

**Attitudes, Perceptions and Practices of
Oncologists and Naturopathic Physicians
Regarding the Role of Diet in Breast Cancer
Prevention and Treatment**

by

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ABSTRACT

Increasing consumer demands for holistic health care and dietary advice parallel conflicting and incomplete messages in the scientific and lay literature regarding the role of nutrition in breast cancer. Oncologists and naturopaths are important sources of advice to help women sort out such conflicting information. In this qualitative study, 10 oncologists and 11 naturopaths were interviewed to explore their beliefs and counseling practices regarding the relationship between diet and breast cancer. Interviews were transcribed verbatim and analysed using qualitative methods. The oncologists believed age, genetics and reproductive factors are important risk factors, and while dietary factors such as fat and alcohol consumption may play a role, such relationships have not been proven scientifically. The oncologists suggested increasing fruit, vegetable and fibre intakes could improve overall health; however because available research evidence does not meet the criteria of evidence-based medicine, they did not make specific dietary recommendations for breast cancer prevention or treatment. Alternatively, the naturopaths implicated exogenous hormones, environmental pollutants and lifestyle factors like diet and stress as important contributors to breast cancer etiology. They recommended that patients increase consumption of organic whole foods, antioxidant supplements, fruits and vegetables, and avoid processed or refined foods, animal fats, dairy products and sugar to decrease breast cancer risk. These recommendations were based on a combination of published scientific evidence, clinical experience and single case studies. The naturopaths' lack of exclusive reliance on science to justify clinical recommendations was described by oncologists as their primary reason

for not working directly with naturopaths. Alternatively, the naturopaths believed they were excluded from conventional breast cancer care for political reasons. Differences in practitioners' beliefs and perceptions of each others' profession reflect variations in their training in the scientific method and their educational and professional socialization. The variation in these health professionals' beliefs, use of evidence, and resulting clinical practices and misperceptions of each other fuel mutual misunderstanding. An open and respectful dialogue between oncologists and naturopaths is important to bridge gaps between these professionals, and to facilitate patients' ability to make informed choices about their health care and dietary practices.

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CHAPTER 1**Introduction**

Breast cancer is the single most frequently diagnosed cancer among adult Canadian women; the incidence doubles that of lung cancer (National Cancer Institute, 1998). It is the most common cancer among women worldwide (World Cancer Research Fund/ American Institute for Cancer Research, 1997) and the incidence in North America has steadily increased since the 1950's (Sondik, 1994). Breast cancer research advocates are raising millions of dollars annually to search for a cure; yet no cure is imminent. Although the breast cancer mortality rate has declined in the last 10 years, the reduction has been partly attributed to increasingly effective methods of early detection rather than the efficacy of primary prevention (King and Schottenfeld, 1996). Because the incidence of breast cancer continues to grow, the identification of effective strategies for prevention is paramount (Love and Vogel, 1997). The push to improve the prevention and treatment of breast cancer is increasingly political as large and vocal groups of women survivors demand the investigation of more holistic, alternative methods of treatment and putative environmental and lifestyle causes of the disease (Mallet, 1996).

Marked differences in international breast cancer incidence have fueled ardent efforts over the last 25 years to elucidate the role of environmental factors in breast cancer etiology. Diet is routinely implicated, however the links between some nutritional factors and breast cancer is clearer than others. The generation of a clear understanding of the role of diet in breast cancer etiology has been restricted by the lack of clinical trial data and by limitations in study design. Furthermore, evidence that does exist is often inconsistent: prospective cohort studies are often inconsistent with ecologic and case-

controlled study findings (El-Bayoumy et al., 1997; Howe et al., 1990a; Wynder et al., 1997a; Willet et al., 1992g; Willet, 1997e). Diet may be more consequential during different stages of a woman's life; although the particular window of time when diet is most influential is largely unknown, the first two decades of life are likely important. Large-scale national intervention studies currently underway, such as the Canadian Diet and Breast Cancer Prevention Study, the United States Women's Health Initiative and the European Prospective Investigation on Cancer and Nutrition should more clearly discern the role of diet in breast cancer etiology (Gonzalez, 1997).

A consequence of the inconclusive state of the extant research is that inconsistent messages about the relationship between breast cancer and diet pervade professional and popular forums (Buttriss, 1997; Clarke, 1992a). Both health professionals and the public at large must make sense of this conflicting information to make professional and personal choices in their everyday lives. Information provided by physicians regarding nutrition and prevention is viewed as particularly credible, reliable and important (David, 1994; Hiddink et al., 1997). Therefore, conventional health care professionals are key in helping women understand confusing messages and are important in facilitating women's health-related decision making for disease risk reduction (Buttriss, 1997; Casselith, Lusk, Strouse, and Podenheimer, 1984e). Health professionals are thus increasingly presented with the challenging responsibility of making sense of disparate sources of information, including inconsistent scientific findings, national dietary recommendations, and pervasive dietary information in the media, to advise to their patients in a meaningful way. Furthermore, specialized nutrition information is becoming increasingly important to patients. Monnin and Schiller (1993) surveyed women who had had surgery for breast

cancer and found most women believed diet was an important factor in their disease. Women wanted dietary information to prevent a recurrence, or reduce the risk among susceptible family members (Monnin and Schiller, 1993). Therefore, patients are looking for current, specialized nutrition information more often and conventional physicians are an important resource.

Opportunities for health and nutrition consultation from outside the conventional medical spectrum are increasing for patients (Ministry of Health, 1997). There is a movement among the public toward health care services perceived to be more holistic, natural and focused on lifestyle issues such as diet (Cassileth, Lusk, Strouse, & Bodenheimer, 1984e; Eisenberg et al., 1993; Jarvis, 1992; Lerner and Kennedy, 1992; MacLennan, Wilson, & Taylor, 1996; Ministry of Health, 1997). These 'alternative' or 'non-conventional' approaches, also termed 'unorthodox' or 'unproven' in many mainstream scientific journals, constitute an array of practices whose efficacy in cancer prevention, treatment or risk reduction, has not been demonstrated in an objective, reproducible or scientifically standardized manner (Bridgen, 1995b; Herbert, 1986; Jarvis, 1992; Risberg et al., 1995a). Alternately, 'conventional' or 'orthodox' medical treatments, constitute the 'mainstream', 'legitimate' biomedical institution commonly practiced in Industrialized societies. Many authorities distinguish 'alternative' from 'complementary' practices because 'complementary' methods may be used in conjunction with conventional treatments, as opposed to replacing them (Cassileth & Chapman, 1996c).

In April of 1995, a panel was assembled by the Office of Alternative Medicine of the U.S. National Institutes of Health to outline definitions and descriptions of these

health care approaches and to clarify future attempts at scientific evaluation (O'Connor et al., 1997). Here, the term complementary and alternative medicine (CAM) was coined, and was defined as

a broad domain of healing resources that encompass all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical period. CAM includes all such practices and ideas self-defined by their users as preventing or treating illness or promoting health and well-being. Boundaries within CAM and between the CAM domain of the dominant system are not always sharp or fixed. (O'Connor et al., 1997).

In the following chapters I will use the term 'CAM' and 'alternative' interchangeably to describe these eclectic health care approaches.

The modalities of CAM specific to cancer are diverse and constitute a heterogeneous array of practices, including spiritual and mind-body techniques, traditional folk remedies, physical or manual healing methods, pharmacological and biological methods, herbal remedies and dietary or nutritional strategies to prevent, treat breast cancer or reduce the risk of recurrence (Cassileth & Chapman, 1996c). Naturopathic therapy is commonly classified within CAM and in British Columbia, is an increasingly prominent field of alternative medicine where patients can receive nutritional and lifestyle counseling for cancer. Naturopathic practitioners also provide a myriad of services in primary health care in addition to cancer care (Canadian College of Naturopathic Medicine, 1997). There are 4 recognized colleges of naturopathy in North America: 3 schools in the United States and 1 school in Toronto, Ontario. Programs in Naturopathic Medicine are four years in duration, and include training in areas such as acupuncture and oriental medicine, clinical nutrition, hydrotherapy, homeopathic medicine, naturopathic physical manipulation and prevention and lifestyle counseling

(Canadian College of Naturopathic Medicine, 1997). Much like most conventional medical schools, some naturopathic medical schools require at least 3 years of course work at an accredited college or university (Bastyr University, 1997; University of British Columbia, 1998) and others require students to have a bachelor's degree (National College of Naturopathic Medicine, 1997). Some schools also require prerequisite science courses (Bastyr University, 1997; National College of Naturopathic Medicine, 1997). Therefore, naturopaths have training in a variety of skills including nutritional counseling, and in disease prevention and risk reduction.

There are over 120 practicing naturopathic physicians in British Columbia and 60 in the Lower Mainland (personal communication, Association of Naturopathic Physicians of British Columbia, 1999). Clinical nutrition is a fundamental modality used by naturopathic practitioners (Bastyr University, 1997). Diet is central to the naturopathic philosophy of "*vis medicatrix naturae*" or the healing power of nature (National College of Naturopathic Medicine, 1997). Nutritional interventions therefore, are aimed at maximizing the body's innate ability to heal. "Treat the whole person; first do no harm; identify the cause; prevention is the best cure; and doctor as teacher" are the other central tenets of naturopathic medicine (National College of Naturopathic Medicine, 1997). Both the number of practicing naturopathic physicians in the Lower Mainland and the number of patients visiting these practitioners is increasing: naturopathic physicians increased in number by 8% in B.C. from 1995 to 1996 and they had a total of 52,330 patient visits (Ministry of Health, 1997). However, little is known about nutrition information patients receive for the treatment and prevention of breast cancer.

Although it was previously assumed that the average consumer of alternative health services was characterized as someone with low formal educational attainment, geographical remoteness or isolation and strong ethnic affiliation, or someone succumbing to quackery, current research indicates otherwise (Blais, Maiga, and Aboubacar, 1997; McGinnis, 1991). Alternative health care consumers are generally better educated, Caucasian and are from a higher socioeconomic status (Blais, Maiga, and Aboubacar, 1997; Lerner and Kennedy, 1992; MacLennan et al., 1996; Ministry of Health, 1997; Thomas et al., 1991a). Furthermore, they are more likely to be working, have better overall health and more good health habits (Blais, Maiga, and Aboubacar, 1997). Women also use alternative health services significantly more often than men (Bernstein and Shuval, 1997; Risberg et al., 1998b). Fulder and Munro (1985) reported two-thirds of non-conventional health care patients in the United Kingdom were female and middle-aged; similar more recent findings in Britain were reported by Thomas et al. (1991a) and Downer et al. (1994). Similarly, significantly more women utilized alternative health services in Australia and in the United States (Lerner and Kennedy, 1992; MacLennan et al., 1996). Women constitute 67% of the recipients of alternative and complementary health care service from naturopaths in British Columbia, totaling 35,228 patients in 1995/96 versus 17,102 men (Ministry of Health, 1997).

Casselith and Brown (1988b) explain "today's unproven methods represent a social movement, bound by beliefs in the fundamental importance of nutrition and responsibility for one's own health". Trends towards increasing use of alternatives to conventional medical care also reflect the contemporary consumer's increasing dissatisfaction with current health care: antiestablishment and anti-medical sentiments are

commonly espoused (McGinnis, 1991a). Common criticisms of conventional health care refer to the heavy reliance on technological interventions, which are 'invasive', 'unnatural' and 'toxic', ignore self managed approaches to wellness and disease prevention such as nutrition, and are largely unsuccessful in treating and preventing cancer (Blair O'Connor, 1995; Casselith, 1989a). Patients often perceive emphasis on personal, humanistic care as diminishing in conventional practice, and physicians are often criticized for the lack of time committed to patient visits (Blair O'Connor, 1995). Fulder and Munro (1985) reported an average of 51 minutes for the first patient consultation with an alternative practitioner and follow-up visits were 36 minutes on average, 6 times longer than the average patient visit from a family practitioner in the United Kingdom.

Although the use of CAM therapies is widespread for various health concerns (Eisenberg et al., 1993), patients diagnosed with cancer are among the most significant users of alternative health services (Brigden, 1995b; Casselith et al., 1984; Danielson, Stewart and Lippert, 1988). People diagnosed with cancer who utilize CAM treatments are the subject of intense study (Begbie, Kerestes, & Bell, 1996; Casselith et al., 1984c; Casselith et al, 1991d; Downer et al., 1994; Lerner and Kennedy, 1992; Risberg et al., 1995a). The goal of these cancer treatments is secondary and tertiary prevention, and cancer patients' use of such treatments is growing (American Society of Clinical Oncology, 1997; Danielson, 1988). Casselith et al. (1984c) surveyed 660 cancer patients in Pennsylvania to determine the use of alternative cancer remedies and found that 325 (49%) reported using alternative remedies in conjunction with conventional cancer treatments and 53 (8%) used such remedies exclusively. Twenty percent of responding

patients used alternative cancer therapies in a survey of Norwegian cancer patients by Risberg et al. (1995a), similar to the 16% of British cancer patients surveyed by Downer et al. (1994) who reported using alternative cancer therapies.

Nutritional approaches are among the most common alternative strategies for cancer treatment and prevention of metastasis or cancer progression used by patients; these include diet therapies and megavitamin and mineral supplementation (Bowman, Kushner, Dawson and Levin, 1984; Casselith et al., 1984c; Herbert, 1986). These popular contemporary approaches to health appeal to prevalent 'do-it-yourself' messages about attaining health 'naturally' and 'holistically'; that is through self management of diet, nutrient supplementation, exercise and stress (Casselith and Brown, 1988b). Casselith et al. (1984c) reported the top three non-conventional health practices used in a survey of U.S. cancer patients included metabolic therapies (45%), diet treatments (32%) and megavitamin supplementations (20%). Similarly, Begbie et al. (1996) reported diet therapies as the most common alternative cancer remedy used by patients in New South Wales Australia. Diets and vitamins were the third and fifth most popular remedies utilized by British cancer patients (Downer et al., 1994).

The economic implications of alternative health care services are clear: the cost to the British Columbia medical system in 1996/97 totaled \$1,949,765, excluding naturopathic physicians who opted out of the provincial billing system (Ministry of Health, 1997). In 1990, the cost of alternative therapies in the US was estimated to be \$13.7 billion, most of which (\$10.3 billion) the consumer paid for herself (Eisenberg et al., 1993). Patronage to alternative practitioners (425 million visits) that year surpassed

the number of patient visits to all U.S. primary care physicians (388 million) (Eisenberg et al., 1993).

Reviews, editorials and comments by conventional medical practitioners and researchers regarding cancer patients' use of alternative treatments have been common over the last decade (Brigden, 1987a; Brigden, 1995b; Casselith and Chapman, 1995c; Danielson et al., 1988; Jarvis, 1992; Smith, 1983b). Many convey dismay and frustration with the pervasive utilization of alternative remedies, referring to the billion dollar industry of "quackery" based in "pseudoscience" (Bourgeault, 1996; Brigden, 1995b; Jarvis, 1992). However, there are increasingly obvious trends among conventional physicians towards inclusion of CAM modalities within conventional practice and openness to and even encouragement of patients' pursuit of other sources of care (Barrocas, 1997; Berstein and Shuval, 1997; Goldszmidt, Levitt, Duarte-Franco, & Daczorowski, 1995; Shenfield, Atkin and Kristoffersen, 1997). A recent survey of American primary care internists by Blumberg et al. (1995) demonstrated over half of physicians would encourage patients to pursue therapies outside of convention, and even more were willing to make certain referrals (57%). The prominence of CAM is also evident worldwide: Knipschild, Klunen and Ter Riet (1990) showed general practitioners in the Netherlands believe in the efficacy of some CAM approaches; however few believed in the effectiveness of certain dietary remedies, such as evening primrose oil or mega-dose supplementation. In Germany, of the responding general practitioners surveyed, 95% used some sort of complementary or alternative approach to medicine (Himmel, Schute, and Kochen, 1993). Thus, there may be a greater tendency for physicians to include CAM approaches in other parts of the world, for example

Europe. Although the inclusion of CAM in conventional general practice is evident, very little is known about how specialty physicians perceive CAM, especially in the context of dietary approaches to cancer risk reduction and prognosis.

1.1 SUMMARY AND STUDY OBJECTIVES

Despite ardent research efforts to elucidate the role of diet in breast cancer etiology, findings have not been conclusive. However, the number of women with breast cancer continues to increase each year (National Cancer Institute, 1998), as does the need to definitively link the unidentified environmental factors to breast cancer which seems to evade researchers. In the meantime, women must make sense of pervasive messages linking diet to cancer in their everyday lives. Health professionals, such as conventional oncologists and complementary or alternative naturopathic practitioners who commonly treat women with breast cancer, are key in helping women understand these links to help them make decisions about feeding themselves and their families. However, there is a dearth of information regarding how these practitioners approach and perceive breast cancer risk reduction through nutritional counseling and intervention. Furthermore, little is known about how these practitioners care for their patients in an increasingly heterogeneous health care environment.

Therefore, the objectives of this study were to explore how health professionals from both conventional oncological and naturopathic fields of cancer therapy understand the complex relationship between diet and breast cancer prevention and treatment, and how and why they counsel their patients about these links. Furthermore, I explored how

practitioners from disparate disciplines perceive each other's role in counseling patients about the dietary prevention of breast cancer, and their perceptions of dietitians.

CHAPTER 2

Background and Literature Review

2.1 AN OVERVIEW OF THE LITERATURE

The purpose of this chapter is to present a summary of the current science-based knowledge regarding the etiology of breast cancer, focusing on the relationship between diet and breast cancer from the mainstream or conventional scientific perspective; that is from refereed journals. I will also review some parallel perspectives from publications which are not necessarily peer reviewed, collected at Bastyr University of Naturopathic Medicine in Seattle (listed * in References). My intention here is to be inclusive and reflect in this review some of the diverse information sources accessible to practitioners of non-conventional medicine, namely naturopaths. My training and educational background is scientific and would likely be considered conventional; however the alternative approach does not exclude science and there is an increasing blending of the boundaries between conventional and alternative medicine. Therefore, I believe that I am in no position to judge whether literature sources fit into 'alternative' versus 'conventional' camps and I will reference all sources consistently and equally within this review. I will also examine the literature describing the clinical application of scientific evidence, both in the conventional medical setting and from the perspective of sources more reflective of alternative medical paradigms. Because little is known about how oncologists counsel patients regarding the role of diet in cancer, I will briefly summarize what is known about nutrition counseling in general conventional medical practice. Furthermore, I will provide an overview of naturopathic clinical nutrition counseling as it pertains to the prevention and treatment of diseases.

2.2 DIETARY FACTORS AND BREAST CANCER ETIOLOGY

Although the specific causes of breast cancer are largely unknown, the etiology of the disease is believed to be multifactorial (Mezzetti et al., 1998). Known genetic factors are believed to be responsible for a small proportion of cases, most of which are early onset breast cancers (Sellers, 1997). The risk of breast cancer increases with age and is directly related to gender: the risk of the disease is 100-fold greater for women than for men (Thomas, 1993b). It is racially non-specific, being the most common cancer among women in every major ethnic group in the United States (Kelsey & Horn-Ross, 1994b).

Reproductive factors are believed to influence breast cancer risk because mammary epithelium is a hormone-sensitive tissue and the risk of developing breast cancer is thought to be influenced by hormone-dependent reproductive events (van't Veer, 1994a). For example, epidemiological research has shown the risk of breast cancer increases when childbearing is delayed or reduced (Graham et al., 1991; Hems, 1978). Women who have early onset of menarche, long years of menstruation and late age of menopause are also more likely to develop breast cancer (Gray, 1979; Pathak & Whittemore, 1992; Qi, Zang, Wu, & Pang, 1994; Rohan, Hiller, & McMichael, 1993b). Studies of the effects of other reproductive events such as spontaneous or induced termination of pregnancy, differences in menstrual cycling and infertility have yielded inconsistent results (Daling et al., 1994; Kelsey, Gammon, & John, 1993a). Findings showing a protective effect of breast feeding have been reported (Freudenheim et al., 1997; Enger, Ross, Henderson and Bernstein, 1997), but again, results are not consistent (Adami, Bergstrom, Lund and Meirik, 1990). Other factors which influence reproductive events such as being married and having a higher socioeconomic status are also

positively associated with breast cancer risk (Hirayama 1978; Kelsey et al., 1993a; Stoll, 1996a). Women with a positive family history of breast cancer are at elevated risk, however 85% of breast cancer occurs in women who do not have a genetic predisposition to breast cancer, and therefore family history does not account for the majority of cancer cases (Colditz, 1995a; Colditz et al., 1993b).

Although reproductive and genetic factors are clearly related to breast cancer risk, 60% of women with the disease do not exhibit any of the established risk factors (Marshall, 1993). Societies having previously low incidence of breast cancer exhibit recent increases in rates which are significantly correlated with changes in dietary habits (Koo, Mang and Ho, 1997). Furthermore, reproductive history and other known risk factors cannot completely account for the striking international variation in breast cancer incidence, thus international differences have been largely attributed to variable patterns of other ecologic factors, namely food consumption habits among women (Hirayama, 1978; Kelsey et al., 1993b; Rohan & Bain, 1987a). The relationship between diet and breast cancer is however far from consistent and continues to be highly controversial. There is little agreement on how significant nutrition is in breast cancer causation, which nutrients elicit the greatest cancer promoting or inhibiting effect or when diet may be most influential in a woman's life (Henderson, 1995; van't Veer, 1994a).

Nutrition influences reproductive and hormonal events and adult height and weight, all of which are believed to contribute to breast cancer risk. Specific dietary factors have also been attributed to both increasing and decreasing breast cancer risk. In the following sections I will first explain how diet may influence hormone-dependent risk factors of breast cancer. Second, I will summarize the current literature linking factors

thought to increase breast cancer risk such as dietary fat, alcohol and fat soluble substances such as pesticides. Finally, I will outline a number of putative protective dietary factors including fiber, fruits, vegetables and soy products.

2.2.1 Nutritionally induced changes in reproductive hormone-dependent risk factors

The risk of breast cancer is thought to be positively correlated with duration of exposure of breast cells to reproductive hormones, namely estrogen. Diet or factors in the diet are known to influence plasma hormone levels and estrogenic activity (Aldercreutz et al., 1989b; Goldin et al., 1994; Hill et al., 1980). Estrogen has been shown to increase normal breast cell proliferation, and it may directly influence DNA (Clarke et al., 1996b). Hill et al. (1980) observed increases in estrogen hormone levels when rural black, vegetarian, premenopausal women from South Africa were fed isocaloric omnivorous diets typical of Western societies; that is higher in fat and protein and lower in fiber. Altered hormone levels were similar to white women maintained on Western diets. These results support the possibility that nutrition may partly explain higher rates of breast cancer characteristic of industrialized societies (Hill et al., 1980).

Case-control and ecological evidence has shown positive relationships among anthropometric factors and breast cancer, such as weight and height. Excess weight and obesity postmenopausally are positively associated with breast cancer incidence (Cleary and Maihle, 1997; Hunter & Willet, 1994e; Le Marchand, Kolonel, Earle, & Mi, 1988; Magnusson et al., 1998; Pathak & Whittemore, 1992; Trentham-Dietz et al., 1997) and mortality (Newman, Miller & Howe, 1986a). Hankinson et al. (1995b) showed a significant positive association between body mass index [BMI kg/m²] and plasma estrogens in women who were menopausal for at least one year, reflecting potential for a

hormone-mediated mechanism of increased breast cancer risk in heavier postmenopausal women.

Some prospective cohort studies similarly support the association between increased body weight postmenopausally and increased breast cancer morbidity and mortality (Cleary and Maihle, 1997; Hershcopf, and Bradlow, 1987; Jain and Miller, 1997b; Senie et al., 1992). Prospective studies have also shown an inverse relationship for premenopausal women, where increasing body weight is related to decreasing breast cancer risk (London et al., 1989a). Senie et al. (1992) demonstrated obesity as the only significant prognostic indicator for the development of breast cancer within a cohort of 923 women treated for breast cancer and followed prospectively. Furthermore, they found obese women were at increased risk of recurrence compared to normal weight women and the survival time was significantly shorter for obese women (Senie et al., 1992).

There has been extensive investigation into the relationship between height and breast cancer risk, yielding fairly consistent modest positive associations (Hunter & Willet, 1994e; London et al., 1989a; Trentham-Dietz et al., 1997; Tretli, 1989). This effect has been shown to be more significant in postmenopausal women with breast cancer compared to premenopausal women (London et al., 1989a). Childhood and adolescent energy intakes which influence adult height have provided some explanation for this relationship, implying the presence of a mechanism whereby childhood and adolescent dietary habits influence adult disease risk (Hunter & Willet, 1994e). Adolescent body weights may also influence adult risk. Magnusson et al. (1998) found Swedish women with invasive breast cancer with the leanest somatotype at age seven had

a three-fold increase in breast cancer risk compared to the women who were most obese at that age, when examined retrospectively in a case-control study. Although little is known about the influence of specific dietary factors consumed during adolescence and subsequent risk of breast cancer, a recent study by Potischman, et al. (1998) did not support a protective role for factors such as fruits and vegetables, or a role for fat and dairy products in increasing breast cancer risk in later life.

In summary, nutrition influences hormonal and reproductive events and individual anthropometric characteristics; however the degree to which these factors contribute to breast cancer is unknown. There may be an as yet unknown window of time when nutrition is especially important in a woman's development.

2.2.2 The Role of Diet in Carcinogenesis

Diet is increasingly implicated in the complex cumulative process leading to the transformation of normal cells into cancerous tumor cells (Pariza, 1994, p.1547). The multistage process of carcinogenesis has three distinct phases: initiation, promotion and progression (Balducci et al., 1986; Pariza, 1994, p.1547-1549). Elucidating the stage at which diet is most influential becomes increasingly obfuscated when considering free-living humans consuming varied diets comprised of a myriad of promoters and inhibitors of carcinogenesis (van't Veer, 1994a). Putative enhancers of carcinogenesis like dietary fat, and putative inhibitors like antioxidants generally influence carcinogenesis in the tumor promotion stage (Pariza, 1994, p.1549). Unlike initiators, tumor promotion requires prolonged and constant exposure of the initiating factor, but is reversible through the removal of enhancers or by anti-cancer agents or chemopreventers (Balducci et al. 1986). Dietary factors generally fit this criteria well: foods are consumed everyday, thus we are

exposed to a multitude of enhancers and promoters for prolonged periods; however, debate continues whether early or late stage tumor initiation and promotion is more consequential for increased breast cancer risk (van't Veer, 1994a).

2.2.2.1 Dietary Fat

Scientific investigation and speculation regarding the role of dietary fat in breast cancer has been extensive, due to widespread beliefs that high fat diets cause this disease (Lechky, 1997; Nicholson, 1996; Wynder, et al., 1997a; Wynder, Cohen, Rose, & Stellman, 1994b). However, these assertions are highly contested (El-Bayoumy et al., 1997; Willet, 1997e). Beliefs about links between dietary fat and breast cancer are based in a multitude of ecological data showing significant positive links between per capita fat consumption patterns and breast cancer incidence (Armstrong, & Doll, 1975; Hems, 1978; Hunter et al., 1993b; Sasaki, Horacsek, & Kesteloot, 1993). International comparisons of breast cancer rates have revealed up to sevenfold differences in breast cancer incidence (Kelsey et al., 1993a). There is a near linear dose-response relationship between breast cancer incidence and average national dietary fat intake when comparing different countries, or differences between decades within countries (Weisburger, 1997b).

Further support for the link comes from studies of migration patterns. Nutritional factors are consistently linked to breast cancer etiology and the most striking dietary component to influence disease risk is dietary fat (De Waard & Tricholopoulos, 1988). Rising breast cancer rates in societies such as those in Japan and Hong Kong, that have previously exhibited lower incidence rates are attributed to Westernization of dietary habits, namely increasing fat intake (Kato, Tominga, and Kuroishi, 1987; Zhang et al., 1995). Women migrating from countries of low risk to those of higher risk exhibit

increases in breast cancer incidence and mortality rates, much like rates in the destined higher risk country (Kliewer & Smith, 1995). Zeigler et al. (1993) showed a sixfold gradient in risk among Asian-American immigrants in the United States depending on their length of stay in the U.S. and their birth place.

Animal studies have largely corroborated ecologic evidence to support a causative link between high fat and increased breast cancer incidence: carcinogen-induced mammary tumor incidence is higher in animals fed high fats diets compared to those fed low fat diets (Lu, Jiang, Fontaine, & Thompson, 1995a; Zevenbergen et al., 1992). Tumor metastases in animal models have also been shown to be related to the amount and type of fat ingested (Katz & Boylan, 1989); however this relationship is not always consistent (Boylan & Cohen, 1986) and dietary fat is thought to be a more important modulator in tumor promotion and progression as opposed to pre-initiation (Imrhan and Hsueh, 1998).

Analytical epidemiological research of the relationship between dietary fat and breast cancer has been less consistent. Some case-control studies have supported the association between dietary fat and breast cancer (Howe, 1994b; Qi et al., 1994; Rohan et al., 1993b; Ronco, De Stefan, Mendilaharsu, and Deneo-Pellegrini, 1996). Howe et al. (1990a) combined case-control research data from nine different sites with contrasting breast cancer risks and dietary habits and found a highly significant relative risk of 1.46 ($P < 0.0001$) for postmenopausal women who consumed the highest quintile of dietary fat.

Inconsistent findings in case-control data are largely attributed to methodological limitations, such as dietary recall-bias which has been partly addressed through prospective cohort studies. However, these studies often do not support associations

between dietary fat and breast cancer explicated in case-control studies (Howe, 1994b; Willet, 1997e; Wynder et al., 1994b; Wynder et al., 1997a). Dissimilar findings are prevalent in the literature: Toniolo, Riboli, Shore, & Pasternack (1994b) showed a positive association between the upper quintile of total and saturated fat intakes and breast cancer risk among New York City women, as did Hirayama (1978) when he prospectively examined 142,857 women in Japan. Similarly, two studies examining survival among women with breast cancer in relation to intake of dietary fat or energy from saturated fat, found that women with breast cancer with higher fat intakes had increased risk of death (Gregorio et al., 1985; Jain, Miller & To, 1994a).

Conversely, Hunter et al. (1996d) analyzed data from seven prospective cohort studies and found little overall association between breast cancer risk and dietary fat consumption or total energy intakes among a total of 337,819 women. Willet et al. (1992g) and Jones et al. (1987) also showed no significant association between dietary fat and breast cancer risk in the cohorts of American women they examined.

A clear understanding of the relationship between dietary fat and breast cancer has been limited by inconsistencies in the extant findings and by the lack of findings from higher level studies such as clinical trials. There are also limitations in the findings from most studies which attempt to elucidate the role of single nutrients like dietary fat, given the myriad of confounding factors in the diet (Greenwald, Sherwood and McDonald, 1997). Furthermore, measurement error bias and insufficient difference in fat intake between participants in analytical epidemiological studies have been suggested to limit the adequate determination of a link between dietary fat and breast cancer (Greenwald, Sherwood and McDonald, 1997).

2.2.2.2 Specific Fatty Acids

There is an increasing interest in understanding how different types of fat influence breast cancer risk. Trends in risk have been shown to depend on the type of fatty acid consumed: saturated fatty acids have been shown to increase breast cancer risk (Ronco et al., 1996; Toniolo et al., 1994b; Zhang et al., 1995), and specific polyunsaturated fats have either decreased or increased risk in some studies (Fay and Freedman, 1997; Hilakivi-Clarke et al., 1996; Imrhan and Hsueh, 1998; Kaizer, Boyd, Kruikov, and Tritchler, 1989; Lee et al., 1991; Pritchard, Jones and Mansel, 1989); however the potential modulation of breast cancer risk through variable fatty acid intakes has not been extensively studied prospectively (Bagga et al., 1997). Aside from saturated fat, high rates of breast cancer among women living in Western societies have been linked to their greater relative consumption of linoleic (ω -6 or n-6) fatty acids (Noguchi, Rose, Earashi, and Miyazaki, 1995; Weisburger, 1997b), whereas those living in regions such as Japan or Iceland with higher linolenic (ω -3) or other n-3 series fatty acid intakes have lower incidence (Kaizer et al., 1989a; Kaizer, Jones and Mansel, 1989b). Increased intakes of n-6 fatty acids relative to n-3 series fats in Western societies provide a possible explanation for increasing breast cancer rates among these populations (Stoll, 1998c). In addition, some monounsaturated fatty acids have been shown to be protective of breast cancer (Lipworth et al., 1997; Martin-Moreno et al., 1994; Simonsen, et al., 1998). Again, these patterns are not consistent (Hunter et al., 1996d; Ip, 1997; Godley, 1995; Petrek et al., 1997; Pritchard, Jones and Mansel, 1989; van't Veer, et al., 1991c; Weisburger, 1997b; Willet, 1997d; Zock and Katan, 1998).

Although the exact mechanism by which polyunsaturated fatty acids influence tumor response is unknown, part of the interest in the role of fatty acids in breast cancer stems from their role in modulating eicosanoid metabolism. Eicosanoids are thought to influence tumorigenesis through the production of immunomodulatory metabolites such as prostaglandins (2-series e.g. PGE₂) and leukotrienes (Cave, 1997; Cohen et al., 1986; Linscheer and Vergroesen, 1994, p.77; Noguchi et al., 1995). 2-Series prostaglandins (PGE₂) and certain leukotrienes (B₄ and C₄) have been correlated with increased mammary tumor incidence and tumorigenesis through a putative signal transduction mechanism (Cohen et al., 1986; Lupulescu, 1996). n-3 fatty acids are theorized to compete with the n-6 series for both cyclooxygenase and lipoxygenase enzyme systems in the eicosanoid metabolic pathway (Bagga et al., 1997). Thus, n-3 fatty acids influence the metabolism of precursors (e.g. arachidonic acid) and therefore influence the production of eicosanoid end-products and potential tumor behavior. Furthermore, fatty acid membrane composition is thought to influence metastatic behaviors of some tumors; for example, linoleic acid has been associated with high membrane fluidity and enhanced cell motility and metastasis (Rose and Hatala, 1994b). The composition of the membrane can also influence cell signaling, membrane enzyme function, mediation of growth factors, and angiogenesis (Rose and Hatala, 1994b). Fatty acid composition of the cell membrane may also contribute to a woman's susceptibility to hyperinsulinemia and insulin resistance, which has been linked to increased breast cancer risk (Bruning et al., 1992; Stoll, 1998c). Many of the putative mechanisms linking various polyunsaturated fatty acids to increased breast cancer risk are yet to be clearly elucidated. In addition,

little is known about the influence of *trans*-fatty acids and the risk of breast cancer (Ip, 1997; Willet, 1997d).

2.2.2.3 Alcohol

Several studies have shown a positive (Hankin, 1993; Le, Hill, Kramar, & Flamant, 1984a; Rosenberg et al., 1982d; Viel, Perarnau, Challier, and Faivre-Nappez, 1997) or null association (Katsouyanni et al., 1986a; Rosenberg et al. 1990c) between alcohol consumption and breast cancer. A recent pooled analysis of cohort studies by Smith-Warner et al. (1998) showed a linear increase in breast cancer incidence within women's reported range of alcohol ingestion. However, much like other nutritional factors, the relationship between breast cancer and alcohol has been difficult to discern because of variations in women's alcohol intake between studies and inconsistencies within study subgroups, such as difference among age groups or between pre or postmenopausal groups (Rosenberg, Metzger, & Palmer 1993b). How alcohol may act in mammary carcinogenesis is largely unknown however, and theories at present are speculative (Rosenberg, Metzger, & Palmer, 1993b).

2.2.2.4 Other Factors Suggested to Increase Risk of Breast Cancer

A number of other factors have been implicated in breast cancer etiology including caffeine, hormone residues in meats and dairy products, and harmful substances in foodstuffs contaminated by pesticides, herbicides or other residues.

Analytical epidemiological studies examining putative links between increased breast cancer and caffeine consistently do not support the association (Schairer, Brinton, Hoover, 1987; Tavani et al., 1998).

Links between high intakes of dairy products and increased risk of breast cancer are supported by some (Knekt et al., 1996; Le, Moulton, Hill, and Kramar 1986b; Mettlin, Schoenfeld and Natarajan, 1990; Richardson, Gerber and Cenee, 1991; Ursin, Bjelke, Heuch and Vollset, 1990) but not all data (Potischman et al., 1998; Toniolo et al., 1994b). Fermented milk products have been shown to be protective of breast cancer (van't Veer et al., 1991c). Dairy products contain trace amounts of chemical contaminants, hormones and growth factors (Groenewegen, McBride, Burton and Elsasser, 1990; Juskevich and Guyer, 1990; Outwater and Bernard, 1997). Insulin-like-growth factor (IGF-I) is one factor that is receiving increasing attention as a link between increased breast cancer rates and milk and dairy consumption (Hankinson et al., 1998a; reviewed in Kaaks, 1996; Larsen, 1998; Macaulay, 1992; Ng et al., 1997; Outwater and Barnard, 1997; Stoll, 1998d; Waters, 1996). IGF-I is mitogenic (De Leon, Wilson, Powers and Rosenfeld, 1992; Karey and Sirbasku, 1988; Ng et al., 1997), found in all untreated human and bovine milk products, and is not destroyed during pasteurization (Miller et al., 1989; reviewed in Outwater and Barnard, 1997). Furthermore, IGF-I receptors are found ubiquitously in human breast tumors (Cullen et al., 1990).

The concentration of IGF-I increases (up to six-fold) in milk from recombinant bovine somatotropin (rbST) treated dairy cows (Prosser, Fleet and Corps, 1989). rbST is used to increase milk production in cattle (Chalupa et al., 1984; Gallo et al., 1997; Juskevich and Guyer, 1990). Plasma IGF-I was recently shown to be positively related to risk of breast cancer in premenopausal women (relative risk 4.58) in a nested case-control study with the prospective Nurses' Health Study cohort (Hankinson et al., 1998a), much

like previous findings by Peyrat et al. (1993). Future prospective studies will help elucidate the potential role of IGF-I in increasing breast cancer risk.

The presence of rbST in cows milk has also been cause for public concern (Juskevich and Guyer, 1990). rbST in milk from rbST treated cows is not bioactive in rats and the presence of detectable rbST is reduced with heat treatment (Groenewegen et al., 1990). It is also believed to be inactive in humans (Juskevich and Guyer, 1990). Although the Federal Drug Administration in the United States has concluded bST does not pose any health threat, there is persistent controversy surrounding these assertions as it may work indirectly through IGF-I to increase breast cancer (Juskevich and Guyer, 1990; Ng et al., 1997; Stoll, 1998c).

Meat has also been linked to increased risk of breast cancer (De Stefani et al. 1997; Richardson, Gerber and Cenee, 1991; Toniolo et al., 1994b); however not consistently (Ambronsone et al., 1998; Mills, Annegers and Phillips, 1988). In addition to increases in risk of breast cancer suggested to result from increased fat intakes correlated with higher meat intakes, putatively harmful compounds in meat sources such as hormones, heterocyclic amines (HCA) and polycyclic aromatic hydrocarbons (PAH) have also been implicated in increasing breast cancer risk (Baghurst, Record and Syrette, 1997).

Estradiol-17 β , progesterone and testosterone are routinely used to increase muscle mass in animals, but not in poultry (Cole and Hovinga, 1991; Cordle, 1988; Ono et al., 1996). However, traces of hormonal residues in meat are believed to be insignificant (Cordle, 1988). Although the carcinogenic risks posed by these hormones are largely

unknown, the cumulative hormonal effects from sources such as meat continue to receive attention (Cole and Hovinga, 1991; Outwater and Barnard, 1997).

The preparation of meat may also increase breast cancer due to increased production of mutagenic compounds (PAH's and HCA's) (reviewed in Snyderwine, 1994). Fried meat has been positively correlated with increased breast cancer incidence (De Stefani et al., 1997; Toniolo et al., 1994b; Toniolo et al., 1989a); however this relationship is not consistent (Ambrosone et al., 1998; reviewed in Baghurst, Record and Syrette, 1997).

The "xenoestrogen hypothesis" (Davis et al., 1993a) has received increasing public attention, implicating compounds in pesticides, herbicides, insecticides, contaminated water and air as possible causes of increased breast cancer rates (Hulka and Stark, 1995; The Economist, Globe and Mail, August 10, 1996, p.D8). Some of these compounds (organochlorines) have been shown to mimic estrogen in both *in vitro* and *in vivo* assays (Fielden, Chittim, Safe, and Zacharewski, 1997; Shekhar, Werdell, and Basrur, 1997), alter estrogen metabolism *in vitro* (McDougal, Wilson and Safe, 1997; Nesaretnam and Darbre, 1997a) and to disrupt reproductive cycles in wildlife (Colborn, vom Saal and Soto, 1993; Wiemeyer et al., 1984). Furthermore, enhanced estrogenic potencies (up to 1000 times) have been seen when compounds are combined, due to their synergistic activity (Arnold et al., 1996). Metabolites of some of these compounds (polychlorinated biphenyls) increase oxidative DNA damage *in vitro* (Oakley, Devanaboyina, Robertson and Gupta, 1996) and many organochlorines have been shown to increase cancer rates in animals (Dunnick and Melnick, 1993). Furthermore, ecological studies show consistent trends of increased cancer rates including cancer of the

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breast, among women living in regions where pesticide and herbicide use is prevalent and among female employees exposed to industrial toxins (Carpenter and Beresford, 1986; Hall and Rosenman, 1991; Kettles, Browning, Prince, and Horstman, 1997).

Some of the commonly implicated organochlorine compounds (PAH's) like beta-hexa-chlorocyclohexane (HCH); organochlorine chlorine compounds including dichlorodiphenyltrichloroethane (DDT), dichloro-dipenyldichloro-ethylene (DDE), and polychlorinated biphenyls (PCB's)) have been detected in women's breast milk (Richter and Safi, 1997; Savage et al., 1981), serum and breast cyst fluid (Blackwood, et al., 1998; Wolff et al., 1993) and breast adipose tissue (Guttes et al., 1998; Lilijegren et al., 1998). However, much of the analytical epidemiological evidence linking these substances to breast cancer is limited to case control investigations (Aschengrau, Coogan, Quinn, and Cashins, 1998; Cocco et al., 1998; Guttes et al., 1998; Schecter et al., 1997). Some studies show higher concentrations of these compounds in breast adipose tissue and serum from breast cancer cases compared to controls (Blackwood et al., 1998; Falck et al., 1992; Guttes et al., 1998; Liljegren et al., 1998; Mussalo-Rauhamaa et al., 1990), while others do not. For example, Schecter et al., (1997) failed to find a significant difference in DDT serum levels between women with and without breast cancer in north Vietnam where DDT pesticide use is prevalent. However, serum levels of some organochlorine compounds, including DDT were not shown to be significantly correlated with mammary adipose tissue levels; thus serum measures may be insufficient predictors of exposure (Archibeque-Engle, 1997). Furthermore, Blackwood et al. (1998) recently demonstrated the presence of both DDE and PCB's in breast cyst fluid, confirming exposure of ductal breast epithelium to these potentially harmful compounds.

Data from prospective cohort analyses have been inconsistent. Manz et al. (1991) showed increased breast cancer mortality rates among women working in a chemical plant contaminated with dioxins. Similarly, Wolf et al. (1993) showed higher sera DDE and PCB concentrations among cases from the Women's Health study cohort compared to controls. However, both Krieger et al. (1994) and Hunter et al. (1997a) had conflicting results, showing no association between these compounds and breast cancer in cases within their cohorts. Although Krieger et al. (1994) described the findings as "negative" and not supportive of hypotheses linking these compounds to increased breast cancer risk, Savitz (1994) and Anderson (1994) contest these interpretations and assert the non-significant trends cited are highly suggestive. So even though findings are not consistent, there are strong opinions that there is merit in these links and more investigation is needed (Chidley and Driedger, 1996; Waters, 1996). Others advocate environmental estrogens are unlikely to be a public threat (Matsumura, 1995; Waddell, 1998). Although the use of many of these compounds are banned in Western societies, some of these pesticides (endosulfan and DDT) are still commonly used in other areas of the world; thus continue to cause concern (Richter and Safi, 1997). Therefore, large scale epidemiological studies currently underway should shed some light on these relationships (Hulka and Start, 1995).

2.2.2.5 Protective Dietary Factors

2.2.2.5.1 Fibre

Inverse associations between breast cancer risk and fibre consumption have been shown in a variety of studies (Graham et al., 1991; Howe et al., 1990a; Rohan, McMichael, & Baghurst, 1988d; van't Veer et al., 1991c; Yuan et al., 1995). Rohan et al.

(1993b) for example, showed a 30% reduction in breast cancer risk among women who consumed the most fibre. This relationship persisted after controlling for potential confounders such as vitamin A, β -carotene, vitamin C, and α -tocopherol. It has been suggested that the reduction in breast cancer risk is due to decreased serum estrogen hormone levels (Goldin et al., 1994; Rose, Godman, Connolly, & Strong, 1991a) and to decreased risk of hyperinsulinemia, correlated with increased fibre consumption (Stoll, 1997b). However, like analytical epidemiological studies of dietary fat and breast cancer risk, evidence linking fibre with decreased breast cancer risk has been inconsistent, given some studies show no association (Willet et al., 1992g). Although the extant epidemiological evidence elucidating the role of fibre in breast cancer is not consistent, the strength of the relationship is believed to lie in the biological mechanism and experimental evidence; therefore, supplementation of dietary fibre among premenopausal women has been recommended to reduce breast cancer incidence (Gerber, 1998; Stoll, 1997b).

2.2.2.5.2 Components of Fruits and Vegetables

There is abundant epidemiological evidence to show an inverse relationship between consumption of fruits and vegetables and incidence of most types of cancer due to the presence of vitamins, minerals, fibre and phytochemicals in these foods (Block, Patterson, & Subar, 1992; Franceschi, et al., 1996a; Katsouyanni, et al., 1988b; Qi et al., 1994; Weisburger, 1991a). In a case-control study of Greek women, Katsouyanni et al., (1986a) showed breast cancer risk among women consuming the lowest quintile of fruits and vegetables was ten times greater than women consuming the highest quintile. Micronutrients within fruits and vegetables, such as vitamin A, C, E and selenium are of

interest due to their antioxidant and anticarcinogenic potential, whereby DNA damage is avoided through the inactivation or elimination of reactive oxygen species (reviewed in Rock, Jacob, and Bowen, 1996b). Djuric et al., (1998) recently showed significant correlations between high intakes of fruits and raw and cooked vegetables and decreased oxidative DNA damage. Phytochemicals, components in fruits and vegetables thought to be cancer preventive, are also being intensely studied (British Columbia Cancer Agency, 1996b).

Vitamin A and carotenoids measured as markers in plant foods have been shown to be modestly protective of breast cancer in most analytical epidemiological investigations (Jain et al., 1994a; Katsouyanni et al., 1988b; Negri et al., 1996; Rohan et al., 1988d), even though there have been inconsistencies, where fewer but some studies have shown no association (London et al., 1992b; Paganini-Hill, Chao, Ross, & Henderson, 1987; Qi et al., 1996; Russel, Thomas and Bulbrock, 1987). There are several hundred different naturally occurring carotenoids which have been shown to exert variable protective effects (La Vecchia, Ferraroni, Negri and Franceschi, 1998). It is thought that vitamin A may act at the level of differentiation and antipromotion to reduce cancer incidence, and carotenoids may act as antioxidants (Rock, Jacob, and Bowen, 1996b; Weisburger, 1991a). However, it is unclear how preformed vitamin A or other carotenoids differ or contribute to their protective effects (Hunter et al., 1993b).

Vitamin C, a water-soluble antioxidant, has been consistently shown as protective in other types of cancers when measured as a plant food component, however data is less consistent in regards to breast cancer (Jain et al., 1994a; Negri et al., 1996; Qi et al., 1996; Rohan et al., 1993b). Howe et al. (1990a) showed a statistically significant inverse

association between vitamin C from foods and postmenopausal breast cancer incidence in their combined analysis of twelve case-control studies. Furthermore, their results show increased consumption of fruits and vegetables by postmenopausal women to attain vitamin C intakes of 380mg/day would result in a decrease in breast cancer incidence of 16% among North American women (Howe et al., 1990a). Jain et al. (1994a) showed a dose-response decrease in breast cancer mortality with increasing vitamin C and beta carotene intakes in a Canadian cohort of women with breast cancer, and the authors assert more attention should be paid to increasing intakes of fruits and vegetables to improve breast cancer prognosis.

Vitamin E from food sources has been shown in animal and experimental studies to destroy carcinogenic compounds such as nitrites, which have been associated with various cancers (Garland, Willet, Manson, & Hunter, 1993; Weisburger, 1991a). A number of tocotrienols have been shown to have antiproliferative effects *in vitro* (Nesaretnam, Stephen, Dils, and Darbre, 1998b). Vitamin E also has potent antioxidant qualities (Garland et al., 1993; Weisburger, 1991a); it is the major lipid-soluble antioxidant of the cell membrane protecting membrane lipids from peroxidation (Kimmick, Antonio Bell, and Maner Bostick, 1997). Although some studies examining the role of vitamin E from foods in the protection of breast cancer have been supportive (London et al., 1992b; Negri et al., 1996; Graham et al. 1991), others have not (Hunter et al., 1993b; Rohan et al., 1992c). Vitamin E has been suggested to be more efficacious in the prevention of cardiovascular disease as opposed to cancer (Rock, Jacob, and Bowen, 1996b).

Studies of the effects of selenium in human breast cancer have also been inconsistent with most studies not supporting a role for selenium in protection against breast cancer (Garland et al., 1993; Hunter et al., 1990c; Qi et al., 1996; Meyer & Verreault, 1987; van Noord, Maas, van der Tweel, & Collette 1993; van't Veer et al., 1990b). However one case control study showed a strong inverse association between selenium intake and breast cancer risk (Salonen, Alfthan, Huttunen, & Puska, 1984). The anticarcinogenic activity is thought to result from its ability to inhibit cellular proliferation from the incorporation of selenium into an antioxidant enzyme glutathione peroxidase which quenches unstable radicals (Garland, 1993).

There are a myriad of compounds in nuts, whole grains, fibre, fruits, and vegetables that may play a significant anticancer role in protecting us from cancer (Craig, 1997). Some of these phytochemicals include "allyl sulfides in garlic and onions; phytates in grains and legumes; glucarates in citrus, grains and solanaceous vegetables; lignans in flax and soybeans; isoflavones in soybeans; saponins in legumes; indoles, isothiocyanates, and dithiolthione in cruciferous vegetables; ellagic acid in grapes, strawberries, raspberries, and nuts; phthalides and polyacetylenes in umbelliferous vegetables;" (Craig, 1997) and other flavonoids, carotenoids, phytoalexins and terpenoids in other plant based foods (Crowell, 1997; Madhavi, Bomser, Smith and Singletary, 1998; Mgbonyebi, Russo, and Russo, 1998; Rock et al., 1997a). Although the anticancer mechanisms of many of the these compounds are largely unknown, some of these compounds are believed to influence breast cell proliferation, tumor redifferentiation, cell death, and / or estrogen metabolism, while others may act as antioxidants (Crowell, 1997; Fransceschi, 1997b; Mgbonyebi, Russo, and Russo, 1998; Verhagen et al., 1995; Wong et

al., 1997). For example, a recent randomized controlled trial of indole-3-carbinol, a substance common in broccoli and other members of the cruciferous vegetable family given at increasing dosages, demonstrated a significant increase in the excretion of an estrogen metabolite among women at high risk for breast cancer consuming the highest dose (Wong et al., 1997).

2.2.2.5.3 Vitamin and Mineral Supplements

Interestingly, intakes of vitamin and mineral supplements are prevalent among the general public (Slesinski, Subar, and Kahle, 1995), especially among women with breast cancer (Newman et al., 1998b). Out of 435 American women with breast cancer, 81% (352) of them reported taking dietary supplements (Newman et al., 1998b). Supplement use may influence breast cancer outcome; however limited studies to date have focused on the role of supplements in the prevention of breast cancer and little exists examining a role for supplements in modulation of breast cancer progress. Furthermore, evidence linking vitamin and mineral supplements and decreased breast cancer risk are inconsistent (Hunter et al., 1993b; London et al., 1992b; Paganini-Hill et al., 1987). Three large cohort studies examining diet in relation to breast cancer (The Nurses' Health Study; The Canadian National Breast Screening Study; the Iowa Women's Health Study) showed reduced breast cancer risks associated with supplemental vitamin A (non-significant) and C (The Canadian National Breast Screening Study); however no associations were found with vitamin E (Patterson et al., 1997).

2.2.2.5.4 Soy Products and Phytoestrogens

The putative protective effects of soybeans and soy products have been of increasing scientific interest in the last few years. Ecologic and analytical

epidemiological evidence show lower rates of breast cancer for Chinese and Japanese women who have diets lower in fat, but also have diets high in soy foods (Ingram, Sanders, Kolybaba, and Lopez, 1997; Lee et al., 1991; Persky & Van Horn, 1995). Although soy appears to be much like other dietary components where findings are less consistent, this foodstuff is not well studied compared to other nutrients such as dietary fat (Messina, Persky, Setchell, & Barnes, 1994; Yuan et al., 1995). The combined findings collected by Yuan et al., (1995) of 2 case control studies from women in China showed no protective effects of breast cancer from soy. Alternatively, Lee et al. (1991) showed significant reductions in risk of breast cancer among women in Singapore with the highest total soy product intakes (OR: 0.62 p=0.01).

Compounds present in soy called phytoestrogens are among some of the many compounds believed to be responsible for the protective effects. A phytoestrogen is a plant derived substance which influences estrogenic gene expression, either through agonistic or antagonistic interactions (Clarke et al., 1996b). They are classified by chemical structure and include isoflavones, lignans, coumestans and resorcylic acid lactones (Davis, Murkies and Wilcox, 1998b). Compounds in soy that have estrogenic activity include lignans, isoflavones and mycotoxins from fungal molds (e.g. zearalenone) (Clarke et al., 1996; Sathyamoorthy and Wang, 1997). These compounds are also found in whole grains, fruits, and berries (Clarke et al., 1996b). Because they can either promote or inhibit estrogenic gene responses, the positive effects of many of these compounds in breast cancer etiology are uncertain (Sathyamoorthy and Wang, 1997). Preliminary data from clinical trials to determine if soy may influence breast cancer risk through estrogenic activity have shown decreases in circulating ovarian

steroids, serum hormone binding globulins, and adrenal androgens and increases in menstrual cycle length (Brzezinski et al., 1997; Clarke et al., 1996b; Lu, Anderson, Grady and Magamani, 1996b; Nagata, Kabuto, Kurisu, and Shimizu, 1997; Persky & Van Horn, 1995); however there are conflicting studies (Baird et al., 1995). These changes may contribute to decreased breast cancer risk.

Further support for the putative protective effects of soy come from investigation into the action of specific flavonoid compounds, such as genestein, which show antiproliferative effects on breast cancer cells *in vitro* at physiological levels (Sathyamoorthy and Wang, 1997; Zava and Duwe, 1997). These phytoestrogens may also reduce enzymes synthesizing endogenous estrogen (Aldercreutz et al., 1993a). There are also a number of other compounds in soy which are thought to be protective of breast cancer in addition to the phytoestrogens such as saponins, protease inhibitors and phytates many of which act as antioxidants while others are anti-angiogenic or induce apoptosis (Head, 1997a).

2.2.2.6 Diet and breast cancer: summary of scientific evidence and dietary recommendations

Diet is one of the most plausible environmental factors influencing breast cancer risk. Although much of the data examining links between diet and breast cancer has been inconsistent, there are many contributing nutritional factors which are well supported by scientific evidence. For example, evidence linking high intakes of fruits and vegetables to decreased breast cancer risk is strong (Block, Patterson, & Subar, 1992; Katsouyanni, et al., 1988b; Qi et al., 1994; Weisburger, 1991a). There are a plethora of compounds in fruits and vegetables exerting anticancer effects such as antioxidants, enzyme inducers and hormone modulators. A number of compounds in soy linked to breast cancer

protection are also increasingly supported by scientific data (Sathyamoorthy and Wang, 1997; Zava and Duwe, 1997). Although some studies do not support a protective role for fibre in breast cancer (Willet et al., 1992g), many do (Goldin et al., 1994; Rose et al., 1991a). It likely exerts a protective effect by influencing hormone metabolism and insulin regulation (Stoll, 1997b). Few contesting studies dispute evidence linking increasing intakes of alcohol and increased incidence of breast cancer (Hankin, 1993; Le et al., 1984; Rosenberg et al., 1982d; Smith-Warner et al., 1998; Viel et al., 1997). Although widespread public perceptions linking total dietary fat and breast cancer have been supported by ecological and experimental data (Armstrong, & Doll, 1975; Hems, 1978; Lu et al., 1995a; Sasaki, Horacsek, & Kesteloot, 1993), these links have not been widely supported by analytical epidemiological studies (Howe, 1994b; Hunter et al., 1996d; Willet et al., 1992g; Wynder et al., 1994a; Wynder et al., 1997a). Type of fat or total energy consumed may be significant confounders obfuscating the elucidation of the role of fat in breast cancer etiology. Furthermore, limitations in the collection of dietary information and study design may limit the ability of these studies to clearly depict relationships between dietary fat and breast cancer. High intakes of omega-6 fatty acids relative to omega-3 sources have been used to explain dramatic international differences in breast cancer incidence (Noguchi et al., 1995; Weisburger, 1997b). Harmful substances soluble in dietary fat have also fueled beliefs regarding links between fat and increased incidence of breast cancer. Evidence to date examining the role of environmental estrogens, hormones in dairy products and meats, and other environmental estrogens in foods is inadequate to draw clear conclusions about their role in breast cancer etiology (Hunter et al., 1997a; Krieger et al., 1996; Schecter et al., 1997); however

current findings are suggestive (Falck et al., 1992; Fielden et al., 1997; Guttus et al., 1998; Mussalo-Rauhamaa et al., 1990; Wolff et al., 1993). Future data from interventional trials in progress should help elucidate the role of these and other dietary factors.

Conventional dietary recommendations (Figure 1.) to reduce breast cancer risk reflect extant scientific evidence and data supporting links between nutritional factors and other common chronic diseases such as cardiovascular disease (British Columbia Cancer Agency, 1996b; Inter-society Commission for Heart Disease Resources, 1970).

Figure 1. Summary of Dietary Recommendations for Cancer Prevention

Public Health Goals and Advice to Individuals

Food Supply and Eating

1. Choose predominately plant-based diets rich in a variety of vegetables and fruits, pulses (legumes) and minimally processed starchy staple foods.
2. Avoid being underweight or overweight and limit weight gain during adulthood to less than 5 kg.

Food and Drinks

3. Eat 400-800 grams or five or more portions a day (7% or more total energy) of a variety of vegetables and fruits, all year round.
4. Eat 600-800 grams or more than seven portions a day of a variety of cereals, pulses, roots, tubers and plantains (45-60% total energy). Prefer minimally processed foods. Limit consumption of refined sugar.
5. Alcohol consumption is not recommended. If consumed at all, limit alcoholic drinks to less than two drinks a day for men (less than 5% total energy) and one for women (less than 2.5%).
6. If eaten at all, limit red meat to less than 80 grams daily or 10% of total energy. It is preferable to choose fish, poultry or meat from non-domesticated animals in place of red meat.
7. Total fats and oils should provide 15% to no more than 30% total energy. Limit consumption of fatty foods, particularly those of animal origin. Choose modest amounts of appropriate oils.

Food Processing

8. When levels of additives, contaminants and other residues are properly regulated, their presence in food and drink is not known to be harmful.
9. Do not eat charred foods. For meat and fish eaters, avoid burning of meat juices. Consume the following only occasionally: meat and fish grilled (broiled) in direct flame; cured and smoked meats.

Dietary Supplements

10. For those who follow the recommendations presented here, dietary supplements are probably unnecessary, and possibly unhelpful for reducing cancer risk.

(Adapted from World Cancer Research Fund / American Institute for Cancer Research, 1997)

For example, recommendations to reduce dietary fat intakes to $\leq 30\%$ of total energy are widespread to reduce cancer risk generally and maintain a 'healthy' diet; even though evidence supporting decreased dietary fat intake to prevent breast cancer specifically is inconclusive (British Columbia Cancer Agency, 1996b; Butrum et al., 1988; Kritchevsky, 1993; World Cancer Research Fund / American Institute for Cancer Research, 1997). Low fat diet recommendations are also advised to help maintain appropriate energy intakes, thereby facilitating weight control and reduced breast cancer risk (British Columbia Cancer Agency, 1996b; Canadian Cancer Society, 1992). Some also suggest substituting sources high in saturated fat (animal products) with foods high in N-3 series fatty acids (e.g. flax seed oil or deep sea fish sources) (British Columbia Cancer Agency, 1996b). Again, these recommendations are similar to guidelines for reducing the risk of cardiovascular disease (Willet, 1995c). General recommendations to increase the number and variety of fruit and vegetables consumed and increase fibre intakes (to at least 30 grams) to reduce general cancer risk abound (British Columbia Cancer Agency, 1996b; Butrum et al., 1988; Kritchevsky, 1993; World Cancer Research Fund / American Institute for Cancer Research, 1997). Although increasing one's consumption of anticancer compounds in soy and other plant products is suggested to be protective of breast cancer, increasing the intake of phytochemicals or phytoestrogens from soy or other plant sources is not directly recommended (British Columbia Cancer Agency, 1996b). Dietary supplements are not widely recommended by many expert agencies, rather institutions advise obtaining nutrients from a varied and balanced diet (Canadian Cancer Society, 1992; World Cancer Research Fund / American Institute for Cancer Research, 1997). The consumption of alcohol is also not recommended (World Cancer

Research Fund / American Institute for Cancer Research, 1997). The British Columbia Cancer Agency (1996b) advises minimal to moderate intakes of alcohol to reduce one's risk of breast cancer. There are no specific recommendations to avoid foodstuffs which are exposed to pesticides, herbicides or other environmental contaminant, or to avoid meat or dairy products due to the presence of hormone residues or other contaminants (British Columbia Cancer Agency, 1996b; World Cancer Research Fund / American Institute for Cancer Research, 1997).

There is less standardization of guidelines within CAM compared to conventional nutrition recommendations, however there are many consistent naturopathic specifications. Although recommendations to reduce fat are similar in both conventional and alternative guidelines, there is a stronger assertion among alternative health experts that dietary fat and animal products increase breast cancer risk (Austin and Hitchcock, 1994). However, both recommend decreasing total fat and red meat, seen in Figure 2. (Austin and Hitchcock, 1994; British Columbia Cancer Agency, 1996b). Conventional appeals to reduce dietary fat are aimed at general health, reduction of cardiovascular disease and cancer risk generally (British Columbia Cancer Agency, 1996b); whereas alternative proponents assert reductions are aimed at decreasing breast cancer risk specifically (Austin and Hitchcock, 1994; Nicholson, 1996). Unlike conventional medical experts, the consumption of organic foodstuffs, or foods produced without exposure to synthetic chemical fertilizers, pesticides or herbicides to reduce one's exposure to chemicals (Worthington, 1998) is increasingly endorsed by alternative health experts (Austin and Hitchcock, 1994; Nicholson, 1996).

REVIEW OF THE LITERATURE

Figure 2. Comparison of Conventional and CAM Guidelines

General Guidelines	Specific Conventional Guidelines	Specific CAM Guidelines
Choose predominately plant-based diets	<ul style="list-style-type: none"> • 5 or more portions / day of fruits and vegetables 	<ul style="list-style-type: none"> • fresh, organic sources preferable (raw, steamed or juiced) • avoid canned or processed sources • avoid foods contaminated with pesticides
Eat a variety of cereals, pulses, roots and tubers	<ul style="list-style-type: none"> • 7 portions / day • avoid processed foods • whole grains, roughage / fibre encouraged 	<ul style="list-style-type: none"> • avoid processed foods • whole grains, roughage / fibre encouraged • choose organic sources
Red meat / animal products	<ul style="list-style-type: none"> • limit red meat consumption: less than 80 grams or 10% of energy • preferable to choose fish, poultry or meat from non-domesticated animals 	<ul style="list-style-type: none"> • avoid red meats (excluding game) • avoid animal fats • avoid dairy products (& cow's milk)
Meat preparation	<ul style="list-style-type: none"> • avoid charred foods 	<ul style="list-style-type: none"> • avoid deep fried or BBQ'd foods
Fats and oils	<ul style="list-style-type: none"> • should provide 15% to no more than 30% of total energy • limit consumption of fatty foods, especially of animal origin 	<ul style="list-style-type: none"> • limit consumption of fatty foods, especially of animal origin • choose fat sources from fish (fish oils) and olive oil
Simple sugars	<ul style="list-style-type: none"> • limit consumption of sugar 	<ul style="list-style-type: none"> • avoid the consumption of sugar (soft drinks, diet pop)
Alcohol is not recommended	✓	✓
Supplements	<ul style="list-style-type: none"> • not recommended 	<ul style="list-style-type: none"> • a number of vitamin, mineral and phytochemical supplements are recommended
Others		<ul style="list-style-type: none"> • avoid caffeine • avoid shell fish • avoid foods high in sodium • avoid preserved, colored or refined foods

(Adapted from World Cancer Research Fund / American Institute for Cancer Research, 1997; Austin and Hitchcock, 1994).

Furthermore, alternative health proponents often encourage patients to avoid meat and dairy due to the presence of harmful substances in these foods (Austin and Hitchcock,

1994; Clorfene-Casten, 1998; Nicholson, 1996; Walker, 1997; Waters, 1996). Nicholson (1996) asserts "animal products contain high levels of fat and organochlorine residues, both of which increase serum levels of estrogen". This is believed to increase breast cancer risk (Nicholson, 1996). Alternatively, for cancer prevention conventional guidelines encourage plant-based diets, but do not encourage vegetarianism, or the exclusion of meat, dairy or animal products generally (British Columbia Cancer Agency, 1996b; World Cancer Research Fund / American Institute for Cancer Research, 1997). Similar to conventional guidelines, alternative medical health experts also advise against the consumption of alcohol (Austin and Hitchcock, 1994; Nicholson, 1996).

Much like conventional recommendations, alternative health experts similarly advise increasing intakes of fruits, vegetables and fibre, high in "protective elements" like indoles, flavonols, vitamins and minerals (Austin and Hitchcock, 1994; Holzman, 1996; Nicholson, 1996). Generally, alternative health proponents would agree

vegetarian diets maximize the amount of protective nutrients while minimizing the amounts of carcinogenic nutrients, and therefore may be the most effective diet both for preventing breast cancer and for improving the prognosis of those who have the disease (Nicholson, 1996),

whereas conventional proponents would not necessarily advocate vegetarian diets.

Both camps also exhibit similar recommendations to increase consumption of phytochemicals found in plant sources (Austin and Hitchcock, 1994); however conventional guidelines describe links between these compounds and breast cancer as suggestive and not confirmed (British Columbia Cancer Agency, 1996b). Unlike conventional nutrition guidelines, supplemental vitamins and minerals are also widely recommended by CAM advocates (Austin and Hitchcock, 1994; Austin, 1997; Grosshans, and Standish, 1997), including megadoses of some antioxidants [%

Recommended Nutrient Intake for Canadian Adult women]: vitamin C (1-18 grams/day) [60,000% at 18g], vitamin E (400IU/day) [745%], beta carotene (350,000-500,000 IU/day) [not applicable] and selenium (200µg/day) [not applicable], and supplemental vitamin D (400 IU/day) [>1,000,000%] (Austin and Hitchcock, 1994; Grosshans, and Standish, 1997; Head, 1998b). Austin and Hitchcock (1994) advise avoiding iron supplements if one is not anemic, as it is believed to increase cancer risk and other supplements are also advised including supplemental Coenzyme Q10, melatonin, Essiac, and dehydroepiandrosterone (DHEA) (Austin, 1997; Kaeigi, 1998).

Although the scientific evidence is commonly cited in both conventional and alternative health dietary guidelines, the interpretation of this information varies. In the following section, I will outline both the conventional and alternative approaches to applying evidence in practice. I will discuss conventional evidence-based medicine strategies and the critiques of this approach which are being increasingly vocalized by proponents of alternative or holistic medicine.

2.3 THE USE OF EVIDENCE IN CLINICAL PRACTICE

There is a transforming movement within conventional medical practice to implement 'evidence based' approaches to clinical decision making (Charlton and Miles, 1998; Friedland, 1998). Evidence based medicine (EBM) refers to a process of "systematically finding, appraising, and using contemporaneous research findings as the basis for clinical decisions" (Rosenberg and Donald, 1995a). This powerful trend is responsive to the ever present need to narrow the gap between clinical research and medical practice, and to justify that clinical decisions are based on evidence that the intervention or recommendation will actually help the patient (Kasta and Weinstein,

1997). Furthermore, there is strong vested interest among those in government, health planning and policy, and in the general public for rationalization of health expenditures, which further drives the EBM movement forward (Sackett et al., 1996). Therefore, the strength in the argument for EBM originates in its fundamental intention to ensure the best evaluated methods are utilized in patient care (Kerridge, Lowe and Henry, 1998).

In this review, I will outline the definitions and applications of EBM approaches to clinical practice. Secondly I will discuss some of the challenges and critiques to this process. Then I will review some alternative perspectives, which present alternative ways of using evidence and argue that other methods should be considered for legitimate inclusion within our diverse approaches to health to yield a more eclectic approach to patient care.

2.3.1 Definitions and uses of evidence based medicine

The focus of EBM is the formulation of guidelines, protocols and recommendations which are based on an integration of current scientific evidence and expert opinion and are aimed at “ensuring the efficiency, effectiveness and appropriateness of healthcare interventions” (Miles, Lugon, and Polychronis, 1997). Resulting policies and recommendations evolve to reflect the strength of extant evidence, which is directly dependent upon the integrity or weight of the particular studies (Miles, Lugon and Polychronis, 1997). Numerous claims have been made that the majority of medical decisions in the past were not based on current scientific evidence and as a result, some have been either ineffective and even harmful (Ellis, Mulligan, Row and Sackett, 1995; Michaud et al., 1998; Miles, Lugon, and Polychronis, 1997; Smith, 1991). Therefore, EBM provides the systematic means of legitimizing and justifying medical

practice decisions: it is not “prescriptive” (Kamill, 1997) and “it cannot result in slavish, cookbook approaches to individual patient care” (Sackett et al., 1996); rather it has strict rules of implementation. Reviews, comments and editorials debating the logistics of this evolving trend of EBM and its application in practice abound (Costa and Hubbard, 1997; Davidoff, 1998; Horton, 1998; Hunt, Haynes and Browman, 1998; Kamill, 1997; Kernick, 1998; Knottnerus and Dinant, 1997; Lipman, 1997). For example, Maynard (1997) asserts EBM strategies could be socially irresponsible if consideration of cost effectiveness and treatment efficacy evidence is not balanced during clinical decisions making.

In order to systematically address the challenges of weighing different types of research data, a five-level scale of evidence has been established to guide evaluation (Figure 3.).

Figure 3. Levels of Evidence

Level	Evidence
I	High power randomized trial or meta-analysis of well-designed randomized clinical trials
II	At least one well-designed non-randomized study or one low-powered randomized clinical trial
III	Well-designed quasi-experimental studies (cohort, case-control etc.)
IV	Well-designed non-experimental studies (comparative, correlational, descriptive, etc.)
V	Case reports

(Costa and Hubbard, 1997)

This scale provides a framework to determine the weight of different research protocols, which is reflective of their reliability, validity, power and ultimate strength. The large-scale randomized clinical trial, and meta-analysis of randomized clinical trials are commonly touted as a “source of infallible dogma for clinical decision making” (Lugon and Polychronis, 1997) due to the potential to preclude subjectivity, reduce

random or systematic errors, and include a number of variable data sets which can potentially yield increased power and robustness (Horton, 1998). Meta-analyses of small randomized controlled trials are recommended when larger ones do not exist (LeLorier et al., 1997). However randomized controlled trials (RCT's) and meta-analyses are not always consistent, as LeLorier et al. (1997) recently showed outcomes of meta-analyses published previously were unable to predict the same outcomes from subsequent large randomized trials a third of the time.

2.3.2 Criticisms of evidence based medicine among conventional medical practitioners

Although the application of EBM is pervasive within conventional medical practice, a number criticisms and challenges to this process have been raised. The EBM framework is viewed by some as overly simple, open to the potential to be misinterpreted, and possibly undermining the complexity of clinical decisions (Kerridge, Lowe and Henry, 1998). There may be increased reliance on the logical framework EBM provides, in lieu of appropriate reasoning and critical assessment of various types of contributing evidence (Horton, 1998). Concerns regarding whose vested interests are represented in the evaluation and selection of appropriate types of research have been voiced. Furthermore, there is potential for perpetual power disparity to form between 'expert' and patient due to the knowledge necessary for applying EBM principles, as well as the potential for variation in interpretation among different stakeholders (Kerridge, Lowe and Henry, 1998). For example, concerns have been raised regarding the influence of sponsorship on clinical trials due to the increased propensity for outcomes to suit the interests of the funding agency; furthermore, criticisms have resulted from trials being stopped without explanation when outcomes are not agreeable to funders

(Vandenbroucke, 1998). Therefore, concerns regarding the oversimplification of decisions due to the over reliance on the EBM framework are common, given these outcome measures are further obfuscated by the power relationships inherent in the business of producing and evaluating research.

The principle assumption underlying EBM approaches to clinical care is that the best scientific evidence will be applied; furthermore, the randomized controlled trial is espoused consistently as the most worthy candidate - the 'gold standard'. As Kernick (1998) jibes, "enter EBM and its ultimate instrument, the randomized controlled trial - "a thing of beauty"- set fair for rapid growth and rising like a phoenix from the observation of the large variation in clinical practice and health outcomes". However, as Vandenbroucke (1998) said "when making medicine singularly dependent on randomized trials... I am not certain that the best interest of the patient is always served". There are many criticisms to RCT itself (Hellman and Hellman, 1991; Passamani, 1991). For example, the underlying premise of randomized controlled trials relies on a careful balance between the potential risk or lack of benefit of the treatment / placebo for the study subjects and the overall gain made for society in the resulting knowledge. Therefore, some suggest an ethical dilemma exists with those patients not benefiting from the experimentation, who are sacrificed for the greater good of society (Hellman and Hellman, 1991).

The singular reliance on experimental protocols, namely randomized controlled trials, runs the risk of ignoring other complementary methods of inquiry such as 'observational' or analytic epidemiological methods, individual case studies and others. These contribute important information to questions which may not be feasibly answered

by randomized control trials (Black, 1996b; Lecky and Driscoll, 1998). Many conventional health experts assert that the nature of the research questions posed should indicate the appropriate tool of investigation, and that there is no hierarchy when applying the existing evidence (Vandenbroucke, 1998).

Another source of contention rests in the transition from clinically based approaches valuing physicians' experience, professional judgment and their evaluation and inclusion of qualitative factors in making clinical decisions, to approaches where the principle rationale is quality assurance through experimentation and quantification (Black, 1998a; Charlton and Miles, 1998; Horton, 1998). Charlton and Miles (1998) argued "EBM involves a takeover of the clinical consultation by an alliance of managers and their statistical technocrats who are empowered to define 'best practice'". Furthermore, there are limitations inherent in those outcomes which can be measured: quantifying justice or quality of life for example has obvious limitations (Kerridge, Lowe and Henry, 1998). Although the purpose of EBM approaches is to integrate current scientific evidence with clinical expertise, EBM has also been implicated as a means of controlling health care costs and limiting clinical freedom, restricting physicians' ability to "thoughtfully identify and compassionately use patients' predicaments, rights and preferences to make clinical decisions about their care" (Sackett et al., 1996). Thus, potential negation of the subjective aspects of care are worrisome.

In addition to the criticisms heard from conventional physicians and academics, there is an increasing resistance to the power of EBM and other scientific approaches to understanding disease and patient care evident among practitioners of (CAM).

2.3.3 Criticisms of evidence based medicine from complementary and alternative medicine practitioners

Achterberg (1998) asserts the increasing prominence of CAM practitioners reflects a shift in widespread perceptions and philosophies about health and illness, likened to the 'crisis' of shifting paradigms described by Thomas Kuhn (1970). The range and diversity of philosophies and ideologies within CAM are staggering. Therefore, it is important to discuss some of the general philosophical and ideological principles that underlie these eclectic approaches to health care, in order to understand arguments against its inclusion into biomedical approaches to measurement. These philosophical underpinnings are not necessarily specific to but include naturopathy. Some of the most basic principles include self-healing and unique or individual paths to wellness; health as a continuum with no beginning or end and the multifactorial nature of disease etiology; holistic or inclusive approaches to care that integrate universal principles such as spirituality and the environment, also referred to as the systems approach to health; and the long-term nature of CAM approaches (Fulder, 1998; Funk, 1995; Jobst, 1998; Levin et al., 1997). Each of these tenets presents a methodological challenge, which fuels arguments against current attempts to evaluate CAM approaches with conventional techniques (Levin et al., 1997). In this section, I will outline the fundamentals (see Figure 4.) of CAM that illuminate the major points of contention between proponents of conventional and alternative camps, in their attempts to develop appropriate methods of evaluation.

Figure 4. Concepts in Conventional and Alternative Medicine

Concepts in Conventional and Alternative Medicine

<u>Concept</u>	<u>Conventional Interpretation</u>	<u>Alternative Interpretation</u>
Health	Absence of disease	Balance of opposing forces internally as well as externally
Disease	Specific, locally defined deviations in organ or tissue structures	Disruptive forces and/or restorative processes
Therapy	Combating destructive forces	Strengthening constructive forces
The Patient	Passive recipient of external solutions	Active participant, taking responsibility in regaining health

(Adapted from Aakster, 1995)

Alternative medicine is described as a tradition founded upon centuries of human healing practices (Fulder, 1998). It is based in a vitalistic, life-oriented approach, intimately integrating the individual with their environment (Fulder, 1998). A diseased state is believed to be one of many sites along the health continuum, yet there is no absolutely healthy or diseased individual, rather these states are described as periods of imbalance in a person's journey along the illness-wellness path (Aakster, 1995; Fulder, 1998). Furthermore, CAM systems of belief include complex understandings of disease etiology, where disease is multifactorial in nature linked to both external and internal variables (Levin et al., 1997). As Fulder (1998) describes, CAM philosophies have more respect for the environment and the global energies flows within it. Differences in CAM practitioners' view of both humans and their relationship to their environment and the nature of disease provide reason for pervasive beliefs that CAM therapies are not suitable to conventional methods of assessment. Therefore, arguments against evaluating CAM therapies with biomedical methodologies stem largely from espoused difference in world views among practitioners of CAM and conventional medicine.

An individual's innate ability to heal is a fundamental principle in naturopathy and specific modalities are geared towards enhancing or augmenting this potential (Bastyr University, 1997; Fulder, 1998). Thus, remedies which are classified as 'natural' or not processed, manipulated or otherwise changed by humans such as herbs and dietary changes and specific nutrients, are believed to be useful tools in this process (Fulder, 1998; Jobst, 1998). Furthermore, the specific regimen set out is particular to the individual, given their unique set of circumstances such as their environment and social and psychological condition (Fulder, 1998; Ranjan, 1998). Each individual's health "signature" as Jobst (1998) describes, is believed to respond uniquely to their protocol and this reaction may vary depending where they are in the course of their illness. This is a defining principle of CAM and it is often described as distinct from conventional or biomedical approaches which implement common treatment strategies based on generalized assumptions about people as a group understood through the use of statistics (Fulder, 1998; Rajan, 1998). Furthermore, these tactics are said to reduce complex phenomena into generalized symptoms and particular disease entities instead of understanding the individual and their unique disease response (Fulder, 1998; Rajan, 1998). The treatment of the patient in CAM is described as holistic as opposed to reductionistic, whereby an individual's unique set of conditions is integrated into their treatment plan, instead of focusing on symptoms (Aakster, 1995; Fulder, 1998). In addition to treatment regimes being individually designed, CAM approaches often include a complex array of eclectic techniques such as dietary change, oxygen therapy, herbal therapy and acupuncture (Levin et al., 1997). Therefore, conventional approaches of evaluation are believed to be inadequate and inappropriate to measure multiple

complex and individually geared treatments (Levin et al., 1997). Furthermore, there is strong belief among advocates of CAM that the construction of explanatory models used to understand particular disease entities is not as important as developing trust in the self-healing capacities of patients (Fulder, 1998).

In addition to CAM approaches being individually formulated and uniquely experienced, a 'systems' approach to health is implemented; that is, a holistic approach which encompasses the different physical, psychological, environmental and social aspects of health into an integrated approach to healing (Dossey, 1995; Ernst, 1995a; Funk, 1995; Ranjan, 1998). It generally includes examining and treating a number of organ systems, in a "synergistic manner" (Funk, 1995). For example, naturopathic approaches to breast cancer would include building the immune system, strengthening the liver, cleansing the intestines to facilitate the process of detoxification and absorption of nutrients, all of which contribute to the enhancement of the body's ability to fend off the cancer (Funk, 1995). Furthermore, many practitioners of CAM believe an individual's disease manifestation results from a complex interaction between organ systems, their environment and their personality and psychological profile (Ranjan, 1998). This is reflected in the burgeoning CAM fields of psychoimmunology and psychosocial oncology (Ranjan, 1998; Simonton and Sherman, 1998). The role of both the conscious and unconscious mind is consistently believed to play a crucial role in the healing process, which presents further challenge to evaluation, due to the inherent difficulty in quantifying, observing and analyzing these obscure entities (Fulder, 1998; Jobst, 1998). Therefore, the multiple organ systems approach linked holistically to the intangible and largely subjective psychological environment and further linked to 'systems' outside the

body (environment, society) is argued to exclude basic CAM approaches from conventional approaches to evidence based medicine.

Many CAM approaches are aimed at disease prevention or the management of chronic illnesses with lifelong implications (Levin et al., 1997). Therefore, treatments may involve short-term (hydrotherapy) treatment and / or long-term lifestyle changes (supplement therapy, dietary changes). These interventions may also vary depending on the course of the illness and the individual. Because these applications occur over extended periods of time and exhibit variable outcomes, they are difficult to measure; furthermore, changes are often described as subtle and or undefined in mainstream medicine (Levin et al., 1997). For example, Ranjan (1998) describes differences in the therapeutic intentions of conventional versus CAM practitioners, one being 'a cure' which is concrete and measurable, while the other emphasizes 'balance' which is intangible and difficult to evaluate. Thus, many CAM advocates assert such interventions are not amenable to conventional methods of assessment (Levin et al., 1997).

Given the fundamental philosophical and practical tenets of CAM, proponents consistently argue against the feasibility and appropriateness of various alternative therapies being evaluated the same way as conventional treatments (Dossey, 1995; Ernst, 1995a; Levin et al., 1997). Many of the debates are centred around whether or not the double blind randomized controlled trial should be the golden standard for CAM as well. Numerous practitioners argue their approaches are too different from those of conventional practice, and entirely new methods of evaluation must be developed (Levin et al., 1997; Ranjan, 1998). Furthermore, extensive criticism exists arguing double-

blinded randomized controlled trials do not eliminate bias and produce an overwhelming number of false negatives (Dossey, 1995; Kiene, 1996a; Kiene, 1996b). Finck (1998) asserts the elimination of the subjective impacts on healing negates the purpose of the practitioner-patient interaction and the crucial role the patient plays in their own healing journey. Dossey (1995) relayed the characteristic argument that

alternative interventions are unlike drugs and surgical procedures. Their action is affected by factors that cannot be specified, quantified, and controlled in double-blind designs. Everything that counts cannot be counted. To subject alternative therapies to sterile, impersonal, double-blind conditions strips them of intrinsic qualities that are part of their power. New forms of evaluation will have to be developed if alternative therapies are to be fairly assessed.

The arguments amongst conventional practitioners against this notion are widespread (Hamilton and Bechtel, 1996; Kent, 1997; Levin et al., 1997). Furthermore, increasing numbers of CAM proponents are encouraging more science-based evaluations of their therapies; however assertions regarding the abandonment of the double blind clinical trial persist and the debate continues about exactly how scientific methods of assessment can be used (Dossey, 1995; Jobst, 1998).

2.3.4 Alternatives to conventional evidence based medicine

CAM proponents have suggested few concrete alternatives to the double blind randomized controlled trial (Dossey, 1995). One of the suggested designs is the single case study: "a prospective experimental trial with a sample size of 1 where a treatment is sequentially given or withheld, and the change in a pre-defined outcome variable is measured and recorded" (Ernst, 1998b). They are not descriptive 'case reports' but rather, are experimental in design. The advantages of this include suitability to individually designed treatments, ease and feasibility due to small sample sizes, and appropriateness for many CAM therapies which are not easily incorporated into large

scale trials (Ernst, 1998b). In addition to lacking generalizability, the single case study is subject to other criticisms such as lack of suitability for treating long-term chronic conditions, potential for carry over effects in cross over designs, and limitations in comparing single cases given the potential lack of reliability in base-line measures (Ernst, 1998b).

Additional alternative methodologies to single case-studies are believed to evolve as CAM retains a foothold within health care. Dossey (1995) said new approaches will come from an improved understanding of consciousness and a better concept of its influence on both CAM practitioners and patients in the healing process, and from improved realization of the effects of chaos and complexity in biological systems. Some editors of recently available CAM journals assert their openness and willingness to evaluate suggestions of alternatives to the randomized trial and other quantitative approaches to measurement (Achterberg, 1998; Dossey, 1995; Jobst, 1998). Many CAM proponents believe methods better suited to their paradigm will inevitably surface.

2.3.5 Summary: evidence based medicine in conventional and alternative medical practice

Evidence based medicine is being implemented in conventional medicine on a global scale, as a means of ensuring the effectiveness of patient care. There are strict rules governing the way treatments are evaluated and applied clinically, with the double-blind randomized controlled trial as the ideal or gold standard. Criticisms to this seemingly rigid system of evaluation exist among some conventional practitioners, due to the potential negation of clinical judgment in patient care as it is superseded by other more apparently credible types of evidence. Proponents of conventional medicine routinely argue against the use of CAM therapies due to the lack of proven benefit

because CAM treatments have not been sufficiently subjected to the rigors of EBM. However, objections to the inclusion of CAM therapies in conventional methods of EBM are widespread. The basis of this argument stems from the belief that the philosophies and approaches to health care within CAM are incompatible to current EBM rigors. Furthermore, CAM proponents believe the gold standard double-blind randomized control trial is inappropriate and therefore ineffective for CAM therapies and alternatives to this must be developed. This is a fundamental source of contention between practitioners of CAM and conventional health care.

2.4 THE PRACTICE OF CANCER RISK REDUCTION BY CONVENTIONAL AND ALTERNATIVE PRACTITIONERS

Approaches to cancer prevention may occur at any one of three levels: the goal of primary prevention is to evade the initial occurrence of disease through health education or immunization for example; secondary prevention approaches attempt to reduce complications and morbidity by detecting the disease at an early stage; finally, tertiary prevention is aimed at controlling the progress of the disease and ultimately avoiding death (McGinnis & Hamburg, 1988b). The importance of breast cancer 'prevention' (primary prevention) is commonly discussed today, and although there are no real current primary prevention interventions for breast cancer, there is increasing interest in helping women reduce the likelihood of developing the disease. Furthermore, if women do develop breast cancer, mounting attention is being paid to early detection and reducing the risk of recurrence or dying from it (secondary prevention). In this section, I will outline what is known about approaches to cancer prevention among both conventional and alternative health care practitioners.

2.4.1 Conventional approaches to cancer prevention

As a result of this growing awareness of 'cancer' and public desire to avoid its grasp, increasing attention has been directed towards the role of lifestyle factors in cancer etiology and how these factors influence and increase cancer risk. Studies examining conventional health professionals' approach to cancer prevention and risk reduction have been numerous (Bernstein and Shuval, 1997; Battista and Spitzer, 1983; Gemson and Elinson, 1986; Logsdon, Lazaro, & Meier, 1989; Monnin and Schiller, 1993a; Valente et al., 1982). Early detection strategies such as population screening mammography are often the subject in studies of physicians' preventive practice, probably because they are easily identified in clinical practice. However, the emphasis has been on secondary methods of prevention with little understanding of primary prevention in clinical practice or the use of nutritional and lifestyle counseling to prevent breast cancer recurrence. As well, most of the focus on physicians' preventive practice has been directed towards family physicians rather than specialists who treat cancer (De Grasse et al., 1996; Glanz, 1997; Lasswell, DeForge, and Sobal, 1993; Mant, 1997).

Interest in physicians' facilitation of patient self-care through health promotion strategies is increasing; however again, the previous focus of these assessments has been on primary care physicians and many of the investigations have come from Europe (Drenthen, 1997; Rosen, Logsdon & Demak, 1984; Lupo, 1997; Mant, 1997; Wiesemann, 1997). Health promotion counseling ranges from smoking cessation counseling to advice on weight loss and obesity. These studies consistently identify physicians to be the most significant and reliable source of health information, according to the patient (Hiddink, 1997; Weinberg & Andrus, 1982). Similarly, physicians often

assign themselves as primarily responsible for health education and perceive patient education about lifestyle as important in clinical practice to reduce cancer risk (Ford and Ford, 1983; Weschler et al., 1983; Valente et al., 1982; Weisemann, 1997). However, primary care physicians' actual practice of prevention and chronic disease risk reduction is often less than desirable, due to various barriers including lack of time, reimbursement, satisfaction or desire and the "prevention paradox" where benefits to the population are not necessarily visible at the individual level (Drenthen, 1997; Gemson and Elinson, 1986; Weschler et al., 1983).

Because oncologists deal primarily with secondary and tertiary prevention, these primary preventive approaches are not appropriate for them. However, little is known about how oncologists counsel their patients regarding reduction of breast cancer recurrence. Thus, there is a paucity of information to aid in describing factors which influence specialty physicians in their clinical practice of cancer risk reduction, especially as it pertains to the role of diet in cancer promotion and progression.

2.4.2 CAM practitioners' approach to cancer prevention

Prevention is one of the central tenets of naturopathy and nutrition intervention is a fundamental approach within prevention (Bastyr University, 1997). Reviews of the scientific literature regarding the relationship between diet and breast cancer and recommendations to treat and prevent breast cancer abound in the CAM literature (Austin, 1997; Austin and Hitchcock, 1994; Head, 1998b; Nicholson, 1996; Zimmerman, 1995). Prevention strategies do not clearly delineate between primary and secondary prevention because of the extensive overlap between the two approaches (Austin and Hitchcock, 1994). That is, guidelines for primary and secondary prevention are similar

and include vitamin and mineral supplements, exercise, avoidance of alcohol and caffeine to reduce symptoms of fibrocystic disease, increasing consumption of green tea, maintaining a healthy weight, obtaining adequate amounts of sunshine exposure to obtain sufficient levels of vitamin D, thought to reduce breast cancer risk, avoiding excessive exposure to electromagnetic radiation (e.g. electric blankets), and avoiding harmful environmental substances by eating organically and preparing and storing food in non-leachable containers like glass (Austin and Hitchcock, 1994, p.232-51). Although Austin and Hitchcock (1994) explain the evidence for some of their recommendations is only suggestive, they emphasize caution and awareness in regards to risk enhancing behaviors and advise adopting what is most appropriate for the individual. Other reviews have similar guidelines (Head, 1998b; Nicholson, 1996). Therefore, guidelines established by proponents of CAM for primary and secondary prevention are similar, and are a focus in practice. However, little is known about the actual prevalence of implementing these recommendations in practice by naturopathic or other CAM practitioners, nor are the attitudes, perceptions and beliefs about breast cancer prevention by CAM practitioners well known.

2.5 SUMMARY OF LITERATURE REVIEW

It is well established that diet influences breast cancer risk; whether or not diet is a significant determinant beyond the influence of nutrition on established risk factors such as growth rate, age at menarche, adult height and postmenopausal adiposity continues to be highly controversial. Other factors appear to be more soundly linked to decreased rates of breast cancer, such as compounds in fruits, vegetables and fibre sources and phytochemicals and soy foods appear promising in protecting against breast

cancer. Controversy persists around the significance of dietary fat in increasing breast cancer, or in the potentially harmful role food contaminants may play. Most of the extant scientific evidence is largely quasi-experimental in design (case-control, cohort studies), therefore, increased certainty regarding the role of dietary factors will come with the conclusion of a number of large scale, multi-centre RCT's currently in progress.

Recommendations by both CAM and conventional experts are similar with regard to guidelines to reduce total fats, animal fats and meats, and increase plant sources in the diet; however the underlying interpretation of scientific evidence supporting guidelines by complementary and alternative proponents varies.

Conventional medical practices are increasingly evidence based. Proponents assert the use of EBM responds to societal need and desire to ensure medical treatments and recommendations are efficacious. There is a strict criteria for applying evidence in practice, with the double-blind randomized control trial as the gold standard. Although criticisms about both the pervasive dominance of the randomized control trial and the reliance on strict criteria of quantitative evidence abound, it is generally accepted that this is the best way to ensure medical quality care for society. There are innumerable therapies used in health care which are not evidence based. These are generally referred to as complementary or alternative (CAM) therapies, which are under increasing pressure to be evaluated with EBM methods. Practitioners of CAM therapies assert the philosophical underpinnings of their health care practice are incompatible with conventional approaches to evaluation and call for new more appropriate methods to be developed. This continues to be a source of contention between conventional and CAM practitioners.

The emphasis on cancer prevention also differs among CAM and conventional practitioners. Barriers to conventional primary care physicians' clinical practice of prevention have been well documented and reasons for inadequate provision of cancer preventive services include lack of time, lack of financial reimbursement or intellectual satisfaction and difficulty in eliciting behavior change in patients through patient education (David, 1994). Although physicians believe lifestyle practices such as diet are important in cancer promotion and progression, there is some general reluctance to educating patients regarding the relationship between breast cancer and diet. Furthermore, research into the preventive practices of physicians are mostly descriptive, focus on their role in the provision of breast screening modalities, and are localized to the family physician. Conversely, prevention is central to the CAM practice of naturopathy. Furthermore, nutrition is a fundamental treatment modality. Although strategies of breast cancer prevention from an alternative perspective are well documented in the CAM literature, the actual implementation of these practices is not well understood. Thus there is a paucity of information about how specialty physicians and alternative practitioners practice preventive care for breast cancer patients.

CHAPTER 3

Design and Methodology

In addition to outlining the purpose and objectives of this research project, this chapter provides an explanation of the theoretical underpinnings, assumptions and rationale of qualitative research approaches, and outlines the specific strategies implemented in this study, including the recruitment and selection of the study participants, the collection and analysis of data, and the strategies utilized to enhance the quality and credibility of the findings.

3.1 RESEARCH OBJECTIVES

The purpose of this study was to explore how health professionals from disparate disciplines understand the complex relationship between diet and breast cancer, and how they counsel their patients about these links. The specific objectives of this study were to:

- describe oncologists' and naturopaths' beliefs regarding the role of diet in breast cancer prevention and treatment
- describe how different types of evidence are used by health professionals to construct their beliefs and recommendations regarding the role of diet in breast cancer prevention and treatment
- explore how health professionals from different disciplines perceive their role in counseling patients regarding links between diet and breast cancer risk reduction
- explore oncologists' and naturopaths' perceptions of each others' role and the role of dietitians' in counseling women about diet in the context of breast cancer risk reduction

3.2 THE CONSTRUCTIVIST PARADIGM AND QUALITATIVE METHODS

The purpose of this study was to explore and describe the beliefs, clinical practices and professional perspectives of practitioners from disparate disciplines and philosophical backgrounds. These conceptions are products of a complex integration of the individual's social environment, past experiences, world view and other factors unique to that person. Achieving these research outcomes necessitates the selection of the appropriate paradigm and corresponding methods to facilitate the most natural and real life elaboration of these complex cognitions. Therefore, qualitative methods based in constructivist ideology were chosen for this project.

Alternative philosophical approaches and more naturalistic approaches of collecting data are increasingly being presented to challenge previously hegemonic positivist methodologies (Lather, 1991). The basic beliefs underpinning positivism include the existence of an apprehensible reality or 'truth' which can be understood through methods which obviate subjective influence through control and experimental approaches, thus revealing the 'real' objective phenomena.

The constructivist paradigm is an attractive alternative. It is born out of the overarching philosophy of postmodernism, which attempts to respond to the vastness of human complexity and contrasts the monolithic ideologies of positivism. Alternatively, constructivism is predicated on understanding reality and truth in a relative context, as subject to multiple interpretations, readings and uses (Lather, 1991). Human knowledge is seen as 'constructed' through continued interaction with the external world: through experience, belief, and interpretation (Jonassen, 1991). Unlike positivist experimental approaches where subjective influences are transcended through control measures,

constructivist ideological approaches acknowledge the influences of the relationship between the researcher and those being investigated, because the process of inquiry is reciprocal in nature and the outcome is dependent on their interaction (Lincoln, 1995).

Constructivist belief systems stipulate that the investigative process the exploration and elaboration of findings occurs collaboratively by the inquirer and the inquiree in a more realistic setting. The intention here is to generate informants' stories reflective of their context. The results of this "responsive evaluation" as Guba and Lincoln (1989a) describe, are relevant and appropriate at a local level, rather than being generalizable or meaningful in an all encompassing theory. Furthermore, the "insights and interpretations gleaned from the inquiry should facilitate and stimulate action" through their accessibility to those who would most benefit from increased understanding (Manning, 1997). So, manifested understandings should contribute to human progress and development, through translation in accessible and appropriate ways.

The methodological bases of elaborating informants' constructions is reciprocal and iterative, where interpretation is enhanced through contrast with opposing views (Guba and Lincoln, 1989a). These interpretive or hermeneutical approaches are developed through constant comparison or dialectical techniques; therefore yielding informants' constructions which are increasingly informative as they are negotiated (Guba and Lincoln, 1994b). 'Truth' therefore, is "defined as that most informed and sophisticated construction on which there is consensus among individuals most competent to form such a construction" (Guba and Lincoln, 1989a).

To this end, methods of inquiry should adequately reflect the experiences and understandings of realities of those people of interest. Therefore, the most appropriate

means of exploring and describing social phenomena are methods which ascertain informants' accounts in a way that closely resembles their natural environment, or are 'context-bound'. Furthermore, constructivist belief based inquiry is exploratory, where the purpose is "not to confirm or disconfirm earlier findings but to contribute to a process of continuous revision and enrichment of understanding of the experience or form of action under study" (Lincoln, 1995). Thus, qualitative methods predicated on a constructivist system of beliefs were most appropriate to explore how health professionals make sense of the relationship between diet and breast cancer, and how this influences their clinical practices.

Because qualitative methodologies are exploratory and descriptive in nature a priori hypotheses are not appropriate. The process of discovering meaning is therefore inductive and holistic: phenomena are being evaluated as part of a complex system and are therefore not reduced to linear cause-effect relationships (Patton, p. 40, 1990).

In the following sections, I will outline how this qualitative research project was conducted. Firstly, I will explain the criteria for including informants into this study and how the informants were recruited. Furthermore, I will describe the methods of data collection and analysis which I implemented. Finally, I will discuss strategies I undertook to ensure the quality of the findings outlined in this thesis document.

3.3 RESEARCH APPROACH

Strategies for sample selection, informant recruitment, data collection and analysis are discussed here. Although these approaches are discussed independently they were carried out concomitantly, in accordance with the naturalistic methods of inquiry based in the constructivist paradigm.

3.3.1 Sample selection and size

To be included in this study, informants had to have completed formal, professional training in either naturopathic medicine or internal medicine with a specialty in oncology, with either medical or radiation oncology sub-specialties. Informants also had to speak fluent English and work in British Columbia. The naturopathic physicians included had to have attended one of the four recognized and accredited naturopathic colleges either in Canada or the United States. Conventional physicians and naturopaths had to be registered with the College of Physicians and Surgeons of British Columbia or the Naturopathic Association of British Columbia respectively.

The sample size was based on the depth and meaningfulness of the data collected, because there are no strict rules governing sample size in qualitative methodology, data collection and recruitment concluded when no new information was seen in data, and the analysis was 'saturated' (Patton, 1990; Morse, 1994). Therefore, after interviewing 10 oncologists and 11 naturopathic practitioners, there was nothing new emerging in the core categories and the sample was considered saturated.

3.3.2 Informant Recruitment

Informants were recruited through a combination of intensity sampling, which involves selecting participants with special experience and expertise, and snowball or chain sampling, where new informants are identified by previously interviewed participants (Morse, 1994). Initially, oncologists and naturopaths who had experience treating patients with breast cancer were identified using The British Columbia Cancer Agency's Breast Tumor Group registry and through consultation with Cheri Kutynec, the Clinical Coordinator of Nutrition Services at the Vancouver Cancer Center. These

practitioners received a letter of inquiry (see Appendix II), followed by telephone contact to schedule interviews with those interested in participating. Most of the oncologists were identified through this registry (n=7) while the other medical practitioners were recruited upon recommendation from previous informants who were asked to suggest the names of colleagues who were perceived as similar or different compared to themselves (n=3). Similarly approximately one half (n=6) of the naturopaths were recruited after being identified by Cheri Kutynec or through the Vancouver telephone directory. The remaining participants (n=5) were recruited through snowball sampling.

Subject recruitment occurred in three phases, the first of which included interviews with 3 oncologists and 4 naturopaths from November 1997 to March 1998. The second and third phases of recruitment occurred after initial analysis of prior interviews and subsequent revisions of the interview guide to elicit key emerging concepts. Informant recruitment was completed at the end of August, 1998. In total, 18 letters of inquiry were sent to oncologists, and 16 letters to naturopaths. Ten interviews with oncologists, and 11 interviews with naturopaths were completed. Reasons for non-participation by oncologists included changed address and returned letter of inquiry (n=1), lack of time (n=1), lack of focus on breast cancer patients (n= 2), injured (n=1) and disinterest with no response (n=3). Of the naturopaths who declined to participate, some were too busy (n=1), did not respond (n=2) or declined (n=2). Second letters were sent to practitioners when it was requested by the practitioner or his / her secretary. Of those naturopaths who received a second letter of inquiry (n=4), 2 were interviewed and 2 did not respond, while 1 oncologist was interviewed and the other declined among those who received a second letter (n=2).

Recruitment procedures were approved by UBC's Behavioral Sciences Screening Committee for Research and Other Studies Involving Human Subjects, and by the BC Cancer Agency Breast Tumor Group.

3.3.3 Data Collection

Data were collected through in-depth, semi-structured, open-ended interviews (Marshall and Rossman, 1989). I personally conducted all of the interviews. Preparation and training for data collection was facilitated by weekly tutorials where key concepts in qualitative methods were discussed, and interviewing skills were developed. Further preparation was obtained through specific courses in research methods.

At the commencement of each interview, each participant completed a consent form (Appendix III) to ensure that participation was informed and voluntary. The interview was then based on an interview guide that identified topics to be covered in the interview and possible follow-up probes. Because the interviews were semi-structured rather than structured, questions were not always asked in the same order or using the same wording. Instead, the interview proceeded as much as possible like an informal conversation, with the interview guide serving as a reference. In addition, the interview guides evolved as the study progressed, based on preliminary analysis of earlier interviews (Appendix IV). As increasingly sophisticated 'constructions' of informants' beliefs and clinical practices were developed, key concepts were presented to subsequent informants for verification and discussion, as a form of member checking. Examples of interview guides from the early and late phases of the study are found in Appendix IV.

The average interview with the oncologists lasted 30-40 minutes while naturopaths' interviews were commonly longer in duration, ranging from 45-80 minutes.

All of the interviews were tape recorded and transcribed verbatim. I also recorded my thoughts, biases or ideas following each interview, which were transcribed. These comments pertained both to my role in the interview process and to the information elaborated from it.

3.3.4 Data Analysis

Upon completing transcription of an interview, I carefully read the transcripts over in full. The interviews were then divided into broad sections, namely “dietary factors / etiology of breast cancer”, “use of science” and “practitioners’ counseling practices”. These very broad categories provided frameworks for dissecting the transcripts into even smaller, more manageable chunks or codes which reflected the previously described broader themes or key categories. For example, “dietary fat” was a universal code present in all the transcripts within the “dietary factors / etiology of disease” key concept, whereas “naturopathic philosophy” was particular to the naturopaths’ interviews within the category of “practitioners’ counseling practices”.

I then collected, organized and compared similarly coded transcript segments by hand from each informant and wrote progressive summaries to explain various issues within the key concepts, including pertinent quotes and informants’ comments to explain and substantiate the summaries. These summaries provided the basis for revising my interview guide, and focusing subsequent data gathering. Furthermore, they reflected the increasingly informative ‘constructions’ which grew out of each code-summary revision. Although the use of computer data-processing systems can be useful to analyze large data sets or when data is being analyzed by more than one person (Patton, 1990), the use of qualitative software programs is often a personal choice. This is due to the variability in

software programs and individual styles of organizing information. Upon my initial attempts at using the software, I found the software program created a barrier between me and the data, because I lost the context of the interview when I coded them in the computer program. Therefore, I did not use a computer program because found coding hard copies of transcripts less cumbersome and more consistent. I preferred to work with hard copies of the transcripts, so I could physically compare codes among different interviews simultaneously, and maintain my own familiarity with the context of each issue. However, I did use a word processing program to facilitate sorting and organizing the data.

This process necessitated the cycling back and forth between analyzing data in the informants' transcripts and collecting more interview data. The progressive process of writing summaries, methodological concerns and comments, and personal ideas linked these iterative strategies throughout the research process. When the collection of data was nearly complete, the final interviews were conducted primarily to confirm / refute the well developed key concepts. Final revision and consolidation of these themes occurred once all completed intact transcripts could be examined (Chapman and Maclean, 1993).

3.3.5 Strategies for maximizing research quality

The goal of qualitative research from a constructivist perspective is to produce quality, meaningful information, which is true to the people which it represents (Manning, 1997). As Manning describes (1997), there are two main criteria for rigor and quality in constructivist research: trustworthiness and authenticity. Trustworthiness can be dissected into concepts which are analogous to positivist approaches and include credibility (internal validity), transferability (external validity), dependability (reliability),

and confirmability (objectivity) (Lincoln, 1995). Authenticity however has no parallel in the positivist paradigm. It reflects the philosophical research ideals of shared meanings, subject-object interrelation and study framework evolution or progressive change as the work proceeds (Manning, 1997). These criteria will be discussed in the proceeding sections.

3.3.5.1 Trustworthiness

To enhance the credibility or trustworthiness of the study findings, it was important for me to be in contact with the participants for a sufficient duration of time with adequate intensity (Chapman and Maclean, 1993; Elder and Miller, 1995). Because I was solely responsible for conducting and transcribing the interviews, coding and writing during the analysis, there was continuity in the iterative process of analysis and data collection. Furthermore, I was in constant contact with the data so I was sympathetic to the context from which the data came (Chapman and Maclean, 1993). I used multiple information sources such as patient information pamphlets and other practice documentation (e.g. naturopaths' diet records), to bolster trust and ensure credibility in the study findings.

Another effective way of ensuring the emerging categories are grounded in the data is to discuss them with peers and others knowledgeable in qualitative research methods (Guba and Lincoln, 1989a). During biweekly tutorials, I was able to discuss my ideas with fellow graduate students, and other experts involved in related research projects. In addition to getting feedback on themes I had developed, this 'peer debriefing' allowed me to better synthesize and organize my ideas. Additional exploration of my findings came from monthly meetings regarding the larger research

project of which my study is a part. Here, we attempted to put my project in the broader context of women, social health and nutrition discourse, and health care systems. This contributed significantly to the integrity of my understanding of the data and the soundness of the findings.

The confirmability and dependability of the study findings were enhanced through member checking, a process whereby salient issues were presented for critique to new informants. Together, the informant and I would then negotiate a new, more informed concept (Guba and Lincoln, 1989a). Furthermore, the purposive sampling process ensured the inclusion of a wide range of opinions, beliefs and practices, which added to the breadth and depth of the emerging core concepts (Guba and Lincoln, 1989a).

Analogous to external validity, the transferability of qualitative research outcomes reflects the appropriateness of applying findings to other similar social environments. As Patton (1990) states: "extrapolations are modest speculations on the likely applicability of findings to other situations under similar, but not identical, conditions". This is based on the belief that the meanings reflected by naturalistic inquiries are a product of everyday social interaction and people in similar environments tend to develop shared meanings (Chapman and Maclean, 1993). Guba and Lincoln (1989a) assert transferability is facilitated by completing the data set to the best of one's ability, and being explicit regarding the context in which the findings were gleaned. Here, I have provided a detailed explanation of the strategies implemented in the generation of meaning from the study informants, and a description of their characteristics, background and demographics. Therefore, it is left up to other interested parties to determine the applicability of these findings to similar social environments.

3.3.5.2 Authenticity

The criteria of authenticity as reviewed by Manning (1997) does not have a parallel in positivist approaches to inquiry; instead, it is another way of evaluating the meaningfulness, usefulness and impact of a study on social interaction. The researcher-respondent interaction is central to measures of authenticity, and open discussions regarding this relationship abound in reference to quality of qualitative findings (Guba and Lincoln, 1989a; Marshall and Rossman, 1989). Furthermore, frankness of bias, judgment, and power are encouraged. The openness of researcher perspectives and world view however, do not obviate the existence of power relations in the investigative relationship (Manning, 1997).

My experience interviewing health professionals from very different perspectives illuminated two interesting challenges. Firstly, I needed to address the power disparities inherent in interviewing individuals in positions of power. This situation is opposite to more typical circumstances where the researcher is in a position of power when interviewing informants. Here, as a young graduate student interviewing physicians and naturopaths, the power relation was reversed. I addressed this dynamic with sufficient preparation before the interviews to facilitate my own confidence during the process. Furthermore, I was aware of a number of additional barriers such as informants' time constraints (Rubin and Rubin, 1995) and the potential cost of their time to themselves and their patients. I ensured that I was well rehearsed, and attempted to be as direct and succinct as possible; this way, I was able to make efficient use of their time and accomplish my research objectives.

Secondly, trust also presented a barrier to eliciting candid information from elites (Rubin and Rubin, 1995), as some health professionals believed they were being tested or evaluated. Again, I attempted to be absolutely explicit about my objectives and intentions, and provide any additional information or supporting information they desired to explain my project. I think the trust relationship was especially precarious with the naturopaths because I have been trained at a traditional, science-based university which is associated with a medical school. This affiliation made an indirect statement about my philosophical orientation, my education background, and my scientific leanings. Many of the naturopaths commented on and inquired about these affiliations, suggesting that they saw me as part of the conventional medical 'establishment'. In order to stay their concerns regarding my world view and associations it was very important for me again to be explicit about my intentions and the objectives of the research project. I firmly and clearly stated my objective was not to judge their knowledge or practice, but rather to explore these with as much fairness and neutrality as I possibly could.

To account for my own biases and preconceptions throughout the research process, I recorded thoughts after each interview which were transcribed and included in each data set. Furthermore, I maintained consistent entries in a journal where both theoretical ideas and opinions about the findings and the research process could be expressed. These reflections consistently illustrated my background training and education within a traditional scientific context; however my critical analysis of this belief system was developed throughout the study. Furthermore, I was raised in a home where both parents were involved in traditional medicine, and my own aspirations include the pursuit of medicine as a career. Therefore, I clearly had some fundamental

biases inherent in my life experiences and exposures, which are further evidenced in my life choices. I understand this likely influenced both the data collection and analysis process because that is the nature of the intimate relationship between the subjective influence of the researcher and respondent; however I have been explicit and forthright about these leanings. Furthermore, I have attempted to address these biases by acknowledging and exploring them throughout the investigative process, thus maintaining transparency in my perspectives. As my research project proceeded, the understanding of my own world and its influences grew, and I increasingly recognized it as one of many belief systems constructed by individuals within the context of their personal experience and environment. Other reading regarding the sociology of science and health care systems also facilitated my exploration of the medical establishment and the scientific paradigm in which I have been rooted. This also contributed to the awareness and understanding of my own world view which increased throughout this project. I made an earnest attempt to be explicit with informants about my background and intentions.

CHAPTER 4**Results**

This chapter presents an overview of participant demographics, followed by a discussion of their beliefs regarding the relationship between diet and breast cancer. Oncologists' and naturopaths' counseling practices are also described. Finally, I will outline their perceptions of professional roles and responsibilities and patients' expectations from them in regards to dietary counseling.

4.1 STUDY PARTICIPANTS

As shown in Table 1., a total of 21 informants participated in this study. Both medical (n=4) and radiation (n=6) oncologists were interviewed. All of the oncologists had special interests in breast tumors in addition to other sites. Some practitioners cited additional professional responsibilities, such as being on grant review committee and being UBC faculty members. Naturopaths were mostly generalists (n=9) and two practitioners had cancer specialties. A few (n=2) of the naturopaths had little to no exposure to breast cancer patients, while most of these practitioners saw between 2-5 breast cancer patients a month (n=7). Two practitioners had specialties in cancer and one of those practitioners saw cancer patients exclusively. One practitioner also had additional specialties in chiropractic and acupuncture; however most cited homeopathy, herbalism, physical manipulation and lifestyle counseling as common approaches within their practice. All of the naturopaths interviewed described clinical nutrition as an area of specialization. Other professional responsibilities described included administration and education.

Table 1. Informant Demographics

Demographics		Oncologists n=10		Naturopaths n=11			Total
Gender	Male	8		7			15
	Female	2		4			6
Ethnicity	Caucasian	8		8			16
	Asian	2		3			5
Specialty		6 Radiation Oncol	4 Medical Oncol	8 Gen- eral	2 Gen + Canc- er	1 Canc- er	—
Clinical experience in years (mean ± SD)		15.4 ± 6.1		8.7 ± 4.9			—

The conventional practitioners had practiced clinical oncology for a range of 6 to 24 years. The majority were educated and trained in Canada (n=6) while two of these practitioners did some of their training in the United States and 2 were educated and trained exclusively in England and then came to Canada, and 1 oncologist completed his medical degree in Hong Kong with residency training in Toronto. Training included the completion of a 4 year residency program in internal medicine with sub-specialty fellowship training in either medical or radiation oncology.

The naturopaths had practiced for a range of 1 to 15 years. Most of the naturopaths were educated at naturopathic colleges in the United States, including Bastyr University in Seattle, Washington (n=4) and The National College of Naturopathic Medicine in Portland Oregon (n=4), while the remaining naturopaths were trained at the Canadian College of Naturopathic Medicine in Toronto, Canada (n=3).

All of the medical practitioners worked in British Columbia, and practiced either with the British Columbia Cancer Agency (n=8), or independently (n=2). Those affiliated with the BCCA worked at different sites, including the Vancouver Cancer Centre (n=4), Fraser Valley Cancer Centre (Surrey, n=3), and the Cancer Centre of the

Southern Interior (Kelowna, n=1). All of the naturopaths interviewed practiced in Vancouver or in surrounding suburbs.

4.2 ONCOLOGISTS' AND NATUROPATHS' BELIEFS REGARDING RISK FACTORS AND CAUSES OF BREAST CANCER

This section presents oncologists' and naturopaths' descriptions of the influence of lifestyle, environmental and physical factors which modulate breast cancer risk. Here I will first describe practitioners' general theories about breast cancer etiology in relation to diet and other factors. Then, I will outline their beliefs regarding the role of diet in both primary and secondary prevention, followed by a detailed examination of beliefs of the role of specific dietary factors in breast cancer.

4.2.1 Oncologists' and naturopaths' beliefs regarding diet and lifestyle in relation to other factors implicated in breast cancer etiology

Oncologists consistently described the etiology of breast cancer as multifactorial; that is, caused by a number of risk factors. They viewed diet as a minor contributor in this process.

There's been a number of risk factors that have been documented; probably the most important or the strongest risk factors arise from people who have family histories of breast cancer. A minority of those people have specific genetic defects which predispose them to breast cancer. There's a number of other factors that play a role such as age of onset of menses, number of children, whether they are breast fed or not. Probably there's some data suggesting that diet plays a role (MD8^{1,2})

Genetic predisposition or family history of breast cancer was identified as the most important contributing factor. Other commonly named factors included age and reproductive history, such as age of menarche or menopause. Some oncologists did not

¹ MD (Medical Doctor) or ND (Naturopathic Doctor) replace actual names. MDs' and NDs' interviews are numbered chronologically, in the order in which they were interviewed.

² Quotes are edited from verbatim transcripts

attribute significant individual breast cancer risk from these factors. As MD3 said "these things are only epidemiologically interesting, they're not individually interesting". Oncologists also routinely implicated unknown environmental factors to explain the dramatic international differences in breast cancer incidence rates. Diet was commonly identified as a probable candidate.

Most of the oncologists said they did not believe exogenous hormones such as those use in Hormone Replacement Therapy (HRT) or oral contraceptives, play a significant role in increasing risk. However, two physicians believed an interplay between estrogen-like substances, either from environmental contamination of foodstuffs or medication and increased breast cancer risk was probable.

All of the physicians interviewed had very similar beliefs regarding the role of diet in breast cancer etiology. Although oncologists consistently identified diet as a plausible contributing factor to breast cancer, they asserted that the relationship between nutrition and breast cancer has not been well substantiated. Furthermore, many of these physicians believed the influence of diet on breast cancer is minor.

Naturopaths' beliefs were different from oncologists'; however, they consistently believed breast cancer etiology is multifactorial and that diet and lifestyle are key contributing factors.

Well I'm just such a believer that diet and stress have such an impact, as well as [the] medications you're on. Unless you have [a] lab report saying there is a genetic link here, or it's an estrogen positive cancer and they've been on HRT for 10 years, it's hard to be able to say, it's just one thing. (ND6)

Unlike the oncologists who as a group, had similar beliefs, different naturopaths often described different theories of breast cancer etiology. However, diet and lifestyle were part of all naturopathic theories and less emphasis was placed on family history and

reproductive factors. Instead, naturopaths believed breast cancer is related to a complex interaction between a woman's polluted environment and the effective function of various body organs and systems, such as the liver, thyroid, and kidneys, and the digestive, and immune systems among others. They consistently described how women are exposed to toxins from sources such as contaminated food, air or water, or through lifestyle practices such as smoking or poor food choices.

In naturopathic medicine, what I try to [do is] to educate our patients with this idea [that]...toxicity is something we're always exposed to, it's in the environment, it's in what we eat, it's in our diet, in what we breathe, you know, car fumes, gas, drugs, alcohol, pesticides, pollution, these are all things in our environment. (ND10)

Exogenous hormones were one of the most important environmental contaminants identified by naturopaths. Sources included hormone medication, exposure from environmental sources of estrogen in cleaning products, plastics, water supplies, or foods. Naturopaths consistently believed hormones increased the propensity of breast cell division and / or compromise the liver's capacity to handle steroidal compounds, which in turn increases a woman's risk of breast cancer.

It's the way they feed these animals, so over and above the fat intake there's also what happens to that fat that you eat from the animals. So what is in it now? If you don't know what the source of your animal protein is, usually it's been force fed, there's a lot of estrogens that have been [added], antibiotics, growth hormones, everything else, and then you ingest that, and of course it's a risk factor. (ND5)

Dietary fat, specifically saturated fats. I'd say dairy consumption, higher meat consumption, once again because of the link with the saturated fat compound in it and also because of the increase in exogenous estrogens, [and] pesticides that are in the food chain [I: How do those increase risk of breast cancer?] More or less because of hormones that they're using synthetically to stimulate growth, to increase milk production, or to increase the propensity of meat production, [which leads to] higher estradiol, which gets converted into the estrones, so those are all your synthetic hormones being used. Herbicides and pesticides have what are

called xenoestrogens. They have estrogen action, so those things definitely increase risk as well (ND6)

Exposure to toxins and unhealthy lifestyle practices were always described to increase free radical formation, which can negatively influence normal cell cycling through DNA damage. This was seen as a significant mechanism in the generation of cancer.

The exposure to toxins and [poor] lifestyles, these toxins get into the body. Now how does the body handle them? These can create free radicals and free radicals can cause damage to the tissues and cells and can cause the multiplication and abnormal growth of these tissues and cells and they can lead to cancers. (ND11)

Although the naturopaths identified genetic predisposition as important, they believed that a woman's susceptibility to breast cancer is influenced by factors in the environment and her lifestyle choices. That is, naturopaths believed genetics determined the basic ability to cope with challenge from toxins, but the degree of exposure ultimately determines risk. Therefore, women have different innate abilities to handle poisons some of which may be more or less efficient, but high rates of exposure can override this capacity and increase the risk breast cancer.

I think there's also the other level of what can be called the body terrain. You can have genetic susceptibility and you can have environmental toxins, and you can have [a] bad diet and everything else, but if the body's able to metabolize toxins and eliminate them, then you're much less likely to get sick. It's the body that can't do the detoxification that stores and build up toxins and the connective tissue is much more vulnerable to developing cancers. (ND7)

Genetics. There's always the hard core genetics that affects [risk], sure. But that always seems slightly changeable, not like your hair color or anything like that, but obviously you can change things. You can have a predisposition but if you don't turn those switches on, you probably won't get the result [of breast cancer] (ND9)

Some naturopaths believed women's parent's lifestyle habits could modulate their immune and detoxification capacity: increased toxin exposure from poor lifestyle habits

would weaken their ability to detoxify. Because the capacity to detoxify is inherited, some naturopaths believed women's parents' habits influenced their breast cancer risk.

Some of the other potential etiologic factors naturopaths described less frequently included breast feeding practices, heavy metal exposure, parasitic infection, weather, food allergies and exposure to emissions from transformers or power lines.

4.2.2 The role of dietary factors in secondary prevention versus primary prevention

Naturopaths and oncologists exhibited different beliefs regarding the role of diet in the primary prevention of breast cancer compared to the prevention of a recurrence, or in the ability of diet to influence the course of a woman's disease. Almost all of the oncologists believed diet plays a very minor role if any in the progress of a woman's current disease, or in her risk of recurrence. Most oncologists described a potential role of diet in influencing a woman's lifetime risk of breast cancer, through constant, long-term exposure to protective or harmful agents in her diet.

The one thing I tell them, especially when they want to make a major change, [is if] they've been eating a lot of red meat [or] a lot of fatty foods I tell them that it's probably a worth while change, although I'm not sure it's going to change our approach to treating their cancer, or whether it will prevent another cancer (MD4)

There's no data that changing her diet will affect the risk of her getting a recurrence at that time. I usually tell them that the risk of getting primary breast cancer seems to be related to diet, and it would be reasonable to try and reduce the consumption of animal fat and increase the consumption of fresh fruits and vegetable products, but that there's no evidence that it will be beneficial. There's no harm in doing it, essentially (MD8)

Most oncologists believed dietary changes would be most influential early in a woman's life, if at all. Furthermore, some oncologists said their support of a patient's dietary changes would likely be stronger for younger women compared to older woman, because of the increased likelihood of positive impact from a younger age. Overall, the

oncologists believed healthy dietary habits (low in fat, high in fruits and vegetables) could reduce the risk of chronic diseases in general, and therefore, they routinely thought healthy dietary habits should start as early as possible. They did not specifically advise breast cancer patients' young female relations to change their eating habits to prevent breast cancer. Any recommendations given to young women adhered to general healthy eating guidelines.

Conversely, all of the naturopaths strongly believed dietary and other lifestyle changes would positively influence the course of a woman's disease, and her risk of recurrence. Naturopaths asserted that the majority of their breast cancer patients want to prevent recurrence and control their current disease. Generally naturopaths believed very few patients come to see them because they want to prevent breast cancer from occurring. Instead, women usually come to them after a breast cancer diagnosis. However a few patients with a strong family history of disease request preventive dietary advice. Naturopaths consistently said the advice given for both primary and secondary prevention of breast cancer is the same, except for supplemental vitamin and mineral dosage. As ND4 said "Everybody gets the same diet from me. A good diet is a good diet". However, naturopaths did assert that it is more important for breast cancer patients to adhere to the recommended antioxidant and dietary regimes and doses were consistently described to be higher for these patients.

I think as a general rule, the people that don't have cancer don't have to go for as strict [a] regimen. But there's some basic health guidelines [for everyone], for instance, try stay away from things that are highly bleached and processed and refined and have no nutrients in it and have tons of chemicals and coloring. [These] things still apply but they may not need to do 20 ounces of extra Ginseng everyday which [is] something that I do recommend for certain individuals. If their body's really toxic, they're very low in nutrients [and] have difficulty absorbing, I would ask [breast cancer patients] to do vegetable juicing. (ND3)

Furthermore, all of the naturopaths felt healthy eating practices should begin as early as possible, even before birth, to prevent diseases generally, in addition to breast cancer.

[I: Is there a time in a woman's life where it's particularly consequential for her to have a healthy diet, let's say the ideal diet you would visualize, or is it as early as possible?] That would mean there would be a time to have a crappy diet. Whenever you take care of your body, your body will take care of you. You just want to get trained with prevention. (ND9)

4.2.3 Beliefs regarding specific dietary factors in the etiology of breast cancer

4.2.3.1 Oncologists' beliefs about factors that increase risk of breast cancer

Oncologists most commonly implicated dietary fat, particularly saturated fat or fat from animal sources as a dietary factor that may increase the risk of breast cancer. However, the data linking dietary fat and breast cancer was thought to be far from conclusive.

There's been any number of studies that seem to demonstrate populations with higher fat intake have a higher risk of breast cancer. There have been perhaps equally [as] many studies that would refute that, and it's a big leap in saying that this population that eats more fat has more breast cancer. It's a big leap to translate that into this particular woman, if she eats less fat [it] will lower her risk. There's lots of intermediate steps that are not proven (MD6).

Most of the oncologists did not identify a particular metabolic role for specific types of fat in increasing or decreasing breast cancer risk. One oncologist suggested total caloric intake likely has more influence on breast cancer risk than total fat intake, however did not specify why. Alcohol was another factor oncologists routinely implicated in increasing breast cancer risk. When asked about links between increased breast cancer risk and exposure to exogenous hormone-like substances or environmental estrogens, almost all oncologists did not believe these contributed to breast cancer causation, or they

lacked knowledge about such links. Two oncologists said these factors might influence risk.

There's the whole area of intake of vegetables or foodstuffs that have been contaminated by pesticides and dietary carcinogens, and the only evidence that I'm aware of that's been really firmly linked there is in lymphoma, where we know there's a higher incidence of lymphoma in farmers who work with pesticides. The one exception is around DDT and exposure to DDT in the population, [through] consumption of foodstuff which may contain insecticide residues. And I think DDT has been the one that has been linked the most. (MD9)

4.2.3.2 Naturopaths' beliefs about factors that increase the risk of breast cancer

Like the oncologists, naturopaths consistently implicated fat as a significant risk factor for breast cancer. They cited a number of reasons for this link and were convinced dietary fat was a significant contributing factor. Firstly, as described previously, they believed fat from animal products is a source of exogenous hormones.

If there's a correlation between dietary fat and breast cancer, I suspect that it may not be the calories necessarily, but what's in the fat. Because everything bad that you can possibly imagine is fat soluble, everything that wipes out our immune system and causes cancer is in fat... Most of the herbicides and pesticides that we use that are fat soluble have estrogen-like properties... it's not just the fact that a lot of these things have estrogenic-like activity, they also slow down your body's ability to deal with your own estrogen, so you have a prolonged estradiol effect in your body. We deliberately feed a lot of our animals estrogens. So chickens, cows. If you eat beef and commercial chicken, if you drink cows milk, of course estrogen's fat soluble it's in the fat part of the cow's milk, so if you drink whole milk or 2% or 1% milk, you're getting more exogenous sources of estrogen. (ND4)

Secondly, most of the naturopaths described the influence of certain types of fat on eicosanoid metabolism, which can modulate breast cancer risk. Theories regarding the role of fats varied among the practitioners; however, most encouraged the consumption of fats that would reduce the inflammatory series of eicosanoids. Some practitioners identified gamma-linolenic acid and omega-3 fatty acids as reducing

inflammatory eicosanoids, or as "healing fats". Saturated fats were believed to be metabolized into pro-inflammatory and pro-immunological prostaglandins and other eicosanoids by many naturopaths. Generally, most naturopaths believed patients should increase their consumption of essential fatty acids, namely n-3 and n-6 series, as well as polyunsaturated fatty acids in general.

Generally, you want to keep away from the saturated fats. There's two lines of metabolism of fats, there's the pro-inflammatory and the anti-inflammatory [lines]. You go through the omega 6 and 9s, and 3s, like olive oil and fish oils, flax oil, you end up with anti-inflammatory prostaglandins at the end, whereas if you go through the saturated fat, animal fats, dairy fats, beef fats, you get the pro-inflammatory prostaglandins, okay? [I: Do they increase risk of breast cancer?] Well, I just see it as just part of the stress on the system, like anything that requires the immune system to deal with anything in the body is going to take away it's ability to deal with cancer or promote earlier degeneration. Because one of the early states [of breast cancer] has to do with chronic inflammation and irritation (ND7)

With a lot of saturated fat we end up not allowing the prostaglandin pathway to go to the proper prostaglandins and having the arachidonic acid forming a lot of the leukotrienes and thromboxanes and that kind of exhausts our immune system a little bit. They are not exactly carcinogenic, but they do pose a threat. [They are] quite a load on our immune response capability. Then also when you have a very high saturated fat [intake], you tend to have very low levels of polyunsaturated fatty acids and these unsaturated fatty [acids], omega-3 omega-6 fatty acids have been shown to uh be somewhat protective from breast cancer. (ND2)

Monounsaturates were believed to have little negative impact on breast cancer by most but not all naturopaths. Saturated fatty-acids and trans-fatty acids were also thought by some practitioners to be more susceptible to oxidative damage, and were thus more likely to cause free-radical induced DNA damage.

We've always known that fat plays a very important role on several levels. One level is saturated fat [which] would go rancid very easily, rancid fat definitely gives us a lot of free radicals... Another problem with us is a lot of trans fatty acids out there, these hydrogenated oils really play havoc because of the free radical formation. When they are being incorporated into the cell membrane, or any of the structures that require lipid, then those enzyme systems won't function

properly, and they would indirectly lead to, eventually, a failure of the immune system or some sort of a mutation taking place. (ND2)

One practitioner believed saturated fat is converted to “bad cholesterol”. Saturated fats from fried foods, red meats and dairy products produce “bad cholesterol” which is a precursor for “poorer quality female sex hormones” and therefore increases breast cancer risk; whereas polyunsaturates yield “good cholesterol” which makes “good hormones” which are less dangerous (ND11).

A few naturopaths believed high fat intakes increase a woman’s propensity for gaining body fat. One believed this increases the primary source of estrogen in a woman’s body and her subsequent risk of breast cancer. Another practitioner believed increased body fat presents added storage sites for fat soluble toxins, thereby increasing the toxic load to the body and adding to breast cancer risk.

Fat tissue, there’s no mystery as to why those areas are more susceptible, it is because fat harbors toxins. If you have fatty glands, it just makes common sense, whether it’s proven or not, that that’s where toxins will be... [I encourage patients to] reduce saturated fats, reduce animal fats that may be high in toxic elements, [and] maintain proper levels of weight because excessive fat on the body once again, is just like an opportunity to deposit toxins. More toxins once again, the whole cycle is perpetuated. (ND10)

Some of the foods naturopaths commonly recommended avoiding include sugar, fried foods, processed foods, and artificially colored or preserved foods. Furthermore, alcohol was seen by some naturopaths as unhealthy, and best to be avoided, while others described it as a “poison”. Sugar or highly refined carbohydrates or simple sugars were commonly thought to decrease immuno-competence, which was in part dependent upon normal blood-glucose regulation. One naturopath said sugar could influence liver enzymes, which then influence eicosanoid metabolism, immune function and free radical production.

It's been found in a couple of research papers that sugar increases a metabolic byproduct that is used specifically for cancer growth, because they're so rapidly dividing. So actually it's a growth factor, it's the food for the cancer. So by decreasing sugar, you're basically starving the cells and also, sugar is an immunosuppressant. It decreases your macrophages, your natural killer cells, and there's many research papers written about that, so having a strong immune system is a big factor in breast cancer prevention. (ND6)

Processed, fried, colored or preserved foods were consistently identified negatively by naturopaths. Reasons cited for avoiding these foods ranged among practitioners; however most asserted anything synthetic or unnatural was unlikely to be good for one's health.

So I always go for some basic general guidelines in terms of avoiding things that are heavily [treated with] chemicals and additives and preservatives. That's one thing that [I] really emphasize is to have more raw and fresh food, instead of things are highly refined, like deep fried food... Basic health guidelines for instance, try stay away from things that are highly bleached and processed and refined and have no nutrients in it and have tons of chemicals and coloring. (ND3)

Genetically engineered foods were often cited as harmful, because they evoke an immune response, such as an allergic reaction or a general immunological sensitivity.

I emphasize more the ancient grains now because again with wheat you hybridize it so much it's changed a lot. So, a lot of people when they take in things that have changed, your body's set up to take food from this earth, if I give you a foreign protein, even though it's wheat, it's foreign. Your immune system might treat it as something foreign. In fact, a large amount of testing that I do, I measure antibodies, IgG [and] IgE antibodies against food in your blood, which is measured by ELISA, enzyme immuno-assay. So you have a 98% accuracy there. [I: You feel that could play a role in the etiology of breast cancer?] Yes because if your antibodies are too busy going after food how are they going to go after your breast cancer? (ND9)

4.2.3.3 Oncologists' and naturopaths' beliefs about factors that decrease breast cancer risk

Oncologists consistently believed diets high in fruits, vegetables and fibre are healthier than a typical North American diet high in fat and protein. The healthier diet

was commonly believed to be more likely to decrease breast cancer risk, although physicians said there was no definitive evidence to substantiate this.

We consider the typical North American diet probably not [being] the healthiest, and we should probably reduce the amount of red meat, lower fat, you know more carbohydrates, more protein and more variety, vegetables and grains (MD4)

Soy foods and products were also suggested by some oncologists as putatively protective of breast cancer, however again, they either had little knowledge of links between soy and breast cancer risk, or believed supportive data was lacking.

Soy products, well of course there's a big study going on right now with soy proteins as to whether or not they can reduce hot flushes. So soy products, as far I can see [are] some sort of replacement for hormones for women who have had breast cancer, so presumably it's protective. Maybe the soy products are supposed to be protective. I have very little knowledge about it, and soy milk protein, my guess is it's thought to be protective, I am not sure what the etiology or the mechanism is around this. (MD9)

The oncologists consistently did not believe supplemental vitamins or antioxidants were protective of breast cancer; however they did not object to patients consuming these substances, as long as they were not overly costly, or were not taken in excessive doses. Physicians believed many of their patients did take supplemental vitamins and minerals. Oncologists did not object to patients' supplement use, because they felt it was important to their patients. Therefore, they approved due to patients' potential psychological benefit from participating in their health, provided it was not causing their patients undue financial stress or physical harm.

In terms of taking vitamin supplements and nutritional supplements, again, there's no really useful data on that I don't believe. A lot of people do like to take these things, [and] I usually tell them there's no evidence that it makes a difference whether they do or they don't. As long as they don't take excess doses of the fat soluble vitamins then they're probably not hurting themselves but, there's no evidence that it's helping either (MD8)

The list of dietary factors identified by naturopaths to reduce breast cancer risk was more extensive. Like the oncologists, the naturopathic physicians believed increasing intakes of fruits, vegetables and fibre would be protective, however they emphasized the importance of consuming products which are as free from contaminants as possible. Therefore, organic produce was universally encouraged. Naturopaths also consistently identified specific fruits and vegetables as particularly advantageous, including those with antioxidant properties (e.g. carotenoid-containing fruits and vegetables), those with high concentrations of sulfur-containing compounds (e.g. cruciferous vegetables), and a plethora of those sources with other cancer-preventing or chemo-preventive agents, such as foods with isoflavonoids, polyphenols, phytoestrogens, terpenoids and lignans.

Things that are high in the carotenoids, so your leafy greens, your yellow, orange vegetables. Citrus has the bioflavonoids in the peel, as well as the vitamin C. Your cruciferous vegetables which are your broccoli's, cauliflower, Brussel sprouts, which have the sulfur content are anti-cancer. Garlic, incredibly useful because of the sulfur containing component, anti-tumor, it's immune enhancing. The flax, lignan, they have the same thing, the anti-estrogen activity, as I mentioned earlier with the soy products, and ...there's the fiber compounds in fruits and vegetables as well. (ND6)

Anything with any kind of antioxidant potential, like lycopenes. Any lutein containing compound, any phytoestrogens, soy, genestein, daidzein. So, of the 7 or 800 there are, any one of those combinations is going to low[er the] risk of getting oxidative damage, or pro-oxidase formation. So any kind of colorful fruit which is going to have mixed carotenoids. Broccoli, which has the one aspect for certain kinds of cancer, prostate cancer, can also be used for breast cancer, actually there's a component in the broccoli. Any sulfur containing food which is going to be in the cauliflower, the onions, is also going to be good for detoxification, and that kind of thing. So any pure foodstuff basically. (ND9)

Increased fibre consumption was routinely encouraged, because it was touted to remove excess estrogens, and clean out the colon.

Whole vegetables, whole fruit, whole grains and legumes are the source of all the hemi-celluloses and lignans and phytates and all those things that we know sweep out our colon and mind your poisons, and add bulk to our stool, increase the incidence of aerobic bacteria. Aerobic bacteria seem to support our immune system. The fibres sweep estrogen and things out of your diet [and] they decrease your post-prandial hyperglycemia. So if blood sugar rises more slowly, there's definitely a link between insulin-like-growth-factor and breast cancer. So the more things you do to reduce insulin-like effects in your body, the better off you are. (ND4)

Most of the naturopaths also believed soy products were protective of breast cancer, due to the presence of specific chemopreventive compounds like genestein. Other constituents of soy were mentioned as well. As ND4 said, soy products contain "things called phytates, that help to cling to your estrogen so that you can poop them out at a much higher rate". One practitioner was skeptical of the role of phytoestrogens, and stated the understanding of the role of phytoestrogens in breast cancer is not yet well understood. ND2 did, however, encourage the consumption of certain soy compounds including genestein.

All of the naturopaths asserted that additional antioxidant support for breast cancer patients is important. The poor state of women's bodies and health and their polluted environment were consistently cited as reasons for recommending supplements. Furthermore, the naturopaths believed supplements would speed up the healing process.

What we're finding, we've got a lot of things to correct in most people, [and] trying to do it with diet alone could take a year, two years. You don't have that much time with cancer anyway, but we can condense things down to about 2 months even with things like arthritis and things like that that would normally take a long time. (ND1)

Therefore, all of the naturopaths recommended supplementing their patients with vitamin C, E, beta-carotene, and selenium. Most practitioners advocated large doses of vitamin C, and many provided these substances to women intravenously.

Vitamin C to bowel tolerance, this is once again depending on the severity. If the person is doing preventative approaches I wouldn't go that high, [but] if someone has cancer I'd say you've got to really be loading up the system, at that point, depending if they're doing chemo, radiation. All of those factors play a part in terms of what you're want to be dosing, how you're going to be dosing. (ND6)

I do have a lot of intravenous treatment. I do two main groups, one is ozone therapy. The other type is intravenous infusion of different vitamins and minerals and homeopathics. [I: Mostly vitamin C or water soluble vitamins?] Usually it's like a cocktail, there's minerals, there's vitamins and also there's herbs, and also homeopathics in a big bag and then they're going to sit down and drip for one and a half hours. And people like that. (ND3)

4.2.4 Summary of oncologists' and naturopaths' beliefs regarding dietary factors linked to breast cancer

This section examined oncologists' and naturopaths' beliefs regarding both general etiologic factors and dietary factors implicated in breast cancer prevention and treatment. Oncologists and naturopaths exhibited different beliefs about the causative nature of this disease. Naturopaths emphasized diet, environmental and lifestyle factors whereas oncologists believed genetics, age and reproductive history were more salient contributing factors. All of the naturopaths also strongly believed dietary changes would influence the outcome of a woman's breast cancer and her risk of recurrence, whereas all but one oncologist did not believe this. All of the conventional physicians, however, agreed that if nutrition played a role in breast cancer etiology, dietary changes would be more effective earlier in a woman's life. Oncologists identified dietary fat as the most significant dietary factor that might increase breast cancer risk. Conventional physicians also suggested general dietary habits including consumption of fruits, vegetables and low fat food choices would be more likely to decrease the risk of chronic diseases in general; however this was not definitively proven yet. Naturopaths on the other hand, identified a number of high risk food items, such as saturated fat, sugar, alcohol, processed, colored,

bleached or refined food products. Furthermore, the naturopaths described a number of preventive and disease risk reducing diets, as well as a myriad of compounds in foods they believed would lower breast cancer risk which were sometimes recommended. Many of these compounds were believed to be found in fruits, vegetables and food sources high in fibre. Naturopaths also strongly support the use of supplements of various vitamins, minerals and phytochemicals (including mega doses) for the prevention and treatment of breast cancer.

In the following section, I will outline how scientific evidence is applied in both conventional and alternative medical practices. Furthermore, I will describe how different types of evidence, including scientific findings, contribute to the beliefs and practices exhibited by the practitioners interviewed in this study.

4.3 HOW THE UNDERSTANDING OF DIET AND ITS ROLE IN BREAST CANCER IS SHAPED BY THE EVIDENCE

4.3.1 Oncologists' understanding and application of scientific evidence

The medical doctors described clear criteria for applying scientific evidence to their counseling practices. They consistently believed the role of nutrition in breast cancer has not been clearly and consistently elucidated by scientific evidence. Therefore, none of the physicians made any specific preventive dietary recommendations to their breast cancer patients. Because the oncologists believed their clinical recommendations should be supported by evidence dietary advice was limited to conditions like cardiovascular disease where its links to diet were believed to be well proven.

We haven't got such solid evidence. If [dietary change is] going to make [patients] miserable, I don't know that we have enough evidence to say that. If they really want to do something, then it's probably good for their heart, it's probably good for their colon, get some more exercise. And, focus on your

daughters, and they're 15, 16, 18 age, on thinking about setting up nutritional patterns that are going to be healthier. (MD2).

When physicians were asked what would be appropriate evidence to justify making a specific dietary recommendation, they routinely said data from randomized controlled, double-blind trials. This was consistently identified as 'hard data' or the most reliable and credible type of evidence to support links between diet and breast cancer.

I don't recommend anything for which I don't think there's any evidence. [What I try to [do is], to make up my own mind, and what I tell patients, based to the best of my ability on [what] I'm trained to [do]: to disregard soft data except as hypothesis generating [I: So what would constitute hard data?] Well, randomized trial or if it's not possible to get controlled data, the nearest that one can get to that. (MD5)

Abundant epidemiological data which exists linking diet to breast cancer was universally perceived as inconsistent and conflicting. Furthermore, this kind of research was not considered appropriate for making inferences about cause-effect links between diet and breast cancer; rather it was useful to generate hypotheses which could then be tested through more rigorous research methods described previously.

I think the thing that's hard is first of all when you gather data about diet, it's not completely reliable. [I: Why do you think that is? The methods of the studies are questionable?] That's right, because there's so many confounding factors...I think the problem is the data. Obviously you can only do population studies, because you're making observations and whether you do screening mammography or diet or whatever, you have to have a whole bunch of people, and only a small proportion of those will get cancer. Then you can compare the rates of cancer in one versus the other. But unlike something like an x-ray, diet is so variable it's so continuous, it's changing and even if you notice differences in diet between the one group versus the other say, one group has a higher incidence of breast cancer, it's hard to determine what part or what aspect of the diet was responsible. (MD4)

However, as MD6 said "it would be nice, it won't ever happen, [if] some case control studies or epidemiological studies that actually agreed with each other would probably be sufficient". Similarly, many of the oncologists voiced their pessimism regarding the

feasibility of delineating links between diet and breast cancer, due to the large size of the population necessary to establish links, the prohibitive cost of such an investigation, and the challenges inherent in confirming individual nutrients within a complex diet. Some oncologists questioned the utility of conducting large scale clinical trials to determine the influence of diet on breast cancer incidence, due to their belief diet plays little if any role in the etiology of the disease. One oncologist suggested the North American diet is too difficult to alter on a large enough scale to induce a significant reduction in disease rates, therefore confirmation of putative links between diet and breast cancer would be unlikely.

My very strong feeling is that if there's any influence on the chance of developing breast cancer, or the chance of being cured from breast cancer, the influence is small, and that way you'd need a huge study to show the difference, and therefore, it's just impossible to do... I think if it was substantial enough to warrant a large clinical trial, I think with enough resolution it can be done. But, I do not believe that it's that substantial. I think there maybe a small influence, but it must be small... if it is not minimal, then it would be extremely difficult to modify that risk. If you live in a social environment, you have to modify your life significantly. If you live in North America, you [would have to] just change your life completely, to follow say the Asian way. (MD10)

Thus, oncologists were consistent in their descriptions of the standards of scientific research upon which clinical recommendations are based. They agreed that they are professionally and ethically obligated to explain the lack of definitive proof for links between diet and breast cancer to their patients. Furthermore, the lack of supportive data routinely inhibited physicians from extensive dietary counseling of patients aimed at breast cancer prevention or risk reduction. Although the belief that diet influences the etiology of breast cancer was described by physicians as logical or reasonable, all of the doctors interviewed believed that methods of understanding the relationship between diet

and breast cancer like logic or common sense should have no bearing on how they counsel their patients.

Are we talking about my beliefs? [I: Yes] I don't believe that is relevant. I don't recommend anything for which I don't think there's any evidence. Personally, I think it's completely inappropriate to be advising people on lifestyle, based on one's personal hunches, particular biases, even though patients want your view and they hardly mind what the basis is. I feel very strongly that it's wrong for me to change somebody's lifestyle, which may mean less enjoyment of their food, maybe even could even be wrong. I mean, it could just be downright harmful. (MD5)

4.3.2 How naturopaths construct their understanding of the relationship between diet and breast cancer

Similar to the oncologists, the naturopaths said scientific evidence contributed both to their beliefs about links between diet and breast cancer and to the development of dietary recommendations in practice. However, the naturopaths used scientific evidence differently. Furthermore, common sense, intuition, logic and their clinical experiences were also believed to be important in naturopaths' practice.

4.3.2.1 Use of scientific evidence

Compared to oncologists, naturopaths exhibited different understandings of what constitutes useful evidence, and how scientific evidence is applied in practice. Naturopaths' approach to using scientific evidence was much broader and more inclusive. Broad references to evidence and research were common, however little discussion regarding varying reliability or validity of different research protocols was discussed. For example, references to double-blind, placebo-controlled studies as the conventional medical gold standard were common; however unlike the oncologists, all of the naturopaths did not give the randomized controlled trial more weight than other types of studies. Instead, all of the naturopaths criticized the value and importance given to the

randomized control trial in conventional medicine, in light of its limits in elucidating the role of a complex phenomena such as dietary influences on cancer.

Well, when I see people get better- you know, I don't care what the paper says if the person gets better. I'm not looking for something that's a double-blind study proving that something worked 100% of the time, because if we looked for that, first of all we can't even find one that proves that the sun comes up and it still does. Even smoking and cancer. I don't need something to tell me something that's so common, that if you treat your body well, it will treat you well. You don't need anything to prove that to me... You can't get a double blind study to study something that's multifactorial, it's impossible. (ND9)

And, [conventional physicians] think that their ideology is science, and that's the only way of looking at things, whereas really there are lots of ways of using medical science, other than using their particular model (ND4)

A few naturopaths said the source of the scientific research article was important and they made reference to a number of mainstream conventional scientific journals they referred to. Most others said the source was less important and any substantiation of links contributed to their clinical recommendations.

What I'm looking for, whether it's in the New England Journal of Medicine or, the South African Journal of Breast Feeding, if there's some stories or epidemiology studies or population studies, then I'll utilize that information, it probably can't hurt... In epidemiology, any kind, any hint that gives you trends. (ND4)

Because naturopaths did not exhibit the same criteria for assessing the scientific evidence, their nutrition counseling was not limited by what the conventional doctors described as a lack of scientific evidence. Naturopaths believed there was an abundance of scientific evidence to support links between diet and breast cancer. They commonly asserted much of the extant research was not available to oncologists, and remained largely unknown. Consequently, they were much more convinced diet plays a crucial role in breast cancer, and practitioners made specific, direct dietary recommendations to patients to prevent or reduce the risk of breast cancer. Furthermore, naturopaths

commonly justified their specific clinical recommendations by the lack of harm or “down side” to this advice.

What’s the down side of telling someone to eat more fruits and vegetables and whole grains? I mean you’re not risking any toxicity, you’re not risking any[thing]. I mean the risk is that you might feel better. Maybe it won’t cure their breast cancer but they’re going to feel a lot better and maybe their family starts eating like that and then someone else doesn’t get heart disease. There’s just no down side to it and there’s no risk. If it was something that had a risk then I would be more conservative. (ND8)

Although some practitioners described inconsistencies in the available evidence, they either identified flaws in the studies that failed to support a relationship between dietary factors and cancer or they simply dismissed negative findings as lacking credibility.

There’s so many stupid studies out there. We’ll take a group of Scandinavian heavy smokers and feed them synthetic beta-carotene and see if [it is protective] in one group, and [give] nothing [or a placebo] in another group. Synthetic beta-carotene not only didn’t prevent it, [it] seemed to increase it. Whereas all the other studies on natural source beta-carotene seemed to prevent [cancer]. (ND4)

Most naturopaths believed it is a matter of time for diet and breast cancer relationships to be clearly substantiated scientifically. A lack of perceived consistency did not limit practitioners’ clinical recommendations.

Naturopaths believed conventional physicians do not have the same access to a lot of the scientific literature linking diet to breast cancer due both to logistical reasons (much of the evidence comes from Europe) and to personal disinterest. They believed physicians tend to negate or ignore research pertaining to diet and lifestyle. Most practitioners cited underlying political reasons for the lack of access to information. Furthermore, some suggested that collusion between pharmaceutical companies and physicians prevents the inclusion of dietary alternatives aimed at prevention within the

treatment centred hegemony of conventional health care. For example, many naturopaths believed there is little financial incentive for pharmaceutical companies to fund nutrition research, due to the limited prospects of return on their investment because food can not be patented. Many naturopaths believed the pharmaceutical companies have great influence over the clinical practices of conventional physicians.

The allopathic community, I don't want to generalize but by and large they're not interested in reading the literature that's there. You can go to the library and read it any time you want, but if you're not interested in reading it, as far as you're concerned it's not there... Is it ignorance or is it just denial? Is it beyond that, is it big business, is it politics, is it pharmaceutical companies? I mean when you talk about the politics of cancer in itself, it's just phenomenal, the implications are crazy and you get to the point where it is dollars and cents. (ND10)

Furthermore, there was a general consensus among naturopaths that current proponents of conventional health care invest less in preventive compared to treatment-based approaches to disease.

4.3.2.2 Use of intuition, belief, common sense and logic

The naturopaths described their approach to health and wellness as distinct from that of conventional physicians, being more holistic, emphasizing the entire organism within the context of the environment. This was consistently described in contrast to the reductionistic and mechanistic approach characteristic of conventional medicine. As ND4 described, "in North American, or [in] Western science, we like to pull things apart and blame it on a gene or a particular molecule". The evidence valued by naturopaths was often described as making sense at the level of the organism, rather than at the level of biochemical pathways.

This is the thing, medical science is a reductionistic approach, they want to find out one factor that affects this, and the body doesn't work like that. This is why clinically significant changes are more valuable than say looking at double-blind study. As to giving just vitamin C, how that affects [the body].. (ND11)

The oncologist is looking for this established piece of research which says that this little piece is valid, right? And he's looking for the validity in every little piece. Whereas I'm looking at the validity of the totality. (ND7)

It is interesting to note, however, that despite their professed holistic approach, many of the naturopaths' explanations of breast cancer etiology and the role of particular dietary factors in the disease process were molecular in nature.

And there's pretty good evidence in the research that your neutrophils under the influence of epoxides will shoot the daylight out of your DNA. Research shows that the average cell replaces about a thousand damaged bases a day...but the interesting thing the research is showing, [is] that p53 is distorted out of shape by excess peroxides, free radicals and low zinc levels (ND1)

The frameworks of understanding that contribute to the way naturopaths make sense of the relationship between diet and breast cancer were not limited to science-based evidence. In addition to clinical findings, naturopaths also implemented other ways of understanding including intuition and common sense.

Appalling studies keep coming out suggesting that the birth control pill does not increase the risk of breast cancer, and yet intuitively, and depending on how you read the statistics, that just doesn't seem to be true. Statistics are a funny thing. You can of course utilize them to justify almost any perspective, and the incidence of premenopausal breast cancer is increasing like the plague. You can not help but think that estrogen has something to do with it and so the more estrogen you give someone, the greater the likelihood of finally irritating breast tissue enough that it gets out of control. (ND4)

The naturopaths often described the relationship between a poor diet, lifestyle and polluted environments and breast cancer and other diseases as logical, obvious or 'common sense' and therefore legitimate. Their reasoning was based in the naturopaths' fundamental belief that the relationship between human body systems and the environment is complex, difficult to measure scientifically, but observable in clinical practice. This kind of knowledge was valued and credible. Furthermore, the naturopaths

often encouraged their patients to use common sense to make more healthful decisions and believed conventional physicians actively negated their common sense due to the predominance of scientific rationale in medicine.

Of course we all as human beings have a certain understanding about diet, that's why you like your bad foods so much. Just that, it's a matter of whether we want to answer to our conscience or not. Okay, whether you really want to sacrifice your common human desire in lieu of something that might not be that tangible at that moment for better health. I believe that almost all human beings would have a common sense. And then there are some who have a better understanding of it, and dependent on how that person wants to conduct their professional behavior in terms of allowing that to flow through... You just have to go with common sense. You're not going to stick your finger in fire if it burns you. (ND2)

All of the naturopathic practitioners further justified their clinical practices by asserting their recommended dietary changes were not harmful. As ND8 said, "What's the downside?"

Scientific evidence was perceived as another source of affirmation for these links, something which was useful if it existed, but its absence did not take away from the credibility of the relationship between diet and breast cancer.

I like it when I can find something that proves to me what I'm doing. I like it when I can read something that says, activated vitamin D has a lower risk for breast cancer, and that's why people in sunnier areas seem to have a lower breast cancer risk than other areas. I like it when I can see something like that. [I: But it isn't a necessity?] No, it isn't necessary, because I still go with the same basis that if you give the body everything that is healthy, it already knows what to do. If you just take away the [harmful] things, you don't heal anybody you just take away the obstructions that are keeping [you] from being healthy. Just take away the obstructions. The body already knows what to do, the body already has its immune system, it just doesn't know what to do. (ND9)

Overall, their clinical recommendations often resulted from a composite of common sense reasoning, and scientific rationale.

What are the goals that you are trying to achieve? So we have four goals here, then you can fudge it from there, with common sense. And the reason why you want to avoid this list of foods, there has to be more or less scientific rationale.

Say for instance cows milk. It's not that we don't like cows, it's because of a high level of insulin-like-growth-factor number one, that's all. For instance, with alcohol, it's so simple. It's a bloody poison, all right? (ND2)

4.3.2.3 Clinical findings or single case study evidence

Naturopaths routinely described clinical findings as informative and meaningful. Patients' accounts and progress were equally or more useful than 'harder' empirical data to rationalize further clinical approaches. Therefore single case study evidence or clinical findings provided an important way for naturopaths to determine the efficacy of their recommendations.

So if I can put a patient on a program, they get better, and let's say they go through chemotherapy and they go through chemotherapy with a big smile on their face and no nausea and come out the other end with all this energy and vitality, then everybody at the hospital says, boy, you really came through that well. So tell me, is that scientific? I don't know. (ND7)

A lot of naturopathic practice, which is great, is the whole anecdotal type of evidence that's out there. When you see something work for people, how can you not say that it doesn't work. And of course there may be a placebo component to it, and I know [in] some patients it's very strong, but who cares? I don't care, if it works for you, what's the big deal? And trust, we've gotten so into the scientific model of medicine, [and] we've gotten away from the whole interaction and relationship between patient and doctor, and having respect and trust. (ND6)

Well, it's called anecdotal, but it's clinical, it's empirical, if you have patients getting better, and you see their blood tests, and their antibodies are improved, their white blood cell count's improved, they feel energetic, I mean does it matter that you [don't] know [of any] double blind studies? (ND11)

Most naturopaths strongly endorsed the use of clinical evidence in the formulation of patient care decisions. A few practitioners however, asserted they believed naturopathic physicians did not use anecdotal evidence, rather relied on scientific data.

[I: What kind of criteria do you use to determine whether something will be useful for your practice?] Well I guess one of the things is the source, where's it [is] coming from. And also whether it's validated by experiments and scientific research, it's not just someone say[ing] that I tried it on myself and it works, so how valid [is] research and whether it is documented. No, I don't pay too much

about anecdotal, because it's not scientific. I mean sample size n is equal to one doesn't really say too much (ND3)

In summary, both the naturopaths and oncologists use scientific evidence to formulate both their own beliefs and their patient recommendations. However, the physicians implement strict rules to govern how scientific evidence is used in practice, whereas naturopaths do not. Alternatively, naturopaths use scientific evidence, but it does not restrict their counseling practices. Furthermore, these practitioners utilize additional sources of evidence, such as common sense, logic, intuition and single case study findings whereas the oncologists explicitly said that these are not appropriate kinds of evidence to formulate clinical recommendations.

4.3.3 Health professionals' approaches to continuing education

Physicians and naturopaths exhibited similar ways of maintaining and improving their understanding of the relationship between diet and breast cancer. Both described the primary importance of reading journal articles, followed by their attendance at conferences and symposiums. Both groups of professionals also described their tendency to concentrate energies as one would expect, in sources within their field, for example some naturopaths focused their attention towards prevention and nutrition. Consultation with colleagues was also cited as an important resource for naturopaths.

I read a lot. This is a favorite source for me, called Clinical Pearls, and it's a computer print out of everything written in every English speaking medical journal on well, most things, in medicine. So I can look under breast cancer as an example, now Clinical Pearls is specifically biased towards pulling out research in nutrition and preventive medicine, because of course that's my bias (ND4)

Most oncologists said they would probably not be exposed to studies related to nutrition and cancer if they were not present in commonly perused oncology journals. Furthermore, one oncologist said he would find it much easier to learn about new

relationships between diet and breast cancer through easily accessible information exchanges like the Tumor Group organizations.

It's unlikely that I would go out of my way, on some arbitrary time scale like every six months or a year, to look up the literature on what they are saying this week about the relationship between fat and breast cancer. It would have to be brought to my attention, it would have to get to me, in the forum that I do cruise around in, like the oncology literature and oncology meetings and that sort of thing. (MD6)

Few oncologists did regular surveys of the conventional literature through the BCCA libraries to stay on top of their understanding of the relationship between diet and cancer. Some conventional practitioners said they would not read reviews on links between diet and breast cancer; rather they would select issues they believed were salient or papers describing large prospective study populations.

Although some oncologists cited general textbooks as sources of information, this resource was much less common than journal reading. Furthermore, oncologists never cited general books on breast cancer and diet as good sources to maintain their understanding, whereas this was a more commonly referenced resource for naturopaths. One particular book by Dr. Steven Austin N.D. (1994), What You Should Know (But May Not Be Told) About Prevention, Diagnosis and Treatment of Breast Cancer was cited by many of the naturopaths interviewed, as a good summary of the current scientific literature for themselves and their patients. Some naturopaths believed oncologists did not have access to the same sources of nutrition information, as some of it was international, and was not in mainstream publications oncologists were likely to access.

There's tons of information about their linking diet to breast cancer, once again, as I mentioned, what we study in our journals, you could be reading for the rest of your life, 24 hours a day. A lot of the information comes from Europe that doesn't have necessarily access here. Why would they [oncologists] be reading our

articles, [or] our journal articles, unless it's published in New England Journal of Medicine and even there, there's plenty of research in there, (ND6)

4.3.4 Summary of how the understanding of diet and its role in breast cancer is shaped by the evidence

Naturopaths and oncologists interviewed in this study used scientific evidence differently to substantiate their clinical dietary recommendations to patients. Oncologists described clear criteria for evidence to justify clinical recommendations. Evidence from randomized controlled trials was the most reliable and credible, and the lack of this type of data precluded specific dietary recommendations in oncologists' clinical practice. Alternatively, naturopaths did not differentiate between types of scientific evidence. Although naturopaths identified contesting studies, these discrepancies were believed to reflect flaws in the study design, rather than a lack of credibility in the component's efficacy to reduce or prevent cancer. The limitations of various types of research and their applicability were however, not discussed by any of the naturopaths. In addition to the use of various conventional scientific sources of evidence, naturopaths implemented other ways of substantiating these relationships. These methods included logic, common sense and intuition, and single case study or clinical evidence. Both oncologists and naturopaths exhibited similar approaches to continuing medical education. Journals and conferences were important resources for both professional groups. All of the oncologists said they would be more apt to learn about links between diet and breast cancer if they came across supportive information within resources common to them. Naturopaths said they utilized information gleaned from textbooks and popular literature more often than oncologists did.

In the following section, I will describe how naturopaths' and oncologists' beliefs about the role of diet in breast cancer, and their use of scientific and other types of evidence influence their preventive counseling practices with breast cancer patients.

4.4 ONCOLOGISTS' AND NATUROPATHS' DIETARY COUNSELING PRACTICES, PROFESSIONAL ROLES AND RESPONSIBILITIES

4.4.1 Oncologists' role in nutrition counseling, in relation to dietitians and naturopaths

In the following section, I will describe the oncologists' counseling practices and their perceptions about how nutrition education fits into their professional responsibilities. Then, I will outline oncologists' perceptions of both naturopaths and dietitians in the context of nutrition counseling for breast cancer.

4.4.1.1 Oncologists' dietary counseling practices

Oncologists did not give their breast cancer patients specific dietary recommendations. Their dietary advice was given within the context of general healthy eating, congruent with recommendations found in the Canada's Guidelines to Healthy Eating (Health Canada, 1992). Oncologists justified these general recommendations by saying healthy eating would help protect patients from diseases such as cardiovascular disease and colon disease. Reducing dietary fat intake was the most common focus of the general recommendations.

There's plenty of data to suggest that dietary modifications, particularly again of animal fats will reduce the risk of cardiovascular disease so you can justify doing to yourself right there (MD5).

Oncologists' dietary recommendations for younger women without breast cancer, or for daughters of women with breast cancer would agree with general healthy eating

guidelines. Furthermore, all of the physicians stated their dietary advice was aimed at general health and not for breast cancer prevention.

However, oncologists generally believed their primary responsibility to patients was in the treatment of breast cancer, rather than improving the quality of their patients' lifestyle practices. However, physicians consistently identified the importance of the doctor-patient experience being "psychotherapeutically useful" as MD1 described, or personally satisfying for patients, and therefore, routinely counseled patients about diet when they requested it. The physicians always believed diet was a side issue, because of the lack of scientific substantiation connecting it to breast cancer and their lack of belief in its efficacy in altering women's disease outcome. Furthermore, many physicians did not believe counseling patients about diet and lifestyle was part of their mandate as oncologists; rather they were professionally obligated to ensure patients were adequately treated. Most physicians believed however, that information in addition to treatment and prognosis was very important to patients, and they all believed patients would probably be more satisfied with their clinical experience if doctors spent more time with them.

I think simply by spending more time, there would a positive effect, now are we going to cure more people, well we're not. And again, in this day and age of cost effectiveness you only have so much money, we can't do that, we don't have that privilege, and that's why we're joking that we could open that clinic, patients could spend as much time as they wanted, in fact, even if they had to pay for it, they wouldn't mind. But here we're constrained by what our role is, like for me, my main role is to be involved with radiation therapy. I don't think the powers that be would appreciate, whether the patients did or not, if I spent an hour chatting with them about lifestyle changes and diet etc. (MD4)

Almost all oncologists said they lacked knowledge about nutrition and they all believed nutrition issues were outside their professional domains. Some referred patients

to dietitians or further counseling when patients requested it, while others said patients never asked to see a dietitian and they did not suggest it.

As an oncologist, I'm not really the person to be doing that. Unless you tell me as the history of the understanding of diet in breast cancer, [and how it] develops, and we understand it really does matter, and people should all be on soy products, then I'll say "medically this is indicated". Then I'll say, "I don't know anything about soy products, go and speak to the nutritionist about where in your diet you should put them in". It's still going to be in that domain. Because we're not going to end up doing that. I'll say the pharmacists are going to be important and here's the drugs. You're having trouble taking them and you want to know about side effects, pharmacy can start to become involved in this. Nursing can help with some of this. You have all these support services you have to use them. We can't as physicians be doing all of this. (MD1)

Furthermore, a few said they were not interested in counseling patients about their diet and questioned whether resources should be invested in this kind of counseling, given the lack of scientific substantiation.

4.4.1.2 Oncologists' perceptions of naturopaths' dietary counseling approaches with breast cancer patients

Oncologists' perception of naturopaths was limited by lack of knowledge regarding naturopaths' training, education and philosophy. Furthermore doctors were generally uncertain about their licensing or accreditation. Physicians believed naturopaths emphasized nutrition and lifestyle aspects of health, and they consistently described pervasive dietary changes and supplements recommended to their patients. The way in which naturopaths apply scientific evidence to substantiate clinical recommendations was the most consistently identified difference between the conventional and naturopathic approach described by all of the oncologists. Naturopathic advice was thought to be more "belief-based" than scientific, supported by testimonials or anecdotal evidence. Thus, conventional doctors were universally certain naturopaths did not apply the same evidence-based criteria to formulate their recommendations.

I don't know exactly what they do and I think they have their own folklore, what herbs and things you might do to treat some things, and so I guess they have their indications for what they do and when. I know they have no standards, there's no governing body of naturopaths, there's no standardized examinations as far as I know. So they're totally unregulated, and I think some of them are well-meaning. I think some of them are in it for the money, and what they tell patients seems to be quite variable. (MD8)

[Naturopathic] belief based therapies if I could put it like that, would be in some cases outright fraudulent at one end of the spectrum: what kind of a story can we make up here that will sell well. And, [at] the other end of the scale, people who by way of their own personal background and cultural exposures and beliefs have developed belief systems that support their own pattern of practice, which they may perhaps entirely believe, as a result of their experience with patients. So I would guess there's probably a spectrum (MD5)

Some physicians believed naturopathic advice was generally more positive and hopeful for patients, due to the lack disclaimers or explanations about inconsistencies in the scientific evidence linking diet and breast cancer to patients. Physicians were most concerned with the possibility that naturopaths suggested certain therapies were efficacious to patients, when they had not been examined scientifically, or were not conclusively supported by scientific data. However, a few physicians believed naturopaths provided an important complementary service to breast cancer patients.

I think probably a lot of what naturopaths do is very important in terms of wellness. There's two sides to health, there's disease and there's wellness. And I think that the doctors are dealing more with disease, and the naturopaths are dealing more with wellness. But the doctors have to deal more with wellness, and then we could marry them more. (MD3)

It's powerful to talk in lay terms because that's what people understand. If I talk about a risk reduction like I did this afternoon, the patient's going "what? What are these numbers?" They don't understand, I have to write it all out, have to read it and give them pieces of paper in order [for them] to understand and the benefit. When you read the benefit is a 5 to 10% benefit, after all their work and all their figuring it all out? Then they go to the naturopath and he says " look, this works really well, bunch of people in China took it" and they say "oh okay" you know? Patients don't give [care] whether they said studies showing risk reduction, just tell me I'm going to do okay. (MD1)

Oncologists universally said referrals to or from naturopaths did not exist, nor was there any formal infrastructure for communication with naturopaths. Although some physicians were interested in improving their relationships and communication with naturopaths, they all were hesitant to work closely with naturopaths due to their pervasive beliefs that naturopaths' clinical counseling practices were not evidence based. Therefore, the lack of scientific compatibility and philosophical agreement among professionals precluded their ability to work together. Furthermore, oncologists consistently believed the remedies and dietary changes naturopaths were recommending were not altering women's disease progress or risk of recurrence.

I think it would take a long time before there was any kind of formal relationship between doctors and not just naturopaths but the whole group of paramedical practitioners. Over the course of time there's a pretty good working relationship between doctors and osteopaths in the States, and a marginal one with chiropractors. The other groups, the herbalists, massage therapists, aromatherapists, and naturopaths, there's an awful lot of other people out there who you've got a long way to go to document that they actually do anything for patients. I think they're sort of tinker-er's. I don't think they're making serious impacts on anything. They've got laxatives and mild soporifics and mild, minor stuff. (MD8)

Physicians were universally supportive of patients' pursuit of naturopathic consultation, so long as they were certain it was not harmful. Oncologists believed it was important to have an open, encouraging relationship with their patients. This was an important part of doctor-patient rapport and trust.

You will lose the patients otherwise. You know, if a patient doesn't feel comfortable about taking Essiac or shark cartilage or whatever the hell it is, then that patient will not communicate with you and you will lose them, so if you're going to be of any benefit to people, you have to maintain some sort of interaction with them. (MD6)

Although the oncologists generally did not object to patients' desires to consult naturopaths, they never suggested it to patients. Physicians did however consistently

stress they believed naturopaths provided elements of patient care they were not getting from conventional physicians.

If I knew where there were practitioners that would give fairly balanced, they weren't trying to take advantage of people - because people are very vulnerable. They're not getting that hope or dogmatic "just do this, everything will be fine" from me. So they need it from somebody and so they're going and seeking these people out. I don't have a good knowledge of who these people are or whether there is accreditation or licensing of these sort of people to say well these people here are very fringent, avoid those but these five, six people are a list of individuals who continue to provide very good care of a certain nature. (MD2)

4.4.1.3 Oncologists' relationship with and perceptions of dietitians

Although most of the oncologists would readily refer breast cancer patients to dietitians if they requested it, many did not refer patients for additional counseling. Oncologists consistently said they were more apt to make referrals to dietitians for what were described as medical issues, such as weight loss counseling.

[The] major reason that we use dietitians is to try and maintain nutrition in the face of loss of appetite either disease related or treatment related, they're losing weight, and they have a sore mouth and they're losing weight or whatever, they're nauseated, so recommendations to maintain their nutrition. (MD6).

All of the physicians interviewed believed their training was similar to dietitians, therefore they felt comfortable making referrals to dietitians for nutrition counseling. Although it was commonly believed that dietitians' advice was likely balanced, conservative, and based on scientific research, some physicians believed their understanding and application of the scientific research literature may be slightly different from a dietitian.

[I: Do you think that your use of evidence would be similar or different, how do you perceive dietitians' use of evidence?] I think my understanding of evidence will be a little different from how a dietitian understands evidence. [I: And how would it be different?] Well we regard ourselves as more rigorous, in terms of determining or demanding evidence. (MD10)

Some physicians believed referring patients to dietitians falsely endorsed the legitimacy of the link between diet and breast cancer, and therefore wrongly encouraged patients to believe changing their diet would make a difference in the outcome of their disease. Most physicians, however, referred patients to dietitians because they believed it would be psychologically meaningful for them, rather than therapeutically meaningful, in regards to breast cancer risk reduction or disease management.

I am going to offer people advice through a nutritionist who can help them pursue it. The question is how many resources should go down that, if it isn't proven to be worthwhile. How much time and money should go into feeding the populations need to be able to manipulate something, which is often dietary. Then say okay we're going to support people spending hours worrying about whether they're eating broccoli or soy milk or something like that and encourage people to believe that is important. Because it does support the issue that it is important if I then send them off to a nutritionist who then spends four and a half hours discussing every dietary thing they eat. It actually supports the fact that it's important when it hasn't been proven. (MD1)

In summary, the oncologists did not believe their professional responsibilities included nutritional counselling, however, they did believe it is psychologically beneficial for patients, so doctors provide patients with general, 'healthy eating' nutritional recommendations. The oncologists did not believe close collaboration with naturopaths is feasible in the near future, due to fundamental differences in the way their professions use scientific evidence. Because physicians believed alternatives are important in patients' health care, they did not discourage patients' pursuit of naturopathic consultation; however they did not specifically recommend it. The physicians did however, routinely refer patients to dietitians, mostly for medical reasons.

4.4.2 Naturopaths' perceptions of professional roles and responsibilities

In the following sections, I will first describe the defining principles of naturopathic medicine, and how nutrition fits into naturopaths' practice of breast cancer

prevention and treatment. I will then discuss the naturopaths' views of both oncologists' and dietitians' practice of dietary counseling to prevent or reduce the risk of breast cancer.

4.4.2.1 Definitions of naturopathic medicine and naturopaths' perceptions of their role in nutritional counseling

Naturopaths consistently described a number of important principles as central to naturopathic medicine, such as focusing on the body's innate ability to heal itself, doing no harm, educating patients, and emphasizing prevention. Another important distinction, as described by naturopaths, is the focus on the cause of the disease rather than the symptoms. Naturopaths believed conventional practitioners are experts in disease treatment, through drug therapy and surgery, whereas naturopaths address the cause of disease through natural approaches such as dietary and lifestyle changes. Therefore, nutritional counseling was believed to be fundamental to the naturopathic approach to healing.

Naturopathic medicine is based on certain principles, and one of the main principles is that we know that the body has the ability to heal itself... the next one is that we try to work on doing no harm to that person. So you try to use all kinds of diagnostic tools that would cause no harm, or that can be invasive... The other one, would be to look at the cause of the problem, so when they come in here, if they have a problem you don't just say well okay, you have a headache all right, then I'll give you this for your headache. So you have to kind of dig to find out well why? ... What's been going on? And so, by looking to the cause then you can better direct either the nutritional plan, the treatment plan etc. and then, physician means teacher, so you're there to teach, how to change lifestyles etc., how to cope with their environment etc. And then the other one, which is very very important too is the prevention aspect. (ND5)

Unlike the oncologists, the naturopathic physicians made specific dietary recommendations to their patients (see Figure 5.).

Figure 5. Naturopathic Dietary Guidelines

A Guide That is Essential for Prevention & During Treatment for Cancer

The most important observation of a diet for cancer patients include:

1. do not consume anything that slows down the immune system
2. do not consume anything that promotes cancer growth
3. foods consumed should enhance immune function
4. try and consume foods which slow down cancer growth

Foods to Avoid:

processed foods	pesticides	canned foods	preserved foods
deep fried foods	'BBQ' foods	shell fish	fatty foods
animal fats	alcohol	sugar	caffeine
cow's milk	soft drinks / diet pop	sodium	
milk products (yogurt, butter, cottage cheese, light cheese are acceptable)			
red meats (excluding wild game)			

Recommended Foods:

fresh fruits and vegetables (raw preferably & organic, steamed or juiced)		
whole grain foods	pure meat, fish and poultry	roughage / fiber
green tea		

(Adapted from patient information of ND11 and ND2, 1998 - See Appendix I)

Because naturopathic physicians' philosophy is described as holistic, their fundamental aim is to improve and strengthen patients' health. Therefore, general recommendations were also given to all patients, regardless of their disease condition. ND7 described breast cancer as one of many "degenerative diseases" which is the result of a harmful environment and poor lifestyle. Counseling approaches above and beyond these general recommendations were however geared specifically towards breast cancer. This was described as 'individualizing' the advice.

Breast cancer, osteoporosis, heart disease, diabetes, arthritis, and all of these things are linked of course to diet, so in that aspect, it's not all that different probably. But you will have more individual things that you would gear towards [I: Specific vitamin C recommendations, for breast cancer patient for antioxidant purposes for example?] Exactly, they may be higher, or more of the emphasis on soy products. Like I wouldn't emphasize [that with] arthritic patients, I'd say eat more soy, but probably not as much. I wouldn't say eat your flax seeds, take four tablespoons ground flax seeds a day, that wouldn't make as much sense [for an arthritic patient]. (ND6)

A few naturopaths believed forming a hypothesis, with adequate clinical and historical information, was important for them to adequately tackle a woman's disease.

I can go ahead and do various assessments and investigations and take a very thorough history including social history, family history and everything, and then I'll come to some sort of hypothesis. Then I can explain, [or] present that to the patient, and at the same time explain why I came to this kind of conclusion, and [determine] how we can correct it, at this point. (ND2)

This allowed some practitioners to develop a treatment plan unique to the individual patient, reflective of their social, personal and environmental circumstances.

4.4.2.2 Naturopaths' perceptions of oncologists' dietary and lifestyle counseling practices with breast cancer patients

Naturopathic practitioners believed oncologists place little or no emphasis on nutrition or other lifestyle issues in their practice, due to their focus and expertise in disease treatment as opposed to prevention. Medical doctors were not perceived to be well educated in nutrition. Although some medical doctors were known to recommend more naturopathic remedies in their medical practice, this was consistently seen as inappropriate and unsuccessful, due to fundamental differences in philosophy about patient care.

Something other than disease care, is obviously scaring the pants off them financially. Every time I open a paper or a professional brochure, there's a new conference on alternative medicine, complementary medicine. I mean MD's are gobbling it up. They want to know what is this stuff, how can we do it? I want to know how to prescribe a natural substance...but it doesn't work, they don't get it. And it doesn't matter how much they learn how to prescribe St. John's Wart, or tofu or flax oil or omega-3 or omega-6 oils, prescribing it mechanistically, is still not naturopathic medicine. It's just using a natural substance to treat a symptom. (ND4)

Many naturopaths believed strongly that conventional approaches to breast cancer treatment are highly invasive, toxic and suppressive to the body's natural healing process.

The treatment that [is] used in [the] allopathic profession may in fact cause problems while treating another problem. This goes against our philosophy. You can't treat one problem or health concern and at the same time be causing a problem somewhere else. And what comes to mind is side effects, so I treat my clients [and] focus on helping the person to recover, by avoiding things like side-effects, dependencies and toxicities...you know that excludes 90% of conventional medicine because virtually everything in the conventional field does have some form of side-effect. (ND10)

Therefore, naturopaths believed their approaches, which are aimed at strengthening the body "terrain" as ND7 described, are important complements to conventional therapies. ND5 similarly believed the "soil" is weakened by conventional therapies and it is her responsibility to strengthen her patients' immune system.

To make sure that their immune system continues to be [strong] because when they take all of the chemotherapy treatments, all of those very very toxic substances, it really destroys what you have, it destroys the soil. And then [to] try to bring it back to some sense of balance. I don't know whether it ever comes back when they've been into such destructive substances. (ND5)

Almost half of the naturopaths encouraged their patients to follow naturopathic therapies exclusively, due to their beliefs conventional chemotherapy and radiation therapy are not as efficacious as they were touted to be and they are harmful. All of the naturopaths referred to the lack of success of conventional approaches to breast cancer in the last twenty-five years, despite massive investments into it.

Well [conventional treatment] only buys time as far as I can see. It doesn't really cure the problem. Doesn't it make you wonder that nothing has changed in the conventional patterns. They're using chemo [&] radiation for years and years, and so much money has gone into cancer research, and what has happened, no changes, what is going on? That's what I'd like to know. That's a big question mark, and with the generation of all of the new machinery and everything else, nothing has [changed]. (ND5)

Almost all of the naturopaths commented on the authority oncologists have with patients because of their prominent and powerful position in society as medical doctors. Furthermore, they questioned this authority.

One thing about doctors, all kinds of doctors. I don't care what kind of doctor you are. For some reason even the shoe doctor, even the car doctor, they all like to play god. That's what has gone wrong. You have to realize that the only guy who's authoritative it is probably the car mechanic, (laughs) because he's got a manual. You take that screw, so many pounds, otherwise it's not good. He's authoritative. For human beings, we do not have manual, and no one can be authoritative, until the day we manage to make a robot. And it's as simple as that. So in other words my final conclusion is that all of the doctors are basically very poorly trained human mechanics who could not find a manual. Who absolutely do not know what to do. There is still so much unknown about this, about the biomechanics, the working of the body, this piece of marvelous machinery. If they speak in any authoritative way, they're fooling themselves, and fooling the public. In other words, doctors are the worst cons on earth, simply because we don't know much. (ND2)

Most naturopaths also believed that physicians' lack of endorsement of dietary or lifestyle influences on breast cancer plays a significant role in determining whether or not their patients pursue these alternatives. Naturopaths consistently believed there is a pervasive bias against alternative approaches to health in conventional health care.

4.4.2.3 Naturopaths' perceptions of dietitians' dietary counseling practices

None of the naturopaths interviewed referred their patients for additional nutritional information. A few naturopaths recommended their patients meet with support staff for guidance on meal preparation, and vegetarian cooking. The naturopathic practitioners interviewed generally had little knowledge of dietitians' counseling approaches. Some naturopaths believed dietitians' dietary advice was limited much like oncologists, because of their exclusive dependence upon scientific evidence to base recommendations.

If a dietitian said iron is okay for breast cancer, [that] is not what I would use. I would disagree with that concept. Iron's a free radical and your body only needs it if you're anemic, and I do your blood work and you're not anemic, so a multi-vitamin with iron we wouldn't do. Iron's got some, again, nothing's solid. When I read an article, or read something, I only see it as a potential problem, I don't need to wait for it to be a problem. If it says "10% had a problem with it", that's

good enough for me to stay away from it. I don't need see 90%, I'm only looking at the possible negatives. So things like that, iron would be one. Milk would be another one, because yes the vitamin D's in there and you get increased the calcium's in there, you've got the two good things and the five bad negative things. (ND9)

I haven't see enough of their [dietitians'] work, or know enough of their training, to know enough of what it is. I guess my problem with, from what I see from conventional approaches [to] nutritional training, [it] is kind of a calorie equals a calorie, fat equals a fat, any kind of protein is the same, as long as the numbers add up, as you know, this many carbohydrates, proteins, fat, then that's the important thing. (ND8)

In summary, nutrition is an important tool in the naturopaths' arsenal of therapeutics; therefore, they provide patients with specific dietary recommendations to prevent and treat breast cancer. This approach is compatible with their general intent to facilitate their patients' innate ability to heal. Alternatively, naturopaths believed oncologists actively exclude preventive measure like diet from their treatment-focused practices, yet are highly influential of patients' decisions to pursue alternative care. Furthermore, many naturopaths believed conventional therapies are toxic and ultimately harmful. The naturopaths generally lacked knowledge regarding dietetic practice, however perceived their nutritional approach as similar to that of oncologists.

4.4.3 Health Professionals' perceptions regarding their patients' expectations of dietary and lifestyle counseling

Here, I will discuss the oncologists and naturopaths beliefs about why patients pursue dietary changes and reasons for patients' interests in alternative health care.

4.4.3.1 Oncologists' beliefs about why their patients pursue dietary changes

All of the physicians outlined the importance of understanding activities patients engage in outside of their conventional treatment, as a means to establish rapport with

patients, and foster patients' faith that their physician respects their ability and desires to make independent decisions.

It's certainly part of the initial assessment "what other things are you doing and are you taking herbs and vitamins, where are you getting that", and they're either getting it from health food stores or they're getting it from naturopaths directly and or others. So as part of my chatting to them and trying to build some rapport, when I'm about to tell them they have to have some other treatments or something, [I] think [it] helps them believe I know what I'm doing, if I know where they are in space. (MD2)

Most physicians were aware patients were not always forthcoming about their involvement in alternative health care, and time and continuity in the doctor-patient relationship is often necessary to increase comfort before patients divulge this information.

I think women are going [to naturopaths], but they don't tell me. No, they're embarrassed to. [I: Why do you think?] I think they'd feel we'd disagree with the naturopathic physicians and other practitioners of alternative health and they are trying to please us, it comes back to fear. And of course they shouldn't be fearful of that because we know that our patients do seek alternative health practitioners. About a third of all patients see or participate in alternative health choices, and they may be anything from a naturopathic physician to a health food store to a good friend with a bottle of shark pills, or Essiac or god knows whatever it is. And they know that the medical community, the so called organised scientific medical community is very skeptical about these issues, and I think they are embarrassed to admit that. When women do tell me about it, they often do it with a "now I know you won't agree with this but", and that's actually wrong. I mean I understand why women seek that. My attitude is, I only will comment if I feel that a woman is being taken advantage of, particularly economically. (MD9)

All of the oncologists believed the single most significant reason their patients pursued dietary change stemmed from their patients' desire to play a role in their own health care and disease treatment, or be in "control" again, as the diagnosis and treatment of breast cancer could be a frightening, and disempowering experience.

One of the things that happens in cancer is we spend all our lives trying to gain some measure of control over our life and our environment. And, anyways, initially you learn how to sit up, and walk and control your bladder, and then

control your mother, these sorts of things, and then, suddenly the cancer comes along, and it's in control, or the doctors and the nurses are telling you what to do. So, what can I do, and as a measure, if nothing else, [diet is] a measure of being in some control over your life again. (MD2).

Thus, diet was perceived to be an accessible way for patients to participate in their own disease care.

What it all boils down to in this business in diet in my view, is powerlessness, and it's the need for women to retain control of the situation which is out of control for them. And I'm totally sympathetic. It's like driving the airplane. We put our faith that the pilot's going to get us down. So when women have breast cancer and they are feeling powerless, because we come along with our blunt weapons of treatment, and say "here's the treatment you have a good outlook", fine, they're left in limbo, and they're feeling scared and frightened and they want control. So they go to the people who offer them control, and that's the alternative food industry, the health industry. Whereas we can't offer them that because it's ethically wrong for us to do that because we don't have evidence specifically to support it. So all we can do is tell them, well you know, in my view, do the best you can with, with common sense and good practice and all that sort of thing. (MD9)

Hope was another important reason physicians believed patients pursued additional dietary and health care advice from naturopaths. Oncologists described common experiences where patients were disheartened with their diagnosis, and would seek out other ways of making a difference in their health outcome.

They spend a lot of money and some times they bring in their invoices and they're spending \$300 and \$400 a months on this sort of crap. So, without evidence that it's going to work, because they want somebody to tell them things are going to be okay, they're willing to pay a lot of money for that kind of reassurance. For the HOPE basically we're taking about hope and belief, that it will work. They need something to believe in, because I've just told them that their numbers are this big, and they can no longer believe they will do well. Because the numbers tell them that the majority will say they won't do well. So you can no longer believe in that system. That system is failing you, [and] belief is what most people go on, belief is in all sorts of things, whether it's pop stars or religion people. [People] believe in all sorts of things in order to cope day in and day out, and they don't get it in looking at the hard core science. (MD1)

Some doctors also believed patients are looking for health care which includes lifestyle and dietary counseling. All of the physicians believed these factors are not a fundamental part of their treatment approach because they are not well understood scientifically. Physicians believed patients are less motivated to find scientific or well substantiated information because they would want sources of dietary information which are more supportive of their beliefs. Physicians consistently believed naturopathic advice is more hopeful because it is not reflective of the scientific evidence.

The other thing is, for situations where the medical or the health professional community does not have anything to offer, either because nothing else has been proven to work, or they have an advanced cancer, people want to take something. ... The other thing is, if you give good news although it may or may not be true, that's perceived far better than, if I'm telling you "unfortunately you have a disease that we can't cure" you're not going to be very happy with that, but if I tell you that "you've got a serious illness, but I've got a product that might make you feel better" even though I haven't really promised you anything, I've made you feel better. (MD4)

All of the oncologists believed supporting patients in their pursuit of harmless dietary or lifestyle changes is important. Physicians stressed that ultimately it is up to the patient to decide what kind of care is important and meaningful to them, and oncologists were universally supportive of patients efforts to make dietary changes if they wanted, although most did not believe it would directly influence their patients' cancer outcome.

They spend a lot of time talking about it [diet], they want a lot of advice, they want to do something that's in their control, that THEY can manipulate, and I'm not inhibiting that. I don't believe in it. I think it provides something that I don't necessarily think medicine provides, which is a lot of psychotherapy type support and control issues in and spiritual issues around how patients cope with disease and risks of and threats and grieving and all that sort of stuff. And so the diet is used at the moment as a method of sort of working through some of this, and feeling control. (MD1)

However, all of the physicians were cautious about making specific nutrition recommendations or links between patient behaviors and their disease. This was

primarily said to be motivated by fear of evoking guilt and feelings of responsibility in their patients. Oncologists were also wary of patients spending excessive personal sums on supplements or other remedies.

A woman with breast cancer is terribly vulnerable and she's vulnerable to all sorts of things including misinformation. There's nothing worse than somehow subtly implying to a woman that she's done something wrong to deserve this cancer. That's the movement that you caused this by being over-stressed and you ate wrong and it's your fault and now you have to get out of it. Well that's really a terrible thing to do to a woman, because she's done nothing wrong. She's living in an environment that is really very much out of her control, and [to] create a guilt trip out of it I think is terribly cruel. (MD9)

Physicians expressed concern about patients taking advice and making radical changes. Many said changes may not be helpful, and might even be harmful. Physicians were therefore highly conservative in their approach to dietary counselling and often advise women their dietary choice should make "sense" to them.

I advise them against some of the crazy things that are out there in the world. Eat only grapefruits or have coffee enemas or [I: Would you discourage them from doing sort of more extreme or radical things?] Perhaps not as radically as some other oncologists. I tend to be fairly tolerant of unproven anti-cancer remedies. I'll give them permission to try that if they wish to, but advise them that it's certainly not proven and it may cause harm, and that it should at least make sense to them, which, coffee enemas and grapefruit only diets or whatever, don't make any sense to me. (MD6)

Additional sources of nutrition information the physicians believed are available to patients included books, women's magazines, other women with breast cancer, family and friends. Most oncologists also described naturopaths and health food stores as a significant source of dietary information for patients. The oncologists were also aware of sources available to patients through the Cancer Agency, however few felt they were familiar with the specific information in these publications. Many physicians believed patients are inundated with nutrition information from disparate sources, and as a result

are much more apt to challenge if not refute information they receive from their doctor. Some oncologists saw this as somewhat problematic, because they believed patients do not have the tools to critically evaluate the legitimacy and credibility of various sources of diet information they are exposed to. Therefore, some oncologists felt it was important to educate patients about different kinds of evidence and scientific information.

I'm often faced with patients who have been advised by the media, by their family, and physicians to make substantial changes in the diet, and I try not to undermine their beliefs unless they ask... I suppose the one thing that I do try to say to patients when we get into these discussions, and I feel my own sort of skeptical inclinations taking control, and I do have to control that, is to say, well really the one thing I would ask of you, speaking to the patient, would be to just think a little bit about distinguishing advice of any kind that's based on evidence, compared to things that are advised on the basis of belief. And ...when we're helping people make decisions, lot's of life's decisions are based on belief, from religious decisions to lifestyle decisions and so on, but I think it's a good intellectual exercise to distinguish where your choices come from. (MD5)

4.4.3.2 Naturopaths' perceptions about why breast cancer patients pursue alternative sources of health care

Much like the oncologists, the naturopaths described a number of reasons why women with breast cancer pursue dietary changes and naturopathic consultation. First, most naturopaths believed a few of their cancer patients had experienced little success through conventional therapies, and were seeking a "magic bullet" as ND2 described.

We get people coming in with cancer, saying "well this doctor tells me I got a cancer in my colon like a grapefruit but I don't want to deal with that, I want to do your diet and fix it" ...But they [patients] don't know, they think that we know everything, that we can cure every cancer. One of the breast cancer patients I had that didn't make it, she came in with a great big tumor like this ... and they [conventional physicians] said "well if we remove the breast you'll probably live another month". She said "okay, let's show them and just turn it around right? (ND1)

Furthermore, many naturopaths said their patients had been previously diagnosed and did not like their treatment options or prognosis.

They might hate surgery so much, or they might hate drugs so much or they might hate the side effects so much. Or they might be scared of that, cause that's usually what it is, that kind of stuff is so radical all the time, why don't we just try this first. My bulk amount of patients is more of the people that go that route first, don't get the effect they want, then come here. (MD9)

Second, some naturopaths described hearing pervasive feelings of dissatisfaction among their patients towards conventional approaches to breast cancer. Practitioners emphasized the time naturopaths spend with patients, and their encouragement of pro-action and empowerment of their patients through patient education of dietary and lifestyle changes.

They [conventional physicians] don't spend the time with [the] patient, a lot of times it's like a number and they just say okay, this is what you've got you come in and get treatment. I think there's a lot being ignored - the patient's emotions and how they feel, their fear, especially for breast cancer there's a lot of fear. And I think that hasn't been addressed. With the modern kind of medical practice, everybody seems so caught up (laughs) so I guess one of the things that people enjoy seeing the naturopaths is because we do spend the time and we do really try to understand and be more supportive ... Well, I think by now it's not new that people start to [question], with the last 30 or 40 years, either from their own direct experience or through the media, they know that the success rate, you know it's not that great. (ND3)

Naturopaths commonly referred to conventional medicine as parochial, paternalistic and leaving little independent choice for patients.

The dogmatic approach to disease care comes from MD's, The breast cancer, you got to get that cut out, and irradiated, and Tamoxifen™ and Erythromycin™ those are your options or you die, to a certain degree... This is what you're told to do, go and have your breast cut off, and biopsied, and irradiated, and surgery and chemotherapy, and you go down through that route. And some patients are quite happy to give away their power, and follow the victim personality or path of not taking any kind of responsibility or not being involved in the process other than okay, here's my body, do with it what you need to do, just make me better again... [Instead of] why do I want to have radiation, are there options? Why are they telling me to do this? Oncologists are notoriously terrible at explaining why they have to do this. (ND4)

Furthermore, many naturopaths believed conventional approaches to breast cancer treatment are not often efficacious, and are toxic and harmful to women's innate ability to heal.

Other practitioners asserted patients are not coming to them out of frustration with conventional health care, but rather are weighing their options and maximizing their chances for optimum breast cancer care. Much like oncologists, naturopaths believed patients want to be more in control of their health care. Patients were commonly perceived by naturopaths to be more proactive, knowledgeable and assertive compared to patients who tended to do conventional care alone.

The biggest influencing factor that causes patients to come to me is, wanting to be in some way back in charge... [with a] diagnosis of cancer, you are now a victim. This has happened to you, and most patients feel like they have lost all their power, and it's very easy to fall into victim mode, where you give away all your power, and this is what you're told to do, go and have your breast cut off, and biopsied, and irradiated, and surgery and chemotherapy, and you go down that route....When you start doing research about cancer, when you start wondering are there other choices? Then on [a] deeper levels of consciousness you are dealing with it. Somehow, I've been involved in creating this, maybe there are things that I need to do to change, so that I don't keep creating it, maybe there are other things that I can do to facilitate this process. So when patients come here, they're wondering, what can they do to facilitate this process, how can they be involved, how can they be in command, not control, but command of this process. (ND4)

All of the naturopaths believed patients pursue dietary advice from naturopaths because they fundamentally believe their nutrition and lifestyle habits play a role in the etiology of their disease.

I think the people that come know that diet is important, they know that something they should be taking supplements, and other than that, I think they just want to get a natural perspective on things. (ND7)

Unlike oncologists, naturopaths did not believe most patients were necessarily motivated by their want of a different prognosis or a miracle. Furthermore, they did not believe in

definitive prognoses. Naturopaths acknowledged patients' desire for improvement and many believed the naturopathic approach is a more viable option for patients than conventional treatment. All of the naturopaths strongly believed there is always a chance for improved health, and a positive state of mind is crucial in this process, regardless of prognosis. Naturopathic practitioners almost always believed it is unfair and tragic for conventional physicians to tell patients they have little or no hope of a positive outcome. All of the naturopaths firmly stressed the importance of the mind-body connection to wellness and health. They believed this connection is understood by their patients, and motivates them to seek naturopathic consultation.

Well, when somebody has cancer I say "look we're going to fight this and do the best we can". And even when the doctor only gave them three months, I say "look, you're going to do the best you can. And you either want to live or you want to die, tell me right now. If you want to live, we're going to try make you live" I say no hope is false hope. Okay, we all die, you either run to it, or you walk to it. We're just trying to walk to it. And if you're going to die, and we can't do anything about it, you don't have to worry about that part. You just have to worry about living. So it doesn't really matter, [you] have a cancer patient and [you] say "look, there's always a chance of living, you just don't know", so now is it going to be three months, five months, five years? We don't know what it is, but if you fight, more likely you're going to have a chance to win. (ND9)

The naturopaths described similar sources of nutrition information available to their patients, compared to the oncologists. Furthermore, the naturopaths also commented on patients' ardent interest and ambition to improve their knowledge regarding diet and breast cancer. Most of the naturopaths said they encourage this among their patients, although there were some concerns regarding the reliability of information from sources such as the internet. Naturopaths said it was common for patients to bring information to them, which practitioners reviewed with them.

They [patients] go and do the research themselves, so they go to libraries, they go health food stores, they go to books, they even go to medical libraries. Now that the net is offering them information, they come here with bag and bag. (ND5)

Therefore, the naturopaths generally believed it is their responsibility to educate patients about the relationship between diet and lifestyle, and facilitate their collection and deciphering of the myriad of diet-related sources of information.

4.4.4 Summary of oncologists' and naturopaths' dietary counseling practices, professional roles and responsibilities

In summary, none of the conventional oncologists felt well trained in nutrition. Furthermore, many of them did not believe nutrition counseling was part of their mandate in treating breast cancer patients, and would rather rely on dietitians who are similarly trained and provide balanced, scientifically solid advice. All of the oncologists were unfamiliar with the training, accreditation and licensing of naturopaths, as well as how they substantiated their recommendations to patients. Furthermore, these practitioners had strong beliefs that naturopaths provided advice that was more hopeful, promising and clear cut, due to its lack of scientific substantiation. Therefore, the oncologists consistently thought their patients pursue alternative consultation out of a desire to control their disease. The physicians also believed their patients are in search of more hopeful, promising advice, which all the oncologists were certain patients would get from naturopaths. Although physicians acknowledged these needs in their patients, all of the conventional physicians were conservative in their approach to dietary counseling; that is, they do not draw any concrete or direct links between diet and breast cancer, nor do they make any specific dietary recommendations. Thus, the physicians interviewed here said they do not directly discourage patients from pursuing naturopathic consultation, because of the potential psychological benefit. Instead, they do try to prevent patients from

personal, physical or financial harm. However, because all of the oncologists did not believe naturopaths have evidence based practice; they would not make referrals to them.

Alternatively, the naturopaths who participated in this study, described nutrition as fundamental to their philosophical and therapeutic approach to patient care. They consistently believed oncologists are poorly trained in nutrition and do not place any emphasis on it in clinical practice. Furthermore, most naturopaths strongly believed there is a bias against nutrition and lifestyle counseling in conventional medical cancer care and this has implications for alternative healers by reducing the legitimacy of their areas of health care. Furthermore, all of the naturopaths believed oncologists and dietitians practices are similar, as both professional groups' patient counseling is limited by their strict adherence to certain types of scientific evidence.

Unlike oncologists, few naturopaths believed their patients are seeking some magic formula to cure their cancer. Instead, most believed their patients are making informed, proactive decisions to improve their health. Some naturopaths believed patients seek their consultation in response to negative experiences with the conventional health care system, and look for more effective, less toxic alternatives to care. All of the naturopaths strongly believed the mind plays an important role in the healing process, and most believed there is always hope for a better outcome. Much like the oncologists, the naturopaths cited similar information sources that are available to women. Although naturopaths did not believe women receive dietary information from their oncologists, medical doctors routinely named naturopaths and health food stores as common information sources. Both groups of practitioners said women were actively seeking diet information, and there is a plethora of it available to them. Only the oncologists thought

this is somewhat problematic, given the public's lack of training in critically assessing the information. Both oncologists and naturopaths believed women should be informed about the credibility and reliability of the information they are accessing.

CHAPTER 5**Discussion**

The purpose of this study was to explore how health professionals from both conventional oncological and naturopathic fields of cancer therapy understand the complex relationship between diet and breast cancer, and how and why they counsel their patients about these links. Furthermore, I explored how practitioners from disparate disciplines perceive each other's role in counseling patients about the dietary prevention of breast cancer. In this chapter I will discuss how insights gained from this study relate to and further the extant literature. I will also outline the limitations and potential applications of the findings of this study.

5.1 DIETARY FACTORS AND BREAST CANCER ETIOLOGY

Although the conventional physicians did not generally believe diet plays a significant role in modulating breast cancer outcome, some physicians did believe a woman's lifetime consumption of a 'healthy' diet high in fruits, vegetables, fiber and soy probably decrease her risk of breast cancer as well as other chronic diseases. Alternatively, naturopaths named a number of specific dietary factors which increase and decrease breast cancer risk and influence outcome. In the following section, I will discuss how physicians' and naturopaths' beliefs compare to the scientific and CAM literature examining links between diet and breast cancer.

5.1.1 Oncologists' beliefs regarding diet, risk factors and breast cancer etiology

There was little variation among the oncologists who participated in this study regarding their beliefs about diet and breast cancer. This may reflect the consistency and standardization of medical education and training in Canada and physicians' similar

interpretation of scientific phenomena (Cockerham, 1998, p.194; Fox, 1989, p.72-141; University of British Columbia, 1998; University of Calgary, 1998). Furthermore, even though oncologists' beliefs were consistent with current science-based literature elucidating the role of diet and breast cancer, they were conservative. This may explain why interviews with the oncologists were generally shorter compared to the naturopaths.

Although these physicians perceived the etiology of breast cancer as multifactorial, they consistently placed more emphasis on risk factors such as reproductive events and genetic history which are not believed to contribute significantly to the majority of breast cancer cases, according to the extant literature (Coliditz et al., 1993b; Marshall, 1993). Furthermore, none of the oncologists believed links between diet and breast cancer are well proven and they had little knowledge of diets or dietary factors that have been well substantiated by scientific evidence to play a role in breast cancer etiology, such as the protective effects of diets high in fruits and vegetables (Djuric et al., 1998; Graham et al., 1991; Howe et al., 1990a). Knowledge was especially lacking in relation to specific compounds found in plant sources such as phytoestrogens, carotenoids, and indoles among others (reviewed in Craig, 1997; Lee et al., 1991; Wong et al., 1997; Zava and Duwe, 1997). Oncologists also lacked knowledge about other food borne substances suggested to increase breast cancer risk such as exogenous estrogens. Although the scientific evidence in this area is suggestive but conflicting, the oncologists asserted these substances are unlikely to play a role in breast cancer risk (Blackwood et al., 1998; Falck et al., 1992; Guttes et al., 1998; Liljegren et al., 1998; Wolff et al., 1993).

Oncologists' beliefs that the relationship between dietary fat and breast cancer is not well substantiated reflects the conflicting extant evidence. However, their knowledge

tended to be limited to the putative role of saturated or total fat in increasing breast cancer risk, with little to no awareness of the role of different polyunsaturated fats (Hilakivi-Clarke et al., 1996; Imrhan and Hsueh, 1998).

The oncologists' universal perceptions that alcohol likely increases breast cancer risk agree with current findings (Smith-Warner et al., 1998).

The oncologists' beliefs that breast cancer patients take supplemental vitamins and minerals in large number is consistent with research evidence (Newman et al., 1998b; Slesinski, Subar, and Kahle, 1995). Although some supplements have been shown to decrease risk (Patterson et al., 1997) and others have not (Ewertz and Gill, 1990), there are few substantive supportive findings in this regard (Kaegi, 1998). This is compatible with the perceptions of the physicians in this study that supplements in no way influence breast cancer risk or outcome. Their beliefs that supplement use may aid the psychological health of breast cancer patients is similar to the perceptions of other conventional physicians regarding alternative therapies and dietary supplements (Bourgeault, 1996).

Little evidence exists in relation to the role of diet in secondary prevention of breast cancer or in the modulation of a woman's current disease compared to primary prevention (Balducci et al., 1986; Hankin, 1993; Wattenberg, 1996). The oncologists' consistent perception that diet is not influential in this regard may reflect this lack of evidence. These beliefs may also reflect a bias in oncologists' practice towards cancer treatment and away from prevention. The oncologists' beliefs that diet may influence a women's life-time risk is currently being examined in large scale multi-centred clinical

trials; however few oncologists were aware of or identified these trials as a means of clarifying the relationship between breast cancer and diet.

5.1.2 Naturopaths' beliefs regarding diet, risk factors and breast cancer etiology

In this study, there was more variation in beliefs and perceptions regarding the role of diet in breast cancer etiology among the naturopaths than there was among the oncologists. This may be because naturopathic college programs in North America are young with the earliest established date in 1956, (personal communication, National College of Naturopathic Medicine) and less well standardized relative to established medical colleges (Bastyr University, 1997; Cockerham, 1998; Southwest College of Naturopathic Medicine and Health Sciences, 1997). It may also be the result of more eclectic educational and training programs within naturopathic institutions where, unlike most conventional medical schools, prerequisite science-based courses are not mandatory and training is not solely based within the scientific method (Bastyr University, 1997; Canadian College of Naturopathic Medicine, 1997; University of British Columbia, 1998; University of Calgary, 1998). Although the Naturopathic Association of British Columbia regulates and oversees naturopathic practice in British Columbia, other provinces in Canada do not have a formal regulatory body or are in the process of establishing one (personal communication, Association of Naturopaths of British Columbia, 1999). Therefore, the establishment of naturopathic medicine as a profession is in progress. Furthermore, the socialization of students and practitioners of naturopathic medicine may be less uniform and structured in comparison to students of conventional medicine (Cockerham, 1998). Recent findings by Boon (1998) showed naturopaths' world view upon graduation from a naturopathic medical school was more dependent

upon students' beliefs and perceptions before entering the institution, compared to the effects of socialization during their training. Therefore, the beliefs and perceptions expressed by the naturopaths here may be less reflective of their institution and training and more reflective of their personal interests, philosophies and beliefs.

The general approach, philosophical underpinnings and focus on diet in naturopathic medicine described by all of the naturopaths are consistent with those described in calendars and publications produced by all four naturopathic colleges (Bastyr University, 1997; Canadian College of Naturopathic Physicians, 1997; National College of Naturopathic Medicine, 1997; Southwestern College of Naturopathic Medicine and Health Sciences, 1997). This is further evidenced by their consistent belief that dietary changes influence women's current disease progress and can prevent recurrence. Furthermore, the naturopaths emphasized prevention and patient education in their practice, two fundamental tenets of naturopathic medicine outlined by the naturopathic colleges (Bastyr University, 1997; Canadian College of Naturopathic Medicine, 1997).

The naturopaths consistently referred to the extant scientific evidence when discussing their about the relationship between diet and breast cancer. However, the naturopaths' beliefs about these links were not as conservative as those described by the oncologists. That is, they had strong opinions about the role of nutrition in breast cancer etiology despite the inconsistencies in the scientific data described by the oncologists. Therefore, the alternative practitioners' understanding of this evidence differed from that of the oncologists. This may be a result of differences in naturopaths' and oncologists'

training and socialization, because naturopaths' different beliefs and understanding of the scientific evidence reflects their training in paradigms other than science.

For example, the naturopaths' beliefs about dietary fat sometimes conflicted with extant scientific evidence. Although a few naturopaths discussed inconsistencies in the findings linking fat and breast cancer, all had strong beliefs that dietary fat, total fat and saturated fat contribute to breast cancer risk. This does agree with some scientific evidence (Howe, 1994b; Howe et al., 1990a; Ronco et al., 1996), but conflicts with other evidence (Hunter et al., 1996d; Willet et al., 1992g). Moreover, practitioners never suggested their beliefs regarding this relationship were weakened by inconsistent evidence. Many identified flaws in study designs or the ways in which data were collected to explain inconsistencies.

Some of the specific mechanisms naturopaths explained to link dietary fat with breast cancer etiology were in direct conflict with accepted scientific evidence. For example, many naturopaths said saturated fat contributes to the production of inflammatory prostaglandins and other eicosanoids, which is inconsistent with conventional scientific understanding of fatty acid and eicosanoid metabolism (Linscheer and Vergroesen, 1994; Lupulescu, 1996). Precursors to eicosanoids are known to be polyunsaturated fatty acids such as n-3 and n-6 series fats (Linscheer and Vergroesen, 1994). All of the naturopaths encouraged their patients to increased consumption of polyunsaturates, including n-6 series which have been consistently shown to increase rodent mammaryogenesis (reviewed in Fay and Freedman, 1997) and high linoleic acid intakes in Western societies have been linked to increasing breast cancer rates (Noguchi, Rose, Earashi, and Miyazaki, 1995; Weisburger, 1997b). Some practitioners also

suggested saturated fatty acids were more prone to oxidation and free radical generation, which is not consistent with conventional beliefs regarding different susceptibilities of fatty acids to oxidation (Linscheer and Vergroesen, 1994). Polyunsaturates have been shown to be more vulnerable to oxidation compared to saturates (Linscheer and Vergroesen, 1994).

The naturopaths' theories regarding the role of dietary fat in breast cancer etiology are consistent with editorials and reviews in the CAM literature; for example high intakes of animal fat are believed to increase breast cancer risk due to the presence of harmful substances such as soluble environmental estrogens (Nicholson, 1996; Austin and Hitchcock, 1994). Although the naturopaths did not describe specific environmental compounds implicated in increasing breast cancer risk, they did explain common sources of these substances, such as residues from pesticides and herbicides. Furthermore, naturopaths' beliefs that these compounds are linked to estrogen-like effects in women which increase breast cancer risk agree with current conventional scientific theories about these substances (Fielden et al., 1997; Shekhar, Werdell, and Basrur, 1997). The naturopaths had more knowledge of environmental sources of estrogen and their putative risks compared to oncologists.

The naturopaths' beliefs that alcohol increases breast cancer risk is supported by current scientific evidence (Smith-Warner et al., 1998; Viel, Perarnau, Challier, and Faivre-Nappez, 1997).

Much of the extant scientific research, evident in the review of the literature described here, addresses the role of macronutrients such as fat in breast cancer risk or the role of specific groups of foods like vegetables as opposed to those foods which are

processed, colored and preserved, or foods high in simple sugars or those that have been genetically engineered. Therefore, many of the additional foods that the naturopaths linked to increased breast cancer risk have not been well investigated and their role in increasing breast cancer is not well known (El-Bayoumy et al., 1997; Richardson, Gerber and Cenee, 1991).

The naturopaths had extensive knowledge about specific compounds in plant sources believed to prevent breast cancer. While there is some research suggesting such compounds may affect cancer risk, the naturopaths attributed more certainty to these links than is suggested by the conventional literature (Crowell, 1997; reviewed in Craig, 1997; Mgbonyebeli, Russo and Russo, 1998). Furthermore, although many of the mechanisms by which these compounds might reduce cancer risk are unknown (Stavric, 1994), the naturopaths often attributed protection to antioxidant activity, which is believed among conventional experts to be a significant protective mechanism of chemopreventers (Stavric, 1994).

The naturopaths consistently recommended dietary supplements and organic food consumption; such recommendations agree with guidelines common in CAM but not conventional medical sources (Austin and Hitchcock, 1994; British Columbia Cancer Agency, 1996b; World Cancer Research Fund / American Institute for Cancer Research 1997). Results from studies attempting to elucidate the significance of vitamin and mineral supplements in reducing breast cancer risk (primary prevention) are inconsistent (Hunter et al., 1993b; London et al., 1992b; Panganini-Hill et al., 1987; Yuan et al., 1995) or lacking (Garland et al., 1993; Patterson et al., 1997; Stavric, 1994) and less is known about the potential benefit from supplements in secondary prevention of breast cancer

(Austin, 1997; Kaegi, 1998; Patterson et al., 1997; Stavric, 1994); however naturopaths asserted supplements contribute to positive patient outcomes and are disease protective. For example, all of the naturopaths recommended mega-doses of vitamin C, and although there is little scientific evidence to substantiate this recommendation (Kaegi, 1998), it does agree with CAM guidelines (Head, 1998b). Furthermore, some naturopaths recommended supplements of food extracts such as indole-3-carbinol from the cruciferous vegetable family or phytoestrogens from sources of soy; yet little is known about the safety and / or efficacy of these supplements in modulating breast cancer progress or risk (Kaegi, 1998).

In summary, the oncologists' beliefs reflect current scientific research and guidelines more so than the naturopaths; however the alternative practitioners' beliefs agree with the CAM literature. Therefore each professional group appears to be true to their respective literature sources and guidelines. For example, the naturopaths tended to emphasize environmental factors more and had more knowledge about specific nutritional factors compared to the oncologists, which agrees with CAM recommendations; however, many of these factors have not been well substantiated by conventional scientific evidence. Differences in practitioners' beliefs likely reflect variations in their training in the scientific method and their educational and professional socialization.

5.2 HEALTH PROFESSIONALS' USE OF EVIDENCE IN CLINICAL PRACTICE

Implicit in the preceding discussion of the study participants' beliefs regarding links between diet and breast cancer is the relationship of beliefs to how evidence is used and interpreted. The way oncologists and naturopaths who participated in this study

understand and use evidence is related to their education, training, and health professional practice, all of which contribute to their overarching world view. In the following section, I will discuss how the oncologists' and naturopaths' world views differ, and how this relates to the implementation of various types of evidence in their practice.

5.2.1 The relationship between oncologists' beliefs regarding links between diet and their practice of evidence based medicine

Sociological analyses and commentaries about physicians and conventional health care abound (Cockerham, 1989; Fox, 1989). Due to the intensity, duration, structure and uniformity of physicians' medical education and training, physicians have common experiences that develop specific cognitive, scientific and technological skills (Fox, 1989). This constitutes a socialization process that results in physicians holding similar beliefs, values, attitudes and norms. The common framework of understanding that usually results is described as "logico-rational" where

null hypothesis, experimental, and probability reasoning are brought to bear on what is observed, manipulated, and analyzed, within a structure of thought that also entails various forms of systematic reductionism. This...is applied to phenomena that are directly or indirectly related to human health and disease, illness and wellness. (Fox, 1989)

This scientific world view characteristic of physicians is predominately positivistic and reductionistic, wherein the laws of nature are believed to be explainable through systematic and progressive observation and experimentation (Fox, 1989). Thus physicians hold similar understandings and belief systems or world views, based on the predominate use of scientific methods of interpretation.

The oncologists' responses in this investigation are consistent with the sociological analyses of the medical profession. That is, conventional physicians in this study consistently interpreted links between nutrition and cancer through a prominent

'scientific filter'. Oncologists' beliefs about the relationship between nutrition and breast cancer were based on what they perceived to be 'proven' scientifically, and relied on their interpretation of the scientific evidence. Furthermore, oncologists described much of the understanding about the role of diet in breast cancer as unknown or yet to be elucidated by science. They relied on science to elucidate the relationship between diet and breast cancer but also identified limitations in experimental designs necessary to confirm links. Although many oncologists described other ways of understanding the relationship between diet and breast cancer, such as personal beliefs or traditional nutrition practices based on "what your mother told you", they actively separated these ideas from legitimate clinical oncology practice. The oncologists' separation of any additional beliefs or personal perceptions as different from and less important than scientific knowledge is in direct agreement with currently endorsed professional guidelines for EBM (Sackett et al., 1996).

Although the oncologists interviewed in this study were unaware of some of the evidence supporting a role for diet in breast cancer etiology, their practice recommendations agree with research trends. Furthermore, knowledge of this additional evidence the oncologists would not have altered their practice patterns, according to EBM guidelines. Therefore, there was integrity in oncologists' use of evidence in practice.

Filtering out pertinent and useful pieces of evidence within potentially massive amounts of extant evidence is one of the challenges of using research in conventional medical practice (Rosenberg and Donald, 1995a). Because oncologists specialize in breast cancer treatment or secondary prevention instead of primary cancer prevention,

data regarding the role of diet in the primary prevention of breast cancer might be considered outside of their clinical area of interest. However, this information would contribute to a general understanding about the role of diet in breast cancer. Oncologists from this study showed some gaps in the working knowledge of evidence supporting the relationship between diet and breast cancer. This may be due to bias among these practitioners from measures that are preventive or less efficacious in the short term, in favor of treatments which are believed to be more important. However, this is unlikely to influence the efficacy of their oncology practice.

5.2.2 Naturopaths' beliefs in relation to their use of evidence in practice

Recently, Boon (1998) interviewed naturopathic medical students and practitioners working and studying in Canada, and found students' world view prior to entering naturopathic medicine influenced their socialization experience during training and their ultimate clinical approach. Boon (1998) characterized informants as having either predominately 'scientific', 'holistic' or in between world views that reflected their original orientation prior to entry into training. The 'scientific' perspective was defined as having the tendency to be more objective and reductionistic, favoring more concrete treatments, such as physical therapies. 'Holistic' world views tended to be more subjective, spiritual, and intuitive; practitioners holding this view tended to treat patients with spiritual or emotional modalities. Variable implementations of nutrition interventions among naturopaths were also identified, with nutritional approaches being more common to those practitioners favoring more scientific or concrete treatment modalities (Boon, 1998).

A clear dichotomy between science and holism does not fit well with informants in this study. Because the sample of naturopaths was small, the ability to accurately determine naturopaths' general orientation is limited. However, all of the practitioners interviewed here routinely implemented nutrition interventions, had tangible and logical explanations to justify their clinical interventions, referred to scientific evidence and used scientific terminology to explain relationships between diet and breast cancer; thus practitioners interviewed here exhibited more 'science' based world views. That is, naturopaths included in this study may be more oriented towards science based practice relative to other naturopaths. However, a larger, more representative sample would be necessary to confirm this. The tendency towards scientism evident among naturopaths in this study may be due in part to bias towards responses perceived to be more acceptable to the interviewer, who represented an established biomedical institution. In addition, those naturopaths using nutrition as a common intervention strategy in practice and those interested in cancer prevention and treatment may have been more willing to participate in this study, reducing the numbers of more holistic practitioners included here.

Although the naturopaths appeared to adhere to a scientific world view, there were distinct differences between their approach and that of the oncologists. The naturopaths consistently exhibited more holistic perspectives of health and breast cancer etiology relative to oncologists. For example, all of the naturopaths believed psychological factors play a significant role in breast cancer risk and treatment via the immune system (psychoimmunology). The naturopaths also asserted stress and emotional factors contribute to disease outcome. Although the conventional physicians also believed psychological factors were important for women's health in general, they

did not emphasize these factors as much as the naturopaths did. The naturopaths' beliefs were also consistent with the philosophical frameworks defined in CAM commentaries, emphasizing prevention, patient self healing and use of natural remedies (Achterberg, 1998; Bastyr University, 1997; Fulder, 1998; Funk, 1995; Jobst, 1998; Levin et al., 1997).

Although all of the naturopaths described sources of scientific evidence that they used to understand the relationship between diet and breast cancer, they had different perspectives on the use of evidence, compared to the oncologists. None of the naturopaths described weighing evidence according to the study design, sample size or other methodological criteria. Instead they valued studies based on outcome. The apparent lack of identifiable criteria paralleling EBM to evaluate different types of evidence reflects naturopaths' rejection of conventional guidelines for evidence, and there was no indication that the naturopaths were using alternative guidelines to help them sift through research evidence.

Another significant difference between the naturopaths and oncologists interviewed here was the naturopaths' inclusion of other ways of understanding the relationship between diet and breast cancer. Scientific evidence was not the predominant source of support used by naturopaths, nor did the alternative practitioners actively attempt to eliminate subjective evidence when making recommendations. Although scientific evidence did contribute to the way the naturopaths understood links between diet and breast cancer, it was not necessary to confirm or refute links. Instead, it strengthened practitioners' beliefs when supportive evidence existed. Additionally, naturopaths implemented other ways of understanding the relationship between diet and

breast cancer, such as intuition and common sense. The naturopaths asserted their use of subjective evidence in practice was justified because of the lack of harm recommended dietary change would pose for patients; however, the practitioners did not substantiate this further. This practice is in direct opposition to the guidelines outlined in conventional EBM, where treatments or recommendations are implemented because they have been shown, with appropriate scientific substantiation, to be efficacious or free of harm.

In summary, the oncologists and naturopaths interviewed in this study understood and used scientific evidence differently. Unlike the conventional physicians, the naturopaths used other ways of understanding links between diet and breast cancer which fall outside of EBM criteria, such as common sense. However, the naturopaths' clinical practices did adhere to CAM guidelines and recommendations. Alternatively, the oncologists' adhered to guidelines for EBM. Therefore, the way in which scientific and other types of evidence are used by the practitioners is distinct and characteristic of their respective fields, illuminating a significant point of difference between conventional oncologists and naturopaths.

5.3 HEALTH PROFESSIONALS' CLINICAL PRACTICE

Both oncologists' and naturopaths' descriptions of their counseling practices were consistent with their descriptions of their beliefs and use of evidence. First, nutrition and lifestyle counseling was not included in oncologists' approaches to patient care unless requested, because the oncologists believed the role of diet in breast cancer prevention is not supported by scientific evidence. Whether physicians believed links were legitimate or not was described to be irrelevant to their practice; however, almost all the

oncologists' personal beliefs were no different from their professional scientific interpretations. This reflects the intimate relationship between physicians' personal preferences or beliefs and their scientific interpretations and it underscores the dominant role science-based reasoning plays in their socialization. Furthermore, it reflects the prominence of evidence based medicine in oncological practice and the increasingly prominent exclusion of subjective aspects of care in lieu of scientific evidence.

Second, although naturopaths commonly described their nutrition recommendations as being geared specifically to the individual patient, they also provided general recommendations for breast cancer patients. This is similar to conventional approaches to patient care, where treatment protocols are more disease specific than individually specific. Interestingly, naturopaths would describe their care as distinct from that of oncologists, despite their similarities. The general recommendations for breast cancer patients common among these naturopaths disagrees with the approaches to patient care outlined in the CAM literature, where patients' treatment protocols are tailored to them, according to their unique circumstances (Jobst, 1998; Fulder, 1998; Funk, 1995). This is a common issue raised by CAM proponents to argue against the inclusion of CAM therapies in conventional methods of evaluation (Levin et al., 1997). The naturopaths in this study likely provide some general recommendations because of their strong beliefs in specific foods modulating breast cancer risk and outcome. Because there are general and consistent naturopathic approaches to breast cancer, regardless of the individuals' circumstances, some of these interventions may be amenable to conventional methods of evaluation.

5.4 PROFESSIONAL ROLES, RESPONSIBILITIES, AND INTER-PROFESSIONAL PERCEPTIONS

Although patients routinely see oncologists, naturopaths and dietitians, there is no formal referral or communication pattern established between naturopaths and oncologists, and while oncologists often refer to dietitians, naturopaths do not, nor did the naturopaths interviewed here have any knowledge of dietetic practice. In the following section I will discuss possible reasons for and implications of these barriers to communication among these professionals.

5.4.1 Oncologists' roles and responsibilities regarding dietary counseling in relation to dietitians and naturopaths

Physicians consistently said dietary counseling is outside their professional domain of responsibility. Given cuts to health care and time constraints, physicians said they are not encouraged to spend time counseling patients about matters which are not believed to directly influence breast cancer outcome. However, they also addressed the importance of lifestyle and dietary counseling for patients' general and psychological health, which physicians did feel responsible for. Therefore, the oncologists identified a tension between their role in providing treatment for breast cancer and their role in supporting patients in their psychological and general health. Although most of the oncologists believed dietary advice was important to their patients, they did not believe it was important for their breast cancer care. Furthermore, they did criticize or identify limitations in EBM guidelines, which restricted their ability to counsel patients about issues not well supported by RCT's. The oncologists said they were probably not meeting their patients' expectations during their discussion of diet and lifestyle, due to the oncologists' lack of belief and / or knowledge that diet influences breast cancer. The

oncologists believed that their provision of treatment focused care rather than lifestyle and dietary counseling is a source of patients' dissatisfaction with conventional medicine; however the oncologists believed in the EBM basis for clinical recommendations, and asserted limitations in making dietary recommendations were appropriate. Thus, the oncologists believed patients want more holistic care, which they likely receive from other practitioners like naturopaths. The frustration the oncologists believed patients have with conventional treatment-focused cancer care is described in both the CAM and mainstream literature (Cassileth, Lusk, Strouse, & Bodenheimer, 1984e; Eisenberg et al., 1993; Jarvis, 1992; Jobst, 1998; Lerner and Kennedy, 1992; Lupton, 1997; MacLennan, Wilson, & Taylor, 1996).

Oncologists lacked an understanding of naturopaths' education, training, accreditation and licensing, despite their knowledge about their patients' pervasive consultation of naturopaths. For example, the oncologists did not know naturopaths are licensed, must have a four year naturopathic medical degree from an accredited institution, and are regulated by governing bodies (Association of Naturopathic Physicians of British Columbia, 1999; Bastyr University, 1997; Canadian College of Naturopathic Medicine, 1997). Oncologists questioned naturopathic approaches to patient care because they believed naturopaths were not willing to scientifically evaluate their remedies nor would they implement appropriate standards of EBM. The naturopaths' individual approaches to measuring treatment outcomes were not addressed in this study; however the findings reported here do support the oncologists' beliefs that the naturopaths do not use conventional approaches to EBM, nor do they use or understand conventional scientific evidence in similar ways.

As a result, physicians had a general lack of interest in and knowledge of naturopathic practice, a lack of belief that naturopathic interventions were medically consequential (except for infrequent circumstances of vitamin overdose), and some had little interest in recognizing the naturopathic profession legitimately contributes to patient care. This disinterest among oncologists may be due in part to their general lack of education regarding naturopathic medicine, education and training. It also reflects the dominant role scientific methods and evidence based medicine play in established systems of health care. Furthermore, because most of the conventional physicians interviewed here felt uncomfortable working with naturopaths who do not adhere to EBM guidelines for practice, the oncologists' attitudes suggests a predominate bias against anything but science based medical care, despite acknowledged patient participation in forums outside conventional medicine. However, these attitudes and practices agree with the scientific paradigm in which oncologists have been socialized and work, honoring the EBM guidelines.

Despite oncologists' general opposition to naturopathic care, they believed it was important for patients to make autonomous health care choices and they valued additional psychological support for patients. Thus, they generally abstained from discouraging patients from seeking naturopathic care. However, this is a passive and indirect endorsement of naturopaths and it does not reflect the oncologists' actual opposition to naturopathic practice ethics.

The attitudes towards naturopathy among oncologists described here agree with commentaries within CAM literature outlining the hegemonic practices of conventional medical doctors and their unwillingness to include health care practices outside the

science based conventional forum (Achterberg, 1998; Fulder, 1998; Funk, 1995). These perceptions also agree with the plethora of editorials and reviews by conventional medical proponents questioning the legitimacy and use of CAM therapies which are not scientifically substantiated (Borgeault, 1996; Brigden, 1995b; Champion, 1993; Jarvis, 1992).

Although most oncologists would readily refer patients to dietitians, the rationale to justify referrals was for either medical or psychological reasons and not because they believed nutrition was important in cancer prevention or treatment. Some physicians rarely referred to dietitians due to the lack of patient requests, while a few others referred but questioned whether health care resources should be directed towards interventions which were not proven to work. Therefore, the bias against nutrition evident with a few of the oncologists in this study was based in the belief that diet is inconsequential in the prevention or treatment of breast cancer, and is again consistent with their education, training and socialization.

5.4.2 Naturopaths' roles and responsibilities regarding dietary counseling in relation to dietitians and oncologists

Although nutrition was described as fundamental to naturopathic medicine, the naturopaths interviewed in this study believed nutrition is not valued by oncologists. Furthermore, they believed oncologists are biased against more preventive, natural methods of treating or preventing breast cancer in favor of drugs and surgery. This agrees with the findings presented here regarding the oncologists' clinical practices.

The naturopaths described political reasons for the exclusion of nutrition from conventional oncological practice, such as the lack of potential financial benefit from nutritional interventions. These perceptions are consistent with CAM editorials

describing the dominant role conventional medical EBM guidelines play in health care (Achterberg, 1998; Fulder, 1998; Funk, 1995). This however, is incompatible with the physicians' rationale for excluding nutrition in oncology, that is lack of scientific evidence as opposed to political reasons. In contrast to the oncologists' perceptions, all of the naturopaths reported using scientific evidence. However, unlike the oncologists, naturopaths did criticize conventional EBM guidelines and implemented individual ways of using scientific evidence. Although the oncologists underestimated naturopaths' use of evidence, their perception that naturopaths do not adhere to EBM guidelines is compatible with the naturopaths' practice. Therefore, the naturopaths and the oncologists have different perceptions about why their professions are not more closely aligned: the naturopaths believed political reasons excluded them from conventional practice, while the oncologists believed the naturopaths did not practice within EBM guidelines and were therefore professionally restricted from working with them. These differences provide a palpable source of contention between these health professionals.

Naturopaths' common perception that conventional cancer therapies are more harmful than beneficial illustrates another difference in these health professionals' perceptions about disease treatment and care. Half of the naturopaths in this study would discourage women from seeking conventional treatments while seeking naturopathic consultation. Many other naturopaths encouraged an integrated approach. However, women are clearly getting conflicting messages regarding breast cancer treatment. This highlights the challenges women can face in their attempts to include both conventional and alternative approaches in their care.

Naturopaths generally perceived nutritional advice from dietitians to be similar to advice from physicians. Therefore, naturopaths believed they had little in common with dietitians' nutritional therapeutic approaches; however naturopaths clearly lacked knowledge regarding dietitians' training and practice. Therefore, naturopaths' perception of dietitians was biased by their view of conventional medicine and physicians. Women who seek naturopathic care therefore, may be discouraged from seeking advice from dietitians. Furthermore, the lack of inter-professional understanding and communication may perpetuate or enhance difficulties women have in making informed decisions regarding their health care, given the potential for misinformation about various sources of nutrition information.

5.4.3 Oncologists' and naturopaths' perceptions of patient expectations

Oncologists and naturopaths had somewhat different perceptions about why patients are interested in making dietary changes to prevent or treat cancer and why patients pursue alternative consultation. Health professionals' perceptions of patients' expectations were partly influenced by their own beliefs about the role of diet in breast cancer. Because oncologists generally did not believe diet was medically consequential for women, they believed patients are seeking increased control over their health, with diet as a vehicle of control. Most oncologists also believed patients are seeking a more positive health outcome, or a miracle. Few naturopaths believed patients are seeking such a "magic bullet", rather most naturopaths believed the majority of their patients want more holistic, lifestyle-centred health care. Furthermore, most naturopaths believed patients' participation in alternative health care is motivated by patients' belief that diet plays an important role in their disease, and that these issues are not emphasized in

conventional medicine. Therefore, they believed many patients are motivated by a lack of satisfaction with conventional medicine. This was not believed to be a primary motivating factor by the oncologists.

Oncologists routinely believed naturopaths provide more hopeful advice to patients, because naturopaths were believed to exclude disclaimers in their dietary advice. Thus oncologists believed advice from naturopaths is more paternalistic and hopeful and therefore, attractive and compelling to patients. Naturopaths had similar perceptions of oncologists, believing patients who seek conventional cancer treatment want a clear and firm treatment protocol or do not want to take personal responsibility for their health. Therefore, both oncologists and naturopaths believed some patients want advice which is more concrete, reliable and leaves them with little independent choice. Furthermore, both health professional groups believed patients seek the other for this kind of advice. Interestingly, both the oncologists and naturopaths believed they encourage patient autonomy, pro-action and self determination and asserted the opposite practitioner tended not to.

There have been numerous recent commentaries regarding self care in health care, where lay people act in a rational and measured manner to determine the kind of care most suitable to them (Blair O'Connor, 1995; Lupton, 1997). This notion is considered ideal in Western societies, in opposition to patients who are dependent and passive in their care (Lupton, 1997). Both the naturopaths and oncologists in this study perceived their own practices to foster autonomy and self direction in their patients. Interestingly, a recent study by Lupton (1997) attempted to examine patients' expectations of their health care providers and why they sought alternative care. Lupton

(1997) showed patients opted for alternative care instead of or in addition to conventional care according to the proficiency of their conventional physician in providing emotional, supportive and empathetic care. Therefore, both physicians and naturopaths in this study perceived patients' desire for autonomy and self control as a primary reason for making dietary changes and consulting alternative health care, whereas their motivation is more likely based on the degree to which the care suits their emotional needs (Lupton, 1997).

5.5 STUDY LIMITATIONS

The size and scope of this exploratory study are limited. However, the purpose of this investigation, based in the constructivist paradigm, is not to generalize the findings. Instead, the objective was to explore the context bound beliefs and practices of health practitioners and generate new information. Given the small size of these professional groups, (60 naturopaths in the Lower Mainland and 71 oncologists currently working in British Columbia) (personal communication, Association of Naturopaths of British Columbia, 1999; personal communication, British Columbia Medical Association, 1999), and the saturation of data collected from the informants after a total of 21 interviews, the findings cited here are likely reflective of both the oncologist and naturopathic practitioner populations in and beyond the Lower Mainland.

Given the nature of the questions, the interview process, and recruitment, the most significant limitation of this study is bias in the informant responses. Because of my affiliation with UBC and the scientific nature of my education program, the results of the naturopaths' interviews may be biased towards responses more acceptable in a scientific context. The questions were focused, which may also narrow the potential variability in the naturopaths' responses. Furthermore, practitioners interviewed here may have

perceived the purpose of the investigation was to evaluate their health care practice, and their responses may also be influenced by this perception. Furthermore, the naturopaths participating in this study may be biased towards more scientific world views and practices, reflected in their use of nutrition in clinical practice and their interest in breast cancer. Only eleven naturopaths were interviewed, and although saturation was reached with a number of concepts (e.g. counseling practices including specific dietary recommendations such as vitamin and mineral supplements), this sample may be limited in size to adequately address the potential variability in naturopathic views and practices. The lower average years experience among the naturopaths compared to the physicians may reflect a greater number of new practitioners in the profession, but it may also reflect sampling bias towards practitioners with less experience. Therefore, future studies should include more naturopathic practitioners with greater variability in practice, world views, age and experience.

Although some oncologists may have also believed the intention of the study was to evaluate their nutrition knowledge, it is unlikely this influenced their responses. This is likely because of physicians' common belief that nutrition has limited applicability, and it is not believed to be part of oncologists' professional responsibility in clinical cancer treatment. Almost all (n=8) of the oncologists practiced at the BCCA and likely have similar beliefs and clinical practices, given their common practice guidelines and similar access to nutrition information, which may bias the findings towards oncologists in group practices, affiliated with organized committees. Furthermore, the nature of the interview and wording of the interview questions may have biased the physicians towards professionally acceptable responses, that is, favoring responses that agree with guidelines

of evidence-based medicine. The oncologists also had more experience on average compared to the naturopaths, therefore, the findings cited here may be biased towards older practitioners. Future studies examining the attitudes, beliefs and counseling practices of younger, less experienced oncologists would be useful.

The informant group in this study is further limited to informants who were invited and had time to participate. Therefore, the findings may also be biased towards individuals who have time for an interview, and who are interested in the role of diet and lifestyle in breast cancer etiology and disease prevention and treatment.

The oncologists' responses were highly consistent. Furthermore, after ten interviews no new information was generated in any of the major concept areas, indicating that the data collected from the oncologists was saturated. Interestingly, there was little variation between gender, age, ethnic groups or between radiological and medical subspecialties among the oncologists. Conventional medical education and training is well standardized across Canada and the United States and has been since the early 1920's, resulting in physicians' development of common understandings reflective of medical professionalization and socialization (Cockerham, 1998, p.188). Therefore, the insights described here regarding the oncologists are likely meaningful and compatible with conventional physicians with similar characteristics beyond this study group, despite the small size of the population studied.

There are almost twice as many radiation oncologists (n=47) in British Columbia compared to medical oncologists (n=24) (personal communication, College of Physicians and Surgeons of British Columbia, 1999), which is reflective of the subspecialty oncologist population interviewed in this study (radiation oncology, n=6; medical

oncology n=4). However, the results gleaned from practitioners within these subgroups may have limited applicability to other groups of radiation and medical oncologists due to the small number of informants from each subspecialty. Because there was little apparent difference in the responses from these subspecialty groups, there may not be substantial differences among practitioners from variable fields. Future studies with larger groups of subspecialty practitioners would clarify differences.

Alternatively, there are only four accredited naturopathic colleges in North America, all of which have been in existence for less than 45 years (National College of Naturopathic Medicine, 1997). There is no standardized post graduate training in naturopathic medicine, unlike internships and residencies in conventional medicine (Bastyr University, 1997; University of British Columbia, 1998). Furthermore, the inter-institutional standardization is unknown (personal communication, National College of Naturopathic Medicine, 1999). Therefore, it is not known whether similar groups of naturopaths practicing in areas beyond the Lower Mainland would exhibit similar beliefs, practices and perceptions about diet and breast cancer prevention and treatment.

The number of complementary and alternative practitioners in British Columbia who are not naturopaths but do provide nutritional counseling is not known; however these practitioners likely exceed the numbers of naturopaths and include nutrition among a wide range of modalities (e.g. chiropractic; herbalism etc.). The informants in this study likely represent a small subset of unconventional practitioners providing nutritional guidance. Due to their specialized post-graduate training and education in clinical nutrition, the findings presented here may have limited applicability to other non-

naturopathic practitioners. Thus, the results of this study may be specific to naturopathic practitioners.

This study was also limited because the informant group was somewhat homogeneous. That is, there were only two female oncologists compared to eight males interviewed and the majority of these conventional practitioners were Caucasian (n=8). Furthermore, there were almost twice as many male naturopaths (n=7) interviewed as females (n=4) and again they were mostly Caucasian (n=8). This limits the applicability of the findings for specific health professional groups. For example, some studies of primary care physicians' preventive practices suggest practitioners who are younger and female tend to incorporate more preventive approaches in their practice (Glanz, 1997; Lasswell, DeForge, and Sobal, 1993).

Although key concepts elucidated during the initial analysis were discussed with subsequent informants to increase their sophistication and enhance their credibility, there was no summary of the completed findings sent to informants for feedback. Given the saturation of most concepts after 21 interviews, member checking during the interview process likely contributed to the strength and credibility of the findings; however, the lack of feedback from the informants of the final summary may limit the confirmability and dependability of the findings.

Finally, there were no naturopathic practitioners participating in the review or examination of this thesis project. All of the members of the Thesis Review Committee were trained in the scientific paradigm and practice within conventional medical institutions. Therefore, the findings cited here were not subjected to review by a

naturopathic practitioner or a representative from CAM. Therefore, the relevance of this study to the naturopathic medicine profession may be limited

5.6 FUTURE RESEARCH DIRECTIONS

Further studies should be undertaken to examine how differences in gender, age and ethnicity influence the beliefs and counseling practices of oncologists and naturopaths in the context of breast cancer and diet. Additional studies using more representative samples may also add to gaps in the current findings. Regions other than the Lower Mainland of British Columbia would provide interesting resources for investigation, given differences in lifestyle practice, ideology and world view in varying parts of the country. It would be useful then, to compare these findings to the results collected here.

It would also be useful to study practitioners from other relevant health professions, including dietetics, general medicine, herbalism, homeopathy and acupuncture. Studying these professions would contribute to a more comprehensive understanding of both conventional and alternative practitioners' beliefs, use of evidence and practices regarding nutrition and dietary recommendations for primary and secondary breast cancer prevention. Furthermore, this would contribute to the progressive development of inter-disciplinary and inter-professional understanding and cooperation.

The exploration of health professionals' beliefs and practices is part of a larger investigation exploring women's beliefs and practices in relation to diet and breast cancer. This study will explore what women believe about the role of diet in breast cancer, how they come to hold those beliefs and how those beliefs shape their nutritional habits. Furthermore, it will examine how women understand and use different types of

evidence, and if this understanding relates to their health care choices. It is important to integrate the findings from the present study of health professionals with those from women informants, to better understand how women make health care decisions, and how their expectations could be best met by their health professionals.

5.7 APPLICATION OF FINDINGS

The findings from this study highlight significant differences in the health professionals' world view and will also contribute to current understandings of alternative and conventional medical paradigms. Therefore, findings may contribute to oncologists', naturopaths' and other related medical and alternative practitioners' (with similar belief systems) increased inter-professional understanding. This will be achieved through practitioners' increased awareness of different ways of understanding and practicing health care and disease prevention and treatment. Mutual ignorance and misunderstanding has fueled some misgivings between professional groups from both alternative and conventional camps (Bridgen, 1995b; Herbert, 1986; Funk, 1995). In light of stark differences between the oncologists' and naturopaths' understanding and use scientific evidence in their medical practice, this study is important to inform both health professionals and their patients about why contention exists between these groups. Regardless of these differences, both the oncologists' and naturopaths' beliefs and practices correspond to their professional practice guidelines. Thus, the recognition and understanding of fundamental philosophical and ideological differences between oncologists and naturopaths (which currently precludes direct referrals to and from practitioners), would encourage a better relationship between these professionals.

It is therefore advisable to foster verbal and written communication amongst neighboring professionals to enhance respect and inclusiveness in health care practice. To this end, a more formal mechanism for communication should be implemented to facilitate the exchange of information among health professionals involved in care of cancer patients.

This process would be facilitated by physicians' education regarding naturopathic education, practice licensing and regulation. This may be achieved through the education of medical students. Specific information for oncologists about naturopathic practices could occur through Tumor Groups, professional meetings and conferences, or through registered dietitians who specialize in oncology nutrition. This way, oncologists would be more informed when discussing naturopathic therapies and practices with their patients. Furthermore, basic principles of medical sociology could be introduced to medical students to increase the awareness of different world views in addition to the scientific belief system.

Similarly, increased exposure to EBM criteria for practice would enhance naturopaths' understanding of conventional medical practice. This could be achieved through naturopathic medical education and training, where students could learn the value and application of various research methodologies as they relate to EBM guidelines, or of mutually acceptable ways to evaluate CAM treatments.

Physicians may also be interested in additional nutrition information. Nutrition resources could be made more available to conventional physicians, either through regular meetings such as the Breast Tumor Group, or through inclusion of information in regularly distributed continuing medical education publications or guidelines for clinical

practice. Oncologists may also be made more aware of nutrition resources available to them through registered dietitians in Nutrition Services at BCCA, and of nutrition literature published in oncology journals.

Findings of this study describing oncologists' and naturopaths beliefs about the role of diet in breast cancer will be informative to women with breast cancer or women at risk of the disease. Awareness of different sources of nutrition information given by different health professionals is important to women to facilitate their ability to make informed health care decisions. Furthermore, increased understanding of the rationale behind information delivered from different professionals will help women decide who can provide recommendations more compatible with their own view of the world.

Strategies to inform patients about how different practitioners use evidence would facilitate patient's ability to make informed decisions. For example, if patients are drawn towards practitioners who emphasize psychological, environmental and lifestyle aspects of disease, they may be more inclined to solicit services from alternative health care providers. Mechanisms should be in place to inform patients about opportunities in alternative health care which include descriptions about the rationale underlying practitioners' recommendations. This may be achieved with information pamphlets available in walk-in clinics, pharmacies, and health food stores.

Because women are seeking information regarding the role of diet in breast cancer and factors within diet that have been consistently shown to influence breast cancer outcome and risk, it would be useful if women could access health professionals with knowledge and interest in this area. Oncologists interviewed in this study readily refer patients to dietitians for medical concerns, however not all physicians said they refer

patients if they did not ask or require special nutritional counseling. Although patients do not need a referral to visit a dietitian, it may be useful to inform them of this during their initial consultation and ensure patients are aware that nutrition counseling from dietitians is available to them. Alternatively, patients could be informed about naturopaths' focus on nutrition and lifestyle aspects of disease, so they may have the choice to pursue nutrition counseling from variable sources.

REFERENCES

- Aakster, C.W. (1995). Concepts in alternative medicine. Soc Sci Med; 22(2): 265-73.
- *Achterberg, J. (1998). Between lightning and thunder: the pause before the shifting paradigm. Alternative Therapies; 4(3): 62-66.
- Adami, H.O., Bergstrom, R., Lund, E., and Meirik, O. (1990). Absence of association between reproductive variables and the risk of breast cancer in young women in Sweden and Norway. Br J Cancer; 62: 122-26.
- Aldercreutz, H., Bannwart, C., Wahala, K., Makela, T., Brunow, G., Hash, T.,m Arosemena, P.J., Kellis, J.T., and Vickery, L.E. (1993a). Inhibition of human aromatase by mammalian lignans and isoflavonoid phytoestrogens. J Steroid Biochem Biol; 44 (2): 147-153.
- Aldercreutz, H., Hamalainen, E., Gorbach, S.L., Goldin, B.R., Woods, M.N., & Dwyer, J.T. (1989b). Diet and plasma androgens in postmenopausal vegetarian and omnivorous women and postmenopausal women with breast cancer. Am J Clin Nutr, 49, 433-442.
- Ambrosone, C.B., Freudenheim, J.L., Sinha, R., Graham, S., Marshall, J.R., Vena, J.E., Laughlin, R., Nemoto, T., and Shields, P.G. (1998). Breast cancer risk, meat consumption and *N*-Acetyltransferase (*NAT2*) genetic polymorphisms. Int J Cancer; 75: 825-30.
- American Cancer Society of Clinical Oncology. (1997). The physician and unorthodox cancer therapies. J Clin Oncol, 15(1), 401-406.
- Anderson, L.F. (1994). DDT and breast cancer: the verdict isn't in. J Natl Cancer Inst; 86(8): 576-7.
- Archibeque-Engle, S.L. (1997). Comparison of organochlorine pesticide and polychlorinated biphenyl residues in human breast adipose tissue and serum. J Toxicol Environ Health; 52: 285-93.
- Armstrong, B., and Doll, R. (1975). Environmental factors and cancer incidence and mortality in different countries, with special reference to dietary practices. Int J Cancer, 15, 617-631.
- Arnold, S.F., Klotz, D.M., Collins, B.M., Vonier, P.M., Guillette, L.J., and McLachlan, J.A. (1996). Synergistic activation of estrogen receptor with combinations of environmental chemicals. Science; 272: 1489-91.

REFERENCES

Aschengrau, A., Coogan, P.F., Quinn, M.M., and Cashins, L.J. (1998). Occupational exposure to estrogenic chemicals and the occurrence of breast cancer: an exploratory analysis. Am J Indus Med; 34: 6-14.

*Austin, S. (1997). Recent progress in treatment and secondary prevention of breast cancer with supplements. Alternative Medicine Review; 2(1): 4-11.

*Austin, S. and Hitchcock, C. (1994). Breast cancer. What you should (but may not be told) about prevention, diagnosis, and treatment. Rocklin, California: Prima Communications.

Baird, D.D., Umbach, D.M., Lansdell, L., Hughes, C.L., Setchell, K.D.R., Weinberg, C.R., Haney, A.F., Wilcox, A.J., and McLachlan, J.A. (1995). Dietary intervention study to assess estrogenicity of dietary soy among postmenopausal women. J Clin Endocrinol & Metab; 80: 1685-1690.

Bagga, D., Capone, S., Wang, H., Heber, D., Hill, M., Chap, L., and Glaspy, J.A. (1997). Dietary modulation of omega-3/omega-6 polyunsaturated fatty acid ratios in patients with breast cancer. J Natl Cancer Inst; 89: 1123-31.

Baghurst, P., Record, S., and Syrette, J. (1997). Does red meat cause cancer? Austral J Nutr Dietet; 54(4 suppl): S1-S44.

Balducci, L., Wallace, C., Khansur, T., Vance, R.B., Thigpen, J.T., and Hardy, C. (1986). Nutrition, cancer, and aging: an annotated review. J Am Geriatr Soc, 34, 127-136.

Barrocas, A. (1997). Complementary and alternative medicine: friend, foe or OWA? J Amer Diet Assoc; 97(12):1373-76.

*Bastyr University (1997). Bastyr University Viewbook. Bothell, WA: Bastyr University.

Battista, R.N., and Spitzer, W.O. (1983). Adult cancer prevention in primary care: contrasts among primary care practice settings in Quebec. Am J Public Health, 73, 1040-1041.

Begbie, S.D., Kerestes, Z.L., and Bell, D.R. (1996). Patterns of alternative medicine use by cancer patients. MJA, 165, 545-548.

Bernstein, J.H., and Shuval, J.T. (1997). Nonconventional medicine in Israel: consultation patterns of the Israeli population and attitudes of primary care physicians. Soc Sci Med; 44(9): 1341-48.

Black, D. (1998a). The limitations of evidence. J Roy Coll Phy Lond;32(1): 23-26.

Black, N. (1996b). Why we need observational studies to evaluate the effectiveness of health care. BMJ, 312: 1215-8.

Blackwood, A., Wolf, M., Rundle, A., Estabrook, A., Schnabel, F., Mooney, L. A., Rivera, M., Channing, K.M., and Perera, F.P. (1998). Organochlorine compounds Dde and PCB in plasma and breast cyst fluid of women with benign and breast disease. Cancer Epidemiol Biomarkers Prev; 7: 579-83.

Blair O'Connor, B. (1995). Healing traditions. (Lynaugh J.E., Ed.) Philadelphia: University of Pennsylvania Press.

Blais, R., Maiga, A., and Aboubacar, A. (1997). How different are users and non-users of alternative medicine? Can J Public Health; 88(3):159-162.

Block, G., Patterson, B., and Subar, A. (1992). Fruit, vegetables and cancer prevention: a review of the epidemiologic evidence. Nutr Cancer, 18, 1-29.

*Blumber, D.L., Grant, D., Hendricks, S.R., Kamps, C.A., and Dewan, M.J. (1995). The physician and unconventional medicine. Alternative Therapies; 1(3): 31035.

Boon, H. (1998). Canadian naturopathic practitioners: holistic and scientific world views. Soc Sci Med; 46(9): 1213-25.

Bourgeault, I.L. (1996). Physicians' attitudes toward patients' use of alternative cancer therapies. Can Med Assoc J, 155(12), 1679-1685.

Bowman, B.B., Kushner, R.F., Dawson, S.C., & Levin, B. (1984). Macrobiotic diets for cancer treatment and prevention. J Clin Oncol, 2(6), 702-711.

Boylan, E.S., & Cohen, L.A. (1986). The influence of dietary fat on mammary tumor metastasis in the rat. Nutr Cancer, 8, 193-200.

Brigden, M.L. (1987a). Unorthodox therapy and your cancer patient. Postgrad Med, 81(1), 271-280.

Brigden, M.L. (1995b). Unproven (questionable) cancer therapies. West J Med, 163, 463-469.

British Columbia Cancer Agency. (1996). A nutrition guide for women with breast cancer. (Bell, L. Ed.) [Brochure] Health Canada: Hobenshield, S.

Bruning, P.F., Bonfrer, J.M.G., van Noord, P.A.H., Hart, A.A.M., De Jong-Baaker, M., and Nooijen, W.J. (1992). Insulin resistance and breast cancer risk. Int J Cancer; 52: 511-16.

REFERENCES

Brzezinski, A., Aldercreutz, H., Shaoul, R., Rosler, A., Shmueli, A., Tanos, V., and Schenker, J.G. (1997). Short-term effects of phytoestrogen-rich diet on postmenopausal women. Menopause: J N Amer Menopause Soc; 4(2): 89-94.

Burtrum, R.R., Clifford, C.K., and Lanza, E. (1988). NCI dietary guidelines: rationale. Am J Clin Nutr, 48, 888-895.

Buttriss, J.L. (1997). Food and nutrition: attitudes, beliefs, and knowledge in the United Kingdom. Amer J Clin Nutr; 65(suppl); 1985S-95S.

Campion, E.W. (1993). Why unconventional medicine? New Eng J Med; 328(4): 282-3.

Canadian Cancer Society (1992). Progress against cancer. Ed. Ring, K. Canadian Cancer Society; 45(3):1-15.

*Canadian College of Naturopathic Medicine. (1997). Fact sheet 1. Toronto, Ont.: Canadian College of Naturopathic Medicine.

*Canadian Naturopathic Association. (1997). Questions & answers about...naturopathic medicine. Etobicoke, Ont.: Canadian Naturopathic Association.

Carpenter, L.M. and Beresford, S.A.A. (1986). Cancer mortality and type of water source: findings from a study in the UK. Int J Epidemiol; 15: 312-19.

Cassileth, B.R. (1989a). The social implications of questionable cancer therapies. CA Cancer J Clin, 39, 311-316.

Cassileth, B.R., and Brown, H. (1988b). Unorthodox cancer medicine. CA Cancer J Clin, 38, 176-186.

Cassileth, B.R., and Chapman, C.C. (1996c). Alternative and complementary cancer therapies. Cancer, 77(6), 1026-1034.

Cassileth, B.R., Lusk, E.J., Guerry, D., Blake, A., Walsh, W.P., Kascius, L., and Schultz, D.J. (1991d). Survival and quality of life among patients receiving unproven as compared with conventional cancer therapy. N Eng J Med, 324, 1180-1185.

Cassileth, B.R., Lusk, E.J., Strouse, T.B., and Bodenheimer, B.A. (1984e). Contemporary unorthodox treatments in cancer medicine: A study of patients, treatments and practitioners. Ann Intern Med, 101, 105-112.

Cave, W.T. (1997). Omega-3 polyunsaturated fatty acids in rodent models of breast cancer. Breast Cancer Res Treat; 46: 239-46.

Chalupa, W., Hausman, B., Kronfeld, D.S., Kensinger, R.S., McCarthy, R.D., and Rock, D.W. (1984). Response of lactating cows to exogenous hormone and dietary sodium bicarbonate. J Dairy Science; 67(sup1): 107-8.

Chapman, G. and Maclean, H. (1993). "Junk food" and "healthy food": meaning of food in adolescent women's culture. J Nutr Educ; 25: 108-113.

Charlton, B.G., and Miles, A. (1998). The rise and fall of EBM. Q J Med; 91: 371-374.

Chidley, J. and Driedger, S.D. (1996). The cancer connection. Macleans' Magazine; April 1, p.55.

Clarke, J.N. (1992a). Cancer, heart disease, and AIDS: What do the media tell us about these diseases? Health Communic, 4(2), 105-120.

Clarke, R., Hilakivi-Clarke, L., Cho, E., James, M.R., and Leonessa, F. (1996b). Estrogens, phytoestrogens and breast cancer. In: Dietary phytochemicals in cancer prevention and treatment. Ed. American Institute for Cancer Research. New York: Plenum Press.

Clearly, M.P., and Maihle, N.J. (1997). The role of body mass index in the relative risk of developing premenopausal versus postmenopausal breast cancer. Proc Soc Experim Biolog Med; 216: 28-45.

Clorfene-Casten, L. (1998). Breast cancer: poisons, profits and prevention. Monroe, Main: Common Courage Press. In: Townsend Letter for Doctors & Patients; May: 24-31.

Cocco, P., Figgs, L., Dosemeci, M., Hayes, R., Linet, M.S., and Hsing, A.W. (1998). Case-control study of occupational exposures and male breast cancer. Occup Environ Med; 55: 599-604.

Cockerham, W.C. (1998). Medical Sociology. 7th Ed. Prentice Hall: New Jersey.

Cohen L.A., Thompson, D.O., Choi, K., Karmali, R.A., and Rose, D.P. (1986). Dietary fat and mammary cancer II. Modulation of serum and tumor lipid composition and tumor prostaglandins by different dietary fat: associations with tumor incidence. J Natl Cancer Inst, 77, 43-51.

Colborn, T., vom Saal, F.S., and Soto, A.M. (1993). Development effects of endocrine-disrupting chemicals in wildlife and humans. Environ Health Perspect; 101(5): 378-81.

Colditz, G.A. (1995a). Fat, estrogens, and the time frame for prevention of breast cancer. Epidemiol, 6(3), 209-211.

Colditz, G.A., Willett, W.C., Hunter, D.J., Stanpfer, M.J., Manson, J.E., Hennekens, C.H., Rosner, B.A., and Spelzer, F.E. (1993b). Family history, age, and risk of breast cancer. Prospective data from the nurses' health study. JAMA, 270, 338-343.

Cole, P., and Hovinga, M.E. (1991). Hormone residues in meat products. Cancer Prevention. Philadelphia: Lippincott Company.

Cordle, M.K. (1988). USDA regulation of residues in meat and poultry. Food Safety and Inspection Service, USDA. J Animal Sci; 66: 413-33.

Cullen, K.J., Yee, D., Sly, W.S., Perdue, J., Hampton, B., Lippman, M.E., and Rosen, N. (1990). Insulin-like growth factor receptor expression and function in human breast cancer. Cancer Res; 50: 48-53.

Costa, A. and Hubbard, S.M. (1997). Evidence based medicine, a new challenge. Eur J Cancer; 33(7): 987-988.

Craig, W.J. (1997). Phytochemicals: guardians of our health. Am J Clin Nutr; 97(suppl 2): S199-S204.

Crowell, P.L. (1997). Monoterpenes in breast cancer chemoprevention. Breast Cancer Res Treat; 46: 191-97.

Daling, J.R., Malone, K.E., Voigt, L.F., White, E., and Weiss, N.S. (1994) Risk of breast cancer among young women: relationship to induced abortion. J Natl Cancer Inst, 86, 1584-1592.

Danielson, K.J., Stewar, D.E., and Lippert, G.P. (1988). Unconventional cancer remedies. CMAJ, 138, 1005-1012.

David, A.K. (1994). Challenges in personal and public health promotion: the primary care physician perspective. Am J Prev Med, 10(suppl 1.), 36-38.

Davidoff, F. (1998). The future of scientific medicine. CMAJ; 159(3): 243-244.

Davis, D.L., Bradlow, H.L., Wolff, M., Woodruff, T., Hoel, D.G., and Anton-Culver, H. (1993a). Medical hypothesis: xenoestrogens as preventable causes of breast cancer. Environ Health Perspect; 101(5): 372-77.

*Davis, S.R., Murkies, A.L., and Wilcox, G. (1998b). Phytoestrogens in clinical practice. Integrative Medicine; 1(1): 27-34.

De Grasse, C.E., O'Connor, A.M., Perrault, D.J., Aitken, S.E., & Joanisse, S. (1996). Changes in women's breast cancer screening practices, knowledge and attitudes in Ottawa-Carleton since 1991. Can J Public Health, 87(5), 333-338.

De Leon, D., and Donovan, S.M. (1997). Is breast cancer a potential side effect of GH treatment? Nature Med; 3(10): 1081-82.

De Leon, D.D., Wilson, D.M., Powers, M., and Rosenfeld, R.G. (1992). Effects of insulin-like growth factors (IGF-Is) and IGF receptor antibodies on the proliferation of human breast cancer cells. Growth Factors; 6: 327-36.

De Stefani, E., Ronco, A., Mendilaharsu, M., Guidobono, M., and Deneo-Pellegrini, H. (1997). Meat intake, heterocyclic amines, and risk of breast cancer: a case-control study in Uruguay. Cancer Epidemiol Biomarkers Prev; 6: 573-81.

De Waard, F., and Trichopoulos, D. (1988). A unifying concept of the etiology of breast cancer. Int J Cancer, 41, 666-669.

Djuric, Z., Depper, J.B., Uhley, V., Smith, D., Lababidi, S., Do, S.M., and Heilbrun, L.K. (1998). Oxidative DNA damage levels in blood from women at high risk for breast cancer are associated with dietary intakes of meats, vegetables, and fruits. J Am Diet Assoc; 98: 524-28.

*Dossey, L. (1995). How should alternative therapies be evaluated? Alternative Therapies; 1(2): 76-85.

Downer, S.M., Cody, M.M., McCluskey, P., Wilson, P.D., Arnott, S.J. Lister, T.A., and Slevin, M.L. (1994). Pursuit and practice of complementary therapies by cancer patients receiving conventional treatment. BMJ, 309, 86-89.

Drenthen, T. (1997). Challenges to prevention in Dutch general practice. Am J Clin Nutr; 65(suppl): 1943S-5S.

Dunnick, J.K., and Melnick, R.L. (1993). Assessment of the carcinogenic potential of chlorinated water: experimental studies of chlorine, chloramine, and trihalomethanes. J Natl Cancer Inst; 85(10): 817-22.

Eisenberg, D.M., Kessler, R.C., Foster, C., Norloch, F.E., Calkins, D.R., & Delbanco, T.L. (1993). Unconventional medicine in the United States. Prevalence, costs and patterns of use. N Eng J Med, 328, 246-252.

El-Bayoumy, K., Chung, F.L., Richie, J., Reddy, B.S., Cohen, L., Weisburger, J., and Wynder, E.L. (1997). Dietary control of cancer. Proc Soc Exper Biol Med; 216: 211-224.

Elder, N.C., and Miller, M.L. (1995). Reading and evaluating qualitative research studies. J Family Pract; 41(3): 279-85.

REFERENCES

Ellis, J., Mulligan, I., Rowe, J., and Sackett, D.L. (1995). Inpatient general medicine is evidence based. Lancet; 246: 407-10.

Enger, S.M., Henderson, B., and Bernstein, L. (1997). Breast feeding history, pregnancy experience and breast cancer. Br J Cancer; 76(1): 118-123.

Ernst, E. (1995a). Complementary medicine: common misconceptions. J Roy Soc Med; 88:244-247.

*Ernst, E. (1998b). Single-case studies in complementary / alternative medicine research. Complementary Therapies in Medicine; 6(2): 75-78.

Ewertz, M., and Gill, C. (1990). Dietary factors and breast cancer risk in Denmark. Int J Cancer; 46: 779-84.

Falck, F., Ricci, A., Wolff, M.S., Godbold, J., and Deckers, P. (1992). Pesticides and polychlorinated biphenyl residues in human lipids and their relation to breast cancer. Arch Environ Health; 47(2): 143-146.

Fay, M.P., and Freedman, L.S. (1997). Meta-analyses of dietary fats and mammary neoplasms in rodent experiments. Breast Cancer Res Treat; 46: 215-23.

Fielden, M.R., Chittim, B., Safe, S.H., and Zacharewski, T.R. (1997). Examination of the estrogenicity of 2,4,6,2',6'-pentachlorobiphenyl (BCB 104), its hydroxylated metabolite 2,4,6,2',6',-pentachloro-4-biphenylol (HO-PCB 104) and a further chlorinated derivative, 2,4,6,2',4',6'-hexachlorobiphenyl (PCB 155). Environ Health Perspect; 105: 1238-48.

*Finck, P.F. (1998). The blind of the double-blind and the path of the placebo: an imaginary dialogue. Advances in Mind-Body Medicine; 14: 68-71.

Ford, A.S., & Ford, S. (1983). Health education and the primary care physician: the practitioner's perspective. Soc Sci Med, 17(20), 1505-1512.

Fox, R.C. (1989). The Sociology of Medicine. A Participant Observers View. Prentice Hall: New Jersey.

Franceschi, S., Favero, A., Decarli, A., Negri, E., La Vecchia, C., Ferraroni, M.M., Russo, A., Salvini, S., Amadori, D., Conti, E., Montella, M., & Giacosa, A. (1996a). Intake of macronutrients and risk of breast cancer. Lancet, 347, 1351-1356.

Franceschi, S. (1997b). Micronutrients and breast cancer. Eur J Cancer Prev; 6: 535-39.

Friedland, D.J. (1998). Introduction. In: Evidence-Based Medicine. A Framework for Clinical Practice. Friedland, D.J. (Ed.) Stamford, Connecticut: Appleton and Lange.

REFERENCES

Freudenheim, J. L., Marshall, J.R., Vena, J.E., Moysich, K.B., Muti, P., Lauglin, R., Nemoto, T., and Graham, S. (1997). Lactation history and breast cancer risk. Am J Epidemiol; 146: 932-38.

*Fulder, S. (1998). The basic concepts of alternative medicine and their impact on our views of health. J Alternative & Complementary Therapies; 4(2): 147-158.

Fulder, S.J., and Munro, R.E. (1985). Complementary medicine in the United Kingdom: patients, practitioners, and consultations. Lancet; Sept 7: 542-46.

*Funk, J. (1995). Naturopathic and allopathic healing. A developmental comparison. Townsend Letter for Doctors and Patients; October:50-58.

Gallo, L., Bailoni, L., Schiavon, S., Carnier, P., Ramanzin, M., Andrighetto, I., and Bittante, G. (1997). Effect of slow-release somatotropin on the pattern of milk yield between and within injection intervals. J Dairy Sci; 80: 46-51.

Garland, M., Willett, W.C., Manson, J.E., and Hunter, D.J. (1993). Antioxidant micronutrients and breast cancer. J Am Coll Nutr, 12, 400-411.

Gemson, D.H., and Elinson, J. (1986). Prevention in primary care: variability in physician practice patterns in New York City. Am J Prev Med, 2, 226-234.

Gerber, M. (1998). Fiber and breast cancer. Eur J Cancer Prev; 7(suppl 2): S63-67.

Glanz, K. (1997). Review of nutritional attitudes and counseling practices of primary care physicians. Am J Clin Nutr; 65(suppl): 2016S-9S.

Godley, P.A. (1995). Essential fatty acid consumption and risk of breast cancer. Breast Cancer Resear Treat; 35: 91-95.

Goldin, B.R., Woods, M.N., Spiegelman, D.L., Longcope, C., Morrill-LaBrode, A., Dwyer, J.T., Gualtieri, L.J., Hertzmark, E., and Gorbach, S.L. (1994). The effect of dietary fat and fiber on serum estrogen concentrations in premenopausal women under controlled dietary conditions. Cancer, 74, 1125-1131.

Goldszmidt, M., Levitt, C., Duarte-Franco, E., and Daczorowski, J. (1995). Complementary health care services: a survey of general practitioner' views. Can Med Assoc J, 153, 29-35.

Gonzales, C.A. (1997). Dietary patterns in Europe- preliminary results of dietary habits in the EPIC study. Eur J Cancer Prev; 6: 125-6.

Graham, S., Hellmann, R. Marshall, J. Freudeheim, J., Vena, J., Swanson, M., Zielezny, M., Nemoto, T., Stubbe, N., and Raimondo, T. (1991). Nutritional

REFERENCES

epidemiology of postmenopausal breast cancer in New York. Am J Epidemiol, 134(6), 552-566.

Gray, G.E., Pike, M.C., and Henderson, B.E. (1979). Breast cancer incidence and mortality rates in different countries in relation to known risk factors and dietary practices. Br J Cancer, 39, 1-7.

Greenwald, P., Sherwood, K., and McDonald, S.S. (1997). Fat, caloric intake, and obesity: lifestyle risk factors for breast cancer. J Amer Diet Assoc; 97(suppl): S24-S30.

Gregorio, D.I., Emrich, L.J., Graham, S., Marshall, J.R., and Nemoto, T. (1985). Dietary fat consumption and survival among women with breast cancer. J Natl Cancer Inst, 75, 37-41.

Groenewegen, P.P., McBride, B.W., Burton, J.H., and Elsasser, T.H. (1990). Bioactivity of milk from bST-treated cows. J Nutr; 120: 514-20.

*Grosshans, C.A., and Standish, L.J. (1997). Scientific rationale for breast cancer treatment protocol. Bastyr University: Seattle, Washington.

Guba, E.G., and Lincoln, Y.S. (1989). Fourth generation evaluation (pp.79-142). Newbury Park: Sage Publications.

Guba, E.G., and Lincoln, Y.S. (1994). Competing paradigms in qualitative research. In N.K. Denzin and Y.S. Lincoln (Eds.), Handbook of Qualitative Research (pp. 220-235). Thousand Oaks: Sage Publications.

Guttes, S., Failing, K., Neumann, K., Kleinstein, J., Georgii, S., and Brunn, H. (1998). Chlororganic pesticides and polychlorinated biphenyls in breast tissue of women with benign and malignant breast disease. Arch Environ Contam Toxicol; 35: 140-47.

Hall, N.E.L., and Rosenman, K.D. (1991). Cancer by industry: analysis of a population-based cancer registry with an emphasis on blue-collar workers. Am J Indust Med; 19: 145-59.

Hamilton, D., and Betchel, G.A. (1997). Research implications for alternative health therapies. Nursing Forum; 31(1): 6-11.

Hankin, J.H. (1993). Role of nutrition in women's health: diet and breast cancer. J Am Diet Assoc, 93, 994-999.

Hankinson, S.E., Willett, W.C., Colditz, G.A., Hunter, D.J., Michaud, D.S., Deroo, B., Rosner, B., Speizer, F.E., and Pollack, M. (1998a). Circulating concentrations of insulin-like growth factor-I and risk of breast cancer. Lancet; 351: 1393-96.

REFERENCES

- Hankinson, S.E., Willet, W.C., Manson, J.E., Hunter, D.J., Colditz, G.A., Stampfer, M.J., Longcope, C., & Speizer, E.F. (1995b). Alcohol, height, and adiposity in relation to estrogen and prolactin levels in postmenopausal women. J Natl Cancer Inst, 87(17), 1297-1302.
- *Head, K.A. (1997a). Isoflavones and other soy constituents in human health and disease. Alternative Medicine Review, 2(6): 433-450.
- *Head, K.A. (1998b). Ascorbic acid in the prevention and treatment of cancer. Alternative Medicine Review, 3(3): 174-186.
- Health Canada. (1992). Using the Food Guide. ISSN Publication No.0-662-19649-X). Ottawa, Ontario: Health Canada Health and Welfare Canada.
- Hellman, S., and Hellman, D.S. (1991). Of mice but not men. Problems of the randomized clinical trial. New Eng J Med; 324(22): 1585-89.
- Hems, G. (1978). The contributions of diet and childbearing to breast cancer rates. Br J Cancer, 37, 974-982.
- Henderson, M.M. (1995). Nutritional aspects of breast cancer. Cancer, 76, 2052-2058.
- Herbert, V. (1986). Unproven (questionable) dietary and nutritional methods in cancer prevention and treatment. Cancer, 58(suppl.), 1930-1941.
- Hershcopf, R.J., and Bradlow., H.L. (1987). Obesity, diet, endogenous estrogens and the risk of hormone-sensitive cancer. Am J Clin Nutr; 45: 283-9.
- Hiddink, G.J., Hautvast, J.G.A.J., van Woerkum, C.M.J., Fieren, C.J., and van't Hof, M.A. (1997). Consumers' expectations about nutrition guidance: the importance of primary care physicians. Amer J Clin Nutr; 65(suppl); 1974S-9S.
- Hilakivi-Clarke, L., Onojafe, I., Raygada, M., Cho., E., and Lippman, M.E. (1996). Breast cancer risk in rats fed a diet high in n-6 polyunsaturated fatty acids during pregnancy. J Natl Cancer Inst; 88: 1821-7.
- Hill, P., Garbaczewski, L., Huskisson, J., Sporangisa, E., and Wynder, E.L. (1980). Diet, lifestyle, and menstrual activity. Am J Clin Nutr, 33, 1192-1198.
- Himmel, W., Schulte, M., and Kochen, M.M. (1993). Complementary medicine: are patients' expectations being met by their general practitioners? Br J Gen Pract; 43: 232-35.
- Hirayama, T. (1978). Epidemiology of breast cancer with special reference to the role of diet. Prev Med , 7, 173-195.

*Holzman, D. (1996). Nutritional chemoprevention. Alternative and Complementary Therapies; March/April: 65-67.

Horton, R. (1998). The grammar of interpretive medicine. CMAJ; 159(3): 245-249.

Howe, G.R., Hirohata, T., Hislop, T.G., Iscovich, J.M., Yuan, J.M., Katsouyanni, K., Lubin, F., Marubini, E., Modan, B., Rohan, T., Toniolo, P., and Shunzhang, Y. (1990a). Diet and breast cancer: combined analysis of 12 case-control studies. J Natl Cancer Inst, 82, 561-569.

Howe, G.R. (1994b). Dietary fat and breast cancer risks. Cancer, 74: 1078-84.

Hulka, B.S., and Stark, A.T. (1995). Breast cancer: cause and prevention. Lancet; 346: 883-87.

Hunter, D.J., Hankinson, S.E., Laden, S.M.F., Colditz, G.A., Manson, J.E., Willett, W.C., Speizer, F.E., and Wolff, M.S. (1997a). Plasma organochlorine levels and the risk of breast cancer. N Eng J Med; 337(16): 1253-1259.

Hunter, D.J., Manson, J.E., Colditz, G.A., Stampfer, M.J., Rosner, B., Hennekens, C.H., Speizer, F.E., and Willet, W.C. (1993b). A prospective study of the intake of vitamins C, E, and A and the risk of breast cancer. N Eng J Med, 329, 234-40.

Hunter, D.J., Morris, J.S., Stampfer, M.J., Colditz, G.A., Speizer, F.E., and Willet, W.C. (1990c). A prospective study of selenium status and breast cancer risk. JAMA; 264: 1128-1131.

Hunter, D.J., Spiegelman, D., Adami, H., Beeson, L., Van Den Brandt, P.A., Folsom, A.R., Fraser, G.E., Goldbohm, A., Graham, S., Howe, G.R., Kushi, L.H., Marshall, J.R., McDermott, A., Miller, A.B., Speizer, F.E., Wolk, A., Yaun, S., and Willet, W. (1996d). Cohort studies of fat intake and the risk of breast cancer - a pooled analysis. N Eng J Med, 554, 356-561.

Hunter, D.J., and Willet, W.C. (1994e). Diet, body size and breast cancer. Epidemiol Rev, 15, 110-132.

Hunt, D.L., Haynes, R.B., and Browman, G.P. (1998). Review on evidence-based cancer medicine. Annals Onc; 9: 377-83.

Imrhan, V.L., and Hsueh, A.M. (1998). Effects of type and level of dietary fat during the pre-initiation phase of mammary carcinogenesis in rats. Nutr Res; 18(3): 543-555.

REFERENCES

Ingram, D., Sanders, K., Kolybaba, M., and Lopez, D. (1997). Case-control study of phytoestrogens and breast cancer. Lancet, 350: 990-94.

Inter-Society Commission for Heart Disease Resources. (1970). Atherosclerosis Study Groups and Epidemiology Study Group. Primary prevention of atherosclerotic diseases. Circulation, 42, A55.

Ip, C. (1997). Review of the effects of *trans* fatty acids, oleic acid, n-3 polyunsaturated fatty acids, and conjugated linoleic acid on mammary carcinogenesis. Am J Clin Nutr, 66(suppl): 1523S-9S.

Jain, M., Miller, A.B., & To, T. (1994a). Premorbid diet and the prognosis of women with breast cancer. J Natl Cancer Inst, 86, 1390-1397.

Jain, M., and Miller, A.B. (1997b). Tumor characteristics and survival of breast cancer patients in relation to premorbid diet and body size. Breast Ca Res Treat, 42:43-55.

Jarvis, W.T. (1992). Quackery: A national scandal. Clin Chem, 38(pt2), 1574-1586.

*Jobst, K.A. (1998). Toward integrated healthcare: practical and philosophical issues at the heart of the integration of biomedical, complementary and alternative medicines. J Alternative & Complementary Therapies, 4(2): 123-126.

Jonassen, D.H. (1991). Objectivism versus constructivism: do we need a new philosophical paradigm? Educational Technol Res & Dev, 39(3): 5-14.

Jones, D.Y., Schatzkin, A., Green, S.B., Block, G., Brinton, R.G., Hoover, R., and Taylor, P.R. (1987). Dietary fat and breast cancer in the National Health and Nutrition Examination Survey I Epidemiologic Follow-up Study. J Natl Cancer Inst, 79, 465-471.

Juskevich, J.C., and Guyer, C.G. (1990). Bovine growth hormone: human food safety evaluation. Science, 249: 875-84.

Kaaks, R. (1996). Nutrition, hormones and breast cancer: is insulin the missing link? Cancer Causes Contr, 7: 605-25.

Kaegi, E. (1998). Unconventional therapies for cancer: 5. Vitamins A, C and E. CMAJ, 158(11): 1483-8.

Kaizer, L., Boyd, N.F., Kruikov, V., and Tritchler, D. (1989). Fish consumption and breast cancer risk: an ecological study. Nutr Cancer, 12: 61-68.

Kamill, P. (1997). Evidence based medicine. Br J Gen Practice, 48: 591.

REFERENCES

Karey, K.P., and Sirbasku, D.A. (1988). Differential responsiveness of human breast cancer cell lines MCF-7 and T47D to growth factors and 17 β -Estradiol. Cancer Res; 48: 4083-92.

Kasta, S.C., and Weinstein, J.N. (1997). Historical Perspective: Ernest Amory Codman, 1869-1940. A pioneer of evidence-based medicine: the end result idea. Spine; 23: 629-633.

Kato, I., Tominga, S., and Kuroishi, T. (1987). Relationship between Westernization of dietary habits and mortality from breast and ovarian cancer in Japan. Gann, 78, 349-357.

Katsouyanni, K., Trichopoulos, D., Boyle, P., Xirouchaki, E., Trichopoulou, A., Lisseos, B., Vasilaros, S., and MacMahon, B. (1986a). Diet and breast cancer: a case-control study in Greece. Int J Cancer , 38, 815-820.

Katsouyanni, K., Willet, W.C., Trichopoulos, D., Boyle, P., Trichopoulou, A., Avsilaros, S., Papadiamantis, J., and MacMahon, B. (1988b). Risk of breast cancer among Greek women in relation to nutrient intake. Cancer; 61: 181-185.

Katz, E.B., and Boylan, E.S. (1989). Effect of the quality of dietary fat on tumor growth and metastasis from a rat mammary adenocarcinoma. Nutr Cancer, 12, 343-350.

Kelsey, J.L., Gammon, M.D., and John, E.M. (1993a). Reproductive factors and breast cancer. Epidemiol Rev, 15, 36-47.

Kelsey, J.L., and Horn-Ross, P.L. (1994b). Breast cancer: magnitude of the problem an descriptive epidemiology. Epidemiol Rev, 15 7-16.

Kent, H. (1997). Ignore growing patient interest in alternative medicine at your peril, MDs warned. Can Med Assoc J; 157(10): 1427-1428.

Kerridge, I., Lowe, M., and Henry, D. (1998). Ethics and evidence based medicine. BMJ; 316: 1151-3.

Kernick, D.P. (1998). Lies, damned lies, and evidence based medicine. Lancet; 351: 1824.

Kettles, M.A., Browning, S.R., Prince, T.S., and Horstman, S.W. (1997). Triazine herbicide exposure and breast cancer incidence: an ecologic study of Kentucky counties. Environ Health Perspect; 105: 1222-27.

*Kiene, H. (1996a). A critique of the double-blind clinical trial. Part 1. Alternative Therapies; 2(1): 74-80.

REFERENCES

- *Kiene, H. (1996b). A critique of the double-blind clinical trial. Part 2. Alternative Therapie; 2(2): 59-64.
- Kimmick, G.G., Antonio Bell, R., and Maner Bostickj, R. (1997). Vitamin E and breast cancer: a review. Nutr Cancer; 27(2): 109-117.
- King, S.E., and Schottenfeld, D. (1996). The "epidemic" of breast cancer in the U.S. - determining the factors. Oncology; 10(4): 453-72.
- Kliewer, E.V., and Smith, K.R. (1995). Breast cancer mortality among immigrants in Australia and Canada. J Natl Cancer Inst, 87, 1154-1161.
- Knekt, P., Jarvinen, R., Seppanen, R., Pukkala, E., and Aromaa, A. (1996). Intake of diary products and the risk of breast cancer. Br J Cancer; 73: 687-691.
- Knipschild, P., Klunen, J., and Ter Riet, G. (1990). Belief in the efficacy of alternative medicine among general practitioners in the Netherlands. Soc Sci Med; 31(5): 625-626.
- Knottnerus, J.A. and Dinant, G.J. (1997). Medicine based evidence, a prerequisite for evidence based medicine. BMJ; 315: 1109-10.
- Koo, L.C., Mang, O.W.K., and Ho, J.H.C. (1997). An ecological study of trends in cancer incidence and dietary changes in Hong Kong. Eur J Cancer; 28(3): 289-301.
- Krieger, N., Wolff, M.S., Hiatt, R.A., Rivera, M., Vogelman, J., and Orentreich, N. (1994). Breast cancer and serum organochlorines: a prospective study among White, Black and Asian women. J Natl Cancer Inst; 86(8): 589-99.
- Kritchevsky, D. (1993). Dietary guidelines. Cancer, 72, 1011-1014.
- Kuhn, T.S. (1970). The Structure of Scientific Revolutions. London: The University of Chicago Press
- Kushi, L.H., Sellers, T.A., Potter, J.D., Nelson, C.L., Munger, R.G., Kaye, S.A., and Folsom, A.R. (1992). Dietary fat and postmenopausal breast cancer. J Natl Cancer Inst; 84: 1092-99.
- La Vecchia, C., Ferraroni, M., Negri, E., and Franceschi, S. (1998). Role of various carotenoids in the risk of breast cancer. In J Cancer; 75: 482-483.
- Lasswell, A., Deforge, B.R., and Sobal, J. (1993). Importance of nutritional issues among family physicians. J Nutr Educ; 25: 251-57.
- *Larsen, H.R. (1998). Milk and the cancer connection. Int J Alt & Comple Med; 16(5): 32-33.

- Lather, P. (1991). Getting Smart. Feminist research and pedagogy within the postmodern. New York: Routlage.
- Le, M.G., Hill, C., Kramar, A., and Flamant, R. (1984a). Alcoholic beverage consumption and breast cancer in a French case-control study. Am J Epidemiol, 120(3), 350-357.
- Le, M.G., Moulton, L.H., Hill, C., and Kramar, A. (1986b). Consumption of dairy produce and alcohol in a case-control study of breast cancer. J Natl Cancer Inst, 77: 633-36.
- Le Marchand, L., Kolonel, L.N., Earle, M.E., and Mi, M.P. (1988). Body size at different periods of life and breast cancer risk. Am J Epidemiol, 128, 137-152.
- Lechky, O. (1997). Researchers hope to determine if link between high-fat diet, breast cancer. CMAJ; 156: 693-4.
- Lecky, F.E., and Driscoll, P.A. (1998). The clinical relevance of observational research. J Acc Emerg Med; 13: 142-8.
- Lee, H.P., Gourley, L., Duffy, S.W., Esteve, J., Lee, J., and Day, N.E. (1991). Dietary effects on breast cancer in Singapore. Lancet 337: 1197-1200.
- LeLorier, J. Grregoire, G., Benhaddad, A., Lapierre, J., and Derderian, F. (1997). Discrepancies between meta-analyses and subsequent large randomized controlled trials. New Eng J Med; 337(8):536-541.
- Lerner, I.J., and Kennedy, B.J. (1992). The prevalence of questionable methods of cancer treatments in the United States. CA Cancer J Clin, 42, 181-191.
- Levin, J.S., Glass, T.A., Kushi, L., Schuck, J.R., Steele, L. and Jonas, W.B. (1997). Quantitative methods in research on complementary and alternative medicine. Med Care; 35(11): 1079-1094.
- Liljegren, G., Hardell, L., Lindsrom, G., Dahl, P., and Magnuson, A. (198). Case-control study on breast cancer and adipose tissue concentrations of congener specific polychlorinated biphenyls, DDE and hexachlorobenzene. Eur J Cancer Prev; 7: 135-40.
- Lincoln, Y. (1995). Emerging Criteria for quality in qualitative and interpretive research. Qualitative Inquiry; 1(3): 275-289.
- Linscheer, W.G., and Vergroesen, A.J. Lipids. In: Modern Nutrition in Health and Disease. 8th Ed. Shils, M.E., Olson, J.A., and Shike, M. (Eds.). Philadelphia: Lea and Febiger.

REFERENCES

- Lipman, T. (1997). Response: Evidence based medicine. Br J Gen Practice; 48: 591-2.
- Lipworth, L., Martinez, M.E., Angell, J., Hsieh, C., and Trichopoulos, D. (1997). Olive oil and human cancer: an assessment of the evidence. Prev Med; 26: 181-190.
- London, S., Colditz, G., Stampfer, M., Willett, W.C., Rusner, B., and Speizer, F.E. (1989a). Prospective study of relative weight, height, and risk of breast cancer. JAMA, 262, 2953-2858.
- London, S.J., Stein, E.A., Henderson, C., Stampfer, M.J., Wood, W.C., Remine, S., Dmochowski, J.R., Robert, N.J., and Willett, W.C. (1992b). Carotenoids, retinol and vitamin E and risk of proliferative benign breast disease and breast cancer. Cancer Causes & Controls; 3: 503-512.
- Logsdon, D.N., Lazaro, C.M., and Meier, R.V. (1989). The feasibility of behavioral risk reduction in primary medical care. Am J Prev Med, 5, 249-256.
- Love, R. R. and Vogel, V.G. (1997). Breast cancer prevention strategies. Oncology; 11(2): 161-8.
- Lu, J., Jiang, C., Fontaine, S., and Thompson, H.J. (1995a). Ras May mediate mammary cancer promotion by high fat. Nutr Cancer, 23, 283-290.
- Lu, L.W., Anderson, K.E., Grady, J.J., and Nagamani, M. (1996b). Effects of soya consumption for one month on steroid hormones in premenopausal women: implications for breast cancer risk reduction. Cancer Epidemiol Biomark & Prev; 5: 63-70.
- Lugon, M., and Polychronis, A. (1996). In: Effective Clinical Practice. Miles, A., and Lugon, M. (Eds.). London: Blackwell Science Ltd.
- Lupo, A. (1997). Nutrition in general practice in Italy. Am J Clin Nutr; 65(suppl): 1963S-6S.
- Lupton, D. (1997). Consumerism, reflexivity and the medical encounter. Soc Sci Med; 45(3): 373-81.
- Lupulescu, A. (1996). Prostaglandins, their inhibitors and cancer. Prostaglandins, Leukotrienes and Essential Fatty Acids; 54(2): 83-94.
- Macaulay, V.M. (1992). Insulin-like growth factors and cancer. Br J Cancer; 65: 311-320.
- MacLennan, A.H., Wilson, D.H., and Taylor, A.W. (1996). Prevalence and cost of alternative medicine in Australia. Lancet, 347, 569-573.

Madhavi, D.L., Bomser, J., Smith, M.A.L., and Singletary, K. (1998). Isolation of bioactive constituents from *Vaccinium myrtillus* (bilberry) fruits and cell cultures. Plant Science; 131: 95-103.

Magnusson, C., Baron, J., Persson, I., Wolk, A., Bergstrom, R., Tricholopoulos, D., and Adam, H. (1998). Body size in different periods of life and breast cancer risk in post-menopausal women. Int J Cancer; 76: 29-34.

Mallet, G. (1996). The politics of breast cancer. The Globe and Mail; October 26: D1.

Manning, K. (1997). Authenticity in constructivist inquiry: methodological considerations without prescriptions. Qualitative Inquiry; 3(1): 93-115.

Mant, D. (1997). Effectiveness of dietary intervention in general practice, Am J Clin Nutr; 65(suppl): 1933S-8S.

Manz, A., Berger, J., Dwyer, J.H., Flesh-Janys, D., Nagel, S., and Waltsgott, H. (1991). Cancer mortality among workers in chemical plant contaminated with dioxin. Lancet; 338: 959-64.

Marshall, E. (1993). Search for a killer: focus shifts from fat to hormones. Science, 259, 618-621.

Marshall, C., and Rossman, G.B. (1989). Designing Qualitative Research. Newbury Park: Sage.

Martin-Moreno, J.M., Willett, W.C., Gorgojo, L., Banegas, J.R., Rodriguez-Artalejo, F., Fernandez-Rodriguez, J.C., Maisonneuve, P., and Boyle, P. (1994). Dietary fat, olive oil intake and breast cancer risk. Int J Cancer; 58: 774-80.

Matsumura, F. (1995). Mechanism of action of dioxin-type chemicals, pesticides and other xenobiotics affecting nutritional indexes. Am J Clin Nutr; 61 (suppl): 695S-701S.

Maynard, A. (1997). Evidence-based medicine: an incomplete method for informing treatment choices. Lancet; 349: 126-28.

McDougal, A., Wilson, C., and Safe, S. (1997). Induction of estradiol 2-hydroxylase activity in MCF-7 human breast cancer cells by pesticides and carcinogens. Environ Toxicol Pharm; 3: 195-99.

McGinnis, L.S. (1991a). Alternative therapies, 1990. Cancer, 67, 1788-1792.

REFERENCES

McGinnis, M.J., & Hamburg, M.A. (1988b). Opportunities for health promotion and disease prevention in the clinical setting. West J Med, 149, 468-474.

Mezzetti, M., La Vecchia, C., Decarli, A., Boyle, P., Talamini, R., and Franceschi, S. (1998). Population attributable risk for breast cancer: diet, nutrition, and physical exercise. J Natl Cancer Inst; 90(5): 389-94.

Mettlin, C.J., Schoenfeld, E.R., and Natarajan, N. (1990). Patterns of milk consumption and risk of cancer. Nutr Cancer; 13: 89-99.

Messina, M.J., Persky, V.P., Setchell, K.D.R. and Barnes, S. (1994). Soy intake and cancer risk: a review of the in vitro and in vivo data. Nutr Cancer, 21, 113-131.

Meyer, F. and Verreault, R. (1987). Erythrocyte selenium and breast cancer risk. Am J Epidemiol, 125(5), 917-919.

Michaud, G., McGowan, J.L., van der Jagt, R., Wells, G., and Tugwell, P. (1998). Are therapeutic decisions supported by evidence from health care research? Arch Intern Med; 158: 1665-8.

Miles, A., Lugon, M., and Polychronis, A. (1996). The development of quality in clinical practice II: the derivation and implementation of clinical standards, guidelines and research evidence. In: Effective Clinical Practice. Miles, A., and Lugon, M. (Eds.). London: Blackwell Science Ltd.

Mills, P.K., Annegers, J.F., and Phillips, R.L. (1988). Animal product consumption and subsequent fatal breast cancer among Seventh-Day Adventists. Am J Epidemiol; 127(3): 440-53.

Ministry of Health and Ministry Responsible for Seniors: Medical Services Plan. (1997). Medical Services Plan information resource manual: fee-for-service payment statistics 1995/96. Victoria, B.C.: Resource Management Division.

Mgbonyebi, O.P., Russo, J., and Russo, I.A. (1998). Antiproliferative effect of synthetic resveratrol on human breast epithelial cells. Int J Onc; 12: 865-69.

Monnin, S., and Schiller, R. (1993a). Nutrition counseling for breast cancer patients. J Am Diet Assoc, 93(1), 72-73.

Monnin, S., Schiller, R., Sachs, L., and Smith, A.M. (1993b). Nutritional concerns of women with breast cancer. J Nutr Educ; 8(1): 63-69.

Morse, J.M. Designing funded qualitative research. In: Handbook of Qualitative Research. N.K. Denzin, N.K., and Lincoln, Y.S. (Eds.). Thousand Oaks: Sage.

REFERENCES

- Mussalo-Rauhamaa, H., Hasanen, E., Pyysalo, H., Kauppila, A.R., and Pantzar, P. (1990). Occurrence of beta-hexachlorocyclohexane in breast cancer patients. Cancer; 66: 2124-2128.
- Nagata, C., Kabuto, M., Kurisu, Y., and Shimizu, H. (1997). Decreased serum estradiol concentration associated with high dietary intake of soy products in premenopausal Japanese. Nutr Cancer; 29(3): 228-233.
- National Cancer Institute of Canada: Statistics Canada (1998). Canadian Cancer Statistics 1998. (ISSN Publication No. 0835-2976). Toronto, Ont.: Health Canada.
- *National College of Naturopathic Medicine. (1997). Naturopathic Medicine. Portland, Oregon: National College of Naturopathic Medicine.
- Negri, E., La Vecchia, C., Franceschi, S., D'Avanzo, B., Talamini, R., Parpinil, M., Ferraroni, M., Filiberti, R., Montella, M., Falcini, F., Conti, E., and Decarli, A. (1996). Intake of selected micronutrients and the risk of breast cancer. Int J Cancer, 65, 140-144.
- Nesaretnam, K., and Darbre, P. (1997a). 3,5,3',5'-Tetrachlorobiphenyl is a weak oestrogen agonist *in vitro* and *in vivo*. J Steroid Biochem Biol; 62(5/6): 409-18.
- Nesaretnam, K., Stephen, R., Dils, R., and Darbre, P. (1998b). Tocotrienols inhibit the growth of human breast cancer cells irrespective of estrogen receptor status. Lipids; 33: 461-69.
- Newman, S.C., Miller, A.B., and Howe, G.R. (1986a). A study of the effect of weight and dietary fat on breast cancer survival time. Am J Epidemiol, 123, 767-774.
- Newman, V., Rock, C.L., Faerber, S., Flatt, S.W., Wright, F.A., and Pierce, J.P. (1998b). Dietary supplement use by women at risk for breast cancer recurrence. Am J Clin Nutr; 98: 285-292.
- *Nicholson, A. (1996). Diet and the prevention and treatment of breast cancer. Alternative Therapies; 2(6): 32-38.
- Ng, S.T., Zhou, J., Adesanya, O.O., Wang, J., LeRoith, D., and Bondy, C.A. (1997). Growth hormone treatment induces mammary gland hyperplasia in aging primates. Nature Med; 3(10): 1141-44.
- Noguchi, M., Rose, D.P., Earashi, M., and Miyazaki, I. (1995). The role of fatty acids and eicosanoid synthesis inhibitors in breast carcinoma. Oncol; 52: 265-271.
- Oakley, G.G., Devanoboyina, U., Robertson, L.W., and Gupta, R.C. (1996). Oxidative DNA damage induced by activation of polychlorinated biphenyls (PCB's):

implications for PCB-induced oxidative stress in breast cancer. Chem Res Toxicol; 9: 1285-92.

*O'Connor, B., Calabrese, C., Cardena, E., Eisenberg, D., Fincher, J., Hufford, D.J., Joans, W.B., Kaptchuk, T., Martin, S.C., Scott, A.W., and Zhang, X. (1997). Defining and describing complementary and alternative medicine. Alternative Therapies; 3(2): 49-57.

Ono, Y., Solomon, M.B., Elsasser, T.H., Rumsey, R.S., and Moseley, W.M. (1996). Effects of Synovex-S® and recombinant bovine growth hormone (Sumavubove®) on growth responses of steers: II. Muscle morphology and proximate composition of muscles. J Animal Sci; 74: 2929-34.

Outwater, J.L., and Barnard, N.N. (1997). Dairy products and breast cancer: the IGF-1, estrogen, and bGH hypothesis. Med Hypoth; 48: 453-461.

Paganini-Hill, A., Chao, A., Ross, R.K., and Henderson, B.E. (1987). Vitamin A, beta-carotene and the risk of cancer: a prospective study. J Natl Cancer Inst, 79, 443-448.

Pariza, M.W. (1994). Modern nutrition in health and disease. (8th ed.). (Shils, M.E., Olson, J.A., Shike, M. Eds.). Philadelphia: Lea & Febiger.

Passamani, E. (1991). Clinical trials - are they ethical? New Eng J Med; 324(22): 1589-91.

Pathak, D.R., & Whittemore, A.S. (1992). Combined effects of body size, parity, and menstrual events on breast cancer incidence in seven countries. Am J Epidemiol, 135, 153-168.

Patterson, R.E., White, E., Kristal, A.R., Neuhaus, M.L., and Potter, J.D. (1997). Vitamin supplements and cancer risk: the epidemiologic evidence. Cancer Causes & Controls; 8: 786-802.

Patton, M.Q. (1990). Qualitative Evaluation and Research Methods. Newbury Park: Sage.

Persky, V., & Van Horn, L. (1995). Epidemiology of soy and cancer: perspectives and directions. J Nutr, 125, 709S-712S.

Petrek, J.A., Hudgins, L.C., Ho, M., Bajorunas, D.R., and Hirsch, J. (1997). Fatty acid composition of adipose tissue, an indication of dietary fatty acids, and breast cancer prognosis. J Clin Oncol; 15: 1377-84.

Peyrat, J.P., Bonnetterre, J., Hecquet, B., Vennin, P., Louchez, M.M., Fournier, C., Lefebvre, J., and Demaille, A. (1993). Plasma insulin-like growth factor I concentrations in human breast cancer. Eur J Cancer; 29A(4): 492-97.

- Potischman, N., Weiss, H.A., Swanson, C.A., Coates, R.J., Gammon, M.D., Malone, K.E., Brogan, D., Stanford, J.L., Hoover, R.N., and Brinton, L.A. (1998). Diet during adolescence and risk of breast cancer among young women. Natl Cancer Inst; 90: 226-33.
- Pritchard, G.A., Jones, D.L., and Mansel, R.E. (1989). Lipids in breast carcinogenesis. Br J Surg; 76: 1069-1073.
- Prosser, C.G., Fleet, I.R., and Corps, A.N. (1989). Increased secretion of insulin-like growth factor I into milk of cows treated with recombinantly derived bovine growth hormone. J Dairy Res; 56: 17-26.
- Qi, X., Zhang, A., Wu, G., and Pang, W. (1994). The association between breast cancer and diet and other factors. Asia Pac J Public Health, 7(2), 98-104.
- *Rajan. (1998). Magic or logic: can "alternative" medicine be scientifically integrated into modern medical practice? Advances in Mind-Body Medicine; 14: 43-73.
- Richardson, S., Gerber, M., and Cenee, S. (1991). The role of fat, animal protein and some vitamin consumption in breast cancer: a case-control study in Southern France. Int J Cancer; 48: 1-9.
- Richter, E.E., and Safi, J. (1997). Pesticide use, exposure and risk: a joint Israeli-Palestinian perspective. Environ Res; 73:211-18.
- Risberg, T., Lund, E., Wist, E., Dahl, O., Sundstrom, S., Andersen, O.K., and Kaasa, S. (1995a). The use of non-proven therapy among patients treated in Norwegian oncological departments. A cross-sectional national multicenter study. Eur J Cancer, 31A(11), 1785-1789.
- Risberg, T., Lund, E., Wist, S., Kaasa, S., and Wilsgaard, T. (1998b). Cancer patients use of nonproven therapy: a 5 year follow-up study. J Clin Oncol; 16: 6-12.
- Rock, C.L., Flatt, S.W., Wright, F.A., Faerber, S., Newman, V., Kealey, S., and Pierce, J.P. (1997a). Responsiveness of carotenoids to a high vegetable diet intervention designed to prevent breast cancer. Can Epidemiol Biomarkers Prev; 6: 617-23.
- Rock, C.L., Jacob, R.A., and Bowen, P.E. (1996b). Update on the biological characteristics of the antioxidant micronutrients: vitamin C, vitamin E, and the carotenoids. Am J Clin Nutr; 96: 693-702.
- Rohan, T.E., and Bain, C.J. (1987a). Diet in the etiology of breast cancer. Epidemiol Rev, 9, 120-141.

REFERENCES

Rohan, T.E., Hiller, J.E., and McMichael, A.J. (1993b). Dietary factors and survival from breast cancer. Nutr Cancer, 20, 167-177.

Rohan, T.E., Howe, G.R., Friedenreich, C.M., Jain, M., and Miller, A.B. (1992c). Dietary fiber, vitamins A, C, and E, and risk of breast cancer: a cohort study. Causes & Controls; 4: 29-37.

Rohan, T.E., McMichael, A.J., & Baghurst, P.A. (1988d). A population-based case-control study of diet and breast cancer in Australia. Amer J Epidemiol, 128(3), 478-489.

Ronco, A., De Stefan, E., Mendilaharsu, M., and Deneo-Pellegrini, H. (1996). Meat, fat and risk of breast cancer: a case-control study from Uruguay. Int J Cancer; 65: 328-331.

Rose, D.P., Godman, M., Connolly, J.M., and Strong, L.E. (1991a). High-fiber diet reduces serum estrogen concentrations in premenopausal women. Am J Clin Nutr, 54, 520-525.

Rose, D.P., and Hatala, M.A. (1994b). Dietary fatty acids and breast cancer invasion and metastasis. Nutr Cancer; 21: 103-111.

Rosen, M.A., Logsdon, D.N., and Demak, M.M. (1984). Prevention and health promotion in primary care: baseline results on physicians from the INSURE project on lifecycle preventive health services. Prev Med, 13, 535-548.

Rosenberg, L., Metzger, L.S., and Palmer, J.R. (1993a). Alcohol consumption and risk of breast cancer: a review of the epidemiological evidence. Epidemiol Rev, 15(1), 133-144.

Rosenberg, L., Palmer, J.R., Miller, D.R., Clarke, E.A., and Shapiro, S. (1990b). A case-control study of alcoholic beverage consumption and breast cancer. Am J Epidemiol, 131(1), 6-14.

Rosenberg, L., Slone, D., Shapiro, S., Kaufman, D.W., Helmrich, S.P., Meittinen, O.S., Stolley, P.D., Levy, M, Rosenshein, N.B., Schottenbeld, D., and Engle, R.L. (1982c). Breast cancer and alcoholic-beverage consumption. Lancet, 1, 267-270.

Rosenburg W., and Donald, A. (1995d). Evidence based medicine: an approach to clinical problem-solving. BMJ;310: 1122-6.

Rubin, H.J., and Rubin, I.S. Qualitative Interviewing. The Art of Hearing Data. Thousand Oaks: Sage.

Sackett, D.L., Rosenberg, W.C., Gray, J.A.M., Haynes, R.B., and Richardson, W.S. (1996). Evidence based medicine: what it is and what it isn't. BMJ; 312: 71-72.

Saks, M. (1998). Professionalism and health care. In: Sociological Perspectives on Health, Illness and Health Care. Field, D., and Taylor, S. (Eds.). Blackwell Sciences Ltd.: Berlin, Germany.

Salonen, J.T., Alfthan, G., Huttunen, J.K., and Puska, P. (1984). Association between serum selenium and the risk of cancer. Am J Epidemiol, 120(3), 342-348.

Sasaki, S., Horacsek, M., and Kesteloot, H. (1993). An ecological study of the relationship between dietary fat intake and breast cancer mortality. Prev Med, 22, 187-202.

Sathyamoorthy, N., and Wang, T.T.Y. (1997). Differential effects of dietary phyto-estrogens daidzein and equol on human breast cancer MCF-7 cells. Eur J Cancer; 33(14): 2384-89.

Savage, E.P., Keefe, T.J., Tessari, J.D., Wheeler, H.W., Applehans, F.M., Goes, E.A., and Ford, S.A. (1981). National study of chlorinated hydrocarbon insecticide residues in human milk, USA. Am J Epidemiol; 113(4): 413-23.

Savitz, D.A. (1993). Re: Breast cancer and serum organochlorines: a prospective study among White, Black and Asian women. J Natl Cancer Inst; 86(15): 1255-6.

Schairer, C. Brinton, L.A., and Hoover, R.N. (1987). Methylxanthines and breast cancer. Int J Cancer; 40: 469-473.

Schechter, A., Toniolo, P., Dai, L.C., Thuy, T.B., and Wolf, M.S. (1997). Blood levels of DDT and breast cancer risk among women living in the North of Vietnam. Arch Environ Contam Toxicol; 33: 453-56.

Sellers, T.A. (1997). Genetic factors in the pathogenesis of breast cancer: their role and relative importance. J Nutr; 127: 929S-932S.

Senie, R.T., Rosen, P.P., Rhodes, P., Lesser, M., and Kinne, D.W. (1992). Obesity at diagnosis of breast carcinoma influences duration of disease-free survival. Ann Intern Med, 116(1), 26-32.

Shekhar, P.V.M., Werdell, J., and Basrur, V.S. (1997). Environmental estrogen stimulation of growth and estrogen receptor function in preneoplastic and cancerous human breast cell lines. J Natl Cancer Inst; 89: 1774-82.

Shenfield, G.M., Atkin, P.A., and Kristoffersen, S.S. (1997). Alternative medicine: an expanding health industry. Med J Australia; 166: 516-17.

Simonsen, N.R., Fernandez-Crehuet Navagjas, J., Martin-Moreno, J.M., Strain, J.J., Huttunen, J.K., Martin, B.C., Thamm, M., Kardinaal, A.F.M., van't Veer, P., Kok,

REFERENCES

F.J., and Kohlmeier, L. (1998). Tissue stores of individual monounsaturated fatty acids and breast cancer: the EURAMIC study. Am J Clin Nutr; 68: 134-41.

*Simonton, S.S., and Sherman, A.C. (1998). Psychological aspects of mind-body medicine: promises and pitfalls from research with cancer patients. Alternative Therapies; 4(4): 50-64.

Slensinski, M.J., Subar, A.F., and Kahle, L.L. (1995). Trends in use of vitamin and mineral supplements in the United States: the 1987 and 1992 National Health Interview Surveys. Am J Diet Assoc; 95(8): 921-923.

Smith, T. (1983). Alternative medicine. BMJ, 287(6388), 307.

Smith-Warner, S., Spiegelman, D., Yaun, S., van den Brandt, P.A., Folsom, A.R., Goldbohm, A., Graham, S., Holmberg, L., Howe, G.R., Marshall, J.R., Miller, A. B., Potter, J.D., Speizer, F.E., Willet, W.C., Wolk, A., and Hunter, D.J. (1998). Alcohol and breast cancer. A pooled analysis of cohort studies. JAMA; 279: 535-540.

Snyderwine, E.G. (1994). Some perspectives on the nutritional aspects of breast cancer research. Food derived heterocyclic amines as etiologic agents in human mammary cancer. Cancer; 74: 1070-7.

Sondik, E.J. (1994). Breast cancer trends. Cancer; 74:995-9.

*Southwest College of Naturopathic Medicine and Health Sciences. (1997). Become a naturopathic physician. [Brochure] Scottsdale, Arizona: Southwest College of Naturopathic Medicine.

Stavric, B. (1994). Role of chemopreventers in the human diet. Clin Biochem; 27(5), 319-332.

Stoll, B.A. (1996a). Obesity, social class and western diet: a link to breast cancer prognosis. Eur J Cancer; 32A(8): 1293-1295.

Stoll, B.A. (1997b). Macronutrient supplements may reduce breast cancer risk how, when and which? Eur J Clin Nutr; 51:573-77.

Stoll, B.A. (1998c). Essential fatty acids, insulin resistance and breast cancer risk. Nutr & Cancer; 31(1): 72-77.

Stoll, B.A. (1998d). Western diet, early puberty, and breast cancer risk. Breast Cancer Res Treat; 49: 187-93.

Tavani, A. Pregnolato, A. Vecchia, C.La., Favero, A. and Franceschi, S. (1998). Coffee consumption and the risk of breast cancer. Eur J Cancer Prev; 7: 77-82.

REFERENCES

The Economist, London. Are fears of chemicals justified? (1996). The Globe and Mail, Saturday, August 10: D8.

Thomas, D.B. (1993a). Breast cancer in men. Epidemiol Rev, 15, 220-231.

Thomas, K.J., Carr, J., Westlake, L., & Williams, B. (1991b). Use of non-orthodox and conventional health care in Great Britain. BMJ, 302, 207-210.

Toniolo, P., Riboli, E., Protta, F., Charrel, M., and Cappa, A.P.M., (1989a). Calorie-providing nutrients and risk of breast cancer. J Natl Cancer Inst, 81: 278-86.

Toniolo, P., Riboli, E., Shore, R.E., and Pasternack, B.S. (1994b). Consumption of meat, animal products, protein, and fat and risk of breast cancer: a prospective cohort study in New York. Epidemiol, 5, 391-397.

Trentham-Dietz, A., Newcomb, P.A., Storer, B.E., Longnecker, M.P., Baron, J., Greenberg, E.R., and Willet, W.C. (1997). Body size and risk of breast cancer. Am J Epidemiol, 145: 1011-19.

Tretli, S. (1989). Height and weight in relation to breast cancer morbidity and mortality. A prospective study of 570,000 women in Norway. Int J Cancer, 44, 23-30.

University of British Columbia (1998). The University of British Columbia 1998/99 Calendar. Vancouver, B.C.: The University of British Columbia Registrar's Office, Student Services.

University of Calgary (1998). University of Calgary Calendar: Faculty of Medicine. Ed. Salo, P. Calgary, Alta: University of Calgary Press.

Ursin, G., Bjelke, E., Heuch, I., and Vollset, S.E. (1990). Milk consumption and cancer incidence: a Norwegian prospective study. Br J Cancer, 61: 454-59.

Valente, C.M., Sobal, J., Muncie, H.L., Lenvine, D.M., and Antlitz, A.M. (1982). Health promotion: physician's beliefs, attitudes, and practices. Am J Prev Med, 2, 82-88.

Vandenbroucke, J.P. (1998). Observational research and evidence based medicine: what should we teach young physicians. J Clin Epidemiol, 51(6): 467-472.

van Noord, P.A.H., Maas, M.J., van der Tweel, I., and Collette, C. (1993). Selenium and the risk of postmenopausal breast cancer in the DOM cohort. Breast Cancer Resear Treatm, 25, 11-19.

van't Veer, P. (1994a). Diet and breast cancer: trial and error? Ann Med, 26, 453-460.

van't Veer, P., van der Wielen, P.J., Kok, F.J., Hermus, R.J.J., and Sturmans, F. (1990b). Selenium in diet, blood, and toenails in relation to breast cancer: a case-control study. Am J Epidemiol; 131(6): 987-994.

van't Veer, P., Van Leer, E.M., Rietduk, A., Kok, F.J., Schouten, E.G., Hermus, R.J.J., and Sturmans F. (1991c). Combination of dietary factors in relation to breast cancer occurrence. Int J Cancer; 47: 649-653.

Verhagen, H., Poulsen, H.E., Loft, S., van Poppel G., Willems, M.I., and van Bladeren, P.J. (1995). Reduction of oxidative DNA-damage in humans by Brussels sprouts. Carcinogen; 16(4): 969-970.

Viel, J., Perarnau, J., Challier, B., and Faivre-Nappez, I. (1997). Alcoholic calories, red wine consumption and breast cancer among premenopausal women. Eur J Epidemiol; 13: 639-43.

Waddell, W.J. (1998). Epidemiological studies and effects of environmental estrogens. Int J Toxicol; 17: 173-91.

*Walker, M. (1997). Chemical pollution of the body. Townsend Letter for Doctors and Patients; June: 48-52.

*Waters, J. (1996). Taking back our stolen future. Int J Alt & Comple Med; 14(12): 24-28.

Wattenberg, L. (1996). Chemoprevention of cancer. Prev Med, 25, 44-45.

Wechsler, H., Levine, S., Idelson, R.K., Rohman, M., & Taylor, J.O. (1983). The physician's role in health promotion-a survey of primary care practitioners. N Eng J Med, 308(2), 97-100.

Weinberg, A., and Andrus, P.L. (1982). Continuing medical education: does it address prevention. J Commun Health, 7(3), 211-4.

Weisburger, J.H. (1991a). Nutritional approach to cancer prevention with emphasis on vitamins, antioxidants, and carotenoids. Am J Clin Nutr, 53, 226S-237S.

Weisburger, J.H. (1997b). Dietary fat and risk of chronic disease: mechanistic insights from experimental studies. Am Diet Assoc, 97(suppl.), S16-S23.

Weisemann, A. (1997). Nutritional counseling in German general practices: a holistic approach. Am J Clin Nutr; 65(suppl): 1957S-62S.

Wiemeyer, S.N., Lamont, T.G., Bunck, C.M., Sindelar, C.R., Gramlich, F.J., Fraser, J.D., and Byrd, M.A. (1984). Organochlorine pesticide, polychlorobiphenyl, and

REFERENCES

mercury residues in bald eagle eggs - 1969-79-and their relationships to shell thinning and reproduction. Arch Environ Contam Toxicol; 13: 529-49.

Willet, W.C. (1994a). Micronutrients and cancer risk. Am J Clin Nutr, 59(suppl.), 1162S-1165S.

Willet, W.C. (1994b). Response to Wynder et al.'s paper on dietary fat and breast cancer. J Clin Epidemiol, 47(3), 223-226.

Willet, W. (1995c). Polyunsaturated fat and the risk of breast cancer. BMJ; 311: 1239-1240.

Willet, W.C. (1997d). Fat, energy and breast cancer. J Nutr; 127: 921S-923S.

Willet, W. (1997e). Specific fatty acids and risks of breast and prostate cancer: dietary intake. Am J Clin Nutr; 66(suppl): 1557S-63S.

Willet, W.C., and Hunter, D.J. (1994f). Prospective studies of diet and breast cancer. Cancer, 74, 1085-1089.

Willet, W.C., Hunter, D.J., Stampfer, M.J., Colditz, G., Manson, J.E., Spiegelman, D., Rosner, B., Hennekens, C.H., and Speizer, F.E. (1992g). Dietary fat and fiber in relation to risk of breast cancer. JAMA, 268, 2037-2044.

Wolf, M.S., Toniolo, P.G., Lee, E.W., Rivera, M., and Dubin, N. (1993). Blood levels of organochlorine residues and risk of breast cancer. J Natl Cancer Inst; 85(8): 648-52.

Wong, G.Y.C., Bradlow, L., Sepkovic, D., Mehl, S., Mailman, J., and Osborne, M.P. (1997). Dose-ranging study of indole-3-carbinol for breast cancer prevention. J Cell Biochem; 28/29(suppl):111-16.

World Cancer Research Fund / American Institute for Cancer Research (1997). Food, Nutrition, and the Prevention of Cancer: A Global Perspective. Menasha, WI: Banta Book Group.

World Cancer Research Fund / American Institute for Cancer Research (1997). Summary. Food, Nutrition and the Prevention of Cancer: A Global Perspective. Menasha, WI: Banta Book Group.

*Worthington, V. (1998). Effect of agriculture methods on nutritional quality: a comparison of organic with conventional crops. Alternative Therapies; 4(1): 58-69.

Wynder, E.L., Cohen, L.A., Muscat, J.E., Winters, B., Dwyer, J.T., Blackburn, G. (1997a). Breast cancer: weighing the evidence for a promoting role of dietary fat. J Natl Cancer Inst; 89: 766-75.

Wynder, E.L., Cohen, L.A., Rose, D.P., and Stellman, S.D. (1994b). Dietary fat and breast cancer: where do we stand on the evidence? J Clin Epidem, 47(3), 217-222.

Yuan, J., Wang, Q., Ross, R.K., Henderson, B.E., and Yu, M.C. (1995). Diet and breast cancer in Shanghai and Tianjin, China. Br J Cancer; 71: 1353-1358.

Zava, D.T. and Duve, G. (1997). Estrogenic and antiproliferative properties of genistein and other flavonoids in human breast cancer cells *in vitro*. Nutr Cancer; 27(1): 31-40.

Zhang, S., Folsom, A.R., Sellers, T.A., Kushi, L., and Potter, J.D. (1995). Better breast cancer survival for postmenopausal women who are less overweight and eat less fat. Cancer; 76: 275-83.

Zeigler, R.G., Hoover, R.N., Pike, M.C., Hildesheim, A., Nomura, A.M.Y., West, D.W., Wu-Williams, A.H., Kolonel, L.N., Horn-Ross, P.L., Rosenthal, J.F., and Hyer, M.B. (1993). Migration patterns and breast cancer risk in Asian-American women. J Natl Cancer Inst, 85, 1819-1827.

Zimmerman, M. (1995). Phytochemicals and disease prevention. Alternative & Complementary Therapies; April/May: 154-7.

Zevenbergen, J.L., Verschuren, P.M., Zaalber, J., van Stratum, P., and Vles, R.O. (1992). Effect of the amount of dietary fat on the development of mammary tumors in BALB/c-MTV mice. Nutr Cancer, 17, 9-18.

Zock, P.L., and Katan, M.B. (1998). Linoleic acid intake and risk: a review and meta-analysis. Am J Clin Nutr; 68: 142-53.

APPENDIX I



NATUROPATHIC CLINIC
General Family Practice
Natural Therapies

Naturopathic Physician

BASIC DIET FOR GOOD HEALTH

WHOLE GRAIN FOODS: Bread, cereal, rice, flour

Avoid refined breakfast cereals such as corn flakes, puffed or sugared cereals and sweet bakery products.

PURE MEAT, FISH AND POULTRY:

Avoid all processed meats such as bologna, weiners, sausages, manufactured meat loaves and luncheon meats.

If you are a vegetarian it is of special importance that you receive information from a trained nutritionist in order that you include sufficient protein, vitamin B12 and iron in your diet.

FRUIT AND VEGETABLES:

Most may be eaten raw, but if you do cook them be sure to use a minimum of water (which can then be used in soups) and do not overcook since this will destroy many of the valuable vitamins. Do not add any salt or sugar, and check the labels of canned and frozen produce for these and other harmful additives.

DAIRY PRODUCTS:

Use sparingly since cream, butter, and cheese are high in sodium (salt) and cholesterol. No other animal drinks milk after weaning nor does it drink the milk of another animal in its natural state.

BEVERAGES:

No caffeine should be used and decaffeinated coffee should be used sparingly. Decaffeinated tea is now available but also should be used sparingly. Pure fruit juices should not be taken in greater quantities that would be comfortable eaten in the whole fruit. Do not drink artificially sweetened juice, juice substitutes, soft drinks, or diet pop. The latter contain sweetening, flavoring, coloring, phosphoric and carbonic acids. Use them very sparingly if you must use them at all.

ROUGHAGE - FIBER:

Is necessary for good bowel function and can be found in whole grains, raw fruits and vegetables such as celery, carrots, lettuce, apples etc. Products such as bran may be added to the diet if constipation is a problem.

VITAMIN AND MINERAL SUPPLEMENTS:

Use only as advised by your doctor because individual needs are variable.

COMPLETELY AVOID ALL SUGAR:

It is not necessary either as a source of energy or for growth. It contributes to the breakdown of the adrenal glands, raised cholesterol levels and may be directly linked with diabetes, hypoglycemia and other disease states. It also contributes to tooth decay. If you must use honey use it very sparingly.

SALT (SODIUM):

Should be avoided since this contributes to high blood pressure and is only necessary in very hot climates or with extreme exertion.

FAT CONTENT OF FOODS

This guide lists the fat contents of foods starting with foods containing less than 10% and working up to foods with a higher fat content. Food high in fat are undesirable in the maintenance of good health.

Less than 20% fat

Beans, peas, and lentils
Bread
Buttermilk
Cabbage, boiled
Cereals, whole grain
 sugarless
Cottage cheese, uncreamed
Fish: ocean perch (broiled)
gruit
grains

Milk, skim
Seafood: scallops, shrimp
 (steamed or boiled)
Soup: Split pea
 consomme
 boullion
Tuna in water
Turkey, white meat, roasted
Vegetables

20-30% fat

Beef, sirloin (lean)
Corn muffins
Fish, cod (broiled)
Liver
Oyster, raw

Pancakes, whole wheat
Soups: chicken-noodle
 tomatoe
 vegetable
Wheat germ

30-40%fat

Beef: flank steak
 lean chuck pot roast
Chicken, roasted without skin
Cottage cheese, creamed
Fish: flounder
 haddock (fried)
 haligut (broiled)
Milk, 2%

Pizza with wheat flour
Seafood: scallops
 shrimp, breaded or fried
Soup: bean with pork
Tuna in oil drained
Turkey, dark meat, roasted
Yogurt (low fat)

40-50% fat

Beef: T-bone (lean only)
Hamburger (lean)
Chicken (fried)
Mackerel
Milk, whole

Pumpkin pie, without sugar
Salmon, canned
Turkey Pot pie
Yogurt (whole milk)

FAT CONTENT OF FOODS - Cont.

50-75% fat

Beef: rump, corned
Canadian Bacon
Chicken roasted with skin
Cream soups
Eggs
Lamb chops, rib
Oyster, fried
Fresh-water fish, fried
Tuna in oil

Cheese: blue
cheddar
american
swiss
Pork: ham
loin
shoulder (trimmed)
Veal
Tuna salad

75% fat or more (mostly unsaturated fats)

Avocados
Cocomut
Coleslaw dressing
Nuts

Peanut butter
Seeds: pumpkin
sesame
sunflower

75% fat or more (mostly saturated fats)

Bacon
Beef: rib
sirloin
loin untrimmed
hamburger (not lean)
Cold cuts, bologna, salami
Cream: heavy light
half & half
sour cream

Cream cheese
Head cheese
Hot dogs
Olives
Pork: Sausage
Spare ribs
butt
loin
ham, untrimmed

SUGAR-FOODS TO AVOID

Bagels*
Baking powder biscuits
Breath mints
Cakes
Candies
Canned fruit in sugar syrup
Chewing gum
Chocolate
Chocolate milk
Cocoa
Cookies
Corn sweetener
Corn syrup
Danish pastries
Dessert toppings
Dextrose or Dextrin
Diet candied appetite suppressants
Dinner rolls*
Doughnuts
English muffins*
Fruit juices (sweetened)
Fruited yogurts
Glucose
Honey
Ice cream
Ice cream toppings
Jams
Jello (various kinds)
Jelly
Ketchup
Kool-Aid (sugar sweetened)
Laxative candies or caramels

Lemon or limeade
Malted barley
Maple syrups
Mayonnaise
Pancake syrup
Pancakes
Pasta-spaghetti, macaroni, etc.*
Pastries
Pies
Pizza
Popsicles
Preserves
Pretzels
Relishes
Sherbets
Sodas
Soft drinks
Sweet pickles
Sweet rolls
Sweet and sour sauces
Thousand Island Dressing
White bread*
White flour croissants
White rice

*NOTE: Bread and pasta products made from whole wheat flour are acceptable.

COMPLEX CARBOHYDRATES

FRUITS

(dried fruits are too high in sugar to be used regularly)

apples
apricots
bananas
blackberries
blueberries
cherries
fresh fruit juices
grapes
grapefruit
guavas
mangoes
melons
nectarines
oranges
papayas
peaches
pears
persimmons
pomegranates
pineapples
prunes
raspberries
strawberries
tangerines

NUTS & SEEDS

(no added salt or additives)

almonds
hazel nuts
cashews
filberts
peanuts
poppy
pumpkin
sesame
sunflower
sprouted seeds
walnuts

WHOLE GRAINS, BEANS & LEGUMES

barley
black beans
black-eyed peas
brown rice
buckwheat
corn
dried split peas
flax
garbanzo beans
gluten flour
grits
kidney beans
lentils
lima beans
millet
navy beans
oats
pinto beans
popcorn
red beans
rye
sorghum
soy beans
wheat
wheat germ
white beans
whole grain-bread
cereals
crackers
pasta

VEGETABLES

artichokes
asparagus
avocadoes
beans-
 green
 yellow
 snap
beets
broccoli
brussel sprouts
cabbage
carrots
cauliflower
celery
corn
cucumber
eggplants
greens-
 collard
 lettuce
 turnips
 beet tops
 kale
green peas
mushrooms
okra
olives
parsnips, potatoes
onion, leeks,
 scallions
peppers
pumpkins
radishes
sauerkraut
spinach
sprouts-
 bean
 pea
 alfalfa
squashes
sweet potatoes
tomatoes
turnips
fresh vegetable
 juices
zucchini

A GUIDE TO A DIET THAT IS ESSENTIAL FOR PREVENTION AND DURING TREATMENT FOR CANCER

The most important observations of a diet for cancer patients are 1) not to have anything that promotes cancer growth, 2) not to have anything that slows down the immune system, 3) have everything that can promote the immune system, 4) would be nice to have something that can slow down cancer growth.

Following are a list of food that one should avoid or minimize in general for their ill effects to health :

Processed food, pesticides, can food, preserved food, deep fried food, 'BBQ' food, shell fish, fatty food, animal fats, red meats other than lean wild game meat, cow's milk (milk products such as yogurt, butter, cottage cheese, light cheese are acceptable), alcohol, caffeine, sugar.

A TYPICAL MENU FOR THE DAY

No margarine

A.M.

An orange or half a grapefruit
Porridge - make porridge thin and add one tablespoon of wheat germ after being cooked
Whole wheat bread (lightly toasted if desired) with butter and honey (lightly)
Cup of yogurt that has been prepared with proper culture (such as Olympic) with fresh fruit if desired
Egg, soft boiled or poached

NOON

Glass of organic tomato juice with large tablespoon of wheat germ cereal
Serving of organic free range chicken, turkey, lean wild game meat, veal liver or wild salmon
Boiled or steamed leafy dark green vegetable - important to keep vegetable green, do not over cook until turning yellow
Raw salads when desired - avoid when digestion is weak
Potato - boiled with skins or baked, rice or any whole grain is an alternative
Whole wheat bread with plenty of unsalted butter
Cup of yogurt
Fresh fruit

P.M.

Glass of soy milk or orange juice with tablespoon of wheat germ cereal
Serving of meat as noon with vegetable and plenty of fresh shiitake mushroom (cooked)
Serving of salad and cooked Gobo (fresh Burdock root) with the soup
Wheat wheat bread with butter - rice is a good alternative
One egg (fertilized if possible) porched on light toast
Fresh fruit
Cheese if desired

SUMMARY

Take plenty of fresh fruits and greens, cup of hot herbal tea with meals if desired. 1-2 servings of lean protein once a day, plenty of carrot juice or vegetable juice, whole grain is more desirable.

APPENDIX II

-UBC Letter Head-

RECRUITMENT LETTER

September 25, 1997

Dr. XXX
Address

Dear Dr. XXX,

I am presently beginning the second year of a Masters program in Human Nutrition at UBC. I have contacted you because of your professional experience with women either at risk of breast cancer, or who have been diagnosed with breast cancer and are undergoing treatment.

The aim of my research is to explore and describe how different traditions within health care understand the complex and often contradictory relationship between diet and breast cancer, and how they convey this understanding to their clients, to prevent or reduce the risk of breast cancer. This is part of a larger project (funded by British Columbia Health and Research Foundation) being conducted by my supervisor, Dr. Gwen Chapman examining the ways in which women construct their beliefs and perceptions of the links between breast cancer and diet. The primary objective of this arm of the project is to examine some of the information women receive from different health professionals.

To this end, I will be conducting in-depth interviews with physicians from both oncology and family medicine fields, and from naturopathic medicine, to collect information about the role of diet in breast cancer, and how this is translated into clinical practice.

I am writing to ask whether you would be willing to grant me an interview, at a time and place convenient for you. It would take an hour or less. I would be asking your opinions about the links between breast cancer and diet, and your experience in counseling women in regards to breast cancer risk. The questions will be open-ended. Your participation would be entirely voluntary, and you would receive an honorarium for your time. Should you grant me an interview, everything you say will be kept strictly confidential.

APPENDIX III

APPENDIX IV

SEMI-STRUCTURED INTERVIEW GUIDE¹**A. Interview Objectives**

- discuss understandings of the relationship between diet and breast cancer, in light of current pervasive scientific and lay messages regarding their links.
- explore physician's clinical counseling practices regarding breast cancer risk, with a specific emphasis on dietary recommendations.
- explore perceptions of other health professional's roles in reducing breast cancer risk, and attitudes and perceptions of how other practitioners may educate their patients about the role of diet in breast cancer.

B. Introduction / Intent of the Interview

- Formal personal introductions followed by an explanation of the purpose and relevance of the project.
- Request for consent (issue of consent form)
- Brief explanation of the research process, and how the interview will be conducted: interview recording and subsequent transcription, and assurance of subject confidentiality.

C. Subject Introductions

- Encourage the subject to discuss their professional practice:
 - Can you tell me a bit about your medical / naturopathic practice? How long have you been in practice?
 - Where were you trained? When was this completed?
 - Do you have any specific areas of interest / specialties?
 - What proportion of your practice relates to cancer detection?
treatment?
risk reduction?
 - What proportion of your patients have cancer?
have breast cancer?

¹ Original interview guide

- Can you briefly describe some of the general demographic characteristics of your breast cancer patients, such as ethnicity, age, and habitation?

D. Interview

1. Breast Cancer Etiology and Its Relationship to Diet

- As you see it, what factors play a role in the development of breast cancer?

- What is your understanding of the role of diet in breast cancer risk?

- Can you discuss any particular nutrition components which are important?

- How have you learned about the relationship between diet and breast cancer risk?

- Probe: sources of information
-criteria for acceptance or rejection of information

- What other sources of information regarding the relationship between breast cancer and diet do you may have access to?

2. Breast Cancer Risk Reduction Clinical Counseling

- In your experience, are adult women generally concerned with dietary change?
→ women with breast cancer?

- What do you tell your patients about diet and breast cancer causation / risk reduction?

- Can you describe information sources you aware of relating diet and breast cancer that are available to women?

- How do you think the public's 'awareness' of 'cancer' and 'cancer risks' influence their everyday life choices about diet and lifestyle?

3. Perceptions of Alternative / Conventional Health Professionals

- Explore your perceptions and attitudes of other practitioners, and towards alternative approaches to breast cancer risk reduction, with a specific emphasis on alternative dietary remedies.

- If one of your patients wanted more information about diet and breast cancer risk than you were able to provide, would you refer them somewhere else?

- Where would you refer them?

→ Would you refer them to a dietitian - why or why not?

→ In your experience, have your cancer patients pursued other sources of health care advice either to reduce the risk of breast cancer recurrence or initial onset?

→ Describe your views regarding the differences or similarities in your approach to cancer risk reduction and prevention compared to other health care practitioners

Probe: If a patient were seeking health care advice from other sources, how would your advice compare to a dietitian? a naturopath? a general practitioner or an oncologist? (informant dependent)

Conventional practitioner: → How would you respond to a client who was pursuing alternative dietary cancer therapies to reduce their risk of recurrence?
 → to reduce the risk of initial onset of cancer?
 → Can you describe any alternative dietary cancer approaches to breast cancer risk reduction or prevention of recurrence you are aware of?
 → In your opinion, how do you see referrals to non-conventional practitioners could play a role in your medical practice?
 → Can you explain your referral practice to dietitians, and where you see this kind of nutrition counseling fits into risk reduction patient education?

Non-conventional practitioner: → Can you explain how you see your practice in relation with conventional medical practice to reduce the risk of breast cancer?

→ In your opinion, is collaboration with conventional medicine important to reduce your patients' risk of breast cancer recurrence or initial onset?

→ Are referrals to conventional practitioners a part of your practice? What about referral to other health professionals?

E. Conclusive Comments / Questions

Discussion of other issues which I may have overlooked during the interview, identified by the physician / naturopath as important.

- Clarification of earlier questions; discussion regarding the honorarium; request for subsequent interview / questioning if necessary, as the research progresses.
- Request demographic information be filled out by the informant
- Mail out summary of findings for informant feedback

SEMI-STRUCTURED INTERVIEW GUIDE:
ONCOLOGISTS²

A. Interview Objectives

- discuss understandings of the relationship between diet and breast cancer, in light of current pervasive scientific and lay messages regarding their links.
- explore physician's clinical counseling practices regarding breast cancer risk, with a specific emphasis on dietary recommendations.
- explore perceptions of other health professional's roles in reducing breast cancer risk, and attitudes and perceptions of how other practitioners may educate their patients about the role of diet in breast cancer.

B. Introduction / Intent of the Interview

- Formal personal introductions followed by an explanation of the purpose and relevance of the project.
- Request for consent (issue of consent form)
- Brief explanation of the research process, and how the interview will be conducted: interview recording and subsequent transcription, and assurance of subject confidentiality.

C. Subject Introductions - Personal Information

- Encourage the subject to discuss their professional practice:
 - Can you tell me a bit about your medical practice?
 - Do you have any specific areas of interest / specialties?
 - What proportion of your practice relates to cancer detection?
treatment?
risk reduction?
 - What proportion of your patients have breast cancer?
 - Can you briefly describe some of the general demographic characteristics of your breast cancer patients, such as ethnicity, age, and habitation?

D. Interview

² Edited interview guide, specific for oncologists, June, 1997. Questions in normal font were in the interview guide for early interviews. Italicized questions were added in later interviews to explore and / or confirm emerging themes.

1. Breast Cancer Etiology and Its Relationship to Diet

- 1) Non-dietary etiologic factors: → As you see it, what factors play a role in the development of breast cancer?
 - Can you discuss any particular nutrition components which are important?
 - ⇒ *Age, genetics*
 - ⇒ *reproductive factors*
 - ⇒ *Exogenous hormones - HRT, birth control pill*
 - In your experience, are adult women generally concerned with dietary change?
 - What is your understanding of the role of diet in breast cancer risk?
 - ⇒ *Dietary fat*
 - ⇒ *Soy*
 - ⇒ *Fiber*
 - ⇒ *Alcohol*
 - ⇒ *exogenous hormones - found in pesticides, herbicides, animal products*
 - ⇒ *Would your dietary recommendations agree with "healthy" eating recommendations, to reduce the risk of CVD etc. - as opposed to specific recommendations re: diet?*
 - ⇒ *Would you consider dietary changes, supplement use in the same category as other 'unproven' cancer therapies?*
 - ⇒ *What would be a sufficient level of evidence to make a clinical recommendation?*
 - ⇒ *Given the fact that there is some evidence linking hormones present in various foodstuffs to cancer, but they do not meet the criteria necessary to substantiate a clinical recommendation, do you see a dilemma inherent in the structures of evidence-based medicine, precluding you from making recommendations when evidence is only suggestive? How does EBM restrict one's ability to make recommendations?*
 - ⇒ *One of the dilemma's described by some of the oncologists regarding evidence-based clinical counseling practices, rests in the struggle between providing 'facts' and still giving 'hope' - what do you think about that?*
 - ⇒ *One oncologist described her beliefs that recommending dietary changes were not warranted medically, however she saw it as an important part of her support of her patients. She said it was an important part of their 'journey' of dealing with the cancer - so she didn't disapprove of it - what do you think about that?*

- ⇒ *Can you explain your referral practice to dietitians, and where you see this kind of nutrition counseling fits into risk reduction patient education?*
- ⇒ *One oncologist said he would probably use a different criteria of 'evidence' when he compared himself to a dietitian - what do you think about that?*
- *How have you learned about the relationship between diet and breast cancer risk?*
- *Are you aware of any other sources of information regarding the relationship between breast cancer and diet that women have access to?*
- ⇒ *Most of the oncologists I have talked to said they did not think dietary changes mid-life, or in most women with breast cancer would make a significant difference in regards to preventing recurrence, however many believed early dietary changes may contribute to decreased risk.*
- ⇒ *First, what would you tell a woman who wanted to make dietary changes for her daughters?*
- ⇒ *Second, when do you think dietary changes could make a difference in cancer risk?*

2. Perceptions of Alternative / Conventional Health Professionals

- **Explore your perceptions and attitudes of other practitioners, and towards alternative approaches to breast cancer risk reduction, with a specific emphasis on alternative dietary remedies.**
- ⇒ *Have you have experienced patients pursuing naturopathic consultation?*
- ⇒ *What kinds of alternative dietary therapies are you aware of which your patients do?*
- ⇒ *Why do you think your patients pursue naturopathic consultation?*
- ⇒ *Some of the naturopaths feel patients come to them because they are getting things from them they aren't getting from physicians, such as a more 'holistic' approach, which emphasizes lifestyle practices. The also said naturopaths tend to take more time - comments?*
- ⇒ *If you could describe the typical patient who pursues alternative advice, what would they be like - for example, would they be the type to sort of want more definitive advice, which they followed verbatim, or would they be more proactive, more critical of their care, and weigh the evidence, and make decisions based on that?*

⇒ *Do you have a sense about how naturopaths make their clinical recommendations?*

⇒ *One oncologist described his perception of naturopathic recommendations as being largely 'belief based' - do you think any of your beliefs about diet and cancer influence the way you counsel your patients?*

→ How do you feel referrals to non-conventional practitioners could play a role in your medical practice (or vice versa for naturopaths)? - i.e. referrals?

E. Concluding Comments / Questions

- Discussion of other issues which I may have overlooked during the interview, identified by the physician / naturopath as important.
- Clarification of earlier questions; discussion regarding the honorarium; request for subsequent interview / questioning if necessary, as the research progresses.
- Request demographic information be filled out by the informant

SEMI-STRUCTURED INTERVIEW GUIDE:
NATUROPATH INTERVIEW³

A. Interview Objectives

- discuss understandings of the relationship between diet and breast cancer, in light of current pervasive scientific and lay messages regarding their links.
- explore physician's clinical counseling practices regarding breast cancer risk, with a specific emphasis on dietary recommendations.
- explore perceptions of other health professional's roles in reducing breast cancer risk, and attitudes and perceptions of how other practitioners may educate their patients about the role of diet in breast cancer.

B. Introduction / Intent of the Interview

- Formal personal introductions followed by an explanation of the purpose and relevance of the project.
- Request for consent (issue of consent form)
- Brief explanation of the research process, and how the interview will be conducted: interview recording and subsequent transcription, and assurance of subject confidentiality.

C. Subject Introductions

- Encourage the subject to discuss their professional practice:
 - Can you tell me a bit about your naturopathic practice? How long have you been in practice?
 - Where were you trained? When was this completed?
 - Do you have any specific areas of interest / specialties?
 - What proportion of your practice relates to cancer detection?
treatment?

³ Edited interview guide, specific for naturopathic practitioners, June, 1997.
Questions in normal font were in the interview guide for early interviews.
Italicized questions were added in later interviews to explore and / or confirm emerging themes.

risk reduction?

- What proportion of your patients have cancer?
have breast cancer?

Can you briefly describe some of the general demographic characteristics of your breast cancer patients, such as ethnicity, age, and habitation?

D. Interview

1. Breast Cancer Etiology and Use of Evidence

- As you see it, what factors play a role in the development of breast cancer?

- Can you discuss any particular nutrition components which are important?

⇒ *Dietary Factors to address:*

dairy products

organic products

sugar

red meat / animal products

soya / phytoestrogens

fat

antioxidants - (supplements, botanicals, others)

dietary fiber

specific vegetables

Others: Alcohol, additives, preservatives, pesticides, herbicides etc.

⇒ *Would your dietary recommendations for breast cancer be much different from those you'd recommend to an arthritic patient?*

⇒ *What are some important ways of understanding how particular dietary factors influence breast cancer?*

⇒ *What constitutes enough evidence for you to feel comfortable recommending a certain diet or dietary change for a patient?*

⇒ *What is the role of personal knowledge or intuition in your dietary counseling practices?*

- ⇒ *One ND described his perception of ND's and MD's as having 'personal' knowledge of nutrition. He believed that everyone has it, but that it "flows through" in some individuals - what does that mean to you?*

⇒ *Some of the other ND's I have spoken with describe their approach with patients as 'individualistic' - where they try to gear their advice / counseling to them personally. Do you have a similar approach / different? How do you achieve that?*

2. Keeping up on the knowledge

→ How have you learned about the relationship between diet and breast cancer risk?

→ Are you aware of any other sources of information regarding the relationship between breast cancer and diet that you may have access to?

3. Breast Cancer Risk Reduction Clinical Counseling

→ In your experience, are adult women generally concerned with dietary change?
→ women with breast cancer?

⇒ *I have just been diagnosed with breast cancer, and I have come to see you. Could you describe how you would proceed from that initial point in my care?*

→ What do you tell your patients about diet and breast cancer causation / risk reduction?

→ Can you describe information sources you are aware of relating diet and breast cancer that are available to women?

⇒ *After you have recommended a particular diet for someone, do they come to you for maintenance purposes, to keep up with it?*

⇒ *Once a diet is suggested, are there other things you recommend to deal with individual concerns or symptoms?*

⇒ *Do people generally stop coming when they are feeling better or have overcome their particular problem?*

4. Perceptions of Conventional Health Professionals

- Explore your perceptions and attitudes of other practitioners, and towards alternative approaches to breast cancer risk reduction, with a specific emphasis on alternative dietary remedies.

→ How do you feel referrals to conventional practitioners could play a role in your medical practice?

⇒ *What do you think patients are looking for when they come to see you / why do you think they come to see you?*

E. Concluding Comments / Questions

- Discussion of other issues which I may have overlooked during the interview, identified by the physician / naturopath as important.
- Clarification of earlier questions; discussion regarding the honorarium; request for subsequent interview / questioning if necessary, as the research progresses.
- Request demographic information be filled out by the informant