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MESA Messenger

Still Open for Business

Jeannie Olson, MD, MESA Project Officer, NHLBI

You may have noticed that the picture of the MESA Project Officer in this issue of MESA Messenger looks different. MESA's former Project Officer, Dr. Diane Bild, has taken a job with the new Patient-Centered Outcomes Research Institute (PCORI) in Washington DC. There, Diane will promote research that will help patients and their health care providers make informed choices about their health and medical care. Diane had been at the NHLBI for almost 24 years, where she designed and launched MESA. She described MESA as "a special pride and joy" for her. All of us who have known and worked with Diane over the years will miss her but wish her well in her new work.

Meanwhile, I am happy to be continuing my involvement in MESA. I have worked "behind the scenes" in MESA since I came to the NHLBI in 2001 and am proud to now serve as the new MESA Project Officer.

If you've been following the news lately, you know that the Federal government has been taking a close look at its budget and finding ways to cut costs. In addition, the budget sequestration — automatic across-the-board spending cuts — began on March 1. Because of the sequestration, the National Institutes of Health (of which the NHLBI is a part) had a $1.55 billion budget cut for the current year. Each of these actions has affected the NHLBI's capacity to support research. The resulting budget cuts have been shared across all NHLBI-funded research programs.

We are fortunate in MESA that these cuts have not affected our ability to conduct our regular study operations. We are continuing to call you from time to time to keep in touch and ask questions about any recent changes in your health. The information you give us during these calls is very important, as the MESA investigators are continuing to interpret the information collected in MESA. This issue of the MESA Messenger includes articles describing more of MESA's recent discoveries based on the information you provide.

We greatly value your ongoing commitment to MESA. We are continuing to honor your contribution by using it to help find new ways to fight heart disease and other related conditions. We are still open for business! Please continue to participate when your MESA Field Center interviewer calls.

Time-Location Data in MESA Air

Cynnie Curl, MS University of Washington

MESA Air is a partner study to MESA, and is focused on understanding the relationship between exposure to air pollution and heart health. One of the reasons that MESA Air is unique is the groundbreaking approach we use to estimate your exposure to air pollution. How much air pollution you breathe can be hard to measure, because pollutant levels can change a lot even over very small distances. For example, air pollution levels right next to a road can be much higher than levels even a few hundred feet away.

Levels can also be very different indoors and outdoors at your home. In MESA Air, we ask information about your home and where you spend your time to come up with an estimate of personal air pollution exposure that is specific to you.

So far, no studies of air pollution and heart disease have had individual level data like this. In many past studies, all of the people in a city have been assumed to breathe in the same amount of air pollution, and comparisons could only be made between one city and another as a whole. Other studies have used methods that have allowed them to predict outdoor exposures that vary across cities, but they still haven't gone the extra step of figuring out how much outdoor air pollution gets indoors.

How much outdoor air pollution gets indoors depends on many things. The type of construction, type of heating or air conditioning, and even actions like window opening can make a difference. In MESA Air, we asked you about your home characteristics, and using that information, we can estimate how much outdoor air pollution gets into your house. In order to use this information, we've also asked you where you spend your time. By combining information on where you spend time with what we learned about indoor and outdoor air pollution levels, we can estimate your individual exposure to air pollution in a way that hasn't been done before.

We're learning a lot about activities that affect air pollution exposure from the data you've provided. It isn't a surprise, but we observed that people spend more time indoors at home as they get older. In MESA Air, we're learning exactly how much more time, and how other factors – like jobs and volunteer activities – influence this. We also knew that people spent more time outdoors in summer than in winter, but we're learning that this difference is more important in cities with more distinct seasons (like St. Paul) than in cities where the weather is more consistent over the year (like Los Angeles). We are also seeing differences in time-location patterns based on gender, race/ethnicity, and health status. MESA participants are providing scientists with important new insights into many of these factors.

The information that MESA Air participants provided on their home and their activities are turning out to be very important in understanding pollution exposures. We've learned that air pollution exposure estimates can differ by as much as 65% depending on whether or not we include

information about where people spend their time. And the more accurate our exposure estimates are, the better we can understand the relationship between air pollution and heart health.

Through this work, we can expect to have new information available on the best ways to advise doctors and policy makers on this important problem.

Evidence Mounts That Four Lifestyle Changes Will Protect Your Heart and Significantly Reduce Your Risk of Death

Roger Blumenthal, MD and Haitham M. Ahmed, MD, MPH, Johns Hopkins University

We all know that healthy lifestyle habits are major factors that protect you from heart disease. What we don't know is which habits are most important, and exactly how these habits prevent disease progression over years and years. We wanted to study the association between lifestyle behaviors and the many steps in developing heart disease, cardiovascular events such as heart attacks, and death. We looked at the following lifestyle behaviors: 1) smoking avoidance, 2) regular exercise, 3) maintenance of normal weight, and 4) a healthy Mediterranean-style diet. We studied how these factors relate to the presence of calcified plaque in the arteries of the heart (determined by measuring coronary artery calcium, or CAC, in heart CT scans) and how quickly that plaque increases over time, as well as with coronary heart disease (CHD) events and total mortality in MESA over an average follow-up time of almost 8 years.

What we found: 1) These good lifestyle habits were associated with lower amounts of calcified plaque in the arteries of the heart, slower accumulation of that calcified plaque, a strong trend toward lower CHD risk, and a significantly lower total death rate. Participants who adopted all four of these behaviors had an 80% lower death rate than those with no healthy behaviors. 2) The benefits were cumulative, meaning the more healthy behaviors the better. So if you maintained a normal weight and ate healthy but weren't exercising, this shows you can still have even more benefit from adding exercise to your life. 3) Smoking was clearly the worst behavior of the ones we investigated. In fact, if you exercised, ate healthy, and maintained normal weight, but smoked; you still were worse off than people who did nothing else right but stayed away from cigarettes. This really highlighted how important it is to stay away from smoking.

In summary, this is the first study to connect the protective effects of a healthy lifestyle with the presence of CAC, build-up of calcified plaque in the arteries of the heart over the years, clinical CHD, and then death in a single long-term study. Our findings bolster the American Heart Association's efforts to reduce CHD risk through Life's Simple 7. Most

Lifestyle changes cont.

importantly, all the factors we looked at are things you can change. You can't pick your family history or change your age, but you can start exercising today, and you can start changing your diet today. All these interventions are things that cost us very little to nothing and are 100% in our hands. We have the ability to improve our own wellness and health!

Life's Simple 7 from the American Heart Association:

- **get active**
- **control cholesterol**
- **eat better**
- **manage blood pressure**
- **lose weight**
- **reduce blood sugar**
- **stop smoking**

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