

THE UNIVERSITY OF CALGARY

**Atrial Fibrillation and Stroke Prevention:
Physicians' Beliefs and Perceptions of Probable Outcomes**

by

Joyce C. Kellen

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF SCIENCE

DEPARTMENT OF COMMUNITY HEALTH SCIENCES

CALGARY, ALBERTA

March, 1996

©Joyce C. KELLEN 1996

THE UNIVERSITY OF CALGARY
FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "**Atrial Fibrillation and Stroke Prevention: Physicians' Beliefs and Perceptions of Probable Outcomes**" submitted by Joyce C. Kellen in partial fulfilment of the requirements for the degree of Master of Science.

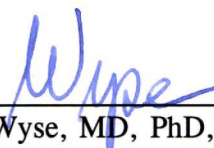


Supervisor, M. L. Russell, Associate Professor
Department of Community Health Sciences



K. L. MacCannell, MD, PhD, Professor
Departments of Medicine and Pharmacology and
Therapeutics

A. R. Vollman, BScN, MA, PhD, Assistant Professor
Faculty of Nursing
Department of Community Health Sciences (Adjunct)



D. G. Wyse, MD, PhD, Professor
Departments of Medicine and Pharmacology and
Therapeutics

Date: March 12, 1996

Abstract

The decision on whether or not to use antithrombotic therapy for stroke prevention varies between physicians. Little is known about physicians' beliefs and perceptions of probable outcomes of prescribing antithrombotic therapy to people more than 80 years of age. The primary purpose of this study was to determine if the choice of antithrombotic drug therapy for stroke prevention for elderly patients with atrial fibrillation differs by physician specialty. In addition, factors that may influence the physicians' choices of antithrombotic therapy in elderly patients with atrial fibrillation (gender of the patient, geographic location of the medical practice, and number of patients with atrial fibrillation currently being managed) were also examined.

The study was a cross-sectional survey of physicians licensed and practising medicine in Southern Alberta. Data were collected using a self-administered questionnaire. A random sample of 193 general practitioners, all cardiologists, and all internists with no identified subspecialty were selected from the 1115 physicians practising in Southern Alberta. Overall, 71% of the physicians (89% of the cardiologists, 71% of the internists and 66% of the general practitioners) responded.

There were differences in physicians' choices of antithrombotic therapy for elderly patients with atrial fibrillation. Warfarin was reported as the most frequently chosen antithrombotic therapy; however, a smaller proportion of physicians actually chose warfarin when provided with a case scenario of an elderly patient with atrial fibrillation. Beliefs and perceptions of probable outcomes differed by medical specialty and by the gender of the patient. Generalists reported more beliefs about potential risks when choosing warfarin than did specialists. Both generalists and specialists felt that prescribing warfarin to an elderly

patient with atrial fibrillation may require medication adjustments. Generalists who chose ASA, regardless of the gender of the elderly patient with atrial fibrillation, felt the patient may have a stroke.

A larger proportion of physicians who managed patients from rural settings reported choosing warfarin for the elderly male patient than for the elderly female patient. Regardless of how many patients with atrial fibrillation the physicians managed in their practice, a smaller proportion of physicians chose warfarin as antithrombotic therapy for the elderly female patient than for the elderly male patient. This preference was particularly marked for physicians who responded to the survey and were not managing patients with atrial fibrillation in their medical practice at the time of the survey.

The drug-choice model provided a framework for describing the physician-patient interaction. This model was useful in describing antithrombotic prescribing practices.

Acknowledgements

There are a number of people I would like to thank sincerely for assisting me in completing my thesis. First, there are the members of my thesis committee: thesis supervisor, Dr. Margaret Russell, and committee members Dr. Ardene Vollman and Dr. George Wyse. Dr. Russell's guidance and support were invaluable to me during all aspects of this study. Dr. Vollman graciously offered me constructive input, encouragement, and enthusiasm as I proceeded with the study. Dr. Wyse's expertise in Electrophysiology, Pharmacology, and Cardiology allowed me to view various aspects of my study from another perspective. The input that each of my thesis committee members shared with me was invaluable.

Jocelyn Lockyer and Victor Lee from the University of Calgary, Department of Continuing Medical Education assisted me with obtaining the random sample of subjects, generating the mailing labels and return of the questionnaires, for which I am grateful.

I would like to thank the physicians who generously participated. Without them this study would not have been possible.

I am also thankful to my husband for his patience, my family (especially my sister Carol Bell who patiently assisted me with editing and revising the tables within this thesis), friends and colleagues who gave me unyielding support and inspiration to proceed.

During my personal life and career, numerous individuals have positively influenced me, and I thank them all.

Finally, I must acknowledge and thank The Centre for Advancement of Health for their financial assistance.*

* The Centre for Advancement of Health is not necessarily supportive of any of the ideas or findings of this study.

Dedication

To my dear husband, Ron, for his patience, support and constructive suggestions, and the time he unselfishly gave me throughout the program. I could not have done it without him.

Table of Contents

Approval Page	ii
Abstract	iii
Acknowledgements	v
Dedication	vi
Table of Contents	vii
List of Figures	x
List of Tables	xi
Appendices	xiv
 Chapter I. Introduction	 1
Purpose	2
Objectives	2
Significance of the Study	3
 Chapter II: Literature Review	 4
Epidemiology of Stroke	4
Morbidity and Mortality	4
Risk Factors for Stroke in Association with Atrial Fibrillation	5
Contemporary Knowledge about Antithrombotic Therapy	8
Studies of Physician Attitudes Towards Oral Anticoagulation	10
Cross-Sectional Physician Practice Surveys	10
Case-Series	15
Conceptual Framework	19
Summary of Literature Review	22
 Chapter III. Methods	 24
Sample	24
The Instrument	26
Pre-Test	30

Measurement	30
Beliefs and Perceptions of Probability About Antithrombotic Therapy	30
Research Questions	31
Data Collection	31
Data Handling	34
Data Analysis	35
Ethical Considerations	37
Chapter IV. Results	38
Ineligible Subjects, Refusals and Response Rates	38
Characteristics of Non-Respondents	40
Characteristics of Eligible Respondents	42
General Management of Atrial Fibrillation	44
Drug Choice for a Hypothetical Elderly Female Patient	47
Drug Choice for a Hypothetical Elderly Male Patient	49
Stroke Prevention for an Elderly Female Patient	51
Beliefs about Warfarin and ASA for an Elderly Female Patient	51
Perceptions of Probable Outcomes of Prescribing Warfarin and ASA for an Elderly Female Patient	53
Stroke Prevention for an Elderly Male Patient	55
Beliefs about Warfarin and ASA for an Elderly Male Patient	55
Perceptions of Probable Outcomes of Prescribing Warfarin and ASA for an Elderly Male Patient	58
Demographic Variables Related to the Elderly Patient with Atrial Fibrillation .	60
Patient Gender Differences of Treatment Choices by Specialty	60
Specialists' Beliefs for the Elderly Female and Elderly Male Patient . .	60
Generalists' and Specialists' Perceptions of Probable Outcomes for the Elderly Female and Elderly Male Patient	63
Relationship of Geographical Location and Drug Choice	65
Number of Patients Seen by Physicians	69

Chapter V. Discussion	72
Summary of Findings	72
Response and Participation	74
Antithrombotic Choices: Similarities and Differences	77
Correlation Between Antithrombotic Therapy and Demographic Factors	80
Beliefs and Perceptions of Probable Outcomes About	
Antithrombotic Choices	81
Antithrombotic Therapy, Gender Differences and	
Geographic Location of Medical Practice	82
Number of Patients Being Managed with Atrial Fibrillation	83
Antithrombotic Therapy and Work Load	84
Limitations	87
Recommendations for Further Research	89
References	90
Appendices	99
Glossary of Terms	140

Figures

Figure 1	Drug Choice Model	23
Figure 2	Data Collection Time Line	33

Tables

1	Prevalence and Incidence Rates of Atrial Fibrillation from the Manitoba Heart Study and Incidence Rates of the Framingham Study	7
2	Published Studies of Physician Surveys	18
3	Categories and Variables from Physicians' Stroke Prevention Survey	28
4	Data Collection	33
5	Response Rates	39
6	Ineligible Subjects	39
7	Eligible Subjects - Refusal Rates	39
8	Characteristics of Eligible Non-Respondents	41
9	Characteristics of Eligible Respondents	43
10	Number of Patients Seen with Atrial Fibrillation (AF) Per Month	45
11	Most Frequently Chosen Antithrombotic Therapy	46
12	Antithrombotic Therapy Chosen for an Elderly Female Patient	48
13	Antithrombotic Therapy Chosen for an Elderly Male Patient	50
14	Generalists' Beliefs about Warfarin and ASA: Elderly Female Patient	52
15	Specialists' Beliefs about Warfarin and ASA: Elderly Female Patient	52
16	Generalists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA: Elderly Female Patient	54
17	Specialists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA: Elderly Female Patient	54
18	Generalists' Beliefs about Warfarin and ASA: Elderly Male Patient	56
19	Specialists' Beliefs about Warfarin and ASA: Elderly Male Patient	57

20	Generalists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA: Elderly Male Patient	59
21	Specialists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA: Elderly Male Patient	59
22	Generalists' versus Specialists' Beliefs: Elderly Female Patient	62
23	Generalists' versus Specialists' Beliefs: Elderly Male Patient	62
24	Generalists' versus Specialists' Perceptions of Probable Outcomes: Elderly Male Patient	64
25	Most Frequently Chosen Antithrombotic Therapy Selected by Geographical Setting in Which the Medical Practice Resides	67
26	Antithrombotic Therapy Chosen for an Elderly Female Patient Selected by Geographical Setting in Which the Medical Practice Resides	67
27	Antithrombotic Therapy Chosen for an Elderly Male Patient Selected by Geographical Setting in Which the Medical Practice Resides	68
28	Most Frequently Chosen Antithrombotic Therapy Selected by Number of Patients Managed per Month with Atrial Fibrillation	71
29	Antithrombotic Therapy Chosen for an Elderly Female Patient Selected by Number of Patients Managed per Month with Atrial Fibrillation	71
30	Antithrombotic Therapy Chosen for an Elderly Male Patient Selected by Number of Patients Managed per Month with Atrial Fibrillation	71
F 1	More Generalists' Beliefs about Warfarin and ASA: Elderly Female Patient	120
F 2	More Specialists' Beliefs about Warfarin and ASA: Elderly Female Patient	121
F 3	More Generalists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA: Elderly Female Patient	123
F 4	More Specialists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA: Elderly Female Patient	125
F 5	More Generalists' Beliefs about Warfarin and ASA: Elderly Male Patient	126

F 6	More Specialists' Beliefs about Warfarin and ASA: Elderly Male Patient	127
F 7	More Generalists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA: Elderly Male Patient	129
F 8	More Specialists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA: Elderly Male Patient	131
F 9	More Generalists' versus Specialists' Beliefs: Elderly Female Patient	133
F10	More Generalists' versus Specialists' Beliefs: Elderly Male Patient	135
F11	More Generalists' versus Specialists' Perceptions of Probable Outcomes: Elderly Female Patient	137
F12	More Generalists' versus Specialists' Perceptions of Probable Outcomes: Elderly Male Patient	139

Appendices

A:	Letter of Invitation	101
B:	Refusal Notification	102
C:	Questionnaire	103
D:	Error Notification	115
E:	Reminder Letters	116
F:	Tables	119

Chapter I. Introduction

Stroke mortality has declined internationally since the early 1900s (Gordon, 1993), and in Canada since at least 1959. Because age is a risk factor for stroke and the proportion of the Canadian population that is elderly is increasing, the number of persons who are stroke survivors is anticipated to increase (Gordon, 1993). The increasing number of stroke survivors with residual deficits will impose an increasing burden on the Canadian health care system (Besdine, 1993).

Several modifiable risk factors for stroke have been identified. These include hypertension (SHEP Cooperative Research Group, 1991); nonvalvular atrial fibrillation (Boston Area Anticoagulation Trial for Atrial Fibrillation Investigators, 1990; Gorelick, 1994; Petersen, Boysen, Godtfredsen, Andersen, & Andersen, 1989; Stroke Prevention in Atrial Fibrillation Study Investigators, 1990); and carotid artery stenosis (Besdine, 1993). Therapies for each of these conditions have been shown to reduce the incidence of stroke (Besdine, 1993).

However, interventions to prevent stroke among high-risk populations are effective only if they are implemented. At least six investigators have shown that only a fraction of persons who would benefit from stroke-prevention strategies are actually offered these therapies (Black, Sefcik, & Kapoor, 1990; Bucknall, Morris, & Mitchell, 1986; Chang et al., 1990; Gurwitz, Goldberg, Holden, Knapic, & Pinsell, 1988; Kutner, Nixon, & Silverstone, 1991; Lip, Tean, & Dunn, 1993). Thus, the identification of factors related to increasing the appropriate prescription of stroke-prevention therapies is important for the ultimate reduction of stroke morbidity.

This study focuses on physicians' management of nonvalvular atrial fibrillation. The method by which physicians choose drugs is far from understood, and it has been suggested that there is often a reluctance to start anticoagulant therapy in patients with atrial fibrillation (Bath, Prasad, & Brown, 1993; Kutner et al., 1991; Lip, Tean, & Dunn, 1993). On the other hand, Gottlieb and Salem-Schatz's (1994) recent research suggested that anticoagulation practices are better than previously reported. More research is needed to clarify these variations.

Purpose

The purpose of this study was to determine if the choice of antithrombotic drug therapy for stroke prevention for elderly patients with atrial fibrillation differs by physician specialty. The study describes beliefs and perceptions of probable outcomes related to potential risks, potential benefits, patient considerations, and physician considerations that influence physicians' choices of antithrombotic therapy in elderly patients with atrial fibrillation. In this study, "elderly" is used to describe patients older than 80 years.

Objectives

It is suggested in the literature that when elderly patients present with atrial fibrillation, physicians' prescribing practices for antithrombotic therapy can vary widely. Thus, the following objectives were developed:

1. To determine if the choice of antithrombotic drug therapy for stroke prevention for elderly patients with atrial fibrillation differs by physician specialty (e.g., general practitioners versus cardiologists and internists).
2. To describe physicians' beliefs and perceptions of probable outcomes about antithrombotic therapy for elderly patients with atrial fibrillation.

3. To explore possible associations of physicians' choice of antithrombotic therapy and their beliefs and perceptions of probable outcomes to: (a) the gender of the patient; (b) the setting from which patients with atrial fibrillation may come; and (c) the number of patients with atrial fibrillation physicians see in their practice per month.

Significance of the Study

Atrial fibrillation among elderly persons is an important risk factor for stroke (Laupacis et al., 1995). Strokes and recurrences of stroke, which often occur soon after the onset of atrial fibrillation, are the most devastating consequences of this arrhythmia. It is known that the use of anticoagulants by persons with atrial fibrillation reduces the risk of stroke, yet this information may not be optimally used by practitioners. The results of this study are significant in a number of areas. The use of anticoagulants in atrial fibrillation is thought to depend in part upon the physician's perception of the balance between the benefits and risks associated with this treatment (Chang et al., 1990). However there is little information in the literature concerning how physicians' beliefs and perceptions of probable outcomes affect drug choice. This study is designed to examine this issue. The findings from this study may add to the body of knowledge about physicians' choices of antithrombotic therapy for the management of elderly patients with atrial fibrillation. An exploration of possible patient gender issues in this area may explain some variation observed in previous studies. Finally, with a better description of the concerns that physicians have about antithrombotic therapy, ideas or strategies to enhance appropriate choices of antithrombotic therapy for patients with atrial fibrillation may be addressed.

Chapter II. Literature Review

This chapter presents the literature review in four parts. The first section reviews the epidemiology of stroke. The second section reviews contemporary knowledge about antithrombotic therapy. The third section outlines the literature about physician attitudes toward oral anticoagulation. The fourth section outlines the drug choice model used as the framework for this study, and the way it may relate to the use of antithrombotic therapy for the management of elderly patients with atrial fibrillation.

Epidemiology of Stroke

Morbidity and Mortality

Stroke is the third leading cause of death in the United States and Canada (Gordon, 1993). About 15,000 persons died from cerebrovascular disease in Canada in 1991, representing 7% of all deaths (Heart and Stroke Foundation, 1993; Petrasovits & Nair, 1994). Cerebrovascular disease currently accounts for over 67,000 hospital discharges and 3.2 million days of hospitalizations per year (Petrasovits & Nair, 1994).

Gordon (1993) summarized the first-ever stroke incidence studies of various countries, emphasizing the relatively high rate of stroke in Japan and Sweden compared to Canada. Stroke mortality has shown a downward trend in Canada since the early 1950s, and Canada now has almost the lowest rate in the world (Petrasovits & Nair, 1994). However, an increase in the incidence of stroke and prevalence of stroke survivors is projected as populations in the industrialized nations become older and the fatality rate declines. In addition, because an aging population experiences more co-morbidity including cognitive impairment, older people are likely to be more disabled by stroke, thus adding to the disease burden (Ostfeld & Wilk, 1990).

Stroke mortality rates are higher among men than women across all nations (Heart and Stroke Foundation, 1993). In Canada, the rate of death from stroke is 20% higher in males than females (Gordon, 1993). In the white population followed in the Framingham Heart Study, the incidence of all strokes was 1.3 times higher in males than females (Gordon, 1993). However, due to the preponderance of women among the oldest age groups and the dramatic increase in stroke incidence with age, more absolute numbers of women die from stroke (Gordon, 1993).

Although there are other risk factors for stroke, atrial fibrillation and its associated risk factors are contributing causes of stroke; however, it is a complex problem. It is unclear whether the increased stroke risk associated with atrial fibrillation in older people is due to concomitant cardiac disease contributing to cardiogenic stroke, associated cerebrovascular diseases, or age-related relative prothrombotic tendencies predisposing to atrial thrombi (Davis & Hart, 1991).

Risk Factors for Stroke in Association with Atrial Fibrillation

Prospective population studies have identified congestive heart failure, coronary heart disease, and atrial fibrillation as independent risk factors for stroke in both sexes (Gordon, 1993). Atrial fibrillation may be responsible for 75,000 strokes per year in the United States (Gordon, 1993). Atrial fibrillation becomes an increasingly important cause of stroke as people get older (Laupacis et al., 1995). Much of what is known about atrial fibrillation comes from long-term epidemiological data from the Framingham Heart Study in which the attributable risk for stroke from atrial fibrillation rose from 1.5% in the age group 50-59 to 23.5% in the age group 80-89 (Wolf, Abbott, & Kannel, 1991). In subjects over the age of 80, atrial fibrillation was the only cardiovascular condition associated with an increased risk

of stroke (Laupacis et al., 1995; Wolf et al., 1991). The proportion of stroke associated with atrial fibrillation also increased in this cohort, from 6.7% in people aged 50-59 to 36.2% in those aged 80-89 years (Gordon, 1993). In subjects less than 60 years of age with atrial fibrillation in the absence of structural heart disease, the risk of stroke was less than 0.5% per year (Kopecky et al., 1987).

The Canadian Cardiovascular Society Consensus Conference on Atrial Fibrillation (Kerr et al., 1994) reported four factors that independently increased the risk of stroke in association with atrial fibrillation. The four factors are: (a) history of transient ischemic attack (TIA) or stroke (relative risk [RR] 2.5); (b) increasing age (RR 2.4 for each decade of age); (c) history of hypertension (RR 1.6); and (d) history of diabetes (RR 1.7). The Canadian Cardiovascular Society (Kerr et al., 1994) reported on the prevalence and incidence of atrial fibrillation in the Manitoba Heart Study. Table 1 shows the prevalence and incidence of atrial fibrillation in the Manitoba Heart Study as well as the incidence in the Framingham Study (Cuddy & Connolly, 1996). The incidence of atrial fibrillation in men at all ages is nearly double that of women; and there is a progressive increase in atrial fibrillation with advancing age (Kerr et al., 1994).

Among elderly women, atrial fibrillation may be the most important single cause of disabling brain infarction (Wolf, Abbott, & Kannel, 1987). The most common cardioembolic source for stroke is atrial fibrillation unrelated to rheumatic valvular disease. This has a risk exceeding 5% per year in those over the age of 70 (Stroke Prevention in Atrial Fibrillation Investigators, 1990, 1991; Wolf et al., 1987).

Table 1
Prevalence and Incidence Rates of Atrial Fibrillation from the Manitoba Heart Study and Incidence Rates of the Framingham Study (Cuddy & Connolly, 1996)

Age Years	Manitoba Heart Study		Framingham Incidence ^a	
	Prevalence ^b	Incidence ^a	Men	Women
20	0.0	0.0	-	-
30	0.0	0.0	-	-
40	1.1	0.3	0.4	0.0
50	5.1	0.7	0.8	0.4
60	18.0	3.5	1.9	0.9
70	54.4	8.6	9.1	4.5
80	92.7	16.3	21.9	12.5
90	105.0	-	-	-

^a 1,000 patients/year

^b per 1,000 patients

- not available

Contemporary Knowledge About Antithrombotic Therapy

Atrial fibrillation is presumed to increase stroke risk by increasing the likelihood of embolization from an atrial thrombus. Six clinical trials assessing antithrombotic therapy as primary prevention in atrial fibrillation have provided the highest quality evidence regarding its efficacy in stroke prevention (Laupacis et al., 1995). These are the Atrial Fibrillation Aspirin Anticoagulation study from Denmark (AFASAK) (Petersen et al., 1989), the Stroke Prevention in Atrial Fibrillation study from the United States (SPAF) (Stroke Prevention in Atrial Fibrillation Investigators, 1991), the Boston Area Anticoagulation Trial for Atrial Fibrillation (BAATAF) (Boston Area Anticoagulation Trial for Atrial Fibrillation Investigators, 1990), the Canadian Atrial Fibrillation Anticoagulation study (CAFA) (Connolly et al., 1991), the Stroke Prevention in Nonrheumatic Atrial Fibrillation from VA hospitals in the United States (SPINAF) (Ezekowitz et al., 1992), and the second phase of the Stroke Prevention in Atrial Fibrillation Study (SPAF II) (Stroke Prevention in Atrial Fibrillation Investigators, 1994).

A dramatic reduction in strokes was noted in clinical trials when nonvalvular atrial fibrillation was treated with antithrombotic therapy (Boston Area Anticoagulation Trial for Atrial Fibrillation Investigators, 1990; Gorelick, 1994; Petersen et al., 1989; Stroke Prevention in Atrial Fibrillation Investigators, 1990). Several randomized trials (Boston Area Anticoagulation Trial for Atrial Fibrillation Investigators, 1990; Connolly et al., 1991; Jorgensen, Nakayama, Raaschou, Gam, & Olsen, 1994; Petersen et al., 1989; Stroke Prevention in Atrial Fibrillation Investigators, 1990, 1991) have demonstrated a reduction in thrombotic stroke by using warfarin in patients with chronic atrial fibrillation. The SPAF II (Stroke Prevention in Atrial Fibrillation Investigators, 1994) compared warfarin with

aspirin for prevention of ischemic stroke and systemic embolism in both patients aged less than 75 years of age and patients older than 75. Among older patients, warfarin decreased the absolute rate of stroke and embolism by 1.2% per year as compared to ASA. The primary stroke event rate per year was 3.6% with warfarin and 4.8% with aspirin. However, because of intercranial bleeding the rate of all stroke with residual deficits (ischemic or hemorrhagic) was 4.3% per year with aspirin and 4.6% per year with warfarin. Among older patients the rate of stroke was substantial regardless of which agent was given.

The National Heart, Lung and Blood Institutes Working Group on Atrial Fibrillation (1993) reported that the risk reduction afforded by warfarin for patients at risk for stroke was almost equivalent to the additional risk of stroke imparted by the presence of atrial fibrillation. However, a large fraction of the strokes occurred in patients not actually taking their prescribed dose of warfarin (Atrial Fibrillation Investigators: Atrial Fibrillation, Aspirin, Anticoagulation Study; Boston Area Anticoagulation Trial for Atrial Fibrillation; Canadian Atrial Fibrillation Anticoagulation Study; Stroke Prevention in Atrial Fibrillation Study; Veterans Affairs Stroke Prevention in Nonrheumatic Atrial Fibrillation Study, 1994).

The Stroke Prevention in Atrial Fibrillation Investigators (1994) reported on a meta-analysis from the five randomized controlled trials (Boston Area Anticoagulation Trial for Atrial Fibrillation Investigators, 1990; Connolly et al., 1991; Ezekowitz et al., 1992; Petersen et al., 1989; Stroke Prevention in Atrial Fibrillation Investigators, 1991) that demonstrated new clinically useful information:

1. The independent predictors for thromboembolic stroke risk in patients with atrial fibrillation were: increasing age, previous stroke or transient ischemic attack, diabetes, and a history of hypertension;

2. Warfarin therapy results in a 68% reduction in the relative risk of thromboembolic stroke in patients with atrial fibrillation;
3. The efficacy of warfarin was statistically significant in female patients with atrial fibrillation;
4. The evidence for efficacy of aspirin was less consistent than for warfarin.

Since this very convincing evidence has accumulated, guidelines for the management of atrial fibrillation have been published (Laupacis et al., 1995). The Canadian Cardiovascular Society (Kerr et al., 1994) convened a consensus conference (October 27, 1994) on the management of atrial fibrillation, and have also published recommendations for the management of atrial fibrillation (Connolly & Turpie, 1996). Recommendations for antithrombotic therapy with patients in atrial fibrillation have been upgraded, reflecting the tremendous gains in knowledge from results of large clinical trials in the last decade (Laupacis et al., 1995). Despite the availability of this scientific information, there is evidence in the literature that physicians' decisions to use antithrombotic therapy for stroke prevention continue to vary widely.

Studies of Physician Attitudes Towards Oral Anticoagulation

Studies of physician attitudes towards prescribing oral anticoagulation have been done using both cross-sectional surveys and case-series designs. Table 2 summarizes the published literature, which are outlined below.

Cross-sectional Physician Practice Surveys

Bucknall, Morris, and Mitchell (1986) conducted a mail survey of 641 members of the Association of Physicians of Great Britain and Ireland to ascertain physicians' attitudes to treatment of four common problems: hypertension, atrial fibrillation, transient ischemic

attacks, and angina pectoris. For the purposes of this literature review only data about atrial fibrillation are reported. The overall response rate to the mail survey was 60%. For patients with idiopathic atrial fibrillation, physicians reported intentions to prescribe anticoagulants 19% of the time. However, patient characteristics that may influence physicians' treatment plans, such as age, gender, and other disease conditions, were not addressed; and the authors made no attempt to compare current treatment practices of antithrombotic therapy to survey responses. Limitations arising from the sampling strategy include uncertainty as to whether a complete sample of physicians was obtained, which raises the question of response bias. The lack of a stratified sample for physician groups disguises effect modification that may occur because of differential interest in atrial fibrillation among different medical specialties. The lack of a stratified sample or analysis presumes that physicians are homogeneous. However, this was the first published study reporting data on physicians' perceptions of probable outcomes about prescribing anticoagulation therapy.

In a survey conducted by Chang et al. (1990) in New Hampshire, variations in the treatment of atrial fibrillation with oral anticoagulants were investigated. They sought to determine whether physicians made treatment decisions consistent with their estimations of (a) patient risk of an embolic event within the next two years if not given an anticoagulant, and (b) patient risk of a hemorrhagic event within the next two years if given anticoagulation. The relative risk ratio was used to look at the risk of hemorrhage versus the risk of stroke, thus attempting to mimic the clinical decision-making process. A total of 274 New Hampshire family physicians, general internists, and cardiologists were mailed a survey. The overall response rate was 49%. There was general agreement in the anticoagulation decision for patients with either mitral valve disease or a history of chronic alcohol abuse, but

substantial disagreement for other categories of patients. Estimations of the risk of embolization and risk of hemorrhagic events differed widely between groups, with cardiologists generally rating the embolization risks lower than other physicians. The physician's treatment decision was strongly related to the perception of the risk of embolism relative to the risk of hemorrhage for each case. A statistically significant relationship between physician specialty and treatment decision was also demonstrated. Cardiologists were least likely, and family physicians most likely, to institute anticoagulation therapy in patients with nonrheumatic atrial fibrillation. This survey also had a number of limitations: response rates were low despite attempts to increase the replies, which may imply a response bias; the reliability of the vignettes was not reported; and there was no way to check that the data collected reflected physicians' actions in real clinical situations. This survey was the first literature to explore differences by physician specialty, and demonstrated a relationship between specialty and the decision to anticoagulate patients with nonrheumatic atrial fibrillation.

Kutner, Nixon, and Silverstone (1991) conducted a mail survey of physicians from two major university-affiliated medical centres on Long Island, New York two months after the results of the SPAF were published, and one year after completion of the AFASAK trial. The study was undertaken to examine physicians' attitudes towards, and rationale for, the use of oral anticoagulant and antiplatelet agents for prevention of strokes among elderly patients with atrial fibrillation. This survey had a response rate of 52%. Only 18% of respondents reported using warfarin in elderly patients with atrial fibrillation of any cause. The most commonly reported reason for not using oral anticoagulation was the risk of hemorrhage associated with warfarin (51%). Twenty-four percent of physicians were not convinced that

warfarin prevents a cerebrovascular accident in patients with atrial fibrillation. Seventeen percent believed that it was difficult to monitor prothrombin times in elderly out-patients due to poor compliance. Twenty-four percent of respondents reported that they would prescribe warfarin for healthy elderly, but not for frail elderly patients. This study defined elderly persons as those aged over 65 of age. However one may speculate that physicians' responses might have differed if the same questions had been asked for persons in different age categories (i.e., 66-74, 75-84, and ≥ 85 years). In addition, the low response rate may have resulted in response bias. This was the first survey describing physicians' beliefs and perceptions of probable outcomes about antithrombotic therapy after publication of the results from the first two major clinical trials (SPAF and AFASAK).

A fourth group (Dow & Bertagne, 1993) reported on a survey of 50 randomly selected general practitioners from the Bristol health district in England. The authors had an 84% response. Their findings revealed that 74% of the respondents would not anticoagulate a patient with chronic atrial fibrillation alone. After the survey, guidelines were developed and a follow-up of anticoagulation practices based on referrals to hematology for monitoring international reference (INR) results was conducted, showing that despite the clinical trial's findings and the development of clinical guidelines for anticoagulation, there was no change in the rate of new referrals.

Taylor and Ramsey (1993) surveyed 127 practices in London, England that referred patients to an anticoagulation clinic. Ninety-nine doctors (78%) responded; however, the authors did not report on the number of physicians composing the practises. The authors reported that few patients received anticoagulant treatment from their general practitioner, and that few general practitioners were willing to take on the management of anticoagulation.

The attitudes of geriatricians and cardiologists giving anticoagulants to patients greater than 70 years old with atrial fibrillation were reported by King and Davies (1993), in Liverpool, England. Cardiologists were more likely than geriatricians to prescribe warfarin for atrial fibrillation associated with dilated cardiomyopathy (86% versus 52%), and geriatricians were more likely than cardiologists to give anticoagulants to those with aortic valve disease and atrial fibrillation (37% versus 24%). Variables that were not studied included patient gender and number of patients with atrial fibrillation the physician managed in their medical practice.

The most contemporary mail survey is a nationwide sample of office-based practitioners from the American Medical Association Physician Master-file of all licensed physicians randomly selected in three strata: (1) primary care (including geriatrics, internal medicine, family practice and general practice), (2) cardiology, and (3) neurology (McCrory, Matchar, Samsa, Sanders, & Pritchett, 1995). The purposes of this survey were to determine whether physicians were less likely to recommend anticoagulation therapy for older than for younger patients with nonvalvular atrial fibrillation and whether physicians use a lower intensity of anticoagulation when treating older than younger patients (McCrory et al., 1995). The survey was a vignette-based questionnaire used to measure beliefs and attitudes about anticoagulation risk and effectiveness as barriers to anticoagulation in clinical practice. The likelihood of using anticoagulation and the target intensity of anticoagulation were examined for three patient ages (55, 65, and 75 years) for four clinical scenarios: chronic nonvalvular atrial fibrillation with mild left atrial enlargement; intermittent or paroxysmal atrial fibrillation; recent onset atrial fibrillation; and atrial fibrillation with recent (three months) embolic stroke. The overall response rate was 38%. Anticoagulants were less often and less

intensively used for elderly patients than for younger patients with nonvalvular atrial fibrillation. Anticoagulation therapy was very or somewhat likely to be used for a 65-year-old with left atrial enlargement by 71% of the physicians responding to this survey, with intermittent or paroxysmal atrial fibrillation by 68%, with recent-onset atrial fibrillation by 86%, and with embolic stroke by 96%. Fewer physicians were likely to use anticoagulant therapy for a 75-year-old with left atrial enlargement (63%), intermittent or paroxysmal atrial fibrillation (56%), recent onset atrial fibrillation (80%), or embolic stroke (93%). Of the proportion who were equally likely to use anticoagulation for 65- and 75-year-old patients, the intensity of anticoagulant therapy (targeted international normalized ratio) was lower for the 75-year-old. Patients greater than 80 years old who are at the greatest risk for stroke were not considered. The very low response rate may have resulted in response bias. This was the first nation-wide survey describing physicians' beliefs and perceptions of probable outcomes about anticoagulant therapy in the elderly by physician speciality, and describing anticoagulant therapy practices based on the age of the patient. In contrast to Chang et al. (1990) and Kutner et al. (1991), the reported use of anticoagulants by physicians in this survey is much higher.

These cross-sectional studies of physicians' beliefs and perceptions of probable outcomes about antithrombotic therapy have been conducted over a ten year span. The findings describe the temporal sequence of changing practice patterns; however case-series studies examine actual practice.

Case-Series

Chart reviews have been used to examine practice in two case-series studies which have been published. However, only one study used multiple sources for data collection and

comparison. Bath et al. (1993) conducted a retrospective analysis of case notes of patients admitted to one London, England hospital from January 1991 to September 1992. A chart review of 13% (95/726) of the patients discharged from hospital with a diagnosis of atrial fibrillation was conducted. The audit highlighted that almost half of the patients without a documented contraindication to anticoagulation (48%) were receiving neither warfarin nor aspirin. This retrospective chart review has design limitations that include: (a) a focus only on hospitalized patients; chart reviews in other settings such as a physicians' office may differ; and (b) the prescription of anticoagulation medications is probably multifactorial; however, this may not be addressed in a retrospective chart audit. Unless there is a required and enforced hospital standard for documenting contraindications to medications, this information may not be recorded. As well, regardless of whether the patient has any contraindications to warfarin, it is also important to know whether the physicians even considered anticoagulation, and this information is not often recorded. However, this survey is important because it describes physicians' actual practice patterns for prescribing antithrombotic therapy in patients with atrial fibrillation in a hospital setting.

Gottlieb and Salem-Schatz's (1994) retrospective case-series audit of patients with a coded diagnosis of atrial fibrillation had four purposes: (a) to determine if the recommendation of offering long-term anticoagulation therapy, which resulted from the five multi-center clinical trials (AFASAK, SPAF, BAATAF, CAFA, and SPINAF) had been translated into routine practice with patients with atrial fibrillation; (b) to determine if the clinical characteristics and associated risk factors for embolization in the community-practice patients were similar to those in the three clinical trials; (c) to determine if anticoagulation control in the community is similar to that achieved in the clinical trials; and (d) to compare

the outcomes of anticoagulation therapy achieved in the community with those of the clinical trials. The study site was the Health Centers Division of the Harvard Community Health Plan, a health maintenance organization in the greater Boston, Massachusetts area. A total of 191,000 patients from 11 multidisciplinary health centres were cared for by 136 primary-care internists. An automated medical records search of all patients with a coded diagnosis of atrial fibrillation prior to April 1, 1990 was compiled. Manual chart reviews were performed on all records identified by the computer search to confirm the diagnosis and extract relevant information. Patients with chronic or intermittent atrial fibrillation were included in the analysis. The authors noted that long-term anticoagulation was generally managed by the patient's primary care internist. Gottlieb and Salem-Schatz (1994) reported that 84.9% of the patients reviewed were offered anticoagulation, and 78.8% of the patients were prescribed anticoagulation.

The major methodological weaknesses of the Gottlieb and Salem-Schatz (1994) study are: (a) this survey was retrospective, and no time-frame for initiation of anticoagulation therapy was identified; (b) involvement in a past clinical trial (BAATAF) may have influenced how this center collects patient information, monitors the patient, and chooses anticoagulant therapy; (c) patients with atrial fibrillation in other clinical settings and regions in the country may be followed by someone other than an internist; and (d) patients in this study were hospitalized; they may have been more ill, and therefore their presentation may have been more compelling to prescribe anticoagulants.

The Gottlieb and Salem-Schatz (1994) study highlights that a larger proportion of physicians are prescribing antithrombotic therapy for patients with atrial fibrillation without contraindications to warfarin as compared to the findings of Chang et al. (1990) and Kutner et al. (1991) (see Table 2).

Table 2
Published Studies of Physician Surveys

Study ^a	Sample <u>n</u>	Study Design	% Who Would Give Antithrombotics	Response Rate (%)
Bucknall (1986)	641 Great Britain & Ireland	Cross Section	18.6 ^d	58.9 ^d 55.4 ^e 29.9 ^f 14.7 ^g
Chang (1990)	274 New Hampshire	Cross Section	31.4 ^d 38.5 ^e 34.6 ^h 11.1 ^h	49.0 ^d 51.0 ^e 46.6 ^h 50.0 ^f
Kutner (1991)	480 Long Island, New York	Cross Section	36.2 ^d	52.3 ^d 42.6 ^e 25.5 ^f 7.9 ⁱ 23.9 ^j
Dow (1993)	50 Bristol, England	Cross Section	11.9 ^e	84.0 ^e
King (1993)	294 Liverpool, England	Cross Section	Not Reported	89.0 ^f 86.0 ^k
McCrory (1995)	1189 United States	Cross Section	56	38.0 ^d
Bath (1993)	95 London, England	Case Series	52	NA
Gottlieb (1994)	238 Boston, Massachusetts	Case Series	84.9 ^b 78.8 ^c	NA

^a Name of first author only

^b Offered anticoagulation

^c Received anticoagulation

^d Total

^e General Practitioners

^f Cardiologists

^g Interest in Cardiology

^h General Internists

ⁱ Neurologists

^j Other

^k Geriatricians

NA Not Applicable

Conceptual Framework

The relationship between the beliefs and perceptions of probable outcomes and the choice of antithrombotic therapy for elderly patients with atrial fibrillation among Canadian physicians has not been previously examined. Previous surveys about physicians' attitudes towards antithrombotic therapy have either implicitly used a conceptual framework or there was none. A number of models or frameworks have been used to understand and predict other health-related behaviours, including physicians' behaviours. Six conceptual frameworks were reviewed for consideration for this project, including: the health belief model (Rosenstock, 1974), the use of clinical recall interviews (Parboosingh et al., 1987) the PRECEDE model of health education (Green, Erickson, & Schol, 1988), social learning theory (Bandura, Jeffery, & Gajdos, 1975), the clinical prevention model (Walsh & McPhee, 1992), and the theory of reasoned action (Ajzen & Fishbein, 1980). Of all the conceptual frameworks considered, only Ajzen and Fishbein's theory of reasoned action may have described physicians' prescribing practices. However, none of the above models was chosen because they did not follow a realistic overview of how physicians manage their patients in a clinical setting.

Results from studies in the United States and the Netherlands suggest that a drug-choice model, drawn from the work of Segal and Hepler (1982), might be an appropriate framework for such a study. A diagram of the drug-choice model is presented in Figure 1. This model examines beliefs and perceptions of probable outcomes and their relationship with intentions. A belief is defined as a feeling of certainty that something exists or that you feel sure about a circumstance (Segal & Hepler, 1982). A belief focuses on the physician's feelings about the outcome.

The drug-choice model focuses on a physician's intention to prescribe as opposed to actual prescribing behaviour. Intent is defined as an idea or plan of what the physician is going to do, for example, a physician's choice of antithrombotic therapy for an elderly patient with atrial fibrillation. The drug-choice model uses a cognitive approach focused primarily on the physician, with little consideration given to patient and environmental factors (Segal & Hepler, 1982). The drug-choice model follows the physician-patient interaction. Initially (Stage I), the prescriber interviews and examines the patient, obtains the necessary laboratory data, and analyzes the data to develop a clinical impression or tentative diagnosis. Next (Stage II), the prescriber formulates a therapeutic plan, which may or may not include drug orders. Then (Stage III), the prescriber assesses the patient's outcomes (e.g., cure) and other outcomes that have personal meaning to the prescriber (e.g., satisfaction or frustration). Patient outcomes may become new data for the analysis stage or for the plan-formation stage.

The drug-choice model views the physician's intent affected by a three-stage set of variables, or valences (preferences), as well as underlying beliefs about drug effects and outcomes (instrumentalities = beliefs). Lewin (1938) defined valence as the anticipated satisfaction associated with an outcome. For the purposes of clarity for this study, the term perceptions of probable outcomes has been used throughout this paper instead of valences, or attitudes. According to Vroom (1964) an outcome is positively valent to a person when that person prefers attaining it to not attaining it. This would be equivalent to a positive perception of a probable outcome (i.e., the patient may live another five years). A zero valence implies indifference about an outcome, which is equivalent to a physician being undecided about his or her perception of a probable outcome, while a negative value denotes a negative perception of the probable outcome (i.e., the patient may have a stroke).

For clarity for this study, the term beliefs has been used instead of instrumentalities.

Instrumentality "is a subjective belief about the correlation between an initial outcome, such as a well-developed treatment plan, and a consequent outcome such as patient improvement or the prescriber's personal feeling of achievement" (Segal & Hepler, 1982).

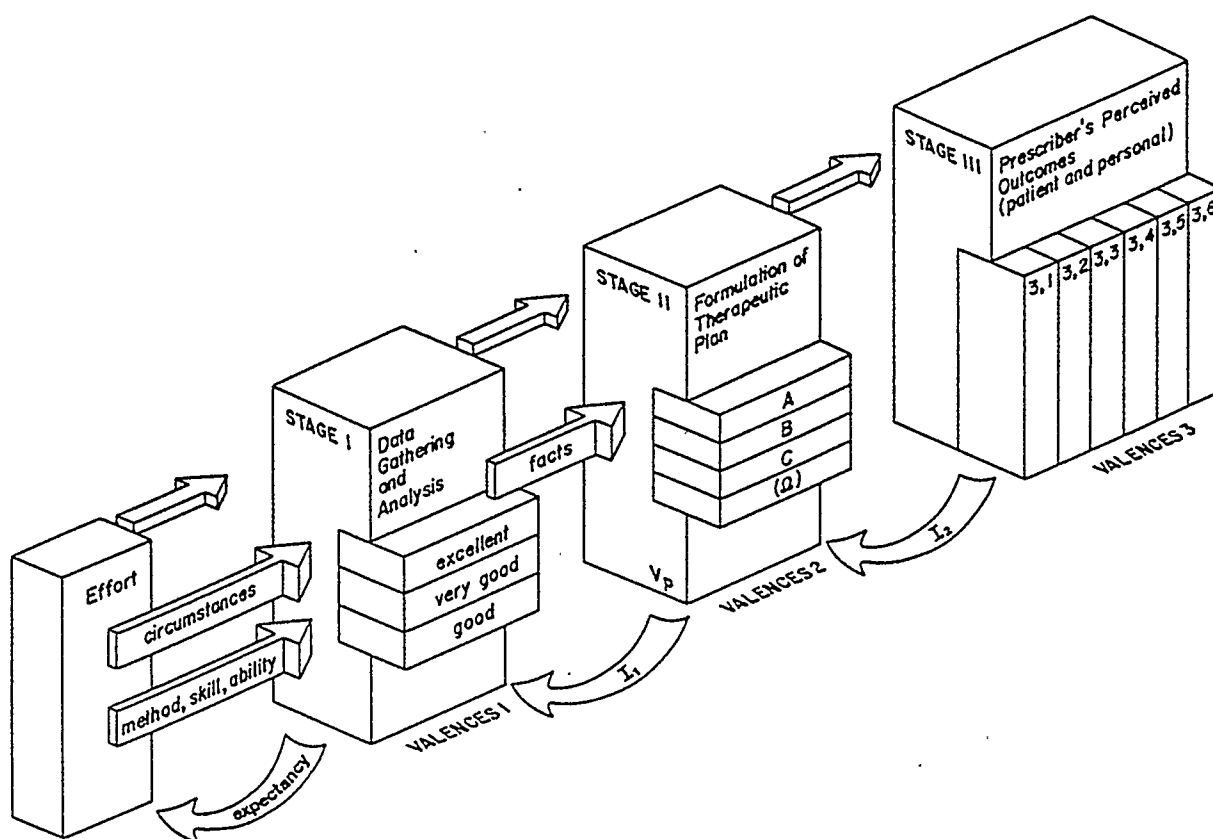
In the drug-choice model, decisions at the first stage are influenced by (a) nonpsychological circumstances; (b) the prescriber's methods, such as interviewing method; and (c) the interaction of the prescriber's beliefs and perceptions of probable outcomes. Thus, a prescriber's therapeutic plan is influenced by (i) the data or "facts" about the patient coming from Stage I, (ii) the prescriber's perceptions of probable outcomes that may occur in Stage III, and (iii) the correlation between the physician's beliefs and perceptions of probable outcomes of each alternative therapeutic plan.

The drug-choice model can appropriately be used to analyze physicians' antithrombotic prescribing patterns for patients with atrial fibrillation, because it does describe the patient-physician interaction. However, the model does not address the issue of discrepancies between what the physician would choose, based on perception of the potential risks and benefits, and what the physician actually does choose. Denig, Haaijer-Ruskamp, Wesseling and Versluis (1993) found that the drug-choice model can provide insight into physicians' prescribing choices. They showed that one reason why some physicians choose drugs seems to be related to the weight attached to certain aspects, such as personal experience. This model highlights some degree of opportunity to provide explanations for drug treatment choices. If a physician's beliefs and perceptions of potential risks and benefits, patient and physician considerations are explored, the drug-choice model may be used to help describe how physicians view antithrombotic therapy in the elderly.

Summary of Literature Review

The most common cardioembolic source for stroke is atrial fibrillation unrelated to rheumatic valve disease. Atrial fibrillation becomes an increasingly important cause of stroke as people get older (Laupacis et al., 1995). In addition to age, factors that independently increase the risk of stroke in association with atrial fibrillation have been identified. Recommendations for antithrombotic therapy for patients in atrial fibrillation have been upgraded, reflecting the tremendous gains in knowledge from results of large clinical trials in the last decade (Laupacis et al., 1995). Despite the availability of this scientific information, there is evidence in the literature that physicians' decisions to use antithrombotic therapy for stroke prevention in elderly patients with atrial fibrillation varies. However, the results of treatment of atrial fibrillation with antithrombotic therapy specifically for elderly patients older than 75 years is less defined. Physicians' beliefs and perceptions of probable outcomes about antithrombotic therapy can vary by speciality and are not well understood. An improved description of physicians' beliefs and perceptions of probable outcomes may be achieved through the use of a theoretical frame such as the drug-choice model. The complexity of issues surrounding beliefs and perceptions of probable outcomes of prescribing antithrombotic therapy in elderly patients with atrial fibrillation underscores the need for a comprehensive descriptive study.

Figure 1
Drug Choice Model



Stage I: Prescriber interviews and examines the patient, obtains necessary laboratory data, analyzes data to develop a clinical impression or tentative diagnosis.

Stage II: Prescriber formulates a therapeutic plan, which may or may not include drug orders.

Stage III: Prescriber assesses the patient's outcomes (e.g., cure) and other outcomes that have personal meaning to the prescriber (e.g., satisfaction or frustration). Patient outcomes may become new data for the analysis stage or for the plan-formation stage.

Note: From "Prescribers' beliefs and values as predictors of drug choices" by Segal, R. & Hepler, C. D., 1982. *American Journal of Hospital Pharmacy*, 39:1891-1897. Reprinted with permission R9536.

Chapter III. Methods

This descriptive cross-sectional study was designed to examine, describe, and compare physicians' choices of antithrombotic medications for elderly patients with atrial fibrillation. The choice of antithrombotic therapy and the physicians' beliefs and perceptions of probable benefits, risks, and patient-related, and physician-related considerations are examined and compared.

A cross-sectional survey design was chosen to avoid the considerable amount of time that would be necessary to accumulate a sufficient sample of actual elderly patients presenting with recent-onset atrial fibrillation in a prospective study. Hypothetical cases were used to obtain a description of physicians' beliefs and perceptions of probable outcomes about elderly patients with atrial fibrillation in a standardized manner, yet still be easy and efficient for the physician to complete. In addition, identification and access to physicians managing patients with atrial fibrillation outside the hospital setting were not feasible.

Sample

The geographical area from which the physicians were drawn was Southern Alberta, consisting of towns and cities including Red Deer and south. Most of the towns and cities are within 1-1/2 to 3-1/2 hours' drive from Calgary. In 1994, a total of 1,115 general practitioners, 87 internists, and 28 cardiologists were licensed to provide health care in Southern Alberta (Office of the Registrar: College of Physicians and Surgeons, 1994). Physicians practising in Southern Alberta were chosen as the sample for the study. Sampling of this group followed rural and urban centres' referral patterns. Thesis committee members and the Faculty of Continuing Medical Education viewed Southern Alberta physicians as a representative sample of physicians licensed and practising medicine in Alberta (personal

communication, J. Lockyer, September 12, 1995; G. Wyse, October 2, 1995).

Assumptions for sample size calculations were based on Chang et al's. (1990) study of differences in antithrombotic prescription practices between general practitioners and specialists (i.e., cardiologists). A sample of 93 general practitioners and 31 cardiologists was required to detect a 26.2% difference with a power of 80% using a two-sided test with the alpha set at 0.05 (Rosner, 1986; Schlesselman, 1982). In addition, the sample was inflated to provide for an expected overall response rate of 65%. Thus, a sample of 1 of every 12 general practitioners was selected. Because there were only 28 cardiologists and 87 internists without an additional identified sub-specialty, all were sampled.

The target population was licensed physicians practising in Southern Alberta in 1995 who treat patients with atrial fibrillation. A list of all physicians licensed and practising in Southern Alberta was assembled from the 1995 Medical Directory, College of Physicians and Surgeons of Alberta (Office of the Registrar: College of Physicians and Surgeons, 1995). The identification of the physicians' specialty was based on the licensure of the specialty formally recognized and identified by coded abbreviations published by the Registrar from the College of Physicians and Surgeons of Alberta. Internists without an identified sub-specialty were chosen because these internists were more likely to manage patients with atrial fibrillation in their practices as compared to internists with other identified sub-specialties. Using a DBase IV program, the names, addresses and telephone numbers of all cardiologists ($n=28$), all internists without an additional identified sub-specialty in medicine ($n=87$), and a random sample of general practitioners ($n=153$) were compiled from the 1995 Medical Directory. Subjects were mailed a letter of invitation (Appendix A), the questionnaire (Appendix C) and a refusal notification form (Appendix B). The questionnaire that was

initially mailed contained a small but critical typographical error (describing the semantic differential scales), and a letter (on neon yellow paper) notifying each physician of the error (Appendix D) was mailed the same day as the questionnaire was first mailed. Two weeks later, a personalized reminder letter was forwarded to thank respondents and re-appeal to non-respondents (Appendix E). After one additional mailing and two telephone follow-up reminders, data were reviewed for subjects who were considered ineligible for the study. Exclusion criteria included: the physician reported retirement from practice, reported not managing patients with atrial fibrillation, or could not be contacted by mail or telephone to establish a reason for not responding to the survey.

A total of 36 general practitioners were considered ineligible and were dropped from the sample. Another 40 general practitioners were randomly selected to replace those ineligible and mailed the questionnaires. The mailed reminder letters and telephone follow-ups were conducted in the same manner as the original sample.

The Instrument

Data were collected with a mail questionnaire (Appendix C). The questionnaire was composed of 11 demographic questions, a general question about treatment of patients with atrial fibrillation, and a five-point semantic differential scale ("strongly agree" to "strongly disagree") for beliefs and perceptions of probable outcomes relating to 14 outcomes for two hypothetical elderly patient cases with atrial fibrillation.

The two case studies were selected from those used at the 1994 Canadian Cardiovascular Society Atrial Fibrillation workshop, and were similar to one of the cases used by Chang et al. (1990). The age and gender of the cases were modified to focus on the octogenarian. The hypothetical case scenarios standardized the information, thus controlling

for variations in the patient profile. This allowed for comparison of general management by sex of the hypothetical patient for treatment of atrial fibrillation by various physician groups.

Fourteen possible outcomes for the case scenarios were developed from a review of the literature (Chang et al., 1990; Dow & Bertagne, 1993; King & Davies, 1993; Kutner et al., 1991; Lancaster et al., 1991; Segal & Hepler, 1982; Taylor & Ramsey, 1993). The 14 outcomes (Table 3) were divided into four categories: (a) the potential risks or complications for the patient, (b) the potential benefits for the patient, (c) patient considerations, and (d) physician considerations.

Table 3
Categories and Variables from Physicians' Stroke Prevention Survey

Category	Outcomes
Potential risks	Treatment may increase the risk of hemorrhage Patient may report bruising Patient may fall and have a serious injury Patient may have a GI bleed Patient may have a stroke Patient may have a subarachnoid hemorrhage
Potential benefits	Treatment may prevent stroke Patient may live another five years
Patient considerations	Patient may request a specific treatment Treatment is acceptable to the patient Cost of the treatment is important Patient may adhere to the treatment
Physician considerations	Treatment may require medication adjustments Colleagues will agree with the treatment

The drug-choice model illustrates the physician-patient interaction pattern and how physicians choose a drug treatment by using their beliefs and perceptions of probable outcomes about the effectiveness of alternative treatments. In Stage I, a physician interviews and examines the patient, obtains the necessary lab data, and analyzes the data to develop a clinical impression or tentative diagnosis. The physicians responding to this survey were provided with basic information in two hypothetical cases, and instructed to then develop a clinical impression of stroke prevention and a tentative diagnosis for these hypothetical elderly male and female patients with atrial fibrillation.

For Stage II of the drug-choice model, a physician formulates a therapeutic plan, which may or may not include prescribing a medication. In the present study, the therapeutic plan options were provided in Stage II. Based on the hypothetical case scenario, physicians were asked to choose which drug they would employ from a list of medications for stroke prevention. The list of medications provided a number of possible alternative treatments: no treatment, aspirin (ASA), warfarin, combination therapy of ASA and warfarin, ticlopidine, and an open-ended option.

In Stage III of the drug-choice model, a physician considers the patient and perceptions of probable outcomes that have personal meaning. Stage III is accounted for by asking the physicians, based on their choice of medication for stroke prevention, to rate their beliefs of the hypothetical patient's potential risks, potential benefits, patient considerations, and physician considerations. Physicians were then asked to rate their impressions of the likelihood of the hypothetical patient's potential risks, potential benefits, patient considerations, and physician considerations. The drug-choice model was not explicitly used to guide the questionnaire development, but was used to guide data analysis.

Pre-test

A convenience sample of seven health-care professionals, six residents, and five physicians reviewed the questionnaire for clarity, content and flow. Pre-test participants were asked to comment on: (a) the time taken to complete the questionnaire, (b) whether the directions were clear, (c) the offensiveness of the questions, and (d) any other comments. The investigator met with the subjects following the completion of the questionnaire and reviewed their comments. Based on the pre-test participants' comments, the letter of invitation was shortened, and the instructions preceding the two case scenarios were reworded. A cardiology resident, a cardiologist, and a geriatrician reviewed the questionnaire and letters and established face validity.

Measurement

The demographic data collected included: gender, age, year of graduation from medical school, the country in which they graduated, full or part-time practice, categories for a description of the type of practice and the number of hours the physician was working in their current practice, university appointment, population of the city/town of the physician's practice, an estimation of the number of patients with atrial fibrillation (per month) the physician is currently treating, and an estimation of the number of patients per month aged 80 or older with atrial fibrillation the physician is currently managing.

Beliefs and Perceptions of Probability About Antithrombotic Therapy

The items listed in Table 3 were evaluated by the physician on a scale of 1 to 5 ("strongly agree" to "strongly disagree").

Research Questions

The research questions for the survey were:

1. Does the choice of antithrombotic therapy for an elderly patient with atrial fibrillation vary with physician's specialty?
2. Does the physician's choice of antithrombotic therapy for elderly patients with atrial fibrillation vary with the physician's beliefs about potential benefits, risks, and other considerations?
3. Does the physician's choice of antithrombotic therapy for elderly patients with atrial fibrillation vary with the physician's perceptions of probable outcomes related to potential benefits, risks, and other considerations?
4. What is the association between the physician's beliefs and perception of probable outcomes and drug choice concerning the prescribing of antithrombotic therapy as it relates to the gender of the elderly patient with atrial fibrillation, the geographical location of the medical practice, and the number of patients with atrial fibrillation per month the physician reported managing at the time of the survey?

Data Collection

Figure 2 and Table 4 outline the time line and the task list for data collection. After ethical approval was obtained from the University of Calgary Conjoint Research Ethics Board, the refusal notification form (Appendix B), the questionnaire (Appendix C), and a personalized explanatory letter (Appendix A) were mailed to subjects. A stamped pre-addressed envelope was also included. The questionnaire that was mailed initially contained a small but critical typographical error (describing the semantic differential scales), and a

letter notifying each physician of the error (Appendix D) was mailed the same day as the questionnaire. Two weeks later, a personalized reminder letter was forwarded to thank respondents and to re-appeal to non-respondents (Appendix E). Respondents who did not respond to the first two letters were contacted by telephone and mailed a third reminder.

According to experienced social science researchers, the use of sequential techniques to enhance response rates in mail questionnaires can improve responses (Dillman, 1978, 1983; Dillman, Dillman, & Makela, 1984; Mullen, Easling, Nixon, Koester, & Biddle, 1987). Thus, on the mailout two weeks after the initial mailing, letters were personalized with use of the physician's first name and a personal note of re-appeal (Appendix E). Three weeks following the first mailout, the physicians' offices were also telephoned to determine if the physician: (a) received the questionnaire, (b) treated patients with atrial fibrillation, and (c) was willing to respond to the questionnaire. Eight weeks after the initial mailout non-responding physicians were telephoned a second time to identify the reason(s) for failure to return the questionnaire. Data were then reviewed for subjects who were considered ineligible for the study. Exclusion criteria included: the physician reported retirement from practice, reported not managing patients with atrial fibrillation, or could not be contacted by mail or telephone to establish a reason for not responding to the survey. A total of 36 general practitioners were considered ineligible and dropped from the sample. Another 40 general practitioners were randomly selected to replace those ineligible and mailed the questionnaires. The mailed reminder letters and telephone follow-ups were conducted in the same manner as the original sample.

Figure 2
Data Collection Time Line

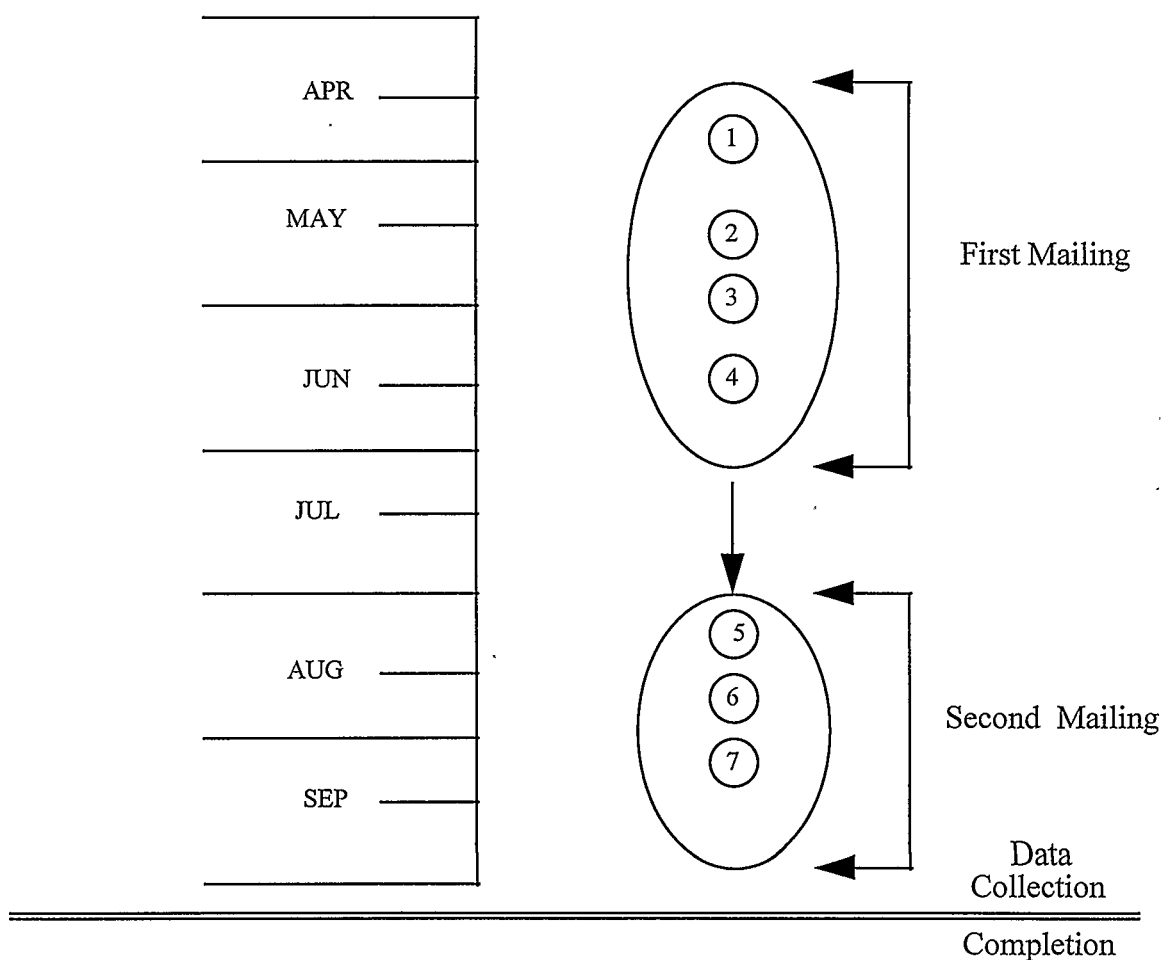


Table 4
Data Collection Task List

Item	Date		Description
	April	26	Mailout #1
1	April	26	Error notification
2	May	17	First mail remainder for Mailout #1
3	May	22	First telephone contact for Mailout #1
4	June	16	Second telephone contact for Mailout #1
	August	10	Mailout #2
5	August	23	First mail reminder for Mailout #2
6	August	30	First telephone contact for Mailout #2
7	September	06	Second telephone contact for Mailout #2
	September	30	Survey completion

Data Handling

Data were initially entered into the database using a dual-entry system EPI Info Version 6.02 and transferred to SPSS/PC for data analysis. Subsequent data were entered into SPSS/PC (Dean, Dean, Burton, & Dicker, 1994; Norusis & SPSS Inc., 1993). All the data were again reviewed by the investigator and an assistant looking for data entry and transfer errors. Initial data cleaning was done during data entry by setting boundaries on the acceptable range of responses for a given variable. After the data were transferred to SPSS/PC (Norusis & SPSS Inc., 1993), each case was again reviewed by the investigator and an assistant. The data were cleaned further using frequencies and cross-tabulations to look for outliers and possible errors in data entry. Where a discrepancy was found, the original questionnaire was consulted. Responses to open-ended questions were reviewed and numerically coded by hand.

Physicians who reported not treating patients with atrial fibrillation were excluded from the main analysis. The proportion of physicians participating was compared to the initial randomly selected sample and to the non-respondents. Frequencies and histograms were employed to assess the distribution of responses for all variables. P-values and 95% confidence intervals are reported for descriptive purposes. Because this is a descriptive, hypothesis-generating study, the cut point for a meaningful association was a p-value less than 0.10. The scales measuring physicians' beliefs and perceptions of probable outcomes were collapsed into dichotomous variables of agree/disagree. The respondents who were "undecided" were excluded from the scale. Physician characteristics were described initially by specialty (generalists, internists, and cardiologists). The groups were then collapsed to generalists (general practitioners) and specialists (internists and cardiologists).

Data Analysis

Descriptive statistics using proportions, means, and standard deviations describe and summarize relevant biographical and demographic characteristics of the sample. Family and general practitioners were identified separately because of a differential educational process. However, because of the small sample size the two groups were combined for all analyses and identified as generalists. Internists and cardiologists were identified separately and subsequently combined and identified as specialists.

To test if there is a difference between generalists and specialists in the general management of stroke prevention for atrial fibrillation, the z-statistic was used. This demonstrated relationships between the use of antithrombotic therapy and physician specialty. The EpiInfo 6.0 'statcalc' program was used for calculating X^2 tests with continuity correction when expected cell values fell below five, and then Fisher's exact test was used.

For research question 1, the dependent variable was the physician's choice of antithrombotic therapy for the two hypothetical case scenarios. The independent variables for this research question were the type of physician: general practitioner, internist, or cardiologist. The independent variable groups were further collapsed into generalists (general practitioners) and specialists (internists and cardiologists).

For research question 2 and 3, the dependent variables were the physician's drug choice to treat patients with atrial fibrillation to prevent stroke. The independent variables for these research questions were the corresponding beliefs and perceptions of probable outcomes for 14 variables exploring potential benefits, potential risks, and patient and physician considerations.

For research question 4, the dependent variables were stratified by patient gender on beliefs, perceived outcomes, and choice of drug. The gender of the patient versus the choice of drug selected by the physicians was examined. The independent variables for this research question were the gender of the patient, the sociodemographic characteristics of the physicians, the speciality of the physician, and the geographic setting from where patients may access their medical care. The setting from where patients seek medical care was inferred from the data about the population of the city or town from where physicians reported practicing medicine. Within Southern Alberta, Calgary is the only city that has a population $\geq 250,000$. Cities with intermediate populations (50,000 - 249,999) included Drumheller, Lethbridge, Medicine Hat, and Red Deer. Cities with intermediate populations and towns from which respondents practiced medicine were thought to manage a large proportion of patients from surrounding rural areas. Thus, the rural setting was defined by the researcher as physicians reporting their medical practice resided in a city or town with a population $\leq 249,999$. The purpose of the rural and urban definition was to attempt to characterize the differences in practice patterns between physicians managing patients from a rural setting and from an urban setting. Correspondingly, the urban setting was defined as respondents reporting that their medical practice resided in a city with a population $\geq 250,000$.

The proportion of physicians' responses varied between each of the 14 outcomes and their beliefs and each of the 14 outcomes and their likelihood scores. Thus, missing responses were dropped and proportions calculated based on the number of respondents.

Only associations with p-values less than 0.10 were reported for descriptive purposes.

Ethical Considerations

The purpose and procedures of the study were explained to participants in a covering letter (Appendix A). Although no direct risks or benefits to individual practitioners were foreseen, the benefits to physicians in general were included. The introductory letter was worded as a request to participate. The option of non-participation was explicit. Consent was indicated by the return of the questionnaire. Non-participation was indicated by return of the refusal notification form, or notification of the investigator by telephone.

Questionnaires were coded to maintain confidentiality. A separate computer file contains subjects' names and codes that will be destroyed at the completion of data analysis. Once entered, the original data forms were stored in a locked cabinet, maintained by the investigator. Data were analyzed by code number only. Results are reported as aggregate data only. The project received ethical approval from the Conjoint Ethics Board of the University of Calgary.

Chapter IV. Results

The first section of this chapter reports the proportions of ineligible subjects, eligible non-respondents, and the overall response rates. In the second section characteristics of the eligible respondents are outlined. The most frequently reported choices of antithrombotic therapy, and the antithrombotic therapy choices for the two hypothetical cases are also outlined in this section. The relationships between beliefs and perceptions of probable outcomes for an elderly female patient are provided in the third section, and the following section outlines those same relationships for the elderly male patient. The relationship of demographic variables such as specialty, geography and number of patients with atrial fibrillation seen per month within the practice for the two hypothetical case scenarios are examined in the final section.

Ineligible Subjects, Refusals, and Response Rates

The overall response rates are outlined in Table 5. The overall response rate was 71.3%; however, response rates differed by specialty. Generalists (65.9%) had a somewhat lower response rate than internists (75.9%) and cardiologists (88.9%). The ineligible subjects and the corresponding response rates by speciality are provided in Table 6. A total of 85 of the 308 physicians (28%) were considered ineligible to participate in the study, because they reported not managing patients with atrial fibrillation in their practice or could not be contacted. Physicians completing the questionnaire who reported not managing patients with atrial fibrillation in their practice were considered ineligible and were excluded from the main analyses. The refusal rates of eligible subjects are provided in Table 7.

Table 5
Response Rates

	Generalists (<u>n</u> =138)		Internists (<u>n</u> =58)		Cardiologists (<u>n</u> =27)	
	n	%	n	%	n	%
Respondents	91	65.9	44	75.9	24	88.9
Overall Response Rate	159/223 = 71.3%					

n = Number of eligible subjects mailed questionnaires

Table 6
Ineligible Subjects

Reason for Ineligibility	Generalists (<u>n</u> =193)		Internists (<u>n</u> =87)		Cardiologists (<u>n</u> =28)	
	n	%	n	%	n	%
Do not treat patients with fibrillation	41	21.2	23	26.4	0	0.0
No contact	11	5.7	1	1.2	0	0.0
Retired/Semi-retired	3	1.6	5	5.8	1	3.6
	55	28.5	29	33.3	1	3.6

n = Number of subjects mailed questionnaires

Table 7
Eligible Subjects - Refusal Rates

Reason for Refusal	Generalists (<u>n</u> =138)		Internists (<u>n</u> =58)		Cardiologists (<u>n</u> =27)	
	n	%	n	%	n	%
Too busy	26	18.8	11	19.0	3	11.1
Refused participation	15	10.9	3	5.2	0	0.0
Offended by the survey	4	2.9	0	0.0	0	0.0
Receives too many surveys/too long	4	2.9	0	0.0	0	0.0
	49	35.5	14	24.2	3	11.1

n = Number of eligible subjects mailed questionnaires

Characteristics of Non-Respondents

A total of 66 of the 223 eligible physicians (30%) chose not to participate. The reasons cited for not participating are outlined in Table 7. The main reason cited for not participating across both specialties was being too busy. However, some of the respondents were offended by the survey as noted by their open-ended responses and are described in the discussion.

The demographic characteristics of eligible non-respondents are provided in Table 8. Of the non-respondents, 71.2% were men. Physicians who chose not to participate had been practising medicine somewhat longer than respondents (19.3 ± 7.2 years versus 18.5 ± 9.2 years). The majority of respondents and non-respondents practised medicine in cities with a population of 50,000 or more (81.3% versus 83%).

Table 8
Characteristics of Eligible Non-Respondents

	Generalists (<u>n</u> =43)		Internists (<u>n</u> =13)		Cardiologists (<u>n</u> =3)		All Non-Respondents (<u>n</u> =59)	
	n	%	n	%	n	%	n	%
Male Gender	30	69.8	9	69.2	3	100.0	42	71.2
Country of Graduation								
Canada	32	74.4	8	61.5	3	100.0	43	72.9
UK/Ireland	2	4.7	0	0.0	0	0.0	2	3.4
Other	9	20.9	5	38.5	0	0.0	14	23.7
Year of Graduation from Medical School								
≤ - 1960	0	0.0	1	7.7	0	0.0	1	1.7
1961 - 1970	7	16.3	5	38.5	0	0.0	12	20.3
1971 - 1980	26	60.4	5	38.5	3	100.0	34	57.6
≥ - 1981	10	23.3	2	15.4	0	0.0	12	20.3
Size of Population Where Practice Located								
< - 10,000	11	25.6	0	0.0	0	0.0	11	18.6
50,000 - 249,999	9	20.9	4	30.8	0	0.0	13	22.0
≥ - 250,000	23	53.5	9	69.2	3	100.0	35	59.3
Mean Years Since Graduation	18.5 ± 6.7		23.2 ± 8.3		19.8 ± 3.3		19.3 ± 7.2	

n = Number of subjects mailed questionnaires

Characteristics of Eligible Respondents

The characteristics of eligible respondents by their speciality are outlined in Table 9. The majority of respondents were male (76.1%). Overall the average age of respondents was 43.7 ± 8.7 years. Generalists were younger (42.7 ± 8.1 years) than internists (45.1 ± 9.8 years) and cardiologists (45 ± 8.2 years). The majority of respondents graduated in Canada (78.6%). Only a small proportion of generalists had a confirmed university appointment (12.2%), while most internists (63.6%) and almost all the cardiologists (95.8%) had a confirmed university appointment. The majority of respondents worked full-time (88%). The predominant type of practice for respondents was working in a shared office or group setting (61.0%). However, more internists than generalists or cardiologists reported practising alone. Most respondents practised medicine in an urban setting with a population greater than 50,000 (83%). All of the cardiologists practised medicine in a large urban setting. Respondents had an average of 18.6 ± 9.2 years of experience in medicine. Generalists had been practising medicine on average a shorter time than internists (17.4 ± 8.5 years versus 20.6 ± 10.7 years).

Table 9
Characteristics of Eligible Respondents

	Generalists (<u>n</u> =91)		Internists (<u>n</u> =44)		Cardiologists (<u>n</u> =24)		All Respondents (<u>n</u> =159)	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Male Gender	63	69.2	37	84.1	21	87.5	121	76.1
Country of Graduation								
Canada	72	79.1	31	70.5	22	91.7	125	78.6
USA	0	0.0	1	2.3	0	0.0	1	0.6
UK/Ireland	13	14.3	4	9.1	0	0.0	17	10.7
Other	6	6.6	8	18.2	2	8.3	16	10.1
Current Practice - Full Time	79	86.8	40	90.9	21	87.5	140	88.1
Current Practice								
Shared office or group	59	64.8	18	40.9	20	83.3	97	61.0
Practice alone	8	8.8	16	36.4	1	4.2	25	15.7
Practice alone, frequent discussions with other colleagues	13	14.3	2	4.6	0	0.0	15	9.4
Walk in clinic	2	2.2	0	0.0	0	0.0	2	1.3
Other	9	9.9	8	18.2	3	12.5	20	12.6
Size of Population Where Practice was Located								
< - 10,000	18	19.8	2	4.6	0	0.0	20	12.6
10,000 - 49,999	5	5.5	2	4.6	0	0.0	7	4.4
50,000 - 249,999	9	9.9	11	25.0	0	0.0	20	12.6
≥ - 250,000	59	64.8	29	65.9	24	100.0	112	70.4
Mean Years Since Graduation	17.4 ± 8.5		20.6 ± 10.7		19.2 ± 8.7		18.6 ± 9.2	

n = Number of physicians who responded

General Management of Atrial Fibrillation

In Table 10 the number of patients with atrial fibrillation that generalists and specialists managed in their practice per month are outlined. Over one-third (36.5%) of the physicians saw 1 - 4 patients with atrial fibrillation per month, and another 51% of the physicians reported seeing 5 - 14 patients with atrial fibrillation per month. A slightly larger proportion of generalists reported seeing 1 - 9 patients with atrial fibrillation in their practice (71.5%) than did specialists (64.7%). However, the same proportion (80%) of both the generalists and specialists reported seeing 1 - 9 elderly patients (>80 years) with atrial fibrillation per month.

The general management of stroke prevention for atrial fibrillation was assessed by asking respondents what antithrombotic medication they most frequently used to treat patients with atrial fibrillation. Table 11 outlines the most frequently chosen antithrombotic medications for patients with atrial fibrillation. The majority of physicians chose warfarin (81.1%) using an international normalized ratio (INR) ranging from 1.5 to 3 times the reference or control (79.9%) for the general management of stroke prevention with atrial fibrillation. Generalists reported using warfarin for stroke prevention less often than did specialists ($p=0.09$). Correspondingly, specialists less often used ASA ($p=0.02$). None of the physicians chose ticlopidine as a medication they most frequently used to treat patients with atrial fibrillation for stroke prevention.

Table 10
Number of Patients Seen with Atrial Fibrillation (AF) Per Month

	Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		All Physicians (<u>n</u> =159)	
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Patients (All Ages) Seen With AF						
1 - 4	40	44.0	18	26.5	58	36.5
5 - 9	25	27.5	26	38.2	51	32.1
10 - 14	15	16.5	15	22.1	30	18.9
15 - 20	2	2.2	4	5.9	6	3.8
≥ - 21	5	5.5	4	5.9	9	5.7
Do not know	4	4.4	1	1.5	5	3.1
Patients Ages ≥ 80 Years Seen With AF						
None	17	18.7	4	5.9	21	13.2
1 - 4	55	60.4	50	73.5	105	66.0
5 - 9	12	13.2	10	14.7	22	13.8
15 - 20	1	1.1	0	0.0	1	0.6
≥ - 21	1	1.1	1	1.5	2	1.3
Do not know	4	4.4	3	4.4	7	4.4

n = Number of physicians who responded

Table 11
Most Frequently Chosen Antithrombotic Therapy

Therapy Chosen	Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		All Physicians (<u>n</u> =159)		z	CI ₉₅	p
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%			
None	2	2.2	1	1.5	3	1.9	0.0	-0.05-0.05	1.00
Warfarin	69	75.8	60	88.2	129	81.1	1.71	-0.01-0.25	0.09*
Intensity (INR)^a									
1.0 - 1.5 times control	6	6.6	4	5.9	10	6.3			
1.5 - 2.0 times control	32	35.2	31	45.6	63	39.6			
2.0 - 3.0 times control	37	40.7	27	39.7	64	40.3			
ASA	15	16.5	3	4.4	18	11.3	2.30	0.02-0.23	0.02*
Dose									
325 mg	10	11.0	2	2.9	12	7.5			
650 mg	2	2.2	0	0.0	2	1.3			
975 mg	1	1.1	0	0.0	1	0.6			
1300 mg	0	0.0	1	1.5	1	0.6			
Combination therapy	7	7.7	2	2.9	9	5.7	0.99	-0.03-0.13	0.32
Ticlopidine	0	0.0	0	0.0	0	0.0			

* $p \leq 0.1$

^a INR = International Normalized Ratio

n = Number of physicians who responded

Drug Choice for a Hypothetical Elderly Female Patient

The antithrombotic therapy chosen for a hypothetical elderly female with a history of congestive heart failure and hypertension is outlined in Table 12. Most respondents (67.9%) selected warfarin as the drug of choice for stroke prevention. Generalists were less likely to choose warfarin for the elderly female patient than were specialists ($p=0.07$).

Table 12
Antithrombotic Therapy Chosen for an Elderly Female Patient

Therapy Chosen	Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		Physicians (<u>n</u> =159)		z	CI ₉₅	p
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%			
None	2	2.2	1	1.5	3	1.9			
Warfarin	56	61.5	52	76.5	108	67.9	1.84	-0.004-0.304	0.066*
Intensity (INR)^a									
0.0 - 0.5 times control	1	1.1	0	0.0	1	0.6			
1.0 - 1.5 times control	5	5.5	4	5.9	9	5.7			
1.5 - 2.0 times control	28	30.8	28	41.2	56	35.2			
2.0 - 3.0 times control	24	26.4	20	29.4	44	27.7			
ASA	27	29.7	14	20.6	41	25.8	1.10	-0.0579-0.238	0.27
Dose									
80 mg	2	2.2	1	1.5	3	1.9			
162 mg	1	1.1	0	0.0	1	0.6			
325 mg	17	18.7	10	14.7	27	17.0			
650 mg	3	3.3	0	0.0	3	1.9			
975 mg	1	1.1	0	0.0	1	0.6			
1300 mg	0	0.0	1	1.5	1	0.6			
Combination therapy	1	1.1	0	0.0	1	0.6			
Ticlopidine	4	4.4	2	2.9	6	3.8	0.0	-0.06-0.08	1.00

* $p \leq 0.1$

^a INR = International Normalized Ratio

n = Number of physicians who responded

Drug Choice for a Hypothetical Elderly Male Patient

The antithrombotic therapy chosen by physician speciality for an elderly male patient scenario is outlined in Table 13. The majority of respondents (71.1%) specified warfarin as the drug of choice for stroke prevention for an elderly male patient with a history of myocardial infarction and hypertension. Similar to the drug choice they made for the elderly female patient, generalists were less likely to choose warfarin than specialists ($p=0.07$). The proportion of respondents who selected warfarin as the drug of choice for stroke prevention for an elderly male patient (71.1%) was slightly higher than the proportion who chose warfarin for the elderly female patient scenario (67.9%, see Table 12). A slightly larger proportion of generalists chose warfarin for the male patient scenario (67%) than the female patient scenario (61.5%, see Table 12). A similar proportion of specialists (76.5%) chose warfarin for both case scenarios. Generalists were more likely to select ASA for the elderly male patient case scenario than were specialists ($p=0.04$).

Table 13
Antithrombotic Therapy Chosen for an Elderly Male Patient

Therapy Chosen	Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		All Physicians (<u>n</u> =159)		z	CI ₉₅	p
	<u>n</u>	%	<u>n</u>	%	<u>n</u>	%			
None	2	2.2	1	1.5	3	1.9			
Warfarin	61	67.0	52	76.5	113	71.1	1.20	-0.052-0.252	0.23
Intensity (INR)^a									
1.0 - 1.5 times control	4	4.4	5	7.4	9	5.7			
1.5 - 2.0 times control	24	26.4	27	39.7	51	32.1			
2.0 - 3.0 times control	34	37.4	24	35.3	58	36.5			
ASA	25	27.5	9	13.2	34	21.4	2.08	0.015-0.285	0.04*
Dose									
63 mg	1	1.1	0	0.0	1	0.6			
80 mg	0	0.0	1	1.5	1	0.6			
100 mg	0	0.0	1	1.5	1	0.6			
162 mg	1	1.1	0	0.0	1	0.6			
325 mg	17	18.7	5	7.4	22	13.8			
650 mg	2	2.2	0	0.0	2	1.3			
Combination therapy	1	1.1	4	5.9	5	3.1	1.33	-0.023-0.123	0.18
Ticlopidine	0	0.0	1	1.5	1	0.6			

* $p \leq 0.1$

^a INR = International Normalized Ratio

n = Number of physicians who responded

Stroke Prevention for an Elderly Female Patient

As drug choice varied by specialty, the analysis of beliefs and perceptions of probable outcomes for generalists and specialists are presented separately. As previously outlined in Table 12, warfarin was chosen by a total of 61.5% of generalists and 76.5% of specialists. ASA was chosen by 29.7% of generalists and 20.6% of specialists for the management of stroke prevention for a specific (albeit hypothetical) elderly female patient.

Beliefs about Warfarin and ASA for an Elderly Female Patient

The generalists' and specialists' beliefs of variables that achieved statistical significance with a p-value less than 0.1 are outlined in Tables 14 and 15. Among generalists, five outcomes were associated with drug choice (Table 14). Generalists who chose warfarin for stroke prevention had two significantly associated potential risks: the patient may have a subarachnoid hemorrhage and the treatment may increase the risk of hemorrhage. In contrast, the generalists who chose ASA for stroke prevention believed that the two significantly associated potential risks were that the patient may have a stroke and the patient may have a GI bleed. Both generalists and specialists (Tables 14 and 15) who chose warfarin for stroke prevention believed that the treatment may require medication adjustments. Variables that did not achieve statistical significance with a p-value less than 0.1 are outlined in Appendix F, Tables F1 and F2.

Table 14
Generalists' Beliefs about Warfarin and ASA: Elderly Female Patient

		Warfarin (<u>n</u> =56)		ASA (<u>n</u> =27)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a stroke	A	26	46.4	16	59.3	0.26	0.06-0.97	0.04*
	D	25	44.6	4	14.8			
	U	5	8.9	7	25.9			
Patient may have a GI bleed	A	34	60.7	19	70.4	0.22	0.02-1.14	0.09*
	D	16	28.6	2	7.4			
	U	6	10.7	6	22.2			
Patient may have a subarachnoid hemorrhage	A	29	51.8	5	18.5	5.41	1.45-22.43	0.008*
	D	15	26.8	14	51.9			
	U	12	21.4	8	29.6			
Treatment may increase the risk of hemorrhage	A	48	85.7	17	63.0	8.47	1.31-90.42	0.01*
	D	2	3.6	6	22.2			
	U	6	10.7	4	14.8			
Treatment may require medication adjustments	A	54	96.4	14	51.9	42.43	5.10-1858.28	0.0*
	D	1	1.8	11	40.7			
	U	1	1.8	2	7.4			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table 15
Specialists' Beliefs about Warfarin and ASA: Elderly Female Patient

		Warfarin (<u>n</u> =52)		ASA (<u>n</u> =14)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Treatment may require medication adjustments	A	51	98.1	6	42.9	68.00	6.48-3071.01	0.0*
	D	1	1.9	8	57.1			
	U	0	0.0	0	0.0			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Perceptions of Probable Outcomes of Prescribing Warfarin and ASA for an Elderly Female Patient

The generalists' and specialists' perceptions of probable outcomes that achieved statistical significance with a p-value less than 0.1 for an elderly female patient with atrial fibrillation are provided in Tables 16 and 17. Generalists who chose ASA felt it was likely that the patient may have a stroke, whereas there were no statistically significant variables among specialists who chose ASA. Both generalists and specialists who chose warfarin felt it was likely that the treatment may increase the risk of subarachnoid hemorrhage. However, specialists who chose warfarin also felt it was likely that the patient may fall and have a serious injury and that the patient may report bruising. Specialists felt it was likely that the treatment may require medication adjustments. Variables that did not achieve statistical significance with a p-value of less than 0.1 differed by specialty, and are outlined in Appendix F, Tables F3 and F4.

Table 16
Generalists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA:
Elderly Female Patient

		Warfarin (<u>n</u> =56)		ASA (<u>n</u> =27)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a stroke	A	14	25.0	16	59.3	0.13	0.03-0.49	0.0009*
	D	33	58.9	5	18.5			
	U	9	16.1	6	22.2			
Treatment may increase the risk of hemorrhage	A	45	80.4	16	59.3	16.88	1.76-792.78	0.0037*
	D	1	1.8	6	22.2			
	U	10	17.9	5	18.5			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table 17
Specialists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA:
Elderly Female Patient

		Warfarin (<u>n</u> =52)		ASA (<u>n</u> =14)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a subarachnoid hemorrhage	A	19	36.5	2	14.3	4.54	0.82-46.04	0.10*
	D	23	44.2	11	78.6			
	U	9	17.3	1	7.1			
Patient may fall and have a serious injury	A	27	51.9	5	35.7	3.74	0.88-16.88	0.07*
	D	13	25.0	9	64.3			
	U	11	21.2	0	0.0			
Patient may report bruising	A	41	78.9	10	71.4	4.10	0.63-25.58	0.08*
	D	4	7.7	4	28.6			
	U	6	11.5	0	0.0			
Treatment may require medication adjustments	A	50	96.2	2	14.3	225.0	14.73-10019.68	0.0*
	D	1	1.9	9	64.3			
	U	0	0.0	3	21.4			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Stroke Prevention for an Elderly Male Patient

As outlined in Table 13, fewer generalists (67%) chose warfarin than did specialists (76.5%), although this was not statistically significant ($p=0.12$). A larger proportion of generalists (27.5%) chose ASA for stroke prevention for the elderly male patient than did specialists (13.2%), and this did achieve statistical significance ($p=0.04$).

Beliefs about Warfarin and ASA for an Elderly Male Patient

Generalists' and specialists' beliefs of variables that achieved statistical significance with a p -value less than 0.1 for an elderly male patient with atrial fibrillation are provided in Tables 18 and 19. Generalists who chose ASA believed that the elderly male patient may have a stroke. Generalists who chose warfarin believed that the elderly male patient may have a subarachnoid hemorrhage, that the patient may fall and have a serious injury, that the treatment may increase the risk of hemorrhage, and that the patient may live another 5 years. Both generalists and specialists who chose warfarin believed that the treatment may require medication adjustments. Holding beliefs similar to the findings for the elderly female patient, specialists regardless of drug choice (e.g., warfarin or ASA) had no strong associations for beliefs about potential risks for the elderly male patient. Variables that did not achieve statistical significance with a p -value less than 0.1 differed by specialty and are outlined in Appendix F, Tables F5 and F6.

Table 18
Generalists' Beliefs about Warfarin and ASA: Elderly Male Patient

		Warfarin (<u>n</u> =61)		ASA (<u>n</u> =25)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a stroke	A	31	50.8	18	72.0	0.20	0.03-0.81	0.02*
	D	26	42.6	3	12.0			
	U	3	4.9	4	16.0			
Patient may have a subarachnoid hemorrhage	A	31	50.8	6	24.0	4.82	1.37-18.14	0.01*
	D	15	24.6	14	56.0			
	U	14	23.0	5	20.0			
Patient may fall and have a serious injury	A	41	67.2	8	32.0	7.40	2.07-27.01	0.0008*
	D	9	14.8	13	52.0			
	U	10	16.4	4	16.0			
Treatment may increase the risk of hemorrhage	A	53	86.9	16	64.0	17.67	4.14-102.24	0.0*
	D	3	4.9	6	24.0			
	U	4	6.6	3	12.0			
Patient may live another 5 years	A	45	73.8	17	68.0	5.29	0.69-61.80	0.06*
	D	2	3.3	4	16.0			
	U	13	21.3	4	16.0			
Treatment may require medication adjustments	A	58	95.1	17	68.0	23.88	2.65-1094.05	0.00054*
	D	1	1.6	7	28.0			
	U	1	1.6	1	4.0			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table 19
Specialists' Beliefs about Warfarin and ASA: Elderly Male Patient

		Warfarin (<u>n</u> =52)		ASA (<u>n</u> =9)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Treatment may require medication adjustments	A	48	92.3	3	33.3	96.00	6.80-4494.84	0.0*
	D	1	1.9	6	66.7			
	U	1	1.9	0	0.0			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Perceptions of Probable Outcomes of Prescribing Warfarin and ASA for an Elderly Male Patient

The generalists' and specialists' perceptions that achieved statistical significance with a p-value less than 0.1 of probable outcomes of choosing warfarin or ASA for an elderly male patient with atrial fibrillation are provided in Tables 20 and 21. Generalists who chose ASA felt it was likely that the patient may have a stroke. Specialists who chose warfarin felt it was likely that the patient may have a subarachnoid hemorrhage. Both generalists and specialists who chose warfarin felt it was likely that the treatment may require medication adjustments. Variables that did not achieve statistical significance with a p-value of less than 0.1 differed by specialty, and are outlined in Appendix F, Tables F7 and F8.

Table 20
Generalists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA:
Elderly Male Patient

		Warfarin (<u>n</u> =61)		ASA (<u>n</u> =25)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a stroke	A	14	23.0	17	68.0	0.13	0.03-0.47	0.0008*
	D	32	52.5	5	20.0			
	U	12	19.7	3	12.0			
Treatment may require medication adjustments	A	57	93.4	14	56.0	28.50	30.8-1305.81	0.0003*
	D	1	1.6	7	28.0			
	U	0	0.0	4	16.0			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table 21
Specialists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA:
Elderly Male Patient

		Warfarin (<u>n</u> =52)		ASA (<u>n</u> =9)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a subarachnoid hemorrhage	A	24	46.1	1	11.1	8.40	0.92-393.98	0.05*
	D	20	38.5	7	77.8			
	U	4	7.7	1	11.1			
Treatment may require medication adjustments	A	44	84.6	1	11.1	154.00	9.55-7071.12	0.0*
	D	2	3.9	7	77.8			
	U	2	3.9	1	11.1			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Demographic Variables Related to the Elderly Patient with Atrial Fibrillation

Variables such as the physician's specialty, the geographical location of the physician's medical practice, and the familiarity of the physician with patients with atrial fibrillation may have an impact on the management of elderly patients with atrial fibrillation. These variables are examined in the sections below.

Patient Gender Differences of Treatment Choices by Specialty

Data were grouped by specialty regardless of drug choice and analyzed to describe beliefs and perceptions of probable outcomes about managing an elderly female patient as compared to an elderly male patient with atrial fibrillation. Tables 22 and 23 provide the generalists' versus specialists' beliefs about the elderly female and elderly male patient that achieved a statistical significance of less than 0.10. Tables F9 and F10 in Appendix F outline generalists' versus specialists' beliefs about the elderly female and elderly male patient that did not reach statistical significance.

Specialists' Beliefs for the Elderly Female and Elderly Male Patient. Tables 22 and 23 outline beliefs about variables that achieved statistical significance of less than 0.1 for the elderly female and elderly male patient. Specialists believed the potential risks for the both the elderly female and elderly male patient were that the patient may have a GI bleed and that the patient may report bruising.

Although the beliefs about variables outlined in Tables F9 and F10 did not achieve statistical significance, some interesting comparisons can be seen. For almost all the listed potential risks and considerations, a larger proportion of specialists than generalists believed potential risks may occur. However, a larger proportion of both generalists and specialists believed that the elderly female patient may live another five years than believed that of the

elderly male patient. Proportionately fewer generalists than specialists believed the elderly female and elderly male patient may live another five years.

Table 22
Generalists' versus Specialists' Beliefs: Elderly Female Patient

		Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a GI bleed	A	58	63.7	51	75.0	0.43	0.15-1.13	0.10*
	D	21	23.1	8	11.8			
	U	12	13.2	9	13.2			
Patient may report bruising	A	64	70.3	62	91.2	0.17	0.02-0.83	0.03*
	D	12	13.2	2	2.9			
	U	15	16.5	4	5.9			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table 23
Generalists' versus Specialists' Beliefs: Elderly Male Patient

		Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a GI bleed	A	53	58.2	53	77.9	0.32	0.11-0.82	0.02*
	D	25	27.5	8	11.8			
	U	10	11.0	5	7.4			
Patient may report bruising	A	67	73.6	58	85.3	0.18	0.02-0.84	0.03*
	D	13	14.3	2	2.9			
	U	8	8.8	5	7.4			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Generalists' and Specialists' Perceptions of Probable Outcomes for the Elderly Female and Elderly Male Patient. In Table 24 generalists' versus specialists' perceptions of probable outcomes about an elderly male patient that reached a statistically significant level of less than 0.1 are outlined. Specialists felt that the elderly male patient may have more risks than the elderly female patient, including the likelihood that the elderly male patient may fall and have a serious injury, and that the treatment may increase risk of hemorrhage. However, as outlined in Appendix F, Table F11, no variables for the elderly female patient reached statistical significance. Appendix F, Table F12 outlines generalists' versus specialists' perceptions of probable outcomes for an elderly male patient that did not reach statistical significance.

Table 24
Generalists' versus Specialists' Perceptions of Probable Outcomes: Elderly Male Patient

		Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may fall and have a serious injury	A	34	37.4	39	57.3	0.49	0.22-1.09	0.09*
	D	32	35.2	18	26.5			
	U	20	22.0	7	10.3			
Treatment may increase the risk of hemorrhage	A	61	67.0	56	82.4	0.22	0.04-0.84	0.03*
	D	15	16.5	3	4.4			
	U	10	11.0	5	7.4			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Relationship of Geographical Location and Drug Choice

All physicians who responded to the survey were included in this analysis. Physicians were grouped according to whether they managed patients from a rural setting or an urban setting. For this reason, the researcher identified the rural (population $\leq 249,999$) or urban setting (population $\geq 250,000$) within the geographical area where the physician practised medicine. Table 25 outlines the proportions of rural and urban physicians and the antithrombotic therapy the physician reported choosing most often. Regardless of the geographic locale of the medical practice, the most frequently chosen antithrombotic therapy was warfarin; 76.7% of the physicians practising in a rural setting, and 77.6% of physicians practising medicine in an urban setting chose warfarin as the most frequently chosen antithrombotic therapy. The second most frequently chosen antithrombotic therapy by physicians practicing in a rural setting was ASA. A larger proportion of them (23.4%) reported ASA as the most frequently chosen antithrombotic therapy, while combination therapy was the second most frequently chosen antithrombotic therapy by physicians practising medicine in an urban setting (12.5%).

Table 26 outlines the proportions of rural and urban physicians who chose either warfarin, ASA, combination therapy, ticlopidine or no antithrombotic therapy for an elderly female patient. The most frequently chosen antithrombotic therapy for the elderly female patient was warfarin, selected by a similar proportion of rural physicians (61.7%) and urban physicians (65.6%), followed by ASA. However, a smaller proportion of physicians chose warfarin for this hypothetical elderly female patient than reported it as their most frequently chosen antithrombotic therapy.

Table 27 outlines the proportion of rural and urban physicians and their corresponding choices for antithrombotic therapy for an elderly male patient. Both rural physicians (78.7%) and urban physicians (65.6%) chose warfarin for antithrombotic therapy for the elderly male patient. However, more rural physicians chose warfarin for the elderly male patient than chose it for the elderly female patient. Correspondingly, rural physicians chose ASA as an antithrombotic therapy less frequently for the elderly male patient than for the elderly female patient.

Table 25
Most Frequently Chosen Antithrombotic Therapy Selected by Geographical Setting
in Which the Medical Practice Resides

Therapy Chosen	Rural		Urban	
	(<u>n</u> =47)	%	(<u>n</u> =125)	%
None	1	2.1	3	2.4
Warfarin	36	76.6	97	77.6
ASA	11	23.4	11	8.8
Combination therapy	1	2.1	10	8.0
Ticlopidine	0	0.0	0	0.0

n = Number of respondents

Table 26
Antithrombotic Therapy Chosen for an Elderly Female Patient Selected by
Geographical Setting in Which the Medical Practice Resides

Therapy Chosen	Rural		Urban	
	(<u>n</u> =47)	%	(<u>n</u> =125)	%
None	1	2.1	2	1.6
Warfarin	29	61.7	82	65.6
ASA	16	34.0	32	25.6
Combination therapy	0	0.0	2	1.6
Ticlopidine	1	2.1	6	4.8

n = Number of respondents

Table 27
Antithrombotic Therapy Chosen for an Elderly Male Patient Selected by
Geographical Setting in Which the Medical Practice Resides

Therapy Chosen	Rural		Urban	
	(<u>n</u> =47)	%	(<u>n</u> =125)	%
None	1	2.1	2	1.6
Warfarin	37	78.7	82	65.6
ASA	9	19.2	30	24.0
Combination therapy	0	0.0	5	4.0
Ticlopidine	0	0.0	2	2.0

n = Number of respondents

Number of Patients Seen by Physicians

All physicians who responded to the survey were included in this analysis, and were aggregated by the number of patients with atrial fibrillation they saw in their practice per month. Physicians responding to the survey who reported not having patients with atrial fibrillation in their practice at the time of the survey were included in this analysis and grouped as "none." It is important to note that, in this study, for previous analyses of physicians' beliefs and perceptions of probable outcomes, the data from physicians who reported not managing any patients with atrial fibrillation in their practice were considered ineligible for the main analysis, but they have been included in this analysis to examine whether the number of patients a physician manages may influence beliefs and perceptions. Physicians who reported managing between one and nine patients with a diagnosis of atrial fibrillation per month were grouped as "few," and physicians who reported seeing ten or more patients per month with a diagnosis of atrial fibrillation were grouped as "several." Physicians who reported that they did not know (or did not answer the question) how many patients per month with atrial fibrillation they saw in their practice were excluded from this analysis. Only the two most commonly chosen antithrombotic therapies by physicians, warfarin and ASA, are reported.

Tables 28 to 30 outline three categories of the number of patients per month the physician reported managing, stratified by the choice of warfarin or ASA, regardless of specialty. The more patients per month the physician reported managing the larger the proportion of physicians selecting warfarin as the antithrombotic therapy most frequently chosen (Table 28).

In Table 29 the proportion of physicians, categorized by the number of patients with

atrial fibrillation per month they managed, selecting a particular antithrombotic therapy for a specific hypothetical elderly female patient are outlined. The antithrombotic drug of choice for an elderly female patient was warfarin. Physicians who reported not managing any patients with atrial fibrillation in their practice were almost equally likely to choose warfarin (47.1%) or ASA (38.2%) as antithrombotic therapy for an elderly female patient. A larger proportion of the physicians who reported managing a few patients per month (1-9 patients) with atrial fibrillation in their practice chose warfarin (68%). Likewise, an equally large proportion of physicians (66.7%) who reported managing several patients with atrial fibrillation per month (≥ 10 patients) chose warfarin. In general, however, regardless of the number of patients with atrial fibrillation per month, a smaller proportion of those physicians actually chose warfarin for antithrombotic therapy for an elderly female patient than reported it as their most frequent choice for antithrombotic therapy.

In Table 30 the number of patients with atrial fibrillation seen per month by physicians and the corresponding proportions of antithrombotic therapy chosen by those physicians for a specific hypothetical elderly male patient are outlined. Regardless of the number of patients with atrial fibrillation physicians managed per month, a similar proportion of physicians reported choosing warfarin as antithrombotic therapy for an elderly male patient.

In summary, regardless of the number of patients with atrial fibrillation the physician managed, a smaller proportion of physicians chose warfarin for the elderly female patient than for the elderly male patient. Likewise, regardless of the number of patients with atrial fibrillation the physician managed, a larger proportion of physicians reported warfarin as their most frequently chosen antithrombotic therapy than actually selected it when they were provided with a case scenario.

Table 28
Most Frequently Chosen Antithrombotic Therapy Selected by Number of Patients Managed Per Month with Atrial Fibrillation

	Warfarin		ASA	
	<u>n</u>	%	<u>n</u>	%
None	22/34	64.7	5/34	14.7
Few	102/128	79.7	16/128	12.5
Several	3/3	100.0	0/0	0.0

n = Number of respondents

Table 29
Antithrombotic Therapy Chosen for an Elderly Female Patient Selected by Number of Patients Managed Per Month with Atrial Fibrillation

	Warfarin		ASA	
	<u>n</u>	%	<u>n</u>	%
None	16/34	47.1	13/34	38.2
Few	87/128	68.0	34/128	26.6
Several	2/3	66.7	1/3	33.3

n = Number of respondents

Table 30
Antithrombotic Therapy Chosen for an Elderly Male Patient Selected by Number of Patients Managed Per Month with Atrial Fibrillation

	Warfarin		ASA	
	<u>n</u>	%	<u>n</u>	%
None	21/34	61.8	9/34	26.5
Few	91/128	71.1	28/128	21.9
Several	2/3	66.7	1/3	33.3

n = Number of respondents

CHAPTER V. Discussion

This study, conducted over a five-month period, surveyed 308 physicians licensed and practising medicine in Southern Alberta. The ultimate goal of this study was to obtain a better understanding of physicians' perceptions about prescribing antithrombotic therapy for elderly patients with atrial fibrillation. The chapter will begin by summarizing the main findings from this study. Next, response and participation among the specialty groups will be discussed. In the third section, the relationships between the most frequently reported antithrombotic therapies chosen will be contrasted to two case scenarios and to the published literature about antithrombotic therapy. The fourth section discusses the relationship between antithrombotic therapy and demographic factors. Finally, limitations and recommendations for further research will be suggested.

Summary of Findings

The primary purpose of this study was to determine if the choice of antithrombotic drug therapy for stroke prevention for elderly patients with atrial fibrillation differed by physician specialty. In addition, factors suggested in the literature that may influence the physicians' choice of antithrombotic therapy for an elderly patient with atrial fibrillation (gender of the patient, geographic location of the medical practice, and number of patients with atrial fibrillation currently being managed) were examined. The findings revealed that there were differences in physicians' choices of antithrombotic therapy for elderly patients with atrial fibrillation. Warfarin was reported as the most frequently chosen antithrombotic therapy; however, a smaller proportion of physicians actually chose warfarin when provided with a case scenario of an elderly patient with atrial fibrillation. Generalists reported more beliefs about potential risks when choosing warfarin than did specialists. Both generalists and specialists felt that prescribing warfarin to an elderly patient with atrial fibrillation may

require medication adjustments. Beliefs and perceptions of probable outcomes differed by medical specialty and by the gender of the patient. Generalists, regardless of gender of the patient, believed the potential risks of treatment for elderly patients with atrial fibrillation were that the patient may have a subarachnoid hemorrhage and that the treatment may increase the risk of hemorrhage. Generalists who chose warfarin believed that the elderly female patient may have potential risks of a subarachnoid hemorrhage and an increased risk of hemorrhage. Both generalists and specialists believed and perceived a probable outcome of prescribing warfarin was that the treatment may require medication adjustments. Generalists who chose warfarin felt it was likely that their treatment choice may increase the risk of hemorrhage. On the other hand, specialists who chose warfarin felt the elderly female patient was likely to have more potential risks including the potential for falls, a serious injury, and bruising.

Generalists who chose warfarin believed that the elderly male patient may have the following: subarachnoid hemorrhage, may fall and have a serious injury, and the treatment may increase the risk of hemorrhage. Generalists also believed that by prescribing warfarin the elderly male patient may live another five years. Both generalists and specialists believed and felt a probable outcome of prescribing warfarin was that the treatment may require medication adjustments. In contrast, specialists choosing warfarin felt it was likely the patient may have a subarachnoid hemorrhage. Generalists who chose ASA, regardless of the gender of the elderly patient with atrial fibrillation, felt the patient may have a stroke.

A larger proportion of rural physicians reported choosing warfarin for the elderly male patient than for the elderly female patient. Regardless of how many patients with atrial fibrillation the physicians managed in their practice, a smaller proportion of physicians chose

warfarin as antithrombotic therapy for the elderly female patient than for the elderly male patient. This preference was particularly marked for physicians who responded to the survey and were not managing patients with atrial fibrillation in their medical practice at the time of the survey. To further explain these findings mentioned above, a more detailed description will be discussed and outlined in the rest of this chapter.

Response and Participation

According to experienced social science researchers (Dillman, 1978, 1983; Dillman, Dillman, & Makela, 1984; Mullen et al., 1983) an overall response rate between 60 and 80% is expected when the total design method for conducting surveys is used. The overall response rate of this study was 71% and met the calculated sample size requirement and Dillman's (1978, 1983) predictions. This study had a differential response rate, with generalists having a lower response rate (65.9%) than cardiologists (88.9%). This may be attributed to the prevalence of atrial fibrillation and the general management of atrial fibrillation in cardiologists' practices and cardiologists' interest in the rhythm problem. The writer knew the cardiology group from previous work experiences, and this may have contributed to a higher response. Compared with the previously reported published studies of physicians' surveys about antithrombotic agents, this study's response rate surpassed four of the six studies (Bucknall et al., 1986; Chang et al., 1990; Kutner et al., 1991; McCrory et al., 1993), and had a comparable response rate to the other two (Dow & Bertagne, 1990; Taylor & Ramsey, 1993). A public listing directory such as the Alberta Medical Directory is an easily accessible means of acquiring names, addresses and telephone numbers of physicians. However, the directory is of limited use in offering a means of appropriately identifying the physician population who manage certain types of problems (such as patients

with atrial fibrillation). Computation of this study's response rate was based on the number of questionnaires returned divided by the number in the sample after those who were ineligible or unreachable had been subtracted. Other studies may use a very broad mailing list, not use eligibility criteria for looking at the true response rate, and then report their response rate based on returns of the survey alone rather than whether respondents were truly appropriate for the survey.

The overall non-response rate was 29%. Physicians as a group are frequently surveyed, and some (21.4%) reported that they were too busy in their practice to complete the survey. The survey may have been viewed as intrusive, as mentioned by four of the non-respondents. These physicians reported that they felt the information solicited was none of the researcher's business, and perceived the survey as an invasion by nurses of the role of the family physician in managing their patients.

Physicians are perceived to be a difficult group from which to acquire an acceptable response. However, in this study the researcher was able to obtain an acceptable response. This may be attributed to the timeliness of the question about managing elderly patients with atrial fibrillation, particularly because atrial fibrillation is a common problem. Furthermore, physicians may be aware that they will have to deal with this health problem more frequently as our population ages.

The researcher used Dillman's total design method for conducting survey research (Dillman, 1978, 1983). The premise of the total design method is based on the theory that people's actions are motivated by the return they expect to gain or elicit from others. Some sort of cost-reward balance is inherent. Theoretically, the person is motivated when the reward outweighs the cost. With this balance in mind, Dillman recommended that surveys

are more likely to be successful if the cost to the person is minimized, the reward is maximal, and trust is established that the reward will be delivered. Examples of techniques used in this survey illustrating Dillman's recommendations include positive regard in the letters sent to the physicians, appreciation communicated in writing and telephone contacts to physicians and their office personnel, and the social usefulness in describing how physicians perceive management of the elderly patient with atrial fibrillation. The tangible rewards used in this study were minimal. Respondents were told that they would receive a summary of the results of the study. A second (potentially more motivating) reward was a guarantee that there would be no further contact from the researcher once a response was returned. Costs to the respondents were minimized by using clear, concise questions, an interesting topic and self-addressed pre-stamped envelopes for returning the survey.

Physicians who chose not to participate in the survey had been practising medicine longer than respondents. This may be a cohort effect, in which physicians who graduated more recently may be more inclined to view survey research as a means of providing some insight into variations in practice standards, and thus be less inclined to take offense.

As previously mentioned, the initial mailing of the survey contained a critical typographical error. A number of respondents noted this in their completed questionnaires. Also, the researcher received a number of telephone inquiries about the error. Furthermore, the questions about beliefs and perceptions of probable outcomes of the 14 variables were reviewed for consistency in answers. Therefore, the typographical error was not felt to contribute to the non-response rate or to a discrepancy for the interpretation of the results.

Antithrombotic Choices: Similarities and Differences

Although there has long been consensus that patients with rheumatic mitral stenosis and atrial fibrillation should receive long-term anticoagulation therapy, the role of anticoagulation for patients with nonrheumatic atrial fibrillation has been more controversial. Recently six large clinical trials of anticoagulation in patients with nonrheumatic atrial fibrillation have all demonstrated significant reduction in stroke rates, with a small incidence of major bleeding complications, in patients with a large range of demographic and clinical characteristics. All six studies concluded that the benefits of anticoagulation outweighed the risks.

As the risk of intracranial hemorrhage with receiving oral anticoagulation increases with age, so does the risk of stroke. In patients over 75, the risk of stroke when not receiving oral anticoagulation appears to outweigh the risk of intracranial hemorrhage when receiving anticoagulants. (Atrial Fibrillation Investigators, 1994)

This study used two hypothetical case scenarios that would illustrate an elderly patient with atrial fibrillation and no obvious contraindications for anticoagulation therapy. Thus, based on the American College of Chest Physicians Consensus Conference on Antithrombotic Therapy recommendations for patients older than 75, oral anticoagulation is recommended because of these patients' high risk of stroke, but this must be balanced with a probable age-related increased risk of bleeding (Laupacis et al., 1995). The most appropriate drug choice for the two case scenarios would be warfarin.

Community physicians' decisions to anticoagulate and their anticoagulation practices have been found to vary widely (11.1% - 84.9%) with an apparent reluctance to anticoagulate large populations of patients (Bucknall et al., 1986; Chang et al., 1990; Dow & Bertagne, 1993; Kutner et al., 1991). Variations by specialty group in anticoagulation

practices have also been reported. Chang et al. (1990) reported that cardiologists were least likely, and family physicians most likely, to institute anticoagulation in patients with nonrheumatic atrial fibrillation. However, more contemporary studies have demonstrated an increase in physicians' willingness to prescribe antithrombotic therapy (Gottlieb & Salem-Schatz, 1994; McCrory et al., 1995). The overall results of this study indicated that the proportion of Southern Alberta physicians who would prescribe this therapy were higher than those reported by Bath et al. (1993), Bucknall et al. (1986), Chang et al. (1990), Dow and Bertagne (1993), Kutner et al. (1991), and McCrory et al. (1995). They were, however, less than those reported by Gottlieb and Salem-Schatz (1994). A total of 61.5% of generalists reported choosing warfarin for an elderly female patient. A slightly higher proportion of generalists (68.5%) chose warfarin for the elderly male patient. And, unlike the results in Chang et al. (1990), a larger proportion of specialists chose warfarin for both the elderly female and elderly male patient (76.5%) than did generalists. There may be various reasons for these differences, such as the time lapsed since the reporting and publication of the large clinical trial results. The case series-audit conducted by Gottlieb and Salem-Schatz (1994) was done in Boston, Massachusetts. Their study reported a high proportion of physicians were prescribing antithrombotic therapy (78.8%). However, the patients in their study were sicker; patients were less likely to have had their atrial fibrillation for one year or less and were much more likely to have had a previous stroke or transient ischemic attack. These risk factors are problems that would make a much more compelling case for physicians to prescribe antithrombotic therapy. However, it is not clear that higher proportions of physicians prescribed antithrombotic therapy for patients with recent-onset atrial fibrillation. Other factors to be considered are the recentness and frequency of exposure to other

physicians' utilization of antithrombotic therapy. The health maintenance organization used by Gottlieb and Salem-Schatz was located in the Boston area, the same locale where the BAATAF trial was conducted. This affiliation with a large multicenter clinical trial can have a positive influence on physicians' prescribing practices. As noted in this survey, prescribing antithrombotic therapy can vary by physician specialty. Both Gottlieb and Salem-Schatz (1994) and McCrory et al. (1995) only provided the total proportion of physicians who would prescribe antithrombotic therapy. Thus, these studies did not account for any variations among the physician specialties. The Canadian Registry of Atrial Fibrillation Investigators (Connolly et al., 1993) reported that the overall rate of anticoagulation use in Canada is low (28%) for patients with new-onset atrial fibrillation, but higher in some sub-groups with known risk factors for stroke (for example, 50% recurrent or chronic atrial fibrillation). Furthermore, the use of warfarin in the frail elderly with atrial fibrillation was recently reported (Monette, Gurwitz, Rochon, Eckler, & Avorn, 1995), and only 29.7% of institutionalized elderly patients with atrial fibrillation were receiving anticoagulation.

In this study, general practitioners reported referring patients with atrial fibrillation to specialists and subsequently following their recommendations. A referral to a specialist may somehow reduce or change the initial level of responsibility and concern that the general practitioners may have regarding decision-making and keeping current about the recent developments for anticoagulation management.

In the Gottlieb and Salem-Schatz (1994) study, long-term anticoagulation was managed by the patient's primary-care internist. In the present study, long-term anticoagulation management was not directly addressed; however, one of the respondents' open-ended statements indicated that usually the specialists initiate anticoagulation and then

the generalists follow their recommendations. From the researcher's clinical experience, it has been observed that the specialists who initiated anticoagulation therapy refer the patient back to their generalist for long-term anticoagulation follow-up.

This study's results suggest that the important recent medical literature regarding anticoagulation for elderly patients with atrial fibrillation has been accepted and theoretically would be put into practice by at least 60% of Southern Alberta general practitioners. Likewise, if general practitioners referred their elderly patients to a specialist, theoretically slightly more than three-quarters of elderly patients with atrial fibrillation with no obvious contraindications to antithrombotic therapy would receive warfarin therapy. However, in view of the published case series reporting low proportions of patients who are actually prescribed warfarin, this study's findings concerning the proportions of physicians who would actually prescribe warfarin for an elderly patient with atrial fibrillation needs to be interpreted with caution.

The drug-choice model was primarily used for the analysis of this study. The model was useful in describing how physicians managed patients with atrial fibrillation. In addition, this model has the potential for exploring the practice patterns of physicians in other practice settings.

Correlation Between Antithrombotic Therapy and Demographic Factors

Generalists and specialists selected varying antithrombotic therapies and had differing beliefs and perceptions of probable outcomes for the elderly female and elderly male patient. The location of the medical practice and the number of patients with atrial fibrillation the physician managed per month varied and are discussed next.

Beliefs and Perceptions of Probable Outcomes about Antithrombotic Choices

In this study, physicians' beliefs and perceptions of probable outcomes about the elderly female and male patients varied by specialty group and by the gender of the patient. Generalists who chose warfarin believed that the potential risks for the elderly female patient were that the patient may have a subarachnoid hemorrhage and the treatment may increase the risk of hemorrhage. Likewise, generalists believed that the treatment may require medication adjustments. Generalists who chose warfarin felt that a probable outcome for the elderly female patient was an increased risk of hemorrhage. On the other hand, specialists who chose warfarin had no statistically significant beliefs. However, specialists did feel that probable outcomes could include that the patient may have a subarachnoid hemorrhage, the patient may fall and have a serious injury, the patient may report bruising, and that the treatment may require medications adjustments. Both groups that chose warfarin felt that probable outcomes the elderly female patient would be exposed to were potential risks of hemorrhage and may require medication adjustments.

Generalists who chose warfarin for the elderly male patient believed that the patient may have a subarachnoid hemorrhage, the patient may fall and have a serious injury, and the treatment may increase the risk of hemorrhage. Generalists who chose warfarin believed that the elderly male patient may live another five years and that the treatment may require medication adjustments. These results corroborate Chang et al.'s (1990) illustrated differences in anticoagulation decisions suggesting that

physicians may use their past experience and knowledge to derive risks, which differ from one physician or one group to another. Perhaps cardiologists see more patients with atrial fibrillation that do not have emboli, or because general practitioners do follow-up and treat these patients for many years, they may be more emotionally impressed by witnessing embolic strokes from atrial fibrillation in their patients. (p. 86)

This study, as well as the reports by Chang et al. (1990), Kutner et al. (1991) and McCrory et al. (1995), disclosed a significant concern about risks for hemorrhage for the elderly patient with atrial fibrillation who is being treated with anticoagulants.

Antithrombotic Therapy, Gender Differences, and Geographic Location of Medical Practice

Previous research did not explore the relationship between the geographic location of a physician's medical practice and that physician's of prescribing antithrombotic therapy. This study found that a larger proportion of physicians who manage patients from rural settings chose warfarin for an elderly male patient with atrial fibrillation than for an elderly female patient with atrial fibrillation. No such disparity was noted among urban physicians, who prescribed treatments in the same proportions for both elderly males and elderly females. The researcher speculates that the rural/urban variations may be attributed to physicians in smaller centers having less opportunity for attending continuing medical education, or possibly not being aware of the current recommendations and potential benefits that antithrombotic therapy may provide elderly patients with atrial fibrillation for stroke prevention.

Patient gender differences for prescribing antithrombotic therapy have not previously been reported. Gottlieb and Salem-Schatz (1994) reported that in their study anticoagulated patients were slightly more likely to be male than female (67% vs 53%, $p < 0.05$). Pagley et al. (1993) reported on a study about gender differences in the treatment of patients with acute myocardial infarction. They found that there were no statistically significant differences seen between male and female patients with regard to the use of anticoagulants in the setting of an acute myocardial infarction. In the present case, the observed difference in proportions of physicians prescribing antithrombotic therapy by sex of the patient could

have been owing to the ordering of the case scenarios, or possibly because of another reason not addressed in the questionnaire. However, gender differences in relation to physicians' beliefs and perceptions of probable outcomes continue to differ in various exploratory analyses throughout this report; this included one physician's spontaneous comment noting that the elderly female patient scenario had not included an echocardiogram. Although gender differences in relation to antithrombotic therapy have not been explored, this is an area that could be explored in further research endeavours. It is speculated the differences in prescribing anticoagulation treatment to an elderly female patient as compared to an elderly male patient may be partially due to limited access for transportation for elderly women. Another possibility may be that physicians may perceive elderly women are more frail, thus contributing to a more conservative approach to their medical management. A third possibility may be that physicians may not be fully aware of the efficacy of warfarin for women.

Number of Patients Being Managed with Atrial Fibrillation

The management of atrial fibrillation is dependent on the number of patients with atrial fibrillation that physicians manage in their practice. The more often a physician sees or manages the problem, the more likely he or she is to be up-to-date on information about the topics and to feel comfortable with managing the problem. Likewise, the fewer elderly patients a physician manages, the less comfortable or willing the physician may be to deal with an elderly patient with atrial fibrillation. Cardiologists, neurologists, and primary-care physicians who did not use anticoagulant treatments for any patients with nonvalvular atrial fibrillation reported seeing significantly fewer patients with nonvalvular atrial fibrillation in the previous year than the rest of the respondents ($p < 0.05$) (McCrory et al., 1995). In the

present study slightly fewer than one-half of the physicians (47%) who reported not managing any patients with atrial fibrillation at the time of the survey chose warfarin for the elderly female patient but more than half (61.8%) chose warfarin for the elderly male patient. Physicians who saw "a few" patients as compared to physicians who saw "several" patients with atrial fibrillation in their practice were almost equally as likely to choose warfarin as antithrombotic therapy for both the elderly female and elderly male patient.

Antithrombotic Therapy and Work Load

Sudlow et al. (1995) reported that, without further resources, general practitioners feel unable to take on the additional work caused by the need to monitor patients receiving antithrombotic therapy (Shakespeare, 1994; Taylor & Ramsey, 1993). Both generalists and specialists who chose warfarin felt that the treatment may require medication adjustments. McCrory et al. (1995) reported that older age is associated with an exaggerated response to anticoagulant therapy, resulting in the requirement for closer monitoring and perhaps justifying the sentiment reported by surveyed physicians in the present study that "anticoagulation is more difficult in the elderly." The issue of additional work to manage anticoagulation was not addressed in this survey; however, general practitioners who conduct the majority of anticoagulation management voiced concerns about the additional work in their spontaneous comments as noted below:

"The time required to monitor all my patients on coumadin is quite a burden. Older patients often have difficulty getting into labs for PTs."

"Although warfarin therapy may be preferred, the expense and difficulty in following these patients (PTs, adjustments) causes one to rethink anticoagulation."

"If general practitioners were paid differently (i.e., on a 'capitation' or 'fee for comprehensive care' basis) we could better manage and delegate some of this time consuming care."

"Practical monitoring of anticoagulation is difficult, making warfarin management inconvenient and dangerous. Could home care be expanded to allow drawing of blood in the home?"

"My experience in the past one to two years is that cardiologists (i.e., my referral base) are somewhat more reluctant to use warfarin in the elderly (> 75 years) because of frequent dosage adjustments, compliance problems etc., and we, as general practitioners tend to follow their lead."

These statements highlight implications about the potential for nursing interventions such as nursing surveillance of patients taking warfarin, or nursing-based monitoring of anticoagulant therapy that may improve the present anticoagulation management circumstances.

Sudlow et al. (1995) reported that factors other than firm contraindications to warfarin -- such as compliance, cognitive function, disability, and quality of life -- are also likely to affect general practitioners' and patients' decisions about treatment. These factors could be accounted for using the drug-choice model. Based on the case scenarios, a large proportion of physicians in this survey felt that the elderly patient with atrial fibrillation may adhere to the prescribed therapy. Predictions of physicians' views have not been tested in the field (Caro, 1993). Sudlow goes on to say that patients' perceptions of inconvenience, risk and benefit are likely to have a major influence on the uptake of treatment. This statement is supported by the results of this study. A large proportion of physicians described the risks

for the patients. Although they were concerned about the inconvenience of the patient making several visits for blood draws, this group of physicians continued to report choosing warfarin for the elderly patient with atrial fibrillation rather than choosing a less potent antithrombotic agent (ASA) or choosing no antithrombotic therapy. These results imply that this physician group was willing to prescribe antithrombotic therapy to an elderly patient with atrial fibrillation. However, these findings must be interpreted with caution based upon some of the thoughtful unsolicited comments provided by respondents, as noted below:

"You have made an effort to describe other factors that would weigh in the decision making but not enough! How competent is the patient? Are they actually taking their medicines? What other illnesses do they have? How close to a hospital do they live? How forgetful are they? (A lot of people living independently really should not be!) Do they truly understand the risks/benefits of a drug treatment? - Would they faithfully to go for PT tests?... My decisions would include consideration of these factors."

"We need to have patients, when they are well informed re: efficacy of treatment, natural history of the disease (AF places them at higher risk for having a CVA) help us with this decision, e.g., yes, I want treatment, and yes I will comply with follow-up."

"I based these decisions in the elderly > 80 years on papers showing ASA is approximately 75% equal to coumadin in stroke prevention and the reduced risk of complications due to falls and injury with bleeding in the elderly. I remain cautious with anticoagulants in the elderly because of seeing lots of complications when they come in with fractured hips!"

" The reason for choosing ASA in Case #1 (elderly female patient) is because of age of the patient (80) and risk of falling."

"This is a difficult and controversial subject. Had your scenarios indicated the slightest contraindication to warfarin (I don't consider those levels of 'controlled hypertension' at that age to constitute a contraindication on grounds of hypertension). I would either have 'done nothing' (especially with cognitive impairment) or considered aspirin. My choices are coloured by a number of 'old-old', otherwise, very well subjects with AF who I have seen placed on warfarin without ill effect. My colleagues and the literature are certainly definite as to preventive prospects (albeit not yet in the very old)."

These statements highlight physicians concerns about initiating anticoagulation therapy in the elderly which has implications for the types of continuing medical education endeavours. The statements illustrate that some physicians use the age of the patient to influence their antithrombotic practices. Smaller, interactive workshops or case presentations conducted by content experts may assist physicians in addressing their concerns about using warfarin, and provide physicians an opportunity to interact with their colleagues.

Limitations

The following is a list of the limitations of this present study:

1. A misclassification of the physicians' specialty may exist. The medical directory that was used published only recognized specialties. Respondents may have other sub-specialty interests, or work in specialized areas such as emergency medicine, intensive care, rheumatology, and other cardiac sub-specialties; however, this level of detail could not be ascertained. Therefore, physicians who were mailed the questionnaire could choose not to participate if the survey did not pertain to their medical practice.

2. Because the majority of physicians who were surveyed were educated in Canada, the results may not be generalizable to other geographically diverse areas such as the United States.
3. Definitions about "beliefs" and "perceptions of probable outcomes" that were adapted from the literature were outlined in the study. There may have been some confusion concerning each physician's interpretation of these terms based upon their own beliefs about managing patients with atrial fibrillation that could have influenced their responses. Therefore, the variation of interpretation of these terms may have influenced the findings of the potential risks, benefits, patient-related and physician-related considerations.
4. There may be errors in the reported number of patients with atrial fibrillation they managed as each physician based their estimation for this response on recall. However, there is no reason to believe physicians would make overestimates or underestimates of the number of patients with atrial fibrillation they managed.
5. Physicians were classified into those that practiced in a rural or urban setting, which was based upon the population of the city or town where the physicians' medical practice resided. As a result, there may have been rural patients managed in the urban setting, which would then influence the overall findings for the two settings.
6. This study is limited by inadequate sample sizes that leave it open to missing important differences between groups. A small study, even if it shows a difference between groups, is likely to be associated with a confidence interval that is so wide that the most important variables in antithrombotic

therapy choice will remain open to question (Cook, Guyatt, Laupacis, Sackett, & Goldberg, 1995).

Recommendations for Further Research

Based upon the findings of this study, the following recommendations for further research in this area have been derived:

1. A national survey examining regional patterns of antithrombotic practices and examining variations in actual implementation of practice guidelines through professional associations could further support the findings of this study.
2. In future studies the use of the Dillman total design method or similar techniques should be considered to enhance response rates dealing with health care professionals.
3. Research exploring social marketing techniques for the incorporation of recommended guidelines could further the appropriate advancements in health care.
4. Research exploring other health care professionals' (such as nurses) knowledge, beliefs and attitudes about the management of patients with atrial fibrillation may enhance the awareness of the importance of using antithrombotic therapy in patients with atrial fibrillation.
5. A prospective case-series study examining which physician group initiates anticoagulation therapy may assist in targeting educational endeavours to enhance the prescribing of antithrombotic therapy.
6. Further testing of the drug-choice model could assist in describing the cognitive and critical thinking elements of decision-making around other prescribing practices.

References

- Ajzen, I., & Fishbein, M. (1980). Understanding attitudes and predicting social behaviour. Englewood Cliffs, NJ: Prentice-Hall.
- Alberts, M. J., Dawson, D. V., & Massey, E. W. (1994). A follow-up survey of clinical practices for the use of heparin, warfarin, and aspirin. Neurology, 44, 618-621.
- Anderson, D. C. (1991). Cardioembolic stroke: primary and secondary prevention. Postgraduate Medicine, 90(8), 67-72, 77.
- Atrial Fibrillation Investigators: Atrial Fibrillation, Aspirin, Anticoagulation Study; Boston Area Anticoagulation Trial for Atrial Fibrillation; Canadian Atrial Fibrillation Anticoagulation Study; Stroke Prevention in Atrial Fibrillation Study; Veterans Affairs Stroke Prevention in Nonrheumatic Atrial Fibrillation Study (1994). Risk factors for stroke and efficacy of antithrombotic therapy in atrial fibrillation. Archives of Internal Medicine, 154, 1449-1457.
- Bandura, A., Jeffery, R. W., & Gajdos, E. (1975). Generalizing change through participant modelling with self-directed mastery. Behaviour Research & Therapy, 13(2-3), 141-152.
- Bath, P. M. W., Prasad, A., Brown, M. M. & MacGregor, G. A. (1993). Survey of use of anticoagulation in patients with atrial fibrillation. British Medical Journal, 307:1045.
- Besdine, R. W. (1993). Stroke prevention in the elderly. Connecticut Medicine, 57(5), 287-292.
- Black, J. S., Sefcik, T., & Kapoor, W. (1990). Health promotion and disease prevention in the elderly. Comparison of house staff and attending physician attitudes and practices. Archives of Internal Medicine, 150(2), 389-393.

Bonita, R. (1992). Epidemiology of stroke. Lancet, 339, 342-344.

*Boston Area Anticoagulation Trial for Atrial Fibrillation Investigators. (1990). The effect of low-dose warfarin on the risk of stroke in patients with nonrheumatic atrial fibrillation. New England Journal of Medicine, 323, 1505-1511.

Bucknall, C. A., Morris, G. K., & Mitchell, J. R. A. (1986). Physicians' attitudes to four common problems: hypertension, atrial fibrillation, transient ischaemic attacks, and angina pectoris. British Medical Journal, 293, 739-742.

Caro, J. J., Groome, P. A., & Flegel, K.M. (1993). Atrial fibrillation and anticoagulation: from randomised trials to practice. Lancet, 341, 1381-1384.

Chang, H. J., Bell, J. R., Deroo, D. B., Kirk, J. W., Wasson, J. H., & Dartmouth Primary Care COOP Project. (1990). Physician variation in anticoagulating patients with atrial fibrillation. Archives of Internal Medicine, 150, 83-86.

Connolly, S. J., Kerr, C. R., Klein, G. J., Talajic, M., Green, M., Sheldon, R., & Drinnan, S. (1993). Patterns of anticoagulation use and embolic events in new onset atrial fibrillation. Canadian Journal of Cardiology, 9, 107E (abstract).

*Connolly, S. J., Laupacis, A., Gent, M., Roberts, R. S., Cairns, J. A., & Joyner, C. (1991). Canadian atrial fibrillation anticoagulation (CAFA) study. Journal of the American College of Cardiology, 18, 349-355.

Connolly, S. J., & Turpie, A. G. G. (1996). Antithrombotic therapy in atrial fibrillation. Canadian Journal of Cardiology, 12, Supp A, 17A-20A.

Cook, D. J., Guyatt, G. H., Laupacis, A., Sackett, D. L., Goldberg, R. J. (1995). Crucial recommendations using levels of evidence for antithrombotic agents. Chest, 4, 227S-230S.

Cuddy, T. E., & Connolly, S. J. (1996). Atrial fibrillation and atrial flutter. Canadian Journal of Cardiology, 12, Supp A, 9A-11A.

Davis, W. D., & Hart, R. G. (1991). Cardiogenic stroke in the elderly. Clinics in Geriatric Medicine, 7(3), 429-442.

Dean, A. G., Dean, J. A., Burton, A. H., & Dicker, R. C. (1994). Epi Info, Version 6.01: a word-processing, database and statistics program for epidemiology on microcomputers. SD, Incorporated, Stone Mountain, GA Incorporated.

Denig, P., Haaijer-Ruskamp, F. M., Wesseling, H., & Versluis, A. (1993). Drug expectations and drug choices of hospital physicians. Journal of Internal Medicine, 234, 155-163.

Dillman, D. A. (1978). Mail and telephone surveys: the total design method. New York: Wiley & Sons.

Dillman, D. A. (1983). Mail and telephone surveys: the total design method. New York: Wiley & Sons.

Dillman, D. A., Dillman, J. J., Makela, C. J. (1984). The importance of adhering to detail of the total design method (TDM) for mail surveys. in D. C. Lockhart (Ed.), New directions for program evaluation (pp. 49-64). San Francisco: Jossey-Bass.

Dow, L., & Bertagne, B. (1993). Under use of warfarin is multifactorial. British Medical Journal, 307, 1492-1493.

*Ezekowitz, M. D., Bridgers, S. L., James, K. E., Carliner, N. H., Colling, C. L., Gornick, C. C., Krause-Steinrauf, H., Kurtzke, J. F., Nazarian, S. M., Radford, M. J., Rickles, F. R., Shabetai, R., Deykin, D., for the Veterans Affairs Stroke Prevention in Nonrheumatic Atrial Fibrillation Investigators. (1992). Warfarin in the prevention of stroke associated with nonrheumatic atrial fibrillation. New England Journal of Medicine, 327, 1406-1412.

Gordon, M. (1993). Monograph series on aging-related diseases: III.Stroke (Cerebrovascular Disease). Chronic Diseases in Canada, 14(3):64-89.

Gorelick, P. B. (1994). Stroke prevention: An opportunity for efficient utilization of health care resources during the coming decade. Stroke, 25, 220-224.

Gottlieb, L. K., & Salem-Schatz, S. (1994). Anticoagulation in atrial fibrillation: does efficacy in clinical trials translate into effectiveness in practice? Archives of Internal Medicine, 154, 1945-1953.

Green, L. W., Erickson, M. P., & Schol, E. L. (1988). Preventative practices by physicians: Behavioral determinants and potential interventions. American Journal of Preventative Medicine, 4(4), 101-107.

Green, L. W., Kreuter M. W., Deeds, S. J., & Partridge, K. B. (1980). Health education planning: a diagnostic approach. Palo Alto, CA: Mayfield.

Heart and Stroke Foundation of Canada. (1993). Cardiovascular disease in Canada. Ottawa, Author.

Jorgensen, H. S., Nakayama, H., Raaschou H. O., Gam, J., & Olsen T. S. (1994). Silent infarction in acute stroke patients: prevalence, localization, risk factors, and clinical significance: The Copenhagen stroke study. Stroke, 25, 97-104.

Kerr, C. R., Connolly, S., Cuddy, T. E., Gardner, M., Gilbert, M., Gillis, A. M., Gow, R. M., Klein, G., Laupacis, A., Macdonald, R. G., Newman, D., Page, R., Pym, J., Talajic, M., & Turpie, A. G. (1994). Canadian cardiovascular society consensus conference on atrial fibrillation. Canadian Journal of Cardiology, (In press).

King, D., & Davies, K. N. (1993). Doctors reluctant despite evidence. British Medical Journal, 307, 1494.

Kopecky, S. L., Gersh, B. J., McGoon, M. D., Whisnat, J. P., Holmes, D. R., Ilstrup, D. M., & Frye, R. L. (1987). The natural history of lone atrial fibrillation. New England Journal of Medicine, 317, 669-674.

Kutner, M., Nixon, G., & Silverstone, F. (1991). Physicians' attitudes toward oral anticoagulants and antiplatelet agents for stroke prevention in elderly patients with atrial fibrillation. Archives of Internal Medicine, 151, 1950-1953.

Lancaster, T. R., Singer, D. E., Sheehan, M. A., Oertel, L. B., Maraventano, S. W., Hughes, R. A., & Kistler, P. for the Boston Area Anticoagulation Trial for Atrial Fibrillation Investigators. (1991). The impact of long-term warfarin therapy on quality of life: Evidence from a randomized trial. Archives of Internal Medicine, 151, 1944-1949.

Laupacis, A., Albers, G. W., Dalen, J. E., Dunn, M. I., Feinberg, W., & Jacobson, A. K. (1995). Antithrombotic therapy in atrial fibrillation. Chest, 108, 352S-359S.

Leonard, A. D., & Newburg, S. (1992). Cardioembolic stroke. American Association of Neuroscience Nurses, 24(2), 69-78.

Lewin, K. (1938). The conceptual representation and the measurement of psychological forces. Durham, NC: Duke University Press.

Lip, G. H. Y., Tean, K. N., & Dunn F. G. (1993). Treatment of atrial fibrillation in a district general hospital. British Heart Journal, 71(1), 92-95.

Matchar, D. B., McCrory, D. C., Barnett, H. J. M., & Feussner, J. R. (1994). Medical treatment for stroke. Annals of Internal Medicine, 121, 41-53.

McCrory, D. C., Matchar, D. B., Samsa, G., Sanders, L. L., & Pritchett, E. L. C. (1995). Physicians attitudes about anticoagulation for nonvalvular atrial fibrillation in the elderly. Archives of Internal Medicine, 155, 277-281.

Monette, J., Gurwitz, J. H., Rocon, P.A., Eckler, M. A. & Avorn, J. (1995). Use of warfarin in the frail elderly with atrial fibrillation (AF). Clinical Pharmacology and Therapeutics, 57, 198 (abstract).

Mullen, P. D., Easling, L., Nixon, S. A., Koester, D. R., & Biddle, A. K. (1987). The cost-effectiveness of randomized incentives and follow-up contact in a national mail survey of family physicians. Evaluation and the Health Professional, 10, 232-245.

National Heart, Lung and Blood Institutes Working Group on Atrial Fibrillation. (1993). Atrial fibrillation: Current understanding and research imperatives. Journal of the American College of Cardiology, 22, 1830-1834.

Norusis, M. J., SPSS Inc. (1993). SPSS for Windows: Base System User's Guide, Release 6.0. Michigan, Chicago.

Office of the Registrar: College of Physicians and Surgeons. (1994). Medical Directory: College of Physicians and Surgeons of Alberta, February 15.

Office of the Registrar: College of Physicians and Surgeons. (1995). Medical Directory: College of Physicians and Surgeons of Alberta, February 15.

Ostfeld, A. M., & Wilk, E. (1990). Epidemiology of stroke. 1980-1990: A progress report. Epidemiology Reviews, 12, 253-256.

Pagley, P. R., Yarzebski, J., Goldberg, R., Chen, Z., Chiriboga, D., Dalen, P., Gurwitz, J., Alpert, J. S., & Gore, J. M. (1993). Gender differences in the treatment of patients with acute myocardial infarction. A multihospital, community-based perspective. Archives of Internal Medicine, 153, 625-629.

Parboosingh, J., Avard, D., Lockyer, J., Watson, M., Pim, C., & Yee, J. (1987). The use of clinical recall interviews as a method of determining need in continuing medical education. Proceedings of the Annual Conference on Research in Medical Education, 26, 103-108.

*Petersen, P., Boysen, G., Godtfredsen, J., Andersen, E. D., & Andersen, B. (1989). Placebo-controlled, randomized trial of warfarin and aspirin for prevention of thromboembolic complications in chronic atrial fibrillation. Lancet, 1, (8631): 175-179.

Petrasovits, A., & Nair, C. (1994). Epidemiology of stroke in Canada. Health Reports, 6(1), 39-44.

Reeder, B. A. (1994). Epidemiology of stroke. Health Reports, 6(1), 9-12.

Robles de Medina, E. O., Bernard, R., Commel, P., Damato, A. N., Fisch, C., Krikle, D., Mazur, N. A., Meijler, F. L., Mogensen, L., Moret, P., Pisa, A., & Wellens, H. J. (1978). Definition of terms related to cardiac rhythm. WHO-ISFC Task Force. American Heart Journal, 95, 796-806.

Rosenstock, I. M. (1974). The health belief model and preventive health behaviour. Health Education Monographs, 2, 354-386.

Rosner, B. (1986). Fundamentals of biostatistics (2nd ed). Boston: Duxbury Press.

Schlesselman, J. J. (1982). Case-control Studies: Design, conduct, analysis. Oxford: Oxford University Press, Inc.

Segal, R., & Hepler, C. D. (1982). Prescribers' beliefs and values as predictors of drug choices. American Journal of Hospital Pharmacy, 39, 1891-1897.

Shakespeare, J. (1994). Anticoagulation in patients with atrial fibrillation. GP's struggle to meet demand. British Medical Journal, 308, 415.

Shuaib, A., & Hachinski, V. C. (1991). Mechanisms and management of stroke in the elderly. Canadian Medical Association Journal, 145(5), 433-443.

SHEP Cooperative Research Group. (1991). Prevention of stroke by antihypertensive drug treatment in older persons with isolated systolic hypertension. Journal of the American Medical Association, 265(24), 3255-5264.

Sudlow, C. M., Rodgers, H., Kenny, R. A., & Thomson, R. G. (1995). Service provision and use of anticoagulation in atrial fibrillation. British Medical Journal, 311, 558-561.

Stanton, M. S., Miles, W. M., & Zipes, D. P. (1992). Atrial fibrillation and flutter. In D.P. Zipes & J. Jalife (Eds), Cardiac electrophysiology: From cell to bedside (pp. 724-735). Philadelphia: WB Saunders Co.

Stroke Prevention in Atrial Fibrillation Investigators. (1990). Preliminary report of the stroke prevention in atrial fibrillation study. New England Journal of Medicine, 322:863-867.

*Stroke Prevention in Atrial Fibrillation Investigators. (1991). The stroke prevention in atrial fibrillation study: patient characteristics and final results of placebo comparisons. Circulation, 84(2):527-539.

Stroke Prevention in Atrial Fibrillation Investigators. (1994). Warfarin versus aspirin for prevention of thromboembolism in atrial fibrillation: Stroke Prevention in Atrial Fibrillation II Study. Lancet, 343:687-691.

Tambor, E. S., Chase, G. A., Faden, R. R., Geller, G., Hofman, K. J., & Holtzman, N. A. (1993). Improving response rates through incentive and follow-up: The effect on a survey of physicians' knowledge of genetics. American Journal of Public Health, 83(11), 1599-1603.

Taylor, F., & Ramsey, M. (1993). GP's not prepared for monitoring anticoagulation. British Medical Journal, 307, 1493.

Vroom, V., H. (1982). Work and motivation. Malabar, FL: Robert E. Krieger Publishing Company.

Vroom, V., H. (1964). Work and motivation. New York: John Wiley & Sons.

Walsh, J. M. E., McPhee, S. J. (1992). A systems model of clinical preventive care: an analysis of factors influencing patient and physician. Health Education Quarterly, 19:157-175.

Wolf, P. A., Abbott, R. D., & Kannel, W. B. (1987). Atrial fibrillation: a major contributor to stroke in the elderly: the framingham study. Archives of Internal Medicine, 147, 156-1564.

Wolf, P. A., Abbott, R. D., & Kannel, W. B. (1991). Atrial fibrillation as an independent risk factor for stroke: the Framingham study. Stroke, 22, 983-988.

Appendix A
Letter of Invitation

Faculty of Medicine
Department of Community Health Sciences

Dear Dr.

We are conducting a study to describe physicians' beliefs about antithrombotic practices for elderly patients with atrial fibrillation. The ideal management of atrial fibrillation in the elderly is yet to be defined. However, individuals more than 80 years of age are at the most risk of atrial fibrillation and the highest risk for stroke.

All cardiologists, internists and one out of every 8 family practitioners in Southern Alberta are being asked to complete this questionnaire. In order for the results of this study to be truly representative it is essential that each person in the sample return the enclosed questionnaire.

Participation in this study involves a short survey which takes approximately 15 minutes, and returning it by: i) faxing to 283-5594, or ii) mail in the self-addressed pre-stamped envelope by *Thursday, May 11*. This survey is not intended as a test. There are no "correct" answers to the questions.

You may be assured of confidentiality. The questionnaire has an identification number for mailing purposes only. This is so that we may check your name off of the mailing list when your questionnaire or card is returned. Data collected from this study will be reported as aggregate data only. A summary of the research findings will be sent to you upon completion of the project, at your request. At any time, we welcome your questions or comments about the management of patients with atrial fibrillation at the telephone numbers listed below.

If you choose not to participate in this study please fax, or mail the enclosed refusal notification indicating your decision by *Thursday, May 4*. Should you not return either the questionnaire or the refusal notification we will attempt contact with you by telephone.

If you have any questions concerning your rights as a possible participant in this research, please contact the Office of Medical Bioethics, Faculty of Medicine, The University of Calgary, at 220-7990.

Thank you very much for your assistance. We hope this study will make an important contribution in describing use of antithrombotic therapy for elderly patients with atrial fibrillation. Once again, the response of each physician is important to the success of the study.

Sincerely,

Joy Kellen, RN, BN
Master's Thesis Student (220-4281)

Margaret Russell, MD, PhD, FRCPC
Department of Community Health Sciences
Thesis Supervisor (220-4279)

George Wyse, MD, PhD, FRCPC
Associate Dean of Clinical Affairs
Thesis Committee Member (220-4245)

Appendix B
Refusal Notification

REFUSAL NOTIFICATION

COMPLETE THIS PAGE ONLY IF YOU DO NOT WISH TO BE FURTHER CONTACTED ABOUT THIS STUDY.

Persons who do not complete this questionnaire will be receive up to two reminders by mail and a telephone call reminding them to complete and return the questionnaire.

I was recently mailed a questionnaire about antithrombotics for stroke prevention for atrial fibrillation.

1 ☐ I prefer not to participate.

REASONS: (check all that apply)

- 2 ☐ Do not treat these patients
- 3 ☐ Too busy
- 4 ☐ Not an important issue
- 5 ☐ Other (specify) _____

Date

CODE#

Appendix C
Questionnaire

ATRIAL FIBRILLATION AND STROKE PREVENTION SURVEY

The information you provide in this questionnaire will be kept strictly confidential. ***PLEASE RETURN THE SURVEY BY MAIL OR FAX TO 283-5594.***

The first few questions ask about demographic information to determine the representativeness of the sample.

1. Sex. (*Check one*)

0 ☐ MALE

1 ☐ FEMALE

2. What is your age? _____

3. In what year did you graduate from medical school? _____

4. In what country did you graduate from medical school? (*Check one*)

1 ☐ CANADA

2 ☐ U.S.A.

3 ☐ U.K./ IRELAND

4 ☐ OTHER (*specify*) _____

5. Your current practice may be best described as: (*Check one*)

0 ☐ FULL-TIME

1 ☐ PART-TIME (< 30 Hours/week)

6. What is your type of practice? (*Check one*)

1 ☐ FAMILY PHYSICIAN

2 ☐ GENERAL PRACTITIONER

3 ☐ INTERNIST

4 ☐ CARDIOLOGIST

7. Your current practice may be best described as: *(Check all that apply)*

- 1 ☐ I PRACTICE ALONE
 - 1 ☐ I PRACTICE ALONE, BUT HAVE FREQUENT DISCUSSIONS WITH OTHER FAMILY PHYSICIANS
 - 1 ☐ I PRACTICE IN A SHARED OFFICE OR GROUP
 - 1 ☐ I WORK AS A LOCUM
 - 1 ☐ I WORK IN A 'WALK IN' CLINIC
 - 1 ☐ I WORK IN A SHARED OFFICE IN A 'WALK IN' CLINIC
 - 1 ☐ I WORK IN A SETTING THAT SERVES A DEFINED POPULATION (IE: EMERGENCY MEDICINE, PRIMARILY GERIATRICS) *[Please explain]*
-

8. Do you have a university appointment? *(Check one)*

- 0 ☐ NO
- 1 ☐ YES

9. The population of the city/town you practice in is approximately: *(Check one)*

- 1 ☐ < 10,000
- 2 ☐ 10,000 - 49,999
- 3 ☐ 50,000 - 249,999
- 4 ☐ ≥ 250,000

10. Estimate the number of patients you have been looking after in your practice, per month, with a diagnosis of atrial fibrillation? *(Check one)*

- 0 ☐ NONE *(Please go to page 3)*
- 1 ☐ 1 - 4 PATIENTS
- 2 ☐ 5 - 9 PATIENTS
- 3 ☐ 10 - 14 PATIENTS
- 4 ☐ 15 - 20 PATIENTS
- 5 ☐ > 20 PATIENTS
- 6 ☐ DON'T KNOW

11. Estimate the number of patients ≥ 80 years of age you have been looking after in your practices, per month, with a diagnosis of atrial fibrillation? (*Check one*)

- 0 ☐ NONE
- 1 ☐ 1 - 4 PATIENTS
- 2 ☐ 5 - 9 PATIENTS
- 3 ☐ 10 - 14 PATIENTS
- 4 ☐ 15 - 20 PATIENTS
- 5 ☐ > 20 PATIENTS
- 6 ☐ DON'T KNOW

12. In general, how do you most **frequently** treat patients with atrial fibrillation? (*Check one*)

- 1 ☐ No antithrombotic therapy (*Please go to page 4*)
- 1 ☐ Aspirin (alone) dose _____
- 1 ☐ Combination Warfarin with Aspirin
- 1 ☐ Ticlopidine
- 1 ☐ Anticoagulation with warfarin (alone) *If you checked this box answer (a) & (b)*

(a) What intensity of anticoagulation, in general, would be your target?

- 1 ☐ 1 - 1½ times the reference or control
- 2 ☐ 1½ - 2 times the reference or control
- 3 ☐ 2 - 3 times the reference or control
- 4 ☐ 3 - 4 times the reference or control
- 5 ☐ > 4 times the reference or control

(b) What measure would you use to determine the intensity of anticoagulation?

- 1 ☐ PT with reference range
- 2 ☐ PT ratio
- 3 ☐ INR ratio

1 ☐ Other management (*Please specify*) _____

The next pages outline 2 hypothetical patients presenting to your office. Based upon the information contained in each case, please answer **all** of the questions. If any additional information is needed to answer a question, assume that the patient is typical of the majority of patients in your practice, and select the options you are most likely to follow. There are no correct answers. Please answer candidly.

CASE 1

Mrs E.A. is an 80 year old house-wife living independently with her 83 year old husband.
Her general health is remarkable for only a single episode of heart failure 2 years ago, and relatively well controlled hypertension.

Current medications: Dyazide (Hydrochlorathizide) 25 mg daily
Lanoxin (Digoxin) 0.25 mg daily

Physical Examination: HR 70 irregular, BP 160/95
No evidence of CHF or other cardiac abnormality

12 Lead EKG: Atrial Fibrillation - Ventricular rate 75 BPM

13. Which of the following medications would you choose for stroke prevention? *(Check one of the following)*

- 1 ☐ None *(Please go to page 6)*
 1 ☐ Aspirin (alone) dose _____
 1 ☐ Combination Warfarin with Aspirin
 1 ☐ Ticlopidine
 1 ☐ Anticoagulation with warfarin (alone) *If you checked this box answer (a) & (b)*

(a) What intensity of anticoagulation, in general, would be your target?

- 1 ☐ 1 - 1½ times the reference or control
 2 ☐ 1½ - 2 times the reference or control
 3 ☐ 2 - 3 times the reference or control
 4 ☐ 3 - 4 times the reference or control
 5 ☐ > 4 times the reference or control

(b) What measure would you use to determine the intensity of anticoagulation?

- 1 ☐ PT with reference range
 2 ☐ PT ratio
 3 ☐ INR ratio

1 ☐ Other management *(Please specify)* _____

14. Listed below are potential situations. This portion of the survey deals with what you think might happen to Mrs. E.A.. Based on the medication that you just have chosen please indicate to what extent you agree with each possible situation.

DEGREE OF AGREEMENT WITH EACH OUTCOME

Based on the treatment I have
chosen, I **BELIEVE** that...

		(Circle Number)				
		Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a)	The patient may have a stroke.	1	2	3	4	5
b)	The patient may request a specific treatment.	1	2	3	4	5
c)	The treatment plan is acceptable to the patient.	1	2	3	4	5
d)	The cost of the treatment is important.	1	2	3	4	5
e)	The patient may adhere to the treatment.	1	2	3	4	5
f)	The patient may have a GI bleed.	1	2	3	4	5
g)	The patient may have a subarachnoid hemorrhage.	1	2	3	4	5
h)	The patient may fall and have a serious injury.	1	2	3	4	5
i)	The patient may report bruising.	1	2	3	4	5
j)	My colleagues will agree with the treatment.	1	2	3	4	5
k)	The treatment may prevent stroke.	1	2	3	4	5
l)	The treatment may increase the risk of hemorrhage.	1	2	3	4	5
m)	The treatment plan may require medication adjustments.	1	2	3	4	5
n)	The patient may live another five years.	1	2	3	4	5

15. THIS PORTION OF THE SURVEY DIFFERS FROM THE LAST SECTION...

This question deals with the probability of a number of outcomes happening to Mrs. E.A. Based on the medication that you have chosen please indicate how likely you think that each situation will occur.

LIKELIHOOD OF EACH OUTCOME

Based on the treatment I have chosen,
there is the **LIKELIHOOD** that...

		(Circle Number)				
		Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a)	The patient may have a stroke.	1	2	3	4	5
b)	The patient may request a specific treatment.	1	2	3	4	5
c)	The treatment plan is acceptable to the patient.	1	2	3	4	5
d)	The cost of the treatment is important.	1	2	3	4	5
e)	The patient may adhere to the treatment.	1	2	3	4	5
f)	The patient may have a GI bleed.	1	2	3	4	5
g)	The patient may have a subarachnoid hemorrhage.	1	2	3	4	5
h)	The patient may fall and have a serious injury.	1	2	3	4	5
i)	The patient may report bruising.	1	2	3	4	5
j)	My colleagues will agree with the treatment.	1	2	3	4	5
k)	The treatment may prevent stroke.	1	2	3	4	5
l)	The treatment may increase the risk of hemorrhage.	1	2	3	4	5
m)	The treatment plan may require medication adjustments.	1	2	3	4	5
n)	The patient may live another five years.	1	2	3	4	5

CASE 2

Mr. A.R. is an 81 year old recreational lawn bowler living independently with his 79 year old wife. He is in good general health. He has a history of remote myocardial infarction, and hypertension. He developed atrial fibrillation 3 weeks ago and is controlled on medications.

Current medications: Lanoxin (Digoxin) 0.25 mg daily
Cardizem (Diltiazem) 180 mg daily

Physical Examination: Well, HR 70 irregular, BP 156/86
Otherwise unremarkable

Echocardiogram: Left atria 35 mm (normal <40 mm diameter)

16. Which of the following medications would you choose for stroke prevention? (Check one)

- 1 ☐ None (*Please go to page 9*)
 1 ☐ Aspirin (alone) dose _____
 1 ☐ Combination Warfarin with Aspirin
 1 ☐ Ticlopidine
 1 ☐ Anticoagulation with warfarin (alone) *please answer (a) & (b)*

(a) What intensity of anticoagulation, in general, would be your target?

- 1 ☐ 1 - 1½ times the reference or control
 2 ☐ 1½ - 2 times the reference or control
 3 ☐ 2 - 3 times the reference or control
 4 ☐ 3 - 4 times the reference or control
 5 ☐ > 4 times the reference or control

(b) What measure would you use to determine the intensity of anticoagulation?

- 1 ☐ PT with reference range
 2 ☐ PT ratio
 3 ☐ INR ratio

1 ☐ Other management (*Please specify*) _____

17. Listed below are potential situations. This portion of the survey deals with what you think might happen to Mr. A.R. Based on the medication that you have chosen please indicate to what extent you agree with each possible situation.

DEGREE OF AGREEMENT WITH EACH OUTCOME

Based on the treatment I have chosen, I **BELIEVE** that...

		(Circle Number)				
		Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a)	The patient may have a stroke.	1	2	3	4	5
b)	The patient may request a specific treatment.	1	2	3	4	5
c)	The treatment plan is acceptable to the patient.	1	2	3	4	5
d)	The cost of the treatment is important.	1	2	3	4	5
e)	The patient may adhere to the treatment.	1	2	3	4	5
f)	The patient may have a GI bleed.	1	2	3	4	5
g)	The patient may have a subarachnoid hemorrhage.	1	2	3	4	5
h)	The patient may fall and have a serious injury.	1	2	3	4	5
i)	The patient may report bruising.	1	2	3	4	5
j)	My colleagues will agree with the treatment.	1	2	3	4	5
k)	The treatment may prevent stroke.	1	2	3	4	5
l)	The treatment may increase the risk of hemorrhage.	1	2	3	4	5
m)	The treatment plan may require medication adjustments.	1	2	3	4	5
n)	The patient may live another five years.	1	2	3	4	5

18. THIS PORTION OF THE SURVEY DIFFERS FROM THE LAST SECTION...

This question deals with the probability of a number of outcomes happening to Mr. R.A.. Based on the medication that you have chosen please indicate how likely you think that each situation will occur.

		LIKELIHOOD OF AN OUTCOME				
Based on the treatment I have chosen, there is the LIKELIHOOD that...		(Circle Number)				
		Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
a)	The patient may have a stroke.	1	2	3	4	5
b)	The patient may request a specific treatment.	1	2	3	4	5
c)	The treatment plan is acceptable to the patient.	1	2	3	4	5
d)	The cost of the treatment is important.	1	2	3	4	5
e)	The patient may adhere to the treatment.	1	2	3	4	5
f)	The patient may have a GI bleed.	1	2	3	4	5
g)	The patient may have a subarachnoid hemorrhage.	1	2	3	4	5
h)	The patient may fall and have a serious injury.	1	2	3	4	5
i)	The patient may report bruising.	1	2	3	4	5
j)	My colleagues will agree with the treatment.	1	2	3	4	5
k)	The treatment may prevent stroke.	1	2	3	4	5
l)	The treatment may increase the risk of hemorrhage.	1	2	3	4	5
m)	The treatment plan may require medication adjustments.	1	2	3	4	5
n)	The patient may live another five years.	1	2	3	4	5

19. Have you attended any scientific sessions or educational workshops in the last 2 years where information about atrial fibrillation and stroke prevention has been presented?

0 ☐ No

1 ☐ Yes

20. Have you read any journals that have addressed atrial fibrillation and stroke prevention in the last 2 years?

0 ☐ No

1 ☐ Yes

21. If you have any thoughts about the management of antithrombotic therapy for patients with atrial fibrillation please note them below:

22. Would you like to receive a summary of results?

0 ☐ No

1 ☐ Yes

Thank you for your time!

Your assistance is very greatly appreciated.

Appendix D

ERROR NOTIFICATION**1995-04-28**

TO: All Physicians Participating in the Atrial Fibrillation and Stroke Prevention Survey

RE: **Typographical Error on the Atrial Fibrillation Stroke Prevention Survey**

You were mailed a questionnaire on April 27, 1995 regarding Atrial Fibrillation Management and Stroke Prevention from Joy Kellen, Margaret Russell, and George Wyse.

Immediately following the mailing it came to our attention that there was a ***critical*** typographical error on the survey. If you have received your survey please note the scale on pages 6, 7, 9 and 10 should be corrected to read as follows:

Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1	2	3	4	5

If you have not received your survey yet, please retain this notice, so you can make these corrections. We sincerely apologize for any inconvenience this error may have caused you. We value your response.

Sincerely,

Joy Kellen, RN, BN
Master's Thesis Candidate (220-4281)

Appendix E
Reminder Letters

Faculty of Medicine
Department of Community Health Sciences

Dear Dr.

Two weeks ago a questionnaire seeking your beliefs about antithrombotic therapy for elderly patients with atrial fibrillation was mailed to you (Investigators: J. Kellen, M.L. Russell, and D.G. Wyse). If you have already completed and returned it please accept my sincere thanks. If not, please return it at your earliest convenience. In the event that your questionnaire has been misplaced, a replacement is enclosed.

At this point in time, while more than one-half of specialists have responded to the questionnaire, a much smaller proportion of non-specialists have done so. Family physicians are the doctors who provide ongoing care and continuity of care, thus it is particularly important that the perspectives of family physicians are adequately addressed.

I appreciate the many demands that are placed on your time; and the mountains of paper that cross your desk daily. However, because the questionnaire has been sent to only a small, but representative sample of physicians it is extremely important that your response be included in the study if results are to accurately represent the opinions of Southern Alberta physicians. There are no "right" answers to the questions that are being asked. The survey takes approximately 10 minutes to complete.

Thank you for your consideration.

Sincerely,

Margaret L. Russell M.D. Ph.D. C.C.F.P. F.R.C.P.C.

Faculty of Medicine
Department of Community Health Sciences

Dear Dr.

About four weeks ago we wrote you seeking your beliefs about antithrombotic therapy for elderly patients with atrial fibrillation. As of today we have not yet received your completed questionnaire.

This research has been undertaken to gain valuable insight to understand physicians' beliefs about antithrombotic practices for elderly patients with atrial fibrillation.

I am writing to you again because of the significance each questionnaire has to the results of this study. All cardiologists, internists and one out of every 8 family practitioners in Southern Alberta are being asked to complete this questionnaire. In order for the results of this study to be truly representative of the opinions of Southern Alberta physicians it is essential that each person in the sample return their questionnaire.

In the event that your questionnaire has been misplaced, a replacement is enclosed.

Your cooperation is greatly appreciated.

Sincerely,

Joy Kellen, RN, BN
Master's Thesis Candidate (220-4281)

Margaret Russell, MD, PhD, FRCPC
Department of Community Health Sciences
Thesis Supervisor (220-4279)

George Wyse, MD, PhD, FRCPC(C)
Associate Dean of Clinical Affairs
Thesis Committee Member (220-4285)

Appendix F

Tables

This appendix presents the statistically insignificant ($p \geq 0.1$) data collected in conjunction with the significant ($p \leq 0.1$) data presented in Tables 14 - 24.

Table F1
More Generalists' Beliefs about Warfarin and ASA: Elderly Female Patient

		Warfarin (<u>n</u> =56)		ASA (<u>n</u> =27)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may fall and have a serious injury	A	37	66.1	13	48.2	2.28	0.63-8.02	0.25
	D	10	17.9	8	29.6			
	U	9	16.1	6	22.2			
Patient may report bruising	A	45	80.4	14	51.9	2.68	0.55-12.25	0.16
	D	6	10.7	5	18.5			
	U	5	8.9	8	29.6			
Treatment may prevent stroke	A	56	100.0	27	100.0			
	D	0	0.0	0	0.0			
	U	0	0.0	0	0.0			
Patient may live another 5 years	A	49	87.5	22	81.5			
	D	0	0.0	0	0.0			
	U	7	12.5	5	18.5			
Patient may request a specific treatment	A	18	32.1	11	40.7	0.95	0.29-3.10	0.86
	D	19	33.9	11	40.7			
	U	19	33.9	5	18.5			
Treatment plan is acceptable to patient	A	47	83.9	25	92.6			
	D	1	1.8	0	0.0			
	U	8	14.3	2	7.4			
Cost of treatment is important	A	35	62.5	20	74.1	0.33	0.06-1.37	0.16
	D	16	28.6	3	11.1			
	U	5	8.9	4	14.8			
Patient may adhere to treatment	A	48	85.7	22	81.5			
	D	0	0.0	0	0.0			
	U	8	14.3	5	18.5			
My colleagues will agree with the treatment	A	50	89.3	21	77.8	1.19	0.02-23.98	1.00
	D	2	3.6	1	3.7			
	U	4	7.1	5	18.5			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table F2
More Specialists' Beliefs about Warfarin and ASA: Elderly Female Patient

		Warfarin (<u>n</u> =52)		ASA (<u>n</u> =14)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a stroke	A	35	67.3	11	78.6	0.73	0.11-3.45	1.00
	D	13	25.0	3	21.4			
	U	4	7.7	0	0.0			
Patient may have a GI bleed	A	40	76.9	12	85.7	0.00	0.00-4.18	0.57
	D	5	9.6	0	0.0			
	U	7	13.5	2	14.3			
Patient may have a subarachnoid hemorrhage	A	29	55.7	5	35.7	2.54	0.57-11.75	0.19
	D	16	30.8	7	50.0			
	U	7	13.5	2	14.3			
Patient may fall and have a serious injury	A	38	73.1	7	50.0	3.39	0.65-16.23	0.12
	D	8	15.4	5	35.7			
	U	6	11.5	2	14.3			
Patient may report bruising	A	49	94.2	13	92.9	0.00	0.00-1.50	1.00
	D	1	1.9	0	0.0			
	U	2	3.9	1	7.1			
Treatment may increase the risk of hemorrhage	A	49	94.2	10	71.4	4.90	0.31-72.53	0.16
	D	2	3.9	2	14.3			
	U	1	1.9	2	14.3			
Treatment may prevent stroke	A	51	98.1	13	92.9			
	D	1	1.9	0	0.0			
	U	0	0.0	1	7.1			
Patient may live another 5 years	A	49	94.2	12	85.7			
	D	0	0.0	0	0.0			
	U	3	5.8	2	14.3			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

(table continues)

Table F2
(continued)

		Warfarin (<u>n</u> =52)		ASA (<u>n</u> =14)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may request a specific treatment	A	20	38.5	7	50.1	0.86	0.20-3.60	0.93
	D	20	38.5	6	42.8			
	U	11	21.6	1	7.1			
Treatment plan is acceptable to patient	A	43	82.7	12	85.7	2.57	0.51-12.09	0.26
	D	0	0.0	0	0.0			
	U	9	17.3	2	14.3			
Cost of treatment is important	A	37	71.2	6	42.9	2.57	0.51-12.09	0.26
	D	12	23.1	5	35.7			
	U	3	5.8	3	21.4			
Patient may adhere to treatment	A	49	94.2	13	92.8			
	D	0	0.0	0	0.0			
	U	3	5.8	1	7.1			
My colleagues will agree with the treatment	A	46	88.5	13	92.8			
	D	1	1.9	0	0.0			
	U	5	9.6	1	7.1			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table F3
More Generalists' Perceptions of Probable Outcomes of Prescribing Warfarin and
ASA: Elderly Female Patient

		Warfarin (<u>n</u> =56)		ASA (<u>n</u> =27)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a GI bleed	A	18	32.1	16	59.3	0.42	0.14-1.25	0.13
	D	27	48.2	10	37.0			
	U	11	19.6	1	3.7			
Patient may have a subarachnoid hemorrhage	A	14	25.0	4	14.8	2.10	0.54-10.02	0.379
	D	30	53.6	18	66.7			
	U	12	21.4	5	18.5			
Patient may fall and have a serious injury	A	22	39.3	13	48.2	0.95	0.28-3.12	0.86
	D	16	28.6	9	33.3			
	U	18	32.1	5	18.5			
Patient may report bruising	A	41	73.2	19	70.4	2.16	0.43-10.51	0.29
	D	5	8.9	5	18.5			
	U	10	17.9	3	11.1			
Treatment may prevent stroke	A	56	100.0	26	96.3			
	D	0	0.0	0	0.0			
	U	0	0.0	1	3.7			
Patient may live another 5 years	A	39	69.6	19	70.4			
	D	0	0.0	1	3.7			
	U	17	30.4	7	25.9			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

(table continues)

Table F3
(continued)

		Warfarin (<u>n</u> =56)		ASA (<u>n</u> =27)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may request a specific treatment	A	12	21.4	10	37.0	0.60	0.17-2.10	0.53
	D	22	39.3	11	40.8			
	U	22	39.3	6	22.2			
Treatment plan is acceptable to patient	A	47	83.9	25	92.6			
	D	2	3.6	0	0.0			
	U	7	12.5	2	7.4			
Cost of treatment is important	A	36	64.3	20	74.1	0.39	0.06-1.64	0.27
	D	14	25.0	3	11.1			
	U	6	10.7	4	14.8			
Patient may adhere to treatment	A	44	78.6	22	81.5			
	D	1	1.8	0	0.0			
	U	11	19.6	5	18.5			
My colleagues will agree with the treatment	A	49	87.5	21	77.8			
	D	2	3.6	0	0.0			
	U	5	8.9	6	22.2			
Treatment may require medication adjustments	A	56	100.0	14	51.9			
	D	0	0.0	11	40.7			
	U	0	0.0	2	7.4			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table F4
More Specialists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA: Elderly Female Patient

		Warfarin (<u>n</u> =52)		ASA (<u>n</u> =14)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a stroke	A	18	34.6	6	42.9	0.92	0.23-3.83	0.86
	D	26	50.0	8	57.1			
	U	7	13.5	0	0.0			
Patient may have a GI bleed	A	24	46.1	7	50.0	1.60	0.39-6.53	0.66
	D	15	28.9	7	50.0			
	U	12	23.1	0	0.0			
Treatment may increase the risk of hemorrhage	A	48	92.3	9	64.3	3.56	0.26-35.01	0.21
	D	3	5.8	2	14.3			
	U	0	0.0	3	21.4			
Treatment may prevent stroke	A	48	92.3	13	92.9			
	D	1	1.9	0	0.0			
	U	2	3.9	1	7.1			
Patient may live another 5 years	A	48	92.3	11	78.6			
	D	0	0.0	0	0.0			
	U	3	5.8	3	21.4			
Patient may request a specific treatment	A	11	21.2	5	35.7	0.70	0.15-3.51	0.72
	D	22	42.3	7	50.0			
	U	18	34.6	2	14.3			
Treatment plan is acceptable to patient	A	39	75.0	13	92.9			
	D	1	1.9	0	0.0			
	U	10	19.2	1	7.1			
Cost of treatment is important	A	34	65.4	6	42.9	2.18	0.44-10.22	0.29
	D	13	25.0	5	35.7			
	U	4	7.7	3	21.4			
Patient may adhere to treatment	A	44	84.6	14	100.0			
	D	0	0.0	0	0.0			
	U	7	13.5	0	0.0			
My colleagues will agree with the treatment	A	44	84.6	12	85.7			
	D	0	0.0	0	0.0			
	U	7	13.5	2	14.3			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table F5
More Generalists' Beliefs about Warfarin and ASA: Elderly Male Patient

		Warfarin (<u>n</u> =61)		ASA (<u>n</u> =25)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a GI bleed	A	36	59.0	16	64.0	0.79	0.22-2.65	0.89
	D	17	27.9	6	24.0			
	U	7	11.5	3	12.0			
Patient may report bruising	A	50	82.0	16	64.0	3.75	0.81-17.49	0.67
	D	5	8.2	6	24.0			
	U	5	8.2	3	12.0			
Treatment may prevent stroke	A	58	95.1	23	92.0			
	D	0	0.0	0	0.0			
	U	2	3.3	2	8.0			
Patient may request a specific treatment	A	27	44.3	14	56.0	0.69	0.16-2.60	0.76
	D	14	23.0	5	20.0			
	U	19	31.2	6	24.0			
Treatment plan is acceptable to patient	A	43	70.5	24	96.0			
	D	0	0.0	0	0.0			
	U	17	27.9	1	4.0			
Cost of treatment is important	A	39	63.9	15	60.0	0.93	0.22-3.38	0.86
	D	14	23.0	5	20.0			
	U	7	11.5	5	20.0			
Patient may adhere to treatment	A	51	83.6	24	96.0			
	D	0	0.0	0	0.0			
	U	9	14.8	1	4.0			
My colleagues will agree with the treatment	A	55	90.2	20	80.0			
	D	0	0.0	0	0.0			
	U	5	8.2	5	20.0			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table F6
More Specialists' Beliefs about Warfarin and ASA: Elderly Male Patient

		Warfarin (<u>n</u> =52)		ASA (<u>n</u> =9)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a stroke	A	32	61.6	8	88.9	0.33	0.01-3.02	0.42
	D	12	23.1	1	11.1			
	U	6	11.5	0	0.0			
Patient may have a GI bleed	A	40	76.9	7	77.8	0.0	0.00-5.05	0.57
	D	7	13.5	0	0.0			
	U	3	5.8	2	22.2			
Patient may have a subarachnoid hemorrhage	A	32	61.5	4	44.4	2.86	0.52-16.41	0.25
	D	14	26.9	5	55.6			
	U	4	7.7	0	0.0			
Patient may fall and have a serious injury	A	37	71.2	6	66.7	1.54	0.13-10.80	0.64
	D	8	15.4	2	22.2			
	U	5	9.6	1	11.1			
Patient may report bruising	A	44	84.6	8	88.9	0.0	0.00-31.96	1.00
	D	2	3.9	0	0.0			
	U	3	5.8	1	11.1			
Treatment may increase the risk of hemorrhage	A	47	90.4	6	66.7	7.83	0.09-627.34	0.24
	D	1	1.9	1	11.1			
	U	2	3.9	2	22.2			
Treatment may prevent stroke	A	46	88.5	9	100.0			
	D	1	1.9	0	0.0			
	U	3	5.8	0	0.0			
Patient may live another 5 years	A	46	88.5	8	88.9			
	D	0	0.0	0	0.0			
	U	4	7.7	1	11.1			

A = Agree D = Disagree U = Undecided

* p ≤ 0.1

n = Number of physicians who responded

(table continues)

Table F6
(continued)

		Warfarin (<u>n</u> =52)		ASA (<u>n</u> =9)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may request a specific treatment	A	25	48.1	5	55.6	1.33	0.23-7.28	0.71
	D	15	28.9	4	44.4			
	U	10	19.2	0	0.0			
Treatment plan is acceptable to patient	A	43	82.7	9	100.0	1.11	0.63-6.13	1.00
	D	0	0.0	0	0.0			
	U	7	13.5	0	0.0			
Cost of treatment is important	A	31	59.6	6	66.7	1.11	0.63-6.13	1.00
	D	14	26.9	3	33.3			
	U	5	9.6	0	0.0			
Patient may adhere to treatment	A	45	86.6	9	100.0	1.11	0.63-6.13	1.00
	D	0	0.0	0	0.0			
	U	5	9.6	0	0.0			
My colleagues will agree with the treatment	A	44	84.6	9	100.0	1.11	0.63-6.13	1.00
	D	1	1.9	0	0.0			
	U	5	9.6	0	0.0			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table F7
More Generalists' Perceptions of Probable Outcomes of Prescribing Warfarin and
ASA: Elderly Male Patient

		Warfarin (<u>n</u> =61)		ASA (<u>n</u> =25)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a GI bleed	A	20	32.8	15	60.0	0.48	0.15-1.55	0.27
	D	22	36.1	8	32.0			
	U	16	26.2	2	8.0			
Patient may have a subarachnoid hemorrhage	A	16	26.2	7	28.0	1.31	0.40-4.57	0.83
	D	28	45.9	16	64.0			
	U	14	23.0	2	8.0			
Patient may fall and have a serious injury	A	25	41.0	8	32.0	0.98	0.21-4.31	0.77
	D	16	26.2	15	60.0			
	U	17	27.9	2	8.0			
Patient may report bruising	A	40	65.6	17	68.0	1.34	0.25-6.13	0.73
	D	7	11.5	4	16.0			
	U	11	18.0	4	16.0			
Treatment may increase the risk of hemorrhage	A	46	75.4	14	56.0	3.83	0.91-16.07	0.42
	D	6	9.8	7	28.0			
	U	6	9.8	4	16.0			
Treatment may prevent stroke	A	57	93.4	23	92.0			
	D	0	0.0	0	0.0			
	U	1	1.6	2	8.0			
Patient may live another 5 years	A	39	63.9	17	68.0	2.29	0.27-18.67	0.38
	D	3	4.9	3	12.0			
	U	16	26.2	5	20.0			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

(table continues)

Table F7
(continued)

		Warfarin (<u>n</u> =61)		ASA (<u>n</u> =25)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may request a specific treatment	A	18	29.5	11	44.0	0.62	0.18-2.16	0.58
	D	21	34.4	8	32.0			
	U	19	31.2	6	24.0			
Treatment plan is acceptable to patient	A	44	72.1	22	88.0			
	D	2	3.3	0	0.0			
	U	12	19.7	3	12.0			
Cost of treatment is important	A	38	62.3	14	56.0	1.46	0.40-4.96	0.69
	D	13	21.3	7	28.0			
	U	7	11.5	4	16.0			
Patient may adhere to treatment	A	53	86.9	22	88.0			
	D	0	0.0	0	0.0			
	U	5	8.2	3	12.0			
My colleagues will agree with the treatment	A	55	90.2	21	84.0			
	D	0	0.0	0	0.0			
	U	3	4.9	4	16.0			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table F8
More Specialists' Perceptions of Probable Outcomes of Prescribing Warfarin and ASA: Elderly Male Patient

		Warfarin (<u>n</u> =52)		ASA (<u>n</u> =9)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a stroke	A	21	40.4	6	66.7	0.63	0.13-2.86	0.52
	D	17	32.7	2	22.2			
	U	10	19.2	1	11.1			
Patient may have a GI bleed	A	28	53.9	5	55.6	1.20	0.16-7.23	1.00
	D	14	26.9	3	33.3			
	U	6	11.5	1	11.1			
Patient may fall and have a serious injury	A	30	57.7	4	44.5	1.73	0.22-11.76	0.67
	D	13	25.0	3	33.3			
	U	5	9.6	2	22.2			
Patient may report bruising	A	38	73.1	5	55.6	3.26	0.40-21.27	0.16
	D	7	13.5	3	33.3			
	U	3	5.8	1	11.1			
Treatment may increase the risk of hemorrhage	A	44	84.6	7	77.8	6.29	0.07-504.16	0.28
	D	1	1.9	1	11.1			
	U	3	5.8	1	11.1			
Treatment may prevent stroke	A	42	80.8	9	100.0			
	D	1	1.9	0	0.0			
	U	5	9.6	0	0.0			
Patient may live another 5 years	A	44	84.6	7	77.8			
	D	0	0.0	0	0.0			
	U	4	7.7	2	22.2			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

(table continues)

Table F8
(continued)

		Warfarin (<u>n</u> =52)		ASA (<u>n</u> =9)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may request a specific treatment	A	18	34.6	5	55.6	0.85	0.14-4.71	1.00
	D	17	32.7	4	44.4			
	U	13	25.0	0	0.0			
Treatment plan is acceptable to patient	A	39	75.0	8	88.9	0.98	0.02-10.67	1.00
	D	5	9.6	1	11.1			
	U	4	7.7	0	0.0			
Cost of treatment is important	A	32	61.5	7	77.8	0.91	0.08-5.98	1.00
	D	10	19.2	2	22.2			
	U	6	11.5	0	0.0			
Patient may adhere to treatment	A	41	78.9	9	100.0			
	D	4	7.7	0	0.0			
	U	3	5.8	0	0.0			
My colleagues will agree with the treatment	A	40	76.9	8	88.9			
	D	1	1.9	0	0.0			
	U	7	13.5	1	11.1			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table F9
More Generalists' versus Specialists' Beliefs: Elderly Female Patient

		Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		OR	CI ₉₅	<u>p</u>
		<u>n</u>	%	<u>n</u>	%			
Patient may have a stroke	A	49	53.9	48	70.6	0.56	0.25-1.23	0.17
	D	29	31.9	16	23.5			
	U	13	14.3	4	5.9			
Patient may have a subarachnoid hemorrhage	A	38	41.8	33	48.5	0.91	0.43-1.92	0.92
	D	33	36.3	26	38.2			
	U	20	22.0	9	13.2			
Patient may fall and have a serious injury	A	56	61.5	47	69.1	0.82	0.33-1.96	0.77
	D	19	20.9	13	19.1			
	U	16	17.6	8	11.8			
Treatment may increase the risk of hemorrhage	A	70	76.9	59	86.8	0.71	0.20-2.32	0.72
	D	10	11.0	6	8.8			
	U	11	12.1	3	4.4			
Treatment may prevent stroke	A	88	96.7	65	95.6	2.71	0.14-161.53	0.58
	D	1	1.1	2	2.9			
	U	2	2.2	1	1.5			
Patient may live another 5 years	A	77	84.6	63	92.7			
	D	2	2.2	0	0.0			
	U	12	13.2	5	7.4			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

(table continues)

Table F9
(continued)

		Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		OR	CI ₉₅	<u>p</u>
		<u>n</u>	%	<u>n</u>	%			
Patient may request a specific treatment	A	33	36.3	29	42.7	0.93	0.43-2.02	0.99
	D	33	36.3	27	39.7			
	U	25	27.5	11	16.2			
Treatment plan is acceptable to patient	A	79	86.8	56	82.4			
	D	1	1.1	0	0.0			
	U	11	12.1	12	17.7			
Cost of treatment is important	A	59	64.8	45	66.2	1.01	0.45-2.27	0.88
	D	22	24.2	17	25.0			
	U	10	11.0	6	8.8			
Patient may adhere to treatment	A	78	85.7	63	92.7			
	D	0	0.0	0	0.0			
	U	13	14.3	5	7.4			
My colleagues will agree with the treatment	A	78	85.7	58	85.3	0.45	0.01-5.78	0.64
	D	3	3.3	1	1.5			
	U	10	11.0	9	13.2			
Treatment may require medication adjustments	A	73	80.2	57	83.8	0.94	0.36-2.38	0.94
	D	15	16.5	11	16.2			
	U	3	3.3	0	0.0			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table F10
More Generalists' versus Specialists' Beliefs: Elderly Male Patient

		Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a stroke	A	51	56.0	45	66.2	0.59	0.26-1.30	0.22
	D	29	31.9	15	22.1			
	U	8	8.8	6	8.8			
Patient may have a subarachnoid hemorrhage	A	37	40.7	39	57.4	0.67	0.31-1.45	0.36
	D	31	34.1	22	32.3			
	U	20	22.0	5	7.4			
Patient may fall and have a serious injury	A	50	55.0	47	69.1	0.53	0.21-1.30	0.19
	D	22	24.2	11	16.2			
	U	16	17.6	8	11.8			
Treatment may increase the risk of hemorrhage	A	70	76.9	59	86.8	0.32	0.06-1.31	0.14
	D	11	12.1	3	4.4			
	U	7	7.7	4	5.9			
Treatment may prevent stroke	A	82	90.1	61	89.7	1.34	0.09-18.99	1.00
	D	2	2.2	2	2.9			
	U	4	4.4	3	4.4			
Patient may live another 5 years	A	63	69.2	59	86.8			
	D	7	7.7	0	0.0			
	U	18	19.8	7	10.3			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

(table continues)

Table F10
(continued)

		Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		OR	CI ₉₅	<u>P</u>
		<u>n</u>	%	<u>n</u>	%			
Patient may request a specific treatment	A	43	47.3	34	50.0	1.33	0.57-3.10	0.60
	D	19	20.9	20	29.4			
	U	26	28.6	12	17.7			
Treatment plan is acceptable to patient	A	70	76.9	56	82.4			
	D	0	0.0	0	0.0			
	U	18	19.8	10	14.7			
Cost of treatment is important	A	56	61.5	42	61.8	1.13	0.49-2.59	0.90
	D	20	22.0	17	25.0			
	U	12	13.2	7	10.3			
Patient may adhere to treatment	A	78	85.7	58	85.3			
	D	0	0.0	0	0.0			
	U	10	11.0	8	11.8			
My colleagues will agree with the treatment	A	77	84.6	58	85.3			
	D	0	0.0	1	1.5			
	U	11	12.1	7	10.3			
Treatment may require medication adjustments	A	77	84.6	57	83.9	1.20	0.38-3.75	0.93
	D	9	9.9	8	11.8			
	U	2	2.2	1	1.5			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table F11
More Generalists' versus Specialists' Perceptions of Probable Outcomes: Elderly Female Patient

		Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a stroke	A	34	37.4	26	38.2	1.11	0.53-2.34	0.90
	D	40	44.0	34	50.0			
	U	17	18.7	7	10.3			
Patient may have a GI bleed	A	38	41.8	30	44.1	0.79	0.37-1.67	0.63
	D	40	44.0	25	36.8			
	U	13	14.3	12	17.7			
Patient may have a subarachnoid hemorrhage	A	22	24.2	20	29.4	0.78	0.35-1.75	0.64
	D	52	57.1	37	54.4			
	U	17	18.7	10	14.7			
Patient may fall and have a serious injury	A	40	44.0	34	50.0	0.96	0.43-2.10	0.94
	D	27	29.7	22	32.4			
	U	24	26.4	11	16.2			
Patient may report bruising	A	65	71.4	51	75.0	1.06	0.38-2.93	0.92
	D	12	13.2	10	14.7			
	U	14	15.4	6	8.8			
Treatment may increase the risk of hemorrhage	A	66	72.5	57	83.8	0.90	0.27-2.92	0.94
	D	9	9.9	7	10.3			
	U	16	17.6	3	4.4			
Treatment may prevent stroke	A	88	96.7	62	91.2	1.42	0.10-20.02	1.00
	D	2	2.2	2	2.9			
	U	1	1.1	3	4.4			
Patient may live another 5 years	A	63	69.2	61	89.7			
	D	2	3.3	0	0.0			
	U	25	27.5	6	8.8			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

(table continues)

Table F11
(continued)

		Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may request a specific treatment	A	26	28.6	17	25.0	1.23	0.53-2.91	0.75
	D	36	39.6	29	42.7			
	U	29	31.9	21	30.9			
Treatment plan is acceptable to patient	A	80	87.9	52	76.5	0.77	0.01-15.15	1.00
	D	2	2.2	1	1.5			
	U	9	9.9	13	19.1			
Cost of treatment is important	A	61	67.0	42	61.7	1.38	0.60-3.13	0.53
	D	19	20.9	18	26.5			
	U	11	12.1	7	10.3			
Patient may adhere to treatment	A	74	81.3	60	88.2			
	D	1	1.1	0	0.0			
	U	16	17.6	7	10.3			
My colleagues will agree with the treatment	A	78	85.7	56	82.4			
	D	2	2.2	0	0.0			
	U	11	12.1	11	16.2			
Treatment may require medication adjustments	A	75	82.4	52	76.5	1.24	0.48-3.14	0.79
	D	14	15.4	12	17.7			
	U	2	2.2	3	4.4			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Table F12
More Generalists' versus Specialists' Perceptions of Probable Outcomes: Elderly Male Patient

		Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may have a stroke	A	32	35.2	30	44.1	0.66	0.30-1.45	0.35
	D	37	40.7	23	33.8			
	U	17	18.7	11	16.2			
Patient may have a GI bleed	A	36	39.6	39	57.4	0.52	0.23-1.15	0.12
	D	32	35.2	18	26.5			
	U	18	19.8	7	10.3			
Patient may have a subarachnoid hemorrhage	A	23	25.3	28	41.2	0.55	0.25-1.20	0.15
	D	46	50.6	31	45.6			
	U	17	18.7	5	7.4			
Patient may report bruising	A	58	63.7	49	72.1	0.91	0.33-2.48	0.98
	D	13	14.3	10	14.7			
	U	15	16.5	5	7.4			
Treatment may prevent stroke	A	81	89.0	57	83.8	1.42	0.10-20.08	1.00
	D	2	2.2	2	2.9			
	U	3	3.3	5	7.4			
Patient may live another 5 years	A	57	62.6	56	82.4			
	D	8	8.8	0	0.0			
	U	21	23.1	8	11.8			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

(table continues)

Table F12
(continued)

		Generalists (<u>n</u> =91)		Specialists (<u>n</u> =68)		OR	CI ₉₅	p
		<u>n</u>	%	<u>n</u>	%			
Patient may request a specific treatment	A	30	33.0	25	36.8	0.92	0.40-2.10	0.98
	D	30	33.0	23	33.8			
	U	26	28.6	16	23.5			
Treatment plan is acceptable to patient	A	69	75.8	50	73.5	4.14	0.70-43.12	0.14
	D	2	2.2	6	8.8			
	U	15	16.5	8	11.8			
Cost of treatment is important	A	54	59.3	46	67.7	0.61	0.24-1.51	0.34
	D	21	23.1	11	16.2			
	U	11	12.1	7	10.3			
Patient may adhere to treatment	A	78	85.7	55	80.9			
	D	0	0.0	4	5.9			
	U	8	8.8	4	5.9			
My colleagues will agree with the treatment	A	77	84.6	53	77.9			
	D	0	0.0	1	1.5			
	U	9	9.9	10	14.7			
Treatment may require medication adjustments	A	73	80.2	51	75.0	1.33	0.45-3.95	0.74
	D	9	9.9	10	14.7			
	U	4	4.4	3	4.4			

A = Agree D = Disagree U = Undecided

* $p \leq 0.1$

n = Number of physicians who responded

Glossary of Terms

The following terms were used to define major study concepts:

Atrial Fibrillation: "an irregular, disorganized, electrical activity of the atria. P waves are absent and the baseline consists of irregular wave forms which continuously change in shape, duration, amplitude and direction. In the absence of advanced or complete AV block, the resulting ventricular response is totally irregular (random)" (Robles de Medina et al., 1978). The patient's pulse is irregularly irregular, rapid, and there may be a pulse deficit between the auscultated rate central and the rate palpated peripherally (Stanton, Miles, & Zipes, 1992).

Belief: (equivalent to instrumentality) is defined as a feeling of certainty that something exists or that you feel sure about (Segal & Hepler, 1982), as determined by scores obtained from items 15 and 18 on the Atrial Fibrillation Stroke Prevention Survey (Appendix A).

Drug-Choice Model: this model follows the framework proposed by Vroom (1964). According to the drug-choice model, a prescriber's therapeutic plan is influenced by (a) the data ("facts") about the patient coming from Stage I, (b) the prescriber's valences for perceived outcomes that may occur in Stage III, and (c) the instrumentality of each alternative therapeutic plan (A through symbol) for each outcome (Figure 1).

Generalist: for the purposes of this project is defined as physicians who are licensed and practicing as general practitioners and family practitioners.

Instrumentality: (equivalent to beliefs) "a subjective belief about the correlation between an initial outcome, such as a well-developed treatment plan, and a consequent outcome such as patient improvement or the prescriber's personal feeling of achievement" (Segal & Hepler, 1982). For the purposes of this study it is equivalent to the physicians' beliefs about

potential risks, potential benefits, patient considerations, and physician considerations.

Intention: is the idea or plan of what one is going to do. In this project, intention to treat is operationalized as the physicians' choice of antithrombotic drug as determined by scores obtained on items 12, 13, and 16 on the Atrial Fibrillation and Stroke Prevention Survey (Appendix A).

Patient Considerations: are operationalized as items the patient may ask the physician to consider when prescribing antithrombotic therapy, or patient-specific items the physician may consider when prescribing antithrombotic therapy (i.e., the patient may request a specific treatment, the treatment is acceptable to the patient, the cost of the treatment is important, the patient may adhere to the treatment) (see Table 3).

Physician Considerations: are operationalized as items the physician may consider when prescribing antithrombotic therapy (i.e. the treatment may require medication adjustments, my colleagues will agree with the treatment) (see Table 3).

Specialist: for the purposes of this project, specialists are physicians who are licensed and practicing as cardiologists or general internists with no identified sub-specialty.

Stroke: "rapidly developing clinical signs of focal (or global) disturbance of cerebral function with symptoms lasting 24 hours or longer which may lead to a major or minor disability or death with no apparent cause other than of vascular origin" (Robles de Medina et al., 1978). Stroke is a general term that includes four main cerebrovascular disease end points: cerebral thrombosis most often due to atherosclerosis; cerebral embolus, most often of cardiac origin; intracerebral hemorrhage; and subarachnoid hemorrhage. Transient ischemic attacks with symptoms lasting less than 24 hours and cerebral hemorrhage or ischemia due to infection or tumour are excluded (Gordon, 1993).

Valence: (equivalent to perceptions of probable outcomes) conceptually, valence may be thought of as the anticipated satisfaction associated with an outcome (Lewin, 1938). Valences can be negative or positive. According to Vroom (1964), an outcome is positively valent to a person when that person prefers attaining the variable. This would be equivalent to a positive perception of a probable outcome (i.e., the patient may live another five years). A negative value denotes a preference not to attain (rather than attain) a particular outcome (i.e., the patient may have a stroke).