

HEARTBEAT

Cardiovascular Health Study

Spring 1993 Special Issue

To our CHS participants

Many of you are now in your fourth year as participants in the Cardiovascular Health Study. The time and energy you have invested in CHS is the basis for what we do. None of it would be possible without you.

Some of you have asked us recently what CHS is learning from the information your interviews and examinations have provided us. We decided to summarize some of the articles that have been published in medical journals describing what our researchers have found since CHS began.

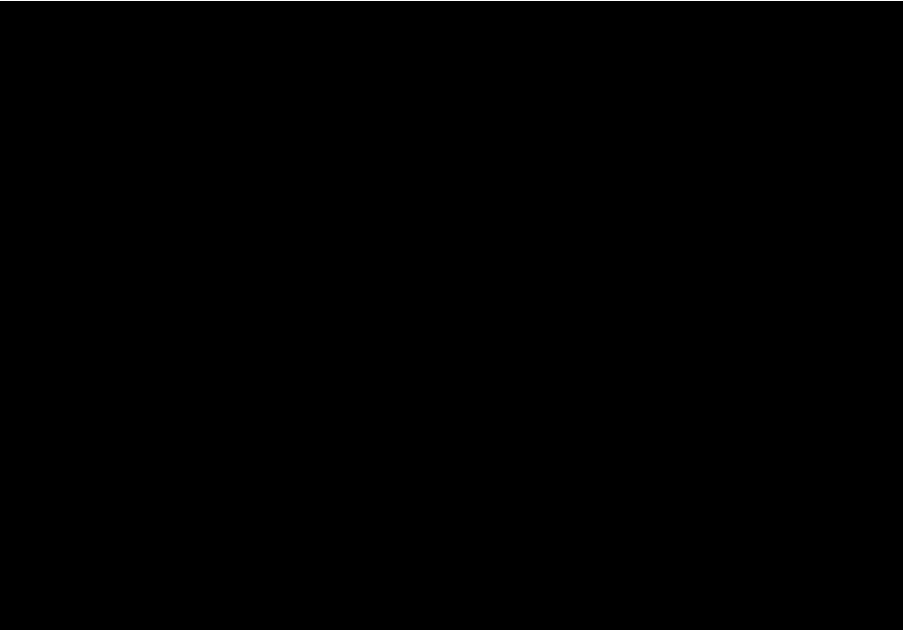
Medical journal articles are an important communications link between researchers and medical professionals who need current information to give their patients the best care possible.

We have paraphrased these articles to make them more readable. To protect your privacy, we used volunteer models in the photographs accompanying the stories rather than CHS participants.

Because CHS is a long-term project, firm conclusions about many aspects of the study may not be made for several more years. Yet CHS has already discovered patterns and trends that will make an immediate difference in the quality of health care for many older adults.

Thank you again for your continuing participation in this project, without which our work would be impossible.

Linda Fried, MD, MPH
Principal Investigator
Washington County Field Center



Dr. Richard Kronmal, left, and Bonnie Hermanson discuss research

Rationale for CHS

The Cardiovascular Health Study: Design and Rationale

Published in *Annals of Epidemiology*, February 1991.

Authors: LP Fried, NO Borhani, P Enright, CD Furberg, JM Gardin, RA Kronmal, LH Kuller, TA Manolio, MB Mittelmark, A Newman, DH O'Leary, B Psaty, P Rautaharju, RP Tracy, PG Weiler.

During the next twenty years, the incidence of coronary heart disease and stroke in the US, and the cost of treating these diseases, is expected to increase by 40%. The majority of this increase will occur in persons aged 65 and older; yet until CHS very little research had targeted this age group. In the past, most studies focused on the risks of coronary heart disease for middle-aged white males; little attention was given to determining which risk factors might lead to heart disease and stroke in females, African-Americans, or older adults. (A risk factor is a condition, a lifestyle or family history pattern, or anything else that may affect health.)

The first research paper published by the investigators of CHS put the medical community on alert that such a study is under way, and that during the coming

years, data from this study may provide information that will help medical professionals identify older adult patients who may be at risk for coronary heart disease, stroke, and other cardiovascular diseases. This identification may in turn lead to earlier diagnosis and treatment of heart disease in these patients, increasing both the quality and length of life. A better understanding of risk factors may also lead to lifestyle changes that will reduce the incidence of heart disease and stroke among older adults.

This first paper, titled "The Cardiovascular Health Study: Design and Rationale," also described in detail how CHS is designed and what methods and procedures are being used to meet the goals of the study. CHS is an observational

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Looking for a connection: orthostatic hypotension and cardiovascular disease

Orthostatic Hypotension in Older Adults

Published in Hypertension, June 1992.

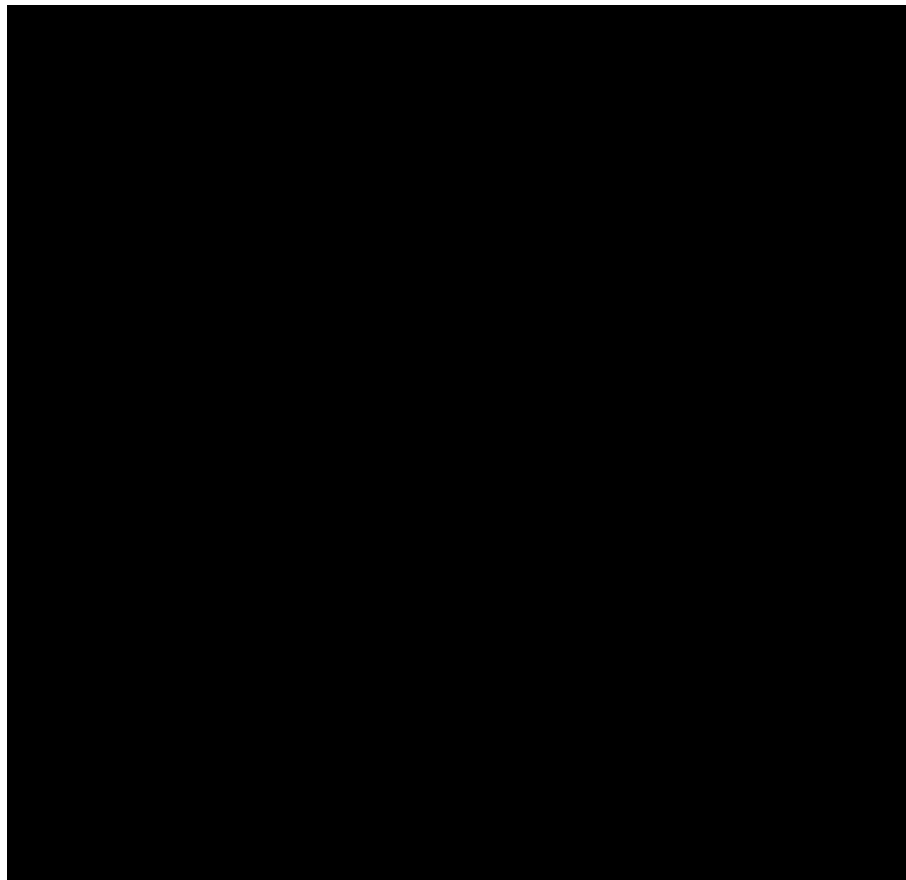
Authors: GH Rutan, B Hermanson, DE Bild, SJ Kittner, F LaBaw, GS Tell.

During your first clinic visit, and perhaps again at a recent visit, you may recall having your blood pressure measured while you were lying on an examining table. Then you were asked to stand up, and your blood pressure was measured again. You may also recall being asked if you felt faint or dizzy when you stood up.

These blood pressure measurements are used to determine how common orthostatic hypotension (a fall in blood pressure upon standing up) is among our CHS participants. Orthostatic hypotension, or OH, may cause dizziness, fainting, and falling. CHS researchers wanted to

determine how common OH is among participants, and whether it may be associated with other factors, such as age, the use of certain medications, or the presence of other diseases such as diabetes.

OH was present in slightly over 18% of CHS participants. This included participants whose measurements were not completed because they said they felt dizzy



A CHS "participant" has her blood pressure measured while lying on an examination table as part of her screening for orthostatic hypertension.

or faint when they stood up. OH was more prevalent with increasing age, and occurred with about equal frequency in men and women. Participants without OH generally had a more positive opinion of their own health. OH was not related to smoking, but participants with OH weighed significantly less than other participants. OH was more common in participants

who also showed symptoms of atherosclerosis, and was more likely to occur when the blood pressure measurements were taken later in the day. It did not appear to be more common in participants with diabetes, and was not associated with taking medications.

As additional data are gathered during the coming years, the information from these blood pressure measurements will help CHS investigators determine whether the presence of OH is related to future cardiovascular or ce-

rebrovascular disease. If there is a strong relationship, then OH may be considered a risk factor for heart disease. Medical professionals may then use blood pressure measurements similar to those used by CHS to determine whether a particular patient is at risk and may therefore require more tests or closer monitoring.

Do cholesterol levels make a difference?

Lipoprotein Lipids in Older People

Published in *Circulation*, September 1992.

Authors: WH Ettinger, PW Wahl, LH Kuller, RL Bush, RP Tracy, TA Manolio, NO Borhani, ND Wong, DH O'Leary.

We at CHS have often told you, our participants, how important you are to this study, and how much we appreciate the time you have contributed in the past. But if we are to reach our goals, it is vital for you to continue coming for your annual examinations and to keep us informed about your health. The information we have collected from you up to now is the base from which we will be able to draw conclusions in the future. But the information can only have meaning as we observe how your health progresses during the coming years. The research paper "Lipoprotein Lipids in Older People" illustrates how this works.

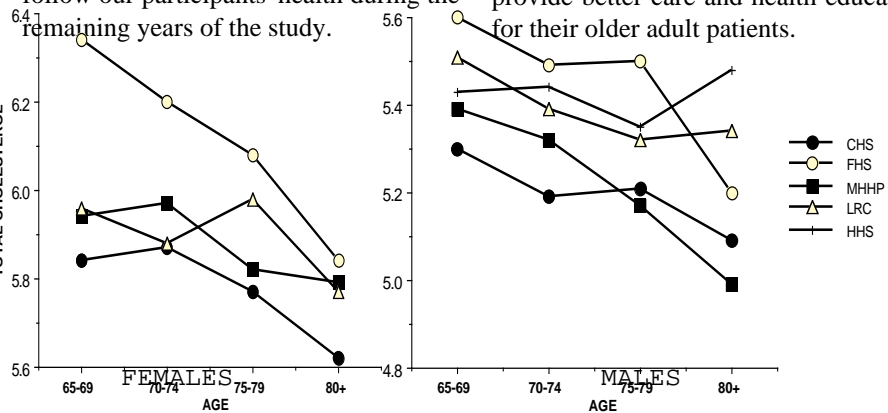
Past research has clearly identified high levels of tryglycerides and low-density lipoprotein cholesterol (LDL-C) as risk factors for coronary heart disease in young and middle-aged adults. High-density lipoprotein cholesterol (HDL-C) has also been shown to help protect against heart disease in these age groups. But very little research has been done on the effects of these lipoprotein lipids in older adults. One of the goals of CHS is to gather information from its participants that will help determine whether finding their levels of lipoprotein lipids can help predict who may be at risk for heart disease, and whether these lipoprotein lipid levels are related to other factors, such as age, sex, and medication use.

This research paper describes how CHS investigators measured the levels of cholesterol and tryglycerides in participants, and what other information was gathered from the participants for use in drawing conclusions. But before we can determine whether lipoprotein lipid levels may be a risk factor for heart disease, we will need to know which participants de-

velop heart disease in the future. That is why your continued participation in CHS is vital.

Although our primary question about lipoprotein lipid levels won't be answered until sometime in the future, the information gathered and examined thus far has provided some interesting facts. We found that triglyceride, total cholesterol, and LDL-C concentrations were lower among our participants than among participants in other similar studies. We also found that these levels were lower among our oldest participants.

As is often the case, this information raises more questions: Does the aging process somehow change cholesterol levels, or are our participants making more conscious efforts to keep their cholesterol levels low? Or, do people with lower cholesterol levels simply live longer? These questions may also be answered as we follow our participants' health during the remaining years of the study.



Comparison by age and sex of total cholesterol levels in participants of Cardiovascular Health Study (CHS), the Framingham Heart Study (FHS), the Minnesota Heart Health Program (MHHP), the Lipid Research Clinics (LRC) and the Honolulu Heart Study (HHS).

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study, which means that the procedures included are designed to provide information about the participants, and no experimental tests, treatments or drugs are used. It is also a longitudinal study, meaning that this observation will continue over a period of years through several clinic visits and telephone contacts.

The authors described how CHS enrolled approximately 1300 men and women age 65 and older in each of four US communities to become participants in the study. The schedule of examinations and telephone contacts was given, and the procedures to be included at each contact were described. The authors explained why each procedure was selected, and what information they hope to gain from performing these tests. They also described the extensive quality control activities designed to ensure that the methods of data collection are uniform among the four clinic sites.

Although much of the data from CHS will not be complete for several years, the detailed descriptions of the goals, structure, and procedures of CHS in this first paper have already had an impact on the medical community. Several other research groups have adapted CHS forms, procedures, and data base management systems for use in their own studies. And medical professionals are now aware that a study is under way that will provide them with information in the near future to help them provide better care and health education for their older adult patients.



A CHS interviewer takes information from a prescription medication container brought in by a "

Finding out how the medicines you take may affect your health

Assessing the Use of Medications in the Elderly: Methods and Initial Experience in the Cardiovascular Health Study

Published in the *Journal of Clinical Epidemiology*, June 1992.

Authors: BM Psaty, M Lee, PJ Savage, GH Rutan, PS German, M Lyles.

Recent research has shown that taking some kinds of medicines may affect future cardiovascular health - either positively or negatively. To determine what, if any, effect the use of medication has on the health of older adults, CHS needed to know what medicines were being taken by each participant at the time the person entered the study.

Finding out what medicines a person is taking sounds like a simple task, but getting an accurate record can be complicated. People often don't remember all of the medicines they are taking, or can't remember the name of a particular medicine. CHS researchers decided the most

accurate way to determine what each participant was taking was to inventory the medicine containers in the participant's home. At baseline, each participant received an in-home interview, and was asked during that interview to provide the containers of all the medicines they were currently taking. The interviewer copied the name, strength, and dosing instructions from each container. Then the interviewer asked whether the participant was also taking any over-the-counter medicines, such as aspirin, and how often they were taken.

This information was entered into a computer database designed specifically

for CHS by one of its investigators. The computer software program was able to give each medicine a code number and to assign similar medications into categories. These data were used to estimate the prevalence of medication use among CHS participants, and will provide a basis for determining whether use of certain medicines seems to predict either the presence or absence of future cardiovascular disease. This information may help medical professionals decide in the future which medicines should be prescribed and which should be avoided for their older adult patients, especially those with evidence of cardiovascular disease.

Isolated systolic hypertension A clue to heart disease

Isolated Systolic Hypertension and Subclinical Cardiovascular Disease in the Elderly
Publishes in the Journal of the American Medical Association, September 1992.

Authors: BM Psaty, CD Furberg, LH Kuller, NO Borhani, P Rautaharju, DH O'Leary, DE Bild, J Robbins, LP Fried, C Reid.

You have been hearing for years that "high blood pressure" can lead to early heart attack. But the "high blood pressure" you have been hearing about is just one kind of high blood pressure: diastolic hypertension. Most research in the recent past has been on the effects of this kind of high blood pressure on the cardiovascular health of middle-aged males.

Another kind of high blood pressure, called isolated systolic hypertension (ISH), has also been shown to be a risk factor for coronary heart disease, especially in older adults. CHS investigators decided to determine whether a person with ISH was more likely to show symptoms of cardiovascular disease when no diagnosis of such illness had been made. This undiagnosed disease is called "subclinical disease."

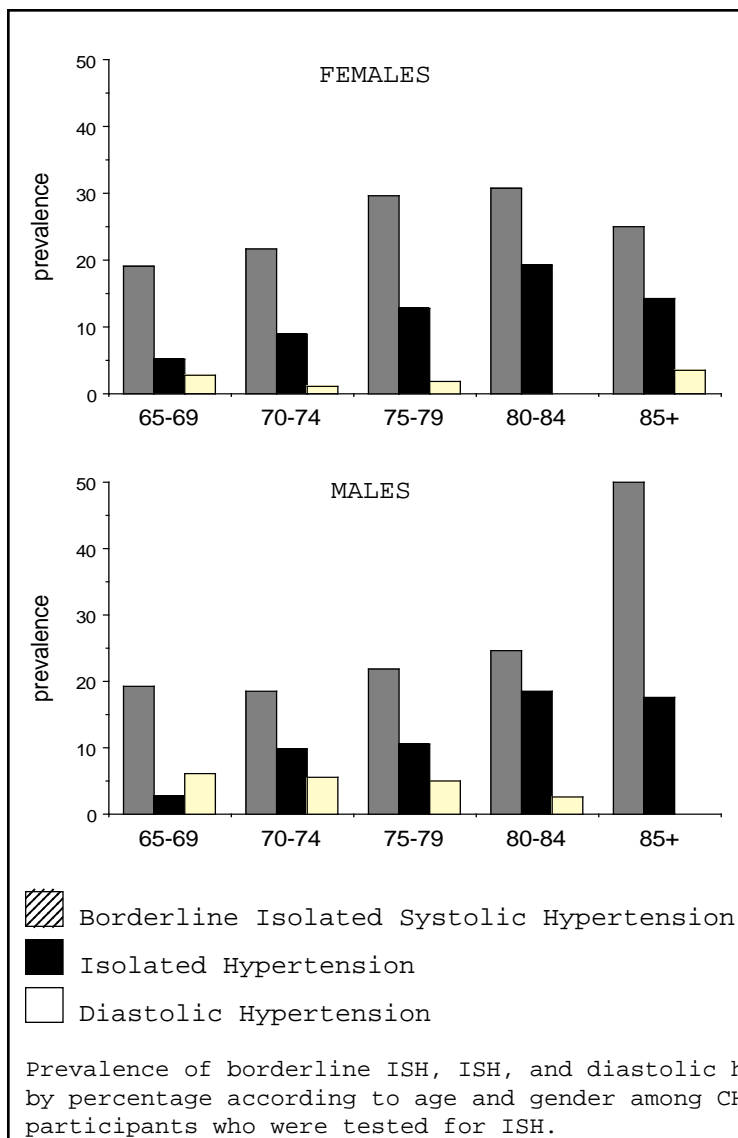
To find out if there is a relationship between ISH and subclinical disease, investigators excluded from this particular part of the study all participants who had a diagnosed cardiovascular disease or who were taking medication for high blood pressure. They then identified those participants with ISH by carefully measuring each participant's blood pressure during the baseline examination. ISH was classified as "definite" or "borderline."

The next step was to look for signs of subclinical disease in these participants. Each CHS participant had been given an electrocardiogram, an echocardiogram, and a carotid ultrasonogram. The results of these tests were examined carefully for any abnormalities

that might indicate the presence of cardiovascular disease.

What the CHS investigators found was that both definite and borderline ISH is fairly common among older adults, and that the condition often goes untreated. Nine percent of CHS participants had ISH, and 23% had borderline ISH. Investigators also found a strong relationship between ISH and the presence of subclinical cardiovascular disease, even in the case of borderline ISH. This is persuasive evidence that ISH is a risk factor for subclinical disease. Information from randomized trials indicates that the treatment of ISH prevents cardiovascular disease in the elderly.

During future examinations, CHS will repeat the blood pressure measurements in part to determine which participants develop hypertension, including ISH. Repeat measures of subclinical disease will allow CHS investigators to examine the relationship between blood pressure and the development of subclinical and clinical cardiovascular disease. This kind of information can make a difference in the lives of people like you, giving them a better chance to live a longer and healthier life. And YOU make this research possible.



Is atherosclerosis a predictor for stroke and heart disease?

Use of Sonography to Evaluate Carotid Atherosclerosis in the Elderly

Published in *Stroke*, September 1991.

Authors: DH O'Leary, JF Polak, SK Wolfson, MG Bond, W Bommer, S Sheth, BM Psaty, AR Sharrett, TA Manolio.

The primary goal of CHS is to identify and better understand the risk factors for cardiovascular disease in older adults. Atherosclerosis (a thickening of the artery walls) has been shown to be a risk factor for heart disease in young and middle-aged adults. To determine if this is also true for older adults, CHS used carotid sonography to find evidence of atherosclerosis among its participants at the beginning of the study.

Carotid sonography produces an image of the walls of the carotid artery in the neck. It uses a technique somewhat similar to the "echolocation" used by bats to navigate in the dark. A sonographer moves an instrument that looks something like a fat pen over the surface of the neck to create an image. A reader then examines the image to determine whether it shows any abnormal thickening in the artery walls. Because it is done outside the body, carotid sonography is not uncomfortable for the patient, and is less expensive than other procedures such as angiograms.

During the next few years, the

information gathered from the sonograms will help CHS determine whether participants who later develop heart disease or have strokes showed evidence of atherosclerosis earlier in the study. If there is a strong relationship between atherosclerosis and heart disease or stroke, then the presence of atherosclerosis will be established as a risk factor in this age group.

But before any conclusions can be drawn from the data, CHS investigators first had to be certain that the sonography procedures were producing valid results. To find out, a group of participants had duplicate sonography procedures done and the images that were produced were compared to see whether they agreed. Some of the participants were tested by the same sonographer on different visits, and others were tested by different sonographers on the same visit. Two different readers were also used to interpret the sonography images. The results of these procedures were similar enough between sonographers and readers to assure investigators that the sonogram images were an accurate and

reliable way to determine whether atherosclerosis was present.

CHS now has a body of data about the presence of atherosclerosis among its participants that will help determine in the future whether atherosclerosis is indeed a risk factor for heart disease and stroke among older adults. Your continued participation will help make that determination possible.

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