



NURSES' HEALTH STUDY NEWSLETTER

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In the past year, we have had a number of publications with important implications for women's health based directly on data from the Nurses' Health Studies. Below is a sampling of findings to which you have been a valuable contributor. Continuing high participation rates are essential to the validity of these results, regardless of your current employment or health status.

Long-Term Intake of Dietary Fiber and Decreased Risk of Coronary Heart Disease Among Women

High-fiber diets have been shown to influence three of the most important risk factors for coronary heart disease: cholesterol, diabetes, and blood clots. In the Nurses' Health Study, we found a direct relationship between fiber consumption and the risk of heart disease: for every 10 grams of fiber that a woman consumed per day, her risk of coronary heart disease decreased by about 20 percent. When we looked at specific sources of dietary fiber (including cereal, fruits, and vegetables), cereal fiber appeared to offer the most protection.

(Wolk A et al. JAMA 1999;281:1995-2004)

A Prospective Study of Walking as Compared with Vigorous Activity in the Prevention of Coronary Heart Disease in Women

Walking is the most common form of physical activity among American women—and may provide the same long-term health benefits as vigorous exercise. We found in the Nurses' Health Study that the risk of heart disease was similarly reduced among women who walked briskly for at least 3 hours a week and those who exercised vigorously for at least 1½ hours a week. Both groups of women were 30–40 percent less likely to develop heart disease than women who were sedentary.

(Manson J et al. New Engl J Med 1999;341:650-8)

Walking Compared with Vigorous Physical Activity and Risk of Type 2 Diabetes in Women

The Nurses' Health Study recently helped confirm what many other studies have previously reported—that

physical activity provides moderate protection against type 2 diabetes and that the more active women are, the less likely they are to develop the disease. We also found, though, that it is not necessary to run marathons to get benefit from physical activity. A modest increase in activity with something as simple as walking can lower the risk of diabetes, even if a woman has been sedentary her whole life. In addition, walking can be just as protective as vigorous activities, such as running or aerobics. In the Nurses' Health Study, women who walked briskly for 3 hours a week reduced their risk of diabetes as much as women who exercised vigorously for 1½ hours a week. Both groups of women had about a 40 percent reduction in the risk of diabetes.

(Hu F et al. JAMA 1999;282:1433-9)

Weight Cycling, Weight Gain, and Risk of Hypertension in Women

In the early 1990s, several studies reported that weight cycling might be associated with increased health risks. Weight cycling occurs when women repeatedly lose weight, only to gain it back. In the Nurses' Health Study II, we found that weight cycling did not affect women's risk of hypertension, but weight and weight gain did. The more a woman weighed (in terms of weight for height), and the more weight she gained, the more likely she was to develop hypertension. For every ten pounds that a woman gained over the course of four years, her risk of hypertension rose by 20 percent.

(Field A et al. Am J Epidemiol 1999;150:573-9)

Whole-Grain Consumption and Risk of Coronary Heart Disease

Whole-grain foods tend to be packed with heart-healthy vitamins and nutrients, including fiber, folate, and vitamin E. In the Nurses' Health Study, we found a 20 percent reduction in the risk of heart disease among women who ate at least one serving of whole grains a day. When we looked at specific whole-grain foods, we found that popcorn, brown rice, whole-grain breakfast cereal, and bran offered the most protection.

(Liu S et al. Am J Clin Nutr 1999;70:412-9)

A Prospective Study of Recreational Physical Activity and Breast Cancer Risk

Because active women tend to have lower estrogen levels than sedentary women, and breast cancer is related to estrogen levels, researchers have long speculated that physical activity might reduce the risk of breast cancer. We examined this possibility in the Nurses' Health Study and found that the effect of physical activity varied, depending on whether or not women had gone through menopause. We observed no association between activity and the risk of breast cancer among premenopausal women. Among postmenopausal women, however, activity appeared to offer modest protection. Those who engaged in at least one hour of activity a day were 20 percent less likely to develop breast cancer than those who were sedentary.

(Rockhill B et al. Arch Intern Med 1999;159:2290-6)

Additional Papers of Interest

- Rich-Edwards J et al. Birthweight and the risk for Type 2 Diabetes Mellitus in adult women. *Ann Intern Med* 1999; 130:278-84.
- Zhang S et al. Dietary carotenoids and vitamins A, C, and E and risk of breast cancer. *J Natl Cancer Inst* 1999;91:547-56.
- Cornuz J et al. Smoking, smoking cessation, and risk of hip fracture in women. *Am J Med* 1999;106:311-14.
- Holmes M et al. Dietary factors and the survival of women with breast carcinoma. *Cancer* 1999;86:826-35.
- Joshipura K et al. Fruit and vegetable intake in relation to risk of ischemic stroke. *JAMA* 1999;282:1233-9.
- Chasan-Taber L et al. A prospective study of vitamin supplement intake and cataract extraction among U.S. women. *Epidemiology* 1999; 10:679-84.
- Feskanich D et al. Oral contraceptive use and risk of melanoma in premenopausal women. *Br J Cancer* 1999;81:918-23.
- Fine J et al. A prospective study of weight change and health-related quality of life in women. *JAMA* 1999; 282:2136-42.

New NHS Website

The Nurses' Health Study has gone on-line. Check out the web site at www.nurseshealthstudy.org



Focus on Our Research Team

Once again, we'd like to introduce you to one of our staff members whose behind-the-scenes work is essential to the successful conduct of the Nurses' Health Studies. Please meet Karen Corsano, Senior Programmer.

Photo by Richard Chase



A Boston native, Karen attended Emmanuel College in her hometown and received a Bachelor's degree in History. Having earned an advanced degree in Medieval History at the University of Toronto, she then spent seven years teaching and studying in Naples, Italy. Upon her return to the US, Karen earned a certificate in com-

puter programming languages from the Cambridge Computer Learning Center. She joined our research team in 1985 to help us meet the growing demands of data management.

Karen plays an integral part in the management, storage, security, and verification of questionnaire data. Given that we receive close to 200,000 questionnaires each year, it is essential that we have uniformity among the many variables in our database. Each variable represents a question that was asked in the past twenty-four years. Even if questions were repeated over the years, there is a separate variable for each time that the question was asked. As a result, the database for the Nurses' Health Study currently contains more than 15,885 variables. Karen's successful design and maintenance of this database, along with her management of the programming team, has allowed us to analyze the wealth of data that participants have provided us with in the past twenty-four years. ■

Questions and Answers

Q The questionnaire always asks about illnesses that were diagnosed in the past two years, and yet there is also a column for diseases that are more than two years old. This is confusing. Do I need to report old illnesses?

A For most study participants, we are looking to update the information they provided on the last questionnaire (two years earlier). Even though some members of the study occasionally miss a cycle of the questionnaire, we still need to learn about any major diagnoses that they have had since we last heard from them. Thus, we provide a space for "older" diagnoses.

Q With all the computer break-ins and hackers around, how do I know that the information I give the Nurses' Health Study will remain private?

A First and foremost, we treat all of your responses in the same spirit that they are offered: as privileged information, to be shared with no one. The Nurses' Health Study is a confidential project, and it is our policy never to release individual information about any participant.

To protect your privacy, we have assigned you a unique ID number. Using this number, we can compile your questionnaire data, without ever using your name to identify the information. To maximize your confidentiality, we also keep your questionnaire data in a secure computer system that is completely separate from the system where your name and address are stored. Thus, while we take great care to protect our systems from unauthorized intrusion, even if someone were able to look at the data, they would not be able to determine which pieces of information belong to you or to any other study participant.

Q A few months ago, I received a certificate in the mail, thanking me for my participation in the Nurses' Health Study II. Does this mean the study is over?

A No, the Nurses' Health Study II is not over. We sent the certificate in celebration of the study's ten-year anniversary and as a token of our gratitude for your loyal participation. We look forward to another decade of collaboration and realize that our efforts could not succeed without your tremendous contribution.

Newsflash!

Throughout the past 24 years, you've no doubt read about the many important findings that have come about because of your participation in the Nurses' Health Study. We, in conjunction with Harvard Medical School, are compiling these findings into a new book from the many articles written by the Nurses' Health Study research group. *How Women Stay Healthy: Lessons from the Nurses' Health Study* is written for the general population, and will focus on the major lifestyle choices that affect women's health. It will also explore in depth those risk factors that contribute to the major diseases responsible for disability and premature death in American women. *How Women Stay Healthy* is scheduled for publication next year. We will let you know when the presses roll.

NHS Administrators

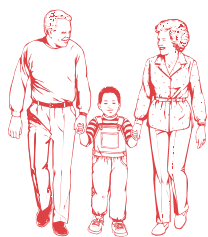
We would like to introduce you to the team of administrators that support the Nurse's Health Study. In addition to providing assistance to the investigators, this group is responsible for answering your questions and directing all calls that come in. They are the faces behind the voices at the Nurses' Health Study.

Photo by Richard Chase



Clockwise from top left; Susan, Sandra, Jennifer, Carol, Beverley, Hilary, and Angela.

New Directions and Ongoing Research



Growing Up Today Study: The Growing Up Today Study (GUTS) was established in 1996 when we enrolled approximately 9000 girls and 8000 boys, aged 9 to 14, all of whom are children of women in the Nurses' Health Study II. The children continue to complete questionnaires on an

annual basis and, as a result, have become part of one of the largest ongoing studies of adolescent health in the world. We know that we owe you a special "Thank You" for reminding your children to complete the questionnaires and return them to us. We appreciate your help tremendously.

During the past year, we have published five papers based on data from GUTS. You may have heard about the findings of two of the papers, since they were widely featured in the media. In October, we published a paper in *Pediatrics* on the relationship between weight concerns, weight control behaviors, and smoking initiation. We found that, among both boys and girls, those who reported being unhappy with their appearance were more likely than their peers to consider starting to smoke. We also found that boys and girls who smoked were more likely to be trying to control their weight than those who did not smoke. Among boys, those who exercised daily for weight loss were 90 percent more likely to have tried cigarettes than those who did not exercise for weight loss. Girls who reported that they were always on a diet were 80 percent more likely to have tried cigarettes than those who said they rarely dieted. Although very few girls reported that they purged (i.e. used vomiting or laxatives) to control their weight, those who did were more likely to have tried smoking than those who did not. (Tomeo C, *Pediatrics* 1999;104:918-24)

A month later, we published a second paper on weight control behaviors, this one focusing on how peers and the media influence the likelihood that girls will begin purging to control their weight. Among nearly 7,000 girls in GUTS, 74 began purging monthly within the first year of the study. The more frequently that girls reported trying to look like females on television or in magazines or movies, the more likely they were to begin purging. Peer influences were also important. The more frequently girls dieted to lose weight, the more likely they were to report that thinness was important to their peers. (Field A, *Arch Pediatr Adolesc Med* 1999; 153:1184-1189)

Our most recent publication appeared in *Pediatrics* in April. We examined how physical activity, inactivity, and dietary patterns affect weight change during a one-year period of the study. What we found is that, for girls, high caloric intake, low levels of physical activity, and high levels of inactivity lead to larger increases in weight. Results were similar for boys, except that caloric intake had no effect on weight gain. (Berkey C, *Pediatrics* 2000;105(4): e56.) ■

Cognitive Function in the Nurses' Health Study:



Many people are worried about maintaining their memory as they get older. This is a particularly important concern for women, who not only live longer than men, but also have higher rates of memory loss. Although much research has been done on the memory of people with established dementia, virtually nothing is known about maintaining memory in healthy women.

The Nurses' Health Study is in a unique position to understand how lifestyle and diet might affect memory, thanks to the informative and detailed lifestyle data you have provided over the past 24 years. We are now collecting information on memory from all of the women in the study who are 70 or older. Throughout the past few years, we have been calling women in this age group and asking them to complete a 15-minute telephone interview that consists of several standard memory assessments. Thanks to the willingness of study participants, we have completed nearly 11,000 of these interviews and are beginning to examine whether certain lifestyle factors might promote memory maintenance. For example, we are currently studying whether postmenopausal hormones help women maintain their memory.

In order for us to understand how women maintain their memory, we need to follow their memory patterns over time. Next winter, we will begin a second phase of telephone interviews, asking all of the women who completed a memory assessment to do so again. The interview will only take about 15 minutes. It is very important that we interview not only the women with good memories, but also those who are having difficulty so that we can understand possible differences between the two groups. ■

Quality of Life



Women are living longer lives than ever before: the average life expectancy of an American woman has increased from around 50 years in 1900 to close to 80 years today. Yet, there is more to long life than simply added years. The quality of life during those years is also important.

Quality of life is about more than just the absence of physical illness. It refers to a woman's ability to carry out her daily activities and perform social and work-related roles. Since 1992 in the Nurses' Health Study (and 1993 in Nurses' Health Study II), we have been asking about quality of life to determine which factors maximize women's ability to lead full and satisfying lives. Our motivation for this research is to understand how to "add life to years, instead of just adding years to life."

We have found in the Nurses' Health Study that a woman's weight in mid-life can affect her quality of life, in particular, her level of physical functioning, mobility, and general well-being. Regardless of their starting weight, women who put on more than five pounds during a four-year period lost the ability to perform daily activities more quickly than women who maintained a steady weight. Conversely, overweight women who successfully shed pounds tended to regain their levels of functioning. (*Fine J Jama 1999;282:2136-2142*)

Among older women, we found that the recipe for maintaining high levels of mental and physical health at advanced ages involves more than the usual prescription of healthy behaviors (like regular exercise and smoking cessation). It also includes community involvement and the maintenance of close contact with friends and relatives. For women in paid employment, stress on the job seems to predict an accelerated decline in mental and physical health. This stress is defined by high levels of psychological demands, combined with low levels of control over workplace decisions.

Research is now underway in the Nurses' Health Study to determine the predictors of quality of life outcomes among women diagnosed with breast cancer. In addition to clinical factors associated with tumor prognosis, the availability of social support seems to be a major determinant of psychological and physical adjustment following breast cancer diagnosis and treatment. ■

Nurse Participant Makes NHS the Recipient of Her Final Wish

Marilyn felt strongly about her participation in the Nurses' Health Study. Recently, she received our supplemental questionnaire directed toward women who have been diagnosed with breast cancer in the past. This questionnaire asks about medical treatment and the impact of the cancer diagnosis on physical and emotional functioning. Marilyn's husband told us that she wanted to fill out the questionnaire, but unfortunately she was too ill from breast cancer. She requested that when she died, donations be made to the NHS in lieu of flowers. Marilyn's husband called us two days after her funeral to tell us about Marilyn's wishes. We have since received over thirty donations to the Friends of Nurses' Health Study Fund from Marilyn's family and friends and are grateful for these contributions. The money in the fund is used to support additional research and educational activities for and about women. ■

Estimating Your Cancer Risk

Our colleagues at Harvard University have recently launched a web site that provides personal recommendations for reducing your risk of cancer. This site builds on results from NHS and gives tailored feedback that takes into account your responses to a set of questions. In this way, you can see how your risk would change if you modified your lifestyle. The site currently assesses the risk of breast, prostate, colon, and lung cancer. In June, it will be expanded to include risk assessments for eight additional cancers: ovarian, cervical, uterine, bladder, kidney, stomach, pancreatic and melanoma. Please visit the web site at <http://www.yourcancerrisk.harvard.edu> ■

Your Input

With every newsletter, our goal is to show you the broad scope of this study of which you are an integral part. We share stories about our research group and put faces with some of the names you may have heard or read. The newsletter, which is partially supported by the Friends of the Nurses' Health Study fund, is also our way of keeping in touch and giving a little something back to you. If there is a particular topic you would like to see in next year's newsletter, please let us know! All suggestions will be considered. Once again, many thanks for your participation. ■

Preventing Colon Cancer

Many women mistakenly think that colon cancer is a man's disease. In fact, more cases are diagnosed in women each year (50,000) than in men (43,000). Colon cancer is the third leading cause of cancer-related death among American women, claiming nearly 25,000 lives each year. However, it need not occupy such a high rank among the leading causes of death and illness in the United States. It is preventable and, when detected early, is almost always curable.

Of all the behaviors that can potentially reduce the risk of colon cancer, getting screened is the single most important one for women over age 50. Screening tests for colon cancer offer twice the benefits of screening tests for other diseases. First, just as mammograms can detect early stages of breast cancer, tests for colon cancer can detect the disease in its earliest, most treatable stages. When colon cancer is found before it has spread to other parts of the body, it is more than 90 percent curable. When it is not found, however, chances of long-term survival drop dramatically—to about 9 percent.

The added benefit of colon cancer screening is that it can actually prevent cancer from developing. When a woman is screened for colon cancer, her doctor is really looking for both cancer and adenomatous polyps (non-cancerous growths that have the potential to become cancerous). If these polyps are found, they can be removed immediately—before they have the opportunity to become cancerous. In this way, screening tests for colon cancer lower not only a woman's risk of dying from the disease, but also her risk of developing it.

Although there is often only one screening test available for any given disease (like mammography for breast cancer or Pap smears for cervical cancer), there are four to choose from for colon cancer: fecal occult blood testing, flexible sigmoidoscopy, barium enema, and colonoscopy. Each of these tests has been shown to be effective at detecting adenomatous polyps and early-stage cancers in women over the age of 50. There is still debate, however, about which test is most effective.

While all women over the age of 50 need to be screened for colon cancer, it may be important for some women to be screened even earlier. Those who have a sibling or parent with colon cancer or adenomatous polyps may need to get screened at age 40—or even earlier, depending on how old their relatives were when they were diagnosed. Those who have Crohn's disease or ulcerative colitis may also need to be screened earlier and more often than most women.

In addition to screening, researchers have identified a large number of behaviors that are related to colon cancer and are easily modifiable. The Nurses' Health Study has contributed greatly to this field, thanks to the detailed information you have provided over the past two decades. We have found that the most important behaviors women can adopt to reduce their risk of colon cancer, without raising their risk of other complications or diseases, are as follows.

Ways to Prevent Colon Cancer

- * Get screened regularly
- * Be more physically active
- * Eat a diet rich in vegetables and low in red meat
- * Take a daily multivitamin containing 400 mcg of folic acid
- * Maintain a healthy weight
- * Limit your alcohol intake to less than one drink a day

Making these lifestyle changes will also reduce your risk of other cancers, cardiovascular disease, osteoporosis, and diabetes. ■

Keeping Us Up to Date

As members of the Nurses' Health Study continue to age, some will unfortunately become disabled or develop conditions such as Alzheimer's or Parkinson's that may make it difficult to respond to future mailings. We hope to examine these and other serious illnesses and learn more about their causes. Thus, we encourage you to discuss your participation in the Nurses' Health Study with your family and your doctor. Should you become disabled in the future, it would greatly help our research if someone could notify us of your health status and subsequently assist us by allowing your pertinent medical records to be released to us. By combining the long medical and dietary histories you have provided over the years with details of later illness, we can identify possible causes of these illnesses, along with ways in which they may one day be prevented. ■