

AIR FORCE HEALTH CARE PROVIDERS INCIDENCE OF PERFORMING
TESTICULAR EXAMS AND INSTRUCTION OF TESTICULAR SELF-EXAM

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ABSTRACT

The purpose of this study was to describe the incidence of Air Force Health Care Provider's performance of testicular exams and their incidence of teaching testicular self-exam (TSE) within an Air Force healthcare setting. The study is also designed to determine any significant differences among providers, Family Practice Physicians, Nurse Practitioners, and Physicians Assistants, regarding the incidence of performing the above health preventive measures. This is a descriptive/comparative study, and is guided by the theoretical framework by Leavell and Clark of preventive medicine. A random sample of Health Care Provider's was surveyed using a 27 item modified questionnaire from a study done previously by Misener and Fuller. Analysis of data revealed that 58% of MD's, 68% of PA's, and 57% of NP's are performing testicular exams on their patients during routine physicals or sports physicals. Additionally, 80% of MD's, 84% of PA's, and 96% of NP's routinely instruct young men regarding TSE. There were no statistically significant differences among providers in either their incidence of performing testicular exams or their incidence of teaching TSE. Although these percentages do not meet the American Cancer Society recommendation for provider testicular exams, they are higher than previous studies have shown. This study is relevant to the Air Force because there are more than 300,000 young men under the age of 35 years currently on active duty, who fall into the age group at highest risk for testicular cancer.

Key Words: testicular cancer, testicular self-exam, knowledge, screening, incidence, testicular neoplasm, provider, performance.

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TESTICULAR SELF-EXAM

by

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PREFACE

This research was conducted to provide information to Air Force Healthcare Providers regarding the general practices of their peers concerning their performance of testicular examinations and teaching testicular self-examination to age appropriate young men. Hopefully the information collected will encourage Air Force providers to appropriately perform and teach these preventive health examinations.

DEDICATION

I wish to dedicate this work to my son, Jared, who has had to wait for dinner or make it himself more than once because I've been so busy with "working on my thesis". Also to my mother who was always there, and has always been there, to listen to me complain about whatever was the crisis for the week; and there were many.

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TABLE OF CONTENTS

PREFACE.....	vi
DEDICATION.....	vii
ACKNOWLEDGEMENT.....	viii
LIST OF TABLES.....	xi
CHAPTER ONE: INTRODUCTION	
Background.....	1
Purpose of the Study.....	6
Research Questions.....	7
Conceptual Framework.....	8
Definitions.....	9
Assumptions and Limitations.....	10
Summary.....	12
CHAPTER TWO: REVIEW OF LITERATURE	
Introduction.....	13
Empirical Studies.....	13
Theoretical Information on Testicular Cancer.....	15
Empirical Data.....	16
Summary.....	19
CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY	
Introduction.....	21
Design and Methodology.....	21

Sample.....	22
Measurement.....	23
Protection of Human Rights.....	25
Data Analysis.....	26
Summary.....	28
CHAPTER FOUR: DATA ANALYSIS	
Introduction.....	30
Sample.....	30
Demographics.....	31
Research Questions.....	32
Summary.....	41
CHAPTER FIVE: SUMMARY	
Conclusions and Recommendations.....	44
Recommendations for Practice.....	47
Future Research.....	48
REFERENCES.....	50
BIBLIOGRAPHY.....	54
APPENDICES.....	55

LIST OF TABLES

Table 1. Demographic Data of Health Care Providers Responding to the Questionnaire.....	33
Table 2. Comparing Providers Knowledge Regarding Epidemiology of Testicular Cancer.....	35
Table 3. Testicular Cancer/Breast Cancer Methods of Education by Provider	37
Table 4. Methods Used by Provider to Educate Patients About Testicular Self- Exam/Breast Self-Exam.....	39
Table 5. Percentages of Providers Performing Testicular Exams During Routine Physical.....	40
Table 6. Percentages of Providers Performing Breast Exam During Routine Physical.....	41

CHAPTER ONE: INTRODUCTION

The purpose of this predominantly descriptive study was to report the incidence of Air Force military healthcare providers' performance of testicular exams on age appropriate men and instruction of their patients about testicular cancer and self-testicular exam. A potential additional benefit of the study was to increase the awareness of medical providers about men's health concerns, regarding testicular cancer. Previous literature is limited concerning provider attitudes, knowledge and incidence of screening testicular exams, teaching testicular self-exam (TSE) and the provision of information about testicular cancer. Indications are that even though there are frequent opportunities to provide TSE information through preparticipation physicals and annual physicals, providers are not providing this important health preventive information to men.

Background

In recent years, there has been increased emphasis and education placed on women's health issues, specifically breast self-exam (BSE). Due to the increased effort of providers and media, women have a much greater knowledge of breast cancer which has resulted in an increase in performance of BSE among United States women (Goldenring & Purtell, 1984; Katz, Meyers, & Walls, 1995). But men's health issues, namely provider screening exams for testicular cancer and TSE, have largely been ignored. This is indicated by the numerous studies showing both men's lack of knowledge concerning testicular cancer and TSE (Cummings, Lampone, Mettlin, & Pontes, 1983; Dachs, Garb, White, & Berman, 1989; Ganong & Markovitz, 1987; Goldenring & Purtell, 1984; Katz et al., 1995; Vaz, Best, & Davis, 1988;), and by a limited number of studies concerning providers knowledge and attitudes about screening for

testicular cancer or discussing TSE with patients (Misener & Fuller, 1995; Singer, Tichler, Orvieto, Finestone, & Moskowitz, 1993; Sladden & Dickinson, 1995). This continues despite the American Cancer Society's (ACS) (1998) recommendation that all postpubescent men perform TSE monthly on themselves and have a testicular exam done by a medical provider every three years. The American Academy of Pediatrics also supports these recommendations and advises beginning to teach TSE at age 18 (Report of the U.S. Preventive Services Task Force, (RUSPSTF) 1996).

Testicular cancer is the most common cancer among men 15-35 years old (ACS, 1998; Vogt & McHale, 1992; <http://cancernet.nci.nih.gov/clinp.healthanswers.com/database/ami/converted/001288.html>) and the second most common malignancy in men 35-39 years old (Ritchie, 1993). Although the actual incidence is rare, it is estimated that 2.3-4 men per 100,000 would be diagnosed with testicular cancer in 1998 (ACS, 1998; Devita, 1982; Vogt & McHale, 1992; <http://www.healthanswers.com/database/ami/converted/001288.html>). The American Cancer Society (1998) estimated that approximately 7600 new cases and 400 deaths would occur in 1998 due to testicular cancer. This has increased since 1997 by 400 new cases and approximately 50 more deaths (Parker, Tong, & Bolden, 1997). Over the past 50 years, the age-adjusted incidence of testicular cancer in Caucasian men in the United States has doubled for unknown reasons. During that same time period, mortality remained constant, until recently, when it declined slightly, thought to be due to advances in therapy (Boring, Squires, & Tang, 1991). Although the incidence has increased in white men, the rate for African American men remains unchanged over the past 40 years, at 0.9 per 100,000 (Ritchie, 1993). The incidence of testicular cancer is four times higher in whites than in

African Americans, while intermediate rates have been reported for Hispanics, American Indians, and Asians (ACS, 1998; http://cancernet.nci.nih.gov/clin...r_testicular_cancer_Physician.html);).

There is significant evidence to show that when testicular cancer is detected early in stage I (when the neoplasm is confined to the testicle), the three-five year survival rate can be as high as 97-100%. However, survival decreases, and may be as low as 57%, when it is not detected until stage III (metastasized beyond lymph nodes of abdomen) (Goldenring & Purtell, 1984; Prout, 1984; RUSPSTF, 1996). Only 15 years ago the prognosis for testicular cancer was significantly worse, with an 80% death rate (Walbrecker, 1995). Increasing survival rates have largely been due to advances in treatment modalities; surgery, radiation, and chemotherapy (ACS, 1998; Shaffner, 1995).

Considering that men themselves detect nine out of ten neoplasms, it seems apparent that the solution to this unnecessarily high death rate is education. If we consider the documented lack of patient knowledge about testicular cancer, it seems that men should be taught about the risks, symptoms and screening techniques of this highly curable disease. Another fact supporting the promotion of early detection is that 95-98% of solid testicular masses are malignant (ACS, 1998; Prout, 1984; Ritchie, 1993; Vogt & McHale, 1992).

Recent review of literature has shown only three studies that address provider's knowledge about testicular cancer. These same three studies assessed the self-reported incidence of performing testicular exams and of patient teaching of TSE. The first was a study done with a group of over 700 Israeli soldiers and 80 Israeli military physicians. It incorporated questions about knowledge and the practice of TSE by patients. It also

asked similar questions to physicians. The study showed that while 70% of providers had been taught to do testicular exams, only 10% actually performed the exam on patients. Additional findings revealed that only a small fraction (16%) of physicians explained the importance of TSE to patients. By contrast, 99% of the same doctors were taught to do breast exams, and 51% routinely taught BSE to patients (Singer et al., 1993). Interestingly, 62% of the doctors indicated that TSE is the best way to detect testicular cancer early.

Another study was conducted with a group of general practitioners in Tasmania. Of the 83 respondents, 71% believed provider testicular exam to be an effective screening tool. The study also showed that 66% believe that they should screen for testicular cancer, but only 21% said they actually did. When questioned about TSE, 68% see it as an effective tool for early detection, but only 37% actually taught patients to perform TSE (Sladden & Dickinson, 1995).

Health Care Providers (HCPs) can play a significant role in the education of the population with the highest risk for testicular cancer; men ages 15-35 years old. The same group of men that is at risk, is also the largest group in the Air Force. As of Jan 29, 1999 there were 57,942 male officers with an average age of 35 years and 237,141 male enlisted members with an average age of 29 years (<http://www.afpc.af.mil/pubaffairs/release/1999/01/demos.htm>). This does not include the numbers of male dependents of military members or Reserve forces who might seek care by a HCP in the military healthcare system. With the advent of Tricare in the military, all active duty and many dependents will be managed by a Primary Care Provider as their gatekeepers. They will receive the majority of their healthcare and disease prevention instruction from these

healthcare providers. This affords the perfect opportunity for these providers to educate young male patients during routine physical exams about the risk of testicular cancer and TSE. Thus, HCPs need to be knowledgeable about testicular cancer, as well as familiar with testicular exams and teaching TSE.

The military significance of this study is twofold. First, due to the high number of men who could be at risk for this disease, there is a significant need to keep our forces healthy for both wartime and humanitarian contingencies by utilizing age appropriate screening. Secondly, in keeping with the Surgeon General's initiative of "Put Prevention Into Practice", it is a HCP's duty to keep all of the military community healthy by screening for highly treatable diseases such as testicular cancer. Early detection of testicular cancer also saves money by reducing the higher cost of treatment seen with advanced stages of the disease (Bosl, et.al., 1981; Ritchie,J., 1993).

To date, there have been no published studies looking at TSE's effectiveness in reducing mortality (http://cancernet.nci.nih.gov/clinp...r_testicular_cancer_Physician.html). However, some researchers believe that through TSE education (resulting in earlier detection of neoplasms) the mortality for testicular cancer could be reduced to zero (Bosl, et al., 1981; Ritchie, 1993). To support this idea, Iammarino and Scardino (1991) referenced the ACS's (1987) plan for Youth Education. It states that "by the year 2000, 80% of 18 year old men will be aware of the recommended early detection techniques and be able to demonstrate competent skill".

Purpose of the Study

Limited research done with physicians has shown that most do not perform testicular exams during routine physicals, nor do they teach TSE (Misener & Fuller, 1995; Singer, et al., 1993; Sladden & Dickinson, 1995). No studies to date have been conducted on this issue in the military. The increased incidence of testicular cancer and subsequent deaths, despite the fact that it is one the most curable neoplasms today, makes this a significant problem of concern for a military population (ACS, 1998). The specific problems this research study has been designed to describe are HCP's knowledge of testicular cancer and incidence of teaching age appropriate men about this increasingly common disease. The study assessed provider's performance of routine testicular exams and the frequency with which they teach TSE to young men within a military community. An additional purpose of the study was to assess for differences in the performance of testicular exams and teaching TSE among providers, MDs, PAs, and NPs. All of these questions will be looked at in comparison to the widely known and accepted practice of routine breast exams and teaching BSE to women.

Theoretically, if more providers were doing routine testicular exams and teaching all age appropriate patients to do TSE, testicular cancer would be detected earlier and the potential rate of cure would increase with a decreased cost for treatment if necessary. This is important in the case of the military because of the high percentage of the total force population who fall into the group considered at risk. It is important to keep the military population in the best possible health so they are able to perform their duties with the greatest efficiency possible.

Research Questions

Based on the purposes of this study the following research questions were addressed:

1. To what extent do HCPs in the Air Force know the epidemiology of testicular cancer?
2. To what extent are Air Force HCPs taught to perform a testicular exam during their formal training or in subsequent continuing education training?
3. To what extent do Air Force HCPs educate their patients about testicular cancer?
4. To what extent do Air Force HCPs instruct their patients to perform TSE?
5. If Air Force HCP's teach TSE to patients, what method do they use?
6. Is there a significant difference among providers, MDs, PAs, NPs, in their incidence of performing testicular exams?
7. Is there a significant difference among providers, MDs, PAs, NPs, in their incidence of teaching TSE to patients?

In addition, two hypotheses were tested using inferential statistics. The hypothesis are tested using the following null hypothesis:

1. There will be no significant differences among HCPs in their incidence of performing testicular exams.
2. There will be no significant differences among HCPs in their incidence of teaching TSE to age appropriate young men.

Conceptual Framework

Leavell and Clark's (1965) theory of preventive medicine provides the organizing framework for this study on the education and practices of Air Force HCPs concerning testicular cancer. Even though the theory was developed over 30 years ago, it still has relevance in today's healthcare environment. The theory may be even more relevant today than during its inception because of the increased cost of today's healthcare compared to 30 years ago.

Healthcare is currently in the process of shifting its focus from the treatment of disease, to disease prevention and health promotion (PHS, 1996; USPHS, 1996). The goal of "Put Prevention Into Practice" is "to enhance the delivery of clinical preventive services" (USPHS, 1996, p. ix). This is almost identical to Leavell and Clark's (1965) theory objective, "the promotion of health, the prevention of disease, and the prolongation of life" (p. 18). Leavell and Clark view health promotion and disease prevention within a framework they call "the natural history of any disease process in man" (p. 18). This schematic is broken down into a prepathogenesis period (prior to disease onset) and a period of pathogenesis (the course of the disease).

The authors describe five levels of prevention. The first two levels fall into the prepathogenesis period and are called primary prevention. They are 'Health Promotion' and 'Specific Protection' (Leavell & Clark, 1965, p. 21). These encompass education on various topics such as nutrition, risk factors for heart disease, exercise promotion and vaccinations; all ways to prevent disease from occurring. The last three levels fall into the period of pathogenesis. The first of these is 'Early Diagnosis' and 'Prompt Treatment' (p. 21). This level is where the focus of this study lies. Included in this level

are screenings and selective examinations, as well as preventing the spread of communicable disease, preventing complications and sequelae, and shortening the period of disability after disease detection. Examples of this category include prostate screening, BSE, mammograms, and colorectal screening, along with screening for testicular cancer. The fourth level usually comes during the period when the disease is more advanced. It is called 'Disability Limitation' (p. 21). The third and fourth levels make up secondary prevention. The last level makes up tertiary prevention and is called 'Rehabilitation' (p. 21). Convalescence, education, and treatment to return an individual to his or her highest level of wellness after disease treatment is the goal of this last level.

Testicular cancer, because of its unknown etiology, cannot fall into the primary prevention level until definitive factors are identified that can prevent the disease. But it comes under the secondary prevention level if it is detected early, where treatment can affect a nearly 100% cure. The purpose of this study is to describe HCP's incidence or lack of screening practices through Leavell and Clark's secondary prevention.

Definitions

For the purpose of this study, the following terms are theoretically and operatively defined.

HCP. Any Family Practice Physicians, Family Nurse Practitioners, Adult Nurse Practitioners, Primary Care Nurse Practitioners, and Physicians Assistants working in an outpatient clinic within a Military Treatment Facility (MTF) in the Air Force healthcare system.

Prevention. “to come before or precede” or “to anticipate, to precede, to make impossible by advance provision” (Leavell & Clark, 1965, p. 19). It is operationally defined as secondary prevention of testicular cancer through education of TSE.

Preventive medicine. “the science and art of preventing disease, prolonging life, and promoting physical and mental health and efficiency” (Leavell & Clark, 1965, p. 27).

Air Force setting. any out patient clinical setting in an MTF within the Air Force where HCPs administer medical/preventive treatment (i.e. Family Practice clinic, Primary Care clinic, Flight Surgery clinic, Internal Medicine clinic, or Wellness clinic).

Assumptions and Limitations

Several potential limitations were identified during the initial research for this study. The specificity of the sample (Air Force HCPs) may limit the generalizability of the study to other populations of providers. The researcher is not aware of all of the duties of the other military services HCPs. If they are different, including different settings for practice, then results from this study may not apply to other branches of the military or civilians.

An additional limitation is that findings of the study are limited by responses on the questionnaire. When using a mailed questionnaire, frequently questions are left unanswered and the researcher has no way of telling if this was due to lack of knowledge about the answer, or just an oversight. Additionally, when using a mailed questionnaire it is impossible to know the conditions under which it is filled out. Respondent's answers may be dependent upon these conditions. For example, if they are rushed to complete it, if someone else is in the room when it is being filled out, or if there are specific

expectations/ or policies in that respondents workplace, their frame of reference may be influenced (Burns & Grove, 1997).

There will be diversity of educational backgrounds within each of the subsets of HCPs. This may prove to be a limitation due to the variety of programs attended with differing curriculums. Some programs may put more emphasis on prevention and screening than others.

Several student researchers within this masters program, voiced concern about using the same sample population (Air Force Family Practice Physicians, Nurse Practitioners, and Physicians Assistants) for their studies. The concern is that the same providers may receive several questionnaires within a short period of time because students are working on a similar timeline. Research participants may be more likely to fill out the first questionnaire they receive, but not want to take any more time out of a busy schedule to fill out subsequent questionnaires. This could potentially alter the validity of a research study if a researcher were to receive a hurried completion or less than a minimum number of completed responses.

In using a mailed questionnaire, the assumption must be made that respondents will be honest in their responses. This could also be seen as a limitation if respondents are not honest. Respondents may be inclined to answer some questions stating a higher incidence of certain practices because of the current guidelines, especially within the military healthcare system, in regard to "Put Prevention into Practice" (USPHS, 1996). They would not like to seem not to be meeting recommended standards.

Summary

This study was designed to describe the current practices of Air Force HCP's concerning screening exams for testicular cancer and teaching patients about testicular cancer and TSE. Through a literature review, an identified lack of research in the area of provider attitudes about preventive care with regard to men's health issues has been noted, specifically early detection of testicular cancer. It has also been identified that no previous research has been done in the military setting with this specific group of providers. Through a mailed questionnaire to a random sample of HCPs in the Air Force, data obtained describes current teaching and screening practices of these military providers. Hopefully the questionnaire, and possibly the results, will increase provider awareness about the need for more patient teaching about this highly curable neoplasm which effects young men.

No previous studies were found in the literature examining practices of providers other than physicians. An additional benefit of this study may be to expand current knowledge about the practices of other types of providers, PAs and NPs.

CHAPTER TWO: REVEIW OF LITERATURE

Introduction

This chapter focuses on reviewing current literature concerning the incidence of HCPs performing testicular exams and teaching TSE. It is a healthcare provider's duty not only to treat disease after it has occurred, but to promote health, wellness and prevent disease. According to previous studies, this goal is not being fulfilled in the case of testicular cancer (Misener & Fuller, 1995; Singer, et al., 1993; Sladden & Dickinson, 1995). Testicular cancer, like breast cancer, is a disease in which secondary prevention, in the form of early detection, is widely accepted as having a positive effect on improved prognosis (Ogle, Snellman, & Henry, 1988).

Empirical Studies

Provider Incidence of Testicular Exams and Teaching TSE

Only one study which was done by Misener and Fuller (1995), was found with regard to testicular cancer teaching and screening using an American population. The investigator's sample included 232 physicians within the specialties of family practice, general practice, internal medicine or pediatrics. The participants completed a 21 item mailed survey to help investigators determine the testicular cancer detection practices of primary care physicians. The response rate was 50%. The survey included questions about breast exams and teaching practices, colorectal screening, in addition to questions about testicular examination and teaching practices. It also asked questions regarding self-exam practices of the respondents.

The authors designed the survey using several research methods to increase validity of the tool. The authors used the technique of masking by including questions

about breast cancer screening and teaching BSE, which research has shown is being performed more frequently, and was therefore perceived to be less threatening and answered more positively. Funneling was another technique used where the more sensitive questions were placed closer to the end of the survey after an assumed rapport with the respondent had been established. The tool was appropriately only one page long, taking less than ten minutes to complete.

The tool was piloted with three Family Practice Physicians prior to being sent out to the target population for content validation. Unfortunately, the authors did not specify if the pilot respondents were demographically similar to the study population, which may have some impact on the validity. The authors also chose not to estimate reliability, expressing concern that using a test-retest format might change answers given due to knowledge gained secondarily from the first test. This could be viewed negatively because the reliability was not established using another method.

The analysis of data showed that 83% of physicians perform breast exam and 86% of physicians teach BSE to age appropriate females (although only 16% request a return demonstration). By contrast, only 49% of physicians reported performing testicular exam during routine, non-condition related visits. Additionally, 29% of physicians reported teaching TSE to their patients with only 4 % having the patient return the demonstration. The survey also revealed that 97% and 92% of physicians, respectively, believe that patients should perform the appropriate self-exam for breast and testicular cancer. Responses regarding personal self examination were as follows: 60% of the female physicians reported performing BSE at least once a month; and 45% of male physicians performed TSE once a month. Considering the percentage of positive responses the

investigators received about performing and teaching testicular exams as an early detection method for cancer, their recommendation was to increase provider's knowledge about the importance of these exams.

Theoretical Information on Testicular Cancer

Disease Overview

No exact cause for testicular cancer has been established (<http://healthanswers.com/database/ami/converted/001288.html>). There are many possible predisposing factors. The most frequently cited factor is cryptorchidism. LeComete, in 1851, is given credit for the initial documentation of a relationship between cryptorchidism and subsequent testicular tumor formation (LeComete (1851): Quoted by Grove, J.S., 1954). It is estimated that cryptorchidism increases a man's risk of developing testicular cancer by as much as 2.5-40 times that of the general population. This risk factor is in the higher range if the testicle does not descend until after age six, even if surgery is done to put the testicle in the scrotal sac early in the child's life. Also, almost half of men with bilateral tumors have a history of cryptorchidism. This is true even when only one testicle does not descend (Ritchie, 1993). Other possible predisposing factors are mumps orchitis, inguinal hernias during childhood, previous cancer in the contralateral testicle, gonadal dysgenesis, Klinefelter's syndrome, hydrocele, family history of testicular cancer, or high socioeconomic status (ACS, 1998; Vogt & McHale; http://cancernet.nci.nih.gov/clinp...r_testicular_cancer_Physician.html; 1992; <http://healthanswers.com/database/ami/converted/001288.html>).

Of all primary testicular tumors, 95% come from germinal elements. Germinal type tumors are then broken down into seminomas and non-seminomatous neoplasms.

Seminomas account for 40 % of all germinal tumors. Germ cell tumors generally have a high growth rate, doubling in size in 10 to 30 days (Ritchie, 1993).

The symptoms of testicular cancer are varied and may be very minimal. They could include testicular enlargement, testicle lump, pain in the back or abdomen, abdominal discomfort or heaviness, blood in the semen, testicular/groin pain, discomfort or heaviness of the groin or testicle, enlarged groin or neck lymph nodes. Testicular pain is a presenting symptom only about 10% of the time. There may be no testicular symptoms at all and infertility may be the only symptom. This is why testicular cancer is frequently misdiagnosed as another illness (Million-Underwood & Saunders, 1991; Ritchie, 1993; http://cancernet.nci.nih.gov/clip...r_testicular_cancer-Physician.html)

Empirical Data

Disease Presentation

When taking into consideration that greater than 95% of solid testicular masses are malignant, it seems prudent to attempt to decrease the delay in diagnosis and initiate treatment as soon as possible (ACS, 1998; Prout, 1984; Ritchie, 1993; Vogt & McHale, 1992). This is borne out in the study done by Bosl, et al. (1991), in which 355 records of patients with testicular cancer were reviewed to determine the length of delay in diagnosis, possible causes for delay, and the impact on outcome of the disease. The study found that only 47.8% of patients were diagnosed or suspected of having cancer at their first consultation. The other 52.2% were diagnosed with trauma, hydrocele, benign tumor, infection or other non-malignant diseases.

The authors separated length of delay into patient/physician delays. The median length of delay by patients between onset of symptoms and first physician contact was 36

days. Reasons given by patients for delay included: unrecognized significance of symptoms, fear of cancer, attributed symptoms to previous trauma, symptoms went away, and some simply put it off. Almost half (43.9%) of the patients stated that the reason for delay was unknown.

In 60.9% of patients there were no delays (less than two weeks) in diagnosis by the physician. In the 39% who were diagnosed greater than two weeks after presentation, 25.7% were misdiagnosed, 5.7% had no diagnosis, 2.4% other, and 1.4% had no testicular exam (4.1% not recorded).

When length of delay was related to stage of disease, it was found that the longer the delay, the greater the stage of disease. The median delay (patient + physician) for stage I was 75 days; stage II, 101 days; and stage III was 134 days. As previously stated, the later the stage at time of diagnosis, the poorer the prognosis for recovery. The author qualified these results with a statement that the medical center where the study was conducted has a higher proportion of patients with metastatic disease than the general population due to referrals. This significant correlation between length of time to diagnosis/treatment and stage of cancer supports secondary prevention by utilizing TSE, which yields few false positive findings (Marsh, 1991).

Knowledge of Testicular Cancer and TSE

Young men's lack of knowledge about testicular cancer and TSE has been well documented for many years. In 1987, Ganong and Markowitz conducted a study involving 64 men aged 18 to 36 years of age from a university setting. Subjects completed a questionnaire about knowledge of testicular cancer and TSE.

It was found that only 25% of the sample knew the correct age range for men at highest risk for testicular cancer, almost half said they did not know the range, and the other approximately 25% guessed that it was older men. When asked to choose from a list of possible predisposing factors for testicular cancer, only 3 men identified cryptorchidism correctly, and another 35% stated they did not know any factors relating to it. Respondents were also asked to list symptoms of testicular cancer on the survey; 17% listed only correct symptoms and 56% indicated they did not know any of the symptoms. Of the respondents who had given the correct answers, none had gotten the information from a nurse or physician. Out of the 64 men, 50 (82%) had never heard of TSE. The remaining 14 men had heard of TSE, but only 5 of these had ever performed it. One of the 14 had been instructed by a physician about TSE, none had been instructed by a nurse.

Another, more recent example of young men's deficit of knowledge is illustrated in the study done by Katz, Myers, and Walls (1995). This study compared knowledge and self-exam practices between men and women about TC and breast cancer. This study was conducted on a college campus utilizing 178 students (44% male, 56% female).

The results of the 24 item survey (appropriate for gender) shows that 98% of women were aware of BSE, but only 33% practiced it consistently. This is compared to only 46% of men who knew about TSE and 19% who practice regularly. Interestingly, there were no gender differences in factual knowledge of the cancers (42% women, 44% men) as demonstrated by the answers given on the questionnaires. Finally, 99% of the women surveyed believed BSE to be important. However, only 62% of the male respondents had a similar belief.

Most studies done illustrating the knowledge deficits of young men about testicular cancer include a question about who instructed them. The majority showed that less than half the time the instructor was a medical provider (Cummings et al., 1983; Ganong & Markowitz, 1987; Goldenring & Purtell, 1984; Katz, Myers, & Walls, 1995). In a study done by Goldenring and Purtell (1984), only seven out of 147 men who knew that testicular cancer was the most common neoplasm in young men, heard it from a physician. Only 14 of the same 147 had been taught TSE by anyone. This was compared to 41 out of 64 (64.1%) women surveyed, who had previously received instruction on BSE. Of these, 78.9% knew about BSE secondary to instruction by a physician (Goldenring & Purtell, 1984). Another study indicated that only 42 out of 266 men knew something about TSE. Of those 42, seven men had been instructed by a physician (Cummings et al., 1983).

Summary

After examining the literature, the researcher found limited data pertaining to providers performing testicular exams and teaching TSE to their patients. It was found that these exams are not being done to the same extent as the comparable exams for women. Moreover, previous research shows that providers are not educating their patients regarding testicular cancer or self-exam techniques. The literature supports these simple, non-costly, quick exams for the early detection of testicular cancer. This screening method is also supported by a number of extensive studies showing men's lack of knowledge about the disease and similar lack of knowledge about methods for early detection. Empirical data shows that earlier detection could increase the cure rate for testicular cancer to nearly 100%. Detection at the earliest stage of disease is consequently

much less costly than cancer diagnosed at a later stage with possible relapses and frequent additional treatment necessary for cure. (Bosl, et al., 1981)

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

Introduction

The purpose of this chapter is to provide information about the study design and methodology, a description of the sample and how it was obtained, and the measurement tool used to gather data. Additionally, it describes the appropriate institutional review boards completed. The chapter describes the research questions and the corresponding questions from the questionnaire.

Design and Methodology

This predominantly descriptive study was meant to add to the small volume of previous data collected regarding current health care provider practices concerning teaching about testicular cancer and TSE to age appropriate patients. As previously identified in Chapter Two, the practice by HCPs of testicular cancer screening via provider exam, or teaching a self-screening method (TSE) to patients, is minimal when compared to other cancer screening practices. These results were noted in only three previous studies about provider practices. The most recent studies were conducted in 1995 (Misener & Fuller, 1995; Sladden & Dickenson, 1995).

Data collection was accomplished by a questionnaire mailed to prospective subjects. Questionnaires were mailed in a manila envelope to HCPs at their squadron addresses. Included with the questionnaire was a cover letter explaining the purpose of the study, and a self-addressed stamped envelope for returning the questionnaire to the investigator's school address.

Questionnaires were numerically coded in case a second mailing was necessary to increase the number of completed questionnaires. The second mailing was unnecessary

due to adequate return rate. The only copy of the code list was secured at the investigator's home and was destroyed after the need for a second mailing was determined to be unnecessary.

The timeframe for mailing the questionnaire and return was October 1998 through December 1998. The original mailing included 160 questionnaires. An additional 11 questionnaires were included in data collection from the first reliability testing.

Sample

The study sample included active duty Air Force Family Practice Physicians (MDs), Physicians Assistants (PAs), Family Nurse Practitioners (FNPs), Adult Nurse Practitioners (ANPs), and Primary Care Nurse Practitioners (PCNPs) at numerous facilities. A list of names was obtained from the Military Personnel Center in Texas, through the Freedom of Information Act. MD and PA subjects were chosen randomly by a modified stratified sample. There were approximately 495 Family Practice physicians, 409 PAs, and 32 NPs (to include FNPs, ANPs and PCNPs) on active duty as of September 1997, (Q. Edwards, Col, USAF, personal communication, April 8, 1998). These numbers change slightly from month to month due to separations, retirements and accessions to the Air Force. The most recent numbers possible were obtained prior to mailing the questionnaires. Computations for the appropriate percentages were based on numbers at that time. At that time, MDs comprised 53%, PAs 44%, and NPs 3% of the total population of HCPs in the Air Force. Due to the large population of MDs and PAs and the investigator's limited budget, a number of MDs and PAs equal to the number of NPs (3%) were surveyed. Due to the small number of NPs, the entire population was sent questionnaires. MD and PA participants were selected by using a random numbers table

to chose the appropriate number of each type of provider, plus 50% to accommodate for incomplete or unreturned questionnaires. The physician that was asked to rate the tool for content validity did not complete the questionnaire. The PA and NP from a geographically convenient site that rated the tool, completed the questionnaire. This data was included in the analysis. The initial responses from the participants in the pilot study were included in the final data results so as not to decrease the already small NP population for the research study.

The study included 104 participants. Eleven questionnaires were returned undeliverable. Two of these were NPs, three were PAs, and six were MDs.

Measurement

The questionnaire was two pages, front and back, and included 10 questions that required dichotomous yes/no or true/false answers, and six questions that required the subjects to answer a multiple choice question. Two questions required a percent estimate and three questions had the option of multiple answers. The questionnaire also included demographic information about age, sex, certification or licensure of the subjects, and practice setting. There was also a multiple-choice question about personal self-examination practices and another about if/how the provider was trained to perform breast/testicular exams. The questionnaire was estimated to take approximately 10-15 minutes to complete.

The questionnaire used in this study was a modified version of the one designed by Misener and Fuller (1995). The original tool included questions about breast and colorectal cancer screening in addition to testicular cancer. The questions about colorectal cancer were omitted. Questions about breast and testicular cancer were

included both for comparison of gender specific cancer screening techniques, and to decrease any possible perceived threat associated with answering questions solely about testicular cancer. If providers were not practicing testicular cancer screening, they may have felt threatened if the only questions were regarding testicular cancer and they answered them negatively.

Due to the modification of the tool and differences of the sample studied, content validity was examined using geographically convenient experts (one MD, one PA, and one NP) currently working in a MTF within the Air Force. Each expert was asked to rate each question on scale of "one" to "four" as to its relevance to the purpose of the study. The percent agreement calculated was 99%. The experts were also asked to identify any study variables that were not included within the questionnaire. Additionally, they were asked to evaluate readability of the tool, although it was not calculated formally, owing to the fact that all of the participants in the study would have a minimum of a bachelor's degree and/or were health care credentialed providers

Several changes to the questionnaire were made based on experts' comments provided when rating the relevance of the questions. Each question included in the questionnaire was rated as "relevant" or "very relevant" by all three experts, with the exception of one. The MD expert rated Question 16 (the five-year survival rate for women with breast cancer confined to the breast at time of diagnosis) as "somewhat relevant". Based on the MD's comments, the answer choices were restated as ranges instead of a specific percentage. Question 24 (the cure rate for testicular cancer when it is detected in its earliest stage) was changed in the same manner so as to be consistent with Question 16.

Based on another comment by the MD, Questions Four and Six were modified to include the words "including medical school and residency" after response option b).

This modification was made to provide more clarity to the MD respondents. Questions Five and Seven were modified by adding gender specificity with regard to personal self-exam practices. The only other change was based on comments from the researcher's committee members about the layout of questions and responses. This change did not result in any modifications or changes in the questions.

Estimates of reliability were not obtained on the survey by Misener and Fuller (1995). However, in this study reliability was assessed using a test-retest format. Reliability testing for this modified questionnaire was conducted in a small pilot study using a convenience sample of Air Force HCPs at a local Air Force facility. There was a five-week interval between test and retest questionnaires. This was due to the logistics of having the same group of providers available through a monthly staff meeting. Questionnaires for both test and retest were hand delivered and administered by the researcher with the approval of the clinic administrator. The pilot included a similar percentage of MDs, PAs, and NPs comparable to the proposed research study population. Questionnaires were numerically coded so that first and second questionnaires could be matched. Percent agreement was calculated between the responses at Time I and Time II for each respondent. Overall, the percent agreement was 91%, reflecting stability of responses over time to the questionnaire.

Protection of Human Rights

Participant's rights were protected through the Institutional Review Board (IRB) of the Uniformed Services University of the Health Sciences. Prior to beginning data

collection, the IRB approved the original proposal to assure that no harm could come to the participants through the data collection process or reporting of the results.

Additionally, the proposal was approved by the Survey Control Department of the Air Force. This department reviewed the tool for content and appropriateness and assigned a survey control number to it (USAF SCN 98-47), which appears on the tool.

Participation in the study was completely voluntary. A cover letter was included with the questionnaire explaining the purpose of the study, procedure, confidentiality, risks/benefits, right to withdraw, and consent. Confidentiality was protected by not requesting any identifying information on the questionnaire. There were no risks to participants by completing the questionnaire. Benefit will come in the form of greater knowledge about general practice of peers/self regarding testicular cancer. Consent was implied when participants completed and returned the questionnaire. The consent form was one page with two sides.

The coded list of participants was kept by the investigator only until a 50% return rate of questionnaires was achieved. The list was then destroyed. Respondents were offered the opportunity to obtain results of the study at its completion. Three respondents requested a copy of the results at the conclusion of the study. These names were maintained only until the thesis was successfully defended, and then were destroyed.

Data Analysis

Since this survey research was predominantly a descriptive study, the data analysis consisted mostly of frequency and percentage distributions. Most of the data collected was reported by provider subtype.

Percentage distributions were reported in addition to frequency of the answers to dichotomous questions. Percentages were then more easily compared for breast and testicular questions. A basic frequency distribution was used to describe correct answers to the four multiple-choice questions about epidemiology of both breast and testicular cancer.

Question 27 asked about methods to provide patient education for gender appropriate cancer. Providers had the opportunity for multiple answers if they had more than one method for education. A frequency distribution best described these results along with a total number of methods used per provider.

Inferential statistics, using chi-square, was used to determine if significant differences between subsets of providers existed in the incidence of their performance of testicular exams and teaching about testicular cancer. The chi-square test was used to analyze nominal data and to determine significant differences between frequencies of data (Burns & Grove, 1997). In this study, chi-square was used to test two hypotheses. These two hypotheses were stated in the null and included the following: (a) There will be no significant difference among HCPs in their incidence of performing testicular exams, (b) There will be no significant difference among HCPs in their incidence of teaching TSE to patients. A three by two table was used to present this data. All data was tested using a two-tail test at the 0.05 level of significance.

Each research question was answered by at least one item on the questionnaire and sometimes by several. There were eight questions (one, two, three, five, seven, eight, nine and seventeen) that describe the demographics of the respondents or their workplace. Some of the questionnaire items were used for comparison purposes; these are noted

below. The following is an inventory of each research question and it's corresponding questionnaire items:

1. To what extent do HCPs in the Air Force know the epidemiology of testicular cancer?

Questionnaire items: 22, 23, 24 (comparison questions 14,15,16)

2. Are Air Force HCPs taught to perform a testicular exam during their formal training or in subsequent continuing education training?

Questionnaire items: 4 (comparison question 6)

3. Do Air Force HCPs educate their patients about testicular cancer?

Questionnaire items: 25, 27 (comparison question 26)

4. Do Air Force HCPs instruct their patients to perform TSE?

Questionnaire items: 25, 19, 21 (comparison question 26, 11, 13)

5. If Air Force HCPs teach TSE to patients, what method do they use?

Questionnaire items: 27,20 (comparison question 12)

6. Is there a significant difference among providers, MDs, PAs, NPs, in their incidence of performing testicular exams?

Questionnaire items: 18 (comparison question 10)

7. Is there a significant difference among providers, MDs, PAs, NPs, in their incidence of teaching TSE to patients?

Questionnaire items: 19 (comparison questions 11)

Summary

In summary, this was a descriptive study that utilized a mailed questionnaire to collect data about the incidence of HCPs performing testicular exams and teaching TSE

to age appropriate patients within the military setting. The questionnaire was a modified version of a tool used previously in a study done in 1995 (Misener & Fuller). Estimates of both content validity and reliability were obtained for the modified tool prior to its use in this study. A description of the data collected will be presented in Chapter Four.

CHAPTER FOUR: DATA ANALYSIS

Introduction

The purpose of this study was to describe current practice of Active Duty United States Air Force HCPs incidence of performing testicular exams and teaching TSE to age appropriate young men during routine physical exams. This was determined through the use of a mailed questionnaire. Questions about performance of breast exams and teaching BSE were included for comparison purposes.

This chapter includes a description of the sample, demographics of the respondents, and a description of the responses from the questionnaire. The responses are presented according to each of the research questions previously presented in Chapter Three using frequencies, percentages, and in some cases Chi-square statistics. SPSS was the computer based program used to analyze the data.

Sample

The total sample size consisted of 104 respondents. Questionnaires were mailed to 160 HCPs at their squadron addresses located at AF military health care facilities. Of the 160 mailed questionnaires, 11 were undeliverable due to permanent change of station (PCS) moves. Two surveys were excluded because of the setting in which the providers worked. One worked in an emergency department, and the other worked in orthopedics. Neither provider did routine annual exams on patients. Three of the returned questionnaires were from Doctors of Osteopathy; these were included with the MD responses.

There were no changes made in the tool after the test/retest to confirm reliability. Therefore, eleven additional surveys were obtained in the course of the pilot study from

the first responses from participants. These were included in the data collection and analysis. None of these respondents were on the original mailing list.

Responses were returned from 40 different Air Force facilities within the continental United States. Four responses were returned from the two Air Force bases located in Alaska. No responses were returned from overseas facilities. The original list of providers did not include any names from overseas facilities except for two NP's whose surveys were returned to the investigator due to PCS moves.

The final response rate was 61% of the total of mailed questionnaires. The goal was to receive at least 50%, and this was met with the first mailing.

Demographics

The total number of questionnaires used for data analysis was 104. Eight of the 27 questions on the survey were concerned with the demographics of the respondents. Questionnaires were returned from 48% (N=50) of the MDs, 30% (N=31) of the PAs, and 22% (N=23) of the NPs. The highest relative return was from the NPs, at 70% of the total population of NPs who were mailed questionnaires (32 were mailed and an additional two were used from the pilot study). There were 69 questionnaires mailed to MD's plus five obtained from the pilot study. Of these 74 questionnaires N=50 (68%) were used in data analysis. The PAs had the lowest relative return rate at 48% (N=31). Sixty questionnaires were mailed to PA respondents, and another four were obtained from the pilot study.

All but three providers worked in a Family Practice or Primary Care setting. One MD works in an Internal Medicine clinic and another works in a Flight Surgeon's office. One PA works in Otolaryngology, but apparently does physical exams. One FNP added

the comment that she worked 28 hours in a Primary Care clinic and an additional 12 hours in a Flight Surgeon's office in a week.

Of the MDs (N=50) who responded, six did not list a specialty, three were Doctors of Osteopathy working in Family Practice, and two listed Internal Medicine as their specialty. The other 39 MDs (78%) had a Family Practice specialty, with four of these being residents. One respondent listed their specialty as a Family Practice/Psychiatry intern working in a Family Practice setting.

Also of note were provider's personal preventive practices demonstrated by their incidence of performing BSE/TSE. At least 50% or more of all providers performed the gender appropriate self-screening exam at least eight times a year or more.

The results of questionnaire items Nine and Seventeen were not included in the following table. This was due to confounding responses from some providers. Each question asked what percentage of the provider's practice is males (or females) over the age of 15 years. The two percentages should not equal greater than 100%. Yet 12 providers (12%) (four of each type) stated percentages equaling more than 100%. Another 20 providers (19%) reported that 100% of their practice was made up of patients all over the age of 15 years. It is unlikely that 31% of the providers completing this survey (almost all work in either Family Practice or Primary Care) did not see any patients under the age of 15. Table 1 summarizes the demographic statistics of the respondents.

Research Questions

This study assessed seven research questions. All seven of the questions use breast cancer (BC) or BSE for comparison to testicular cancer (TC) and TSE

Table 1

Demographic Data of Health Care Providers Responding to the Questionnaire

	Physicians (n=50)		Physicians Assistants (n=31)		Nurse Practitioners (n=23)	
	#	%	#	%	#	%
Age(26-53 yr.)						
26-34 years	32	64	3	10	1	4
35-43 years	13	26	22	71	15	65
44-53 years	5	10	6	19	7	31
Gender						
Male	36	72	25	81	2	9
Female	14	28	6	19	21	91
Specialty						
Family Practice	42	84	---	---	---	---
Internal Med.	2	4	---	---	---	---
Personal testicular self- exam performance						
Never	1	3	1	4	0	0
1-3x yr	6	17	3	12	0	0
4-7x yr	8	22	2	8	1	50
8-11x yr	5	14	4	16	0	0
1x mon	12	33	14	56	1	50
>1x month	4	11	4	16	0	0
Personal breastself- exam performance						
Never	1	7	0	0	1	5
1-3x yr	0	0	1	17	2	10
4-7x yr	2	14	1	17	3	14
8-11x yr	5	36	2	33	2	10
1x mon	5	36	2	33	11	52
>1x month	1	7	0	0	2	10
Setting						
Family Practice	34	68	23	74	13	57
Primary Care	14	28	7	23	10	43
Flight Surgeon	1	2	0	0	0	0
Internal Med	1	2	0	0	0	0
Other	0	0	1	3	0	0

performance.

Question One examined the extent of HCP's knowledge concerning TC and compared it to their knowledge of BC. There were six (three each TC/BC) questions relating to knowledge. More than 50% of MDs and PAs correctly answered that the highest incidence of BC is in the 60-79 year old age range for women. Only 39% of NPs correctly answered this question. More than 94% of each type of provider answered that the highest incidence of TC is in the 15-35 year old range. Only three providers (one of each type) incorrectly answered that question. All (100%) providers correctly answered false regarding the fact that BC only affects women.

The true/false question (#23) regarding testicular masses being malignant 95% of the time, was frequently answered incorrectly by all providers. Only 25% of MDs, 29% of PAs, and 23% of NPs correctly answered true to this statement.

The last set of questions (#16 and 24) related to the percent of people with a five year survival rate for both BC and TC. Only a small percentage of providers answered correctly that five year survival was greater than 95% for BC victims when the disease was confined to the breast; 10% of MDs, 20% of PAs, and 26% of NPs. However, in regard to five year survival of TC, when confined to the testes, the percentages of correct answers were higher; MDs 47%, PAs 40%, and NPs 57%. This information is summarized in Table 2.

The second research question asked where HCPs were trained to perform breast and testicular exams. The majority of all subsets of providers were trained in a formal education setting to perform both types of exams. With regard to breast exams: 98 % (N=47) of MDs, 100% (N=31) of PAs, and 78% (N=18) of NPs received their knowledge

Table 2
Comparing Providers Knowledge Regarding Epidemiology of Testicular Cancer

	Physicians (n=50)		Physicians Assistants (n=31)		Nurse Practitioners (n=23)	
	#	%	#	%	#	%
Highest incidence of breast cancer in women						
20-39 years	1	2	1	3	0	0
40-59 years	17	34	14	45	11	48
60-79 years*	25	50	16	51	9	39
80+	6	12	0	0	2	8
Breast cancer only effects women						
False *	50	100%	31	100%	23	100%
True	0	0	0	0	0	0
5 year survival for localized BC						
0-55%	1	2	0	0	0	0
56-65%	0	0	3	9	1	4
66-85%	14	28	6	19	9	39
86-95%	30	60	15	48	4	13
>95% *	5	10	6	19	5	16
Highest incidence of testicular cancer in men						
15-35 years*	49	98	29	94	22	96
40-55 years	1	2	1	3	1	4
60+	0	0	1	3	0	0
Testicular masses are malignant 95% of the time						
True *	12	24	8	26	5	22
False	37	74	20	65	17	74
Cure rate in earliest stage of testicular cancer						
0-55%	1	2	0	0	0	0
56-65%	4	8	1	3	0	0
66-85%	6	12	1	3	3	13
85-95%	15	30	16	52	7	30
>95% *	23	46	12	39	13	57

*denotes correct response

through formal education. One MD learned to do breast exams “on the job”, as did three NPs. Another two NPs reported they had learned through continuing education. Only two MDs did not answer. Additionally, four NPs, three PAs, and three MDs gave multiple answers. The first answer given was entered into the database. But the additional answers were as follows: all three PAs also learned to perform breast exams in a continuing education course; two of the four NPs listed continuing education as a second method of learning; a third NP listed three ways that she was trained (formal education, continuing education, and “on the job”); one NP learned to perform breast exams “on the job” also; two of the MDs who circled more than one method were trained in a continuing education course; and the third wrote in that she was trained first by her personal physician.

Regarding providers training for testicular exams, data revealed that most learned in a formal education setting; MDs 82% (N=40), PAs 97% (N=30), and NPs 52% (N=12). One MD failed to answer this question and the other nine answered that they had learned “on the job”. All 31 of the PAs responded to the question, with only one stating that he had never learned. One NP said that she had never learned, one learned in continuing education, and nine more learned “on the job”; there were no missing answers from the NPs. There were no providers who gave multiple answers to this question.

All providers answered the question and comparison question with regard to whether they educate their patients about TC and BC. Sixty-four percent of all HCPs included patient education about TC, and 78% provided BC education to their patients. Table 3 summarizes the individual percentages by provider about education of BC/TC and the methods used by each type of provider.

Table 3

Testicular Cancer/Breast Cancer Methods of Education by Provider

	Physicians (n=50)		Physicians Assistants (n=31)		Nurse Practitioners (n=23)	
	#	%	#	%	#	%
Testicular cancer education						
Yes	28	56	21	68	18	78
No	22	44	10	32	5	22
Breast cancer education						
Yes	37	74	26	84	18	78
No	13	26	5	16	5	22
Provider discussion						
Testicular cancer	34	69	24	80	17	77
Breast cancer	36	73	24	80	17	77
Registered nurse educator						
Testicular cancer	4	8	5	16	1	5
Breast cancer	9	18	9	3	1	5
Written materials						
Testicular cancer	12	24	14	47	9	41
Breast cancer	22	45	19	63	12	55
Video tape						
Testicular cancer	0	0	2	6	0	0
Breast cancer	2	4	3	10	3	13
None						
Testicular cancer	4	8	0	0	1	5
Breast cancer	3	6	0	0	0	0

Research questions Four and Five are somewhat related. Question Four asks if Air Force HCPs are instructing their patients to perform TSE (BSE for comparison) routinely. There are six survey questions that pertain to this research question. A total of 80% of MDs instruct their patients to perform TSE and 90% provide them with other forms of TSE instruction. Ninety-six percent instruct their patients about BSE and 100%

provide them with some additional form of BSE education. Eighty-four percent of Physician's Assistants instructed their patients during routine exam about TSE, and 94% instructed patients about BSE. One PA did not answer this question. Regarding TSE/BSE education respectively: 97% and 100% of PAs provide some alternative form of education. All NPs answered all four of these questions with 96% instructing patients to perform TSE, while 100% provided some other form of education. All 23 (100%) NPs instructed their female patients to perform BSE and also provided some form of alternative education.

Two additional questions were asked regarding provider's beliefs about whether age appropriate men and women should be taught to perform TSE and BSE. There were no missing answers to either of these questions. Overall, 97% and 99% of all providers respectively believe that BSE and TSE should be taught to young women and men.

Research Question Five pertains to their methods of instruction. Questions 27, 12, and 20 from the questionnaire were used for the purpose of answering this research question. There were 20 potential responses for Question 27 about how education was accomplished for BC, TC, BSE, and TSE. Education could have been in the form of provider discussion, return demonstration from the patient, videotape, written materials, or instruction by a registered nurse. The summation of methods used per provider to educate patients about BC and TC are found previously in Table 3. The results of the methods used for education of BSE and TSE are displayed in Table 4. Discussion by the provider with patients is the method most often used by all types of providers for education of TSE and BSE. Three providers (one MD, one PA, and one NP) did not answer question 27.

The last questions (# 12 and 20) from the survey that pertained to research Question Five concerned return demonstration of BSE/TSE by the patient to the provider. These results are also included in Table 4. Although most providers discuss TSE/BSE with their patients, few assure that their patients are knowledgeable about performance with feedback and a return demonstration.

Table 4

Methods Used by Provider to Educate Patients About Testicular Self-Exam/Breast Self-Exam

	Physicians (n=50)		Physicians Assistants (n=31)		Nurse Practitioners (n=23)	
	#	%	#	%	#	%
Provider discussion						
TSE	44	90	30	100	22	100
BSE	47	96	30	100	22	100
Nurse educator						
TSE	3	6	4	13	2	9
BSE	9	18	9	30	3	14
Written materials						
TSE	20	41	23	77	18	82
BSE	34	69	25	83	20	91
Video tape						
TSE	1	2	3	10	3	14
BSE	3	6	7	23	7	32
None						
TSE	1	2	0	0	0	0
BSE	0	0	0	0	0	0
Return demonstration						
TSE	4	8	6	19	6	26
BSE	7	14	10	33	11	48

The last two research questions were answered using descriptive and inferential statistics. One questioned how many HCPs are performing testicular exams during routine physical exams, and whether a significant difference in performance of this exam exists among providers. All respondents provided a response to the question regarding testicular exam performance. One PA did not answer the comparison question regarding incidence of breast exams. The results, by percentage are displayed in Table 5, noting that more than half of each type of provider performed testicular exams during routine physical exams. Inferential statistics using Chi-square was used to determine if differences among providers occurred regarding TSE/BSE. Results revealed a $\chi^2 = .964$, 2df, and $p = .618$ for testicular exams and a $\chi^2 = 3.754$, 2df, and $p = .153$ for breast exams. There were no significant differences among HCPs in their performance of testicular or breast exams during routine physicals.

Table 5

Percentages of Providers Performing A Testicular Exam During Routine Physical

	Yes (%)	No (%)
MDs (n=50)	58	42
PAAs (n=31)	68	32
NPs (n=23)	57	43

Table 6

Percentages of Providers Performing A Breast Exam During Routine Physical

	Yes (%)	No (%)
MDs (n=50)	58	42
PAs (n=30)	43	55
NPs (n=23)	70	30

Research Question Seven pertains to comparison among providers regarding their incidence of teaching TSE to patients. Earlier narrative provides the percentages of providers teaching these self-exams. Every provider answered both questionnaire items (19 and 11) with the exception of one PA who did not report his incidence of teaching BSE. Chi square inferential statistics regarding comparison of HCPs performing TSE revealed: χ^2 for TSE = 2.984, 2df, and $p=.225$. Chi square results regarding comparison of HCPs incidence of BSE is $\chi^2 = .918$, 2df, $p=.632$. Neither of these values was statistically significant, meaning that there was not a significant difference among providers relative to teaching TSE/BSE to patients.

Summary

In summary, 104 surveys were collected for inclusion in the data for analysis. There were N=50 MD, N=31 PA, and N=23 NP responses utilized for this study. The highest relative response came from the NPs (71%). All but three providers work in either a Family Practice or Primary Care setting. There were 63 male providers and 41 female providers across all three groups.

This study presented seven research questions for investigation. Every question concerning TC or TSE had a similar question about BC or BSE for comparison purposes. The first research question requested information regarding HCP's knowledge of TC as compared to their knowledge of BC. The provider group with the overall highest percentages of correct answers regarding TC was the PAs. With regard to BC knowledge, the NPs had the highest average percentage of correct responses.

The vast majority of MDs and PAs (more than 82% of each) learned to perform both breast and testicular exams in a formal education setting. Alternately, most NPs learned breast exams through formal education (78%), but only 52% stated that they learned to perform testicular exams in this setting.

This study found that 64% of all HCPs provided education about TC by varying methods. BC education was provided by a greater percentage (78%) of HCPs, also by varying methods. The method most used by all types of providers for both TC and BC education was discussion by the provider. The second most often noted response was written materials. The method least often reported was use of a videotape.

Research Questions Four and Five were related because both were concerned with teaching TSE/BSE and the beliefs by providers about self-exams. Nurse practitioners had the highest percentage (96%) of positive responses concerning instruction of TSE. More than 96% of each type of provider instructs patients to perform BSE. The NPs were the only group who instructed their patients 100% of the time to perform BSE. All groups provided some form of additional education besides verbal instruction. Interestingly, 99% of all providers believed that TSE should be taught, although none of the groups of providers had a percentage as high for actual teaching. Additionally, 97% of all groups

believed in teaching BSE to young women. As with TC/BC teaching methods, provider discussion was the most often cited method used for teaching TSE/BSE within all groups of providers.

The last two research questions inquired about differences among providers in both performing testicular and breast exams, and also about their incidence of teaching TSE/BSE. Results, using Chi-square, revealed no statistical differences among providers for any of the above teaching or exams.

CHAPTER FIVE: SUMMARY

Conclusions

The main focus of this study was to examine the incidence of HCPs performing testicular exams and teaching TSE within an Air Force healthcare setting. Three previous studies had shown that these simple, non-costly exams were not being accomplished at the level supported by ACS (1999), and the American Academy of Pediatrics (1996). The recommendation is that all postpubescent men perform monthly TSE and have a testicular exam by a provider every three years (ACS, 1999; RUSPTF, 1996). Each of the previous three studies revealed that less than 50% of providers (all MDs) were performing testicular exams during annual physical exams (Misener & Fuller, 1995; Singer, et al., 1993; Sladden & Dickinson, 1995). In one study (Singer, et al., 1993) only 10% of providers reported performing testicular exams.

Although this study is small (104 respondents) and focuses on a very specific population (Air Force HCPs), the results showed that this group of providers was better at meeting the recommendations for testicular exams relative to that reported in the previous three studies found in the literature. Fifty-eight percent of MDs, 68% of PAs, and 57% of NPs stated that they routinely performed testicular exams during a physical. Interestingly, with regard to the comparative question about incidence of breast exams, there is still much room for improvement showing that only 58% of MDs, 43% of PAs, and 70% of NPs were performing these exams routinely. One of the previous studies also used breast exams for comparison purposes and had a higher incidence of performance (83%) (Misener & Fuller, 1995). Another study (Singer, et al., 1993) had a much lower incidence (13%).

With regard to the two survey questions about performance of testicular and breast exams, it was interesting that respondents wrote in comments next to their yes/no answers to qualify them; almost 30 times. Most often the respondent marked no to either breast and /or testicular exam, but then qualified their answer by writing that they did perform the exam during annual, sports, or well person physicals. Because this was almost the only question where comments were offered, it leads the researcher to query whether the question may have been misunderstood. The researcher's intent was to find out whether these exams were being performed during routine (meaning annual, sports, well person) physicals. It is the researcher's concern that if a respondent misunderstood the intent of the question, and did not qualify the answer with a written comment, that they may have marked "no", when in fact they actually perform these exams. If this questionnaire were to be used again for a study, the researcher would recommend making these two questions clearer. Perhaps if the question had read "during well woman/man exams" to make the intent more apparent. It would also be helpful to query respondents about the intervals used at their specific facility regarding "annual" or "well-person" exams. It may vary from facility to facility.

The other main focus of this study was HCPs' incidence of teaching TSE to their patients. The lowest incidence was by MDs at 80%, and the highest was NPs at 96%. Comparatively, more than 94% of all providers taught their patients to perform BSE, with 100% of NPs teaching it. All three of the previous studies asked about incidence of providers teaching TSE. In the study done by Sladden and Dickinson (1995), only 37% of MDs actually taught self-exams, even though almost 70% thought that TSE was an effective method to detect testicular cancer, and believed that it should be taught. In the

Misener and Fuller study (1995), only 29% of providers taught TSE compared to 86% who taught BSE. Similarly, 92% and 97% respectively believed that TSE and BSE should be taught to age/gender appropriate persons. The last research that studied this phenomenon did not ask about MDs beliefs concerning TSE/BSE. But it did ask about incidence of teaching TSE/BSE; results revealed that 16% of MDs explained TSE to patients and 51% explained BSE to patients (Singer, et al., 1993). The researcher also asked providers in this study whether they believed that TSE/BSE should be taught to age/gender appropriate individuals. All but one responded positively (103/104) concerning TSE. Comparatively, there were three providers who did not believe that BSE should be taught to young women. It is interesting that in all four studies, spanning eight years, that many more HCPs believed that routine self-screening exams were effective and should be taught to patients, than actually taught them.

This study examined providers knowledge of the epidemiology of TC (BC) through six survey questions (research Question One). Only one study previously looked at provider knowledge concerning TC (Sladden & Dickinson, 1995). In that study only two questions were presented. One concerned the age of highest incidence; 96% of respondents answered correctly. The other question asked about age group when death was most likely. There was a 71% correct response rate. This researcher's data showed that HCP's in this study usually chose the correct answer when responding to questions regarding the epidemiology of both TC/BC with the exception of one. A true/false question started that "testicular masses are malignant 95% of the time". The highest percentage of correct answers was from the PAs at 26%. Both MDs and NPs had a lower number of correct responses. Possibly this question was misinterpreted. It could be that

respondents considered hydroceles and varicoceles as masses. If this question was to be used in a future study, it may be clearer to say “solid testicular masses”. Similar to previous studies, most of the providers in this study learned to perform breast exams through a formal education program. But, as in a previous study, not all providers were taught to perform testicular exams during their formal education. Eighty-two percent of MDs, 97% of PAs, and only 52% of NPs learned this skill in a formal education setting. Of the providers who answered these two questions, there were only two who stated they had never learned to perform testicular exams. This answer was confounding considering that they responded positively to performing testicular exams. In the study done by Singer et al. (1993), 99% of physicians were taught to perform breast exams in medical school compared to only 70% being taught to examine testicles in the same programs.

Recommendations for Practice

Although this was a relatively small sample population, with limited generalizability due to the population studied, it does demonstrate that this group of providers is performing testicular exams at the appropriate times compared to previous groups studied. However, the incidence of performing exams and teaching TSE is still not in compliance with the ACS and AAP recommendations.

Formal education programs, medical schools, or certification programs, need to be more proactive in promoting preventive care instruction to providers. As previously noted in this study, annual well woman exams have become the norm, including a pap smear and provider breast exam. However, it appears that providers need more education about well man exams.

With regard to teaching self-screening for TC, this study showed a marked improvement by this specific group of providers in their incidence of teaching TSE, compared to previous studies. Again however, there is still a lot of room for improvement in increasing provider's knowledge regarding the importance of these exams.

Future Research

This research study has shown a discrepancy between provider's beliefs regarding effectiveness of self-screening and provider exam screening, and actual incidence of performing these screening exams. It would be interesting to do further research studies specifically looking at whether there is a correlation between providers' belief that self-screening and provider exams are effective methods of early cancer detection, and their actual incidence of exams and teaching TSE/BSE.

Recommendations for future study include repeating this research in a different provider population with previous recommendations for changes in the questionnaire completed. It would even be interesting to repeat this study with the same group of providers after the changes had been made to the survey. In a future study, pediatricians should be included in the group of respondents. The youngest patients of the high-risk group (15-21 year olds) might be receiving their care from these providers. Hopefully it would show a more accurate rate of incidence of exams and teaching.

If this study was repeated, this researcher believes that a question regarding years of practice should be included. The study by Singer et al. (1993) found that younger physicians taught the significance of TSE to patients more frequently than did older

providers. It would also be interesting to look at whether there is an impact on incidence of preventive care by provider gender.

An additional recommendation would be to perform a study assessing military personnel and/or military beneficiaries regarding patient perspectives about instruction of TSE and their incidence of performing this valuable self-screening exam. This researcher did not find any previous literature where a study was done with a military community. This would also add to providers' understanding concerning their patients' level of knowledge about testicular cancer and TSE, therefore contributing incentive to provide their patients with this valuable information if patient knowledge was lacking.

Another study that would compliment results of this one could be done with military health care beneficiaries. A study accomplished with that population would determine the patient's level of knowledge regarding TC and TSE. That study, if patient knowledge was found to be lacking could be used to support the findings from previous studies, including this one, that HCPs need to be performing testicular exams and teaching TSE more frequently. Either of the above studies would lend significance to this research in supporting the Surgeon General's "Put Prevention Into Practice" initiative. By examining the knowledge base of both HCPs and military health care beneficiaries, providers will see the benefit of teaching TSE and providing testicular screening exams to their patients.

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APPENDICES

APPENDIX A: Approval Letter from Researcher

APPENDIX B: Uniformed Services University of the Health Sciences IRB Approval

APPENDIX C: Assignment of Survey Control Number

APPENDIX D: Consent Form

APPENDIX E: Cover Letter

APPENDIX F: Questionnaire

APPENDIX A



March 4, 1998

Nicola S. Adams, Capt, USAF, NC
18511 Eagles Roost Drive
Germantown, MD 20874

Dear Captain Adams:

I am pleased to give you permission to use my instrument to measure health care providers practices surrounding cancer screening and testicular cancer in particular. Good luck in your research endeavors. Do not hesitate to ask if I can do to assist you in your study of this important practice domain.

I would appreciate a copy of your thesis when you are finished.

Sincerely,

Terry R. Misener, RN, PhD, FAAN
Dean and Professor

APPENDIX B



UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES

4301 JONES BRIDGE ROAD
BETHESDA, MARYLAND 20814-4799



July 24, 1998

MEMORANDUM FOR NICOLA S. ADAMS, GRADUATE SCHOOL OF NURSING

SUBJECT: IRB Review and Approval of Protocol T06178 for Human Subject Use

Your research protocol, entitled "*Air Force Health Care Providers' Incidence of Performing Testicular Exams and Teaching Testicular Self-Exams.*" was reviewed and approved for execution on 7/22/98 as an exempt human subject use study under the provisions of 32 CFR 219.101 (b)(2). This approval will be reported to the full IRB scheduled to meet on 8/13/98.

The IRB understands that this study surveys a random sample of Air Force health-care providers about their habits in performing testicular exams and teaching patients to perform self-exams. Results will be compared with analogous breast exam studies. No information by which individual subjects may be identified will be collected.

Please notify this office of any amendments or changes in the approved protocol that you might wish to make and of any untoward incidents that may occur in the conduct of this project. If you have any questions regarding human volunteers, please call me at 301-295-3303.

Richard R. Levine, Ph.D.
LTC, MS, USA
Director, Research Programs and
Executive Secretary, IRB

cc: Director, Grants Administration

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APPENDIX C

26 June 1998

MEMORANDUM FOR CAPTAIN NICOLA ADAMS

FROM: HQ AFPC/DPSAS
550 C Street West, Suite 35
Randolph AFB TX 78150-4737

SUBJECT: Request for Survey Control Number for Student Research Thesis (Your e-mail, 23 Jun 98)

Your proposed survey of medical personnel is approved for use with Air Force members. A Survey Control Number (SCN) of USAF SCN 98-47 is assigned to your survey contingent upon the minor revisions listed in the following paragraphs. This number and authorization will expire on 31 December 1998.

The required changes include:

1. Ref Survey Cover Letter. When the survey is distributed to the field please ensure an appropriate cover letter is attached. At a minimum the cover letter should provide an overview of your research, how and why they were selected, participation is voluntary, and how they can obtain a copy of the results once the research is completed.
2. Ref Questions 16 & 24. The response alternative groups for these two questions needs to be consistent. Recommend you use the following options as a guide: A) 0% - 55%, B) 56% - 65%, C) 66% - 85%, D) 86% - 95%, E) Greater than 95%.
3. Ref Question 22. Response option "D" should read "60+ Years" to be consistent with like questions in your survey.
4. Ref Question 16. The syntax of the question is improper. Revise the question to read. "The five-year . . . confined to the breast **at the time of diagnosis is**" (bold lettering indicates the required change).

With regard to the survey and its associated results, it is important to draw your attention to the provisions of the Freedom of Information Act (FOIA). Under the FOIA, the results of your survey can be requested by the public. Furthermore, if the results will be released outside the Air Force please ensure you follow proper approval procedures through Public Affairs before the results are released. Finally, the USAF SCN needs to appear either in the cover letter or on the face of the survey itself. Once the survey is revised, and in its final format, please forward a copy of the survey and cover letter to my office for our files.

If you have any questions, please do not hesitate to call me or Lt Mike Benson at DSN 487-5680. Good luck with your data collection effort.

CHARLES H. HAMILTON
Chief, Survey Branch

APPENDIX D

Consent Form

Title of Research: Air Force Health Care Providers Incidence of Performing Testicular Exams and Instruction of Testicular Self-Exam

Investigator: Nicola S, Adams, Capt, USAF, NC
Uniformed Services University of the Health Sciences (USUHS)
Graduate School of Nursing
4301 Jones Bridge Road
Bethesda, MD 20814-4799
(301) 916-1395 (home)

Purpose of Study: The purpose of this research study is to determine the incidence of Air Force Health Care Providers (Physicians, Physicians Assistants, and Nurse Practitioners) performing testicular exams and teaching testicular self-exam within military treatment facilities. An additional purpose is to fulfill the thesis requirement for the Graduate School of Nursing-Family Nurse Practitioner Program.

Condition for Participation: You must be a Family Practice Physician, a Physician Assistant, Family Nurse Practitioner, Adult Nurse Practitioner, or Primary Care Nurse Practitioner on active duty working within the setting of a military treatment facility.

Procedure/Tasks: You will be asked to complete the accompanying two page survey form and return it to the investigator in the self-addressed stamped envelope provided.

Risk/Benefit: This study involves no physical risks or discomfort to you. It may provide information about healthcare provider's practices by which you may furnish better preventive education regarding testicular cancer and testicular self-exam to your patients. If you have any questions about your participation in the study, please contact the investigator or the Office of Research at USUHS at (301) 295-3303.

Confidentiality: All information that you provide as a part of this study will be confidential and will be protected to the fullest extent of the law. Please do not write any identifying information such as name, phone number, address, or social security number on the survey. Information that you provide and other records related to this study will be kept private, accessible only to the investigator and members of the USUHS Institutional Review Board and other Federal agencies who provide oversight for human use protection. All questionnaires and forms will be kept in restricted access, locked cabinet by the investigator at her home while not in use. However, please be advised that under Federal law, a military member's confidentiality cannot be strictly guaranteed. To enhance your privacy of the answers that you provide, data from questionnaires will be entered into a database information, the hard copy of the questionnaires containing identifiers will be shredded.

Right to Withdraw: Your cooperation is completely voluntary. You have the right to withdraw from the study. You have the right not to answer any or all of the questions.

Cost: There is no cost to you for your participation in this study, nor will you receive monetary reimbursement or reward for your participation in the study.

Information from the Investigator: The investigator will be happy to answer any questions regarding the study. This study is sponsored by USUHS. The results of the study will be available from the investigator at the address above after the data has been collected and analyzed.

Consent: To maintain anonymity, completion of the survey form implies consent to participate in the study.

Thank you for your cooperation.

APPENDIX E

Cover Letter for Thesis Study

You are receiving this survey as part of nursing graduate student thesis study. My name is Capt Nicola S. Adams. I am currently a Family Nurse Practitioner student at the Uniformed Services University of the Health Sciences (USUHS). Included in the materials mailed to you are this cover letter, the two-page survey, the informed consent, and a return envelope.

This study is designed to be a descriptive study of Air Force Healthcare Providers incidence of performing testicular exams during routine visits and teaching testicular self-exam to their male patients. Results of this study will be on file at USUHS. If you wish to receive a copy of the results of this study at it's completion, please indicate this, when returning your survey. I will be happy to mail results to you next year (expected completion date).

As indicated in the informed consent, no identifying information is included on the survey returned to me except for a number on the survey to track returned surveys.

Your participation in this study is voluntary, indicated by returning a completed survey. The survey should only take 10-15 minutes of your valuable time to complete. I am including an herbal teabag to enjoy a cup of tea on me while filling out the survey.

Thank you for taking time to complete this survey and assisting me to complete requirements for my masters degree and hopefully provide information to Air Force Healthcare providers about what they are doing well or how we can improve our practice.

Nicola S. Adams, Capt, USAF, NC

APPENDIX F

SURVEY ON INCIDENCE OF PERFORMING TESTICULAR/BREAST EXAMS
AND TEACHING ABOUT TESTICULAR/BREAST CANCER AND TSE/BSE
USAF SCN 98-47

Instructions: Please answer questions 1-27 as indicated in each question. It is important that you complete the survey to gain valuable data.

1. What is your age? _____ year
2. What is your gender?
(Check the appropriate answer) _____ Male
_____ Female
3. Are you a: (Check/circle the appropriate answer) _____ MD
MD specialty _____
(please specify)
_____ PA
_____ FNP/ANP/PCNP
4. Where were you trained to do testicular examinations?: (Circle the appropriate answer)
 - a) Never
 - b) in a formal education program (including medical school or residency)
 - c) in a continuing education course
 - d) "on the job"
5. If you are **male**, how often do you personally perform testicular self-exam?(Circle the appropriate answer)
 - a) Never
 - b) once a month
 - c) more than once a month
 - d) 8 -11 times a year
 - e) 4-7 times a year f) 1-3 times a year
6. Where were you trained to do breast examinations?
(Circle the appropriate answer)
 - a) Never
 - b) in a formal education program (including medical school or residency)
 - c) in a continuing education course
 - d) "on the job"

7. If you are *female*, how often do you personally perform breast self-examinations?

(Circle the appropriate answer)

- a) Never
- b) once a month
- c) more than once a month
- d) 8 -11 times a year
- e) 4-7 times a year f) 1-3 times a year

8. Check the setting that best describes your practice.

(Check only one)

- ☐ Family Practice clinic
 - ☐ Primary Care clinic
 - ☐ Flight Surgeon clinic
 - ☐ Internal Medicine clinic
 - ☐ Emergency Department
 - ☐ Other(explain)
-

9. What percentage of your practice would you estimate are females over the age of 15 years?

%

10. For female patients, when you perform routine physical examinations do you routinely include a breast examination when the presenting problem is not a breast related condition?

(Check the appropriate response)

☐ Yes
☐ No

11. Do you routinely instruct women to perform breast self-examination? (Check the appropriate response)

☐ Yes
☐ No

12. Does this include a return demonstration by the patient? (Check the appropriate response)

☐ Yes
☐ No

13. Do you believe that all female patients beyond menarche should be taught to perform breast self-examination on a routine basis?

(Check the appropriate response)

☐ Yes
☐ No

(next page please)

14. The highest incidence of breast cancer in women occurs between the ages of:(Circle the appropriate response)

- a) 20-39 years
- b) 40-59 years
- c) 60-79 years
- d) 80+ years

15. Breast cancer only effects women:
(Check the appropriate answer)

_____ True
_____ False

16. The five-year survival rate for women with breast cancer **confined to the breast** at the time of diagnosis is:
(Circle the appropriate answer)

- a) 0-55%
- b) 56-65%
- c) 66-85%
- d) 86-95%
- e) Greater than 95%

17. What percentage of your practice would you estimate are males over the age of 15 years?

_____ %

18. For male patients, when you perform routine physical examinations, do you routinely include a testicular examination when the presenting problem is not genitourinary?(Check the appropriate response)

_____ Yes
_____ No

19. Do you routinely instruct age-appropriate males to perform testicular self-examination?
(Check the appropriate response)

_____ Yes
_____ No

20. Does this include a return (TSE) demonstration by the patient? (Check the appropriate response)

_____ Yes
_____ No

21. Do you believe that all male patients past puberty should be taught to perform testicular self-examination on a routine basis?
(Check the appropriate response)

_____ Yes
_____ No

(please turn over to complete)

22. Testicular cancer most often affects men between the ages of: (Circle appropriate answer)

- a) 1-10 years
- b) 15-35 years
- c) 40-55 years
- d) 60+ years

23. Ninety-five percent of testicular masses are malignant: (Check the appropriate answer)

_____ True
_____ False

24. If testicular cancer is **detected in its earliest stage**, the cure rate is: (Circle the appropriate answer)

- a) 0-55%
- b) 56-65%
- c) 66-85%
- e) 86-95%
- f) Greater than 95%

25. Do you provide education about testicular cancer (TC) and self screening (TSE) to your patients? (Check the appropriate response/responses)

_____ TSE
_____ TC

26. Do you provide education about breast cancer (BC) and self screening (BSE) to your patients? (Check the appropriate response/responses)

_____ BSE
_____ BC

27. What methods do you use to provide the above education? (Circle all appropriate responses)

Provider discussion with patient..... TSE /BSE /TC /BC
RN clinic educator..... TSE /BSE /TC /BC
Written materials..... TSE /BSE /TC /BC
Video tape..... TSE /BSE /TC /BC
None..... TSE /BSE /TC /BC

(survey completed!)