

The M E S A Messenger

Newsletter of the Multi-Ethnic
Study of Atherosclerosis

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Ancillary Studies in MESA

• Diane Bild, MD, MPH MESA Project Officer



From the start of your enrollment in MESA, you have been invited to participate in "ancillary studies." Ancillary studies are ones that are added on to the main MESA study for more focused research in a specific area.

While MESA is collecting a large amount of data on cardiovascular risk factors and subclinical cardiovascular disease, the ancillary studies dig deeper and greatly enrich the overall study. Examples of MESA ancillary studies include:

- MESA Air Pollution - a study of the relationship between exposure to different types of air pollution and cardiovascular disease
- MESA Family - a study of genetics in MESA, which has also enrolled brothers and sisters of many of the original MESA cohort members
- MESA Lung - a study of asthma, emphysema, and other chronic obstructive pulmonary disease (COPD) which is the 3rd leading cause of death in the United States
- Neighborhoods and CVD - a study of how characteristics of neighborhoods, including safety, access to high quality food, and other social conditions, relate to cardiovascular disease risk factors and conditions.

Along with these large ancillary studies, there are dozens of smaller studies that are examining blood samples, CT scans, blood flow to the heart muscle, genetics, sex hormones, carotid artery disease detected by ultrasound, coronary artery wall thickness detected by MRI, fat deposits in different regions of the body, kidney function, diabetes, and other areas.

The MESA investigators and the NHLBI are extremely pleased that these studies have expanded the research value of MESA. They have allowed many different research areas to be studied at the same time - a great use of taxpayer dollars.

The results have been outstanding: MESA has now published over 300 scientific articles, about half of which have resulted from these ancillary studies.

In the Exam 5, you will again be asked if you will participate in ancillary studies, which will again include measures of lung function, air pollution, MRI of the heart, and other measures. The value of these ancillary studies is enormous, so I hope you will consider participating.



Diane Bild, MD, MPH MESA Project Officer

Air Pollution and Heart Disease - Why are we interested and why is MESA important?

By Joel Kaufman, MD, MPH

MESA participants know that we've been paying a lot of attention to understanding their exposure to air pollution. That's because a number of studies have recently pointed to an important relationship between air pollutants and the development of heart disease--especially atherosclerosis (A condition in which fatty material collects along the walls of arteries), which is being studied carefully in MESA.

A recent study from Southern California highlights the reason for this interest. The researchers put together information from five small studies in which volunteers had repeated measurements of the common carotid artery wall thickness (IMT). This is the same measurement we collect from you in MESA, when we take ultrasound images of the arteries in your neck. They then compared the change in artery wall thickness over time with estimates of air pollution where the people lived. The research was published in an online journal called PLoS One ("Ambient Air Pollution and the Progression of Atherosclerosis in Adults"; Künzli et al. 2010; 5(2):e9096.doi:10.1371). These researchers found a relationship between the estimated air pollution exposure and the amount that the artery wall thickened over time. That is, the arteries of people who lived in more polluted areas got thicker faster than those living in cleaner areas. This suggests that air pollution might contribute to the acceleration of the artery problems (atherosclerosis) that cause most heart attacks and strokes. In other words, this research hints that the more pollution that is in the air you breathe, the greater your risk of a heart attack or stroke. The MESA Air Pollution Study is looking at the same kinds of things, but the information we are collecting in "MESA Air" - including in Exam 5 - will give us a much better picture of the effects of air pollution. In the study just published, the volunteers were not as representative of the general population as MESA participants are, and were only followed for about 2 years. Also, the estimates of air pollution exposure were not nearly as sophisticated as the measurements in MESA Air.



In the MESA Air study, we are interested in the development of heart disease, just like the previous research group. But thanks to the time and cooperation of MESA participants, we are setting a new standard for research on the effects of the environment on health. After Exam 5, we will be able to assess the impacts of air pollution in the diverse setting of MESA, with participants from six states, several races and ethnic groups, and an unprecedented set of information on both health and environmental exposure. Also, MESA Air collected air pollution measurements at the homes of more than 700 participants all across the study cities. We also collected thousands of additional samples throughout your communities, and some of you even wore air monitors in backpacks for several weeks! All of this work should allow us to come up with the best possible understanding of the quality of the air you breathe.

Your participation in MESA and in MESA Air makes it possible for us to understand how the environment might influence heart disease, even if you never develop heart disease. When you come back for Exam 5, it will help us to know more than ever before about what levels of air pollution are safe, and what levels are too high.

Greetings from the University of Minnesota

Minnesota MESA Staff for Exam 5

Our newly funded MESA Exam 5 started in the spring of 2010 and will continue into the fall of 2011. Thank you to all who've already completed this visit and we're looking forward to seeing those who are yet to come. MESA staff members from all six MESA clinic sites attended a special, centralized training session at Wake Forest University in North Carolina in February of 2010. Trainings like this are essential for conducting good quality research.

We have a conscientious and welcoming group of staff members conducting MESA Exam 5. If you've already been in, these people may sound familiar, if your visit is still to come, here are the folks you may see and meet.

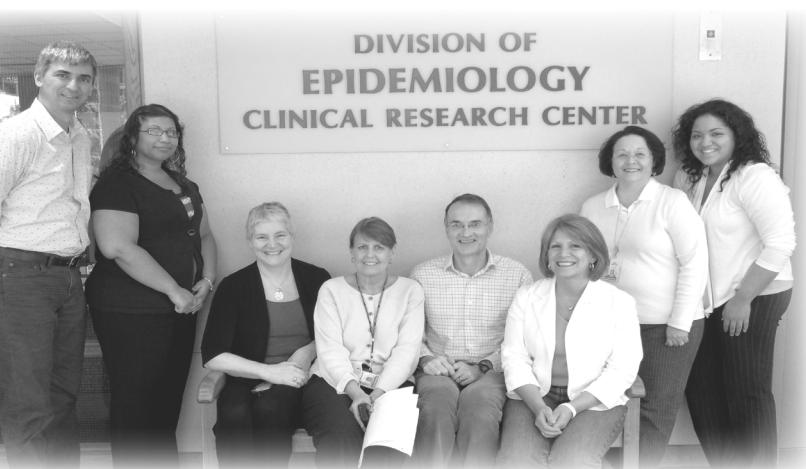
Chris - I'm the study coordinator; I've been with MESA since the planning stages in 1999. I'm sure I've met most of you and look forward to seeing you again.

Jackie - has been with MESA since 2000. Over the years you have talked to her on the phone and she has worked with you in clinic doing interviews and various technical procedures.

Crystal, Heidi, Otto and Ursula - will work with you in the clinic, to get interviews and technical procedures completed. In addition, Crystal takes care of forms and files, Heidi makes clinic appointments, Otto makes sure you get your results letters, and Ursula makes appointments for MRI & CT scans.



Alex Ellie Chris Kara



Otto, Crystal, Chris, Debra, Dr. Folsom, Heidi, Mary, Ursula



Debra Dan



Jessica



Jackie

Dan and Debra - are our lab technicians; you will meet them in the lab for the blood draw. After that, they begin the many, very important steps of processing the samples that enable researchers to gain new knowledge about heart and blood vessel diseases.

Jessica - is our ultrasound technician and she will perform the ultrasound scan of the carotid arteries in the neck for those who are selected for this.

Alex and Ellie - have recently joined our MESA team to conduct overnight sleep studies with interested participants. Some of you have done the sleep study already and met them. All participants will have an opportunity to do this, but only after MESA Exam 5 has been completed.

Behind the scenes:

Dr. Aaron Folsom - is our Principal Investigator. He was instrumental in bringing the MESA Study to the University of Minnesota. He collaborates with other researchers to plan the research and analyze the data.

Kara - has been talking to you on the phone for Follow Up interviews since 2000. You won't see her in the clinic, but you probably know her voice!

Mary - has been with MESA since 2000; she works with the information that you give us about illnesses or hospitalizations. She corresponds with the hospitals, doctors and clinics about medical records related to MESA research.

Esther - retired from MESA in 2010. Her familiar voice will be replaced by other staff members who will conduct our regular telephone follow up call. Many thanks to her years of service to this important research.

Cardiovascular Epidemiology at the University of Minnesota

MESA is an epidemiologic research project. Epidemiology is the study of disease occurrence in whole populations, with an attempt to identify the causes of disease and how to prevent it. The Division of Epidemiology and Community Health at the University of Minnesota has a 50 year history of research into the epidemiology of diseases cardiovascular system, that is, the heart and blood vessels.

One of the first cardiovascular disease (CVD) research projects, initiated in the 1950s, was the Seven Countries Study, which documented for the first time a wide range of CVD rates around the world. At highest risk at that time were Finns and Americans; Japanese and Mediterranean populations had low rates, due largely to healthier diets. In the 1980s, the University of Minnesota began a study that is still ongoing, called the Minnesota Heart Survey, to understand why CVD death rates were falling in the US. In the 1980s, it also conducted the Minnesota Heart Health Program, to try to reduce CVD in three Minnesota towns.

This project yielded much experience in how to promote health. In the late 1980s, we began a project called the Atherosclerosis Risk in Communities Study, followed by MESA in the early 2000s. These projects are trying to determine the importance of possible new risk factors for CVD, including genetic factors. Currently, over a dozen University of Minnesota Division of Epidemiology and Community Health faculty and research trainees are engaged in research to understand and prevent CVD. Thank you for doing your part in MESA.

The Importance of Hispanic Involvement in MESA Exam 5

A main aim of MESA is to identify unique factors that may relate to occurrence of cardiovascular disease (CVD) in minority groups—African Americans, Chinese Americans and Hispanic Americans. In Minnesota, whites and Hispanics from the St. Paul area are taking part. Hispanic involvement is especially important because little cardiovascular research has been done in this ethnic group. In fact, there are no good national data on mortality from CVD because of the difficulty of identifying Hispanic ethnicity from death certificates. The rate of CVD among Hispanics is certainly significant, and MESA hopes to find answers to how it can be prevented or identified early. For example, compared to Anglos, Hispanics have roughly twice the rate of diabetes. Diabetes is an important CVD risk factor, so prevention and control of diabetes is certainly important. Hispanics fortunately have lower smoking rates than Anglos, but still smoking is an important cardiovascular health concern. The Minnesota MESA population has had a good response to the 5th MESA examination so far, and we appreciate this. Nevertheless, Hispanic involvement has lagged somewhat, and we want to encourage everyone to take part. Remember, we will help find transportation and offer some reimbursement for your time. We hope that, when a MESA interviewer contacts you, you will agree to take part in Exam 5.

MESA - Eye Examination

By Tien Yin Wong, MD, PhD • Ronald Klein, MD, MPH • Barbara Klein, MD, MPH



At the MESA 2 examination, we had the opportunity to take a photograph of the back of your eyes (retina). For many years, scientists have been puzzled by the role of small blood vessels in the development of stroke and heart attack. Part of the problem is that it is difficult to evaluate these tiny blood vessels in the brain and heart. In the eyes the situation is different. We have the ability to directly examine the tiny blood vessels and measure changes occurring in them by taking a retinal photograph. Over the past few years, we have measured changes in the small blood vessels in the retina (Figure 1 shows a normal retina and Figure 2 shows one with narrowed arteries, and red and yellow spots due to leaky blood vessels). We have analyzed how these changes may be associated with heart disease, diabetes and high blood pressure. We have found, for example, that narrowed retinal arteries are related to higher blood pressure and stiffening of the large arteries arising from the heart.

In contrast, we have reported that people with diabetes are more likely to have dilated retinal veins. Furthermore, we have linked leaky eye blood vessels with higher calcium levels in the heart. Finally, we have also reported on the relationship of heart disease with another eye condition, age-related macular degeneration or AMD, which is a common cause of vision loss in America.

These investigations provide further clues to the early changes that may occur in heart disease, and the link between disease of the small blood vessels (eye) and larger arteries (heart). The MESA-Eye team is now investigating how eye changes may provide information on future risk of heart disease, stroke and other conditions.

Figure 1. Normal Retinal Photograph

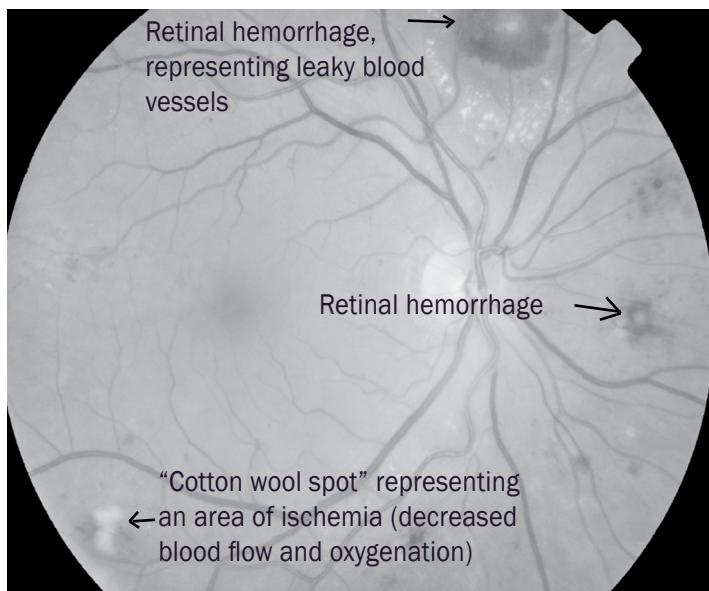


Figure 2. Abnormal Retinal Photograph.

MESA Elasticity Study

By David Jacobs, MD • Daniel Duprez, PhD

High blood pressure is a critical risk factor for heart attack, stroke, kidney disease and vascular disease. Blood pressure changes from moment to moment during each heart beat as the heart pumps the blood out into the arteries and the heart relaxes to be refilled. However, to decide to prescribe blood pressure lowering pills, physicians use only systolic blood pressure (the highest number) and diastolic blood pressure (the lowest number). Knowing the numbers between the systolic and diastolic blood pressures could make better diagnoses of risk.

In the MESA Elasticity ancillary study, we register the pulse at the artery of the wrist. We are getting 250 blood pressure numbers during each heart beat. This information will allow us to go beyond systolic and diastolic blood pressures. Specifically, we estimate the stiffness of the arteries. By participating in MESA Elasticity you contribute enormously to understanding blood pressure, aging of blood vessels, and effects on heart, brain, and kidneys.



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