The MESA Messenger

Newsletter of the Multi-Ethnic Study of Atherosclerosis
Fall 2007, No. 8

MESA on Public TV! Watch "The Mysterious Human Heart," 10/15 and 10/22.

MESA Participants and Investigators Featured in a New PBS Documentary, "The Mysterious Human Heart," Airing October 15th.

By Karol Watson, MD, MESA Principal Investigator at UCLA

Karol Watson, MD

I am very excited to report that I have joined with several other cardiologists from around the country to help develop a three-part public television (PBS) documentary called *The Mysterious Human Heart.*

The Mysterious Human Heart will focus on the importance of the coronary arteries, what happens when they become blocked, and how cardiologists treat patients who have experienced a heart attack brought on by coronary artery disease. The program will also explore the history of how we have come to understand heart disease, by interviewing researchers and participants in the Framingham study.

The Framingham Heart Study, which began in 1948, enrolled 5209 men & women aged 30 - 62. The objective of the study was to identify the factors that contribute to cardiovascular disease.

And here's the best part: The third segment of *The Mysterious Human Heart,* "The Silent Killer," will feature MESA and extensive coverage of some of our MESA participants, as the program explores what ongoing and future studies hope to achieve in heart research. Dr. Elizabeth Nabel, director of the National Heart, Lung, and Blood Institute (NHLBI), and Dr. Diane Bild, MESA's project officer at the NHLBI, suggested MESA for the series because of our study's high-tech approach to gathering data, its ethnic and geographic diversity, and the expansive range of data MESA has collected (which you have generously provided!).

The program's producer is David Grubin, producer of numerous critically acclaimed documentaries, most notably, perhaps, the Emmy Award-winning "Healing and the Mind with Bill Moyers." The first installment of the series will air on PBS on October 15th at 9 pm Eastern time. MESA is featured in the third episode, "The Silent Killer," which will air on October 22nd at 9 pm Eastern time. Look for it on your local public television station. You can read more about *The Mysterious Human Heart* at ***www.pbs.org/heart***. ♡

In this issue of the *MESA Messenger* you'll see the words ***clinical*** and ***subclinical*** used quite often to describe a disease or condition (*subclinical heart disease*, for example). If you don't recall what these words mean, and in case you've misplaced the ol' medical dictionary, here's a refresher: ***Subclinical*** diseases or conditions have no observable signs or symptoms. ***Clinical*** diseases or conditions have signs or symptoms that can be observed without using special tests such as an MRI, for example.

Welcome, New MESA Air Participants!

By Joel Kaufman, MD, MPH, University of Washington

We would like to welcome into the MESA community those new participants who have enrolled in the MESA Air study ("MESA Air").

MESA (Multi-Ethnic Study of Atherosclerosis) started in 2000 and enrolled 6,814 men and women ages 45-84. It was designed to study the early signs and symptoms that may lead to heart disease, and to determine how race, gender, and age might affect those early signs and symptoms. The study is currently finishing up its fourth exam and is transitioning into a 4-year follow-up period.

MESA Air (a partner study of MESA) collects and analyzes air samples inside and outside participants' homes and in their communities. MESA Air is being conducted in communities near the six MESA field centers. The purpose of MESA Air is to find out if there is a link between atherosclerosis and long-term exposure to air pollution.

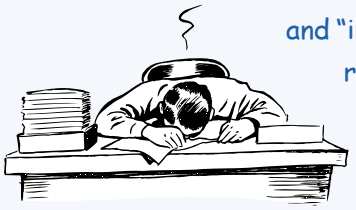
MESA participants have been receiving these newsletters since they joined the study in 2000, and we are now excited to share them with the newest members of the MESA partnership, our MESA Air participants! ♡

Does Your Job Affect Your Health?

By Karen Hinckley Stukovsky, MS, University of Washington

MESA has recently teamed up with the National Institute for Occupational Safety and Health (NIOSH) to look at the relationship between the type of work you perform and your risk of heart disease.

During each MESA exam, we have asked you whether you have ever worked outside of the home and, if so, what type of work you do or last did. Now, experienced NIOSH researchers will assign a "job type" and "industry code" to each job you reported. We will then be able to evaluate whether some jobs or jobs in a particular type of industry can affect heart disease risk. Some of the possible reasons why one job versus another might cause different levels of heart health are job stress, exposure to pollutants, and physical activity on the job.



MESA is in a unique position to look at the relationship between occupation and heart disease, because MESA participants come from different communities, have varied occupational backgrounds, and represent many races and ethnicities. We are fortunate that NIOSH has agreed to work with us on this important research, and we thank you for continuing to share your work history with us. ♡

The MESA Air Pollution Study: Advances in Monitoring Air Quality

By Marty Cohen, ScD, University of Washington

The MESA Air Pollution team has been making exciting progress in measuring air quality over the past few years. When we talk about air quality, we are really talking about the amount of tiny particles and gases that are in the air. These gases and particles make up air pollution, which we usually refer to as soot, smoke, smog or haze.

Some participants have been actively involved in our monitoring, allowing our technicians to set up air monitors in their homes and yards (and out through some windows, too!). Others have been part of the personal monitoring, carrying monitoring equipment with them for days. You might be quite surprised to know just how much air quality monitoring is going on in your neighborhood.

We use two types of sampling methods to measure air quality. A "passive" sampler, which can be set up anywhere, quietly "sniffs" the air around it and collects different gases on its surface. Other "active" samplers use pumps to draw air through filters and are used to measure the soot, smoke, and dust in the air.

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Neighborhoods and Physical Activity in MESA

By Ana V. Diez-Roux, MD, PhD, MPH, University of Michigan

As part of the MESA Neighborhood Study, we are studying how the characteristics of peoples' neighborhoods may be related to their health. One of the ways in which neighborhoods may affect health is through the availability of places people can be physically active.

In order to study this, we collected detailed information on the availability of recreational facilities and parks at three of the six MESA sites (New York City, New York; Baltimore, Maryland; and Forsyth County, North Carolina). We obtained information not only on whether facilities and parks were present but also on the types of activities and resources they offered. Using this information, we developed a measure of the availability of physical activity resources in each MESA participant's neighborhood.

We found that participants living in neighborhoods with more resources for physical activity were more likely to be physically active, even after taking into account the unique characteristics of each participant. Many factors, including personal characteristics, affect whether a person is physically active.

We believe our results show that having resources in the neighborhood may contribute to a physically active lifestyle, which we know from many other studies is very important to good health. Advocating for improved access to physical activity in neighborhoods could be an important component of efforts to improve physical activity in communities all around the country. ♡

A Sampler of Some of MESA's Most Recent Findings

By Diane Bild, MD, MESA Project Officer at the National Heart, Lung, and Blood Institute

In the last newsletter, I mentioned that the MESA investigators had published 40 scientific papers based on our study. As of this writing, that number is now up to 77 (and still growing)! What's behind these numbers? What has MESA found? Below is a sample of recent results that I hope you will find interesting:

Calcium Plaque Build-up in the Arteries Predicts Coronary Heart Disease in Multiple Ethnic Groups

Coronary calcium has been shown in several studies to "predict" the development of coronary heart disease, especially heart attacks. That is, people with coronary calcium are more likely to have heart attacks. However, MESA has shown for the first time that this relationship seems to be similar for African-Americans, Hispanics, and Chinese, whereas previous studies had included mainly Whites. This important finding helps doctors who use coronary calcium as a screening test understand its value in different groups. The study's main author, MESA investigator Dr. Robert Detrano, presented this major finding to the American College of Cardiology in March, and it will be published soon in a medical journal.

Risk Factors for Reduced Regional Cardiac Function

In the last *MESA Messenger,* Dr. Joao Lima explained the "MRI Tagging" study. In this study, the movement of sections of the heart was carefully measured. The study found that reduced function in certain parts of the heart was associated with

- coronary artery calcium
- smoking
- high blood pressure
- decreased blood flow in the heart's small blood vessels

We expect these factors to be associated with clinical heart disease. What is new here, however, is that these harmful factors are associated with *early* changes that are occurring before any heart disease is apparent to people or their physicians.

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"A Sampler of MESA Findings," continued from page 3

Whole Grain Intake Is Related to Obesity and Inflammation but Not Subclinical CVD

During the first MESA exam, participants answered many questions about their eating habits. Analysis of some of this data has shown that eating whole grain products—mainly certain types of cereals and bread—was associated with *lower* levels of obesity, inflammation, fasting blood sugar, and newly-diagnosed diabetes. However, whole grain intake was *not* associated with lower levels of subclinical cardiovascular disease (coronary calcium and carotid artery wall thickness). These findings provide support for the role of whole grains in a healthy diet, although many other factors play roles as well.

We will keep these reports coming to you. If you have questions about them, please contact your MESA field center. Of course, these important findings would not have been possible without your participation. Once again, thank you! ♡

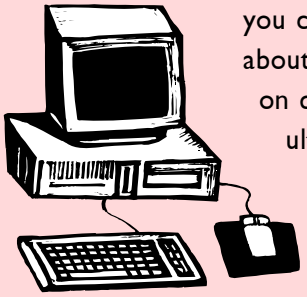
Coronary Artery Calcium in MESA Participants

By Robyn McClelland, PhD, University of Washington

MESA is the first large multi-ethnic study to report on how coronary artery calcium develops and changes over time. Calcium is one of several components of atherosclerotic plaques, and the amount of calcium buildup in the arteries is a measure of subclinical heart disease. With this unique data, we have been able to assess how frequently new calcium appears in people who didn't have it previously, and how quickly calcium buildup worsens in people who already had calcium in their arteries.

We found that each year about 5.9% of all women and 8.3% of all men develop *new* coronary artery calcium. Regardless of gender or race, the older we are, the more likely we are to develop new calcium: each year, less than 5% of people under 50 develop new calcium, compared to 12% of people 80 and older. White race, larger body size, higher blood pressure or cholesterol, diabetes, family history of heart attack, creatinine, and inflammation all influence the development of new calcium. For people of all races and ethnicities, many, but not all, of these same factors influence the rate at which *existing* coronary artery calcium gets worse; however, Whites have more progression of existing calcium than Blacks, Hispanics, or Chinese. ♡

Have you visited the MESA participant web site? If you do, you'll find a lot of interesting information about MESA.



All you need is a computer that can access the Internet. (If you don't have a computer, try the public library, local senior center, or community center.) To go to the web site, just open a web browser (such as Internet Explorer or Mozilla), type **www.mesa-nhlbi.org** into the web address box, and press the enter key. This will take you right to the MESA home page. On the left side you will find a link to the participant website. If you click on that link, you can see all the participant newsletters, news about MESA or your site, interesting findings based on data you provided, and images from CT, MRI, or ultrasound scans. There will also be forms that you can use to send us information about address changes or hospitalizations. And, if you have a question for MESA, the participant website has a place for you to ask it. You'll find the answer there, too.

"Try it, you'll like it!"

"MESA Air," continued from page 2

As of April 2007, we have made more than 400 home visits to collect indoor and outdoor air samples. And we have collected over 1900 samples near roads or other potential sources of pollution, by temporarily placing hundreds of passive samplers on telephone and utility poles. These give us a snapshot look at air quality.

We have also set up more permanent air monitoring stations that continuously monitor air quality at set locations in and around your communities. These stations use both the active and passive sampling equipment. We have collected more than 2,100 individual filter samples from these locations.

Government agencies also monitor air quality. In fact, there are hundreds of permanent air quality monitoring stations set up across the country. By combining our data with these agency air quality measurements, we are developing a broad understanding of how air pollution is spread out across your communities.

We have learned a great deal from our air monitoring efforts, and we aren't finished yet! For example, we can already see how the levels of some gases drop as we move farther and farther away from roads. We also have a better understanding of how air pollution is distributed across each of the MESA cities. As we continue to collect our data, we will improve our understanding of each study participant's exposure. In order to do this, we also use the questionnaire information that every MESA Air participant has provided.

The exposures of MESA participants, together with your health test results, allow scientists to examine the relationship between air quality and cardiovascular disease.

Your participation in MESA and MESA Air continues to teach us about how and why cardiovascular disease occurs. The valuable information we gain from MESA Air will be used for years to study and protect people from the effects of harmful air pollution. ♡

Just a friendly reminder...

Please call us if you have:

- been hospitalized
- moved and have a new address
- any questions about MESA

Wake Forest: 336-716-6650

Johns Hopkins: 410-944-6780

Minnesota: 612-626-9980

UCLA: 626-979-4920

Northwestern: 312-908-7914

Columbia: 212-305-9932 or 212-305-9723

...for some pretty important folks

Air Pollution, Heart Disease, and the Women's Health Initiative Study

By Joel Kaufman, MD, MPH, University of Washington

On February 1, 2007, the New England Journal of Medicine published a study led by MESA researcher Dr. Joel Kaufman, "Long-Term Exposure to Air Pollution and Incidence of Cardiovascular Events in Women." The study results were reported on ABC's Good Morning America and the CBS Evening News, and in newspapers and magazines around the country. This study used data from another major study, the Women's Health Initiative (WHI), to look at the relationship between air pollution and heart health.

Sixty-five thousand women between the ages of 50 and 79 took part in the WHI study. At the start of the study, none of the women had cardiovascular disease (CVD). Researchers monitored their health for up to nine years and watched for CVD events (heart attacks, for example). The researchers also estimated each woman's exposure to *fine particulate matter ($PM_{2.5}$)* in the air near their homes. $PM_{2.5}$ is composed of tiny airborne particles of soot or dust and can come from a variety of sources, such as vehicle exhaust, coal-fired power plants, industrial sources, and wood-burning fireplaces.

An important finding from the study was that women living in areas with higher levels of air pollution had an increased risk of developing CVD. These study results have helped researchers better understand a potential cause of heart disease. The results also provided evidence to support efforts to reduce harmful air pollution.

The MESA Air study is also looking at the relationship between air pollution and heart health, but we have more advance research techniques. We are using both the high-tech testing in MESA and special new methods for measuring air pollution. By taking part in MESA and MESA Air, you are helping us determine whether and how air pollution is related to early signs of atherosclerosis and CVD events. We hope this research will help us better understand CVD, reduce CVD events, and learn how to avoid pollution that affects our health.

If you are interested in reading the full article on the WHI study, visit: http://content.nejm.org/cgi/content/full/356/5/447 ♡

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