set their dispensing fees below \$8.61 per prescription while the remainder set their fees above the \$8.60 ceiling¹⁸.

As 46.68% of BC's expenditures on prescribed drugs were paid by households and private insurers in 2001¹⁹, the number of retail pharmacies in a geographic area can play an important role in the determination of dispensing fees. Geographic areas with more retail pharmacies enable customers to comparison shop for lower dispensing fees. In order to compete

¹⁶ *PharmaCare Trends 2002*, p.4.

¹⁷ CIHI, p. 98.

¹⁸ Ken Foreman, "PharmaCare Dispensing Fee Statistics", *The Tablet*, Vol. 14, No. 5. p.4 (2005).

¹⁹ CIHI, 98.

for customers, pharmacies in those areas are required to charge lower dispensing fees. Similarly, areas with fewer retail pharmacies provide limited shopping choices for customers and pharmacies in those areas charge higher dispensing fees. As PharmaCare reimburses up to \$8.60 as dispensing fee per prescription only, PharmaCare clients are required to pay the difference in dispensing fees.

During the period from 1992 to 2001, BC PharmaCare prescription drug costs increased by 2.6 times and professional dispensing fees increased by only 1.4 times.²⁰

These data indicate that the growth rate of drug costs is higher than that of the professional dispensing fees. The professional dispensing fee is one of the components of drug expenditures in BC; however, it is not the leading cause for the rapid increase in BC's drug expenditures. Because dispensing fees per prescription have remained unchanged for the last five years, they cannot be responsible for the increase in drug expenditures for the BC Correctional Centres.

1.5.3 Drug mark-ups

Pharmacy drugs are supplied by either drug manufacturers or wholesalers. Drug manufacturers usually establish a minimum order quantity and impose delivery charges and processing fees on drug orders that do not meet the minimum order threshold. Due to the lack of bulk purchasing power and storage capability, most retail pharmacies choose not to purchase drugs directly from drug manufacturers. Drug wholesalers receive substantial discounts from drug manufacturers through volume and contract buying. Contract buying requires a drug wholesaler to purchase a fixed amount of drugs at a fixed price from a drug manufacturer in a period of one to three years. In order to purchase and store drugs in bulk quantity, a drug wholesaler must have significant capital and large storage capacity.

²⁰ *PharmaCare Trends 2002*, p.25.

Drug wholesalers usually keep most drugs in stock and do not impose minimum order requirements; therefore, retail pharmacies usually purchase drugs from drug wholesalers. As drug wholesalers are located in every major Canadian city, drugs are delivered to retail pharmacies within twenty four hours after orders are placed. Drug wholesalers' mark-up on product sold to retail pharmacies is usually between 12 to 15%.

Due to strict federal and provincial regulations, prescribed drugs and most of the non-prescribed drugs in Canada are supplied to individuals through hospitals and retail pharmacies only. In order to improve bargaining power, hospitals in BC have joined the hospital buying group called BC Health Services. BC Health Services purchases drugs from drug manufacturers and receives significant discounts through volume buying. Most discharged patients will continue the drug therapies initiated in hospital and will purchase the same drugs from retail pharmacies. Knowing this, drug manufacturers usually offer additional discounts to hospitals. As a result, hospitals can purchase drugs at a price much lower than that available to retail pharmacies.

In addition to dispensing prescribed drugs, retail pharmacies manage the sales of non-prescribed drugs. Non-prescribed drugs are generally paid for by the customer. The mark-ups on non-prescribed drugs are inconsistent among retail pharmacies. The factors that affect non-prescribed drug mark-ups are the geographic location of the pharmacy and the sales volume of the drugs. Due to a severe shortage of pharmacists in remote areas of BC, pharmacies located in remote areas are forced to offer higher wages to attract and retain pharmacists. The increase in pharmacist wages leads to an increase in pharmacy operational costs and results in higher mark-ups on non-prescribed drugs. In addition, sales volume also affects price points. Drugs that reach their expiry dates must be discarded, resulting in a revenue loss for the pharmacies. By definition, low demand non-prescribed drugs require a longer time to sell than high demand

drugs. To compensate for loss from potential expiry date discards, low demand non-prescription drugs often carry a higher mark-up.

1.5.4 Drug utilization

Drug utilization is the volume of drugs used and is one of the drivers of drug expenditures. Drug utilization is affected by population and number of prescriptions per capita. From 1992 to 2001 BC's population increased by 19%, PharmaCare beneficiaries increased by 40% and the total number of prescriptions dispensed increased by 51%. The growth in beneficiaries has led to the growth in drug utilization and, as a result, PharmaCare expenditures increased by 127% during the same period. From 1992 to 2001, the average number of prescriptions per capita increased from 14 to 17.7 for BC seniors and from 17 to 21.7 for income assistance recipients. During the same time period, PharmaCare's drug expenditures increased from \$266 million to \$604 million²¹. The growth in the average number of prescriptions per capita has resulted in a significant increase to PharmaCare's drug expenditures.

A similar increase in prescriptions per capita has also been observed at BC Correctional Centres. Total number of drug orders for BC Corrections' inmates increased by 35.20% from 2002 to 2004 (Table 3). As the maximum capacity of the BC Correctional Centres has remained unchanged, there has been no major inmate population growth over the last four years. The increase in the number of prescriptions from 2002 to 2004 is attributed to the increase in the number of prescriptions per capita in the BC Correctional Centres.

1.5.5 New drug entry

The cost per prescription has contributed 63% to PharmaCare's overall expenditure growth from 1992 to 2002. Drug cost, the major component of the prescription cost, is the primary cost driver of PharmaCare's drug expenditure. Based on PharmaCare data,

²¹ *PharmaCare Trends 2002*, pp.13, 28, 36, 37.

PharmaCare's drug cost per prescription has increased from under \$23 to over \$37 from 1991 to 2001²². As drug prices are relatively stable²³, the rising cost per prescription is attributed to the use of more expensive new drugs.

New drugs usually have higher efficacy and/or lower risk of drug adverse effects. However, the prices of new drugs are much higher than those of conventional older drugs. Expensive new drugs are frequently being substituted for existing therapies, resulting in a drastic increase in drug cost. For example, recent research has confirmed that the new atypical anti-psychotics are more effective than conventional anti-psychotics in the treatment of schizophrenia because they have a lower risk of extrapyramidal symptoms and tardive dyskinesia. As the atypical anti-psychotic drugs are new drugs, they are much more expensive than the older conventional anti-psychotic drugs. The atypical anti-psychotic drug cost for BC Corrections was \$237,666, and accounted for 23% of the BC Corrections total drug cost in 2004²⁴. The increase in the use of new drugs has led to a significant increase in total drug costs for the BC Correctional Centres.

This chapter provided an overview of drug expenditures for Canada, British Columbia and British Columbia Correctional Centres. In addition, general factors affecting drug expenditures were identified and discussed. The next chapter will discuss the BC Corrections' health care system and its impact on BC Corrections' drug expenditures.

²² *PharmaCare Trends 2002*, pp. 26, 36.

²³ CIHI, p. 27.

²⁴ David Au, (2004)"Anti-Psychotic Medication Cost for the BC Correctional Centres", unpublished report prepared for BC Corrections, 2004.

2 BC CORRECTIONS HEALTH CARE SYSTEM

2.1 BC Correctional Centres

BC Correctional Centres, also known as BC provincial prisons, are operated by the Corrections Branch under the BC Ministry of Public Safety and Solicitor General. There are ten BC Correctional Centres: Alouette Correctional Centre for Women (ACCW), Ford Mountain Correctional Centre (FMCC), Fraser Regional Correctional Centre (FRCC), Kamloops Regional Correctional Centre (KRCC), Nanaimo Correctional Centre (NCC), Prince George Regional Correctional Centre (PGRCC), North Fraser Pretrial Centre (NFPC), Surrey Pretrial Services Centre (SPSC), the Vancouver Jail, and Vancouver Island Regional Correctional Centre (VIRCC). ACCW is for female inmates only. FMCC, FRCC, KRCC, NCC and VIRCC are for male inmates only. PGRCC, SPSC and the Vancouver Jail are co-ed centres and can accommodate male and female inmates. BC Correctional Centres have a maximum total capacity of 2,293 adult inmates.

There are two broad categories of inmates held in the BC Correctional Centres: individuals who are awaiting trial or sentence in custody and offenders who have received a jail sentence. Based on operational and supervision requirements, the BC Correctional Centres are subdivided into regional correctional centres, pretrial centres and medium correctional centres. Sentenced offenders are kept in the regional correctional centres and remanded individuals are kept in the pretrial centres²⁵ Sentenced inmates whose risk assessments indicate lower levels of supervision are kept in a medium correctional centre. There are four regional correctional centres, three pretrial centres, and three medium correctional centres in BC. FRCC, KRCC,

²⁵ British Columbia Ministry of Public Safety and Solicitor General, "Correctional Facilities in British Columbia," [online].

PGRCC, and VIRCC are the regional correctional centres located in different areas of BC. Any inmate sentenced to two years or longer stays in a regional correctional centre for approximately 15 days before being transferred to a federal penitentiary. NFPC, SPSC and the Vancouver Jail are pretrial centres. Usually remanded individuals who are awaiting trial or sentencing remain at NFPC or SPSC for a few weeks. Pretrial centres house remanded individuals for whatever period of time it takes to bring them to trial. In rare instances it can be months. The Vancouver Jail holds remanded and sentenced male inmates from Vancouver Provincial and Supreme Courts and intermittent sentenced male and female offenders from the Lower Mainland. Intermittent sentenced male and female offenders usually serve their sentences on the weekends. The Vancouver Jail does not hold inmates for more than 96 hours and therefore, has the highest inmate turnover rate among the institutions. Depending on the trial outcome, remanded inmates are either released at court, or sentenced and transferred to the regional centres. Compared to the regional correctional centres, pretrial centres usually have a higher inmate turnover rate. ACCW, FMCC, and NCC are medium security correctional centres for inmates who require minimum supervision. The medium security correctional centres provide work programs such as farming and animal husbandry, sawmill and woodwork, gardening, salmon enhancement and fire hose cleaning and repairing to inmates²⁶

2.2 BC Corrections' health care services

Except for the Methadone maintenance program and canteen medications, health care services for inmates are provided and financed by the Corrections Branch. As health care services provided for inmates are required to be equivalent to those provided for individuals in the community, inmates in the BC Correctional Centres have access to nurses, a physician, a

²⁶ British Columbia Ministry of Public Safety and Solicitor General, "Correctional Facilities in British Columbia," [online].

dentist, a psychologist and a psychiatrist.²⁷ The health professionals working for the BC Correctional Centres are either employed by or contracted to the Corrections Branch. In order to ensure that health care standards are maintained, the medical director of BC Corrections is contracted by the Corrections Branch to monitor and provide input to Corrections' health care services.

Every BC Correctional Centre has a health care centre with nurses on duty. Most of the health care centres consist of a physician's and dentist's office, nurses' station, and medication room. The physician's and dentist's office, and nurses' station are utilized for treatments and the medication room is used for medication storage.

Upon admission to a BC Correctional Centre, each inmate is assessed by an admitting nurse. Inmates who require medical or dental treatments are referred to a physician and/or dentist by the admitting nurse. Inmates who require psychiatric consultation and therapy are referred to a psychologist or psychiatrist by the physicians. Inmates with acute and severe medical problems are sent to local hospitals. The health practitioners routinely perform sick parades for the inmates at the BC Correctional Centres, and provide medical, dental, and psychiatric care and treatment for the inmates. The frequency of the health practitioners' visits depends on the inmate population in the specific institution. As medium correctional centres have smaller inmate populations, the physicians and dentists usually visit these centres once a week. For pretrial centres and regional correctional centres with large inmate populations, the physicians' visits occur up to five times a week, and dentists' visits occur more than once a week.

2.2.1 Medications for inmates

Once medications are ordered by the physician or dentist, a nurse will fax the orders to the PDC Pharmacy, which currently provides pharmacy services for the BC Correctional Centres.

²⁷ British Columbia Ministry of Public Safety and Solicitor General, "Correctional Facilities in British Columbia," [online].

For urgent drug orders, the physician or dentist may give verbal orders over the telephone directly to the pharmacist. Prior to dispensing a drug order, the pharmacist checks the drug dosage and for potential drug allergies and interactions. The health practitioner will be contacted if there are any problems relating to drug allergies, overdose potential, or severe drug interactions that may result from the drug orders. Medications are then dispensed and packaged by the pharmacy staff and delivered to the BC Correctional Centres. Medications are administered to the inmates at a designated time, and each dose of medication administered to an inmate must be charted in the medication administration record by the nurse. The designated drug administration times at the BC Correctional Centres are 7 AM, 11 AM, 4 PM, and 9 PM.

Due to the fact that the majority of inmates in the BC Correctional Centres are male adults, the physicians most frequently prescribe medications for the treatment of common male adult ailments. There are five groups of drugs that dominate drug utilization in BC Correctional Centres: non-steroidal anti-inflammatory drugs, psychiatric drugs, anti-hypertensive drugs, antibiotics, and methadone. Non-steroidal anti-inflammatory drugs are used to treat headaches, joint and muscle aches, back pain, and fever. Due to their versatile indications and low drug abuse potential, non-steroidal anti-inflammatory drugs are the mostly frequently prescribed drugs in the BC Correctional Centres.

Psychiatric drugs include anti-depressants and anti-psychotics. As depression and schizophrenia are prevalent in BC Corrections inmate population, anti-depressants and anti-psychotics are frequently prescribed. Due to the higher efficacy and lower incidence of adverse effects, there has been a significant increase in the use of atypical anti-psychotic drugs in the pretrial and regional correctional centres. The high cost of atypical anti-psychotic drugs has resulted in a significant increase in drug costs for BC Correctional Centres²⁸.

²⁸ David Au, "Anti-Psychotic Medication Cost for the BC Correctional Centres".

A number of inmates with hypertension are admitted to BC Correctional Centres. As untreated hypertension could lead to strokes and severe cardiac illnesses, physicians are often required to initiate or continue anti-hypertensive drug therapies. In order to maintain normal blood pressure, patients on anti-hypertensive drug therapies are required to continue taking their anti-hypertensive drug(s) daily for the rest of their life. As a result, the utilization of anti-hypertensive drugs is high in the BC Correctional Centres.

Inmates are frequently housed in communal living units and share furniture and equipment. The frequent direct and indirect contact among inmates has a high likelihood of facilitating bacterial transmissions and increasing the spread of infectious diseases. As many inmates are or have been heavy alcohol users and/or smokers, they are susceptible to infectious diseases. The high rate of infectious diseases has resulted in a greater demand for antibiotics in the BC Correctional Centres than the general at large population. Penicillin, which is a low cost and broad spectrum antibiotic, was one of the most popular antibiotics prescribed in the BC Correctional Centres. However, with the emergence of resistant strains, penicillin has become ineffective against many bacteria, and physicians are often required to order more expensive and potent antibiotics to combat penicillin resistant bacteria.

BC Corrections Branch has approved the continuation of the methadone maintenance program in BC Correctional Centres. Inmates who have enrolled in the methadone maintenance program prior to incarceration are allowed to continue their methadone therapy in BC Correctional Centres. As drug costs and dispensing fees for methadone are covered by BC PharmaCare, there is no impact on Corrections' drug expenditures from the methadone maintenance program.

Inmates staying at pretrial centres are awaiting trial or sentencing and their release dates are unpredictable. The average stay of an inmate in a pretrial centre is five to seven days, so

physicians usually continue drug therapies that were initiated for the inmates prior to incarceration. In order to prevent smuggling of illicit drugs and chemicals into BC Correctional Centres, inmates are not allowed to bring any medications into the Centres. As a result, inmates keep their medications at home, and medications provided for inmates in the Centres must be ordered by Corrections physicians and supplied by the PDC Pharmacy or contracted local community pharmacies. The contracted local community pharmacies provide non-contingency and urgently needed drugs to BC Correctional Centres only when necessary. This will be discussed in chapter 5. As medications prescribed to inmates prior to incarceration are not allowed into Corrections facilities, there is no need for inmates to take Corrections medications with them upon discharge. The unfinished medications from discharged inmates constitute substantial drug wastage. Pretrial centres have the highest wastage of medications among the BC Correctional Centres.

As inmates in a regional correctional centre have longer stays, physicians are able to initiate, implement, and monitor long-term drug therapies. The initiation, implementation, and monitoring of long-term drug therapies can be very expensive and can result in high medication costs for the regional correctional centre. For example, Hepatitis C drug therapy, which involves a minimum of six month treatment and a drug cost totalling \$9,000, is usually provided only in regional correctional centres.

2.3 BC Corrections drug expenditures financed by the Corrections Branch

All of the prescription and over-the-counter drugs consumed by BC Corrections inmates, with the exception of Methadone and canteen drugs, are financed by the Corrections Branch.

Table 5 The Maximum Holding Capacity, Drug Expenditures Financed by Corrections Branch, Total Number of Drug Orders and Cost per Drug Order for Each BC Correctional Centre in 2004

2004	Maximum Capacity (inmates)	Drug Expenditures financed by Corrections Branch	Total Number of Drug Orders	Cost per Drug Order
Regional Correctional Centres				
FRCC	422	\$205,969	9,276	\$22.20
VIRCC	294	\$169,038	6,301	\$26.83
PGRCC	232	\$73,866	3,443	\$21.45
KRCC	223	\$141,463	4,878	\$29.00
Pretrial Centres				
NFPC	490	\$237,891	11,736	\$20.27
SPSC	199	\$161,172	8,116	\$19.86
VAN JAIL	63	\$15,820	594	\$26.63
Medium Correctional Centres				
NCC	170	\$54,613	2,418	\$22.59
ACCW	112	\$99,050	4,807	\$20.61
FMCC	88	\$37,177	1,362	\$27.30
TOTAL	2,293	\$1,196,066	52,931	\$22.60

Sources: Author's compilation from various data sources including: British Columbia Ministry of Public Safety and Solicitor General, "Correctional Facilities in British Columbia," [online]. PDC Pharmacy "Dispensing Data for the BC Correctional Centres in 2004".

As the data in Table 5 indicate, there is a significant difference in cost per drug order among the BC Correctional Centres. The difference between the highest and lowest cost per drug order within each Centre grouping is over \$7.00. Because each Centre is charged the same professional dispensing fee per prescription, the difference in cost per drug order can be attributed to the difference in drug cost per order. The significant difference in drug cost per order reflects a great discrepancy in drug cost among the BC Correctional Centres. It is worth noting that ACCW had the highest drug expenditures among medium correctional centres in 2004. As NCC and FMCC are male adult centres, and ACCW is a female adult centre, the results indicate that drug costs for female inmates is higher than that of male inmates in medium correctional centres.

This chapter discussed the role and structure of the BC Correctional Centres and BC Corrections health care services and their impacts on drug costs. In addition, medications for inmates and drug costs for the BC Correctional Centres were discussed. The next chapter will consider the issues in the management of drug costs for the BC Correctional Centres.

3 BC CORRECTIONS' DRUG COST ISSUES

3.1 BC Corrections' pharmacy services provided by the private sector

Prior to the closure, and with the exception, of the Lower Mainland Regional Correctional Centre (LMRCC) in 1991, pharmacy services for the BC Correctional Centres were provided by the private sector. LMRCC had an on-site pharmacy that provided prescription and non-prescription drugs to inmates at the Centre. At the other BC Correctional Centres, medications were provided by local retail pharmacies. Based on the pharmacy location and dispensing fee per prescription, the head nurse and program director at each BC Correctional Centre selected a local drug store to provide pharmacy services for the institution. The chosen drug store was usually located in the vicinity of the BC Correctional Centre and charged the lowest professional dispensing fee per prescription in the area. Drugs were ordered by the health practitioners and faxed by the nurses to the pharmacy.

In order to ensure that there were no delays in the initiation or continuation of drug therapies; medications were dispensed by pharmacists and delivered to the BC Correctional Centres four to six hours after they were ordered. An invoice, which listed the name, quantity, cost and professional dispensing fees of the drugs supplied to the BC Correctional Centre, was delivered with the drugs to the centre. The nurse checked off the received drugs from the invoice and notified the pharmacy of any discrepancies. The local retail pharmacies usually received monthly payments for the pharmacy services from the BC Correctional Centres.

3.2 Drug wholesale mark-ups

As prescription drugs are usually sold at acquisition cost, and most of the retail pharmacies in BC purchase their drugs from the same drug wholesalers, there is no difference in prescription drug prices among BC retail pharmacies. Prior to 2000, Alpha Pharmaceuticals was the biggest drug wholesaler in BC and supplied drugs to most of BC's retail pharmacies. Due to its huge sales volume and warehouse capacity, Alpha Pharmaceuticals was able to purchase a large volume of drugs directly from the pharmaceutical manufacturers. Prior to selling the drugs to retail pharmacies, Alpha Pharmaceuticals marked up the drugs by 18% to 20% above acquisition costs. As a result, all of the BC Correctional Centres, except LMRCC were paying 18% to 20% above the manufacturer's price for their prescription drugs.

The LMRCC pharmacy department was a government pharmacy and purchased pharmaceuticals directly from a BC government pharmaceutical wholesaler. As the government-owned pharmaceutical wholesaler was able to purchase drugs directly from the manufacturers and reduce the drug mark-up to 10% to 12% above its acquisition cost, the LMRCC was able to obtain prescription drugs at a much lower price.

3.2.1 Non-prescribed drugs mark-ups

Non-prescribed drugs consist of pharmacy and non-pharmacy sales of over-the-counter drugs. Prior to the establishment of the BC Corrections canteen medication list (discussed in chapter 4), over-the-counter drugs were ordered for inmates by Corrections' physicians and supplied by local retail pharmacies. As local community pharmacies do not charge professional dispensing fees for over-the-counter drugs, pharmacy revenues from supplying over-the-counter drugs come solely from the drug mark-ups.

Due to the difference in mark-ups for over-the-counter drugs, there is a great variation in drug prices among BC's retail pharmacies. Depending on the geographic location and local

competition, mark-ups on over-the-counter drugs range from 50% to 100% above their acquisition costs. As BC Correctional Centres are located in different areas of BC, and drugs were provided by different retail pharmacies, there was a great discrepancy in non-prescribed drug prices among the BC Correctional Centres. For example, the drug cost for a bottle of antacid was \$4.00 for the Nanaimo Correctional Centre and only \$3.00 for the Vancouver Island Regional Correctional Centre. As non-prescribed drugs were sold at their acquisition cost at the LMRCC pharmacy department, the drug cost for a bottle of antacid was only \$2.00.

3.2.2 Professional dispensing fees

In addition to the difference in non-prescribed drug prices, the dispensing fees paid by BC Correctional Centres varied significantly. In 1992, the difference between the highest and lowest dispensing fees for BC Correctional Centres was over \$2.00 per prescription. The centres located in remote areas of BC paid higher dispensing fees than those located in urban areas. As the LMRCC pharmacy was not required to generate profits, the dispensing fees for LMRCC were based solely on operational costs, and were the lowest among the BC Correctional Centres in 1991.

3.2.3 Lack of incentive and resources for the management of drug costs

The goal of local retail pharmacies is to generate profits from drug sales and any increase in drug utilization will lead to an increase in profits for the retail pharmacies. Retail pharmacies, as drug suppliers for the BC Correctional Centres, gained no benefits from managing BC Corrections' drug utilization and costs. In addition, because pharmacy revenues from dispensing prescription drugs come solely from professional dispensing fees, the promotion of cost effective drugs would take up more pharmacists' time and create no profits for retail pharmacies. Furthermore, no resources were provided by the Corrections Branch in the development of drug cost management programs.

3.2.4 Drug costs and principal-agent problems

3.2.4.1 Physicians' drug orders

Health practitioners such as physicians, dentists and psychiatrists are contracted by the Corrections Branch and are responsible for ordering prescribed and non-prescribed drugs for the inmates at BC Correctional Centres. Based on the Corrections Branch Health Care Policy, psychiatrists are considered health care consultants, and their drug orders must be approved and co-signed by the physicians. According to the PDC Pharmacy dispensing data, less than 1% of prescriptions are ordered by dentists at the BC Correctional Centres. As physicians are responsible for most of the drug orders, the physicians' choice of drugs is a critical factor in the determination of inmate drug costs at BC Correctional Centres.

3.2.4.2 Physicians' prescribing habits

One of the most important roles of a physician is to select the most appropriate drug therapy for their patients. Within the medical practice guidelines, a physician in BC may select a drug from a therapeutic category of available drugs. While each therapeutic category consists of a number of drugs that are equally efficacious, physicians are usually more familiar with drugs that are heavily promoted by drug companies, and therefore tend to order those drugs more frequently.

Based on a BC physician survey, physicians in BC are unaware of the large differences in drug prices, and tend to overestimate the prices of inexpensive drugs and underestimate the prices of expensive drugs. In the survey, BC physicians were asked to estimate the prices of twenty drugs. The price of thirteen drugs was under \$40.00, and the price of seven drugs was over \$40.00. The physicians overestimated the price of all thirteen drugs under \$40.00, and underestimated six out of seven drugs over \$40.00. This lack of drug cost awareness is due to a number of factors including inadequate education and limited access to drug cost information.

The physicians' age, gender, practice location, and years of practice have no correlation with the awareness of drug costs²⁹. Generally, physicians do not take drug costs into consideration when selecting drug therapies for their patients. Prior to the development of the PharmaCare Reference Drug Program in 1996, the government did not provide guidelines for the management of prescription drug costs.

Physicians' prescribing habits can be significantly influenced by pharmaceutical sales representatives. In order to become a physicians' preference in its therapeutic category, a new drug must be promoted aggressively by drug sales representatives.

Some pharmaceutical sales representatives provide product information and free drug samples to physicians regularly. In order to reduce drug costs for patients, physicians often offer these free drug samples to their patients for the initiation and continuation of drug therapies. As a result, a new drug that is successfully promoted by drug sales representatives could become the physicians' favourite. Unsurprisingly, the prices of newly introduced, patent protected drugs are generally substantially higher than the prices of existing drugs in the same therapeutic category.

It is difficult for physicians to replace expensive drug therapies with equivalent and lower cost alternatives in the BC Correctional Centres. When a patient has taken a drug for a while and obtained a good clinical response from the medication, he or she is typically unwilling to take a different drug. The difference in colour, shape and dosage between the expensive drug and its lower cost alternative could reduce the patient's confidence and compliance and result in a loss of drug effectiveness. As patients are reluctant to change drug therapies, inmates could become extremely angry and hostile if medications which were initiated and continued prior to their incarceration were changed. In some cases, inmates will contact their lawyers and file official

²⁹ G.M. Allan and G. D. Innes, "Survey in British Columbia, Do family physicians know the costs of medical care", *Canadian Family Physician*, vol. 50 (2004) pp. 263-70.

complaints against the physicians. In addition, any changes in drug therapies could increase the risk of medical complications and create a higher risk for malpractice liability for the physicians.

3.2.5 The impact on drug cost from physicians' choice of drugs

As physicians' prescribing habits could be affected significantly by successful drug promotions, the increase in the prescribing of new drugs, brand name drugs, and higher cost drugs in the therapeutic category could lead to a substantial increase in drug cost. To explain and illustrate the impact of physicians' prescribing habits on the prescribing of new drugs, brand name drugs, and higher cost drugs in the therapeutic category, examples will be used in the following discussion.

New drugs are expensive because drug companies are required to recover the huge expenses incurred in researching and developing new drugs. For example, Losec and Zantac are both effective in the treatment of peptic and duodenal ulcers with minimal drug adverse effects. Compared to Zantac, Losec is considered a new drug, and its price is five times that of Zantac. Based on the PDC Pharmacy dispensing data in 2004, Losec was more frequently prescribed than Zantac and led to an increase in drug cost for BC Correctional Centres.

New drugs are believed to be more effective and have less adverse effects; however, given the lack of long-term use data, the safety of new drugs for long-term use is often unknown. For example, Vioxx is a new drug and one of the most expensive drugs in its therapeutic category. With successful promotion, Vioxx became Canada's eleventh most frequently prescribed drug in 2003 and 2004³⁰. Due to findings indicating increased risk of heart attacks and strokes, Vioxx was withdrawn from the worldwide market in September 30, 2004³¹.

³⁰ Sue Cavallucci, "Top 200 of 2004", *Pharmacy Practice*, Vol, 20, No 12 (2004), p.40.

³¹ Health Canada, "Safety information regarding selective COX-2 inhibitors", [online]

The pattern evident in the prescribing of Tylenol #3 illustrates the impact of physicians' prescribing habits on the sales of brand name drugs. Tylenol #3 is a brand name drug and ranked as Canada's fifth most frequently prescribed drug in 2004³². Tylenol #3 consists of acetaminophen, codeine and caffeine and has been on the market for many years. The price of Tylenol #3 is higher than that of generic products. However, as it has first mover advantage, most of the physicians in Canada are more familiar with Tylenol #3 and continue to order the brand name drug only. Based on PDC dispensing data, Tylenol #3 has been ordered more frequently than any of the generic products.

Olanzapine sales illustrate how, by heavy promotion, a higher price drug could outsell its lower price competitors. Risperidone, Quetiapine and Olanzapine are effective in the treatment of schizophrenia with low risk of extrapyramidal symptoms. Despite the fact that Olanzapine is one of the most expensive drugs in its therapeutic category, with aggressive and successful promotion, Olanzapine was the most frequently prescribed atypical anti-psychotic drug for inmates at BC Correctional Centres in 2004³³.

Overall, physicians do not have strong incentives to prescribe cost effective drugs for inmates at BC Correctional Centres, and that plays a role in the significant increase in the Centres' purchases of more expensive drugs. A principal-agent problem exists when the employer of the physicians cannot fully observe the physicians' effort. The principal-agent problem occurs when the physicians' actions are imperfectly observable, and when the incentives of the physicians are less than perfectly aligned.

³² Cavallucci, p. 40.

³³ David Au, "Anti-Psychotic Medication Cost for the BC Correctional Centres".

3.2.6 Drug cost issues created by the failure of price to ration drug consumption

3.2.6.1 Increase in drug consumption

Prescription drug costs for inmates in the BC Correctional Centres are fully covered by the Corrections Branch; therefore, there is no incentive for inmates to balance the marginal benefit and marginal cost for each unit of drug consumed. Drug price does not ration drug consumption and inmates may opt for expensive drug consumption. The supply of Nicoderm patches to inmates is a good example to illustrate the impact of drug price changes on drug consumption. In order to promote a second-hand smoke free environment in the BC Correctional Centres, Corrections Branch provided inmates with Nicoderm patches, free of charge for a trial period of three months. The Nicoderm patch, which contains nicotine, is used to replace cigarettes and helps people quit smoking. When a Nicoderm patch is applied topically to the skin, it releases nicotine into the body and produces the same physiological effects as cigarette smoking. Nicoderm patches have three staged levels of nicotine content, 21, 14 and 7 mg. As smokers move from high to lower nicotine dosages, cravings diminish and eventually the smoker is able to stop using the patches and continue as a non-smoker. During the trial period, most of the cigarette smokers in the BC Correctional Centres appeared to use the Nicoderm patches to replace cigarettes. Most of the inmates that enrolled in the program used the high potency patches throughout the trial period. Once the trial period was over and inmates were required to pay for their Nicoderm patches, Nicoderm patch consumption in the BC Correctional Centres dropped to almost zero. After inmates were required to pay for their Nicoderm patches, there was an incentive for inmates to balance the marginal benefit and cost of the patches. As the inmates considered Nicoderm patches and cigarettes as similar products, they chose the lower priced cigarette and returned to cigarette smoking.

3.2.7 Increase in patients' resistance to drug substitution

In addition, the free drug program offered by the Corrections Branch has created inmate resistance to the substitution of cost effective products for expensive drugs. For example, Olanzapine and Risperidone are both atypical anti-psychotic drugs and both are effective in the treatment of schizophrenia with minimal adverse effects. However, the cost of Olanzapine is two and a half times higher than that of Risperidone. As inmates are not required to pay for their medications, there is no incentive for inmates to consider the cost of their drug therapies. Inmates who were on Olanzapine therapy prior to their incarceration always refuse to change from Olanzapine to Risperidone and as a result, the Corrections Branch is required to pay for the higher cost medication.

3.2.8 Increase in drug wastages

It is not uncommon for inmates to request frequent and premature drug changes prior to the completion of their recommended drug therapy treatment. For example, anti-depressants usually require up to six weeks before producing a significant clinical response. However, inmates frequently request a drug change after two weeks of an anti-depressant drug therapy. As a one month supply of anti-depressants is usually dispensed to the inmates, the frequent and premature change of anti-depression drugs leads to an increase in drug wastage. This increases the drug cost for BC Correctional Centres.

This chapter discussed issues in the management of drug costs for the BC Correctional Centres. The next chapter will discuss the development of BC Corrections drug control strategies.

4 BC CORRECTIONS DRUG EXPENDITURE CONTROL STRATEGIES

4.1 The establishment of the PDC Pharmacy

In order to manage the rapidly rising drug expenditures of the BC Correctional Centres, Corrections Branch and the Product Distribution Centre (PDC) launched a pilot project in 1991. The PDC, which is a cost recovery operation within the Ministry of Labour and Citizens' Services of BC, provides full service inventory management and distribution to Crown corporations, government funded organizations, and federal and municipal governments. The organization has provided pharmaceuticals, medical products, surgical supplies, janitorial items, emergency health and safety products, and uniforms to customers throughout BC for over fifteen years.

The objective of the pilot project was to explore new opportunities to reduce BC Correctional Centres' drug expenditures. The PDC Pharmacy, one of the PDC departments, was chosen by the Corrections Branch to provide pharmacy services for SPSC (Surrey Pretrial Services Centre) for a trial period of one year. At the end of the trial period, the drug cost per prescription for SPSC was compared with the drug cost per prescription for the other BC Correctional Centres. The Corrections Branch discovered that the SPSC drug cost per prescription was significantly lower than that of other BC Correctional Centres. The decreased cost per prescription for SPSC was due to the PDC Pharmacy's lower drug costs and lower professional dispensing fees.

As the PDC Pharmacy purchases drugs with a lower mark-up from PDC Pharmaceutical Wholesales, PDC Pharmacy is able to provide its customers drugs at a lower price. PDC

Pharmaceutical Wholesales, which is also one of the PDC departments, provides drugs in bulk to hospitals, public health units, BC Ambulance Services, and the PDC Pharmacy. Due to its bulk buying power and large warehouse capacity, PDC Pharmaceutical Wholesales is able to purchase drugs directly from manufacturers. In addition, PDC Pharmaceutical Wholesales has joined with BC Health Services and is now able to purchase drugs at an even lower contracted price. BC Health Services, which is a hospital supply purchasing group, purchases pharmaceuticals and medical supplies for most of the hospitals in BC. As PDC is a cost recovery operation and is not required to generate profits for the BC Government, PDC Pharmaceutical Wholesales is able to provide very competitive pricing to its customers.

Based on the results of the pilot project, the Corrections Branch decided to transfer the pharmacy services for the BC Correctional Centres from local community pharmacies to the PDC Pharmacy. The PDC Pharmacy has grown rapidly in the past fourteen years, and currently provides pharmacy services to ten BC Correctional Centres, three BC Youth Custody Centres, and sixteen government funded group homes. The pharmacy sales were \$1,836,879 in fiscal year 2004³⁴. PDC Pharmacy activities consist of: dispensing medications, providing drug information and dispensing data to the health professionals, developing drug distribution policies and procedures, and administering methadone to patients. In order to fulfil its operational requirements, the PDC Pharmacy employs one pharmacy manager, nine pharmacists, and six pharmacy technicians.

4.2 The establishment of the BC Corrections Pharmacy and Therapeutics Committee

In order to manage drug expenditures for the BC Correctional Centres, the PDC Pharmacy Manager assisted the Medical Director of the BC Corrections in the creation of the BC

³⁴ David Au, "The Financial Analysis and Strategic Planning for PDC Pharmacy", unpublished report produced to satisfy MBA 606, Financial Management course requirements, 2004.

Corrections Pharmacy and Therapeutics Committee. The committee's mandate is to manage drug costs and utilization, and develop and implement policies and procedures for the distribution and administration of medications in BC Correctional Centres. The committee, which consists of the PDC Pharmacy Manager, the Medical Director, the Head Nurse, and the Physician for the BC Corrections, meets bi-annually to discuss and resolve current issues related to drug distribution.

In order to manage drug costs for BC Corrections, the Committee develops and revises the BC Corrections Drug Formulary, Automatic Substitution Protocols, and a Contingency Medication List. The Committee considers the cost effectiveness of a drug as one of the most important factors in the drug assessment process. The drugs selected by the Committee are usually the most cost effective drugs in their therapeutic categories. In order to manage drug utilization for the BC Corrections, the committee restricts the dispensing quantity to no more than a one month supply of medications for inmates in the BC Correctional Centres. Due to frequent changes of drug dosages and therapies, limiting the dispensing quantity could reduce drug wastage. In addition, the turnover rate of remanded inmates is high, and limiting the dispensing quantity could reduce the quantity of unfinished drugs left by the discharged inmates.

4.3 Value added services

In addition to providing lower cost drugs and professional dispensing fees, the PDC Pharmacy has provided many value added services for BC Correctional Centres. Some of the value added services are useful in the management of BC Corrections' drug expenditures. Expenditure reduction related services include the development and implementation of a drug formulary, a contingency medication list, a list of over-the-counter medications to be made available in canteens, a set of drug protocols, automatic substitution policies, and standing medication orders. PDC Pharmacy has also provided BC Corrections with drug therapy evaluations.

4.3.1 BC Corrections' Drug Formulary

Based on the Drug Formulary from Riverview Hospital and St. Paul's Hospital, the PDC Pharmacy Manager drafted the BC Corrections Drug Formulary. Prior to the launch of the BC Corrections Drug Formulary, each drug was reviewed and approved by the BC Corrections Pharmacy and Therapeutics Committee. The Drug Formulary, which identifies safe, efficacious and cost effective drugs in each therapeutic category, is provided to BC Corrections' health practitioners as a drug selection reference. Under each therapeutic category, the health practitioner is limited to ordering only drugs that are listed in the Drug Formulary. The health practitioners may order non-formulary drugs; however, they must complete a Non-Formulary Medication Prescription Order form and provide valid reasons for ordering the non-formulary drugs.

In order to update the BC Corrections Drug Formulary, suggestions from the health practitioners, pharmacists, and nurses concerning changes to the Drug Formulary are sent to the BC Corrections Pharmacy and Therapeutics Committee. Prior to making any changes to the Drug Formulary, proposals to add or delete drugs are assessed and approved by the committee.

In order to raise the health practitioners' awareness of drug costs, a PDC pharmacist provided drug cost ratings for the drugs in the Drug Formulary. Based on the drug cost, each drug in the formulary is assigned a different number of dollar signs. The drugs that are assigned more dollar signs are considered as more expensive drugs. For example, the drugs that are assigned four dollar signs are considered very expensive drugs, and drugs that are assigned one dollar sign are considered inexpensive drugs³⁵. The drug cost ratings in the Drug Formulary can help to reduce drug cost by allowing physicians to use the lower cost drugs in the initiation of drug therapies, and to consider the use of higher cost drugs only if the lower cost drugs fail to provide satisfactory clinical responses. For example, Toradol 10mg and Motrin 400mg tablets

³⁵ BC Corrections, "Drug Formulary", unpublished internal policy document, 2001, p.36.

are considered to be effective drugs in the treatment of pain and inflammation; and both drugs are listed in the Drug Formulary as non-steroidal anti-inflammatory analgesic drugs. The cost for each Toradol 10mg tablet is \$0.36. The cost for each Motrin 400mg tablet is \$0.04³⁶. According to the drug cost ratings, Toradol is assigned four dollar signs and Motrin is assigned one dollar sign in the Drug Formulary. As a result, Motrin should be considered by the health practitioner as the drug of choice in the management of pain and inflammation. Toradol should be considered as an alternative only when Motrin is unable to provide satisfactory clinical responses. After the drug cost ratings were published in the Drug Formulary, Motrin became one of the most frequently prescribed drugs in the BC Correctional Centres.

4.3.2 BC Corrections' Contingency Medication List

The PDC Pharmacy is located in the Lower Mainland. Four of the BC Correctional Centres are located outside of the Lower Mainland. A minimum of twelve hours is required to deliver medications from the PDC Pharmacy to the 'out-of-town' Centres. As some of the drug therapies must be initiated or continued within four hours of being ordered by the health practitioners, contingency medications are required for the initiation or continuation of the drug therapies until medications arrive from the PDC Pharmacy. A contingency medication list, which consists of frequently prescribed and urgently needed medications, was composed by the PDC Pharmacy Manager.

Prior to launching the BC Corrections Contingency Medication List, each drug on the Contingency Medication List was reviewed and approved by the BC Corrections Pharmacy and Therapeutics Committee. Due to the difference in medication demand among the BC Correctional Centres, the Centres are not required to stock all of the contingency drugs on the List. However, non-contingency drugs cannot be stocked in the BC Correctional Centres. In

³⁶ PDC Pharmacy, "Dispensing Data for the BC Correctional Centres in 2004", unpublished internal data review.

order to ensure that there are no delays in the initiation and continuation of urgently needed drug therapies, the BC Corrections Contingency Medication List is reviewed and revised by the BC Corrections Pharmacy and Therapeutics Committee twice annually.

In addition to providing urgently needed drugs in the treatment of acute and severe illnesses, the contingency medications could reduce the BC Corrections' drug expenditures by avoiding professional dispensing fees and drug wastage. Some of the inmates stay in the BC Correctional Centres for less than twenty-four hours and are unable to finish a full course of medications. Costs incurred by professional dispensing fees and drug wastage could be avoided if these short stay inmates were administered one or two doses of their medications from the contingency medication stock. Furthermore, the use of contingency medications could promote the use of cost effective antibiotics. The difference in drug cost among antibiotics with a similar bacterial spectrum is significant. As only the lower cost antibiotics are listed in the Contingency Medication List, physicians prescribe the lower cost antibiotics in the treatment of acute and severe infections.

In order to ensure the proper use of contingency medications in the BC Correctional Centres, contingency medications must be administered to an inmate by a nurse following the directions of a physician's order. In addition, each dose of contingency medication administered to an inmate must be charted in the contingency medication record card and medication administration record. As well, the completed contingency medication record cards are returned to the PDC Pharmacy and reviewed by the PDC Pharmacists.

4.3.3 List of Over-The-Counter Medications Available In Canteen

In order to reduce drug costs for BC Corrections, the PDC Pharmacy Manager proposed that over-the-counter drugs be sold in the canteen of each BC Correctional Centre. A list of over-the-counter medications available in canteens was drafted by the PDC Pharmacy Manager and

submitted to the BC Corrections Pharmacy and Therapeutics Committee for approval. The drugs on the list are the most commonly used over-the-counter drugs and can be sold from non-pharmacy outlets such as grocery or convenience stores.

After the canteen drug list was approved and launched by the BC Corrections Pharmacy and Therapeutics Committee, the drugs on the list were no longer distributed in living units or from BC Correctional Centres' health care centres. Inmates are now required to purchase these drugs from the canteens.³⁷ Using price to ration drug consumption is one of BC Corrections' drug cost management strategies. The consumption of over-the-counter drugs declined significantly after the launch of drug sales in the canteens. For example, Tylenol tablet consumption dropped by eight fold after the launch of the program. In order to ensure that no inmates are deprived of the canteen medications, inmates who are unable to pay for the canteen medications can have the drugs ordered for them by a physician. Due to new drug entries and drug status changes, the List of Over-The-Counter Medications Available in Canteen is reviewed and revised by the BC Corrections Pharmacy and Therapeutics Committee twice annually.

4.3.4 BC Corrections' Drug Protocols

Because a high number of inmates admitted to the BC Correctional Centres suffer from alcohol and drug withdrawal, physicians working in BC Correctional Centres are required to order drug therapies to manage withdrawal symptoms. Due to differences in medical training and drug preferences, physicians were using different drugs to manage withdrawal symptoms. As a result, drug costs and treatment duration varied greatly among the BC Correctional Centres.

In order to provide consistent and cost effective drug therapies for the inmates, the PDC Pharmacy Manager consulted with a number of alcohol and drug detoxification centres and developed four drug protocols for the management of alcohol, benzodiazepine, opiate, and

³⁷ BC Corrections, "List of Over-The-Counter Medications Available in Canteen", unpublished internal policy document, revised September 19, 2003.

cocaine withdrawal. The objective of the drug protocols was to provide some guidelines for BC Corrections' physicians to encourage the use of equally effective and lower cost drugs, and to shorten the duration of treatment in the management of withdrawal symptoms. These protocols were reviewed, implemented and approved by BC Corrections' physicians and the BC Corrections Pharmacy and Therapeutics Committee, and have been accepted as the treatment protocols for all BC Correctional facilities^{38 39 40 41}.

4.3.5 BC Corrections Automatic Substitution Protocol

The Automatic Substitution Protocol was developed by PDC pharmacists and revised and approved by the BC Corrections Pharmacy and Therapeutics Committee. The main objective of the Automatic Substitution Policies was to reduce medication costs by promoting the use of formulary and generic drugs. Any non-formulary drugs or specific formulation/brands of formulary drugs not stocked by the PDC Pharmacy are automatically substituted according to the Automatic Substitution List. Physicians are required to specify "No Substitution" in their prescriptions if no substitutions are allowed⁴². For example, based on the Automatic Substitution Protocol, Erythromycin 250 mg tablets taken four times a day could be substituted for Erythromycin 333 mg capsules taken three times a day. Based on a drug cost of \$0.39 per Erythromycin 333 mg capsule and \$0.09 per Erythromycin 250 mg tablet, the cost savings obtained by replacing the Erythromycin 333 mg capsules with the Erythromycin 250 Tablets for a 10 day drug therapy would be \$8.10. The Automatic Substitution Protocol can reduce BC Corrections' drug expenditures by allowing the pharmacists to substitute lower cost generic and formulary drugs for brand name and non-formulary drugs.

³⁸ BC Corrections, "Management of Alcohol Withdrawal", unpublished internal policy document, 2001.

³⁹ BC Corrections, "Management of Benzodiazepine Withdrawal", unpublished internal policy document, 2001.

⁴⁰ BC Corrections, "Management of Cocaine Withdrawal", unpublished internal policy document, 2001.

⁴¹ BC Corrections, "Management of Opiate Withdrawal", unpublished internal policy document, 2001.

⁴² BC Corrections, "Automatic Substitution Protocol", unpublished internal policy document, 2002.

BC Corrections' Standing Medication Orders

The BC Corrections system could achieve additional cost reduction by establishing a policy and procedures for standing medication orders. Currently inmates can purchase “non-pharmacy sales” over-the-counter drugs at the institution’s canteen. However, to obtain “pharmacy sales only” over-the-counter drugs, they must first see a physician. In many instances the ailment is relatively minor and there is no medical need for a doctor’s visit or prescription drugs. An option should be available for inmates to obtain over-the-counter drugs without a doctor’s visit, much like the general public.

Based on the *Drug Schedules* established by the College of Pharmacists of BC, over-the-counter drugs are divided into “pharmacy distribution required” and “non-pharmacy distribution permitted” products. The products in the latter category can be sold in the canteen but the products in the former category can only be sold in a pharmacy. In order to distribute the “pharmacy distribution required” over-the-counter drugs in the BC Correctional Centres, the PDC Pharmacy Manager consulted with the BC Corrections’ physicians and developed standing medication orders for each of the BC Correctional Centres. The standing medication orders, which consist of a list of over-the-counter drugs, and policy and guidelines for the use of these medications, allow the BC Corrections’ nurses to administer over-the-counter drugs in the treatment of minor illnesses. A large quantity of these over-the-counter drugs are supplied by the PDC Pharmacy and kept in the nurses’ stations. Based on the nurse’s clinical judgment, the nurse may follow the directions in the standing orders and administer over-the-counter drugs to the inmates. As standing medication orders are recommended for short-term use only, the nurse is required to contact the physician if patient’s conditions do not improved within the time limit specified in the standing medication orders.

The standing medication orders must be approved and signed by a BC Corrections' physician and are required to be reviewed and renewed by the physician annually⁴³. As most minor illnesses can be managed by a few doses of over-the-counter drugs, the standing medication orders can reduce the prescribing and dispensing of expensive prescription drugs. For example, the number of prescriptions for and consumption of Chlor-tripolon 4mg tablets in BC Correctional Centres has dropped by over 100% after the drug was provided by the nurse through standing medication orders. An effective standing medication orders policy should significantly reduce drug costs and dispensing fees for BC Corrections.

4.3.6 Drug therapy evaluations

The PDC pharmacists frequently evaluate new drug therapies and recommend safe, efficacious, and cost effective drug therapies to BC Corrections' physicians. Two of the drug therapy assessments, which can provide substantial savings in the drug cost, are discussed below.

The various drug therapies in the treatment of stomach ulcers were assessed by the PDC Pharmacy Manager in terms of drug cost and efficacy. There are several effective drug regimens used to eradicate bacteria as a method of treating stomach ulcers. The drug cost ranges from \$36.00 to \$186.00 for each regimen. In order to reduce the drug costs for BC Correctional Centres, the PDC Pharmacy Manager reported his findings to the BC Corrections Pharmacy and Therapeutics Committee and with the committee's approval, the most cost effective drug regimen was added to the BC Corrections' Automatic Substitution Protocol as the automatic formulary substitution for the replacement of all other drug regimens used to eradicate bacteria in the treatment of stomach ulcers⁴⁴.

⁴³ BC Corrections, "Standing Medication Orders for Burnaby Correctional Centre for Women", unpublished internal policy document, revised September 12, 1995, pp.1-3.

⁴⁴ BC Corrections, "Automatic Substitution Protocol", unpublished internal policy document, 2002, pp.1, 2

The second drug therapy assessment compares four atypical anti-psychotic drugs in the treatment of schizophrenia. The atypical anti-psychotic drugs are Risperidone, Quetiapine, Olanzapine, and Clozapine and the comparison data are displayed in Table 6.

Table 6 Atypical Anti-Psychotic Drug Costs.

Atypical Anti-Psychotic Drug	Daily Dose	Cost per Month
Risperidone	4 mg	\$157.2
Quetiapine	450 mg	\$239.0
Olanzapine	15 mg	\$414.9
Clozapine	400 mg	\$471.6

Source: Author's compilation from PDC Pharmacy, "Dispensing Data for the BC Correctional Centres in 2004", unpublished internal data review

As indicated by the data presented in Table 6, Risperidone provides the lowest drug cost in the treatment of schizophrenia. In order to reduce drug costs for BC Corrections, the PDC Pharmacy Manger recommended that Risperidone be added to the BC Corrections Drug Formulary.

Value added services provided by PDC Pharmacy have generated many ideas and tools in the management of drug expenditures for the BC Correctional Centres. It is difficult to estimate the benefits of the value added services as physicians' compliance and support can influence the outcomes of the value added services significantly. Consequently, value added services will be mentioned but not included in the program appraisal undertaken in the next chapter.

This chapter discussed the transfer of BC Corrections' pharmacy services from local community pharmacies to the PDC Pharmacy. In addition, the value added services provided by the PDC Pharmacy in the management of BC Corrections' drug expenditures were discussed. As the PDC Pharmacy plays a critical role in the management of drug expenditures for BC Correctional Centres, an analysis is performed in the next chapter to assess the cost effectiveness

of the current pharmacy services. In the analysis, PDC Pharmacy's drug costs and professional dispensing fees are compared to those of local retail pharmacies from ten BC regions.

5 AN ANALYSIS OF THE EFFECTIVENESS OF THE PDC PHARMACY INITIATIVES

5.1 Introduction

The objective of the analysis of PDC Pharmacy initiatives is to assess the cost effectiveness of the current pharmacy services, and then evaluate two options in the management of the drug expenditures for BC Correctional Centres.

The first option would allow local community pharmacies to provide pharmacy services for the BC Correctional Centres. Under this option, each BC Correctional Centre would purchase drugs from a local community pharmacy.

The second option would allow a centralized and privately owned community pharmacy to provide pharmacy services for BC Correctional Centres. Under this option, all of BC Correctional Centres would purchase drugs from one privately owned community pharmacy.

The PDC Pharmacy currently provides pharmacy services for BC Correctional Centres. Therefore, the cost effectiveness of the PDC Pharmacy services will be compared to that of options one and two. As the cost effectiveness of pharmacy services is mainly dependent on the drug cost and the professional dispensing fee charged, the drug cost and professional dispensing fees of the PDC Pharmacy are compared to those of local community pharmacies.

Ten local community pharmacies are used in the analysis. Each of these pharmacies currently provides non-contingency and urgently needed drugs for a BC Correctional Centre in its vicinity. These local community pharmacies are familiar with the drug packaging requirements of BC Correctional Centres. The pharmacies are, selected by the Head Nurses and Program

Directors of BC Correctional Centres, are chosen because they are able to provide lower drug costs and dispensing fees in their regions. For example, the Surrey Pretrial Services Centre purchases non-contingency and urgently needed drugs from the Shoppers Drug Mart in Surrey. As over ninety-nine percent of the drugs for BC Correctional Centres are currently provided by the PDC Pharmacy, drug sales by local community pharmacies are considered insignificant to the BC Corrections' drug expenditure.

The BC Corrections' five most frequently prescribed drugs in 2004 are used in the determination of the drug cost and professional dispensing fees for the PDC Pharmacy and local community pharmacies. The five most frequently prescribed drugs accounted for 10.27% of BC Corrections' total drug expenditures in 2004. The five drugs are: Cephalexin 250mg tablet; Tylenol #3 tablet; Trazodone 50mg tablet; Quetiapine 25mg tablet; and Risperidone 1mg tablet.

The data for professional dispensing fees per prescription for local retail pharmacies were collected in July, 2005. In order to accurately compare the dispensing fees of local community pharmacies with the PDC Pharmacy, the PDC Pharmacy dispensing fee from July, 2005 (\$8.60 per prescription) is used in the analysis.

5.1.1 The assessment of option 1

Option 1 assumes that each BC Correctional Centre would obtain pharmacy services from its local community pharmacy. For example, ACCW would purchase drugs exclusively from Shopper Drug Mart in Maple Ridge. Table 7 provides a comparison of the drug costs and professional dispensing fees of the local community pharmacies with those of the PDC Pharmacy. The compared costs include the professional dispensing fee per prescription and the cost per tablet of BC Corrections' five most frequently prescribed drugs in 2004. The data were obtained from the PDC Pharmacy and a survey of local community pharmacies.

Table 7 The Drug Cost for BC Corrections' Five Most Frequently Prescribed Drugs in 2004 and Professional Dispensing Fees Charged by Local Community Pharmacies.

BC Correctional Centre	Local Community Pharmacy	Professional Dispensing Fee per Prescription	Cost / Tablet Cephalexin 250mg	Cost / Tablet Tylenol #3	Cost / Tablet Trazodone 50mg	Cost / Tablet Quetiapine 25mg	Cost / Tablet Risperidone 1mg
ACCW	Shoppers Drug Mart Maple Ridge	\$9.85	\$0.201	\$0.108	\$0.280	\$0.615	\$1.288
FMCC	Vedder Pharmacy	\$9.20	\$0.284	\$0.185	\$0.371	\$0.720	\$1.370
FRCC	Shoppers Drug Mart Maple Ridge	\$9.85	\$0.201	\$0.108	\$0.280	\$0.615	\$1.288
KRCC	Kipp Mallory Pharmacy	\$8.25	\$0.190	\$0.070	\$0.230	\$0.530	\$1.150
NCC	Central Drugs	\$8.60	\$0.179	\$0.081	\$0.265	\$0.586	\$1.260
NFPC	Wilson Pharmacy	\$8.95	\$0.223	\$0.138	\$0.305	\$0.608	\$1.277
PGRCC	Hart Pharmacy	\$9.45	\$0.211	\$0.110	\$0.294	\$0.582	\$1.263
SPSC	Shoppers Drug Mart Surrey	\$8.60	\$0.150	\$0.070	\$0.220	\$0.530	\$1.150
Vancouver Jail	Garlane Pharmacy	\$8.60	\$0.179	\$0.067	\$0.233	\$0.527	\$1.147
VIRCC	McGill & Orm	\$8.60	\$0.365	\$0.240	\$0.469	\$0.780	\$1.445
PDC Pharmacy		\$8.60	\$0.096	\$0.087	\$0.090	\$0.614	\$1.234

Sources: Author's compilation based on author's survey of local private sector pharmacies carried out in July 2005 and data from PDC Pharmacy, "Dispensing Data for the BC Correctional Centres in 2004", unpublished internal data.

Based on the PDC Pharmacy dispensing data for 2004 and data in Table 7, the total number of drug orders for each of BC Corrections' five most frequently prescribed drugs in 2004 is listed in Table 8 by correctional centre. The total dispensed quantity in tablets for each of the BC Corrections' five most prescribed drugs in 2004 is listed in Table 9 by correctional centre.

Table 8 Total Number of Drug Orders for Each of the Five Most Frequently Prescribed Drugs for the BC Correctional Centres in 2004.

BC Correctional Centre	Local Community Pharmacy	Professional Dispensing Fee per Prescription	Total # Drug Orders 2004	Total # Drug Orders 2004	Total # Drug Orders 2004	Total # Drug Orders 2004	Total # Drug Orders 2004
Drug			Cephalexin 250mg	Tylenol #3	Trazodone 50mg	Quetiapine 25mg	Risperidone 1mg
ACCW	Shoppers Drug Mart Maple Ridge	\$9.85	34	77	205	142	51
FMCC	Vedder Pharmacy	\$9.20	30	1	6	4	12
FRCC	Shoppers Drug Mart Maple Ridge	\$9.85	309	156	124	71	166
KRCC	Kipp Mallory Pharmacy	\$8.25	26	252	100	125	41
NCC	Central Drugs	\$8.60	63	31	15	21	18
NFPC	Wilson Pharmacy	\$8.95	442	203	149	186	159
PGRCC	Hart Pharmacy	\$9.45	34	48	155	47	45
SPSC	Shoppers Drug Mart Surrey	\$8.60	166	182	169	185	173
Vancouver Jail	Garlane Pharmacy	\$8.60	24	18	7	8	9
VIRCC	McGill & Orm	\$8.60	48	198	168	187	129
Total Number of Drug Orders			1.176	1.166	1.098	976	803
PDC Pharmacy		\$8.60	1.176	1.166	1.098	976	803

Sources: Author's compilation based on author's survey of local private sector pharmacies carried out in July 2005 and data from PDC Pharmacy, "Dispensing Data for the BC Correctional Centres in 2004", unpublished internal data.

Table 9 Total Number of Tablets Dispensed for Each of the Five Most Frequently Prescribed Drugs for the BC Correctional Centres in 2004.

_BC Correctional Centre	Local Community Pharmacy	Total # Tablets Dispensed 2004				
		Cephalexin 250mg	Tylenol #3	Trazodone 50mg	Quetiapine 25mg	Risperidone 1 mg
ACCW	Shoppers Drug Mart Maple Ridge	2,690	7,208	6,501	5,223	2,232
FMCC	Vedder Pharmacy	2128	300	231	210	311
FRCC	Shoppers Drug Mart Maple Ridge	19,122	10,157	3,718	3,223	5,010
KRCC	Kipp Mallory Pharmacy	1,664	14,347	4,380	10,433	2,145
NCC	Central Drugs	3,790	2,458	514	1463	727
NFPC	Wilson Pharmacy	27,798	10,102	3,271	6,144	4,469
PGRCC	Hart Pharmacy	2,634	2,018	4,013	2,254	1,964
SPSC	Shoppers Drug Mart Surrey	10,320	8,447	4,284	6,532	4,643.5
Vancouver Jail	Garlane Pharmacy	2,786	790	330	300	420
VIRCC	McGill & Orm	2,733	13,199	5,047	9,763	5,467
Total Number of Tablets		75,665	69,026	32,291	45,545	27,389

Sources: Author's compilation based on author's survey of local private sector pharmacies carried out in July 2005 and data from PDC Pharmacy, "Dispensing Data for the BC Correctional Centres in 2004", unpublished internal data.

Using data from Tables 8 and 9, the total drug cost, professional dispensing fees, and total cost charged by the local community pharmacies and PDC Pharmacy for dispensing BC Corrections' five most frequently prescribed drugs in 2004 are compiled in Table 10. The comparison between PDC Pharmacy's total cost for dispensing the top five drugs and that of the local community pharmacies shows that the PDC Pharmacy total cost is \$21,312 less. Therefore, it would not be cost effective for each of the BC Correctional Centres to acquire pharmacy services from its local community pharmacy.

Table 10 Total Drug Cost, Professional Dispensing Fees and Total Cost for BC Corrections Five Most Frequently Prescribed Drugs in 2004 Charged by the Local Community Pharmacies and PDC Pharmacy

BC Correctional Centre	Local Community Pharmacy	Total Drug Cost (Five Most Frequently Prescribed Drugs)	Total Professional Dispensing Fees	Total Cost (Total Drug Cost + Total Professional Dispensing Fees)
ACCW	Shoppers Drug Mart Maple Ridge	\$9,227	\$5,014	\$14,240
FMCC	Vedder Pharmacy	\$1,324	\$488	\$1,812
FRCC	Shoppers Drug Mart Maple Ridge	\$14,417	\$8,136	\$22,553
KRCC	Kipp Mallory Pharmacy	\$10,324	\$4,488	\$14,812
NCC	Central Drugs	\$2,787	\$1,273	\$4,060
NFPC	Wilson Pharmacy	\$18,033	\$10,194	\$28,227
PGRCC	Hart Pharmacy	\$5,751	\$3,109	\$8,860
SPSC	Shoppers Drug Mart Surrey	\$11,884	\$7,525	\$19,409
Vancouver Jail	Garlane Pharmacy	\$1,268	\$568	\$1,836
VIRCC	McGill & Orm	\$22,048	\$6,278	\$28,326
Total Cost		\$97,062	\$47,072	\$144,134
PDC Pharmacy		\$77,939	\$44,883	\$122,822

Sources: Author's compilation based on author's survey of local private sector pharmacies carried out in July 2005 and data from PDC Pharmacy, "Dispensing Data for the BC Correctional Centres in 2004", unpublished internal data.

5.1.2 The assessment of option 2

Option 2 assumes that pharmacy services for all of the BC Correctional Centres are provided by one centralized and privately owned community pharmacy. The total drug cost and

dispensing fees for providing BC Corrections' five most frequently prescribed drugs in 2004 are compared to the ten local community pharmacies. Based on data from Table 8 and Table 9, the total number of drug orders and total number of tablets dispensed for each of the BC Corrections' five most frequently prescribed drugs are listed in Table 11.

Table 11 Total Number of Drug Orders and Tablets Dispensed for Each of BC Corrections' Five Most Frequently Prescribed Drugs in 2004

2004	Cephalexin 250mg Tablet	Tylenol #3 Tablet	Trazodone 50mg Tablet	Quetiapine 25mg Tablet	Risperidone 1mg Tablet	Total
Total # Drug Orders	1,176	1,166	1,098	976	803	5,219
Total # Tablets Dispensed	75,665	69,026	32,291	45,545	27,389	

Sources: Author's compilation of data from PDC Pharmacy, "Dispensing Data for the BC Correctional Centres in 2004", unpublished internal data.

Based on the data from Table 7 and Table 11, the total cost for the BC Corrections' five most frequently prescribed drugs in 2004 charged by each local community pharmacy is listed in Table 12. According to the total cost comparison among the local community pharmacies and PDC Pharmacy in Table 12, the PDC Pharmacy has the lowest total cost for dispensing BC Corrections' five most frequently prescribed drugs in 2004. The BC Corrections' drug expenditures would increase if pharmacy services were provided by any one of the listed local community pharmacies. Therefore, it would not be cost effective to transfer the pharmacy services from the PDC Pharmacy to a single, privately owned community pharmacy.

This may seem an unreasonable comparison in that it might be assumed that BC Corrections could negotiate a more favourable, exclusive contract with a single private sector pharmacy. However, there are several factors that would impede establishment of such an exclusive arrangement. As noted earlier, forty percent of expenditures for prescribed pharmaceuticals in the Province of British Columbia are paid for through PharmaCare.

PharmaCare has a "most-favoured-customer" requirement with respect to dispensing fees. No pharmacy can charge a higher dispensing fee for a PharmaCare covered prescription than it charges any other individual or agency. Put differently, if an individual pharmacy cut dispensing fees in order to win a contract with BC Corrections, it would have to apply that cut to approximately forty percent of its normal business. It is possible that a pharmacy could be established solely for the purpose of serving BC Corrections and in this way avoid any spillover effects with respect to PharmaCare. This seems unlikely. There are transaction specific sunk costs involved in dealing with BC Corrections. For example, pharmacy staff would have to be trained so as to comply with the BC Corrections Drug Formulary, Drug Protocols, Automatic Substitution Policy, Contingency Medication List and Standing Medication Orders. Investments would have to be made in specialized equipment not specific to transactions with BC Corrections such as blister packaging equipment (all prescribed drugs for inmates must be blister packed). These types of investments seem unlikely given the volume of sales to BC Corrections. Annual sales would amount to about \$1 million. To put this in context, in 1998, the last year for which data are available, the average "drug and patent medicine store" in British Columbia had sales of \$2.7 million.⁴⁵

Finally it should be noted that in transacting with BC Correctional Centres, PDC Pharmacy would likely have advantages over private sector pharmacies. In addition to pharmacy services the PDC ships medical supplies, nutritional products and uniforms to the BC Correctional Centres. This results in two types of savings. First, the Correctional Centres save on transactions costs through "one-stop shopping". Second, because of the shipment volumes of both pharmaceuticals and other supplies, PDC has been able to negotiate a very favourable service contract with Purolator Courier.

⁴⁵ Statistics Canada, *Retailing in Canada - 1998* (Ottawa: Ministry of Industry, 2001) p. 24.

In summary, it is possible that a single private sector pharmacy could negotiate an exclusive contract with BC Corrections. However, without going through the bidding process it is difficult to know whether such an arrangement would result in lower overall costs for BC Corrections.

Table 12 Total Drug Cost and Professional Dispensing Fees, and Total Cost of the BC Corrections' Five Most Frequently Prescribed Drugs in 2004 Charged by the Local Community Pharmacies and PDC Pharmacy

Local Community Pharmacy	Total Drug Cost 2004					Total Professional Dispensing Fees	Total Cost	
	Drug	Cephalexin 250mg	Tylenol #3	Trazodone 50mg	Quetiapine 25mg			Risperidone 1 mg
Shoppers Drug Mart Maple Ridge		\$15,209	\$7,455	\$9,041	\$28,010	\$35,278	\$51,407	\$146,400
Vedder Pharmacy		\$21,489	\$12,770	\$11,980	\$32,793	\$37,524	\$48,015	\$164,570
Shoppers Drug Mart Maple Ridge		\$15,209	\$7,455	\$9,041	\$28,010	\$35,278	\$51,407	\$146,400
Kipp Mallory Pharmacy		\$14,376	\$4,832	\$7,427	\$24,139	\$31,498	\$43,057	\$125,329
Central Drugs		\$13,544	\$5,591	\$8,557	\$26,690	\$34,511	\$44,883	\$133,776
Wilson Pharmacy		\$16,873	\$9,526	\$9,849	\$27,692	\$34,976	\$46,710	\$145,626
Hart Pharmacy		\$15,965	\$7,593	\$9,494	\$26,507	\$34,593	\$49,320	\$143,472
Shoppers Drug Mart Surrey		\$11,350	\$4,832	\$7,104	\$24,139	\$31,498	\$44,883	\$123,806
Garlane Pharmacy		\$13,544	\$4,625	\$7,524	\$24,002	\$31,416	\$44,883	\$125,994
McGill & Orm		\$27,618	\$16,566	\$15,144	\$35,525	\$39,578	\$44,883	\$179,315
PDC Pharmacy		\$7,264	\$6,005	\$2,906	\$27,965	\$33,799	\$44,883	\$122,822

Sources: Author's compilation based on author's survey of local private sector pharmacies carried out in July 2005 and data from PDC Pharmacy, "Dispensing Data for the BC Correctional Centres in 2004", unpublished internal data.

Based on the total cost comparison among the three options reviewed, the PDC Pharmacy offers the lowest total cost for providing the BC Corrections' five most frequently prescribed drugs in 2004.

According to the PDC Pharmacy financial analysis for fiscal year 2004, the Pharmacy was able to fully recover its total costs and generate a surplus of \$208,050 for the BC Government⁴⁶. The data strongly indicate that the PDC Pharmacy should continue to provide pharmacy services for BC Correctional Centres.

In order to cover rising operation costs and pharmacy renovation expenses, the PDC Pharmacy tentatively increased the professional dispensing fee from \$5.50 to \$8.60 per prescription in June, 2005. However, the dispensing fee is still under negotiation and could be reduced. Any reduction in dispensing fees would provide better savings for BC Correctional Centres.

Furthermore, the high pharmacy operational cost, which is attributed to high labour costs for processing and packaging medications, has resulted in higher professional dispensing fees. In order to reduce the professional dispensing fees, the PDC Pharmacy has considered purchasing an automated medication dispensing system to offset the high labour cost. The PDC Pharmacy currently employs six pharmacists and four pharmacy technicians to fill drug orders for BC Correctional Centres. The use of a fully automated medication dispensing system could allow the PDC Pharmacy to cut back on employee hours and reduce operational cost drastically. The savings from the use of a fully automated medication dispensing system could be substantial and allow the PDC Pharmacy to lower its professional dispensing fees significantly.

This chapter evaluated the cost effectiveness of the PDC Pharmacy services in terms of drug costs and dispensing fees. The drug costs and professional dispensing fees for BC

⁴⁶ David Au, "The Financial Analysis and Strategic Planning for PDC Pharmacy".

Corrections' five most frequently prescribed drugs in 2004 were compared among the PDC Pharmacy and ten local community pharmacies. The data clearly show that the PDC Pharmacy provided the lowest prescription costs for these five drugs.

In order to manage the rapidly rising drug costs, more cost saving programs and policies for BC Corrections should be developed and will be discussed in the next chapter.

6 RECOMMENDATIONS FOR THE MANAGEMENT OF BC CORRECTIONS' DRUG EXPENDITURES

Drug expenditures, for BC Correctional Centres, financed by the Corrections Branch have increased by over 13.0% annually from 2002 to 2004 (Table 3). The professional dispensing fee per prescription remained unchanged, and the cost per drug order decreased by 0.36% from 2002 to 2004. The BC Corrections' drug cost increase in 2004 was attributed to the increase in drug utilization.

In addition, the PDC Pharmacy's professional dispensing fee was increased from \$5.50 to \$8.60 per drug order in June, 2005. This drastic increase in the dispensing fee will lead to a significant increase in BC Corrections' drug expenditures.

To this point, BC Corrections has used a two pronged policy to control drug costs. One policy involves a public sector centralized pharmacy. As shown in chapter 5, PDC Pharmacy effectively reduces drug costs and professional dispensing fees for BC Correctional Centres. To maintain cost control it is important that BC Corrections continues to source through the PDC Pharmacy. Nevertheless, given the escalation in drug expenditures, further initiatives are called for. As noted earlier, the PDC Pharmacy participated in the creation of the BC Corrections Pharmacy and Therapeutics Committee. This committee is responsible for a number of initiatives aimed at controlling drug costs. In chapter 4, these initiatives were referred to as value added services. A first step in curbing cost escalation would be to place greater emphasis on these programs. In addition, new cost saving programs that could provide better management of BC Corrections physicians' prescribing habits, drug costs and utilization, and professional dispensing fees, will be described and should be considered.

6.1 Management of physicians' prescribing habits

An ongoing problem for BC Corrections, indeed for all health management in institutions, is the difficulty in sensitizing physicians to comparative drug costs. The physicians' choice of a drug therapy is usually based on the therapeutic and adverse effects, not the cost of the medication. In order to promote the use of cost effective drugs in BC Correctional Centres, the following discussion describes policies and suggestions recommended to manage physicians' prescribing habits.

6.1.1 Raising physicians' drug cost awareness

Physicians in BC acknowledge having a limited knowledge of drug cost, and also believe that increased drug cost knowledge could improve their prescribing behaviour and, therefore, reduce drug costs⁴⁷. The BC Corrections Drug Formulary does not provide drug prices and is only revised twice annually. In order to provide readily accessible drug price information, all BC Corrections' physicians should be provisioned with a pocket personal computer equipped with wireless fidelity (Wi-Fi) and expandable memory. The price of each drug in the BC Corrections Drug Formulary, Contingency Medication List, and Automatic Substitution Protocol could be downloaded to the pocket personal computers. Prior to prescribing medications, BC Corrections' physicians could check drug prices and select the lower price drugs whenever possible.

The PDC Pharmacy could also provide drug prices on the PDC website and allow BC Corrections' physicians to check new and non-formulary drug prices with their pocket computers. The potential savings in drug costs for Corrections could be substantial if physicians were aware of the drug prices. As the cost of a pocket computer is only a few hundred dollars, providing physicians with a handheld mobile computers could be a worthwhile investment for BC Corrections.

⁴⁷ G.M. Allan, and G. D. Innes, "Survey in British Columbia, Do family physicians know the costs of medical care", *Canadian Family Physician*, vol. 50 (2004), pp. 263-70.

6.1.2 Monitoring physicians' prescribing habits

Physicians' prescribing habits are one of the critical factors in the determination of drug costs for the BC Correctional Centres. The PDC Pharmacy could provide a monthly prescribing report for each BC Correctional Centre to the Medical Director of the BC Corrections. The monthly prescribing report should consist of the average drug cost per drug order for each BC Corrections' physician as well as the BC Corrections' average drug cost per drug order for that month.

The average drug cost per prescription for each physician should be compared to the BC Corrections' average drug cost per drug order. As physicians who prefer to order expensive new and non-formulary drugs will generate a higher average drug cost per drug order, the physicians whose average drug cost per prescription is significantly higher than the BC Corrections' average should be reminded by the Medical Director of the BC Corrections that valid reasons are required for ordering non-formulary drugs. In addition, drug prices of the frequently ordered new and non-formulary drugs should be compared with the prices of their lower cost alternatives, and the results should be sent to BC Corrections physicians on a monthly basis.

6.1.3 In-service education for physicians

As increased new drug knowledge could enhance physicians' ability to order cost effective medications, the BC Corrections should provide new drug therapy seminars and research papers to BC Corrections' physicians on a regular basis. In addition, health professional meetings could allow physicians, dentists, nurses and pharmacists to discuss and share drug information. In order to promote the use of cost effective drugs, BC Corrections should provide regular health professional discussion sessions in BC Correctional Centres and at the BC Corrections' health care conference.

6.2 Management of drug costs

6.2.1 Contracting with a clinical pharmacologist

As new drug entries significantly affect BC Corrections' drug expenditures, the Corrections Branch should contract a clinical pharmacologist to assist in the assessment of new drugs and to recommend cost effective drugs for BC Correctional Centres. In addition, the clinical pharmacologist should provide input to the BC Corrections Pharmacy and Therapeutics Committee to enhance the development of new drug protocols and the implementation of the BC Corrections Drug Formulary and Automatic Substitution Protocol. Furthermore, the clinical pharmacologist should develop and maintain a list of lower cost alternatives for the frequently prescribed non-formulary drugs and provide the list to the BC Corrections' physicians.

6.2.2 Updating the drug formulary

The BC Corrections Drug Formulary promotes the use of cost effective drugs and is useful in the management of drug cost. In order to improve the effectiveness of the Drug Formulary, it should be updated quarterly by the BC Corrections Pharmacy and Therapeutics Committee.

In addition, the BC Corrections' frequently prescribed non-formulary drugs should be assessed for their cost effectiveness by the BC Corrections' clinical pharmacologist. Based on the clinical pharmacologist's recommendations, cost effective non-formulary drugs could be added to the BC Corrections Drug Formulary. Furthermore, physicians who frequently prescribe non-formulary drugs without valid reasons should be reminded by the BC Corrections' Medical Director to comply with the Formulary and list of the lower cost alternatives.

6.2.3 Canteen sales of over-the-counter medications

The sale of over-the-counter drugs in BC Corrections' canteens allows inmates to purchase over-the-counter drugs directly and consequently reduces BC Corrections' drug costs. In order to further reduce drug costs for BC Correctional Centres, the BC Corrections Pharmacy and Therapeutics Committee should consider adding all of the most frequently used non-pharmacy sales, over-the-counter drugs to the List of Over-The-Counter Medications Available in Canteen.

6.2.4 Prescribing cost effective atypical anti-psychotic drugs

As atypical anti-psychotic drugs accounted for 23% of the total drug cost for BC Corrections from September 1, 2003 to August 31, 2004, the significant increase in the use of atypical anti-psychotic drugs in the treatment of schizophrenia and bipolar disorder has resulted in the drastic increase in drug costs for the BC Correctional Centres. The choice of drugs in the treatment of schizophrenia or bipolar disorder is usually based on the therapeutic and adverse effects of the drug. Cost plays no role. As schizophrenia and bipolar disorder are chronic diseases for which long-term drug therapies are required to control symptoms and prevent relapses, the drug cost for the treatment of schizophrenia or bipolar disorder is extremely high. Due to the difference in the drug cost among atypical anti-psychotic drugs, the choice of atypical anti-psychotic drugs has a significant impact on the total drug expenditure for BC Correctional Centres.

The drug cost comparison for atypical anti-psychotic drugs shown in Table 13 indicates a significant difference in drug costs. Because different patients have different clinical responses to a medication, the outcome of a drug therapy is sometimes unpredictable. In order to determine the most suitable drug for a patient, the physician usually prescribes several drugs for a patient and selects the drug which produces the best clinical response. Due to the lack of conclusive data

demonstrating that any one of the atypical anti-psychotics is better than the others in the treatment of schizophrenia, Risperidone should be considered as the drug of choice because of its low cost. The other atypical anti-psychotic drugs such as Olanzapine, Quetiapine and Clozapine should be considered only when Risperidone fails to achieve a satisfactory therapeutic response and patient compliance.

Table 13 Drug Cost Comparison for Atypical Anti-Psychotic Drugs and Mood Stabilizers

Drug	Drug Cost for One Month of Drug Therapy
Atypical anti-psychotic drugs	
Clozapine	\$471.60
Olanzapine	\$414.90
Quetiapine	\$239.00
Risperidone	\$157.20
Mood stabilizers	
Divalproex Sodium	\$44.20
Lithium Carbonate	\$22.50
Carbamazepine	\$13.20

Source: Data compiled by author.

It is evident from the drug cost comparison in Table 13 among the atypical anti-psychotic drugs and mood stabilizers, that the drug cost for the mood stabilizers is much lower than that of the atypical anti-psychotic drugs. As mood stabilizers such as Divalproex Sodium, Lithium Carbonate, and Carbamazepine could achieve the same efficacy as the atypical anti-psychotic drugs in the treatment of bipolar disorder, the mood stabilizers should be considered as the drugs of choice in the treatment of this disorder. Atypical anti-psychotic drugs should be considered only when the mood stabilizers fail to achieve a satisfactory clinical response and patient compliance.

In order to reduce the anti-psychotic drug costs for BC Correctional Centres, physicians should be informed of the rapidly rising drug costs and significant cost difference among atypical anti-psychotic drugs. The recommendations are not intended to stop physicians from prescribing effective drugs; however, it is important for the physicians to consider drug costs when selecting anti-psychotic drugs.

6.2.5 Preventative measures

Due to frequent direct and indirect contact among inmates, influenza is prevalent in the BC Correctional Centres during flu seasons. The use of medications to manage the signs and symptoms of influenza has increased drug costs for BC Correctional Centres. Some of the inmates who suffer from influenza may develop more severe illnesses such as bronchitis and pneumonia. The treatment of bronchitis and pneumonia requires expensive antibiotics and cough syrup, and causes a further increase in the drug costs for BC Correctional Centres. In order to reduce BC Corrections' drug costs, free influenza vaccines should be provided for inmates during the flu seasons.

In addition, vitamin and mineral deficiencies could cause many illnesses and lead to an increase in BC Corrections' drug costs. In order to prevent illnesses caused by vitamin and mineral deficiencies, free multi-vitamins with minerals tablets should be offered to inmates who are malnourished and/or alcoholics in BC Correctional Centres.

6.3 Management of drug utilization

Due to short inmate stays and unpredictable release dates, many inmates are unable to finish their medications during their incarcerations, and most of them leave their unfinished medications in BC Correctional Centres upon discharge. In addition, frequent changes in drug therapies and dosages have resulted in an increase in medication wastage. In order to reduce drug wastage, the BC Corrections Pharmacy and Therapeutics Committee should consider the

Maximum Days' Supply policy and Trial Prescription program developed by BC PharmaCare in the management of drug utilization.

6.3.1 Maximum Days' Supply policy

PharmaCare coverage for short-term drug prescriptions and first-time prescriptions for maintenance drugs is limited to 30 days supply only⁴⁸. Due to the development of drug tolerance and drug addictions, drugs such as sedatives and hypnotics are not recommended for long-term use. Maintenance drugs are used in the treatment of chronic diseases and are intended for long term use. In addition to high efficacy, a maintenance drug must have minimal adverse effects and be tolerated by the patient. In order to select the most suitable maintenance drug for a patient, the physician usually prescribes several drugs for a patient and then selects the most suitable drug. As unsuitable drugs will be terminated by the physician and discarded, limiting the first-time prescription for a maintenance drug to a 30 day supply could reduce the wastage of unsuitable drugs.

6.3.2 Trial Prescription program

A list of expensive drugs with high incidence of adverse effects is prepared jointly by PharmaCare, the BC Pharmacy Association and the College of Pharmacists of BC. The adverse effects of these drugs can be severe and patients who suffer serious adverse effects are required to stop taking these drugs. For example, the cost for a month's supply of Olanzapine is \$414.90. If a one month supply of Olanzapine is dispensed for a patient and the patient takes the drug for only one week, the wastage cost is over \$300. In order to reduce drug wastage, PharmaCare suggests that a small quantity of drugs with a high incidence of adverse effects be dispensed for a

⁴⁸ BC Ministry of Health, PharmaCare, "Maximum Days' Supply Policy", [online].

trial period of 10 to 14 days. This procedure could moderate drug expenditure by reducing the wastage of expensive drugs⁴⁹

6.3.3 The initiation of a user's fee for inmates receiving non-formulary brand name and new drugs

BC Corrections has the responsibility of providing health care services to inmates that are equivalent to those provided to members of the general public. Inmates requesting non-formulary brand name and new drugs that are not fully covered by BC PharmaCare should pay a user's fee. The user's fee should be the difference between the requested drug's price and the price established by the PharmaCare Reference Drug Program. After the launch of the user's fee policy, inmates could choose between a non-formulary drug with a user's fee or an equivalent formulary drug at no charge. As inmates would consider the marginal cost and benefit once they are required to pay for their drugs, the user's fee policy could reduce the utilization of expensive non-formulary drugs. The user's fee could be waived if an inmate has insufficient funds in his account to cover the drug cost, or when no acceptable formulary drugs are available for substitution.

6.4 Management of professional dispensing fees

6.4.1 Standing Medication Orders

The Standing Medication Orders allow BC Corrections' nurses to use their clinical judgment and distribute over-the-counter drugs to inmates to treat minor illnesses⁵⁰. Treating minor ailments at the early stage could prevent illnesses from progressing and thereby reduce the need for more potent prescription drugs. The reduction in the use of prescription drugs could lead to a reduction in dispensing fees. In order to reduce the professional dispensing fees for BC Correctional Centres, the BC Corrections Pharmacy and Therapeutics Committee should consider

⁴⁹ BC Ministry of Health, PharmaCare, Trial Prescription Program", [online].

⁵⁰ BC Corrections, "Standing Medication Orders for Burnaby Correctional Centre for Women".

expanding the Standing Medication Orders and allowing the nurses to distribute all of the frequently used over-the-counter drugs to inmates in BC Correctional Centres. Instructions for use of each drug should be included in the Standing Medication Orders, and in-service training for the nurses could be provided by the PDC pharmacists to ensure the proper use of the over-the-counter drugs.

6.5 Conclusion

The analysis of PDC Pharmacy initiatives in chapter 5 indicates that the PDC Pharmacy is able to recover its total costs and provide a cost effective pharmacy service for BC Correctional Centres. The PDC Pharmacy should continue to provide pharmacy services for BC Correctional Centres.

In addition, drug expenditure management programs such as the BC Corrections Drug Formulary, List of Over-the-Counter Medications Available in Canteen, and Automatic Substitution Policy can help to control the rapidly rising drug costs and drug utilization in BC Correctional Centres. For example, the launch of the List of Over-the-Counter Medications Available in Canteen has reduced drug cost and utilization of Tylenol tablets significantly. The consumption of Tylenol tablets dropped eight fold after inmates were required to purchase the drug from institutions' canteens. In addition, the Corrections Branch is no longer required to pay for Tylenol tablets.

In order to successfully manage rising drug expenditures, support from the BC Corrections' physicians is absolutely necessary. These physicians should be informed of the rapidly rising drug costs and the impact of their drug choices on drug costs. Providing pocket personal computers, drug discussion sessions, new drug assessment reports, and a list of lower cost alternatives for non-formulary drugs to BC Corrections physicians' could improve the physicians' compliance with the Drug Formulary, and could promote the prescribing of cost

effective medications in BC Correctional Centres. The recommendations made above are not intended to prevent physicians from prescribing effective drugs; however, it is vital for physicians to consider drug costs when selecting drug therapies.

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ABBREVIATIONS

ACCW	Alouette Correctional Centre for Women
BC	British Columbia
FMCC	Ford Mountain Correctional Centre
FRCC	Fraser Regional Correctional Centre
KRCC	Kamloops Regional Correctional Centre
NCC	Nanaimo Correctional Centre
OECD	Organization for Economic Cooperation and Development
PGRCC	Prince George Regional Correctional Centre
NFPC	North Fraser Pretrial Centre
SPSC	Surrey Pretrial Services Centre
VIRCC	Vancouver Island Regional Correctional Centre