THE THERAPEUTIC MANAGEMENT OF HIV DISEASE: CONCURRENCE WITH CONTEMPORARY CLINICAL GUIDELINES AMONG THE PHYSICIANS OF BRITISH COLUMBIA

by

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ABSTRACT

Objectives: To describe patterns of knowledge regarding the therapeutic management of HIV-disease and concordance with therapeutic guidelines among three groups of British Columbian physicians and to identify possible determinants of these patterns

Methods: Anonymous questionnaires were mailed to: all registrants of a province-wide HIV/AIDS drug treatment program (Group-G, n=659), all physicians who had a patient test HIV positive since 1989 (Group-H, n=816), and a random sample selected from the remaining physicians of British Columbia (Group-R, n=484). Questionnaires provided information about: physician demographic, personal and professional characteristics; level of current and total HIV-related experience; and knowledge of the use of therapeutic strategies including vaccinations, clinical tests, laboratory tests and antiretroviral therapy in the context of HIV patient care. An extended version of the survey sent to Group-G physicians requested additional information about the management of HIV-related opportunistic infections (OIs). Summary scores of patient care knowledge were computed by comparing physician responses to questions pertaining to knowledge of clinical management with recommendations made in contemporary therapeutic guidelines. Linear regression was used to identify associations between physician characteristics and knowledge scores.

Results: Complete information was received from 38% of G-Group and 50% of Groups H and R, with limited demographic and experiential information obtained from a further 27%, 18% and 20% of groups G, H and R respectively. Multivariate analysis revealed a significant inverse relationship between physician knowledge and age in all groups (all p<0.02). Increased knowledge scores were also associated with the number of active HIV positive patients in groups G and H (all p<0.001) and lack of specialty training in groups H and R (all
p< 0.001). Regarding the additional information gathered from Group-G respondents, physicians practising in Vancouver were more knowledgeable about OI prophylaxis (p=0.047) while those with medical specialty training were more knowledgeable about the treatment of these illnesses (p=0.009).

**Conclusion:** The data provides evidence of substantial heterogeneity in physician’s preferred approaches to the therapeutic management of HIV disease and considerable deviation from contemporary guidelines. The level of concordance with these guidelines is associated with physician characteristics, most notably age, medical specialty training and level of current HIV-related experience.
TABLE OF CONTENTS

ABSTRACT ii

TABLE OF CONTENTS iv

LIST OF TABLES ix

LIST OF FIGURES xii

ACKNOWLEDGEMENTS xiv

CHAPTER 1

INTRODUCTION AND GENERAL CONSIDERATIONS 1

1.1 THE IMPACT OF HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION AND ACQUIRED IMMUNODEFICIENCY SYNDROME (AIDS) IN BRITISH COLUMBIA 1

1.2 CURRENT ISSUES: UNCERTAINTY SURROUNDING HIV PATIENT MANAGEMENT AND THE ROLE OF CLINICAL GUIDELINES 2

1.3 STUDY OBJECTIVES 6

CHAPTER 2

THE THERAPEUTIC MANAGEMENT OF HIV INFECTION AND CURRENT CONSENSUS RECOMMENDATIONS 8

2.1 PREVENTIVE VACCINATIONS AND CLINICAL TESTS 8

2.2 LABORATORY TESTS 11

2.3 ANTIRETROVIRAL THERAPIES 12

2.4 PROPHYLAXIS AND TREATMENT OF OPPORTUNISTIC INFECTIONS 17
CHAPTER 3

METHODS

3.1 SETTING

3.2 JUSTIFICATION OF METHODOLOGY

3.3 SAMPLE / POPULATION SPECIFICATION

3.4 INSTRUMENT DEVELOPMENT

   i) Selecting content areas and variables
   ii) Questionnaire format
   iii) Pre-testing and review procedures
   iv) Internal limitations: Instrument reliability and validity
   v) Methodological limitations

3.5 SURVEY CONTENT

3.6 SURVEY ADMINISTRATION

3.7 DATA MANAGEMENT

3.8 UNIVARIATE STATISTICAL ANALYSES AND SCORING PROCEDURES

   i) Descriptive statistics
   ii) Scores of physician knowledge
   iii) Selecting variables for use in multivariate analysis

3.9 TRANSLATING KNOWLEDGE SCORES TO PATIENT CARE

3.10 MULTIVARIATE ANALYSIS

   i) Techniques and limitations
   ii) Independent variables
   iii) Dependent variables
CHAPTER 4

RESULTS

4.1 RESPONSE RATE

4.2 ASSESSING NON-RESPONSE BIAS

i) Comparison of survey responders and those non-responders who returned the follow-up mini-survey

ii) Comparison of early and late responders

iii) Qualitative interpretation of the results of non-response assessment: The direction of responder bias.

4.3 DESCRIPTIVE STATISTICS

i) Demographic and personal characteristics of respondents

ii) Experience with HIV positive patients

iii) Self perception of abilities and approach to HIV patient care

iv) Familiarity with and opinion of resources

v) Knowledge of therapeutic management of HIV

4.4 PHYSICIAN KNOWLEDGE SCORES

4.5 PHYSICIAN KNOWLEDGE VERSUS PATIENT CARE

4.6 UNIVARIATE ANALYSIS: SELECTING VARIABLES FOR MULTIVARIATE INVESTIGATION

4.7 MULTIVARIATE ANALYSIS

i) Aptness of resulting models
CHAPTER 5
DISCUSSION 145
5.1 RESPONSE RATE AND NON-RESPONSE BIAS 145
5.2 UNIVARIATE ANALYSIS 146
   i) Demographic and personal characteristics of respondents
   ii) Experience with HIV positive patients and ability and willingness to provide HIV patient care
   iii) Estimating the number of physicians in British Columbia currently providing care to HIV positive patients
   iv) Familiarity with, and opinion of resources
   v) Knowledge of the therapeutic management of HIV
   vi) Answer patterns and bias
5.3 PHYSICIAN KNOWLEDGE SCORES: IMPLICATIONS FOR PATIENT CARE AND RESOURCE NEEDS 156
5.4 MULTIVARIATE ANALYSIS 158
5.5 SUMMARY OF RESULTS: MEETING STUDY OBJECTIVES 160
5.6 LIMITATIONS 163
   i) Causal inference
   ii) Bias

CHAPTER 6
RECOMMENDATIONS AND CONCLUSION 165
6.1 RECOMMENDATIONS 165
6.2 CONCLUSIONS 166
LIST OF TABLES

Table 3.3.1  Physician Sample/Population Sizes: Initial and Final  27
Table 3.5.1  Content of Surveys 1 and 2: Questions Contributing to
  Included Domains  38
Table 3.8.1  Knowledge Scores: Score Number, Score Category and Contributing
  Survey Questions  42
Table 3.8.2  Measures of Self-Perceived Ability and Corresponding Knowledge
  Scores  47
Table 4.1.1  Initial and Adjusted Sample Sizes and Final Response Rates by Group  53
Table 4.2.1  Comparisons of Survey Respondents and Non-Responders
  Who Replied to the Follow-Up Mini-Survey  55
Table 4.2.2  Explanations for Survey Non-Response Cited by Non-Responders
  Replying to the Follow-Up Mini-Survey  57
Table 4.2.3  Early Versus Late Responders: Demographic Characteristics by Group  60
Table 4.2.4  Early Versus Late Responders: Level of Experience in HIV Patient
  Management by Group  61
Table 4.2.5  Early Versus Late Responders: Patient Management Scores by Group  62
Table 4.3.1  Demographic Characteristics of Respondents by Group  65
Table 4.3.2  Medical Specialty Training of Respondents by Group  67
Table 4.3.3  Practice Characteristics of Respondents by Group  68
Table 4.3.4  Total Experience Providing Care to Patients With HIV
  Among Respondents by Group  70
Table 4.3.5  Current Experience Providing Care to HIV Positive Patients
  Among Respondents by Group  72
Table 4.3.6  Approach to Newly Diagnosed HIV Positive Patients: All Respondents and Respondents Without Medical Specialty Training by Group  

Table 4.3.7  Proportion Very or Quite Able and Very or Quite Willing to Provide Services to HIV Positive Patients: All Respondents and Respondents Without Specialty Training by Group  

Table 4.3.8  Proportion of Respondents Who Indicated That They Would Be Likely to Participate in HIV-Related Continuing Medical Education  

Table 4.3.9  Awareness of Physician Resources Among Respondents by Group  

Table 4.3.10  Utilisation and Opinion of the Therapeutic Guidelines and Toll-Free Phone Line Among Respondents in G-Group  

Table 4.3.11  Preferred Approach to the Use of Preventive Vaccinations Among Respondents by Group  

Table 4.3.12  Preferred Frequency of Recommended Vaccinations Among G-Group Respondents Who Preferred to Use the Vaccination in Question  

Table 4.3.13  Preferred Approach to Laboratory and Clinical Tests Among Respondents by Group  

Table 4.3.14  Preferred Frequency of Recommended Laboratory and Clinical Tests Among G-Group Respondents Who Preferred to Use the Test in Question  

Table 4.3.15  Preferred Agent for the Primary Prophylaxis of Toxoplasmosis  

Table 4.3.16  Preferred Agent for the Primary Prophylaxis of *Mycobacterium Avium-Intracellulare*
Table 4.3.17 Proportion of Respondents in Agreement and Disagreement With
Contemporary Guidelines for the Use of Preventive Vaccinations,
Tests, and Antiretroviral Therapy

Table 4.3.18 Proportion of Guideline Recipients in Agreement and Disagreement
With Contemporary Guidelines for the Frequency of Vaccinations and
Tests, the Use of Antiretroviral Therapy, and the Management of
Opportunistic Infections

Table 4.4.1 Comparison of Group Mean Knowledge Scores by Category of
Current Patient Numbers

Table 4.4.2 Comparison of Group Mean Knowledge Scores by Specialty
Training

Table 4.6.1 Univariate Associations Between Independent Variables and
Outcome Scores for All Groups

Table 4.7.1 Linear Regression Beta Coefficients and Level of Significance
for All Outcome Scores in All Groups
LIST OF FIGURES

Figure 2.3.1 Antiretroviral Strategy in AZT-Naive Persons: Recommendations of the Centre for Excellence in HIV/AIDS 15

Figure 2.3.2 Antiretroviral Strategy in AZT-Pretreated Persons: Recommendations of the Centre for Excellence in HIV/AIDS 16

Figure 4.3.1 Preferred Antiretroviral Therapy for an Asymptomatic Patient With a CD4 Count of 200 to 500 Cells/mm$^3$ 96

Figure 4.3.1a Proportion of Correct, Incorrect and Unsure Responses 96

Figure 4.3.2 Preferred Antiretroviral Therapy for a Symptomatic Patient With a CD4 Count Decline from 350 to 175 Cells/mm$^3$ 98

Figure 4.3.2a Proportion of Correct, Incorrect and Unsure Responses 98

Figure 4.3.3 Preferred Antiretroviral Therapy for a Symptomatic Patient With a New AIDS Defining Illness 99

Figure 4.3.4 Preferred First Line Agent for Primary Prophylaxis of Pneumocystis Carinii Pneumonia 102

Figure 4.3.5 Preferred Second Line Agent for the Primary Prophylaxis of Pneumocystis Carinii Pneumonia 103

Figure 4.3.6 Preferred First Line Agent for Secondary Prophylaxis of Pneumocystis Carinii Pneumonia 105

Figure 4.3.7 Preferred Second Line Agent for the Secondary Prophylaxis of Pneumocystis Carinii Pneumonia 106

Figure 4.3.8 Preferred Approach to Primary Prophylaxis of Toxoplasmosis 107
Figure 4.3.8a  Preferred CD4 Count for Initiation of Toxoplasmosis Among Respondents Who Recommended Prophylaxis 107

Figure 4.3.9  Preferred Agent for the Secondary Prophylaxis of Toxoplasmosis 111

Figure 4.3.10  Preferred Approach to the Primary Prophylaxis of Cryptococcal Meningitis 112

Figure 4.3.11  Preferred Approach to the Primary Prophylaxis of Cytomegalovirus Infection 113

Figure 4.3.12  Preferred Approach to the Primary Prophylaxis of *Mycobacterium Avium* Intracellulare Infection 115

Figure 4.3.12a  Preferred CD4 Count for Initiation of MAI Prophylaxis Among Respondents Who Recommended Prophylaxis 115

Figure 4.3.13  Preferred Agent for the Treatment of Mild or Moderate *Pneumocystis Carinii* Pneumonia 119

Figure 4.3.14  Preferred Agent for the Treatment of Severe *Pneumocystis Carinii* Pneumonia 120

Figure 4.3.15  Preferred Agent for the Treatment of Newly Diagnosed Toxoplasmosis Infection 121

Figure 4.3.16  Preferred Agent for the Treatment of Cryptococcal Meningitis 123

Figure 4.3.17  Preferred Agent for the Treatment of Cytomegalovirus Retinitis in a Patient With an Absolute Neutrophile Count of Greater Than 1000 124

Figure 4.3.18  Preferred Agent for the Treatment of *Mycobacterium Avium* Intracellulare Among Respondents Who Indicated That They Would Use Combination Therapy 126
Figure 4.4.1  Comparison of Groups G, H and R on the Basis of Three Comparable Mean Knowledge Scores 130

Figure 4.4.2  Mean Knowledge Scores for G-Group Using Three Scoring Systems: Single Question, Lead-Follow and Two Independent Questions 131

Figure 4.5.1  Comparison of Groups G, H and R on the Basis of Three Comparable Mean Care Scores 136

Figure 4.5.2  Mean Care Scores for G-Group 137
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CHAPTER 1

INTRODUCTION

1.1 THE IMPACT OF HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION AND ACQUIRED IMMUNODEFICIENCY SYNDROME (AIDS) IN BRITISH COLUMBIA

On an international level, Canada is a country of intermediate cumulative AIDS incidence, ranking 5th among industrialised nations and third among G7 nations. As of April 30th, 1996, there have been 13,291 reported cases of AIDS in Canada [1]. Some 72% of those diagnosed are now dead. The true number of cases is considered to surpass this estimate by approximately 15% as a result of underreporting [2,3]. Recent reports indicate that among men, the impact of premature deaths due to HIV infection is reaching levels similar to those associated with strokes and colorectal cancer [4]. Over the period 1987 to 1992, HIV/AIDS was associated with 184,728 Person Years of Life Lost before the age of 75 (PYLL) in Canada. Projections based on current trends indicate that PYLL among Canadian men due to HIV/AIDS will soon surpass those associated with suicides, motor vehicle accidents and lung cancer [5]. In addition, the epidemic is unlikely to abate as new infections continue to occur and HIV becomes increasingly common in traditionally less affected populations [1,5,6].

British Columbia has the highest cumulative incidence AIDS rate and the highest HIV/AIDS male mortality rate of all Canadian provinces and territories [4,7]. With some 2,175 AIDS cases reported as of December 31, 1995 and an estimated 6,000 residents living with HIV infection, British Columbia has not been spared the full impact of this epidemic [8].
1.2 CURRENT ISSUES: UNCERTAINTY SURROUNDING HIV PATIENT MANAGEMENT AND THE ROLE OF CLINICAL GUIDELINES

Infection with the Human Immunodeficiency Virus, a pathogenic RNA retrovirus, causes the destruction of CD4 lymphocytes (CD4 cells or helper T cells) in humans. This results in a progressive deterioration of immune function culminating, after a median time period of 10 years, in Acquired Immunodeficiency Syndrome (AIDS). The progressive loss of immune function renders those infected susceptible to various malignancies and opportunistic infections caused by other viruses, fungi, parasites and bacteria. AIDS itself is characterised by the presence of an AIDS defining illness in accordance with the Centres for Disease Control and World Health Organisation classification system of HIV infection and, in the United States, by a CD4 cell count of less than 200 cells/mm$^3$ [9]. While the long term prognosis for infected individuals remains poor, appropriate and timely therapeutic intervention can substantially improve the quality of remaining life and increase AIDS free life span and survival duration for many patients.

The therapeutic management of HIV infection and related conditions represents a unique challenge in clinical care. Treatment both generally and in relation to individual patients is complex, requiring continuous adjustment to reflect patient needs, disease progression and new research findings. As the rapid pace of clinical investigation continues, it is becoming increasingly difficult for physicians to remain apprised of advances in treatment and current research activity. Furthermore, it is often difficult to achieve consensus on how research findings should be interpreted and how they should be applied in clinical practice. Finally,
clinical trial results may appear to contradict previous or concurrent findings thus adding to
the atmosphere of uncertainty.

Regarding antiretroviral therapy, investigations have shown that uncertainty as to the optimal
approach to treatment is common. In an attempt to describe patterns of antiretroviral therapy
utilisation, four experts were asked to discuss the clinical circumstances in which they would
choose to switch or combine therapies and the basis for their recommendations [10].
Differences of opinion emerged as to the appropriate course of treatment and the timing of
changes to combination treatment regimens.

In a similar study, the editors of *AIDS Clinical Care* recently invited four experts to share
their opinions regarding the prophylaxis and treatment of *Mycobacterium avium* complex
(MAI or MAC), an opportunistic infection common in infected individuals late in disease
progression [11]. Although these experts resolved that prophylaxis with rifabutin was
desirable, they disagreed on the circumstances under which such prophylaxis should be
offered. As to therapy in the event of acute infection, these experts agreed that combination
drug therapy was superior to monotherapy and, to a large extent, on the appropriate drug
regimen. There were however, differences of opinion regarding the indicators used to
establish whether or not treatment should be initiated.

Efforts have also been made to describe the existing patterns of practice and identify areas of
uncertainty over a broader range of patient care issues and to estimate the extent of practice
experience among selected populations of physicians. In one survey, eighty general internists
currently following at least one HIV positive patient were asked about their use of twelve
examinations and laboratory tests under three clinical scenarios [12]. The study found considerable heterogeneity (≤ 50% agreement among respondents) in at least one of the scenarios in eight of the twelve areas.

In 1992, a U.S. survey was conducted by the editors of *AIDS Clinical Care* in efforts to describe the heterogeneity of care provided to patients by their physician subscribers in specific areas of therapeutic management [13]. The results indicated that there is indeed disagreement among experienced physicians as to the best approach to antiretroviral therapy, specifically in relation to patients experiencing disease progression. Questions concerning opportunistic infection prophylaxis and treatment also elicited a wide range of responses particularly in regard to second line prophylactic agents, primary prophylaxis for toxoplasmosis and MAI, and the treatment of cryptococcal meningitis.

The results of these aforementioned studies were used simply to describe current normative practice, i.e., what physicians did, rather than to define domains of knowledge, estimate quality of patient care through comparison to formally expressed practice recommendations, or as a basis for longitudinal comparisons.

In a preliminary investigation of patterns of care existing amongst physicians in British Columbia (B.C.), an amended version of the *AIDS Clinical Care* survey was sent to all physicians in B.C. during the first quarter of 1994 [14]. Analyses restricted to respondents self identified as having had experience in HIV management provided evidence of significant heterogeneity in the approaches to patient management and substantiated the existence of notable deviations from patterns of care recommended in contemporary guidelines.
Multivariate analysis revealed that physicians actively involved in the care of one or more HIV-infected patients were more likely to agree with contemporary guidelines. General practitioners and family physicians were more likely to agree with guidelines concerning preventive and antiretroviral therapies than physicians with specialty training.

Other studies have focused on measuring the effect of specific interventions such as practice guidelines on the knowledge, attitudes and practices of physicians with mixed results [15, 16, 17, 18, 19]. A recent meta-analysis of fifty-nine rigorously conducted studies of the impact of guidelines on physician practice concluded that “explicit guidelines do improve clinical practice” [20].

Given the complexities of patient care, it is of great interest to assess the level of knowledge currently held regarding the therapeutic management of individuals with HIV/AIDS among physicians. Much of the aforementioned research has been conducted in the United States and reveals little about what can be expected among physicians in Canada. With the expected continuation of current trends in the HIV epidemic in this province it will become increasingly important to estimate the level and distribution of the burden of care among physicians of persons living with HIV/AIDS. Keeping pace with changes in physician knowledge under conditions of rapid evolution in HIV therapeutics requires vigilance and regular assessment. Previous studies, while providing valuable information regarding demographic profiles of care givers and their experiences or descriptions of generalised issues in primary care, lack the breadth required to provide a comprehensive picture of the status of current patient management. Finally, the characterisation of the care giving population and their needs would
serve to better direct resources particularly in terms of the therapeutic guidelines and other educational strategies.

1.3 Study Objectives

The current study attempts to combine the contexts engaged in the previously described research in order to address issues of HIV patient care in the context of British Columbia more completely. One may provide a comprehensive overview of patterns of HIV management in this province by incorporating information regarding physicians' personal and practice characteristics, extent of experience, level of current knowledge in several well-defined areas of patient management, self perceived ability to provide care as well as their use and opinions of resources, under sampling conditions which are well specified and reproducible. In assessing therapeutic strategies, this study focuses on areas of management which must be routinely addressed by physicians providing care to HIV infected patients. In terms of guidelines for patient care, the focus is not direct assessment of the effect of guidelines as an intervention under controlled conditions. The combined effects of "history" and the existence of numerous confounding variables makes this untenable at present. Instead, the purpose is to gain an overview of the use of resources and to provide a mechanism of feedback from those familiar with these resources.

The ultimate goal of this study is to describe the patterns of knowledge of HIV management and patient care currently provided by physicians and to identify possible determinants of these patterns. Utilising the information gained and subsequent feedback to the physician community it will be possible to design and target intervention to better meet the educative
and support needs of those caring for HIV positive patients thus contributing to the long term aim of enhancing patient care. This study is essentially descriptive in nature and precludes hypotheses testing regarding causal associations. However, some general objectives can be outlined:

1.3.1 To describe current patterns of knowledge in several areas of therapeutic management of HIV disease among physicians in British Columbia.

1.3.2 To describe the awareness and utilisation of resources provided by the Centre and identify areas in which physicians require further information and training.

1.3.3 To estimate the lower limit of the number of physicians in British Columbia currently caring for HIV positive patients.

1.3.4 To describe the level of concordance with contemporary guidelines in selected areas of patient management.

1.3.5 To compare patterns of knowledge among several pre-defined physician populations or samples.

1.3.6 To estimate the proportion of patients who are likely to be receiving appropriate care.

1.3.7 To identify associations between the characteristics of physicians and their level of agreement with contemporary guidelines.

The following chapter introduces current issues in patient care and previous research that may impact on how these study objectives may best be achieved.
CHAPTER 2
THE MANAGEMENT OF HIV DISEASE AND CURRENT CONSENSUS RECOMMENDATIONS

In the absence of a cure for HIV infection, clinical management is based on the timely administration of vaccinations, early screening for a number of diseases and the use of antiretroviral therapy in combination with the prevention and treatment of opportunistic infections. In light of the complex and continuously evolving nature of patient care, estimating physician knowledge requires comparison to a standard reflecting an acceptable level of care. The management strategies recommended here are drawn from the recommendations offered by two sources; the British Columbia Centre for Disease Control and the British Columbia Centre for Excellence in HIV/AIDS [21, 22, 23].

These recommendations, drawn from the consensus opinions of experts, reflect a reasonable standard of care based on therapeutic strategies which had been established as beneficial at start of data collection. The recommendations outlined in this chapter provide the foundation on which the questions employed in this study are based.

2.1 PREVENTIVE VACCINATIONS AND CLINICAL TESTS

Due to immune system dysfunction, individuals infected with HIV are at higher risk of contracting many infectious agents and are often more likely to suffer severe complications as a result of these infections. It is important to bolster humoral immunity to some common pathogens while antigen recognition is still intact and to test for the presence of others so that
treatment can commence as soon as possible. These vaccinations and tests are integral to HIV patient care and questions regarding their use must form a part of any comprehensive assessment of current physician knowledge.

Vaccination against pneumococcus and influenza have long been accepted as efficacious and appropriate for HIV infected individuals who are at risk of prolonged and more severe disease [24, 25, 26]. It is recommended that persons with HIV/AIDS receive a one time only vaccination against pneumococcus and yearly influenza vaccinations.

Intravenous drug users and sexually active individuals with multiple sexual partners (populations at increased risk of HIV infection) are also considered to be at high risk for Hepatitis B infection. Hence, HIV infected individuals without antibodies constitute a highly susceptible population and should be vaccinated against Hepatitis B at the time of HIV positive diagnosis.

Haemophilus influenza type B (HiB) vaccination for HIV-infected individuals is an area of some debate. There is no evidence that routine administration to those infected with HIV is beneficial and its use is not recommended in this patient population.

Inactivated polio vaccination (IPV) should be updated at diagnosis. While risk of infection in North America is low and there is no evidence to suggest that vaccination against poliomyelitis is necessary, vaccination poses no risk to HIV positive patients and erring on the side of caution seems warranted. On no account should live (oral) polio vaccine (OPV) be
offered to those with HIV infection due to the risk of greater than usual replication of live attenuated virus.

Tetanus immunisation is highly effective and is recommended for all persons in Canada due to its ubiquitous nature and the severity of the ensuing illness. It is recommended that tetanus vaccination be updated in persons with HIV infection.

The association between tuberculosis (TB) and HIV infection is indisputable. Persons latently infected with *Mycobacterium tuberculosis* who become infected with HIV are at an increased risk of developing active TB disease [27]. HIV positive individuals newly infected with TB are at high risk for developing rapidly progressive clinically active tuberculosis disease [28,29]. The ease of testing, availability of effective treatment and the infectious nature of this disease cement the utility of annual tuberculosis skin tests (PPD) for those with HIV infection.

By virtue of their underlying risk factors and immunocompromised state, sexually active HIV infected individuals are also at increased risk of contracting syphilis. Furthermore, pre-existing sexually transmitted diseases which cause genital ulcerations, such as syphilis, are associated with increased risk of HIV transmission [30,31]. Annual syphilis testing is recommended for HIV positive patients as long as they remain sexually active.

Women with HIV are at increased risk for a number of gynaecological problems, most notably cervical malignancy [32, 33, 34]. It is recommended that HIV infected women be encouraged to undergo gynaecological examination on a biannual basis.
2.2  LABORATORY TESTS

While the debate over the clinical meaning and utility of surrogate markers of disease severity and progression is long standing, several laboratory markers are of interest either clinically and/or for research purposes. For the purposes of this survey we concentrate on the clinical utility of measuring surrogate markers of disease activity.

Despite significant variability resulting from physiologic and methodological factors, CD4+ T-lymphocyte (CD4) counts appear to be a valid and reliable predictor of HIV disease progression [35, 36, 37, 38]. CD4 counts have been incorporated into the Centres for Disease Control AIDS case definition, are routinely used to monitor disease progression, as a basis for treatment decisions, and to study the effects of new therapies in the context of clinical trials [39]. It is recommended that CD4 counts be monitored in all HIV positive patients. The frequency of CD4 count measurement is very much dependent on the patient and may range between yearly and four times per year depending on stage of disease, rate of progression and previous CD4 count status.

The clinical utility of measuring p24 antigen and beta 2 microglobulin is controversial and past reports have been in conflict as to their utility. Recent evidence however, supports the use of measures of viral load as a prognostic indicator [40]. At the time of the survey however, the Centre made no specific recommendation as regards the clinical use of p24 antigen or β 2 microglobulin to HIV care-giving physicians for the purposes of standard
patient care. The regular measurement of immune complex dissociated p24 antigen (ICD p24), has not been shown to be a reliable prognostic marker and its use is not recommended.

Lastly, HIV testing itself is of interest. The use of enzyme linked immunosorbent assay testing in combination with confirmatory western blot techniques render the test for the presence of HIV antibodies both sensitive and specific. It is currently recommended however, that patients undergo repeat testing in the circumstances of a positive test to confirm HIV serostatus, particularly for patients who are at low risk for contracting HIV or for patients who themselves request a repeat test.

2.3 ANTIRETROVIRAL THERAPIES

Zidovudine (azidothymidine/AZT/ZDV) monotherapy has been the preferred initial treatment for patients with AIDS or AIDS Related Complex (ARC) since it was shown to be safe and effective in decreasing mortality and the frequency of opportunistic infections in these patients [41]. Assurances offered by studies examining long term survival benefits of AZT have led to trials among symptomatic patients not yet diagnosed with AIDS or ARC [42, 43, 44, 45]. These trials found that the use of zidovudine in symptomatic patients could significantly delay the progression to AIDS. Further studies showed that progression could also be delayed in asymptomatic patients with fewer than 500 CD4 cells/mm$^3$ and was safe for use in asymptomatic patients with more than 400 CD4 cells/mm$^3$ [46, 47, 48].

The “Concorde” trial comparing immediate and deferred zidovudine therapy in asymptomatic patients however, found that no advantage in survival or disease progression was achieved
through the use of AZT [49]. There is, however considerable controversy regarding the interpretation of these results as the timing for the initiation of therapy in the group receiving deferred therapy was modified in mid-trial. The result has been to cast doubt on the utility of zidovudine and to cause confusion regarding the appropriate timing of antiretroviral therapy initiation [50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61].

Current investigations focus on trials of new antiretroviral agents which may be used as alternatives to, or in combination with, AZT. Two well studied alternative therapies, didanosine (ddI) and dideoxycytidine (ddC), appear to be well tolerated even in patients with advanced disease [62, 63, 64]. Sequential monotherapy with ddI (following more than 16 weeks of AZT therapy) has been shown to have beneficial effects on disease progression and the development of viral resistance [65]. More recently, ddI monotherapy and combination therapy with AZT/ddI or AZT/ddC were shown to be more effective than AZT monotherapy among HIV infected individuals with CD4 counts below 500 cells/mm$^3$ [ACTG175-unpublished data]. In fact, the European-Australia Delta study recently showed a nearly 40% reduction in the three year mortality of HIV infected patients with CD4 counts below 300 cells/mm$^3$ when zidovudine in combination with ddI or ddC was compared to zidovudine alone [66]. ddC does not appear to have benefits similar to ddI as a monotherapy and is not approved for this use [67].

Lamivudine (3TC) and stavudine (D4T) are other promising new nucleoside analogues shown to have antiretroviral properties. Clinical trials of 3TC in combination with AZT compared to AZT alone confirm that this combination is associated with improvements in surrogate markers of HIV disease[68, 69]. Preliminary results from studies comparing AZT to D4T are
also promising. Current clinical trials are evaluating the effects of these agents, either alone or in combination with several other antiretroviral agents, on surrogate markers of disease, clinical disease progression and mortality. The use of 3TC has recently been licensed in Canada.

Experts at the Centre for Excellence recommend specific strategies for the application of antiretroviral therapy depending on disease stage and prior patient experience with antiretroviral medications. Figures 2.3.1 and 2.3.2 outline the recommendations by the Centre for Excellence regarding antiretroviral therapy as of December 31, 1995. For asymptomatic patients naive to antiretroviral therapy with a CD4 count below 500 cells/mm$^3$ or for symptomatic patients (regardless of CD4 count) it is recommended that antiretroviral monotherapy with AZT or ddI be initiated. Some highly experienced clinicians may prefer to initiate combination therapy with AZT/ddI, AZT/ddC, AZT/3TC or, alternatively, enter their patients in clinical trials of antiretroviral therapy at this stage. These strategies, while aggressive are completely acceptable in light of Centre recommendations.

For patients on antiretroviral monotherapy who experience significant disease progression as defined by a decrease in CD4 count or a new AIDS defining illness, combination therapy with AZT/ddI or AZT/ddC is recommended. The use of AZT/3TC or participation in a clinical trial of combination therapy are, again, more advanced strategies preferred by some experts and are in accordance with the Centre recommendations.
Figure 2.3.1: Antiretroviral Strategy in AZT-Naive Persons: Recommendations of the Centre for Excellence in HIV/AIDS (Reproduced From *Therapeutic Guidelines for the Treatment of HIV/AIDS and Related Conditions* with the kind permission of the Centre for Excellence in HIV/AIDS)
Figure 2.3.2: Antiretroviral Strategy in AZT-Pretreated Persons: Recommendations of the Centre for Excellence in HIV/AIDS (Reproduced From Therapeutic Guidelines for the Treatment of HIV/AIDS and Related Conditions with the kind permission of the Centre for Excellence in HIV/AIDS)
2.4 **Prophylaxis and Treatment of Opportunistic Infections**

Primary prophylaxis refers to the use of medication to reduce the risk of becoming infected with the pathogens which cause opportunistic infections common in persons with HIV infection. Secondary prophylaxis, or maintenance therapy, utilises medications to avoid reinfection with a pathogen following successful treatment of acute infection.

Recommendations for primary and secondary prophylaxis are a function of risk of primary or secondary infection, the severity of the consequences of infection, prophylactic efficacy and patient tolerance to available agents.

*Pneumocystis Carinii* Pneumonia (PCP)

PCP remains the most common HIV-associated opportunistic infection and, as such, its prevention is crucial to HIV disease management [70]. Determining timing of primary prophylaxis on the basis of CD4 count alone may fail to prevent a substantial proportion of first cases of PCP and this point has been the focus of some controversy as physicians work to identify appropriate criteria which indicate the need for PCP prophylaxis [71,72]. Currently, the Centre recommends that PCP prophylaxis be commenced in all infected individuals with CD4 counts of \( \leq 200 \text{ cells/mm}^3 \).

Three approaches to primary and secondary prophylaxis have received wide-spread examination; trimethoprim/sulfamethoxazole (TMP/SMX), dapsone, and aerosolised pentamidine. Aerosolised pentamidine and dapsone, while convenient and well tolerated, appear to be less effective than TMP/SMX [73, 74, 75, 76, 77, 78]. A recent pivotal comparison of all three approaches however, reported similar levels of effectiveness overall.
among these three agents for primary prophylaxis of PCP in patients with fewer than 200 CD4 cells/mm$^3$ [79]. TMP/SMX and dapsone were felt to have greater efficacy while aerosol pentamidine was better tolerated. The balance of evidence favours the use of TMP/SMX for both primary and secondary prophylaxis of PCP and this regimen is currently recommended by the Centre. Dapsone or aerosol pentamidine are the recommended second line agents in cases where the patient is intolerant to TMP/SMX.

As regards the treatment of PCP, dapsone-trimethoprim and TMP/SMX appear to be of similar efficacy however, the many available options for treatment may result in confusion as preferred treatment regimen is dependent on severity of illness and tolerance to initial treatment [80, 81, 82, 83, 84, 85]. For patients with no known allergies who are ambulatory or who are hospitalised with mild to moderate disease, dapsone in conjunction with trimethoprim is the regimen of choice. TMP/SMX is recommended only for patients intolerant to dapsone/trimethoprim. In the case of severe disease or in patients who can not tolerate oral medication the Centre recommends intravenous TMP/SMX or pentamidine or intravenous clindamycin plus primaquine taken orally if possible.

*Mycobacterium avium-intracellulare complex (MAI or MAC)*

MAC eventually affects most patients with advanced HIV disease. Due to the substantial morbidity and decreased survival associated with MAC, primary prophylaxis is warranted for persons with advanced illness [86, 87, 88]. The Centre, until recently, recommended that all patients with a CD4 count of $\leq$ 100 cells/mm$^3$ be offered prophylaxis for MAC. The recommendation has now changed to $\leq$ 75 cells/mm$^3$. Recent clinical trials have shown rifabutin and other antifungal agents to be effective and well tolerated primary prophylactics
[89, 90]. While clinical trials comparing other agents or combinations of agents to rifabutin for prophylaxis are ongoing, the Centre recommends monoprophylaxis with rifabutin as a well established, effective and cost efficient strategy.

Treatment of *Mycobacterium* infection remains a complex therapeutic challenge best met through combination therapy. While various combination regimens have been considered, the most effective strategy remained undefined until the combination of rifampin + ethambutol + clofazimine + ciproflaxin recently underwent successful trial [91]. More recently, the combination of clarithromycin + ethambutol + rifabutin was shown to be associated with improved survival in comparison to the above strategy [92]. Although several other combinations, too numerous to mention here, represent acceptable alternatives, the guidelines recommend either of the combinations listed above with clarithromycin/ethambutol/rifabutin being the preferred strategy.

**Cryptococcal meningitis**

HIV infected individuals are also susceptible to infection with *cryptococcus neoformans* which may cause cryptococcal meningitis. A recent randomised trial established that prophylactic fluconazole reduces the risk of cryptococcus particularly in patients with fewer than 50 CD4 cells/mm$^3$ [93]. Primary prophylaxis is not currently recommended however, as it does not appear to be cost effective in light of the low rate of occurrence of cryptococcal meningitis.

For treatment of cryptococcal meningitis, initial therapy using either amphotericin B and fluconazole have been well studied. While amphotericin B alone appears to be effective, the
addition of 5-flucytosine appears to reduce toxicity while maintaining the full efficacy of the treatment regimen and has been associated with increased survival [94]. Other investigators report no such survival advantage and are conflicted in regards to the question of efficacy [95, 96]. On the basis of the existing evidence, the Centre recommends initial therapy with amphotericin B with or without the addition of 5-flucytosine. Approximately 50% of patients HIV patients who contract acute cryptococcal meningitis experience relapse. Therefore, secondary prophylaxis is recommended. Maintenance therapy with fluconazole is highly effective and appears to be superior to amphotericin B and is the regimen recommended in contemporary guidelines [97, 98].

Toxoplasmosis

Infection with toxoplasmosis occurs frequently among infected persons during the late stages of HIV disease [99]. Primary prophylaxis against toxoplasmosis with TMP/SMX is recommended in patients having a positive toxoplasmosis titre and a CD4 count of \( \leq 200 \) cells/mm\(^3\). Recently, the Centre has altered the recommendation to prophylaxis at cell counts of \( \leq 100 \) cells/mm\(^3\).

Treatment of toxoplasmosis consists of induction therapy followed by chronic suppressive low dose therapy to prevent relapse. The drug regimen of choice is folinic acid and pyrimethamine in combination with sulphadiazine or, alternatively, clindamycin [100]. Folinic acid may not be necessary for all patients and, because it is expensive, use should be considered on a patient by patient basis.
Cytomegalovirus (CMV)

The reactivation of CMV is also of great concern, particularly in patients with fewer than 100 CD4 cells/mm³. No primary prophylaxis is available for cytomegalovirus infection and no agent can be recommended for the prevention of this disease.

Intravenous ganciclovir or foscarnet may be used to treat CMV infection and for maintenance therapy. Gancyclovir is better tolerated and more cost effective but is not compatible with the use of full dose AZT. Foscarnet, while more expensive and less well tolerated, may provide a survival advantage when used for maintenance therapy [101]. The centre currently recommends the use of intravenous gancyclovir for the treatment of cytomegalovirus disease.

Discussion

The preceding review of current literature and recommendations may appear to minimise the ambiguity surrounding HIV patient care. One should bear in mind that this review utilises a fraction of available published literature in its selection of only the most pivotal research and germane sources. The concise summarisation of strategies reflected in these recommendations are a result of extensive and ongoing reviews of current literature and discussions among experts, each with a great deal of clinical experience and a long acquaintance with the issues surrounding the management of HIV positive patients. For physicians less experienced in the management of HIV disease, opportunities for confusion and either lapsing behind, or moving beyond, contemporary standards exist in abundance.

In the following chapter we turn to a discussion of the methods by which the objectives may best be met in light of accumulated experiences and contemporary issues.
CHAPTER 3

METHODS

3.1 SETTING

The British Columbia Centre for Excellence in HIV/AIDS, housed at St. Paul’s Hospital in Vancouver, British Columbia, is a working group dedicated to HIV disease research. The Centre provides education and training to health care professionals, distributes drugs to those with HIV/AIDS and is actively engaged in furthering our understanding of HIV disease through clinical trials, epidemiological studies and laboratory research as well as direct clinical involvement in patient care.

The HIV/AIDS Drug Treatment Programme (DTP) is the single largest undertaking of The Centre. The primary goals of the programme are to ensure that British Columbians with HIV/AIDS have free access to the drugs that will improve their quality of life, to provide physicians with the most current information available regarding the therapeutic management of HIV and, through collecting patient profiles, to make projections for the coming years by predicting the numbers of persons eligible for new therapies and treatments. Currently, 2,400 HIV-infected individuals and some 800 physicians are Drug Treatment Programme members. Physicians are recruited to the Drug Treatment Programme when they prescribe drugs for HIV positive patients who opt to take advantage of the access to therapies provided by the programme at no cost.

In continued efforts to enhance the application of clinical and research findings to HIV/AIDS treatment regimens, the Centre established a Therapeutic Guidelines Committee in the fall of
1992. This multidisciplinary committee is comprised of individuals with clinical and research expertise in various areas of patient management as well as pharmacists, community advisors and persons living with HIV/AIDS. Through a process of consensus this committee has developed a set of therapeutic guidelines that reflect the best available standards of care. In turn, the Centre is responsible for selecting and distributing drugs recommended for use, free of charge, to eligible individuals infected with HIV.

The Centre's *Therapeutic Guidelines for the Treatment of HIV/AIDS and Related Conditions* was first published in November of 1993. Since their publication, 747 copies of the guidelines have been distributed to physicians who are members of the Drug Treatment Programme and others with an interest in the management of HIV/AIDS. A second updated and extended edition of the guidelines were published in December of 1995 and distributed during the first quarter of 1996 [21]. As such, these guidelines represent the most current and comprehensive guide published in BC regarding the management of HIV disease.

### 3.2 JUSTIFICATION OF METHODOLOGY

It is important that factors of methodological validity, cost effectiveness and possible future research plans be considered in the selection of a methodological approach. The ultimate aim of this study, a thorough assessment of existing patterns of physician knowledge and experience, can be best accomplished by eliciting responses directly from physicians. Due to the sensitive nature of questions regarding both physician practices and the management of those living with HIV/AIDS, it is imperative that anonymity of respondents be assured. Self-administered mail surveys preserve the anonymity of both the respondent and
their patients thereby enhancing participation and encouraging frank responses. Telephone and face to face interviews preclude this possibility and are more likely to result in interviewer and social desirability biases and may be equally susceptible to responder bias despite the possibility of enhanced response. Furthermore, these methods require the training of additional personnel and as such are prohibitively expensive and time consuming.

Written standardised questionnaires also lend themselves well to the collection of longitudinal data. Through future application, questionnaires can be used in an ongoing evaluation of HIV/AIDS management in British Columbia and related Centre activities. The use of a mailed, self administered, anonymous questionnaire is the most appropriate methodological option, however, their use does have serious limitations (Chapter 3, Section 4).

3.3 SAMPLE / POPULATION SPECIFICATION

Three groups of physicians were selected for study participation.

The first group (G-Group) comprised physicians who had requested a copy of the Centre guidelines including those who are actively participating members of the HIV/AIDS Drug Treatment Programme. This population of care givers is likely to have had experience in caring for HIV positive patients and may be more motivated to answer an extensive survey regarding HIV patient care than physicians sampled randomly from among the general population. HIV/AIDS Drug Treatment Program physician members include a core group of HIV specialists in British Columbia. These physicians generally have large practices dominated by HIV positive patients and provide care to a large proportion of the persons in
British Columbia living with HIV/AIDS within these few practices. Due to their clinical experience or interest in HIV patient care and their connection with the Centre, these physicians constitute a unique population which may provide much information in terms of their approaches to patient care and their opinions and use of available resources.

The second group of physicians selected to receive surveys (H-Group) comprised all physicians in British Columbia who had a patient test positive for HIV since 1989. The names and work addresses of 1,185 physicians meeting this criteria were obtained from the provincial laboratory at the British Columbia Centre for Disease Control.

The third group of physicians comprised a random sample of physicians (R-Group) from among the remaining members of the college of Physicians and Surgeons of British Columbia. This sample contributes information regarding the level of HIV-related knowledge which can be expected to exist among physicians with no identifiable interest in HIV management. More importantly, information from these practitioners regarding their level of HIV related experience provides insight into the number of physicians, not identifiable through either the Centre for Excellence or through records of the B.C. Centre for Disease Control, who are currently caring for HIV positive patients. These data will aid in defining the current and future impact of the epidemic on British Columbia’s physician population and the needs of physicians and the patients they serve.

These populations and samples inevitably contain some overlap with some physicians appearing in more than one group. Hierarchical adjustments were made such that those receiving the guidelines were excluded from the other two groups and those having had a
patient test positive for HIV were excluded from the random sample. Table 3.3.1 shows the initial sample/population sizes, overlap, necessary adjustments and final sample sizes for each of the three groups surveyed.

3.4 INSTRUMENT DEVELOPMENT

3.4.i) Selecting content areas and variables

Identification and description of existing associations between physician characteristics and agreement with the strategies outlined in contemporary guidelines, require that data be gathered regarding physician characteristics. Questions regarding demographic, personal and professional characteristics of physicians were selected if it seemed possible that responses would contribute to multivariate models of physician knowledge and on their utility in comparing responders to non-responders. While the existence of further confounding variables can not be ruled out, every attempt was made to ensure that those characteristics most likely to impact on physician knowledge were assessed.

Meeting objectives of estimating the lower limit of the number of physicians in British Columbia currently caring for HIV positive patients and the proportion of patients who are likely to be receiving appropriate care, require that complete information about the level of experience of respondents be generated. Variables measuring physician experience were selected to indicate current and total experience in terms of number of patients. These variables also provide a profile of patients seen and permit estimation of the proportion of physicians seeing patients in British Columbia and the proportion of patients under the care of physicians possessing particular personal characteristics or levels of knowledge.
Table 3.3.1: Physician Sample and Population Sizes: Initial and Final

<table>
<thead>
<tr>
<th>Group</th>
<th>Initial n</th>
<th>Overlap</th>
<th>Total Adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>G-Group</td>
<td>755</td>
<td>-68</td>
<td>Non physicians,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Deceased/Retired or</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Outside of B.C.</td>
</tr>
<tr>
<td>Final n</td>
<td>687</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Group</th>
<th>Initial n</th>
<th>Overlap</th>
<th>Total Adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-Group</td>
<td>1,185</td>
<td>-368</td>
<td>-1 Deceased</td>
</tr>
<tr>
<td>Final n</td>
<td>816</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Group</th>
<th>Initial n</th>
<th>Overlap</th>
<th>Total Adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-Group</td>
<td>644</td>
<td>-69</td>
<td>-38 No longer in B.C</td>
</tr>
<tr>
<td>Final n</td>
<td>537</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In meeting the first objective of the study, the description of current patterns of knowledge in several areas of therapeutic management of HIV disease, requires that questions be designed to measure knowledge in specific areas of patient care. Questions regarding knowledge of therapeutic management of HIV positive patients were also designed to reflect issues which would commonly be met by physicians providing care to HIV+ patients. Questions were designed to represented a wide range of patient care issues and levels of difficulty.

Direct questions assessing the self reported ability and willingness to address several areas of HIV/AIDS patient care were included. These questions were designed to determine associations between level of knowledge and self identified level of ability. Both willingness and ability were addressed specifically to clarify each as a distinct concept and avoid misinterpretation of these terms among respondents.

A further objective of the study was to describe physician awareness and utilisation of currently available resources, an objective best met by asking respondents direct questions about their knowledge and use of these resources. Questions regarding the use and utility of resources and continuing medical education were limited to those resources provided by the Centre for Excellence. These resources were created within British Columbia and designed for the use of physicians of that province. As such, these resources are widely recognised and available in British Columbia and are of greatest interest for the purposes of this investigation.
3.4.ii) Questionnaire format

A closed question format was selected for all questions. Responses to open-ended, fill-in-the-blank, or discussion questions may be difficult to read and interpret and are also time consuming to categorise for quantitative analysis. Closed questions are generally simpler and less time consuming to answer than open ended questions and preclude the need to recall exact drug names and spelling. Multiple choice or scaled closed questions however, allow respondents to guess or to choose answers based on name recognition and may be frustrating to answer if responses do not correspond to available answer choices. To reduce the likelihood of these common problems, a large number of possible answers were provided for most questions and all knowledge questions included “Unsure/Do not know” and “Other” options to ensure exhaustive alternatives.

Transition statements and instructions were used to introduce survey sections, encourage follow through, maintain a personal tone and to reiterate original instructions. Skip instructions were used where possible to limit the number of questions to be answered and avoid frustration connected with answering questions not applicable to the respondent.

Questions regarding demographic and personal characteristics and level of experience were placed at the beginning of the survey to ease respondents into the more demanding questions that followed and reassure respondents that the survey was sensitive to their possible lack of experience. This strategy might also increase the response rates for these questions allowing more complete description of the responders and consequent comparison to non-responders.

Where possible, knowledge questions were posed in a pattern of progressing difficulty.
Questions regarding physicians educational needs and resource utilisation were placed at the end of the survey to encourage follow through. It is however, impossible to preclude the possibility that respondents might have selectively skipped the “more difficult” questions concerning knowledge of therapeutic management.

3.4.iii) Pre-testing and review procedures

An external reviewer with expertise in survey methodology and measurement received a $50.00 honorarium for reviewing the survey. Five internal reviewers having expertise in continuing medical education and laboratory science also reviewed the survey at several stages and approved its final form. This process ensured that the survey was technically accurate and that the answers provided for each question were mutually exclusive, exhaustive and appropriate to the question.

Eight physicians, 3 specialists and 5 general/family practitioners, received a $50.00 honorarium for reviewing and completing the survey and returning a pre-test suggestion form (appendix 1). Physicians were selected to represent the full spectrum of HIV experience. Among these physicians, the total number of patients ever seen ranged from 0 to 200 while the number of current patients ranged from 0 to 80. The pre-test indicated that questions and directions were clear, answers provided were mutually exclusive and exhaustive, the format was easy to use, and that face and content validity were achieved (see Chapter 3, Section 4.iv). The survey was modified to reflect the changes recommended by the pre-test group. The modified survey was then reassessed and approved by the internal review panel.
3.4.iv) **Internal limitations: Instrument reliability and validity**

[103, 104, 105]

**Reliability**

Reliability, the extent to which a measurement is internally consistent and repeatable, can be assessed by three statistical methods. Each results in a measure of correlation based on the comparison of two items designed to measure a single domain or of a single item compared to itself at two points in time.

The ‘split half’ and ‘alternate form’ methods of reliability assessment are restricted to circumstances in which two questions are used to measure a single facet of behaviour or knowledge. The answers to one question are then compared to those of the second corresponding question with the resulting correlation coefficient indicating the extent of item reliability. In the split half method the two questions are administered in a single survey while alternate form technique requires that two forms of the survey be administered to the same respondents. In either method, the result is that two questions must be formulated and responded to. This feature is likely to reduce response rates among physicians. Furthermore, therapeutic management is very specific to patient symptoms, signs or stage of disease and have definite criteria for administration. This makes it difficult to phrase questions in sufficiently divergent terms to utilise either of these methods. The only exception are questions regarding antiretroviral therapy in patients with disease progression as this progression may take several forms. A pair of alternate form questions were incorporated into one of the surveys (specifically questions 20 and 21 in Survey 1-see Chapter 3, Section 5 and Appendix 2).
The third method of reliability assessment, test-retest reliability, determines whether the same individual answers the same questions in the same way on two different occasions. Knowledge is dynamic, particularly in the rapidly evolving field of HIV management and might be expected to change, even over a short period of time. Other variables, such as current practice characteristics or level of experience may also change rapidly. Measures of test-re-test reliability are, therefore, not appropriate under the current circumstances. It should be noted that basic demographic variables, by virtue of their common use and familiarity within the general population, are considered to be of proven reliability.

Validity:

Validity refers to the ability of specific questions to measure what they are intended to measure. There are four types of validity which need to be considered; content validity, face validity, criterion validity and construct validity.

Content validity refers to the representativeness of the questions i.e., do the questions cover the content of the property being measured. The domain under examination in this case is knowledge, a much less abstract concept than beliefs, attitudes or self reported behaviour, making content validity relatively easy to assess.

Our clinical experts were asked to review content and ensure that the questions portray an adequate and representative sample of questions regarding therapeutic management of HIV. In addition, physicians in the pre-test group were asked directly whether there were any other content areas that they felt should be addressed in such a questionnaire. Eight of the nine pre-test physicians stated that there were not. One suggested that questions regarding counselling
might be asked. It was decided that this area would represent a substantial extension to the
survey which might reduce response rate. In addition, clinical guidelines, our basis for
comparison, do not cover this content area.

Face validity refers to the appearance of validity i.e., that questions seem to be well thought
out and purposeful to both the administrators and recipients of the survey. The reviewers and
all physicians in the pre-test sample indicated that face validity was achieved.

Criterion validity is a method of validation whereby the results achieved using a new or
untried instrument are compared to those gained using a pre-existing independent instrument
(the criterion). This method is not feasible as no independent criterion exists. The use of
previously administered surveys is not acceptable as there is no evidence that these have been
established as reliable or valid in themselves. Furthermore, previously used surveys were
administered some time ago. Advances in patient care over time would, naturally, affect item
reliability rendering assessment of validity impracticable.

Construct validity is at issue when the instrument is used to measure a multi-faceted, complex
and abstract construct such as intelligence or artistic ability and is not applicable in the current
context.
3.4.v) Methodological limitations

[106, 107, 108, 109, 110]

Some limitations are inherent in survey methodology and are experienced to some extent regardless of the population surveyed, the subject of the survey, and instrument validity and reliability. Those that may have some impact in the current context are described below.

Low response rate

Response rates to mail surveys may be low, particularly among physicians. The absolute number or proportion of respondents, while important in terms of the adequacy of the sample size for statistical analysis, is not as pivotal a concern as the prospect of responder bias. While a great deal of research has been done regarding methods of enhancing response, much of it is inconclusive. Methods that appear to consistently accomplish increased response rates are multiple mailings, the selection of motivated respondent groups, user friendly format and an explanatory covering letter [106,107,109]. Each of these strategies has been used in the development, formatting and administration of the surveys used here.

Non-response bias

If responders and non-responders are systematically different on the basis of variables which are linked to the outcome variables then bias will occur. One tenet of survey research is that those to whom the subject of the survey is not salient are less likely to respond [110]. Survey recipients who are unable to read or comprehend the language of the survey are also less likely to respond [106]. These latter factors should not present a problem amongst British Columbia’s physicians. Detailed discussions of non-response bias in the current context appear in Chapter 4, Section 2 and Chapter 5, Section 1.
Item non response

Item non-response by those surveyed may be due to accidental skipping, skipping difficult questions with a view to returning to them later, not knowing “the answer”, question ambiguity, non-exhaustive answer choices or non-applicability of the questions to the responder. Ultimately, it is difficult to identify reasons for item non-response. It is best to strive to avoid its occurrence rather than to try and interpret the resulting answer patterns subsequent to data collection. To reduce the probability of skipped questions, pre-testing physicians were asked to identify questions or directions which they had difficulty interpreting. “Unsure/Do not know” and “Other” answer options were provided to ensure that physicians understood that not knowing was both acceptable and expected as well as to provide an exhaustive selection of answers.

Postal disruption or misdirection

Questionnaires may not reach their target responder due to postal disruptions or misdirection. Multiple mailing makes this unlikely. It is also unlikely that physicians would pass the survey along for someone else to answer as this is clearly a personally directed physician survey and other physicians would be unlikely to accept the responsibility of completing a survey addressed to a colleague.

Social desirability bias

Some responders may consult colleagues or references when completing the survey- a form of social desirability bias. It is unlikely however, that physicians will be highly motivated to
spend time researching the "correct" responses, particularly when the survey is anonymous. It is also likely that many respondents will not have such resources readily available to them.

3.5 SURVEY CONTENT

A set of 51 questions were developed and used in the construction of two surveys; a full length format (Survey 1) and a shortened version (Survey 2). The first survey, containing all 51 questions, was sent to the population of physicians who had received a copy of the guidelines (G-group). Survey 2, containing a subset of 20 questions, was administered to those physicians who had had a patient test HIV positive in British Columbia since 1989 (H-group) and the randomly selected sample (R-group). Survey 2, the short format, was implemented to enhance response rate among physicians in the H- and R-groups. The basis for this belief is the assumption that these two groups of physicians are likely to have lower levels of experience and involvement with the HIV positive patient population and would, in consequence, be less motivated to answer an extensive questionnaire regarding the care of these patients.

Both surveys are provided in their entirety in Appendices 2 and 3. The full length survey (Survey 1- Appendix 2) elicits information about: physician demographic, personal and practice characteristics; experience in HIV patient management; self-perception of knowledge of HIV patient management; knowledge of therapeutic management of HIV positive patients; physician resources; recall of past practices; and clinical opinions. The short survey (Appendix 3) covers similar content areas using the same questions with the exception of domains of physician recall and clinical opinions regarding management strategies which were omitted. In
addition, questions in the short survey regarding specific patient management strategies and
the use and opinion of physician resources are fewer in number.

Table 3.5.1 provides an outline of the content domains covered in each of the surveys, the
information each domain contains and notes the questions contributing to each domain.

Finally, a one page mini-survey was mailed to all potential respondents on February 15th
(Appendix 4). One purpose of this non-response mini-survey was to aid in the comparisons of
responders to non responders. The follow-up mini survey elicit information similar to that
obtained in the full length survey regarding gender, age, location, whether the respondent had
ever provided care to an HIV positive patient and to how many HIV patients they were
currently providing care. This follow-up survey also asked physicians who did not respond to
the original survey to identify their reason for not responding to that survey. This enabled the
investigator to describe some common reasons for non-response among a proportion of non-
respondents. Finally, the mini-survey also enquired whether non-respondents would be willing
to answer the original survey for an honorarium of $30.00. This provides information which
may be used for future applications of similar surveys to these populations of physicians.
Table 3.5.1: Content of Surveys 1 and 2: Questions Contributing to Included Domains

<table>
<thead>
<tr>
<th>Information Domain</th>
<th>Corresponding Question Number</th>
<th>Survey 1</th>
<th>Survey 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic/Personal/Practice</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
<td></td>
<td>1</td>
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<tr>
<td>Age</td>
<td>2</td>
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</tr>
<tr>
<td>Location</td>
<td>3</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Medical Specialty</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature of practice</td>
<td>5</td>
<td></td>
<td>5</td>
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<tr>
<td>Current practice status</td>
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<td></td>
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<tr>
<td><strong>Physician Self Perception</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Approach to new HIV patient</td>
<td>7</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Ability to treat</td>
<td>8</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Willingness to treat</td>
<td>9, 10</td>
<td></td>
<td>12, 13</td>
</tr>
<tr>
<td><strong>Level of Experience</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any experience yes/no</td>
<td>11</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Total # of patients</td>
<td>12</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Current experience</td>
<td>13.1 to 13.4</td>
<td></td>
<td>9.1 to 9.4</td>
</tr>
<tr>
<td>Duration of experience</td>
<td>14</td>
<td></td>
<td>NIL</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventive vaccinations and tests</td>
<td>16a</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>16b</td>
<td></td>
<td>NIL</td>
</tr>
<tr>
<td></td>
<td>17a.5 to 17a.7</td>
<td></td>
<td>18.5 to 18.7</td>
</tr>
<tr>
<td></td>
<td>17b.5 to 16b.7</td>
<td></td>
<td>NIL</td>
</tr>
<tr>
<td>Laboratory tests</td>
<td>15, 17a and b .1 to .4</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Antiretroviral therapy</td>
<td>19 to 21, 23</td>
<td></td>
<td>19, 20</td>
</tr>
<tr>
<td>Prophylaxis for opportunistic infections</td>
<td>25 to 35</td>
<td></td>
<td>NIL</td>
</tr>
<tr>
<td>Treatment of opportunistic infections</td>
<td>36 to 42</td>
<td></td>
<td>NIL</td>
</tr>
<tr>
<td><strong>Recall</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time of first combination therapy</td>
<td>24</td>
<td></td>
<td>NIL</td>
</tr>
<tr>
<td><strong>Clinical Opinion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usefulness of preventive measures/tests</td>
<td>18</td>
<td></td>
<td>NIL</td>
</tr>
<tr>
<td>Use of clinical trials</td>
<td>22</td>
<td></td>
<td>NIL</td>
</tr>
<tr>
<td><strong>Physician Resources</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness of resources</td>
<td>44</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Use of resources</td>
<td>45 to 47, 50</td>
<td></td>
<td>NIL</td>
</tr>
<tr>
<td>Utility of resources</td>
<td>48, 51</td>
<td></td>
<td>NIL</td>
</tr>
<tr>
<td>Agreement with clinical guidelines</td>
<td>49</td>
<td></td>
<td>NIL</td>
</tr>
<tr>
<td>Opinion of medical education events</td>
<td>43</td>
<td></td>
<td>14</td>
</tr>
</tbody>
</table>
3.6 SURVEY ADMINISTRATION

Surveys were mailed to all selected physicians on July 4th 1995. Repeat mailings of identical surveys were sent to all potential respondents on August 20th and again on November 6th. In addition, a reminder notice was enclosed in the “Forecast”, a newsletter provided to all physician members of the Drug Treatment Programme in late September. All survey packages were personalised with the name and address of the intended recipient, bulk mailed in envelopes stamped with the logo and address of the Centre for Excellence and contained a self addressed, postage paid return envelope. Returns from each group and from each mailing were identifiable by the attached covering letter, paper colour and, in the case of G-group, by the survey length and content. For each mailing the cover letter was updated to explain the repeated mailing and further emphasise the importance of participation. Data collection was terminated on January 5th, 1996.

3.7 DATA MANAGEMENT

All returned surveys were reviewed and coded by the author according to a pre-arranged schedule to ensure quality and consistency of coding. A national data entry firm, Elan Data Makers, was contracted to enter the coded survey data. Data was double entered into a flat ASCII file format. All entries which data entry clerks found ambiguous or problematic were queried then reviewed and coded by the author. Data was imported into Excel spreadsheet format for random verification and cleaning. Data was then transferred to SPSS files for
analysis. SPSS base and advanced statistics modules were used for all univariate procedures and regression analyses.

3.8. **UNIVARIATE STATISTICAL ANALYSIS AND SCORING PROCEDURES**

3.8.i) *Univariate/descriptive statistics*

For each of the three groups of physicians surveyed, the response rate and the proportion of respondents indicating each answer choice or groups of answer choices were calculated. Measures of central tendency and dispersion and 95% confidence intervals were calculated where appropriate.

3.8.ii) *Scores of physician knowledge*

Objectives 4 and 6 call for a description of the level of concordance with contemporary guidelines and the comparison of level of knowledge among the three groups of physicians. For the purposes of illustrating physician knowledge more succinctly and identifying associations between physician knowledge and both personal and professional characteristics, it is necessary to synthesise composite scores of physician knowledge for each of the three groups in the areas of patient management of interest. Selected questions pertaining to the therapeutic management of HIV positive patients were used to generate these patient management scores. Respondents had to complete at least 80% of the questions contributing to any given score in order to receive a score.

Not all questions regarding patient management appearing in the surveys were used in score compilation. In the cases of some questions, there is no correct response or formally
recommended approach. These questions represent areas of care in which the correct response is dependent upon a complex algorithm related to the condition of individual patients or for which no consensus regarding their use has been reached. For example, the questions regarding P24 antigen, B2 microglobulin and the frequency of CD4 counts were not used in computing scores as no consensus recommendation regarding these tests has been made. These questions were asked only to garner information on the current consensus opinions of physicians.

The questions regarding syphilis testing and the frequency of hepatitis B vaccination were also eliminated as they may have been unclear. Annual syphilis testing is recommended only for sexually active patients. The question did not specify whether testing referred to sexually active patients or all patients. In the case of one question (pneumococcal vaccination), the check box corresponding to the correct answer was omitted in the printing process resulting in a high rate of non-response and the question was withdrawn.

Table 3.8.1 summarises the knowledge score categories, the questions in each version of the survey on which scores are based, how composite scores were computed and the maximum achievable score for each category of patient care. As the survey received by guidelines recipients (G-group) is more extensive in terms of questions regarding knowledge of HIV management, direct comparisons of all three groups are limited to three scores based on questions common to both forms of the questionnaire. These three restricted scores are: Preventive measures-restricted score; Antiretroviral therapy-restricted score; and the resulting summary score, Overall management-restricted score.
<table>
<thead>
<tr>
<th>Score #</th>
<th>Score Category/Name</th>
<th>G-Group - Survey 1</th>
<th>H and R-Groups - Survey 2</th>
<th>Maximum Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>Preventive measures- restricted score</td>
<td>15 (.1, 2) 16a (1, 2, 3, 5, 6) 17a (1, 3, 5, 6)</td>
<td>16 (.1, .2) 17 (1, 2, 3, 5, 6) 18 (1, 3, 5, 6)</td>
<td>11</td>
</tr>
<tr>
<td>2 ~</td>
<td>Preventive measures- total score</td>
<td>15 16a (1, 2, 3, 5, 6) 16b (1, 3, 5) 17a (1, 3, 5, 6) 17b (5, 6)</td>
<td>Nil</td>
<td>10</td>
</tr>
<tr>
<td>3 *</td>
<td>Antiretroviral therapy- restricted score</td>
<td>19 20</td>
<td>19 20</td>
<td>2</td>
</tr>
<tr>
<td>4 ~</td>
<td>Antiretroviral therapy- total score</td>
<td>19 20 21 23</td>
<td>Nil</td>
<td>4</td>
</tr>
<tr>
<td>5 ~</td>
<td>Prophylaxis of Ol's</td>
<td>25 through 35</td>
<td>Nil</td>
<td>9</td>
</tr>
<tr>
<td>6 ~</td>
<td>Treatment of Ol's</td>
<td>36 through 41</td>
<td>Nil</td>
<td>6</td>
</tr>
<tr>
<td>7 *</td>
<td>Overall management- restricted score</td>
<td>Sum of scores: Score1 + Score 3</td>
<td>Sum of scores: Score1 + Score 3</td>
<td>13</td>
</tr>
<tr>
<td>8 ~</td>
<td>Overall management- total score</td>
<td>Sum of scores: Score2 + Score 4 + Score 5 + Score 6</td>
<td>Nil</td>
<td>29</td>
</tr>
</tbody>
</table>

* Scores comparable between groups G, H and R.

~ Scores restricted to G-Group
Recall that the management strategies recommended are drawn from two sources; the British Columbia Centre for Disease Control and the British Columbia Centre for Excellence in HIV/AIDS Therapeutic Guidelines for the Treatment of HIV/AIDS and Related Conditions. The recommendations, drawn from the consensus opinions of experts, reflect a reasonable standard of care based on therapeutic strategies which were established as beneficial at start of data collection.

For the purposes of scoring, each question may elicit one of three categories of answers: correct (in accordance with the guidelines), incorrect (in contradiction to the guidelines) or unsure. Correct responses garner the respondent points in the score or scores to which that question contributes. In terms of physician knowledge, answers such as “unsure”, “consult with expert” or “refer patient” indicate a lack of knowledge and were scored as incorrect with the respondent received no points for such answers. In cases in which recommendations have recently been changed (specifically questions regarding the approach to primary prophylaxis for toxoplasmosis and MAI), responses in accordance with both the new or old recommendations were considered acceptable.

In several instances, questions appearing in the longer version of the survey (Survey 1) sent to guidelines recipients are in the form of two linked questions, the answer to the second question being dependent on the first. Questions regarding the use of preventive measures (vaccinations, clinical and laboratory tests) fell into this category as did the questions regarding primary prophylaxis of toxoplasmosis and MAI. The first part of the question asked if and when the respondents would use the preventive therapy or prophylaxis and the second asks how often preventive measures should be applied, or in the case of prophylaxis
questions, which drug should be used. These questions represent single treatment concepts. They were divided into two questions for the purposes of making the question clearer and easier to complete and not because these concepts are considered to be of greater importance or should contribute more heavily to resultant scores. These questions are scored in a lead-follow fashion in which each part of the question is worth half a point. Respondents may receive partial points for answering the first sub-question correctly but may gain points for the second sub-questions only if they answered the first correctly.

Recall that in Survey 2, questions regarding prophylaxis of opportunistic infections were not included while questions regarding preventive measures asked only the first part of the question i.e., whether or not the vaccination or test should be offered at all. For the purposes of inter-group comparison on scores of knowledge of preventive measures, the group receiving Survey 1 (G-group) was initially scored on only the first part of the question with one full point awarded for correct answers. This created a comparable score; the Preventive Measures- restricted score. Subsequently, for the purposes of determining additional scores among those who had received Survey 1, the additional criteria (the second sub-question) and lead-follow scoring process was applied to compute the Preventive Measures- total score.

It should be noted that two alternative approaches to scoring such two-part questions exist. First, each question may be scored independently. In this best case scenario, respondents would be given points for answering each sub-question correctly. For example, a respondent may be able to identify the appropriate drug for treatment or prophylaxis but may not be able to identify the correct approach to prophylaxis or treatment in terms of timing of therapy initiation. Alternatively, in a more conservative approach, these two part questions may be
scored as a single question with no partial points awarded and in which both parts of the question must be answered correctly to gain a point. While these alternative approaches are essentially valid, their application is unlikely to change outcome scores significantly. An illustration of the effect of scoring procedures on outcome scores is provided in Chapter 4, Section 5.

3.8.iii) Selecting independent variables for use in multivariate analysis

Univariate techniques were used to identify independent variables which might be associated with outcome scores and could therefore, be considered in the development of multivariate models. All applicable outcome scores were considered as dependent variables for the respondents in each group; seven scores in G-group and two scores in both H- and R-groups.

The following independent variables were considered: 1) Age (continuous); 2) Sex (dichotomous); 3) Location (dichotomous - Vancouver / Outside of Vancouver); 4) Medical specialty training (dichotomous- Yes / No); 5) Number of patients currently in the practice (categorical - 0, 1 to 5 and > 5 patients); 6) Ever treated an HIV positive patient (dichotomous- Yes / No); and 7) Physician’s self perceived ability to provide care (categorical- Very / Quite / Somewhat / Not Very / Unable).

This last variable, self perception of ability, refers to self perception of ability to provide care in areas of patient management which correspond to the scores which assess those same areas of patient care. Ability to provide prophylaxis for opportunistic infections, for example, would
be compared only to the prophylaxis knowledge score. Table 3.8.2 shows the areas of care for which ability was measured and the outcome scores to which they are related.

Physician’s self perceived willingness to provide care was not included because of an a priori assumption that willingness and ability would be correlated. Of these two variables, physician’s self perceived ability was of greater interest and was considered a more important indicator of knowledge than willingness. Self perception of ability however, may also be correlated with the number of patients currently in physicians practices. Physicians may accept HIV positive patients as a result of a high level of ability or, conversely, physicians with current patients may achieve a sense of ability through providing care to those patients. In either case testing for co-linearity of ability and current patient status will be necessary.
Table 3.8.2: Measures of Self-Perceived Ability and Corresponding Knowledge Scores.

<table>
<thead>
<tr>
<th>Areas of Care Addressed in Self-Perceived Ability</th>
<th>Vaccinations</th>
<th>Antiretrovirals (asymptomatic)</th>
<th>Antiretrovirals (symptomatic)</th>
<th>Prophylaxis of Opportunistic Infections</th>
<th>Treatment of Opportunistic Infections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>Corresponding Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G-group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventive: restricted</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall management: restricted</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventive: total</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antiretroviral: total</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prophylaxis of OI's</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment of OI's</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall management: total</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>H-Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventive: restricted</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall management: restricted</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventive: restricted</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall management: restricted</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.9 TRANSLATING PHYSICIAN KNOWLEDGE TO PATIENT CARE

The scores resulting from the process described in the previous section, while being good indicators of the level of knowledge held by the respondents, are not necessarily indicative of the level of care that patients are likely to receive. In terms of physician knowledge, answers such as "do not know", "would refer the patient" and "would need to look up the correct approach" indicate a lack of knowledge and were scored as being "incorrect". In terms of patient care however, physicians who identify themselves as not knowing the correct responses are not likely to undertake patient care in these areas without consultation and further education. In order to describe the care that patients might receive, a second scoring strategy was applied. Here, all contributing questions were re-scored with answers reflecting self identified physician uncertainty scored as being correct. Subsequent composite scores were re-tabulated.

3.10 MULTIVARIATE ANALYSIS

Multivariate techniques were utilised to identify existing associations between physician demographics, practice characteristics and level of experience, and the outcome variables of interest after adjusting for multiple parameters. It is of interest to discern the association of these variables to physician knowledge and to discover whether the resulting models are similar for each group. It is also of interest to determine whether the actual selection group (G, H or R) effects knowledge after adjustment for important physician characteristics.
3.10.i) Techniques and limitations

Linear regression was selected as the most appropriate statistical technique due to the continuous nature and normal distribution of the dependent variables. This approach however, is only valid when the assumptions of linear regression are met, specifically: 1. The number of observations is sufficient given the number of parameters (generally 10 observations for each parameter is considered acceptable); 2. Observations are independent, i.e., error terms are independent; 3. The residuals are normally distributed; 4. Variances of the error terms should be homoscedastic; 5. Independent variables should not display co-linearity; and 6. Additional, unconsidered independent variables should not act as cofounders.

Assumptions 1 and 2 can be verified prior to analysis by simply referring to the sample size and assessing the method of data collection. As regards assumptions 3 through 6 however, one can not be certain of the aptness of the model prior to analysis, therefore, diagnostic techniques were applied.

3.10.ii) Independent variables

The independent variables considered were those identified through univariate analysis described in Chapter 3, Section 8.iii as having a possible association (p<.10) with the outcome variable. The relationship between experience and knowledge were of key interest. Therefore, measures of physician experience were forced into each model.

3.10.iii) Dependent variables

Dependent variables included all previously described knowledge scores. Among guidelines recipients (G-group) dependent variables included: 1) Preventive measures- Total score; 2)
Preventive measures- Restricted score; 3) Antiretroviral therapy- Total score; 4) Prophylaxis of opportunistic infections; 5) Treatment of opportunistic infections; 6) Overall management- Restricted score and 7) Overall management- Total score.

Among the two remaining groups (H and R-groups) dependent variables included: 1) Preventive measures- Restricted score; and 2) Overall management- Restricted score.

Preventive measures-Restricted score and Overall management-Restricted score models may be directly compared between the three groups as the questions contributing to these scores were identical in both surveys 1 and 2. In this way one can ascertain whether any existing independent associations are consistent regardless of population of physicians of interest.
CHAPTER 4

RESULTS

4.1 RESPONSE RATE

At the termination date set for data collection, January 5th, 1996, unique responses had been received from 866 physicians. Guidelines recipients (G-Group physicians) returned 252 surveys. Physicians who had ever had a patient test positive for HIV since 1989 (H-Group) returned 374 surveys while 242 responses were received from those physicians selected at random from among the remaining physicians of British Columbia (R-Group).

Physicians were eliminated from the initial sample if they returned the survey indicating that they were not currently practising and did not intend to return to patient care for at least three years. This included, for the most part, physicians who were retired, with the remainder having managerial or academic appointments or being on extended leave. In the case of surveys which were returned unopened because the intended recipient was deceased or had moved, duplicate returns were deleted and the intended recipient who was unavailable for response was eliminated as is the accepted practice among survey methodologists [106, 107].

Some physicians who responded to the non-responder follow-up mini-survey indicated that they were not involved in clinical practice, thus explaining their initial non-response. These mini-survey responders were checked for duplication against those eliminated from the survey data-base who indicated that they were not involved in patient care. All were unique respondents and were, therefore, eliminated from the initial sample or population.
Despite the fact that the accompanying cover letter for the second and third mailings of the surveys advised recipients not to answer the survey more than once, it is possible that some physicians may have re-responded. A search for duplicates within groups was done by first matching respondents on the basis of gender, medical specialty training and postal code. The process was then repeated by matching respondents on gender, medical specialty training and consecutive age groups. This two step process was necessary as re-responders might, between mailings, move location or have a birthday which moved them from one 5 year age group to the next. Possible duplicates were resolved by reviewing, by hand, the surveys returned by those who matched on all variables. Of the two surveys completed by re-responders, one was randomly selected by coin toss for elimination.

Table 4.1.1 shows the initial sample sizes, the number of respondents eliminated from each group, number of duplicates eliminated and unique responders. The final response rates, after elimination and relevant adjustments, were 38% for G-group, 49% for H-Group and 50% for R-Group.
Table 4.1.1: Initial and Adjusted Sample Sizes and Final Response Rates by Group

<table>
<thead>
<tr>
<th></th>
<th>G-Group</th>
<th>H-Group</th>
<th>R-Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample/Population Size</td>
<td>689</td>
<td>816</td>
<td>537</td>
</tr>
<tr>
<td>Eliminated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Survey returns</td>
<td>18</td>
<td>39</td>
<td>35</td>
</tr>
<tr>
<td>3 Non responder follow-up survey</td>
<td>12</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>4 Adjusted Sample/Population (1 - (2+3))</td>
<td>659</td>
<td>765</td>
<td>484</td>
</tr>
<tr>
<td>5 Number of Respondents</td>
<td>257</td>
<td>380</td>
<td>248</td>
</tr>
<tr>
<td>6 Duplicates eliminated</td>
<td>5</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>7 Unique respondents (5-6)</td>
<td>252</td>
<td>374</td>
<td>242</td>
</tr>
<tr>
<td>8 Response Rate (7/4 (100))</td>
<td><strong>38.2%</strong></td>
<td><strong>48.9%</strong></td>
<td><strong>50.0%</strong></td>
</tr>
</tbody>
</table>

G - Physician recipients of the therapeutic guidelines  
H - Physicians who have had a patient test positive for HIV since 1989  
R - Random sample of remaining physicians
4.2 ASSESSING NON-RESPONSE BIAS

Non-response bias (or response bias) may occur despite all attempts to secure a high response rate. Generally, one may state that in a survey of this nature the higher the response rate the lower the probability of response bias. One should note however, that low response rates do not necessarily imply that bias has occurred. In short, the extent of bias is not necessarily proportional to the rate of non-response. Given that even moderate response rates may be associated with significant bias, it becomes important to make some estimation of the magnitude and direction of the effects that such bias may have on the results rather than to discuss the response rate itself.

Two methods of non-response assessment are useful in the current context and are described below. The first approach utilises comparisons of responders and non responders based on limited demographic or personal variables. The second approach uses late responders to estimate possible characteristics of non-responders on the basis of all variables. It should be noted that statistical comparisons of group characteristics using a significance level of $P=.05$ is conservative. Adjustment for multiple comparisons is indicated, however, a conservative criteria draws attention to possible differences between responders and non-responders which may then be tempered by qualitative appraisals of these apparent disparities.

4.2.i) Comparison of survey responders, and non-responders who returned the follow-up mini-survey

Table 4.2.1 compares those who responded to the original survey to non-responders who returned the follow-up non-responder mini-survey. Comparisons were made on the basis of
<table>
<thead>
<tr>
<th>Variable</th>
<th>G-Group %</th>
<th>H-Group %</th>
<th>R-Group %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non Responders</td>
<td>Responders</td>
<td>Nominal P-Value</td>
</tr>
<tr>
<td></td>
<td>Follow-up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>n=181</td>
<td>n=252</td>
<td>0.311</td>
</tr>
<tr>
<td>Male</td>
<td>83</td>
<td>79</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>17</td>
<td>22</td>
<td>0.004*</td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vancouver</td>
<td>27</td>
<td>30</td>
<td>0.485</td>
</tr>
<tr>
<td>Other</td>
<td>73</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 45</td>
<td>48</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>≥ 45</td>
<td>52</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Ever provided care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>90</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>10</td>
<td>10</td>
<td>0.993</td>
</tr>
<tr>
<td>Currently providing care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>48</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>52</td>
<td>29</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Current # of patients**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to 5</td>
<td>81</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>6 to 10</td>
<td>10</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>&gt; 10</td>
<td>9</td>
<td>18</td>
<td>0.719</td>
</tr>
<tr>
<td>No Estimate</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

** limited to those currently providing care
* significant after adjustment for multiple comparisons
G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
sex, age, location of practice, and level of experience in HIV patient care. The data reveals that for all groups, initial responders and mini-survey responders do not differ in terms of gender or location of practice. It does appear however, that follow-up responders were, in general, older than initial respondents with all groups having a significantly greater proportion of follow-up respondents over the age of forty-four at the significance level adjusted for multiple comparisons, $p = .008$ ($p = .004$ for G-group, $p = .005$ for H-group and $p < .001$ for R-group).

Initial and follow-up responders are equally likely to have ever provided care to an HIV positive patient after adjustment for multiple comparisons. Follow-up responders in groups G and R however, are significantly less likely to currently be providing care to HIV positive patients (both $p < .001$). While it may appear that among respondents currently providing care to HIV positive patients, follow-up responders are providing care to fewer patients, the differences are not significant (although the small numbers of respondents in each group who are caring for larger numbers of patients may explain this finding).

Table 4.2.2 summarises the reasons given by follow-up respondents in each group for not responding to the full length survey. It should be noted that many physicians felt that two reasons were equally valid and the categories are, therefore, not mutually exclusive. Nevertheless, the pattern seems clear. The primary reason for non-response stated by G-group respondents was that the questionnaire was too lengthy (68%). Among H-group respondents, 54% stated that they had little past, or anticipated future experience, while 51% felt that the questionnaire was too long. The majority of R-group respondents (80%) stated
Table 4.2.2: Explanations Cited for Survey Non-response by Non-Responders Replying to the Follow-Up Mini-Survey

<table>
<thead>
<tr>
<th>Reason</th>
<th>G-Group %</th>
<th>H-Group %</th>
<th>R-Group %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little past and anticipated future experience in HIV management</td>
<td>37.6</td>
<td>53.6</td>
<td>79.6</td>
</tr>
<tr>
<td>Do not know very much about the management of HIV disease</td>
<td>9.9</td>
<td>12.3</td>
<td>16.3</td>
</tr>
<tr>
<td>The questionnaire was too long</td>
<td>68.0</td>
<td>50.7</td>
<td>28.6</td>
</tr>
<tr>
<td>Do not have time / too much paperwork / too busy</td>
<td>10.5</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>Concerned that responses would not be confidential</td>
<td>1.1</td>
<td>3.6</td>
<td>1.0</td>
</tr>
<tr>
<td>Other</td>
<td>3.9</td>
<td>2.9</td>
<td>7.1</td>
</tr>
<tr>
<td>No Response</td>
<td>0.6</td>
<td>2.2</td>
<td>0.0</td>
</tr>
</tbody>
</table>

* Categories not mutually exclusive

Would answer the survey if offered an honorarium of $30.00

<table>
<thead>
<tr>
<th></th>
<th>G-Group %</th>
<th>H-Group %</th>
<th>R-Group %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>27.6</td>
<td>36.2</td>
<td>23.5</td>
</tr>
<tr>
<td>No</td>
<td>60.2</td>
<td>55.1</td>
<td>71.4</td>
</tr>
<tr>
<td>No Response</td>
<td>12.2</td>
<td>8.7</td>
<td>5.1</td>
</tr>
</tbody>
</table>
that they did not respond to the initial survey because they had had little experience in the past and/or anticipated that they would be unlikely to provide HIV patient care in the future. Ten percent, 12% and 16% of G-group, H-group and R-group respectively, stated directly that they did not answer the questionnaire because they did not know very much about HIV patient management. A small proportion of each group were concerned that their responses would not be kept confidential, cited other reasons for non-response, or supplied no reason for non-response.

When asked whether they would consider answering the original, full-length survey if offered an honorarium of $30.00, the majority of respondents (60%, 55% and 71% in G-, H-, and R-groups respectively) indicated that they would not.

4.2.ii) Comparison of early and late responders

Survey methodologists have provided evidence that individuals who respond late to a survey may be similar to non-responders, thereby acting as an informative link between these two groups [105].

Respondents in each group were divided into two samples; early responders (those who responded to the first mailing), and late responders (those who responded to the second or third mailings). Table 4.2.3 shows the demographic and practice characteristics of early and late responders in each group. Chi squared analysis revealed no significant differences in gender, specialty training, location or age group between early and late responders in any of the three groups after adjustment for multiple comparisons. R-group late responders
however, were less likely to have medical specialty training based on a more liberal p-value of .05 (p=.05).

Table 4.2.4 reveals that, in all three groups, late responders and early responders were equally likely to have ever treated an HIV positive patient and to be currently providing care to at least one HIV positive patient (all p > .05). The p-values resulting from summary chi squared reveals that no significant difference exists in the number of HIV positive patients (by category) currently being seen by early and late responders (all p > .05).

Table 4.2.5 compares knowledge scores of early and late responders in each group. No significant differences in scores were noted and indeed, at least for G-group, scores are almost identical between early and late responders. These comparisons suggests that early and late responders in the three groups are similar in terms of all independent variables explored. Furthermore, early and late responders do not differ in terms of the outcome variables of interest.

It should be noted that a third method of non-responder assessment is available- that of comparing responders to the parent population as a whole. Respondents in each group could be compared to the total population or sample surveyed on the basis of information recorded in the databases from which the population/samples were drawn. The information available in these databases is however, extremely limited. Information regarding practice location is readily available, gender might be guessed by reviewing physician’s first names, and
Table 4.2.3: Early Versus Late Responders: Demographic Characteristics by Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>G-Group %</th>
<th>H-Group %</th>
<th>R-Group %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Early (140)</td>
<td>Late (112)</td>
<td>Nominal P-value</td>
</tr>
<tr>
<td>Proportion of respondents</td>
<td>56</td>
<td>44</td>
<td>70</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>81</td>
<td>76</td>
<td>81</td>
</tr>
<tr>
<td>Female</td>
<td>19</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td>Specialty training</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22</td>
<td>24</td>
<td>26</td>
</tr>
<tr>
<td>No</td>
<td>78</td>
<td>76</td>
<td>74</td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vancouver</td>
<td>33</td>
<td>27</td>
<td>41</td>
</tr>
<tr>
<td>Other</td>
<td>67</td>
<td>73</td>
<td>59</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 45</td>
<td>57</td>
<td>68</td>
<td>47</td>
</tr>
<tr>
<td>≥45</td>
<td>43</td>
<td>32</td>
<td>53</td>
</tr>
</tbody>
</table>

*Not significant after adjustment for multiple comparisons
G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
### Table 4.2.4: Early Versus Late Responders: Level of Experience in HIV Patient Management by Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>G-Group %</th>
<th></th>
<th>H-Group %</th>
<th></th>
<th>R-Group %</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Early (140)</td>
<td>Late (112)</td>
<td>P-value</td>
<td>Early (261)</td>
<td>Late (113)</td>
<td>P-value</td>
</tr>
<tr>
<td>Ever provided care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>92</td>
<td>88</td>
<td></td>
<td>75</td>
<td>79</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>8</td>
<td>12</td>
<td>0.31</td>
<td>25</td>
<td>21</td>
<td>0.69</td>
</tr>
<tr>
<td>Currently providing care</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>76</td>
<td>65</td>
<td></td>
<td>44</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>24</td>
<td>35</td>
<td>0.07</td>
<td>56</td>
<td>52</td>
<td>0.50</td>
</tr>
<tr>
<td>Current # of patients *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to 5</td>
<td>61</td>
<td>77</td>
<td></td>
<td>79</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>6 to 10</td>
<td>11</td>
<td>11</td>
<td></td>
<td>8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>&gt; 10</td>
<td>24</td>
<td>10</td>
<td>0.78</td>
<td>9</td>
<td>14</td>
<td>0.36</td>
</tr>
<tr>
<td>Unknown</td>
<td>4</td>
<td>2</td>
<td></td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

* limited to those currently providing care

G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
### Table 4.2.5: Early Versus Late Responders: Patient Management Scores by Group

<table>
<thead>
<tr>
<th>Score</th>
<th>G-Group mean score %</th>
<th>H-Group mean score %</th>
<th>R-Group mean score %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Early</td>
<td>Late</td>
<td>P-value</td>
</tr>
<tr>
<td>Preventive- restricted</td>
<td>65</td>
<td>66</td>
<td>0.78</td>
</tr>
<tr>
<td>Overall management- restricted</td>
<td>64</td>
<td>64</td>
<td>0.87</td>
</tr>
<tr>
<td>Preventive- total</td>
<td>62</td>
<td>61</td>
<td>0.61</td>
</tr>
<tr>
<td>Antiretroviral- total</td>
<td>54</td>
<td>51</td>
<td>0.53</td>
</tr>
<tr>
<td>Prophylaxis of OI's</td>
<td>42</td>
<td>38</td>
<td>0.23</td>
</tr>
<tr>
<td>Treatment of OI's</td>
<td>31</td>
<td>27</td>
<td>0.42</td>
</tr>
<tr>
<td>Overall management</td>
<td>48</td>
<td>45</td>
<td>0.28</td>
</tr>
</tbody>
</table>

na - Not applicable  
G - Physician recipients of the therapeutic guidelines  
H - Physicians who have had a patient test positive for HIV since 1989  
R - Random sample of remaining physicians
database linkage might reveal medical specialty. While this technique might reassure one of the similarity of each group to its parent population on the basis of these few variables, it does nothing to ameliorate concerns about their differences on other, perhaps more important, characteristics (see Chapter 5, Section 1 for further discussion on this point in light of the results of multivariate analysis).

This method also incurs additional problems in that those who should actually be eliminated from the database (those who are deceased, retired or not in clinical practice for other reasons) can not be identified and eliminated. One, in effect, compares responders to the entire population rather than the population of acceptable or possible responders.

4.2.iii) Qualitative interpretation of the results of non-response assessment: The direction of responder bias.

The two non-response assessments described above provide some information about the differences between those who responded to the survey and those who did not. The comparison of early versus late responders uncovered no significant differences. The comparison of responders and true non-responders however, found follow-up responders (non-responders) were significantly more likely to be ≥ 45 years of age and, in groups G and R, to be less likely to be currently providing care to HIV positive patients.

While qualitative reasoning may offer no quantitative evidence regarding the differences or similarities of responders and non-responders, it sets a theoretical framework based on common sense and prior experiences or observations. It is well established, and intuitively reasonable, that those having little interest in the subject matter covered in a survey are less
likely to respond when compared to those who have an interest in the topic [105]. The application of this reasoning, in combination with a qualitative assessment of the data derived from the non-response assessment, leads the author to conclude that survey non-responders are unlikely to represent physicians who are more experienced in the management of HIV positive patients than responders. If it is found that the level of HIV care giving experience is positively associated with physician knowledge regarding HIV patient care (as seems reasonable) then one could conclude that non-responders are likely to be no more knowledgeable about providing care to HIV positive patients than the responders.

4.3 DESCRIPTIVE STATISTICS

Item non response rates to questions on demographic and personal characteristics were generally low, ranging from 0 to 4.0%. The proportions reported here were based on valid responses only. In cases in which rates of non-response exceed 5%, these rates were reported.

4.3.i) Demographic and personal characteristics of respondents

Table 4.3.1 summarises the demographic characteristics of the respondents in each of the three groups of physicians surveyed. Approximately 79% of respondents were male and 21% female in each group. In G-group, 43% of respondents were < 40 years of age while 30% and 33% were < 40 in H-group and R-group respectively. Thirty percent of G-group respondents, 39% of H-group respondents, and 26% of R-group respondents work in the city of Vancouver.
Table 4.3.1: Demographic Characteristics of Respondents by Group

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>G-Group %</th>
<th>H-Group %</th>
<th>R-Group %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>78.5</td>
<td>80.7</td>
<td>76.8</td>
</tr>
<tr>
<td>Female</td>
<td>21.5</td>
<td>19.3</td>
<td>23.2</td>
</tr>
<tr>
<td>Age Group (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 30</td>
<td>4.4</td>
<td>1.3</td>
<td>3.3</td>
</tr>
<tr>
<td>30 to 39</td>
<td>38.9</td>
<td>29.1</td>
<td>29.7</td>
</tr>
<tr>
<td>40 to 49</td>
<td>36.2</td>
<td>38.0</td>
<td>31.8</td>
</tr>
<tr>
<td>50 to 59</td>
<td>15.4</td>
<td>21.4</td>
<td>17.4</td>
</tr>
<tr>
<td>&gt; 59</td>
<td>5.2</td>
<td>10.2</td>
<td>17.8</td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vancouver</td>
<td>30.2</td>
<td>38.8</td>
<td>26.2</td>
</tr>
<tr>
<td>Other</td>
<td>69.8</td>
<td>61.2</td>
<td>73.8</td>
</tr>
</tbody>
</table>

G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
Regarding medical specialty training, 23% of G-group respondents, 25% of H-group respondents and 51% of R-group respondents indicated that they had a medical specialty (Table 4.3.2). Among those in G-group and H-group with specialty training, the most commonly reported specialty was internal medicine (30% and 20% respectively). In R-group, specialists in internal medicine comprised 12% of specialists, an equal proportion were paediatricians while psychiatry was the most commonly reported specialty (14%). Infectious disease specialists made up 8% of specialists in G-group, 2% of specialists in H-group and none of those in R-group. Non specification of medical specialty among those reporting that they were specialists was common. This was particularly noticeable among G-group respondents, of whom 26% omitted reporting their specialty as compared to 11% in H-group and 6% in R-group.

Respondents were also asked about the nature and setting of their work. The results are summarised in Table 4.3.3. It should be noted that categories are not mutually exclusive as physicians may work in several settings simultaneously. Eighty four percent, 69% and 48% of G-group, H-group and R-group respectively report themselves to practice primary care, while 10%, 20% and 35% respectively report themselves to be consulting physicians. These results are easily interpreted in light of the proportion of respondents with medical specialty training in each group. Physicians working in a solo or group community practice comprise 50% of respondents in G-group and 46% in each of the two remaining groups. Thirteen percent of G-group respondents, 19% of H-group respondents and 27% of R-group respondents indicated that their work was hospital based and 17%, 13% and 16% respectively were involved in sessional or clinic work or were currently employed on a temporary basis.
Table 4.3.2: Medical Specialty Training by Group

<table>
<thead>
<tr>
<th></th>
<th>G-Group %</th>
<th>H-Group %</th>
<th>R-Group %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total with specialty training</td>
<td>23.0</td>
<td>24.5</td>
<td>50.8</td>
</tr>
<tr>
<td>Distribution of specialties*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal medicine</td>
<td>29.8</td>
<td>19.6</td>
<td>12.2</td>
</tr>
<tr>
<td>Infectious disease</td>
<td>7.8</td>
<td>2.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Surgery</td>
<td>1.8</td>
<td>9.8</td>
<td>7.3</td>
</tr>
<tr>
<td>Obstetrics/Gynecology</td>
<td>10.5</td>
<td>3.3</td>
<td>6.5</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>3.5</td>
<td>3.3</td>
<td>12.2</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>3.5</td>
<td>9.8</td>
<td>13.8</td>
</tr>
<tr>
<td>Respiratory medicine</td>
<td>0.0</td>
<td>7.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Other</td>
<td>16.8</td>
<td>33.5</td>
<td>42.3</td>
</tr>
<tr>
<td>Did not specify specialty</td>
<td>26.3</td>
<td>10.9</td>
<td>5.7</td>
</tr>
</tbody>
</table>

*Restricted to those with specialty training

G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
### Table 4.3.3: Practice Characteristics of Respondents by Group

<table>
<thead>
<tr>
<th>Practice Characteristics*</th>
<th>G-Group %</th>
<th>H-Group %</th>
<th>R-Group %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Care</td>
<td>83.7</td>
<td>69.0</td>
<td>47.9</td>
</tr>
<tr>
<td>Consulting</td>
<td>9.9</td>
<td>20.1</td>
<td>35.1</td>
</tr>
<tr>
<td>Research</td>
<td>3.2</td>
<td>4.8</td>
<td>5.4</td>
</tr>
<tr>
<td>In Training</td>
<td>0.4</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Private Practice</td>
<td>50.0</td>
<td>46.0</td>
<td>45.5</td>
</tr>
<tr>
<td>Sessional/Locums</td>
<td>16.7</td>
<td>12.8</td>
<td>16.1</td>
</tr>
<tr>
<td>Hospital</td>
<td>12.7</td>
<td>18.7</td>
<td>27.3</td>
</tr>
<tr>
<td>Other</td>
<td>2.8</td>
<td>1.9</td>
<td>1.2</td>
</tr>
</tbody>
</table>

*Categories not mutually exclusive

G - Physician recipients of the therapeutic guidelines

H - Physicians who have had a patient test positive for HIV since 1989

R - Random sample of remaining physicians
The differences between groups in terms of age distribution, location of practice and specialty training are not surprising given the unique and divergent parent populations from which responders originate. Drug treatment programme physician members are, in general, younger than the average physician and are likely to be general practitioners and family physicians. H-group physicians were selected because they had ordered an HIV test to be performed on a patient, something likely to be done by a family physician or general practitioner rather than a specialist. Testing may also be more likely to occur in an urban centre such as Vancouver.

4.3 ii) Experience with HIV positive patient care

Several questions were asked to ascertain the level of HIV-related care giving experience among respondents. Some 91% of respondents in G-group, 76% of those in H-group and 55% of those in R-group had ever provided care to an HIV positive patient (Table 4.3.4). The total number of patients ever seen by these respondents was similar between groups in terms of categories of patient numbers. The respondents in G-group however, with 48% engaged in HIV care exclusively, or with all or most aspects of care, appear to be more involved in providing HIV-specific care to their HIV positive patients than respondents in H and R-groups, of whom only 23% and 11% provide this level of care respectively.
Table 4.3.4: Total Experience in Providing Care to Patients with HIV Among Respondents by Group

<table>
<thead>
<tr>
<th>Physician Total Experience</th>
<th>G-Group %</th>
<th>H-Group %</th>
<th>R-Group %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have ever provided care to HIV patient</td>
<td>90.5 (n=228)</td>
<td>76.2 (n=282)</td>
<td>54.5 (n=132)</td>
</tr>
<tr>
<td>Extent of involvement *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No aspect of HIV care</td>
<td>3.5</td>
<td>8.9</td>
<td>12.9</td>
</tr>
<tr>
<td>Some aspects of HIV care</td>
<td>48.0</td>
<td>66.7</td>
<td>75.8</td>
</tr>
<tr>
<td>All or most aspects of HIV care</td>
<td>46.2</td>
<td>22.3</td>
<td>8.3</td>
</tr>
<tr>
<td>Exclusively HIV care</td>
<td>2.2</td>
<td>1.1</td>
<td>2.3</td>
</tr>
<tr>
<td>Did not specify involvement</td>
<td>1.3</td>
<td>1.1</td>
<td>0.8</td>
</tr>
<tr>
<td>Total number of patients ever seen *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to 5</td>
<td>50.8</td>
<td>58.4</td>
<td>54.6</td>
</tr>
<tr>
<td>6 to 10</td>
<td>22.2</td>
<td>16.6</td>
<td>18.2</td>
</tr>
<tr>
<td>11 to 49</td>
<td>15.0</td>
<td>13.8</td>
<td>15.2</td>
</tr>
<tr>
<td>50 to 100</td>
<td>12.0</td>
<td>10.2</td>
<td>12.0</td>
</tr>
<tr>
<td>≥ 100</td>
<td>9.3</td>
<td>4.1</td>
<td>4.5</td>
</tr>
</tbody>
</table>

*Limited to those who had ever provided care to an HIV positive patient
G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
Table 4.3.5 indicates the current level of HIV-related experience among respondents. Seventy-two percent of G-group respondents were seeing HIV positive patients at the time of the survey (n=179) as compared to 45% of H-group (n=165) and 20% of R-group (n=49) respondents. The majority of respondents currently involved in HIV patient care are providing care to adult men with HIV (88% in G-group, 85% in H-group and 88% in R-group). In G- and H-groups, some 47% of respondents are currently treating women with HIV as compared to 29% of R-group respondents. Only 9% of G-group respondents are currently providing care to children as compared to 13% of those in H-group and 14% of those in R-group.

Respondents reported providing care to a total of 3,173 HIV positive patients at the time of the survey (2,777 adult men, 316 adult women, 36 children aged 6 to 17 years and 44 children aged 0 to 5 years). Due to the possibility that persons with HIV are likely to consult more than one physician, e.g. their family physician and various specialists, analysis was repeated restricted to general practitioners (GPs) and those in family practice (FP's). In total, responding GPs and FPs reported providing current care to 2,015 persons with HIV (1,779 adult men, 210 adult women, 12 children aged 6 to 17 years and 14 children aged 0 to 5 years). Overall, GPs and FPs in G-group provided care to 79% of all patients, those in H-group provided care to 19.6% of patients while R-group general and family practitioners provided care to only 1.4% of patients. The proportion of these patients representing unique individuals remains unclear due to the likelihood of overlap between patients in groups R and H and those represented by G-group care providers (see Chapter 5, Section 2.ii for further discussion).
Table 4.3.5: Current Experience in Providing Care to HIV Positive Patients Among Respondents by Group

<table>
<thead>
<tr>
<th>Physician Current Experience</th>
<th>G-Group</th>
<th>H-Group</th>
<th>R-Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently providing care to HIV+ patients %</td>
<td>72.0</td>
<td>44.9</td>
<td>20.4</td>
<td></td>
</tr>
<tr>
<td>Proportion currently caring for: %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to 2 patients</td>
<td>37.6</td>
<td>26.5</td>
<td>17.0</td>
<td></td>
</tr>
<tr>
<td>3 to 9 patients</td>
<td>18.8</td>
<td>10.3</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>10 or more patients</td>
<td>14.2</td>
<td>5.7</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Unable to estimate category</td>
<td>1.5</td>
<td>2.4</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Proportion currently caring for:* %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult males</td>
<td>87.9</td>
<td>84.8</td>
<td>88.2</td>
<td></td>
</tr>
<tr>
<td>Adult females</td>
<td>46.6</td>
<td>46.7</td>
<td>29.4</td>
<td></td>
</tr>
<tr>
<td>Children aged 6 - 17 years</td>
<td>3.4</td>
<td>4.8</td>
<td>5.9</td>
<td></td>
</tr>
<tr>
<td>Children aged 0 - 5 years</td>
<td>5.7</td>
<td>8.5</td>
<td>7.8</td>
<td></td>
</tr>
<tr>
<td>No. of current patients - all respondents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult males</td>
<td>2272</td>
<td>438</td>
<td>67</td>
<td>2777</td>
</tr>
<tr>
<td>Adult females</td>
<td>184</td>
<td>112</td>
<td>20</td>
<td>316</td>
</tr>
<tr>
<td>Children aged 6 - 17 years</td>
<td>24</td>
<td>2</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td>Children aged 0 - 5 years</td>
<td>26</td>
<td>7</td>
<td>11</td>
<td>44</td>
</tr>
<tr>
<td>Total</td>
<td>2506</td>
<td>559</td>
<td>108</td>
<td>3173</td>
</tr>
<tr>
<td>No. of current patients - GP’s and FP’s only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult males</td>
<td>1462</td>
<td>293</td>
<td>24</td>
<td>1779</td>
</tr>
<tr>
<td>Adult females</td>
<td>111</td>
<td>94</td>
<td>5</td>
<td>210</td>
</tr>
<tr>
<td>Children aged 6 - 17 years</td>
<td>10</td>
<td>2</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Children aged 0 - 5 years</td>
<td>8</td>
<td>6</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>1591</td>
<td>395</td>
<td>29</td>
<td>2015</td>
</tr>
</tbody>
</table>

* Limited to those currently seeing HIV positive patients
GP - General Practitioner
FP - Family Physician
G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
If the number of patients reported by respondents and non-responders who completed the mini-survey are combined some 4,314 patients were represented. Overall, G-group provided care to 3514 (81%) of these patients, H-group to 685 (16%) of these patients while R-group provided care to only 115 (3%) of these patients.

4.3.iii) Self perception of abilities and approach to HIV patient care

Physicians were first asked to describe their current approach to a patient who has been recently diagnosed as HIV positive. Table 4.3.6 describes the pattern of responses among all respondents and among general practitioners and family physicians. This restriction was necessary as specialists, who are likely to provide care related to their specialty only, were not equally represented in each group of respondents. In either case, respondents in groups H and R were most likely to refer the patient for HIV-related care (43% and 37% respectively among GP’s and FP’s in H and R-groups). Those in G-group were most likely to choose to undertake complete care of these patients through consultation with experts or specialists or learning more about HIV management (42%). Two percent of GP’s and FP’s in G-group stated that they would immediately refer the patient for all future care as compared to 8% of those in H-group and 6% of those in R-group.

Physicians were then asked to indicate both how able and willing they were to provide care to HIV positive patients in seven areas of patient management, given their current knowledge and the resources available to them. For each question, the allowable responses were: very able; quite able; somewhat able; not very able; and not able. The proportion
### Table 4.3.6: Approach to Newly Diagnosed HIV Positive Patients: All Respondents; and Respondents Without Medical Specialty Training by Group

<table>
<thead>
<tr>
<th>Approach to Newly Diagnosed Patient</th>
<th>G-Group %</th>
<th>H-Group %</th>
<th>R-Group %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All (n=256)</td>
<td>GP/FP* (n=196)</td>
<td>All (n=374)</td>
</tr>
<tr>
<td>Immediate referral</td>
<td>2.0</td>
<td>2.1</td>
<td>11.7</td>
</tr>
<tr>
<td>Referral for HIV disease only</td>
<td>30.3</td>
<td>32.1</td>
<td>38.3</td>
</tr>
<tr>
<td>Complete management with consult/learning</td>
<td>41.4</td>
<td>42.0</td>
<td>17.7</td>
</tr>
<tr>
<td>Either referral or management with consult</td>
<td>2.4</td>
<td>1.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Depends on symptoms/disease stage</td>
<td>18.3</td>
<td>19.7</td>
<td>14.1</td>
</tr>
<tr>
<td>Depends on relationship with patient</td>
<td>1.2</td>
<td>0.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Depends on relationship/symptoms/disease stage</td>
<td>2.8</td>
<td>2.6</td>
<td>5.7</td>
</tr>
<tr>
<td>Specialty care only</td>
<td>1.6</td>
<td>0.0</td>
<td>7.1</td>
</tr>
<tr>
<td>Patients preference</td>
<td>0.0</td>
<td>0.0</td>
<td>0.3</td>
</tr>
</tbody>
</table>

* GP/FP - General Practitioners and Family Physicians  
G - Physician recipients of the therapeutic guidelines  
H - Physicians who have had a patient test positive for HIV since 1989  
R - Random sample of remaining physicians
reporting that they were very or quite able willing to provide care in each area patient care is shown in Table 4.3.7. Again, results are shown for all respondents and for the subgroup of non-specialists to control for the proportion of specialists in each group of physicians.

While statistical comparisons might be undertaken, it was considered to be of greater interest to form a general impression of response patterns. In all areas of patient management, whether limited to GPs and FPs or generalised to all respondents, physicians in G-group were most willing and able to provide services, H-group second most willing and able and R-group responders least willing and able to provide care. In all groups, the proportion of physicians who perceived themselves as able and willing was greatest in the area of HIV test counselling, followed by counselling regarding issues related to being HIV positive and thirdly, in providing vaccinations. All groups perceived themselves as least able to provide antiretroviral therapy to symptomatic patients. Both H and R-groups also saw themselves as least willing to provide antiretroviral therapy to symptomatic patients. In G-group however, fewer respondents considered themselves very or quite willing to provide treatment for opportunistic infections.

In all groups and subgroups, and in all but one area of care, respondents perceived themselves to be more willing than able to provide care. The consistent exception is the willingness to provide HIV test counselling. A greater proportion of respondents rated themselves as very or quite able to provide this service than the proportion who reported themselves as very or quite willing to do so.
Table 4.3.7: Portion of Respondents Very or Quite Able, and Very or Quite Willing to Provide Services to HIV Positive Patients: All Respondents; and Respondents Without Medical Specialty Training by Group

<table>
<thead>
<tr>
<th>Services Provided</th>
<th>G-Group %</th>
<th>H-Group %</th>
<th>R-Group %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All GP/FP</td>
<td>All GP/FP</td>
<td>All GP/FP</td>
</tr>
<tr>
<td>Ability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV test counseling</td>
<td>89</td>
<td>82</td>
<td>58</td>
</tr>
<tr>
<td>HIV issues counseling</td>
<td>81</td>
<td>66</td>
<td>44</td>
</tr>
<tr>
<td>Vaccinations</td>
<td>64</td>
<td>41</td>
<td>18</td>
</tr>
<tr>
<td>Antiretroviral therapy- asymptomatic</td>
<td>43</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
<td>Antiretroviral therapy- symptomatic</td>
<td>33</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Prophylaxis for opportunistic infections</td>
<td>52</td>
<td>31</td>
<td>15</td>
</tr>
<tr>
<td>Treatment of opportunistic infections</td>
<td>36</td>
<td>26</td>
<td>19</td>
</tr>
<tr>
<td>Willingness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV test counseling</td>
<td>88</td>
<td>74</td>
<td>51</td>
</tr>
<tr>
<td>HIV issues counseling</td>
<td>86</td>
<td>67</td>
<td>45</td>
</tr>
<tr>
<td>Vaccinations</td>
<td>74</td>
<td>51</td>
<td>29</td>
</tr>
<tr>
<td>Antiretroviral therapy- asymptomatic</td>
<td>67</td>
<td>39</td>
<td>24</td>
</tr>
<tr>
<td>Antiretroviral therapy- symptomatic</td>
<td>61</td>
<td>36</td>
<td>24</td>
</tr>
<tr>
<td>Prophylaxis for opportunistic infections</td>
<td>70</td>
<td>46</td>
<td>31</td>
</tr>
<tr>
<td>Treatment of opportunistic infections</td>
<td>57</td>
<td>44</td>
<td>32</td>
</tr>
</tbody>
</table>

* GP/FP - General Practitioners and Family Physicians
G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
Quantitative analysis confirms the a priori belief that physician's self perceptions of their ability and willingness to provide care in each of the areas are correlated. Spearman's rank correlation analysis revealed that in all groups, for every area of patient care, correlations between ability and willingness to provide care were highly significant (all p < .001, data not shown).

A final question asked whether or not physicians would be more willing to provide care to HIV positive patients if more resources were made available to them or if existing resources were improved. Fifty six percent, 55% and 63% of G-group, H-group and R-group respondents affirmed they would be more willing to provide care under these circumstances. These results however, are difficult to interpret as individual respondents' perception of what was meant by "resources" may vary.

4.3.iv) Familiarity with, and opinion of, physician resources

As part of a preliminary investigation into the needs of physicians, respondents were asked about their interest in continuing medical education and to comment on the resources currently provided to HIV care giving physicians: specifically the publication *Therapeutic Guidelines for HIV/AIDS and Related Conditions*, and the toll-free physician help line made available by the Centre for Excellence in HIV/AIDS. The results of this investigation are summarised below.

Continuing medical education

Physicians were asked to indicate how likely they would be to participate in or use continuing medical education events or resources if they were made available. For each event or
resource, physicians in G-group could answer; definitely, probably, perhaps, probably not, and definitely not. For the other two groups, the answers were contracted to form three categories; yes, no, and perhaps. The proportion of respondents in each group who indicated that they were likely to participate in various educational events or resources ("definitely" or "probably" among G-group respondents or "yes" among H and R-group respondents), is shown in Table 4.3.8. The same four types of events or resources appear to be most popular in all three groups, each garnering interest from more than 50% of respondents. These were: one day seminars regarding the initial work-up for new HIV positive patients; formal lectures given by visiting experts; informal lectures and discussion groups lead by visiting experts; and access to an expanded 24-hour toll-free physician help line.

Familiarity with resources

Physicians in all three groups were asked whether they were aware of three resources currently available from the British Columbia centre for Excellence in HIV/AIDS, i.e., the therapeutic guidelines, the toll-free physician help line and the Centre’s quarterly newsletter, The Forecast. Item non response was acceptable in both R and H groups (1.2% and 1.3% respectively). In G-group however, item non-response ranged from 1.2% for the question regarding the guidelines to 18.7% for the question about The Forecast. Presumably, this was due to a misunderstanding by respondents of an instruction to skip several subsequent questions if they were not aware of the guidelines. Some respondents failed to respond to the remainder of the question regarding the toll-free line and The Forecast before moving to the next applicable question. The results presented are based on valid responses only.
Table 4.3.8: Proportion of Respondents Who Indicated That They Would be Likely to Participate in Continuing Medical Education

<table>
<thead>
<tr>
<th>Medical Education Event/Resource</th>
<th>G-Group %</th>
<th>H-Group %</th>
<th>R-Group %</th>
</tr>
</thead>
<tbody>
<tr>
<td>In house primary care training</td>
<td>37.3</td>
<td>19.1</td>
<td>15.3</td>
</tr>
<tr>
<td>In-house specialty training *</td>
<td>43.4</td>
<td>19.5</td>
<td>14.9</td>
</tr>
<tr>
<td>Seminar on initial HIV+ patient work-up</td>
<td>63.1</td>
<td>60.2</td>
<td>54.3</td>
</tr>
<tr>
<td>Formal lectures by experts</td>
<td>71.0</td>
<td>56.8</td>
<td>58.1</td>
</tr>
<tr>
<td>Informal lectures and discussion groups</td>
<td>66.5</td>
<td>54.7</td>
<td>53.0</td>
</tr>
<tr>
<td>Regular discussion groups based on written materials</td>
<td>25.8</td>
<td>12.9</td>
<td>14.0</td>
</tr>
<tr>
<td>Regular discussion groups based on case studies</td>
<td>27.5</td>
<td>20.1</td>
<td>17.4</td>
</tr>
<tr>
<td>One on one mentorship program</td>
<td>23.3</td>
<td>17.4</td>
<td>8.4</td>
</tr>
<tr>
<td>Internet or computer networking</td>
<td>28.9</td>
<td>29.5</td>
<td>28.2</td>
</tr>
<tr>
<td>Expanded toll-free, 24 hour physician help line</td>
<td>74.9</td>
<td>60.6</td>
<td>56.3</td>
</tr>
</tbody>
</table>

* Limited to those with specialty training
G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
As shown in Table 4.3.9, 81% of G-group respondents, 63% of H-group respondents and 46% of R-group respondents were aware of the existence of the therapeutic guidelines. Fifty three percent, 28% and 23% of respondents in each of the respective groups were aware of the toll-free phone line while just 39%, 13% and 5% were aware of *The Forecast* news letter.

The fact that only 81% of G-group respondents indicated that they were aware of the guidelines is intriguing given that this group of physicians was selected on the basis of participation in the Drug Treatment Programme and, as such, had been sent a copy of the guidelines. Apparently, some of these physicians had forgotten about the guidelines or were not aware of the title of this publication.

**Opinion and utilisation of resources**

Physicians in G-group, due to an a priori belief that these physicians were more likely to have used both the guidelines and the toll-free help line, were asked to provide information regarding their use and opinion of these resources. The numbers of respondents to whom the question was applicable and who responded to applicable questions were variable and are noted. The proportions presented are based on valid responses only. The data in Table 4.3.10 shows that, among G-group responders that were aware of the guidelines, 82% stated that they had a copy to which they could refer and 54% said that they had read the guidelines, at least in part.
Table 4.3.9: Awareness of Physician Resources Among Respondents by Group

<table>
<thead>
<tr>
<th>Resource</th>
<th>G-Group %</th>
<th>H-Group %</th>
<th>R-Group %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapeutic guidelines</td>
<td>80.7</td>
<td>62.9</td>
<td>45.6</td>
</tr>
<tr>
<td>Toll-free phone line</td>
<td>53.4</td>
<td>28.7</td>
<td>22.6</td>
</tr>
<tr>
<td><em>Forecast</em> news letter</td>
<td>39.0</td>
<td>13.3</td>
<td>5.0</td>
</tr>
</tbody>
</table>

G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
Table 4.3.10: Utilization and Opinion of the Therapeutic Guidelines and Toll-free Phone Line Among Respondents in G-Group

<table>
<thead>
<tr>
<th>Use of Guidelines 1</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have a copy (n=201)</td>
<td>82.5</td>
</tr>
<tr>
<td>Have read a copy (n=201)</td>
<td>53.9</td>
</tr>
<tr>
<td>Currently always or usually use the guidelines 3 (n=142)</td>
<td>41.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opinion of Guidelines 1, 2 (n=127)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>How useful have you found them</td>
<td></td>
</tr>
<tr>
<td>Very or quite useful</td>
<td>85.0</td>
</tr>
<tr>
<td>Somewhat useful</td>
<td>12.6</td>
</tr>
<tr>
<td>Not very or not useful</td>
<td>1.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proportion always/often in agreement with guidelines</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Antiretroviral therapy</td>
<td>94.4</td>
</tr>
<tr>
<td>Prophylaxis of opportunistic infections</td>
<td>98.2</td>
</tr>
<tr>
<td>Treatment of opportunistic infections</td>
<td>98.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Use of Toll-free Phone Line 3, 4 (n=120)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently often or sometimes use the phone lines</td>
<td>36.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opinion of Phone line 4, 5 (n=66)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>How useful have you found it</td>
<td></td>
</tr>
<tr>
<td>Very or quite useful</td>
<td>83.3</td>
</tr>
<tr>
<td>Somewhat useful</td>
<td>13.6</td>
</tr>
<tr>
<td>Not very or not useful</td>
<td>3.0</td>
</tr>
</tbody>
</table>

1 Restricted to respondents who are aware of the guidelines
2 Restricted to respondents who have used the guidelines and who have ever had an HIV positive patient
3 Restricted to respondents who currently have HIV positive patient(s)
4 Restricted to respondents who are aware of the phone line and who have ever had an HIV positive patient
5 Restricted to those who have used the phone line
Of the 188 respondents who were aware of the guidelines and were currently providing care to HIV positive patients, 47% reported that they always or usually used the guidelines in the management of their patients. Among the 127 respondents who had used the guidelines and had an opinion about their utility, 85% found them to be very or quite useful. Among the 108 physicians who had used the guidelines and could recall whether or not they agreed with them, 94% always or often agreed with the guidelines regarding antiretroviral therapy and 98% always or often agreed regarding the prophylaxis and treatment of opportunistic infections.

Of the 120 physicians who were aware of the phone line and were providing care to HIV positive patients, 37% used the phone line often or sometimes in the management of their patients. Among the 66 respondents who had an opinion about the utility of the phone line, 83% found it to be very or quite useful.

4.3.v) Knowledge of therapeutic management of HIV

Regarding the portion of the surveys devoted to capturing data regarding therapeutic management strategies, respondents were asked to indicate their preferred approaches to the clinical management of HIV positive patients. Questions elicited information regarding: the use of preventive vaccinations, clinical tests and laboratory tests; the timing of antiretroviral therapy initiation; preferred antiretroviral agents; approach to prophylaxis for opportunistic infection and the use of prophylactic agents; and finally, the drugs which should be used to combat acute opportunistic infections.
Recall that those in G-group received a more detailed and lengthy survey (Survey 1) than those in groups H or R. Selected questions were used to produce the six scores previously described (Chapter 3, Table 3.8.1):

1) Preventive measures- restricted score;
2) Preventive measures- total score;
3) Antiretroviral therapy- restricted score;
4) Antiretroviral therapy- total score;
5) Prophylaxis of opportunistic infections;
6) Treatment of opportunistic infections.

There are also two summary scores:

7) Overall management- restricted score; and
8) Overall management-total score.

Of these scores, direct inter-group comparisons can be made only on scores 1, 3 and 7. The remaining scores are limited to G-group respondents.

The responses to each of the questions regarding therapeutic management are summarised in the tables and figures that follow. For each question or group of questions the score(s) to which each question contributes are noted within the table or, in the case of figures, in the figure title.

Item non-response rates were variable but generally ranged from 0 to 3% and are noted if they exceed 5%. All reported results are based on valid responses unless otherwise indicated.
Preventive vaccinations

Physicians in all three groups were asked to respond; yes, no, or do not know, to questions asking whether or not they would choose to use specific vaccinations in the course of managing any individual HIV positive patient. Preferred approaches to the use of seven vaccinations were elicited: influenza; haemophilius influenza type B (HiB); hepatitis B; pneumococcal pneumonia; tetanus; and oral polio (OPV). The results are summarised in Table 4.3.11.

Rates of correct response were greatest among G-group respondents for each of the seven vaccinations. Questions regarding influenza, hepatitis B, pneumococcal and tetanus vaccinations elicited the highest rates of correct response, ranging from 75% to 83% among G-group respondents and 32% to 47% among R-group respondents. Rates of correct response among H-group physicians was intermediate between those of G and R-group respondents. It should be noted that the rates of correct response to the question regarding pneumococcal vaccination are based on item response rates of between 84% and 87% due to the missing answer box corresponding to the correct answer in the first mailing of the survey. Rates of correct response were substantially lower for HiB vaccination (11%, 9% and 3% for G, H and R-groups respectively) and oral polio vaccine (45%, 39% and 33% for G, H and R-groups respectively).
Table 4.3.11: Preferred Approach to the Use of Preventive Vaccinations Among Respondents by Group

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>Influenza (1,2)</th>
<th>HiB (1,2)</th>
<th>Hepatitis B (1,2)</th>
<th>Pneumococcal</th>
<th>Tetanus (1,2)</th>
<th>Oral Polio (1,2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate Response</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G-group</td>
<td>82.9</td>
<td>43.5</td>
<td>82.5</td>
<td>75.8</td>
<td>75.4</td>
<td>17.1</td>
</tr>
<tr>
<td>H-group</td>
<td>62.1</td>
<td>40.4</td>
<td>65.7</td>
<td>52.1</td>
<td>59.8</td>
<td>16.7</td>
</tr>
<tr>
<td>R-group</td>
<td>44.1</td>
<td>32.8</td>
<td>46.0</td>
<td>31.6</td>
<td>46.0</td>
<td>8.4</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G-group</td>
<td>2.0</td>
<td>10.9</td>
<td>2.7</td>
<td>2.4</td>
<td>2.8</td>
<td>45.1</td>
</tr>
<tr>
<td>H-group</td>
<td>3.8</td>
<td>9.1</td>
<td>1.9</td>
<td>3.6</td>
<td>5.5</td>
<td>38.6</td>
</tr>
<tr>
<td>R-group</td>
<td>4.2</td>
<td>3.4</td>
<td>2.5</td>
<td>4.8</td>
<td>3.4</td>
<td>33.0</td>
</tr>
<tr>
<td>Unsure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G-group</td>
<td>13.5</td>
<td>44.0</td>
<td>14.7</td>
<td>21.8</td>
<td>21.8</td>
<td>37.8</td>
</tr>
<tr>
<td>H-group</td>
<td>34.0</td>
<td>50.4</td>
<td>31.6</td>
<td>44.4</td>
<td>34.7</td>
<td>44.6</td>
</tr>
<tr>
<td>R-group</td>
<td>51.6</td>
<td>63.9</td>
<td>51.5</td>
<td>64.3</td>
<td>50.6</td>
<td>57.5</td>
</tr>
</tbody>
</table>

(1,2) Contributes to scores 1 and 2; Preventive measures restricted and total scores.
G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
Physicians who received the more detailed survey (G-group) were asked to indicate how often each of the vaccinations which were recommended (influenza, hepatitis B, pneumococcal and tetanus) should be administered to HIV infected patients. Frequency questions for the other vaccinations acted as dummy questions to ensure that physicians could not use these secondary inquiries to guess at the correct answers for the previous questions regarding their use of the vaccinations. For each question regarding vaccination frequency, physicians could respond; once only, yearly, or do not know. For each vaccination recommended, overall agreement with the guidelines in terms of both the use and frequency has been calculated as the product of the proportion agreeing that the vaccination should be used and the proportion identifying the correct frequency with which it should be applied.

The results are shown in Table 4.3.12. Among respondents who stated that they would recommend influenza vaccination, 98% agreed with contemporary guidelines in preferring to administer the vaccination yearly. This results in an overall agreement in terms of vaccine use and frequency of administration of 81.3%. Single time vaccination for hepatitis B, pneumococcal pneumonia and tetanus, in accordance with guidelines, was preferred by 96%, 84% and 86% of respondents respectively with overall agreement of 79.2%, 63.8% and 65.1% for each vaccination respectively.
Table 4.3.12: Preferred Frequency of Recommended Vaccinations Among G-Group Respondents Who Preferred to Use the Vaccination in Question

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>Influenza (2)</th>
<th>Hepatitis B (2)</th>
<th>Pneumococcal</th>
<th>Tetanus (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondents (n)</td>
<td>208</td>
<td>208</td>
<td>160</td>
<td>187</td>
</tr>
<tr>
<td>Recommended Frequency</td>
<td>Yearly</td>
<td>Once Only</td>
<td>Once Only</td>
<td>Once Only</td>
</tr>
<tr>
<td>Appropriate Response</td>
<td>98.1</td>
<td>96.1</td>
<td>84.2</td>
<td>86.3</td>
</tr>
<tr>
<td>Inappropriate Response</td>
<td>1.4</td>
<td>1.5</td>
<td>7.9</td>
<td>1.1</td>
</tr>
<tr>
<td>Do Not Know</td>
<td>0.5</td>
<td>2.4</td>
<td>7.9</td>
<td>12.6</td>
</tr>
</tbody>
</table>

(2) Contributes to score 2, Preventive measures-total score.
Laboratory and clinical tests

Physicians in each group were asked about their use of three clinical tests and five laboratory
tests in the context of HIV patient care. The clinical tests included: tuberculosis skin test
(PPD); syphilis serology; and gynaecological exam for female patients. The laboratory tests
considered were: re-testing for HIV after the first positive test; CD4 counts; P24 antigen
measurement; immune complex dissociated P24 antigen (ICD P24) measurement; and beta 2
microglobulin (B2 micro) measurement. The results are summarised in Table 4.3.13.

It is currently recommended that patients with a positive HIV test be re-tested once.
Regarding the use of repeat testing, 76% of G-group respondents indicated that patients who
had tested positive for HIV should be re-tested, either in general, or for patients at low risk or
who request repeat testing. Of these 190 respondents, 84.7% (n=161) said that one repeat
test was sufficient, 13.7% recommended two or three repeat tests and the remaining 1.6%
were unsure. In H-group, 77% (n=284) of respondents agreed with re-testing. Of these,
77.5% (n=220) preferred to re-test only once, 21.5% recommended two or three repeat tests.
Two respondents (.7%) recommended more than 3 repeat tests and 1 (.4%) did not respond.
Sixty eight percent (n=165) of R-group respondents indicated that patients who had tested
positive for HIV should be re-tested. Of these, 78.2 % (n=129) reported one test to be
sufficient, 20% believed two or three repeat tests to be necessary and 1.8% did not respond.
Therefore, complete agreement with the recommendations in terms of re-testing and the
number of required repeat tests was seen among 64.1% of G-group, 59.6% of H-group and
53.3% of R-group respondents.
As regards the use of CD4 counts, 92%, 81% and 63% of respondents in G, H, and R-groups respectively indicated that they thought that CD4 counts should be used for HIV positive patients. The remainder in each group were unsure.

The majority of respondents in each group (61% in G, 79% in H and 89% in R) were uncertain as to whether or not P24 antigen measurements should be used. No specific recommendations are made in regards to the use of p24 antigen in current guidelines. A similar trend can be seen as regards the use of ICDp24 antigen, with 76%, 85% and 91% of G, H and R-group respondents being uncertain as to its clinical use. ICDp24 antigen measurement is not recommended and this was recognised by 21% of those in G-group, 11% of those in H-group and 4% of those in R-group.

The final laboratory test question regarding the use of β2 microglobulin, for which there are no formalised recommendations for use, also elicited a large proportion of responses reflecting uncertainty as to its clinical utility. Sixty six percent of G-group respondents were uncertain whether or not its use was appropriate as were 82% of those in H-group and 91% of those in R-group.

Questions regarding the use of clinical tests elicited relatively high rates of correct response from all three groups surveyed. Eighty six percent of G-group respondents, 79% of H-group and 58% of R-group reported that they were likely to use tuberculosis skin testing for HIV infected patients as is recommended. In G, H and R-groups 92%, 83% and 68% respectively recognised the need for syphilis screening while 91%, 79% and 64% recommended
Table 4.3.13: Preferred Approach to Laboratory and Clinical Tests Among Respondents by Group

<table>
<thead>
<tr>
<th>Test</th>
<th>HIV Re-test (1,2)</th>
<th>CD4 Count (1,2)</th>
<th>P24 Antigen</th>
<th>ICD P24 (1,2)</th>
<th>B2 Micro</th>
<th>T B Test (1,2)</th>
<th>Syphilis</th>
<th>Gynecology (1,2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended Approach</td>
<td>Yes</td>
<td>Yes</td>
<td>None</td>
<td>No</td>
<td>None</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G-group</td>
<td>75.7</td>
<td>91.6</td>
<td>18.7</td>
<td>3.3</td>
<td>14.5</td>
<td>86.1</td>
<td>91.2</td>
<td>91.2</td>
</tr>
<tr>
<td>H-group</td>
<td>76.9</td>
<td>81.4</td>
<td>11.7</td>
<td>4.1</td>
<td>8.7</td>
<td>78.9</td>
<td>83.2</td>
<td>79.1</td>
</tr>
<tr>
<td>R-group</td>
<td>68.2</td>
<td>63.3</td>
<td>7.7</td>
<td>4.7</td>
<td>5.1</td>
<td>58.4</td>
<td>67.8</td>
<td>63.7</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G-group</td>
<td>20.7</td>
<td>0.0</td>
<td>20.3</td>
<td>21.2</td>
<td>19.4</td>
<td>1.6</td>
<td>0.4</td>
<td>0.8</td>
</tr>
<tr>
<td>H-group</td>
<td>16.6</td>
<td>0.0</td>
<td>9.6</td>
<td>10.9</td>
<td>9.6</td>
<td>1.9</td>
<td>1.9</td>
<td>1.9</td>
</tr>
<tr>
<td>R-group</td>
<td>18.6</td>
<td>0.0</td>
<td>3.4</td>
<td>3.8</td>
<td>4.3</td>
<td>2.9</td>
<td>0.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Unsere</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G-group</td>
<td>3.0</td>
<td>8.4</td>
<td>61.0</td>
<td>75.6</td>
<td>66.2</td>
<td>12.4</td>
<td>8.4</td>
<td>8.0</td>
</tr>
<tr>
<td>H-group</td>
<td>6.4</td>
<td>18.6</td>
<td>78.7</td>
<td>85.0</td>
<td>81.7</td>
<td>18.9</td>
<td>14.9</td>
<td>19.0</td>
</tr>
<tr>
<td>R-group</td>
<td>11.6</td>
<td>36.7</td>
<td>88.9</td>
<td>91.3</td>
<td>90.7</td>
<td>38.6</td>
<td>31.4</td>
<td>36.3</td>
</tr>
</tbody>
</table>

(1,2) Contributes to scores 1 and 2; Preventive measures restricted and total scores.  
G - Physician recipients of the therapeutic guidelines  
H - Physicians who have had a patient test positive for HIV since 1989  
R - Random sample of remaining physicians
gynaecological examinations for female HIV positive patients. Only a small proportion of respondents in each group indicated that any of these clinical tests or exams were inappropriate (range = 0% to 2.9%).

As for vaccinations, G-group physicians were asked to indicate the frequency with which the recommended laboratory and clinical tests (CD4 counts, tuberculosis testing, syphilis serology and gynaecological exam), as well as the two laboratory tests for which no recommendations exist (p24 antigen and β2 microglobulin), should be performed for any individual HIV positive patient (Table 4.3.14). Physicians could respond that tests should be administered; annually, twice yearly, four times yearly, that the frequency would depend on the patient’s condition or prior test results, or could indicate that they did not know how frequently the tests should be administered. For each test or examination recommended, overall agreement with the guidelines in terms of both the use and frequency was calculated as for vaccinations.

It should be re-iterated that only two of these questions were included in the scoring process; the frequency of tuberculosis testing and gynaecological examination. The remaining questions regarding testing frequency were not used due to omission of poor question context (syphilis), lack of contemporary guidelines (p24 antigen and β2 microglobulin) or the complex nature of the test resulting in all the answer choices provided being acceptable under certain conditions (CD4 counts).

Among G-group respondents who recommended using CD4 counts, 65% stated that the frequency of CD4 counts would be dependent on the patient’s condition and prior CD4 count. There appears to be a consensus among those who recommend p24 antigen and β2
microglobulin that the frequency of these tests should also be dependent on the patient’s condition or prior test results (61% and 54% respectively).

Thirty seven percent of respondents believed that syphilis testing should proceed yearly and 38% felt that testing should be dependent on the condition of the patient and prior test results. This is consistent with knowledge that syphilis testing is generally recommended yearly but only in sexually active patients.

Fifty six percent of respondents who stated that TB testing should be considered for HIV patients, recognised the need for yearly screening. Overall agreement with current recommendations, in terms of whether TB testing should be offered and how often, reached 41.4%.

The recommendation that women with HIV have gynaecological examinations twice yearly or dependent on their condition and the results of prior gynaecological exams was recognised by 39% and 17% of respondents respectively which, when combined, result in agreement of 56% with recommendations of exam frequency. Overall agreement with the current guidelines as to the performance and frequency of gynaecological exam reached 51.1%.
Table 4.3.14: Preferred Frequency of Recommended laboratory and Clinical Tests Among G-Group Respondents Who Preferred to Use the Test in Question

<table>
<thead>
<tr>
<th>Test</th>
<th>CD4 Count</th>
<th>P24 Antigen</th>
<th>B2 Micro</th>
<th>T B Test (2)</th>
<th>Syphilis</th>
<th>Gynecology (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondents (n)</td>
<td>229</td>
<td>45</td>
<td>35</td>
<td>216</td>
<td>228</td>
<td>227</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Yearly</td>
<td>5.4</td>
<td>18.2</td>
<td>8.6</td>
<td>55.8</td>
<td>36.7</td>
<td>39.4</td>
</tr>
<tr>
<td>2 times yearly</td>
<td>9.5</td>
<td>0.0</td>
<td>14.3</td>
<td>2.4</td>
<td>3.3</td>
<td>38.9</td>
</tr>
<tr>
<td>4 times yearly</td>
<td>16.7</td>
<td>0.0</td>
<td>2.9</td>
<td>0.0</td>
<td>0.0</td>
<td>2.3</td>
</tr>
<tr>
<td>Depends</td>
<td>65.3</td>
<td>61.4</td>
<td>54.3</td>
<td>25.7</td>
<td>37.7</td>
<td>17.2</td>
</tr>
<tr>
<td>Do not know</td>
<td>3.2</td>
<td>20.5</td>
<td>20.0</td>
<td>16.0</td>
<td>22.3</td>
<td>2.3</td>
</tr>
</tbody>
</table>

(2) Contributes to score 2, Preventive measures-total score.
Border denotes response in agreement with contemporary guidelines
Antiretroviral therapy:

Physicians in all three groups were asked how they would approach antiretroviral therapy in two situations: The case of an asymptomatic patient with a CD4 count of 200 to 500 cells/mm$^3$; and in the case of a symptomatic patients who has received AZT for more than one year and whose cell count has declined from 350 to 175 cells/mm$^3$. The resulting answer patterns are shown in Figures 4.3.1 and 4.3.2.

In the first case, 27%, 50% and 71% of G-, H-, and R-groups respectively, indicated that they did not know what the appropriate therapy would be (Figure 4.3.1). AZT monotherapy was recommended by 41%, 31% and 18% in each of the three groups. None of the respondents chose to use ddl monotherapy while 17% of G-group, 5% of H-group and 2% of R-group respondents selected an acceptable combination therapy. Among those who selected combination therapy, AZT/ddI and AZT/ddC were the most popular choices. Fourteen percent of respondents in G- and H-groups and 9% of those in R-group elected to use no therapy. Fewer than 1% G and H-group respondents selected other inappropriate alternatives such as ddC monotherapy or “other” unspecified choices.

As indicated in Figure 4.3.1a, responses in accordance with contemporary recommendations, such as AZT monotherapy, AZT/ddI, AZT/ddC or AZT/3TC, were selected by 58% of G-group, 36% of H-group and 20% of R-group. Responses which contradicted the recommendations (no therapy or ddC alone) were selected by 15% of G-group, 14% of H-group and 9% of R-group respondents.
Figure 4.3.1: Preferred Antiretroviral Therapy for an Asymptomatic Patient With a CD4 Count of 200 to 500 cells/mm$^3$.

(Responses contribute to scores 3 and 4)
✓-reflects contemporary recommendations

Figure 4.3.1a: Proportion of Correct, Incorrect and Unsure Responses.
In the case of a patient experiencing a decline in CD4 count, 41% of G-group, 70% of H-group, and 82% of R-group respondents indicated that they did not know which antiretroviral therapy to use (Figure 4.3.2). Combination therapy, as recommended in current practice guidelines, was selected by 51% of G-group respondents, 25% of H-group respondents and 14% of R-group respondents. The combination of AZT/ddI was selected by 30% of G, 19% of H and 10% of R-group respondents while AZT/ddC was selected by 14%, 3% and 4% respectively. Seven percent of G-group respondents, 2% of H-group respondents and less than 1% of R-group respondents selected alternative appropriate combinations such as ddI/ddC, AZT/3TC or named two appropriate combination therapies. Monotherapy or other choices not recommended were selected by 8% of those in G-group, 5% of H-group and 4% of R-group.

As shown in Figure 4.3.2a, responses in agreement with the guidelines were selected by 51%, 25% and 14% of G, H, and R respondents respectively. Eight percent, 5% and 4% disagreed with the contemporary recommendations while the remainder were unsure.

Four additional questions regarding the use of antiretroviral therapy (two of which contribute to scores of knowledge regarding antiretroviral therapy) were asked of physicians in G-group. These physicians were asked how they would approach antiretroviral therapy in the case of a symptomatic patient who had received AZT for one year and who had recently developed a new AIDS defining opportunistic infection (Figure 4.3.3). Answers were similar to those for the preceding question, with 51% stating that they were unsure of the correct
Figure 4.3.2: Preferred Antiretroviral Therapy for a Symptomatic Patient With a CD4 Count Decline From 350 to 175 cells/mm\(^3\).
(Responses contribute to scores 3 and 4)
✓ - reflects contemporary recommendations

![Figure 4.3.2a: Proportion of Correct, Incorrect and Unsure Responses](image)

Figure 4.3.2a: Proportion of Correct, Incorrect and Unsure Responses
Figure 4.3.3: Preferred Antiretroviral Therapy for a Symptomatic Patient With a New AIDS Defining Illness.
(Responses contribute to score 4)
✓ - reflects contemporary recommendations

Correct = 41%
Incorrect = 8%
Unsure = 51%
approach, with 23% recommending a combination of AZT/ddI, 12% AZT/ddC and 6% selecting an alternative combination. As before, 8% of G-group respondents selected inappropriate mono-therapeutic or “other” options. Overall rate of correct response was 41%. Inappropriate responses were selected by 8%.

G-group physicians were also asked how often they would use combination antiretroviral therapy for patients with advanced disease. Respondents could reply: always, usually, sometimes, rarely, never, or do not know. This question contributes to score 4, Antiretroviral-total score, with the answers “always” and “usually” considered to be in agreement with current recommendations. Among G-group respondents, 61% said that they would use combination therapy always or usually, in accordance with the guidelines. Twenty four percent indicated that they did not know while the remaining 15% stated that they used or would use, combination therapy less frequently.

The physicians in G-group were also asked whether they would consider enrolment of a patient in a clinical trial of combination antiretroviral therapy to be a treatment option for symptomatic patients. The majority of respondents, 78%, indicated that they would, 21% said that they were unsure and the remaining 1% indicated that they would not.

Because the physicians selected for G-group were believed to represent B.C.’s most experienced HIV/AIDS care givers, they were asked to indicate whether they had ever prescribed combination therapy, and if so, the month and year in which they first prescribed it. Thirteen respondents did not respond to the question, a non-response rate of 5.2%. Of respondents, 57% had never prescribed combination therapy and 1% could not recall. Of the remaining 99 (42%) respondents, 11% had first prescribed in 1989 or 1990, 9% in 1991, 15%
in 1992, 32% in 1993, 19% in 1994 and 13% in 1995. It should be noted that this question
should not be considered a reliable indicator of the advent of combination therapy utilisation
as it is based largely on recall which may be faulty (of 99 respondents only 33% could state
the month of prescription). Also, one can not know if, or when, the respondents had patients
who were eligible for combination therapy.

**Prophylaxis of opportunistic infections**

Physicians in G-group were asked to describe their approaches to the prophylaxis of five
opportunistic infections: *Pneumocystis carinii* pneumonia, toxoplasmosis, Cytomegalovirus
retinitis, cryptococcal infection and *Mycobacterium avium-intracellulare* complex.

Physicians were asked to indicate their preferred first and second line agents for primary and
secondary prophylaxis of PCP. Trimethoprim sulfamethoxazole (TMP/SMX) was selected by
87% of respondents as their first line agent in accordance with the guidelines (Figure 4.3.4).
Aerosol pentamidine was chosen by 3%, other agents by 1%, and the remaining 9% were
unsure. Figure 4.3.5 shows that the preferred second line agent was dapsone (40%), followed
by aerosol pentamidine (30%), either of which are considered appropriate. Only 3% selected
agents which are not recommended as second line agents (TMP/SMX or
clindamycin/primaquine) and 27% indicated that they did not know. Overall, 70% of
respondents selected second line agents which were recommended in the guidelines.
Figure 4.3.4: Preferred First Line Agent for Primary Prophylaxis of *Pneumocystis Carinii* Pneumonia.

(Responses contribute to score 5).

✓ - reflects contemporary recommendations

Correct = 87%
Incorrect = 4%
Unsure = 9%

Preferred Therapy

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMP/SMX</td>
<td>87</td>
</tr>
<tr>
<td>Pentamidine</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
<tr>
<td>Unsure*</td>
<td>27</td>
</tr>
</tbody>
</table>
Figure 4.3.5: Preferred Second Line Agent for the Primary Prophylaxis of *Pneumocystis Carinii* Pneumonia.

(Responses contribute to score 5)

✓ -reflects contemporary recommendations

Correct = 70%
Incorrect = 3%
Unsure = 27%

Preferred Therapy

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMP/SMX</td>
<td>2</td>
</tr>
<tr>
<td>Pentamidine</td>
<td>30</td>
</tr>
<tr>
<td>Dapsone</td>
<td>40 (✓)</td>
</tr>
<tr>
<td>Clind/Primaquine</td>
<td>1</td>
</tr>
<tr>
<td>Unsure*</td>
<td>27</td>
</tr>
</tbody>
</table>
Regarding secondary prophylaxis, physicians were less certain as to the correct first line agent. Just 36% recognised TMP/SMX as the preferred agent for secondary prophylaxis (Figure 4.3.6). The same proportion, 36%, were unsure as to the correct agent while the remaining 28% selected inappropriate therapies (aerosol pentamidine, dapsone or clindamycin/primaquine). Fewer than 2% of respondents felt that no secondary prophylaxis was warranted. Dapsone was recognised as a preferred second line for secondary prophylaxis agent by 25% of respondents and aerosol pentamidine by 15% (Figure 4.3.7). Either of these drugs may be used as second line agents, resulting in an overall rate of agreement of 40%. Ten percent of respondents selected therapies not recommended as second line agents while the remaining 50% could not identify the preferred second line agent.

When asked to specify their preference regarding the criteria used to determine whether a patient should receive primary prophylaxis for toxoplasmosis, 15% said they would not consider primary prophylaxis at all (Figure 4.3.8). A further 53% were unsure as to whether prophylaxis should be offered and 32% (n=79) indicated that they would recommend primary prophylaxis at a variety of CD4 cell counts.

Among the 79 respondents who recommended primary prophylaxis, 57 (72%) preferred to begin prophylaxis when CD4 count dropped below 200 cells/mm$^3$ (n=45) or below 100 cells/mm$^3$ (n=12) (Figure 4.3.8a). Guidelines have very recently been changed from recommending that primary prophylaxis begin at CD4 counts below 200 cells/mm$^3$, to recommending prophylaxis at CD4 counts below 100 cells/mm$^3$. Therefore, either of these responses would be in accordance with existing guidelines. Other CD4 count criteria were
Figure 4.3.6: Preferred First Line Agent for Secondary Prophylaxis of *Pneumocystis Carinii* Pneumonia.
(Responses contribute to score 5)
✓ -reflects contemporary recommendations

Correct = 36%
Incorrect = 28%
Unsure = 36%

<table>
<thead>
<tr>
<th>Preferred Therapy</th>
<th>36</th>
<th>15</th>
<th>9</th>
<th>3</th>
<th>2</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMP/SMX</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pentamidine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Dapsone</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>9</td>
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<tr>
<td>other</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>36</td>
</tr>
</tbody>
</table>
Figure 4.3.7: Preferred Second Line Agent for the Secondary Prophylaxis of Pneumocystis Carinii Pneumonia.

(Responses contribute to score 5)
✓ -reflects contemporary recommendations

Correct = 40%
Incorrect = 10%
Unsure = 50%
Figure 4.3.8: Preferred Approach to Primary Prophylaxis of Toxoplasmosis.
(Responses contribute to score 5)
✓ -reflects contemporary recommendations

Correct = 32%
Incorrect = 15%
Unsure = 53%

Preferred Approach

Figure 4.3.8a: Preferred CD4 Count for Initiation of Toxoplasmosis Prophylaxis Among Respondents Who Recommended Prophylaxis.
(Responses contribute to score 5)
✓ -reflects contemporary recommendations

Correct = 72%
Incorrect = 15%
Unsure = 13%
selected by 12 (15%) respondents, while 10 (13%) respondents were unsure of the correct CD4 count at which prophylaxis should commence. Therefore, the proportion of respondents who identified the correct approach to primary prophylaxis of toxoplasmosis was 23% (57 of 248 respondents) overall.

The second part of this question asked respondents who either recommended the use of primary toxoplasmosis prophylaxis or were unsure about its use, to identify the appropriate drug for this purpose (Table 4.3.15). The recommended drug is TMP/SMX. Forty two of the 79 respondents who recommended prophylaxis identified the correct drug, 40 of whom had also identified the correct CD4 count at which prophylaxis should commence. Among those respondents who preferred to start prophylaxis at an incorrect CD4 count or who were unsure of the CD4 count at which prophylaxis should begin, only three agreed with current recommendations and stated that they would use TMP/SMX. Of the 132 respondents who were not certain about whether or not prophylaxis should be offered at all, only 1 could identify the prophylactic agent of choice.

In all, 40 physicians (16% of the 248 that responded to the question) were in complete agreement with the guidelines in terms of: 1) if and when primary prophylaxis for toxoplasmosis should commence; and 2) the drug best suited to this purpose.

It is evident, at least in this case, that physicians who are not in agreement with the guidelines as to when prophylaxis should be initiated, either because they indicate that they do not know or because they selected incorrect criteria for commencing prophylaxis, are
Table 4.3.15: Preferred Agent for the Primary Prophylaxis of Toxoplasmosis (Contributes to Score 5)

<table>
<thead>
<tr>
<th>Approach</th>
<th>TMP/SMX</th>
<th>Pyrimethamine+</th>
<th>Dapsone+</th>
<th>Pyrimethamine+</th>
<th>Pyrimethamine</th>
<th>Do not know</th>
<th>No Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommend Prophylaxis (n=79)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct CD4 (n=57)</td>
<td>40</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Incorrect CD4 (n=12)</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Unsure CD4 (n=10)</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Unsure of Prophylaxis (n=132)</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>124</td>
<td>4</td>
</tr>
</tbody>
</table>

Border denotes correct agent and correct CD4 count
unlikely to be able to identify the drug which should be used for this purpose. Similarly, those who are not sure whether prophylaxis should be used at all are unlikely to know what drug should be used.

When asked about their preferred agent for secondary prophylaxis against toxoplasmosis, 13% of respondents were in agreement with the guidelines and recommended pyrimethamine and sulfadiazine in combination (Figure 4.3.9). Fewer than 1% recommended no secondary prophylaxis and 14% recommended secondary prophylaxis with a drug which is not recommended in contemporary practice guidelines. The remaining 73% of respondents were unsure which drug should be used.

Regarding primary prophylaxis for cryptococcal meningitis, 29% of respondents were in accordance with recommendations in stating that prophylaxis was not necessary (Figure 4.3.10). Forty eight percent were not sure if they would use prophylaxis while the remainder said they preferred to institute prophylaxis with fluconazole (19%), ketoconazole (3%), or either drug (1%), at a variety of CD4 counts.

Physicians were also asked about their approach to the primary prophylaxis of cytomegalovirus infection. Prophylaxis is not recommended in contemporary guidelines. Figure 4.3.11 shows that 33% of responders agreed with the recommendation and indicated that they would not use CMV prophylaxis. Uncertainty as to the use of prophylaxis was indicated by 60% of responders and the remaining 7% disagreed with guidelines, preferring to prophylax against CMV with foscarnet, gancyclovir or acyclovir.
Figure 4.3.9: Preferred Agent for the Secondary Prophylaxis of Toxoplasmosis.

(Responses contribute to score 5)
✓ - reflects contemporary recommendations

Correct = 13%
Incorrect = 14%
Unsure = 73%

Preferred Therapy

- Pyrimethamine + Sulfadiazine
- TMP/SMX
- Pyrimethamine + Clindamycin
- Dapsone + Pyrimethamine
- Unsure
- Other
- None
Figure 4.3.10: Preferred Approach to the Primary Prophylaxis of Cryptococcal Meningitis.
(Responses contribute to score 5)
✓ -reflects contemporary recommendations

Correct = 29%
Incorrect = 23%
Unsure = 48%
Figure 4.3.11: Preferred Approach to the Primary Prophylaxis of Cytomegalovirus Infection.
(Responses contribute to score 5)
✓ -reflects contemporary recommendations

Correct = 33%
Incorrect = 7%
Unsure = 60%

Preferred Therapy

None  |  Foscarnet  |  Gancyclovir  |  Acyclovir  |  Unsure

None  |  33  |  1  |  4  |  2  |  60
The last question regarding opportunistic infection prophylaxis concerned primary prophylaxis for *Mycobacterium avium-intracellulare* infection. As shown in Figure 4.3.12, 9% said that they would not use prophylaxis, 47% were unsure if prophylaxis should be used.

Forty three percent of respondents (n=105) recommended MAC prophylaxis at a variety of CD4 counts. Guidelines have very recently been changed from recommending that primary prophylaxis begin at CD4 counts below 100 cells/mm$^3$, to recommending prophylaxis at CD4 counts below 50 cells/mm$^3$. Among the 105 respondents that preferred to use prophylaxis, 64 preferred to begin prophylaxis when CD4 count dropped below 100 cells/mm$^3$ and 9 preferred to begin prophylaxis only when CD4 count drop below 50 cells/mm$^3$ (Figure 4.3.12a). Other CD4 count criteria were selected by 21 respondents while 11 respondents were unsure of the correct CD4 count at which prophylaxis should commence. Therefore, the proportion of respondents who identified the correct approach to primary prophylaxis of MAI was 30% (73 of 244 respondents) overall.

The second part of this question asked those respondents recommending the use of primary MAI prophylaxis, or who were unsure about its use, to identify the appropriate prophylactic agent (Table 4.3.16). Either rifabutin or clarithromycin are recommended for this purpose. Of the 105 respondents who recommended prophylaxis, 87 identified either of the correct drugs, 67 of whom had also identified the correct CD4 count at which prophylaxis should commence. Among the 32 respondents who stated that they would preferred to start prophylaxis at an incorrect CD4 count or who were unsure of the CD4 count at which
Figure 4.3.12: Preferred Approach to Primary Prophylaxis of *Mycobacterium Avium-Intracellulare* Infection.

(Responses contribute to score 5)
✓ -reflects contemporary recommendations

Correct = 43%
Incorrect = 9%
Unsure = 48%

Preferred Approach

Figure 4.3.12a: Preferred CD4 Count for Initiation of MAI Prophylaxis Among Respondents Who Recommended Prophylaxis.

(Responses contribute to score 5)
✓ -reflects contemporary recommendations

Correct = 70%
Incorrect = 19%
Unsure = 11%

Preferred CD4 Count
Table 4.3.16: Preferred Agent for the Primary Prophylaxis of *Mycobacterium Avium Intracellulare* (Contributes to Score 5)

<table>
<thead>
<tr>
<th>Approach</th>
<th>Clarithromycin</th>
<th>Rifabutin</th>
<th>Azithromycin</th>
<th>Combination</th>
<th>Do not know</th>
<th>No Response</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommend Prophylaxis (n=105)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct CD4 (n=73)</td>
<td>3</td>
<td></td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Incorrect CD4 (n=21)</td>
<td>5</td>
<td>11</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Unsure CD4 (n=11)</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td><strong>Unsure of Prophylaxis (n=116)</strong></td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>105</td>
<td>1</td>
</tr>
</tbody>
</table>

Borders denote correct agents and correct CD4 count
prophylaxis should begin, 20 agreed with current recommendations and stated that they would use either rifabutin or clarithromycin. Of the 116 respondents who were unsure as to whether prophylaxis should be offered at all, only 8 selected either of the correct prophylactic drugs.

In all, 67 physicians (of the 244 that responded to the question) or 27%, were in complete agreement with the guidelines in terms of: 1) if and when primary prophylaxis for MAI should commence; and 2) the drugs best suited to this purpose.

In this case, physicians who were not in agreement with the guidelines as to when prophylaxis should be offered, either because they “did not know” or because they selected incorrect criteria for commencing prophylaxis, while fairly likely to be able to identify the correct drugs for this purpose, represented a small proportion of responding physicians. Among those who were not sure whether prophylaxis should be initiated at all, few (8 of 116) were likely to know what drug would be used.

Treatment of opportunistic infections

Physicians in G-group were asked about their therapeutic strategies under circumstances of acute infection with: Pneumocystis carinii pneumonia, toxoplasmosis, Cytomegalovirus retinitis, cryptococcus and Mycobacterium avium complex.

Physicians were asked to indicate their preferred treatment for mild to moderate acute PCP and for severe cases of infection. Dapsone plus trimethoprim is recommended for patients
with mild or moderate PCP while more severe disease should be treated with pentamidine isethionate, TMP/SMX or clindamycin plus primaquine.

Dapsone/trimethoprim was selected as the treatment of choice by 14% of respondents (Figure 4.3.13). A large proportion (46%) of respondents believed TMP/SMX to be the therapy of choice and 7% chose other therapies which are not recommended for use in mild or moderate infection. The remaining 33% stated that they did not know the appropriate therapy.

As shown in Figure 4.3.14, 38% of respondents indicated an appropriate therapy for severe PCP disease, most commonly TMP/SMX (23%). Forty six percent were unsure of the correct therapeutic strategy and 16% preferred other therapies such as atovaqone, aerosol pentamidine or dapsone which are not recommended for severe PCP.

Regarding the treatment of newly diagnosed acute toxoplasmosis infection, 27% of respondents preferred to use a combination of pyrimethamine and sulfadiazine, 2% chose pyrimethamine plus clindamycin and 5% elected to use pyrimethamine in combination with other agents or as a monotherapy (Figure 4.3.15). Pyrimethamine in combination with either sulfadiazine or clindamycin are currently recommended by treatment guidelines. Therefore, agreement with the guidelines was seen among 29% of respondents. Uncertainty regarding the correct therapeutic strategy was indicated by the remaining 66% of respondents.
Figure 4.3.13: Preferred Agent for the Treatment of Mild or Moderate Pneumocystis carinii Pneumonia.
(Responses contribute to score 6)
✓ -reflects contemporary recommendations

Correct = 14%
Incorrect = 53%
Unsure = 33%
Figure 4.3.14: Preferred Agent for the Treatment of Severe *Pneumocystis carinii* Pneumonia.

(Responses contribute to score 6)
✓ -reflects contemporary recommendations

Correct = 38%
Incorrect = 16%
Unsure = 46%
Figure 4.3.15: Preferred Agent for the Treatment of Newly Diagnosed Toxoplasmosis Infection.

(Responses contribute to score 6)
✓ -reflects contemporary recommendations

Correct = 29%
Incorrect = 5%
Unsure = 66%
Physicians were next asked to identify their preferred initial treatment of newly diagnosed cryptococcal meningitis. As shown in Figure 4.3.16, 18% of respondents identified a recommended therapy (amphotericin B with or without the addition of 5-flucytosine).

Twenty seven percent preferred to use fluconazole, either alone or in combination with amphotericin B, 5-flucytosine, or other agents not currently recommended. The remaining 55% of respondents were unsure which therapy should be used to treat this infection.

Figure 4.3.17 shows the preferred therapeutic strategies for the treatment of cytomegalovirus retinitis among respondents. As presented, 38% of respondents elected to use gancyclovir, 5% chose to use foscarnet, or foscarnet in combination with gancyclovir, or acyclovir. The remaining 58% were unsure which strategy they would use to treat CMV retinitis. Therefore, only 38% of respondents agreed with contemporary guidelines by selecting gancyclovir, the recommended therapy.

Lastly, physicians were asked whether they would prefer to use combination therapy or monotherapy in the treatment of acute MAI infection. Combination therapy was preferred by 41% (n=99) of respondents and monotherapy by 3%. The remaining 56% were unsure whether monotherapy or combination therapy was appropriate. Combination therapy is the preferred approach to the treatment of acute MAI infection. Therefore, agreement with the guidelines reached 41%.

Overall, of the 99 respondents preferring combination therapy, 39 identified one of the combinations which may be used to treat MAI infection according to current treatment
Figure 4.3.16: Preferred Agent for the Treatment of Cryptococcal Meningitis.

(Responses contribute to score 6)
✓ -reflects contemporary recommendations

Correct = 18%
Incorrect = 27%
Unsure = 55%
Figure 4.3.17: Preferred Agent for the Treatment of Cytomegalovirus Retinitis in a Patient With an Absolute Neutrophile Count of Greater Than 1000.

(Responses contribute to score 6)
✓ -reflects contemporary recommendations

Correct = 38%
Incorrect = 4%
Unsure = 58%
guidelines. A further 23 indicated that they did not know which drug combination to use and the remaining 37 chose invalid or incomplete drug combinations.

Figure 4.3.18 shows the frequency with which 10 drugs were selected by the 99 respondents who preferred to use combination therapy. Ethambutol was the most commonly selected drug used in combination therapy (57%) followed by rifampin (49%), clarithromycin (42%), ciproflaxin (38%) rifabutin (17%) and isoniazid (12%). The remaining drugs were identified by fewer than 5% of respondents as contributing to their preferred combination regimens.

Summary

Table 4.3.17 describes the proportion of physicians in each group who were in agreement or disagreement with contemporary guidelines for questions asked of all groups regarding vaccinations, clinical tests, laboratory tests and antiretroviral therapy. Table 4.3.18 summarises the rates of agreement and disagreement for the additional questions asked of G-Group physicians regarding the frequency of test and vaccine applications, additional questions regarding the use of antiretroviral therapies, and the management of opportunistic infections.
Figure 4.3.18: Preferred Agent For the Treatment of Mycobacterium Avium-Intracellularare Among Respondents Who Indicated That They Would Use Combination Therapy. (Categories not mutually exclusive).
Table 4.3.17: Proportion of Respondents in Agreement and Disagreement With Contemporary Guidelines for the Use of Preventive Vaccinations, Tests and Antiretroviral Therapy

<table>
<thead>
<tr>
<th>Area of Care</th>
<th>% Agreement</th>
<th>% Disagreement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G-group</td>
<td>H-group</td>
</tr>
<tr>
<td>Vaccinations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza</td>
<td>83</td>
<td>62</td>
</tr>
<tr>
<td>Haemophilus influenza type B</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>83</td>
<td>66</td>
</tr>
<tr>
<td>Tetanus</td>
<td>75</td>
<td>60</td>
</tr>
<tr>
<td>Oral polio</td>
<td>45</td>
<td>39</td>
</tr>
<tr>
<td>Clinical tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuberculosis skin test</td>
<td>86</td>
<td>79</td>
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<tr>
<td>Gynecological exam</td>
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<td>79</td>
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<tr>
<td>Laboratory tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV repeat testing. Yes/no</td>
<td>78</td>
<td>77</td>
</tr>
<tr>
<td>CD4 counts</td>
<td>92</td>
<td>81</td>
</tr>
<tr>
<td>Immune complex dissociated p24</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td>Antiretroviral therapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asymptomatic, CD4 200 to 500 cells/mm³</td>
<td>58</td>
<td>36</td>
</tr>
<tr>
<td>Symptomatic, CD4 decline from 350 to 175 cells/mm³</td>
<td>51</td>
<td>25</td>
</tr>
</tbody>
</table>

G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
Table 4.3.18: Proportion of Guideline Recipients in Agreement and Disagreement With Contemporary Guidelines for the Frequency of Vaccinations and Tests, the Use of Antiretroviral Therapies and the Management of Opportunistic Infections.

<table>
<thead>
<tr>
<th>Area of Care</th>
<th>% Agreement</th>
<th>% Disagreement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency of vaccinations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza</td>
<td>98</td>
<td>1</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>96</td>
<td>2</td>
</tr>
<tr>
<td>Tetanus</td>
<td>86</td>
<td>1</td>
</tr>
<tr>
<td><strong>Frequency of clinical tests</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuberculosis skin test</td>
<td>56</td>
<td>28</td>
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<tr>
<td>Gynecological exam</td>
<td>56</td>
<td>42</td>
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<tr>
<td><strong>Antiretroviral therapy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symptomatic, new AIDS defining illness</td>
<td>41</td>
<td>8</td>
</tr>
<tr>
<td>Combination therapy for advanced disease</td>
<td>61</td>
<td>24</td>
</tr>
<tr>
<td><strong>Prophylaxis of opportunistic infections</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary PCP prophylaxis- first line agent</td>
<td>87</td>
<td>4</td>
</tr>
<tr>
<td>Primary PCP prophylaxis- second line agent</td>
<td>70</td>
<td>3</td>
</tr>
<tr>
<td>Secondary PCP prophylaxis- first line agent</td>
<td>36</td>
<td>28</td>
</tr>
<tr>
<td>Secondary PCP prophylaxis- second line agent</td>
<td>40</td>
<td>10</td>
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<tr>
<td>Primary toxoplasmosis prophylaxis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD4 count criteria</td>
<td>23</td>
<td>20</td>
</tr>
<tr>
<td>Prophylactic agent*</td>
<td>70</td>
<td>21</td>
</tr>
<tr>
<td>Secondary toxoplasmosis prophylaxis</td>
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<td>14</td>
</tr>
<tr>
<td>Primary cryptococcal prophylaxis</td>
<td>29</td>
<td>23</td>
</tr>
<tr>
<td>Primary cytomegalovirus prophylaxis</td>
<td>33</td>
<td>7</td>
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<tr>
<td>Primary MAC prophylaxis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD4 count criteria</td>
<td>30</td>
<td>17</td>
</tr>
<tr>
<td>Prophylactic agent*</td>
<td>92</td>
<td>1</td>
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<tr>
<td><strong>Treatment of opportunistic infections</strong></td>
<td></td>
<td></td>
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<tr>
<td>Mild to moderate PCP</td>
<td>14</td>
<td>53</td>
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<tr>
<td>Severe PCP</td>
<td>38</td>
<td>16</td>
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<tr>
<td>Toxoplasmosis</td>
<td>29</td>
<td>5</td>
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<tr>
<td>Cryptococcal meningitis</td>
<td>18</td>
<td>27</td>
</tr>
<tr>
<td>Cytomegalovirus infection</td>
<td>38</td>
<td>4</td>
</tr>
<tr>
<td>MAC combination therapy versus monotherapy</td>
<td>41</td>
<td>3</td>
</tr>
</tbody>
</table>

PCP- *Pneumocystis carinii* pneumonia  
MAC- *Mycobacterium avium* complex  
* Restricted to those who identified the recommended CD4 count criteria
4.4  PHYSICIAN KNOWLEDGE SCORES

As a consequence of low item non-response rates, all scores could be calculated for at least 96% of G-group respondents and 98% of both H- and R-group respondents.

While the purpose is not to compare groups of physicians as they were known a priori to represent distinct populations, it is of interest to examine the trends in mean group scores on the basis of the three scores which can be compared between groups— the restricted scores. As might be expected, physicians in G-group scored substantially higher than those in either H- or R-groups (Figure 4.4.1). Respondents in the group selected at random fared least well, with all scores indicating a low rate of agreement (less than 50%) with contemporary guidelines. For all groups, mean scores for antiretroviral therapy were lower than those for preventive measures. This trend is repeated for the additional scores confined to G-group respondents. As shown in Figure 4.4.2, scores continue to decline as questions become progressively more difficult (greater difficulty being defined as association with decisions being made as disease progresses). Overall, knowledge scores for all groups are relatively low, with the maximum scores of 66% seen among G-group respondents in the area of preventive measures and the lowest scores (17%) among R-group respondents for questions regarding antiretroviral therapy.

Figure 4.4.2 also shows the resulting scores when the two alternative scoring systems described in section 3.8.ii are applied. It is clear that the scoring system has little impact on the scores themselves or the trends in the scores overall.
Figure 4.4.1: Comparison of Groups G, H and R on the Basis of Three Comparable Mean Knowledge Scores
Figure 4.4.2: Mean Knowledge Scores for G-group Applying Three Scoring Systems: Single Question, Lead-Follow and Two Independent Questions
Based on the results of previously described preliminary studies there is reason to believe that physicians with greater levels of experience in HIV patient care will be more knowledgeable regarding the therapeutic management of these patients. It also seems reasonable that medical specialists may differ from general practitioners and family physicians in their domains of knowledge. Table 4.4.1 compares knowledge scores within each group on the basis of category of current patient number. R-group is restricted to two patient number categories as the number of physicians with more than two patients was too small to reliably indicate any distinction in scores (n=6). For all groups and all scores, it appears that having at least one or two patients currently in the physician’s practice confers substantial increases in scores as compared to those with no current patients. Furthermore, when scores are compared among physicians with the same number of current patients, those in G-group score consistently higher than those in H-group who in turn have higher scores than those in group R.

Table 4.4.2 compares knowledge scores within each group on the basis of physician medical specialty training. On the basis of scores comparable between all groups, those physicians with specialty training appear to have scores lower than those of GP’s and FP’s, particularly among H- and R- group respondents. Within G-group, scores tend to be more consistent with the exception of opportunistic infection treatment in which it seems that physicians with specialty training have increased scores.
Table 4.4.1: Comparison of Group Mean Knowledge Scores by Category of Current Patient Numbers

<table>
<thead>
<tr>
<th>Group</th>
<th>G-Group</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Patients</td>
<td>0</td>
<td>1 to 2</td>
<td>3 to 9</td>
<td>10+</td>
<td>0</td>
<td>1 to 2</td>
<td>3 to 9</td>
<td>10+</td>
</tr>
<tr>
<td></td>
<td>Sample size</td>
<td>70</td>
<td>90</td>
<td>34</td>
<td>45</td>
<td>191</td>
<td>97</td>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td>Preventive measures - restricted</td>
<td></td>
<td>58</td>
<td>67</td>
<td>68</td>
<td>72</td>
<td>51</td>
<td>63</td>
<td>62</td>
<td>64</td>
</tr>
<tr>
<td>Overall management - restricted</td>
<td></td>
<td>53</td>
<td>66</td>
<td>67</td>
<td>74</td>
<td>45</td>
<td>59</td>
<td>64</td>
<td>65</td>
</tr>
<tr>
<td>Preventive measures - total</td>
<td></td>
<td>52</td>
<td>62</td>
<td>65</td>
<td>75</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Antiretroviral - total</td>
<td></td>
<td>30</td>
<td>58</td>
<td>57</td>
<td>82</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Prophylaxis of OI's</td>
<td></td>
<td>23</td>
<td>38</td>
<td>46</td>
<td>77</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Treatment of OI's</td>
<td></td>
<td>10</td>
<td>26</td>
<td>37</td>
<td>65</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Overall management - total</td>
<td></td>
<td>31</td>
<td>46</td>
<td>53</td>
<td>73</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
Table 4.4.2: Comparison of Group Mean Knowledge Scores by Specialty Training

<table>
<thead>
<tr>
<th>Group</th>
<th>G-Group</th>
<th>H-Group</th>
<th>R-Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Preventive measures- restricted</td>
<td>61.5</td>
<td>66.9</td>
<td>43.9</td>
</tr>
<tr>
<td>Overall management- restricted</td>
<td>59.3</td>
<td>65.2</td>
<td>41.2</td>
</tr>
<tr>
<td>Preventive measures- total</td>
<td>58.5</td>
<td>62.4</td>
<td>-</td>
</tr>
<tr>
<td>Antiretroviral- total</td>
<td>48.8</td>
<td>53.8</td>
<td>-</td>
</tr>
<tr>
<td>Prophylaxis of OI's</td>
<td>43.7</td>
<td>39.2</td>
<td>-</td>
</tr>
<tr>
<td>Treatment of OI's</td>
<td>40.0</td>
<td>26.3</td>
<td>-</td>
</tr>
<tr>
<td>Overall management- total</td>
<td>48.2</td>
<td>46.6</td>
<td>-</td>
</tr>
</tbody>
</table>

G - Physician recipients of the therapeutic guidelines
H - Physicians who have had a patient test positive for HIV since 1989
R - Random sample of remaining physicians
As previously described, physician scores were adjusted to reflect physician self-identified lack of knowledge to provide an estimate of how likely patients are to be receiving appropriate care. Responses to knowledge questions such as “do not know”, “unsure” and “refer to expert care” were re-defined as correct in terms of care that patients are likely to receive.

As seen in Figure 4.5.1, comparable restricted care scores for each of the three groups increase dramatically over those of knowledge with the lowest score being 88%. Scores also become more consistent between groups and between scores with less than nine percentage points separating the highest and lowest scores. Figure 4.5.2, depicting additional scores limited to G-group respondents, shows a similar increase in all scores as well as a reduction in the range of scores (82% to 88%).

In an attempt to further elucidate the issue of physician knowledge versus patient care, the proportion of total patients under the care of knowledgeable physicians was determined. Given the low mean knowledge scores, high knowledge was defined as a score of greater than 65% on the overall management score for G-group, and greater than 65% on the overall management-restricted score for H- and R- groups. It was found that 75% of the total number of patients reported as receiving care currently from general practitioners and family physicians in all three groups combined, are under the care of physicians with comparatively high overall management knowledge scores. This trend however, appears to be more
Figure 4.5.1: Comparison of Groups G, H and R on the Basis of Three Comparable Mean Care Scores
Figure 4.5.2: Mean Care Scores for G-Group
distinct among G- and H-group respondents than among those in R-group, with 79%, 64% and 31% of patients reportedly being cared for in each of the three respective groups receiving this care from those with high scores.

4.6 UNIVARIATE ANALYSIS: SELECTING VARIABLES FOR MULTIVARIATE INVESTIGATION

The independent and dependant variables considered in univariate analysis, and resulting measures of association are summarised in Table 4.6.1. Variables associated with outcome scores at a significance level of p≤.1 were included for consideration in subsequent multivariate analysis.

For both H- and R- groups, younger age and lack of specialty training were associated with increased knowledge scores. In H-group, female respondents scored significantly higher on measures of preventive care and overall management while in R-group female physicians scored significantly better only on preventive measures. Location of practice (in Vancouver versus outside of Vancouver) did not appear to be associated with physician knowledge in either R- or H- group. Overall management scores in H-group increased significantly with the presence of HIV positive patients currently in the respondents practice however, this association was not apparent among R-group physicians.

Among G-group respondents, all outcome scores were associated with current physician experience. Respondent gender was not associated with any significant differences
Table 4.6.1: Univariate Associations Between Independent Variables and Outcome Scores for All Three Groups

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Age</th>
<th>Sex</th>
<th>Location</th>
<th>Specialty</th>
<th>Current Patients</th>
<th>Ability Ranked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable Categories</td>
<td>Continuous</td>
<td>Male/Female</td>
<td>Vancouver/Other</td>
<td>Yes/No</td>
<td>Yes/No</td>
<td>Categorically</td>
</tr>
<tr>
<td>Dependent Score</td>
<td>P-value</td>
<td>P-value</td>
<td>P-value</td>
<td>P-value</td>
<td>P-value</td>
<td>P-value</td>
</tr>
</tbody>
</table>

**G-group**

- Preventive: restricted: .007* .416 .201 .153 .001* .000*
- Overall management: restricted: .003* .673 .134 .119 .000* .000*
- Preventive: total: .003* .416 .046* .300 .000* .000*
- Antiretroviral: total: .107 .279 .288 .384 .000* .000*
- Prophylaxis of Ol's: .126 .457 .029* .318 .000* .000*
- Treatment of Ol's: .746 .446 .048* .011* .000* .000*
- Overall management: total: .049* .683 .038* .679 .000* .000*

**H-Group**

- Preventive: restricted: .000* .005* .689 .000* .000* .000*
- Overall management: restricted: .000* .006* .784 .000* .000* .000*

**R-Group**

- Preventive: restricted: .000* .081* .681 .000* .383 .000*
- Overall management: restricted: .000* .123 .794 .000* .213 .000*

* P value < or = 0.01
in outcome scores while younger age was associated with improved restricted and total scores for both preventive measures and overall management. G-group respondents practising in Vancouver, like those in H- and R-groups, did not score significantly higher on restricted preventive measures and overall scores. Vancouver location does however, appear to be associated with improved scores for opportunistic infection prophylaxis and treatment as well as total scores for preventive measures and overall management. The pattern of scores suggested by Table 4.4.2 is substantiated, with specialty training being significantly associated with increased knowledge of opportunistic infection treatment. Unlike those in R- and H-groups, physicians without medical speciality training in G-group do not appear to have greater knowledge of preventive measures.

As seen in Table 4.6.1, the association between respondent’s self perception of ability in specific areas of patient care, and their performance in affiliated scores of knowledge were highly significant for all groups and for all outcome scores. Spearmans rank correlation tests revealed that self perception of ability and the number of patients currently in physician’s practices were indeed co-linear for every area of care in all groups with coefficients of correlation ranging from .13 (p=.045) to .52 (p=.000). Similar co-linearity was apparent between current number of patients by category versus total number of patients ever seen.

Given this pattern of multiple co-linearity, a single variable, current patient number by category, was selected to represent physician experience and included for consideration in all multivariate models. Current experience, as opposed to past or total experience, was selected to reduce the likelihood of recall bias and because this measure is easily replicated and verified in future studies. Using categories rather than employing a continuous scale also
decreases the likelihood that recall bias, end digit preference and outlying observations will affect existing measures of association identified in multivariate analysis. This approach also reduces the risk of imposing linear relationships between independent and dependent variables where none may exist. The categories of patient numbers; no patients, one to two patients, three to nine patients and ten or more patients, while to some extent arbitrary, are felt to represent sensible levels of current experience i.e., no experience, minimal experience, moderate experience and high experience, and ensures that sub-sample size allows for reliable estimates of resulting coefficients.

4.7 MULTIVARIATE ANALYSIS

4.7.i) Resulting models

The results of regression analysis are shown in Table 4.7.1.

In group G, knowledge of all areas of patient care was significantly associated with the presence of active HIV positive patients (range of p values .003 to <.001). The trend of increased beta coefficients as patient number increases, with the exception of antiretroviral therapy scores, indicates that knowledge increases with number of patients as they are categorised here. Younger physicians attained significantly higher knowledge scores for both measures of preventive care (p=.004 for restricted score and p=.001 for total score), and for overall patient management (p=.004 for restricted score and p=.019 for total score). Having medical specialty training was associated with higher knowledge scores only in the area of acute opportunistic infection treatment (p=.009). Adjusted R² values ranged from a low of .084 (8.4%) for preventive measures -restricted model to highs of .357 (35.7%) for
Table 4.7.1: Linear Regression Beta Coefficients and Significance Levels for Three Groups and All Outcome Scores

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Age Variable Categories</th>
<th>Gender</th>
<th>Gender</th>
<th>Location</th>
<th>Specialty</th>
<th>Current Experience</th>
<th>Current Experience</th>
<th>Current Experience</th>
<th>Current Experience</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Score</td>
<td>βcoef</td>
<td>P</td>
<td>βcoef</td>
<td>P</td>
<td>βcoef</td>
<td>P</td>
<td>βcoef</td>
<td>P</td>
<td>βcoef</td>
<td>P</td>
</tr>
<tr>
<td>G-Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventive-total</td>
<td>-0.235</td>
<td>0.001</td>
<td>na</td>
<td>0.103</td>
<td>0.733</td>
<td>na</td>
<td>0.911</td>
<td>0.003</td>
<td>1.415</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Antiretroviral therapy</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>1.135</td>
<td>&lt;.001</td>
<td>1.075</td>
<td>&lt;.001</td>
<td>2.082</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Prophylaxis of OI's</td>
<td>na</td>
<td>na</td>
<td>0.665</td>
<td>0.047</td>
<td>na</td>
<td>1.299</td>
<td>&lt;.001</td>
<td>2.217</td>
<td>&lt;.001</td>
<td>5.250</td>
</tr>
<tr>
<td>Treatment of OI's</td>
<td>na</td>
<td>na</td>
<td>0.453</td>
<td>0.085</td>
<td>0.689</td>
<td>0.009</td>
<td>1.010</td>
<td>&lt;.001</td>
<td>1.617</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Overall- total</td>
<td>-0.479</td>
<td>0.019</td>
<td>na</td>
<td>1.297</td>
<td>0.131</td>
<td>na</td>
<td>4.124</td>
<td>&lt;.001</td>
<td>6.620</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Preventive-restricted</td>
<td>-0.224</td>
<td>0.004</td>
<td>na</td>
<td>na</td>
<td>0.878</td>
<td>0.010</td>
<td>1.227</td>
<td>0.002</td>
<td>1.561</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Overall-restricted</td>
<td>-0.272</td>
<td>0.004</td>
<td>na</td>
<td>na</td>
<td>-0.552</td>
<td>0.161</td>
<td>1.473</td>
<td>&lt;.001</td>
<td>1.862</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>H-Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventive-restricted</td>
<td>-0.180</td>
<td>0.010</td>
<td>0.364</td>
<td>0.275</td>
<td>na</td>
<td>-1.763</td>
<td>&lt;.001</td>
<td>1.193</td>
<td>&lt;.001</td>
<td>1.326</td>
</tr>
<tr>
<td>Overall-restricted</td>
<td>-0.227</td>
<td>0.004</td>
<td>0.392</td>
<td>0.291</td>
<td>na</td>
<td>-1.825</td>
<td>&lt;.001</td>
<td>1.614</td>
<td>&lt;.001</td>
<td>1.196</td>
</tr>
<tr>
<td>R-Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventive-restricted</td>
<td>-0.266</td>
<td>0.003</td>
<td>0.282</td>
<td>0.494</td>
<td>na</td>
<td>-2.665</td>
<td>&lt;.001</td>
<td>0.445</td>
<td>0.322</td>
<td>1.250</td>
</tr>
<tr>
<td>Overall-restricted</td>
<td>-0.325</td>
<td>&lt;.001</td>
<td>na</td>
<td>na</td>
<td>-2.970</td>
<td>&lt;.001</td>
<td>0.672</td>
<td>0.175</td>
<td>2.698</td>
<td>0.462</td>
</tr>
</tbody>
</table>

na = Not applicable- variable not considered for multivariate analysis
OI - Opportunistic infection
opportunistic infection prophylaxis and .354 (35.4%) for overall management-total score models.

In H-group, knowledge of preventive measures and overall management were associated with younger age (p=.010 and p=.004), lack of specialty training (both p<.001), and current HIV care experience (p<.001). As in group G, the coefficients associated with patient number increase as level of current experience rises indicating a trend towards increasing knowledge with higher numbers of active patients. Adjusted R$^2$ values were .183 (18.3%) for the preventive measures model and .214 (21.4%) for overall management.

For R-group however, current HIV-related experience does not appear to influence outcome scores significantly, although there is a trend towards significantly improved overall management scores for physicians with more than nine patients (p=.052). Caution is warranted in interpreting this trend however as the number of respondents in R-group with more than nine patients is small (n=6). Both preventive and overall management scores however, increase significantly with younger age (p=.003 for preventive score and p<.001 for overall management) and the lack of specialty training (p<.001 for both scores). Adjusted R$^2$ values were .296 (29.6%) for the preventive measures model and .311 (31.1%) for overall management.

4.7.ii) Aptness of resulting models

The use of linear regression techniques assumes that observations are adequate in number and independent of each other. As far as can be assessed in the present case, respondents are independent of each other and, given the large number of observations, any dependency that
may exist among residuals is relatively unimportant. The maximum number of parameters considered in any one model is seven and in each case the number of observations well exceeds seventy.

Diagnostic residual analyses were applied to ensure that the remaining assumptions of linear regression techniques were met. Histograms of residuals revealed that residuals appear to be normally distributed. Plots of the residuals versus independent variables revealed that, while there was a slight trend towards decreased variance of residuals among some respondents with very large numbers of patients, the resulting heteroscedasticity was minimal and did not seriously violate assumptions of homoscedasticity. It is possible that other independent variables for which data are not available may act as cofounders. However, any multivariate model which does not account for 100% of the variation in outcomes is subject to this concern and no specific evidence of confounding is apparent.
Chapter 5
Discussion

5.1 Response rate and non-response bias

The response rates obtained, while lower than is optimal, are within the ranges normally obtained for surveys of physicians [111, 112, 113, 114]. The relatively poor response rate among G-group physicians to the initial survey appears to be the result of the extensive nature of the survey. When one includes the responses received from those non-responders who returned the follow-up mini survey however, information regarding physician personal characteristics and level of current experience is available for 63% of G-group, 67% of H-group, and 70% of R-group. Among responders, rates of item non-response were low, indicating that the questions and directions were both well understood and unambiguous and that the responses received were valid.

Non-response assessment indicates that the level of knowledge held by the respondents is likely to represent the best case scenario regarding knowledge of HIV patient management among physicians in British Columbia in each of the groups surveyed. Non-responders were somewhat older than respondents in all groups. In groups G and R, non-responders appear to be less likely to currently be seeing HIV positive patients. Furthermore, a large proportion of non-responders who replied to the follow-up survey stated that they did not respond to the full-length survey because they had little past or anticipated future experience with HIV management or they did not know very much about the management of HIV disease. While the responses are thus biased, the direction of this bias can be established. Given the
associations identified between age, experience and self perceived ability and outcome scores of knowledge, it appears that non-responders (both those that responded to the mini-survey and, by extrapolation the absolute non-responders) may well represent physicians with lower levels of knowledge than those who responded.

These results also suggest that the third method of non-response assessment- a comparison of the total parent population to responders- would not be useful. The postal code, gender and specialty of non-responders would provide little information regarding their knowledge of HIV disease management.

5.2 UNIVARIATE ANALYSIS

5.2.i) Demographic and personal characteristics of respondents
As expected, the three groups of respondents are distinct in terms of some demographic, personal and practice characteristics by virtue of their unique parent populations. G-group physicians tended to be slightly younger and R-group physicians were more likely to have medical specialty training in comparison to the other groups. Overall however, the respondents represented the full cross-section of British Columbia’s physicians in terms of gender, age group, location of practice, medical specialty training and practice characteristics.

5.2.ii) Experience with HIV positive patients and ability and willingness to provide HIV patient care
By virtue of the process by which the groups of physicians surveyed were selected, the three groups of physicians differed as to their level of HIV-related experience. Respondents in G-
group were most likely to have ever provided care to an HIV positive patient, to have been involved more extensively in the care of these patients and reported themselves more likely to undertake total patient management in the case of a patient newly diagnosed as HIV positive. These physicians were also more likely to have currently active HIV positive patients, and to be providing care to larger numbers of patients in comparison to H and R-group physicians with current patients.

Not surprisingly, G-group respondents (whether considering all respondents or those without medical specialty training only) also saw themselves as more willing and able to provide HIV-related services in every area of patient care than those in H and R groups. These findings are in accordance with those of a study conducted among 2,000 US general practitioners and internists in 1990 which found that physicians with larger numbers of HIV positive patients were more willing to provide care to HIV positive patients [115]. This study also reported that physicians without HIV positive patients were more likely than those with HIV patients to report attitudinal barriers to HIV patient care (specifically homophobia and negativity towards IV drug users), antipathy toward HIV positive patients, and saw themselves as being at higher risk of infection by patients.

The present study also showed that respondent’s self perception of ability, and performance in affiliated scores of knowledge were linked for all groups and for all areas of care. This indicates that, regardless of their other characteristics, physicians themselves appear well able to estimate their current level of knowledge, or at least to differentially rank their level of knowledge in the various areas of patient care. Interestingly, physicians in G-group saw themselves as being more able to provide prophylaxis for opportunistic infections than to
provide antiretroviral therapy even though they had higher mean scores of antiretroviral therapy. Perhaps this is because the field of antiviral therapeutics moves very quickly while clinical advances in prophylactic measures tend to occur at a slower pace. This may result in physicians questioning their ability to stay abreast of the information regarding antiretroviral therapy.

5.2.iii) **Estimating the number of physicians in British Columbia currently providing care to HIV positive patients.**

It is estimated that some 6,000 people in BC are living with HIV/AIDS. The proportion of these persons aware of their HIV positive status is uncertain. Drug Treatment Programme statistics show that 1,200 patients were active members at the time of the survey. Combining responses regarding current HIV patient care experience extracted from survey respondents and those who answered the follow-up mini survey, some 4,314 patients were represented in this current study.

Thus, it appears probable that the survey captured a large proportion of those in the drug treatment program. The excess patients reported by G-group physicians may represent patients not yet eligible for the therapies offered by the treatment programme, those who elect not to participate and consequently purchase their medications outside of the treatment program, and those who opt not to utilise available traditional therapies at all.

Many patients reported by respondents, even within groups and limited to patients seen by non-specialists, may not represent unique individuals. We have shown that a select number of physicians within G-group act as core care providers, caring for a large proportion of the HIV
positive patients reported by our respondents. It is possible, even likely, that patients being
provided with primary care by other physicians in G-group, or those in R-group and H-group,
will also be patients of these HIV expert physicians. Patient transfer between general and
family practitioners within H and R-groups may be less likely to occur.

Caution is warranted when generalising the survey results concerning patient care to the
population of HIV positive individuals at large. It is possible that there exist HIV care
providers with large HIV centred practices who did not respond to the survey. Among H and
R groups this seems unlikely. Among non-responders who completed the follow-up survey,
just two physicians in H-group were seeing ten patients while in R-group none of the follow-
up responders were seeing more than three HIV positive patients. Among non-responders in
G-group however, eleven follow-up respondents had practices with ten or more HIV positive
patients, three of whom were currently providing care to two hundred HIV positive patients.

Survey results indicate that there are a large number of physicians providing at least some
care to HIV positive patients who could not be identified, by way of the Centre for
Excellence or the British Columbia Centres for Disease Control records, as having an interest
in HIV management. It is possible to provide a conservative estimate of the proportion of
physicians in B.C. not identifiable in this way who are currently providing care to HIV
positive patients. It is known that 55 doctors among those 484 selected via random sampling
(R-group), are currently providing care to HIV positive patients. If one assumes, to be
conservative, that all absolute non-responders are not currently seeing HIV positive patients,
then some 11.4% of physicians selected at random, are currently seeing HIV positive patients.
This suggests that, at least 11.4% (95% CI 10.8% to 12.0%) of British Columbia’s 6,500
remaining physicians (i.e., those outside of groups G and H), or approximately 740 physicians province-wide, are currently providing care to patients they know to be HIV positive. If we add to this figure the 168 physicians in H-group known to be currently providing care to HIV positive patients some 900 physicians are represented. These 900 physicians are actively seeing HIV positive patients but are not members of the Drug Treatment Programme, have not received British Columbian therapeutic guidelines and may not be aware of currently available resources designed to help them cope with the special needs of an HIV positive patient population.

5.2.iv) Familiarity with, and opinion of resources

It appears that the awareness of existing resources might be improved, particularly that of the toll-free phone line among all three groups of physicians surveyed. It is clear however, that physicians who are familiar with available resources find them to be useful and valid tools in their management of HIV patients. Therefore, increased awareness and utilisation will be important to meet the goal of increasing physician concordance with contemporary clinical guidelines. Increased awareness of available resources may also help to recruit physicians outside of G-group into a more active role in HIV patient management, particularly those 900 previously mentioned physicians, with the eventual aim of providing patients with basic HIV-related primary care closer to home thus leaving HIV core care providers free to apply their specialised knowledge in more advanced areas of patient management.

Continuing medical education will also play an important role in facilitating any shift in the burden of patient care. The majority of physicians in all groups appeared to be supportive of additional educational events or programmes assuming that these could be made accessible to
them. Most popular would be seminars, lectures, discussion groups and advisory toll-free help lines. These findings are in agreement with previous studies which report physicians’ instructional preferences as being group meetings or short courses [117, 118, 119]. A 1994 study of Vermont physicians similarly found that 63% of respondents indicated that they would like to be able to consult with an HIV specialist by phone and 55% said they would attend local presentations regarding HIV-disease [119]. While many physicians in our study indicated that they would be likely to utilise the educational events and programmes, the proportion of physicians who would actively commit to participation is unknown but is likely to be substantially lower.

5.2.v) Knowledge of the therapeutic management of HIV

The findings presented here provide evidence of the existence of substantial heterogeneity regarding the preferred therapeutic strategies of British Columbia’s physicians in the management of HIV positive individuals. Questions regarding specific problems faced by HIV patient care providers elicited a wide range of responses among each of the groups surveyed. Furthermore, direct contradiction of contemporary therapeutic recommendations was not uncommon and uncertainty regarding the management of HIV patients was extensive, even among physicians with active patients.

Regarding the use of laboratory and clinical tests, respondents fared relatively well with the exception of ICDp24, with greater than 55% of respondents in each group recognising the unique needs of HIV positive patients in monitoring health status. The responses of G-group indicate, however, that there exists a considerable amount of disagreement or uncertainty regarding the frequency with which these tests should be administered. The current
controversy surrounding the use of p24 antigen and Beta 2 microglobulin was reflected in the large proportion of physicians who indicated that they were uncertain as to the utility of these laboratory measures.

A similar pattern was observed in the use of vaccinations, with those being currently recommended for persons with HIV infection (influenza, hepatitis B, pneumococcal and tetanus) eliciting moderately high rates of correct response in G and H groups. The fact that fewer than 47% of those in R-group, and substantial numbers of those in H-group were unable to say whether these necessary vaccinations should be offered to HIV patients represent a gap in knowledge which is cause for concern. While the use of HiB vaccine is to some extent controversial, among the respondents who indicated an opinion of its use, the majority indicated that they preferred to offer it to HIV positive patients. That between 8% and 17% of respondents believed that oral (live) polio vaccine should be offered is more troubling given that its use is contraindicated in immunocompromised individuals. It is possible however, that some respondents misread the question to mean simply “polio vaccine”. Similar results were reported from a recent study of 121 primary care physicians in Washington State. Physicians were asked to take a medical history from and counsel a standardised patient trained to portray an asymptomatic person known to be HIV positive who was seeking a primary care physician [120]. The participating physicians were categorised on the basis of HIV-related experience into three groups. The investigators found that on average just 87% of participants recommended doing CD4 counts, 35% recommended hepatitis screening, 32% syphilis serologic testing, 19% influenza vaccination and 23% recommended pneumococcal vaccination. They also found significant associations
between higher rates of agreement with recommended practices and level of physician experience.

The field of antiretroviral therapeutics is a complex and rapidly evolving one and these attributes were reflected in the responses to questions about the use of these therapies. The trends in the responses indicated a high degree of uncertainty, particularly among H and R group respondents, as to which of the many available therapies should be used. This uncertainty increased in the case of patients experiencing disease progression. While a substantial number of physicians elected not to use antiretroviral therapy for an asymptomatic patient, all respondents felt that some form of antiretroviral therapy was appropriate for persons with symptoms of disease progression. The need for combination therapy as disease progresses was recognised by a large proportion among those with an opinion. Overall, physicians in G-group were more likely to have an opinion regarding antiretroviral therapy and, in comparison to physicians who had opinions in other groups, were more likely to recommend a more aggressive approach. These results concur with a previous report which found that experienced physicians initiated antiretroviral therapy among eligible patients some 3 years before those physicians with little or no experience [121]. In the previously mentioned study of physician approaches to a standardised patient, some 72% of highly experienced physicians recommended zidovudine therapy for a standardised patient with a self reported CD4 count of <500 cells/mm$^3$ as compared to 61% of moderately experienced physicians and 33% of least experienced physicians.

Considering the additional questions asked of the respondents in G-group, those regarding the prophylaxis of opportunistic infections elicited a wide range of responses. Rates of correct
response ranged from a high of 87% for the primary prophylaxis of PCP to a low of 13% for the secondary prophylaxis of toxoplasmosis. Overall, of the eleven questions regarding prophylaxis, nine elicited rates of correct response equal to or below 40%. In general, even fewer respondents were able to identify appropriate therapies for the treatment of opportunistic infections. While a large proportion of respondents were simply uncertain of the answers to these questions, responses in direct contradiction to contemporary guidelines were not uncommon.

In the rapidly evolving field of HIV therapeutics, the existence of varied opinions among physicians is inevitable as some physicians fail to keep pace with new research, while other respond to new findings before they are substantiated. It is also understandable that physicians may not become familiar with recommended management strategies until he or she has actively encountered the problem in clinical practice. This may assuage concerns regarding poor scores in areas of antiretroviral therapy and opportunistic infection management. However, it seems reasonable to expect physicians, particularly those involved in primary care, to have an understanding of HIV testing procedures, and the use of clinical and laboratory tests and preventive vaccinations.

5.2.vi) Answer patterns and bias

In some cases, particularly when those being surveyed wish to appear knowledgeable or feel that they should have an opinion, respondents may guess at answers rather than admit to not knowing or not having an opinion- a form of social desirability bias. Rates of response in direct contradiction of contemporary guidelines ranged from 4% to 53% and rates of self identified uncertainty ranged from 9% to 73%, indicating that physicians in Group-G (the
group most likely to feel obliged to be knowledgeable) did not hesitate to admit that they lacked knowledge about HIV patient care. Thus, the pattern of responses seen in this survey do not suggest that the occurrence of this phenomena is pervasive.

A second, closely related form of bias in which respondents depend on “product recognition” should also be considered. In cases where questions are closed with answer choices laid out for the respondent, respondents might be tempted to select answers which are familiar to them. For example, AZT (ZDV) is a commonly recognised drug name, even in the general population, and TMP/SMX and dapsone are certainly well recognised in the medical community. One might expect some respondents to select these familiar drugs as answer choices, thereby increasing their odds of “backing a winner”. This does not appear to be common here. For example, only a small proportion of respondents in each group selected AZT monotherapy as appropriate for patients with advanced disease while much greater numbers of respondents felt that it was appropriate for asymptomatic patients. In the case of PCP prophylaxis, a comparatively large proportion of G-Group physicians selected the correct answer to the two questions regarding the first and second line agents for the primary prophylaxis of PCP. This might lead one to suspect that answer selections were based on product recognition and answer choice elimination. Far fewer respondents however, selected these same agents for use in secondary prophylaxis (despite the fact that these were the correct responses) indicating that this product recognition phenomena, while its occurrence can not be ruled out, did not contribute substantially to the high rate of correct response to the questions on primary PCP prophylaxis. On the other hand, an example in which this phenomena may have occurred is seen in the responses to the question regarding the agents preferred for the treatment of MAC. Among those who stated that they would use
combination therapy, 12% selected isoniazid (which has never been recommended for the
treatment of MAC) as one of the agents that they would use. Isoniazid is used to prophylax
against *mycobacterium* tuberculosis and its selection was likely due simply to product
familiarity and by virtue of its association with HIV patient management.

5.3 **Physician Knowledge: Implications for Patient Care and Resource Needs**

The data presented suggests that, on the whole, G-group physicians represent a more
knowledgeable physician cohort than those in H or R-groups. While this is not unexpected
due to the more experienced nature of this physician population, this trend remained clear
even after adjustment for level of current experience in terms of patient numbers.

We also saw that questions covering domains of care commonly associated with increasingly
advanced disease elicited lower knowledge scores. Presumably this reflects the fact that as
patients experience disease progression, physicians are likely to refer patients to colleagues
with expertise in the management of these HIV-related conditions.

While scores may have been less than optimal, in most cases a wide range of scores was seen
with at least one respondent achieving maximum scores. This indicates that the questions
covered a full range of level of difficulty.

It is worth re-iterating that low mean knowledge scores do not necessarily imply inadequate
or inappropriate care for patients for several reasons. For instance, a large proportion of
respondents in each group indicated that they were unsure of the answers to knowledge based questions. Presumably, a self assessed lack of knowledge is likely to result in the patient receiving appropriate care because physicians will either refer patients to, or gain consultation with, HIV clinical experts. Alternatively, they may utilise other resources to become proficient in the management of HIV disease themselves. Physician’s responses to questions about their approaches to patient care provides some evidence that this is the case. A large proportion of respondents, particularly in groups H and R reported that they would refer HIV patients for HIV related care or consult with HIV experts in the management of HIV positive patients. In addition, a large proportion of respondents in groups H and R reported that they were less than quite willing to provide care beyond HIV test counselling or issues counselling.

Secondly, the majority of patients are being cared for by physicians with high levels of knowledge. Some 79% of all reported currently active patients are receiving care from physicians in G-group, who on average have higher scores than the two remaining groups. Also, among general and family practitioners within each group, the majority (75%) of all current HIV positive patients reported by respondents were being provided care by physicians with comparatively high levels of knowledge.

5.4 MULTIVARIATE ANALYSIS

While other studies have identified associations between physician characteristics and knowledge of HIV patient management, comparisons should proceed with caution. Other studies have utilised different questions to indicate knowledge, applied various survey methods, answer choices and scoring criteria which makes direct comparison untenable.
It appears that level of experience in terms of patient numbers is associated with physician knowledge in groups G and H but not among physicians selected randomly from among the remaining physicians in B.C. Using simple descriptive techniques, it was shown that physicians in G-group had higher scores than those in H-group who, in turn, had higher scores than those in R-group at any given level of current experience. These results suggest that volume of experience in terms of patient number, while certainly of interest, may not be as important as the extent of involvement in patient care. What features occasion this increased involvement are however, unknown. Most studies relating physician knowledge or patient outcome to physician experience have measured experience using patient numbers, either total number of patients ever seen over a defined period or current number of patients. Past studies have indicated that increased hospital experience is related to lower HIV patient mortality [122, 123] and that this pattern holds true in Canada [124]. Several groups have found that physicians with higher levels (with higher levels being defined differently for each study) of HIV-related experience have been found to have fewer attitudinal barriers to care [125, 126, 127] and feel more competent in providing ambulatory care for persons with AIDS [128]. More recently the focus has turned to examining the relationship between the experience of individual physicians and the impact on patient health. One such study found that physicians with greater experience were more likely to recognise and diagnose some HIV-related diseases in standardised patients [129]. Research recently reported by Kitihata et al. showed a definitive increase in patient survival attendant with increasing levels of physician experience [130].
It was also found that younger physicians in all groups had significantly improved scores regarding preventive measures and overall patient management. Other researchers have noted that younger physician age is associated with increased knowledge of HIV transmission and epidemiology [119, 131] and diagnosis of HIV-infection [132]. Theoretically, these findings may be the result of more recent medical training in which HIV-related primary care issues have been incorporated into medical school curricula.

In group-G, physicians with a practice located in Vancouver were more likely to agree with recommendations regarding the prophylaxis of opportunistic infections while those with medical specialty training appear to be more knowledgeable about the treatment of these infections in general. As was previously stated, it is understandable that physicians may not become familiar with recommended strategies until they have encountered the problem in clinical practice. Perhaps physicians in Vancouver are more likely than their non-Vancouver counterparts to see patients with more advanced disease who, consequently, are more likely to require prophylaxis for opportunistic infections. Often, acute occurrences of opportunistic infections require management by specialised physicians. Additionally, we should recall that a substantially greater proportion of G-group respondents, as compared to H and R-group respondents, did not identify their specialty. We have speculated that this may indicate that these physicians consider themselves “unofficial” specialists in HIV management and, as such, are familiar with advanced concepts in patient management. These factors, taken in combination, may explain the superior performance of specialist in the area of opportunistic infection treatment.
Multivariate models of comparable overall management scores show a modest level of consistency between groups with physician age in all groups, lack of specialty in groups H and R, and experience in groups G and H related to increased scores. G-group physicians tend to be somewhat younger, more experienced and less likely to have medical specialty training. How these factors influence membership in Group-G and the inter-relationships between these characteristics and increased knowledge remain a matter for speculation and further study.

5.5 Summary of Results: Meeting Study Objectives

Recall that this study had seven objectives (Chapter 1, Section 3, 1.3.1 to 1.3.7). The following summarises the pertinent study findings in light of these a priori defined objectives:

1. To describe current patterns of knowledge in several areas of therapeutic management of HIV disease among physicians in British Columbia.

The data provides detailed information regarding physicians knowledge of the preferred approaches to the clinical management of HIV positive patients. The data suggests that heterogeneity exists among physicians in their preferred management strategies in terms of the changing spectrum of knowledge from one area of patient care to another and, to a lesser extent for individual knowledge items which allowed a variety of answer choices. Consensus for questions regarding preventive care was generally high while questions regarding more advanced areas of care elicited a greater variety of responses. In areas in which there was consensus, this consensus was more often a self identified lack of knowledge rather than agreement on the specific strategy preferred by physicians. For items measuring knowledge of a specific aspect of care, heterogeneity was most noticeable
for questions regarding the prophylaxis and treatment of opportunistic infections among physicians in Group-G.

2. To describe the awareness and utilisation of resources provided by the Centre and identify areas in which physicians require further information and training.

A large proportion of physicians in all groups indicated an interest in continuing medical education with an emphasis on the expansion of physician toll-free phone lines, lectures and seminars. Awareness and utilisation of existing resources was relatively poor. Among those with an opinion, however, the available resources were deemed useful.

3. To estimate the lower limit of the number of physicians in British Columbia currently caring for HIV positive patients.

It was estimated that of physicians who are not active members of the Centre for Excellence’s Drug Treatment Programme and who are not identifiable through Centre for Disease Control records, approximately 11% are currently providing care to HIV positive patients. In total, at least 1,250 physicians in British Columbia are currently treating HIV positive patients, 900 of those without the benefit of Centre resources. It should be noted however, that the patients to whom they are providing care are not necessarily sufficiently ill to be eligible for entry into the Drug Treatment Programme.

4. To describe the level of concordance with contemporary guidelines in selected areas of patient management; and

5. To compare patterns of knowledge among several pre-defined physician populations or samples.
The results provide evidence that substantial deviations from contemporary guidelines exist. Composite knowledge scores indicate that disagreement with or uncertainty of recommended approaches tends to increase as items address areas of patient care associated with more advanced disease. On the basis of scores comparable between groups, it appears that G-group physicians represent the most knowledgeable physician population. Physicians who had had a patient test positive for HIV since 1989 had intermediate scores of knowledge, while those chosen through probability sampling techniques appear to be least knowledgeable. While G, H and R groups represent physicians with successively diminishing levels of HIV-related experience, substantial differences in scores remain even after adjustment for numbers of active HIV positive patients.

6. To estimate the proportion of patients who are likely to be receiving appropriate care in each area of patient management examined.

It was estimated that some 79% of patients reported by the survey respondents were receiving care from physician in Group-G, the most experienced and highest scoring group of physicians surveyed. Furthermore, 75% of these patients were receiving care from general practitioners and family physicians who had high patient management scores (scores > 65%).

7. To identify associations between the characteristics of physicians and their level of agreement with contemporary guidelines.

It was shown that physician age may play an important role in the level of knowledge held by physicians in all groups as regards the applications of preventive measures and the use
of antiretroviral therapies in early stages of HIV disease. Lack of specialty training in groups H and R and HIV-related experience in groups G and H also appear to be significantly associated with increases in these knowledge scores.

5.6 LIMITATIONS

5.6.i) Causal inference
While it has been shown that significant associations exist between various personal, professional and experiential characteristics and physician knowledge, the causal relationships and intermediary factors linking these variables can not be elucidated in a cross sectional approach as was taken here. It is not possible to say whether knowledge results from increased experience, younger age or other physician characteristics or conversely, whether increased interest in, or knowledge of, HIV patient care results in greater likelihood of providing care to these patients. Other factors which were not examined such as physicians’ attitudes and perceived barriers to care may also play vital and complex intermediary roles. In actuality the relationship between experience and knowledge is likely to be a circular one, with initial acceptance leading to primary HIV patient contact and initial experience, followed by increased knowledge and greater self perceived ability which may lead in turn to increased experience and so on.

5.5.ii) Non-response bias
This survey, as with any survey that does not elicit high response rates has the weakness of non-control over the representativeness of the response. The methods of responder versus non-responder comparison employed indicate that, in general, non-responders are likely, if
anything, to be somewhat less knowledgeable regarding the management of HIV positive patients than responding physicians. The true characteristics of non-responders however, remain unknown. An additional shortcoming is the possible existence of additional confounding variables which may impact physician knowledge and are not equally distributed between respondents and non-respondents. These uncertainties should be given careful consideration when generalising to the respondent’s parent populations.
6.1 RECOMMENDATIONS

Future efforts should consider additional techniques to ameliorate limitations of the present study. Non-response bias could be reduced by enhancing response rate and improved and more extensive non-responder follow-up. The information gathered suggests that this first would best be achieved by reducing survey length. As it would be impossible to gather data on all the aspects covered in the present surveys in a shorter version, a feasible option would be to utilise multiple, smaller random samples from among selected physician populations and apply short theme based surveys which would provide detailed data about a specific area of care. Response rate might also be improved by clarifying to surveyed physicians that their responses are important regardless of their level of experience in HIV patient care and offering an honorarium for survey completion. Confidential identification numbers would allow non-responders to be identified, more aggressively followed and better characterised. Finally, the size of the samples selected at random should be increased as it is difficult to anticipate the number of retired, moved and non-practising physicians which may be included in any selected sample.

Issues of causality are best approached through elucidation of the relationships between physician characteristics and knowledge, and assessing the predictive validity of the models developed. More sophisticated measures of physician experience are needed if the relationship between experience and knowledge is to be investigated more thoroughly. Specifically these
might include identifying the services actually provided by respondents to HIV patients currently and in the past. Meaningful assessments of the quality of care that is being provided requires a more complete picture of what physicians know, what they need to know in their practice and what they actually do. Let us take, for example, knowledge of PCP prophylaxis. In addition to the questions addressed in the present survey, one needs to know whether the respondent has patients eligible for PCP prophylaxis, if patients are referred to expert physicians at this stage of their disease or if the physician in question provides prophylaxis themselves. Patient compliance is a further complication in terms of the care that patients actually receive. Employment of such techniques would also aid in better defining the extent, distribution and quality of the care being provided among physicians in British Columbia and render a more comprehensive profile of this B.C.'s patient population.

6.2 CONCLUSION

The data suggests that the pattern of HIV-related knowledge among physicians is heterogeneous in nature and that deviation from contemporary therapeutic guidelines is not uncommon.

It is the province of those who determine and design medical school curricula to identify the extent of knowledge that should be held by primary care physicians in British Columbia. It seems reasonable however, that primary care physicians should understand that the immunocompromised state experienced by those with HIV disease confers on the patient a set of unique needs in terms of prevention of common infections, routine clinical and laboratory tests as well as consideration of antiretroviral therapy. We appear to be falling
somewhat short of this goal. As advances in HIV therapeutics continue, the possibility of
provider variation in HIV-related morbidity and mortality will assume increasing importance.
Given the current disparities in knowledge of HIV patient care, it is possible that the care that
patients receive might be influenced by the care provider to such an extent that important
patient outcomes, specifically mortality and morbidity may be affected. On a more promising
note, it appears that physicians are aware of their own lack of knowledge and are,
presumably, unlikely to provide care in areas in which they do not feel competent.

While the majority of patients reportedly cared for by the respondents are receiving care from
knowledgeable physicians, the number of physicians currently providing at least some care to
HIV positive patients and who may not be taking advantage of available resources is
substantial. The challenge remains how best to encourage those without training to seek
further education, how to assist physicians in remaining cognisant of updates in HIV patient
management and how to encourage physicians encountering HIV positive patients to utilise
available resources in applying themselves to the challenge of HIV positive patient
management. The application of basic educational techniques, including the distribution and
utilisation of up-to-date, accessible therapeutic guidelines and access to a supportive network
of HIV experienced physicians are needed. These resources may have an important role to
play in encouraging primary care physicians province-wide to recognise that HIV is, to a large
extent, a primary care disease, many aspects of which can be well managed without extensive
training. Recruitment of physicians who are willing to expand their skill sets and open their
practices wider to HIV positive patients will be necessary if we are to reduce the burden
presently shouldered by physicians who represent this province’s core care providers.
We must continue in our efforts to provide the best possible care to persons with HIV while maintaining a socially, clinically and economically tenable balance between, on the one hand, maintaining a sufficiently large population of physicians with expertise in HIV patient care while, on the other, recognising the need to serve an expanding patient population closer to home. The application of such directives will allow patients to maintain continuity in their social support networks and primary medical care relationship as well as fostering continuing contributions in terms of employment and their place in their home communities.
REFERENCES


67) Dr. Julio SG Montaner, Director of Clinical Activities, Centre for Excellence in HIV/AIDS. Personal communication.


124) Dr. Janet Raboud / Dr. Robert Hogg, Canadian Clinical Trials Network and Centre for Excellence in HIV/AIDS. Personal Communication.


APPENDIX 1: Pre-test Suggestion Form
Dear Dr.:

Thank you for taking the time to participate in the pilot testing phase of this survey. As you answer the questions please keep the following concerns in mind.

- The questions are unambiguous
- The directions are unambiguous
- The answers are mutually exclusive (unless otherwise stated)
- The answers are exhaustive within reason
- The survey is well thought out and “user friendly”

It is important that you attempt to complete the survey in a way which reflects your usual approach to responding to questionnaires. Under some circumstances some respondents will be asked to omit questions. You should omit these questions if these circumstances apply to you however, please read these questions so that you can contribute your suggestions concerning these questions.

We have provided nine questions for you to answer regarding the survey itself. The first three questions should be kept in mind and answered as you complete the survey. The remaining questions may be answered after you complete the survey.

We appreciate your help and we are pleased to offer you a $50.00 (Canadian funds) honorarium for providing this service. Please indicate to whom you would like the cheque made payable and the address to which you would like the cheque directed.

Name
Street address
City Province
Postal Code
Signature

Please note the time that you started and finished in the spaces provided so that we can accurately estimate how long it takes to complete the survey.

Start time Finish time

Once again, we thank you for your participation.

Please return the completed survey by March 6th, 1995 to:
Katherine Heath- Care of
The British Columbia Centre for Excellence in HIV/AIDS
608-1081 Burrard St.

Dr. Julio S.G. Montaner, Principal Investigator
Director, Clinical Science, Centre for Excellence in HIV/AIDS
SURVEY SUGGESTION FORM
Please answer question 1 through 3 while you fill out the survey

1) Please circle the number of any questions that you find to be ambiguous or unclear in any way.

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2) Please circle the number of any questions in which the answers are not mutually exclusive or exhaustive.

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3) If you find any of the directions unclear please note the page numbers on which they appeared.

Pages

Explain

Please enter your finish time now!
4) Are there any other important issues that you believe should be covered in the questionnaire (keeping in mind that the survey is limited to 6 pages)?

- Yes  - No

If so, what are they?

_________________________________________________________________

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5) The survey was easy to read.

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<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
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<td>□</td>
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</tr>
</tbody>
</table>

6) The directions were clear.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>□</td>
<td>□</td>
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</tbody>
</table>

7) The survey seemed well thought out and asked reasonable and purposeful questions.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>□</td>
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<td>□</td>
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</tbody>
</table>
8) Are there any changes that could be made to the survey itself which might make it more likely that physicians would respond to the survey?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

9) Please comment on any other ways in which you feel this survey might be improved.

1__________________________________________________________________________

__________________________________________________________________________

2__________________________________________________________________________

__________________________________________________________________________

3__________________________________________________________________________

__________________________________________________________________________

4__________________________________________________________________________
APPENDIX 2: British Columbia HIV/AIDS Care Physician Survey (Survey 1)
The British Columbia Centre for Excellence
in HIV/AIDS: HIV/AIDS Care Survey

HOW TO FILL OUT THE QUESTIONNAIRE

(1) □ This is a check box. Please put a ✓ mark in the box which matches your answer. Please check only one box for each question unless otherwise requested.

(2) The underline is provided for you to write in the requested information. Should you choose an "other" option please specify what this other option is.

PHYSICIAN INFORMATION

1) What is your sex?
   □ Male  □ Female

2) What is your current age?
   □ Under 25 years  □ 45-49 years
   □ 25-29 years  □ 50-54 years
   □ 30-34 years  □ 55-59 years
   □ 35-39 years  □ Over 59 years
   □ 40-44 years

3) What are the first three digits of the postal code of your workplace?
   First three digits: _ _ _

4) Do you have any medical specialty training? Please choose all that apply.
   □ No
   □ Yes (Please specify) ——>
   □ Internal Medicine
   □ Surgery
   □ CCFP (residency or practice certified)
   □ Infectious Diseases
   □ Other __________________________
5) How would you describe the nature and setting of your current work? Please choose all that apply.

- [ ] Primary Care
- [ ] Consulting
- [ ] Research
- [ ] In training
- [ ] Not currently practicing
- [ ] Private/group practice
- [ ] Sessional/clinic work/locums
- [ ] Hospital based
- [ ] Other ____________________

6) Are you directly responsible for patient care?

- [ ] Yes
- [ ] Not currently but **intend to be** within the next 3 years
- [ ] Not currently and **do not intend to be** within the next 3 years
  (please skip to question 11)

7) **In general**, if a patient under your care (regardless of your practice type) was to test positive for HIV or reveal their HIV positive status to you, which course would you be most likely to follow? Please utilize the "other" option to make qualifying statements if necessary.

- [ ] Immediate referral of the patient to a more experienced physician for all future care.
- [ ] Retain the patient under your care but refer the patient to a more experienced physician for treatment of HIV and AIDS related illnesses.
- [ ] Undertake total management of the patient through consultation with experts and/or review of pertinent literature.
- [ ] Would depend on the patient's symptoms and stage of disease.
- [ ] Would depend on the strength and duration of my relationship with the patient.
- [ ] Other (describe) ____________________
8) Given your **current knowledge and available resources**, to what extent do you feel that you would be **able** to provide care/treatment for HIV positive patients in the following areas.

<table>
<thead>
<tr>
<th>Area</th>
<th>Very Able</th>
<th>Quite Able</th>
<th>Somewhat Able</th>
<th>Not very Able</th>
<th>Not Able</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV test counseling</td>
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<tr>
<td>HIV issues counseling</td>
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<tr>
<td>Vaccinations</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Antiretroviral therapies for <strong>asymptomatic</strong> patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antiretroviral therapies for <strong>symptomatic</strong> patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prophylaxis for opportunistic infections</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Treatment of opportunistic infections</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9) Given your **current knowledge and available resources** to what extent would you be **willing** to treat/care for HIV positive patients in these areas.

<table>
<thead>
<tr>
<th>Area</th>
<th>Very Willing</th>
<th>Quite Willing</th>
<th>Somewhat Willing</th>
<th>Not very Willing</th>
<th>Not Willing</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV test counseling</td>
<td></td>
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<tr>
<td>HIV issues counseling</td>
<td></td>
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<tr>
<td>Vaccinations</td>
<td></td>
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<tr>
<td>Antiretroviral therapies for <strong>asymptomatic</strong> patients</td>
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<tr>
<td>Antiretroviral therapies for <strong>symptomatic</strong> patients</td>
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<tr>
<td>Prophylaxis for opportunistic infections</td>
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<tr>
<td>Treatment of opportunistic infections</td>
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</tr>
</tbody>
</table>
10) Would you be more willing to provide services to HIV positive patients if more resources were available to you or existing resources were improved?

☐ Not applicable, I am very willing to provide all services to HIV patients.
☐ Yes
☐ No

HIV / AIDS PATIENT INFORMATION

11) Have you ever been responsible for the clinical management or a particular aspect of clinical management of an HIV positive patient?

☐ No (Skip to question 15)
☐ Yes »—» To what extent in general have you been involved in the management of your HIV positive patient(s)? Choose all that apply.

☐ Management of all / most aspects of patient care related to HIV.
☐ Management of just some aspect(s) of HIV related conditions.
☐ Management of patient care except HIV and related conditions.
☐ Management of HIV and related conditions almost exclusively.
☐ Other ___________________________
12) How many HIV positive patients in total, have you provided care to since you began practicing medicine?

Approximate total number

13) How many HIV+ patients in each of the following groups are you CURRENTLY providing care to?

_____ Men 18 years and older;

_____ Women 18 years and older

_____ Children aged 6 to 17 years;

_____ Children aged 0 to 5 years

14) For how many years have you been seeing HIV/AIDS patients?

☐ Less than 1 year ☐ 5 to 9 years

☐ 1 or 2 years ☐ More than 9 years

☐ 3 or 4 years ☐ Do not recall
The following questions concern the treatment of adult HIV patients. We understand that you may not have had occasion to treat the conditions discussed. If you have not had experience in the area covered by a particular question(s) please answer the question(s) in terms of what you would do or believe to be the best choice. Please answer all of the questions.

Questions 15 through 18 concern some tests and preventive therapies.

15) In general, do you / would you re-test patients for HIV antibodies after their first positive test?

☐ No
☐ Yes
☐ Yes, if the patient requests.
☐ Yes, if the patient is at low risk of infection.
☐ Unsure/Do not recall

If you answered "yes" for any reason please indicate how many times on average you would re-test the patient assuming all test results are positive.

☐ Once ☐ 2 times ☐ 3 times ☐ 4 times ☐ 5 or more times

16.a) In general, when considering treatment for any one individual HIV/AIDS patient, should the following vaccinations be used?

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>No</th>
<th>Do not know</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza vaccine</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Haemophillus influenza type B vaccine</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Hepatitis B vaccine</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Pneumococcal vaccine</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Tetanus toxoid</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Oral polio vaccine</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
16.b) For all vaccinations that should be used, please indicate how often each should be given to any individual patient.

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>Once only</th>
<th>Yearly</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza vaccine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenza type B vaccine</td>
<td></td>
<td></td>
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<tr>
<td>Hepatitis B vaccine</td>
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<tr>
<td>Pneumococcal vaccine</td>
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<tr>
<td>Tetanus toxoid</td>
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<td></td>
<td></td>
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<tr>
<td>Oral polio vaccine</td>
<td></td>
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</tbody>
</table>

17.a) In general, when considering treatment for any one individual HIV/AIDS patient should the following tests be performed?

<table>
<thead>
<tr>
<th>Test</th>
<th>No</th>
<th>Do not know</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4 counts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P24 Antigen</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Immune Complex</td>
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<td></td>
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<tr>
<td>Dissociated P24 Antigen</td>
<td></td>
<td></td>
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<tr>
<td>f2 Microglobulin</td>
<td></td>
<td></td>
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<tr>
<td>Gynecological exam for female patients</td>
<td></td>
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<tr>
<td>TB skin test (PPD)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Syphilis serology</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
17.b) For all tests that **should** be performed please indicate how often each should be performed for any individual patient.

<table>
<thead>
<tr>
<th></th>
<th>Yearly</th>
<th>2X's yearly</th>
<th>4X's yearly</th>
<th>Depends on patient's condition/prior results</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4 counts</td>
<td></td>
<td></td>
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<tr>
<td>P24 Antigen</td>
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<td>Immune Complex</td>
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<td>Dissociated P24 Antigen</td>
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<tr>
<td>β2 Microglobulin</td>
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<tr>
<td>Gynaecological exam for female patients</td>
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<tr>
<td>TB skin test (PPD)</td>
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<tr>
<td>Syphilis serology</td>
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</tbody>
</table>

18) In general, how would you rate the usefulness of the following vaccinations, tests, or therapies in caring for HIV/AIDS patients?

<table>
<thead>
<tr>
<th>Vaccination/Testing</th>
<th>Very useful</th>
<th>Somewhat useful</th>
<th>Not useful</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza vaccine</td>
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<tr>
<td>Haemophilus influenza type B vaccine</td>
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<tr>
<td>Pneumococcal vaccine</td>
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<tr>
<td>Tetanus toxoid</td>
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<tr>
<td>Oral polio vaccine</td>
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</tr>
<tr>
<td>PCP prophylaxis</td>
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<tr>
<td>MAI prophylaxis</td>
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<tr>
<td>CD4 counts</td>
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<tr>
<td>P24 Antigen</td>
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<tr>
<td>Immune Complex</td>
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<tr>
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<tr>
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<tr>
<td>Syphilis serology</td>
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</tbody>
</table>
The British Columbia Centre for Excellence in HIV/AIDS: HIV/AIDS Care Survey

Questions 19-23 concern antiretroviral therapy. If you have had no occasion to use these therapies please answer the questions in terms of what you believe to be the approach you would take.

If you are unsure, indicate this by checking the box provided.

19) My preferred initial treatment of asymptomatic HIV infection in a patient with 200 to 500 CD4 cells/mm$^3$ is / would be:

- No therapy until CD4 count is < 200 cells/mm$^3$
- AZT alone
- ddI alone
- AZT plus ddI
- ddC alone
- AZT plus ddC
- Other (specify) ____________________________
- Unsure/Do not know

20) My preferred treatment of symptomatic HIV infection in a patient who is otherwise clinically stable, has received AZT for more than one year and whose cell count has dropped from 350 to 175 cells/mm$^3$ is / would be:

- Continue AZT alone
- Switch to ddI alone
- Switch to AZT plus ddI
- Switch to ddC alone
- Switch to AZT plus ddC
- Switch to ddI plus ddC
- Other (specify) ____________________________
- Unsure/Do not know
21) My preferred antiretroviral treatment for a symptomatic AIDS patient who has received AZT for one year and who has recently developed a new AIDS defining opportunistic infection is / would be:

- Continue AZT alone
- Switch to ddI alone
- Switch to AZT plus ddI
- Switch to ddC alone
- Switch to AZT plus ddC
- Switch to ddI plus ddC
- Other (specify) ________________
- Unsure/Do not know

22) Would you consider enrolment of a patient in a clinical trial of combination antiretroviral therapy to be a treatment option for symptomatic patients?

- Yes
- No
- Unsure/Do not know

23) Currently, for patients with advanced HIV how often do you use (believe you would use) combination antiretroviral therapy?

- Always
- Usually
- Sometimes
- Rarely
- Never
- Do not know

24) If you have ever prescribed combination antiretroviral therapy when did you first prescribe it? Please fill in both the month and year. If you do not recall the month please report the year only.

Month _____ Year ____________

- Never prescribed
Questions 25 - 35 concern prophylaxis for opportunistic infections. While you may have had little or no experience your responses are important. Please answer the question in terms of what choice you would make or your preferred approach.

25) My first choice for **primary** prophylaxis for *Pneumocystis carinii* Pneumonia (PCP) is / would be:

- [ ] Trimethoprim sulfamethoxazole (Bactrim, Septra)
- [ ] Aerosol pentamidine
- [ ] Dapsone
- [ ] Clindamycin/Primaquine
- [ ] Other (specify) ___________________________________________________________________
- [ ] No prophylaxis
- [ ] Unsure/Do not know

26) My second choice for **primary** prophylaxis for PCP is / would be:

- [ ] Trimethoprim sulfamethoxazole (Bactrim, Septra)
- [ ] Aerosol pentamidine
- [ ] Dapsone
- [ ] Clindamycin/Primaquine
- [ ] Other (specify) ___________________________________________________________________
- [ ] No prophylaxis
- [ ] Unsure/Do not know

27) My first choice for **secondary** prophylaxis for PCP is / would be:

- [ ] Trimethoprim sulfamethoxazole (Bactrim, Septra)
- [ ] Aerosol pentamidine
- [ ] Dapsone
- [ ] Clindamycin/Primaquine
- [ ] Other (specify) ___________________________________________________________________
- [ ] No secondary prophylaxis
- [ ] Unsure/Do not know
28) My second choice for secondary prophylaxis for PCP is / would be:

- Trimethoprim sulfamethoxazole (Bactrim, Septra)
- Aerosol pentamidine
- Dapsone
- Clindamycin/Primaquine
- Other (specify) ____________________________
- No secondary prophylaxis
- Unsure/Do not know

29) My preferred approach to primary prophylaxis for toxoplasmosis is / would be:

- No prophylaxis (Skip to question 31)
- Use in patients with positive toxo titre and CD4 count of: (please select one answer from among those below).
  - ≤500 cells/mm³
  - <200 cells/mm³
  - ≤100 cells/mm³
  - <50 cells/mm³
  - All CD4 counts
  - Unsure/Do not know
- Other (specify) ____________________________
- Unsure/Do not know

30) When considering the use of primary prophylaxis for toxoplasmosis I prefer / would prefer to use:

- Trimethoprim sulfamethoxazole
- Pyrimethamine/Clindamycin
- Dapsone/Pyrimethamine
- Pyrimethamine/Sulfadiazine
- Pyrimethamine alone
- Sulfadiazine alone
- Other (specify) ____________________________
- Unsure/Do not know
31) When considering the use of secondary prophylaxis for toxoplasmosis I prefer / would prefer to use:

- Trimethoprim sulfamethoxazole
- Pyrimethamine/Clindamycin
- Dapsone/Pyrimethamine
- Pyrimethamine/Sulfadiazine
- Pyrimethamine alone
- Sulfadiazine alone
- Other (specify) ______
- No secondary prophylaxis
- Unsure/Do not know

32) My preferred approach to primary prophylaxis for cryptococcal meningitis is / would be:

- No prophylaxis
- Fluconazole when CD4 count is:
  - ≤500 cells/mm³
  - ≤200 cells/mm³
- Ketoconazole when CD4 count is:
  - ≤500 cells/mm³
  - ≤200 cells/mm³
  - All CD4 counts
- Other (specify) ____________________________
- Unsure/Do not know

33) My preferred approach to primary prophylaxis for cytomegalovirus (CMV) is / would be:

- No prophylaxis
- Foscarnet regardless of CD4 count
- Ganciclovir regardless of CD4 count
- Acyclovir regardless of CD4 count
- Other (specify) ____________________________
- Unsure/Do not know
34) My preferred approach to prophylaxis for *Mycobacterium avium-intracellulare* (MAI) is / would be:

- No prophylaxis (Skip to question 36)
- Use prophylaxis when CD4 count is:
  - ≤500 cells/mm$^3$
  - ≤200 cells/mm$^3$
  - ≤100 cells/mm$^3$
  - ≤50 cells/mm$^3$
  - All CD4 counts
  - Unsure/Do not know

- Other (specify) ____________________________
- Unsure/Do not know

35) When I use prophylaxis for MAI I prefer / would prefer:

- Clarithromycin
- Rifabutin
- Clofazimine
- Azithromycin
- Combination of 2 or more drugs
- Other (specify) ____________________________
- Unsure/Do not know

Questions 36-42 concern the use of some acute therapies.

36) My preferred treatment for PCP in patients with no known allergies who are ambulatory or who are hospitalized with mild to moderate PCP is / would be:

- Atovaquone
- Pentamidine isethionate
- Dapsone/Trimethoprim
- Trimethoprim sulfamethoxazole
- Clindamycin/Primaquine
- Aerosol pentamidine
- Other (specify) ____________________________
- Unsure/Do not know
37) My preferred treatment for PCP in patients with severe PCP or patients who cannot tolerate oral medications is / would be:

- Atovaquone
- Pentamidine isethionate
- Dapsone/Trimethoprim
- Trimethoprim sulfamethoxazole
- Clindamycin/Primaquine
- Aerosol pentamidine
- Other (specify) _____
- Unsure/Do not know

38) My preferred treatment for newly diagnosed toxoplasmosis in a patient with no known allergies is / would be:

- Pyrimethamine
- Pyrimethamine/ Sulfadiazine
- Pyrimethamine/ Clindamycin
- Azithromycin
- Pyrimethamine/ Azithromycin
- Atovaquone
- Other (specify) _______________________
- Unsure/Do not know

39) My preferred initial treatment for patients with newly diagnosed cryptococcal meningitis is / would be:

- Fluconazole
- Amphotericin B
- Amphotericin B/Fluconazole
- Amphotericin B/5-flucytosine
- Fluconazole/5-flucytosine
- Other (specify) _______________________
- Unsure/Do not know
40) My preferred treatment for newly diagnosed CMV retinitis in a patient with an absolute neutrophil count greater than 1000 is / would be:

- Ganciclovir
- Foscarnet
- Ganciclovir plus Foscarnet
- Acyclovir
- Other (specify) ______________
- Unsure/Do not know

41) My preferred treatment approach for newly diagnosed MAI is / would be:

- Combination therapy
- Monotherapy
- Other (specify) ______________
- Unsure/Do not know

42) When treating newly diagnosed MAI I would prefer to use the following drug or combination of drugs. Please choose one answer if you prefer to use monotherapy and all that apply if you prefer to use combination therapy.

- Clarithromycin
- Rifampin
- Cycloserine
- Ciprofloxacin
- Azithromycin
- Ethambutol
- Rifabutin
- Clofazimine
- Amikacin
- Isoniazid
- Other (specify) _____
- Unsure/Do not know
The British Columbia Centre for Excellence in HIV/AIDS: HIV/AIDS Care Survey

Just a few more important questions.

43) We would like to design a Continuing Medical Education Program to meet your needs. Please indicate how likely you would be to participate in each of the education options listed below. Each would be made available in your area with the exception of in-house training provided on site at St. Paul’s Hospital in Vancouver.

1) In-house primary care training. One week with all expenses to be born by the Centre.
   - Definitely
   - Probably
   - Perhaps
   - Probably Not
   - Definitely Not

2) In-house specialty training with an emphasis on aspects pertaining to the specialty of interest. Variable in length with all expenses to be born by the Centre.
   - Definitely
   - Probably
   - Perhaps
   - Probably Not
   - Definitely Not

3) One day seminar regarding initial workup for new HIV patients.
   - Definitely
   - Probably
   - Perhaps
   - Probably Not
   - Definitely Not

4) Formal lectures by visiting experts.
   - Definitely
   - Probably
   - Perhaps
   - Probably Not
   - Definitely Not

5) Informal lectures followed by discussion with visiting experts.
   - Definitely
   - Probably
   - Perhaps
   - Probably Not
   - Definitely Not

6) Weekly/monthly discussion groups based on distributed written materials.
   - Definitely
   - Probably
   - Perhaps
   - Probably Not
   - Definitely Not

7) Weekly/monthly discussion groups based on case studies.
   - Definitely
   - Probably
   - Perhaps
   - Probably Not
   - Definitely Not

8) One on one mentorship program.
   - Definitely
   - Probably
   - Perhaps
   - Probably Not
   - Definitely Not
The British Columbia Centre for Excellence in HIV/AIDS: HIV/AIDS Care Survey

9) Information via Internet or other computer networks.

☐ Definitely  ☐ Probably  ☐ Perhaps  ☐ Probably Not  ☐ Definitely Not

10) Expansion of a toll-free, 24 hour HIV/AIDS physician help line

☐ Definitely  ☐ Probably  ☐ Perhaps  ☐ Probably Not  ☐ Definitely Not

Please describe any other options that you would like to have provided as part of the Continuing Medical Education Program in HIV/AIDS.

44) Are you aware of the existence of the following resources available through the Centre for Excellence in HIV/AIDS?

Yes  ☐ No

☐ Therapeutic Guidelines for the Treatment of HIV/AIDS and Related Conditions

☐ The toll free HIV/AIDS physician help line

☐ The "Forecast" quarterly newsletter

If you are unaware of both the guidelines and the toll free help line please omit all remaining questions.

Once again we thank you for your time.

45) Do you have a copy of the Therapeutic Guidelines to which you can refer?

☐ Yes  ☐ No

46) Prior to completing this survey had you read a copy of the Therapeutic Guidelines?

☐ Yes  ☐ No
If you have never had an HIV positive patient please omit all remaining questions

47) How frequently do you currently use the Therapeutic Guidelines in the treatment of HIV/AIDS patients in your care?

Always    Usually    Sometimes    Seldom    Never
☐          ☐          ☐          ☐         ☐

48) If you have used the Therapeutic Guidelines how useful have you found them? (If you have not used the guidelines please indicate this by checking the “never used” option).

Very useful    Quite useful    Somewhat useful    Not very useful    Not at all useful    Never used
☒          ☐          ☐          ☐         ☐         ☐

49) Please indicate to what extent in general, you agree with the recommendations made in the Therapeutic Guidelines for each of the following areas of patient management.

<table>
<thead>
<tr>
<th></th>
<th>Always</th>
<th>Often</th>
<th>Sometimes</th>
<th>Seldom</th>
<th>Never</th>
<th>Unsure/ Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antiretroviral therapy</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td></td>
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<tr>
<td>Prophylaxis for</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
<td></td>
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<tr>
<td>opportunistic infections</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Acute therapies for</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>opportunistic infections</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
</tbody>
</table>

Please comment on how we can make the Therapeutic Guidelines more useful to you.
If you have heard of the toll free line please answer the remaining questions.

50) In general, how frequently do you use the toll free line in the treatment of your HIV/AIDS patients?

- Often
- Sometimes
- Seldom
- Never

51) If you have used the toll free help line how useful have you found it? (If you have not used the help line please indicate this by checking the “never used” option)

- Very useful
- Quite useful
- Somewhat useful
- Not very useful
- Not at all useful
- Never used

Please comment on how we can make the toll free help line more useful to you.

__________________________________________________________________________

Thank you very much for taking the time to answer these questions. Please fold the questionnaire, place it in the enclosed self-addressed, postage paid envelope and put it in the mail.
APPENDIX 3: British Columbia HIV/AIDS Care Physician Survey (Survey 2)
HOW TO FILL OUT THE QUESTIONNAIRE

(1) □ This is a check box. Please put a ✓ mark in the box which matches your answer. Please check only one box for each question unless otherwise requested.

(2) The underline is provided for you to write in the requested information. Should you choose an "other" option please specify what this other option is.

PHYSICIAN INFORMATION

1) What is your sex?
   □ Male  □ Female

2) What is your current age?
   □ Under 25 years  □ 35-39 years  □ 50-54 years
   □ 25-29 years  □ 40-44 years  □ 55-59 years
   □ 30-34 years  □ 45-49 years  □ Over 59 years

3) What are the first three digits of the postal code of your work place?
   First three digits: __________  __________  __________

4) Do you have any medical specialty training? Please choose all that apply.
   □ No
   □ Yes (Please specify)___________________________

5) How would you describe the nature and setting of your current work? Please choose all that apply.
   □ Primary Care  □ Private/group practice
   □ Consulting  □ Sessional/clinic work/locums
   □ Research  □ Hospital based
   □ In training  □ Other ______________________
   □ Not currently practicing
The British Columbia Centre for Excellence in HIV/AIDS: HIV/AIDS Care Survey

6) Are you directly responsible for patient care?

☐ Yes
☐ Not currently but intend to be within the next 3 years
☐ Not currently and do not intend to be within the next 3 years
(please omit all remaining questions)

7) Have you ever been responsible for the clinical management or a particular aspect of clinical management of an HIV positive patient?

☐ No (Skip to question 10)
☐ Yes »—» To what extent in general have you been involved in the management of your HIV positive patient(s)? Choose all that apply.

☐ Management of all / most aspects of patient care related to HIV.
☐ Management of just some aspect(s) of HIV related conditions.
☐ Management of patient care except HIV and related conditions.
☐ Management of HIV and related conditions almost exclusively.
☐ Other ____________________
HIV / AIDS PATIENT INFORMATION

8) How many HIV positive patients in total, have you provided care to since you began practicing medicine?

   Approximate total number __________________

9) How many HPV+ patients in each of the following groups are you CURRENTLY providing care to?

   _____ Men 18 years and older;   _____ Women 18 years and older
   _____ Children aged 6 to 17 years;   _____ Children aged 0 to 5 years

10) In general, if a patient under your care (regardless of your practice type) was to test positive for HIV or reveal their HIV positive status to you, which course would you be most likely to follow? Please utilize the "other" option to make qualifying statements if necessary.

   □ Immediate referral of the patient to a more experienced physician for all future care.

   □ Retain the patient under your care but refer the patient to a more experienced physician for treatment of HIV and AIDS related illnesses.

   □ Undertake total management of the patient through consultation with experts and/or review of pertinent literature.

   □ Would depend on the patient's symptoms and stage of disease.

   □ Would depend on the strength and duration of my relationship with the patient.

   □ Other (describe) ____________________________
The British Columbia Centre for Excellence in HIV/AIDS: HIV/AIDS Care Survey

**PHYSICIAN RESOURCES**

11) Given your **current knowledge and available resources**, to what extent do you feel that you would be **able** to provide care/treatment for HIV positive patients in the following areas.

<table>
<thead>
<tr>
<th>Area</th>
<th>Very Able</th>
<th>Quite Able</th>
<th>Somewhat Able</th>
<th>Not very Able</th>
<th>Not Able</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV test counseling</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>HIV issues counseling</td>
<td></td>
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<tr>
<td>Vaccinations</td>
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<tr>
<td>Antiretroviral therapies for <strong>asymptomatic</strong> patients</td>
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<tr>
<td>Antiretroviral therapies for <strong>symptomatic</strong> patients</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Prophylaxis for opportunistic infections</td>
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<td></td>
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<tr>
<td>Treatment of opportunistic infections</td>
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</tr>
</tbody>
</table>

12) Given your **current knowledge and available resources** to what extent would you be **willing** to treat/care for HIV positive patients in these areas.

<table>
<thead>
<tr>
<th>Area</th>
<th>Very Willing</th>
<th>Quite Willing</th>
<th>Somewhat Willing</th>
<th>Not very Willing</th>
<th>Not Willing</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV test counseling</td>
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<td>HIV issues counseling</td>
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<tr>
<td>Vaccinations</td>
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<tr>
<td>Antiretroviral therapies for <strong>asymptomatic</strong> patients</td>
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<tr>
<td>Antiretroviral therapies for <strong>symptomatic</strong> patients</td>
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<tr>
<td>Prophylaxis for opportunistic infections</td>
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<tr>
<td>Treatment of opportunistic infections</td>
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</tr>
</tbody>
</table>
13) Would you be more willing to provide services to HIV positive patients if more resources were available to you or existing resources were improved?

☐ Not applicable, I am very willing to provide all services to HIV patients.
☐ Yes
☐ No

14) We would like to design a Continuing Medical Education Program to meet the needs of all physicians. Would you use the education resources listed below if each were made available in your area, (with the exception of in-house training provided at St. Paul's Hospital, Vancouver)?

1) One week in-house primary care training (expenses paid).
2) Variable length in-house specialty training (expenses paid).
3) One day seminar regarding initial workup for new HIV patients.
4) Formal lectures by visiting experts.
5) Informal lectures followed by discussion with visiting experts.
6) Weekly/monthly discussion groups based on written materials.
7) Weekly/monthly discussion groups based on case studies.
8) One on one mentorship program.
9) Information via Internet or other computer networks.
10) Expanded toll-free, 24 hour HIV/AIDS physician help line.

Yes
No
Maybe

Please describe any other education resources that you believe should be made available.
15) Are you aware of the existence of the following resources available through the Centre for Excellence in HIV/AIDS?  

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
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</tbody>
</table>

**"Therapeutic Guidelines for the Treatment of HIV/AIDS and Related Conditions"**

**The toll free HIV/AIDS physician help line**

**The "Forecast" quarterly newsletter**

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**HIV / AIDS CARE INFORMATION**

16) In general, do you / would you **re-test** patients for HIV antibodies after their first **positive** test?  

|☐ No|☐ Yes|
|☐ Yes, if the patient requests.|☐ Yes, if the patient is at low risk of infection.|
|☐ Unsure/Do not recall|  |

If you answered "yes" for any reason please indicate how many times on average you would **re-test** the patient assuming all test results are positive.  

|☐ Once|☐ 2 times|☐ 3 times|☐ 4 times|☐ 5 or more times|
17) **In general,** when considering treatment for any one individual HIV/AIDS patient, should the following vaccinations be used?

<table>
<thead>
<tr>
<th>Vaccination</th>
<th>No</th>
<th>Do not know</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza vaccine</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenza type B vaccine</td>
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<tr>
<td>Hepatitis B vaccine</td>
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<td></td>
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<tr>
<td>Pneumococcal vaccine</td>
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<td></td>
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<tr>
<td>Tetanus toxoid</td>
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<td></td>
<td></td>
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<tr>
<td>Oral polio vaccine</td>
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</tbody>
</table>

18) **In general,** when considering treatment for any one individual HIV/AIDS patient should the following tests be performed?

<table>
<thead>
<tr>
<th>Test</th>
<th>No</th>
<th>Do not know</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4 counts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P24 Antigen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immune Complex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissociated P24 Antigen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>82 Microglobulin</td>
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<td></td>
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<tr>
<td>Gynecological exam for female patients</td>
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<td></td>
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<tr>
<td>TB skin test (PPD)</td>
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<td></td>
<td></td>
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<tr>
<td>Syphilis serology</td>
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<td></td>
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</tr>
</tbody>
</table>
19) My preferred initial treatment of asymptomatic HIV infection in a patient with 200 to 500 CD4 cells/mm$^3$ is / would be:

- No therapy until CD4 count is < 200 cells/mm$^3$
- AZT alone
- ddl alone
- AZT plus ddl
- ddC alone
- AZT plus ddC
- Other (specify) __________________________
- Unsure/Do not know

20) My preferred treatment of symptomatic HIV infection in a patient who is otherwise clinically stable, has received AZT for more than one year and whose cell count has dropped from 350 to 175 cells/mm$^3$ is / would be:

- Continue AZT alone
- Switch to ddl alone
- Switch to AZT plus ddl
- Switch to ddC alone
- Switch to AZT plus ddC
- Switch to ddl plus ddC
- Other (specify) __________________________
- Unsure/Do not know

Thank you very much for taking the time to answer these questions, your participation is appreciated.
APPENDIX 4: Non response follow-up mini survey
1 Your sex is:  M  F  
2 What is your age?  Years

3 The first 3 digits of your work postal code are:  

4 From the list below select the answer that BEST DESCRIBES why you did not respond to the survey. If two options are EQUALLY valid please mark both answers.

☐ I was concerned that my responses would not be confidential.
☐ I have not recently/ever provided care to an HIV positive patient.
☐ I am not responsible for patient care (retired, academic, management, on leave, etc.).
☐ I do not know very much about the management of HIV disease.
☐ I found that the questionnaire was too long/time consuming to answer.
☐ Due to the nature of my practice or specialty it is unlikely that I will ever provide care to HIV positive patients.
☐ Other (Specify)  

5 Would you be willing to complete the original survey in the future if we could offer you a $30.00 honorarium?  ☐ No  ☐ Yes

6 Have you ever provided care to an HIV positive patient?  ☐ No  ☐ Yes

7 Are you CURRENTLY providing care to any HIV positive patients?

☐ No  ☐ Yes  

Approximately how many HIV positive patients are you currently providing care to?

Approximately  patients

THANK YOU VERY MUCH