FRAMINGHAM HEART STUDY
Three Generations of Dedication
1948 1971 2002
A Project of the National Heart, Lung, and Blood Institute and Boston University

The Framingham Heartbeat

The annual newsletter for the participants of the Framingham Heart Study | **Winter 2013**

The Framingham Heart Study is a project of the National Heart, Lung, and Blood Institute and Boston University.

What You Helped Discover in 2012

Your participation in the Framingham Heart Study continues to help scientists throughout the world unlock answers to many of medicine's most important and timely questions. Last year, scientists analyzed the information that you and thousands of other participants provided and published more than 130 articles in medical journals, including in premier journals such as *the Lancet* and *the Journal of the American Medical Association*.

But what do all of these discoveries have in common? They all started with you. After 65 years at the forefront of medical research, the Framingham Heart Study continues to show the world that extraordinary discoveries come from extraordinary participants. We thank you for your participation and proudly share with you the highlights of our discoveries from 2012.

January

New statistical methods are reported for measuring improvements in mathematical equations developed by Framingham investigators. These equations use a person's age, blood pressure, and other characteristics to estimate the risk of developing heart disease. The new methods evaluate whether adding a new measure, such as a genetic factor, improves the estimation.

February

A high number of white blood cells is associated with a heart rhythm disturbance called atrial fibrillation. (White blood cells are triggered in response to infection and also indicate inflammation.)

News for All Participants

News for Offspring (Second Generation) and Omni 1 Participants

March

13 new DNA sites are found to be associated with the age at which menopause begins.

April

Measures of body fat, such as waist circumference, are not associated with certain hormones regulating the body's salt and water levels.

May

A new DNA site is found to be associated with the distribution of fat cushioning the internal organs in women. No association is found in men.

32 new DNA sites are found to be associated with bone density.

June

6 new DNA sites are found to be associated with atrial fibrillation.

Individuals with stiff arteries have greater increases in blood pressure while performing daily living activities than those without.

July

12 DNA sites are found to be associated with sex hormone-binding globulin, the key transporter of testosterone and estrogen.

August

Narrowed arteries in the ankles or arms, often caused by plaque buildup, are associated with a decline in kidney function.

September

3 proteins released in response to heart stress in seemingly healthy individuals help to predict heart failure and death.

New evidence suggests that stiffening of the aorta, the largest artery in the body, happens before high blood pressure, not after.

October

A protein in the body that detects changes in the structure and function of the heart after it becomes injured (i.e., cardiac remodeling) also predicts the onset of heart failure and death.

November

Results from two different tests assessing kidney function are similarly associated with kidney failure and death. These associations are similar for individuals with and without diabetes.

December

High blood pressure has harmful effects on the brain. These effects can be seen in young adults before the age of 50 years.

The amount of calcium intake from the diet and supplements bears no relationship to the amount of calcium deposits found in the arteries supplying blood to the heart.

New in January 2013

Bouts of physical activity less than 10 minutes long are associated with lower levels of triglycerides (a certain type of fat in the blood), higher HDL or "good" cholesterol, smaller waist circumference, lower body mass index, and lower overall Framingham risk score.

For All Participants

Online medical history form

In Spring 2013, we're planning for you to be able to update your medical history on a private, secure website. We'll still send you the medical history forms by mail as usual, but you'll now have the options of reporting your responses online or by mail or telephone.

Calling all cohorts: Please keep sending us your medical history updates. In only a few minutes, you can make a lasting contribution to medicine.

The Dawber Memorial Scholarship

Are your children or grandchildren graduating from high school this year and planning to attend college? If so, please invite them to apply for our Dawber Memorial Scholarship, sponsored by the Friends of the Framingham Heart Study and now offering two prizes totaling $1,500. The first-prize recipient will receive $1,000. The second-prize recipient will receive $500. Please note that only children and grandchildren of Framingham Heart Study participants may apply.

Applicants should apply via email. Each email should include name, address, telephone number, and college and career plans (roughly a two-paragraph description) and an essay titled *What it Means to be a Participant in Medical Research*. This essay should be at least 1,000 words and be sent as an email attachment.

All submissions must be emailed to Brent Ardaugh (ardaugh@bu.edu) by Friday, April 12, 2013. Each applicant will receive an email confirmation within one business day. If applicants do not receive a confirmation, they should call Brent at (508) 663-4019.

The board members of the Friends of the Framingham Heart Study will judge the essays and notify recipients by May 2013. We'll invite the recipients to accept their prizes at our research center in Framingham.

Lynnel Eldridge/FHS

Last year's Dawber Scholarship recipient Abigail Johnson (Center) poses with (L-R) Framingham Heart Study Director Dr. Daniel Levy, her mother Cynthia Johnson, and the Friends of the Framingham Heart Study President Karen LaChance and Treasurer Peter Allen after accepting her $1,000 award on July 17, 2012, at our research center in Framingham.

When we notify you of genetic findings

Brent Ardaugh/FHS

Tubes of DNA-producing white blood cells at the Framingham Heart Study Genetics Lab at Boston University. DNA from these cells is analyzed to determine which genetic characteristics are associated with certain diseases.

DNA has improved our understanding of complex diseases but also has raised many important and challenging questions along the way. Today at the Framingham Heart Study, we're fortunate to be able to scan whole sets of participant DNA to explore which genetic characteristics are associated with certain diseases. For example, in addition to us asking whether body weight is associated with heart disease, as we did in the 1950s, we may now ask: which DNA sites are associated with heart disease? And where might these sites be found?

But research questions like these have also sparked important ethical questions, and one in particular: when should you be notified if we find that you have a certain form of a gene that is associated with a treatable disease?

This question has elicited responses from scientists, ethicists, and government bodies, such as the Centers for Disease Control and Prevention and the National Heart, Lung, and Blood Institute. We also take this question seriously and continue to hold regular meetings with our advisory boards containing geneticists and local physicians and our Ethics Advisory Board, which includes Framingham Heart Study participants.

With the approval of the Boston University School of Medicine Institutional Review Board and with your consent, we currently report genetic findings, if a scan of your DNA reveals that you have a sequence associated with Hemochromatosis or Familial Mediterranean Fever. Hemochromatosis is a disorder that leads to too much iron in your body. Familial Mediterranean Fever is a disorder that causes repeated fevers and inflammation.

We report these two findings to some of you and, with your permission, to your physician because they are scientifically valid and because effective testing and treatment approaches are available. These research findings may prompt a visit to your physician, but they are not meant to replace the results of clinical diagnostic genetic tests. Many other genetic associations that we find are preliminary and exploratory, and therefore are not reported to individuals at this point in the research. We value your trust and will continue to update you.

Thank you to our Ethics Advisory Board

We're grateful to have a team of thoughtful physicians, clergy, ethicists, lawyers, participants, and other members of the local community, who help us navigate the challenging but inevitable questions in medical research. These talented men and women, who represent many perspectives, all share one mission: "We are to ensure the utmost confidentiality, uphold the highest ethical standards on information, practices, processes that strengthen, preserve and protect the enormous trust given to the Framingham Heart Study by the members." We thank the Ethics Advisory Board for its outstanding job upholding that mission.

To learn more about our Ethics Advisory Board, please contact Moira Pryde at (508) 935-3487 or mmpryde@bu.edu.

Had your exam already? Sign up for our MRI, neuropsychological, and bone studies

Our brain and bone studies are leaping forward with success and yielding extraordinary results. Recently, our brain researchers discovered that choline, a nutrient found in foods such as milk and eggs and also a building block for a chemical that excites neurons and other cells, is related to improved cognitive performance. Our bone researchers also discovered that with aging, the muscles surrounding the spine become less dense, indicating that fat is getting into the muscle tissue.

We're making history at the Framingham Heart Study, and we'd like you to be part of it as much as possible. If you've completed your exam cycle, please contact Linda or Paulina (see below) to learn about how you can participate in these studies. We'll gladly schedule any additional exams on the same day as your regular exam. Offspring Spouse participants, Omni participants, and those who missed previous exams may also participate.

For questions about the MRI, neuropsychological, and bone studies, please contact Linda Farese at (508) 935-3488, (800) 248-0409, or lfarese@bu.edu. For Spanish-speaking participants with questions about the neuropsychological study, please contact Paulina Drummond at (508) 935-3485, (888) 689-1682, or pautras@bu.edu.

For Offspring (Second Generation) and Omni 1 Participants

Exam deadlines approaching

We're on pace for a magnificent finish to this round of exam cycles, but we need a boost in your participation in the home stretch. If you haven't yet visited us for your exam, please contact Maureen or Paulina (see below) today to schedule your visit. We'll gladly accommodate your schedule, especially if you'll be visiting us from out of town. Remember, every discovery from the Framingham Heart Study starts with you.

For participants in the Offspring (Second Generation) cohort, please contact Maureen Valentino at (508) 935-3417, (800) 536-4143, or maureenv@bu.edu. For participants in the Omni cohort, please contact Paulina Drummond at (508) 935-3485, (888) 689-1682, or pautras@bu.edu.

A new ancillary study to investigate sleep, by mail

In a proposed ancillary study on sleep currently under review, we plan to collect data entirely by mail, providing a simple and convenient way for you to make a valuable contribution to medicine—all while you sleep.

Brent Ardaugh/FHS

The Nonin WristOx (left) measures blood oxygen during sleep. The M1 recorder (right) measures the electrical activity of the heart.

We're teaming up with Dr. Robert Thomas, an assistant professor at Harvard Medical School and a physician at Beth Israel Deaconess Medical Center, to explore how sleep quality affects the onset and progression of various diseases. The data collected from this study could have profound implications for our understanding of sleep quality.

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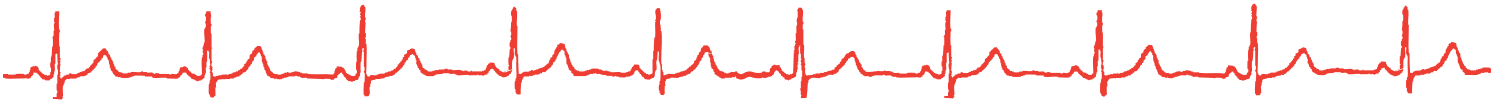

Sleep loss is associated with a variety of health problems, including obesity, diabetes, heart disease, and death.

Participants would wear small devices on the wrist, finger, and chest, to monitor the rhythm between the heart and breathing rates during sleep, an important indicator of sleep quality.

Actical and 24-hour urine collection

Our investigators recently analyzed data from the Actical monitors of Third Generation participants and discovered that bouts of physical activity less than 10 minutes long were associated with lower levels of triglycerides (a certain type of fat in the blood), higher HDL or "good" cholesterol, smaller waist circumference, lower body mass index, and lower overall Framingham risk score. We're continuing to collect data for our 24-hour urine project.

Please keep sending us your Acticals and urine samples. Each time you do, you're directly contributing to a discovery.

For questions about the Actical physical activity monitor, please contact Christine Hess at (508) 935-3459 or chess@bu.edu. For questions about the 24-hour urine study, please contact Barbara Inglese at (508) 935-3451 or bji@bu.edu.

www.framinghamheartstudy.org

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Newsletter written by Brent Ardaugh/FHS