



# NURSES' HEALTH STUDY NEWSLETTER

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## Celebrating 25 Years with the Nurses' Health Study

Dear Colleagues:

We are thrilled to be celebrating the 25th anniversary of the Nurses' Health Study with you. When we began the study in 1976, we only hoped that we would be fortunate enough to be working with you into the new millennium. Through your continued participation and commitment to the study, you have made a tremendous contribution to the understanding of women's health, and we are grateful for your collaboration.

In the past twenty-five years, the study has evolved in a number of notable ways, from its research priorities to its spawning of two additional cohorts (the Nurses' Health Study II and the Growing Up Today Study). As you may recall, the original intent of the Nurses' Health Study was to examine the long-term health effects of birth control pills. As time has passed, we have expanded our research to study topics that are more relevant to older women, such as the effects of postmenopausal hormones and ways to prevent osteoporosis and memory loss. Our research focus has also shifted to reflect your interests as participants. For example, many nurses told us that they were concerned about factors that affect their quality of life. In response, we added questions to our surveys about caregiving, work stress, and social relationships. Finally, our research agenda has always remained flexible enough that we could address any new and potentially important issues that arose in women's health.

Among the most important findings that we have produced over the years are those that have shown that modest exercise like walking can lower the risk of heart disease, diabetes, stroke, and colon cancer; and that weight gain and postmenopausal hormones can increase the risk of breast cancer.



*Dr. Frank Speizer celebrating his 65th birthday, which coincided with the 25th anniversary of the Nurses' Health Study.*

Our future research also holds great promise. We have recently been funded by the National Institutes of Health to continue our work under the able direction of Dr. Graham Colditz. Research topics will include further exploration into genetic epidemiology, as well as a continued focus on the link between lifestyle behaviors and the risk of chronic diseases. As we move forward into this next stage of our work, we look forward to continuing our collaboration with you. Thank you again for your dedication and commitment.

Sincerely,

Frank E. Speizer, MD  
Founding Principal Investigator

## Genetic Analysis



Technological advances in recent years have led to an explosion in the knowledge of human genetics. Laboratory investigators have shown that alterations in specific genes can cause the transformation of a normal cell into a cancer cell—and that mutations in multiple genes are required to produce the most common forms of cancer. Much of the research on cancer genetics, including that of the Nurses' Health Study, now focuses on understanding how genes interact with lifestyle factors and environmental carcinogens to cause cancer. For example, although most people with lung cancer are smokers, the large majority of smokers never develop the disease. This suggests that some people might be more genetically susceptible to the dangers of cigarette smoking than others. By combining epidemiology with the exciting science of genetics, we hope to better understand what causes different types of cancer and how to prevent them.

In the Nurses' Health Study, our genetics research is currently focused on endometrial cancer, the most common gynecologic malignancy in the United States. This disease is thought to be caused primarily by an imbalance between estrogen and progesterone, or more specifically, by too much estrogen and not enough progesterone. For example, women who take estrogen after menopause without also taking progesterone have a greatly increased risk of endometrial cancer. Similarly, women whose menstrual periods began early in adolescence—and those who reached menopause late—are also at increased risk, since they will have been exposed to high levels of estrogen for a greater duration of their lives. However, many women with these risk factors never develop endometrial cancer, and this is probably due to variations in the genes that regulate estrogen. To address this in the Nurses' Health Study, we are using blood samples collected in 1989/1990 and assessing whether genetic alterations in the hormone pathway are associated with the risk of endometrial cancer. We will also examine whether these alterations interact with the risk factors mentioned above to further affect risk. Because our analyses are still considered research rather than clinical tests, we do not return individual results to participants. As always, we will not share individual participants' data, including results from genetic tests, with anyone. ■

## Focus on Our Research Team

With each newsletter, we like to introduce you to some of the researchers and staff members who make this important investigation possible. Please meet Dr. Immaculata De Vivo, Assistant Professor of Medicine at Harvard Medical School.

Photo by Richard Chase



*Dr. Immaculata De Vivo*

Dr. De Vivo received her doctorate from Columbia University after completing her thesis on the study of genes and cancer in a population-based setting. She continued her education with two post-doctoral fellowships, one at the University of California at Berkeley and the other at Stanford University, where she studied mouse models of leukemia. She came to Boston in July 1998 to continue her focus on the human genetics of cancer.

Dr. De Vivo is one of a new breed of investigators to come on board with the Nurses' Health Study, and in particular, our research on the population genetics of cancer. In the past two years, she has received funding from the National Institutes of Health and the American Cancer Society to study the interaction between genes, hormones, and the risk of endometrial cancer. Dr. De Vivo combines lifestyle information collected from participants with the genetic information collected from blood samples to identify relationships in cancer risk.

Dr. De Vivo is a living example of the healthy lifestyle that is promoted by the Nurses' Health Study. She bikes to work every day and is an active runner and hiker in all weather. She is also an avid vegetarian. She loves puzzles and admits that the study of science, particularly the broad study of cancer, is like a giant puzzle. ■

## Healthy Women, Healthy Lives



In celebration of the 25th anniversary of the Nurses' Health Study, we are pleased to announce the publication of *Healthy Women, Healthy Lives: A Guide to Preventing Disease from the Landmark Nurses' Health Study*. In this book, we gather together findings from our study and offer a summary of what is currently known about the major chronic diseases affecting women and ways to prevent them.

Providing straightforward information, tips for making healthy changes, and practical advice from primary care providers, we hope this book will be a valuable guide for all women. It is only because of your tremendous commitment to the study that such a guide was possible.

Since we realize that many Nurses' Health Study participants will be interested in this book, we have worked with the publisher to secure a greatly discounted rate of \$15 (plus \$3.95 shipping and handling) for all Nurses' Health Study participants. The regular retail price will be \$26. You can order up to five copies at the discounted rate. We had hoped to provide a complimentary copy to each participant, but the cost would have been more than 3 million dollars. Any proceeds we receive from the sale of full-price copies will go into the Friends of the Nurses' Health Study fund to support further research and training.

Nurses' Health Study participants:  
Please refer to the NHS newsletter we mailed you for details on how to order at this special rate.

## Recent Findings

### Whole Grains, Ischemic Stroke, and Type 2 Diabetes



Whole-grain foods tend to be rich in many nutrients and may also reduce the body's demand for insulin. In the Nurses' Health Study, women who ate at least one serving of whole grains a day had a 30 to 40 percent reduction in the risk of ischemic stroke and a 25 percent reduction in the risk of type 2 diabetes. A serving of grains is equivalent to a slice of wheat bread or a cup of brown rice. We also found that refined grains, such as white bread and muffins, offered little to no benefit—and may even increase the risk of diabetes. (Lui S et al. *JAMA* 2000;284:1534–1540. Lui S et al. *Am J Public Health* 2000;90:1409–15)

### Glycemic Index and the Risk of Coronary Heart Disease

The impact that a food has on blood glucose and insulin levels is estimated by its glycemic index. Foods with a high glycemic index (e.g., white bread) are converted to glucose quickly, while those with a low glycemic index (e.g., dried beans) are converted more slowly. A quick conversion causes both blood glucose and insulin to spike, and this can be bad for the heart.

In the Nurses' Health Study, we found that glycemic index had different effects on women's risk of heart disease depending on how much they weighed. Among lean women, there was no link between glycemic index and the risk of heart disease. Among overweight women, however, the risk of heart disease was twice as high among those who ate the most high glycemic index foods compared to those who ate the least. Why the difference between lean women and overweight women? Overweight women often have problems using their insulin efficiently. As a result, the insulin spikes caused by high glycemic index foods probably have a more dramatic impact than they would in leaner women who have normal insulin production. (Lui S et al. *Am J Clin Nutr* 2000;71:1455–61)

### Postmenopausal Hormones and Cognitive Function in Older Women

A number of studies in animals have suggested that estrogen has important influences on the brain, particularly on those parts that affect learning and memory. To address this question in women, we

used data collected from participants age 70 and older and looked at memory in relation to postmenopausal hormone use. Overall, women who were using hormones (or had used them in the past) did not have better memory skills than women who had never used hormones. The only difference was that women on hormones had slightly better verbal skills.

(Grodstein F et al. *J Am Geriatr Soc* 2000;48:746–52)

### Social Networks and Quality of Life

New data from the Nurses' Health Study suggest that social networks may play an important role in enhancing women's quality of life. Among older women, we found that having close friends, relatives, and confidants predicted the maintenance of physical function. For example, not having a confidant was associated with the same loss in physical function that is associated with being a heavy smoker or being obese. We also found that women who were socially connected had a much higher quality of life after breast cancer than those who were socially isolated.

(Michael Y et al. *Qual Life Res* 2000;8:711–22. Michael Y et al. *Cancer* 2000;89:2176–86)

### A Healthy Lifestyle and the Risk of Heart Disease

Research has long shown that women can lower their risk of heart disease either by eating well, exercising regularly, or not smoking. While each of these behaviors can certainly lower risk by a moderate amount, combining them into an overall healthy lifestyle can yield even greater benefit. In the Nurses' Health Study, we found that 80 percent of heart disease cases could be prevented or delayed if women did not smoke cigarettes, were not overweight, exercised for half an hour a day, and maintained a healthy diet.

(Stampfer M et al. *N Eng J Med* 2000;343:16–22)

### Physical Activity and the Risk of Cardiovascular Disease

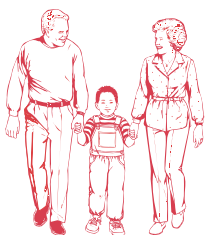


Data from the Nurses' Health Study suggest that walking regularly can protect both healthy women and diabetic women from cardiovascular disease. We found that walking at a pace of more than three miles an hour for at least one hour a week lowered the risk of stroke by about 30 percent among healthy women. The quicker a woman's pace was, the lower her risk. Results were similarly encouraging for diabetic women.

(Hu F et al. *JAMA* 2000;283:2961–7. Hu F et al. *Ann Intern Med* 2001;134:96–105) ■

## New Directions and Ongoing Research

### Growing Up Today Study:



As you may remember from a previous newsletter or because you have children participating, the Growing Up Today Study (GUTS) is our newest cohort study. It was started in 1996 and is comprised of approximately 17,000 girls and boys, who are now 14 to 19 years of age. Because adolescents change so rapidly, the participants in GUTS complete questionnaires every year. So far the response rates have been good, but we realize that as participants move off to college or work, it will be more challenging to follow them with annual mailed questionnaires. As part of our ongoing effort to adapt new technology and develop new strategies to maintain or improve response rates, we have developed a web-based version of the GUTS questionnaire. This year, more than 20 percent of participants chose to complete the new on-line questionnaire instead of the paper form. Below we summarize some of the most recent findings from GUTS.

**Family Dinner and Diet Quality.** Approximately 43 percent of GUTS participants eat dinner with their families every night, while 17 percent do so only rarely. The older the participants are, the less frequently they eat dinner with their families. After taking age into account, we found that eating family dinner was associated with a healthier diet that included more fruits and vegetables and less fried food and soda. (*Gillman M et al. Arch Fam Med 2000;9:235-40*)

**Adolescent Cigar Use and Other Tobacco and Alcohol Use.** We found that cigar use was particularly high among the oldest adolescents in the study (age 15), with 11 percent of girls and 25 percent of boys having tried cigars. At all ages, the children who had tried cigars were more likely than their peers to have experimented with cigarettes, smokeless tobacco, and alcohol. They were also more likely to have used these substances excessively. For example, among both girls and boys, binge drinking was reported by 7 percent of those who had tried cigars and only 1 percent of those who had not. (*Frazier AL et al. Pediatrics 2000;106:E26*)

**Parental, Peer, and Media Influences on the Development of Weight Concerns and Frequent Dieting.** Among both girls and boys, we found that the heavier children were the most likely to become

concerned with their weight and begin dieting frequently. In addition, some of the leanest girls also became concerned and began dieting. Although some weight concern might be appropriate among overweight children, and diets might even be advisable for these children, extreme concern with weight is never healthy, regardless of one's age or weight. Notably, we found that weight concerns were linked with both media and parental influences. Independent of age and weight, children who were making a lot of effort to look like same-sex figures in the media were 2 to 3 times more likely than their peers to become very concerned with their weight. Moreover, both girls and boys who reported that their thinness/lack of fat was important to their father were 2 to 3 times more likely than their peers to become constant dieters. (*Field AE, et al. Pediatrics 2001;107(1):54-60*) ■

### Second Blood Collection for Nurses' Health Study Participants:



We want to thank the thousands of women who contributed samples of blood and urine in the past ten years. These samples have been and continue to be an incredible resource for investigating the role of plasma markers (such as hormone or nutrient levels) and genetic markers in the development of disease in women. We are currently collecting a second blood sample from Nurses' Health Study participants who provided a first sample in 1989-90. These second samples will allow us to study how changes in plasma markers are associated with healthy aging. We have received an overwhelming response to this new sample collection and are extremely grateful for your willingness to participate. If you provided a blood sample ten years ago but have not yet received an invitation to participate in this new effort, you will hear from us soon. Thank you again for your continued dedication to the study. ■

### Asthma and Chronic Obstructive Pulmonary Disease:

Asthma and COPD are increasingly common problems among women in the United States. In July 2000, we were funded to investigate how lifestyle and diet might influence women's risk of these two respiratory diseases. This work will continue for several years but has already provided some interesting results. Early findings indicate that even among nurses, there is a tendency to under-treat these two conditions. Also, we have confirmed an earlier finding that overweight women have an increased risk of asthma. ■

### Cognitive Function in the Nurses' Health Study:

Although much research has been done on the memory of people with established dementia, virtually nothing is known about the maintenance of memory in healthy women. We are hoping to change that with new data being collected in the Nurses' Health Study. Thanks to the willingness of study participants, we recently completed almost 20,000 telephone interviews with nurses over age 70—making this the largest memory study ever done. We are now entering the next phase of the study and have begun calling back all of the women who initially participated, asking them to repeat a similar interview so that we can follow whether their memories have changed over time. It is very important that we interview all of the women, whether their memories are fine or they are having concerns, so that we can understand possible differences between the two groups. ■

### Saliva Sample Collection:

During the spring of 2001, we started asking Nurses' Health Study participants who had not previously donated a blood sample to participate in a simple, non-invasive saliva sample collection. Saliva samples contain DNA, which we can use as part of our ongoing research into the potential genetic markers of disease. Fortunately, providing a saliva sample is a very simple procedure. Those who agree to participate will just rinse their mouths with an ordinary mouthwash and then return a small cup of it to us. We will send all of the necessary materials, including the mouthwash, cup, and postage. Although we have only just begun the collection, we have been very successful so far, thanks to the long-standing commitment of study participants. To date, we have collected 500 of the 40,000 samples we hope to eventually obtain. ■



*Genetic Laboratory Personnel - Back Row: Robert O'Brien, David Hunter, Pamala Lescault. Front Row: Lori Arbeitman, Monica McGrath, Immaculata De Vivo.*

### Your Privacy

As a participant in the Nurses' Health Study, you have provided us with a wealth of data in the form of very personal information. Because of the trust you have shown in us, we are very careful to hold ourselves to the highest standards in the safekeeping and use of the data. As we move forward with the use of on-line questionnaires and other technological advances, we have made it a top priority to continue taking all available precautions to protect the privacy of your responses. We do not (and never will) make our mailing list available to anyone outside of the study for any reason. Your trust is essential to the success of the study, and we would never do anything to risk losing your faith in us. Thank you for your continued commitment to and trust in the Nurses' Health Study. ■

### . . . To the Ends of the Earth



In our 25 years with the Nurses' Health Study, we have heard a lot of reasons for why participants sometimes send their surveys in late. Here is one of our favorites. A couple years ago, a nurse returned a completed questionnaire that was badly warped and had obviously at one time been immersed completely in water. In the note accompanying the form, the participant explained that she had been living overseas and that the survey was in her husband's briefcase, which was stolen in Australia. The police later found the briefcase floating in the Indian Ocean with the survey more or less intact. The nurse told us she was slightly hesitant to explain the details because she thought it might sound too much like "my dog ate it." ■

### Your Input

With every newsletter, our goal is to show you the broad scope of the study of which you are an integral part. We share stories about our research group and put faces to 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. ■