

MESA Messenger

MESA and Precision Medicine

By MESA Project Office, NHLBI

In January 2015, President Obama announced a new approach to develop disease prevention and treatment strategies called the “Precision Medicine Initiative.” The goal of precision medicine is to provide the right treatment, at the right time, for each person’s individual needs. Precision medicine has already helped to target treatment for some cancers, but there is much more to learn.



MESA and several other study cohorts are participating in precision medicine research on heart, lung, blood, and sleep disorders sponsored by the National Heart, Lung, and Blood Institute (NHLBI) which is part of

the National Institutes of Health (NIH). This research program is called “TOPMed” (Trans-Omics for Precision Medicine). The participants span many age groups and come from varied social, cultural, and racial/ethnic backgrounds. TOPMed studies the ways genetic information along with information about health status, lifestyle, and the environment can be used to predict the best ways to prevent and treat heart, lung, blood, and sleep disorders. The program is also developing ways to organize and save the TOPMed data for future health and disease research.



MESA participants are not being contacted to participate in this program. TOPMed only uses previously collected health information, blood samples, and other information that you have given permission to share with researchers. We want to emphasize that your privacy will be rigorously protected in all aspects of this research effort.

Precision medicine research is also being conducted on many other types of diseases. As part of this research, a nation-wide research Cohort Program of about one million volunteers is being established. It is sponsored by the NIH, along with other agencies and interested groups. Participants will be involved in the study design and will have the opportunity to contribute health data from many sources.

Overall, through TOPMed and other precision medicine efforts, researchers hope to improve health through a better understanding of each person’s risk for developing diseases and response to different treatments. Your participation in MESA continues to help researchers make scientific advances and increase our knowledge about disease risk and prevention and overall health. ❤️

For more information...

TOPMed:

<https://www.nhlbi.nih.gov/research/resources/nhlbi-precision-medicine-initiative/topmed>

Precision Medicine Cohort Program:

<https://www.nih.gov/precision-medicine-initiative-cohort-program/precision-medicine-initiative-cohort-program-frequently-asked-questions>

Precision Medicine Initiative:

<https://www.nih.gov/precision-medicine-initiative-cohort-program>

Sleep Disturbances and Health

By Susan Redline, MD, MPH and Sogol Javaheri, MD, MA, Harvard Medical School

In the past few decades, the importance of a good night's sleep has become more clear. Research shows that short sleep duration and poor sleep quality may increase the risk of high blood pressure and heart diseases. Poor sleep health can be the result of different factors, including sleep disorders like obstructive sleep apnea, which affects about one in 12 adults. Sleep apnea happens when the throat repeatedly closes during sleep. These closures typically last between 10 and 60 seconds and can occur hundreds of times a night. Sleep apnea symptoms include snoring and breathing pauses, which can cause oxygen levels to drop, stressing the heart, brain, and other parts of the body.

MESA researchers aimed to learn more about the impact of sleep health on heart disease by conducting a sleep study between 2010 and 2013. MESA participants filled out questionnaires about their sleep, wore a wrist device to measure sleep-wake patterns, and had an overnight sleep study in their homes.

Findings showed that over 30% of MESA participants slept less than 6 hours per night. The recommended amount of sleep in adults is 7 to 8 hours per night. Participants with shorter sleep duration were more likely to be overweight than those with longer sleep duration.

The study also found over 30% of MESA participants had moderate or severe sleep apnea (meaning they stopped breathing at least 15 times per hour of sleep). Rates were highest among Chinese and Hispanic participants. MESA investigators examined the links between sleep apnea and a number of aspects of heart function. Individuals with sleep apnea were more likely to have high blood pressure, heart rhythm disturbances (particularly atrial fibrillation) and calcium in their coronary blood vessels. Using cardiac imaging (MRI) studies, researchers also showed that participants with sleep apnea were more likely to have changes

in their heart structure, including increased size of the muscle in the left side of the heart (known as "left ventricular hypertrophy") and increase in the overall size of the left ventricle, one of the four chambers in the heart. The more severe the sleep apnea, the bigger the changes. These associations were seen in both men and women, and in all ethnic/racial groups. These abnormalities in heart structure are often seen in people with high blood pressure and are associated with an increased risk of later heart disease, such as heart attacks. In this study, we saw an association between sleep apnea and changes in heart structure even in people without hypertension.

Together, these results point to the close connection between sleep apnea and risk of heart disease. It is thought that treatment of sleep apnea, by preventing drops in oxygen during sleep and improving sleep quality, may reduce the risk of heart disease. In addition to attempting to maintain a healthy body weight, treatments include use of a machine that provides extra air at night (CPAP) and use of a dental-type appliance that helps to open up the throat. People who snore and do not feel refreshed after sleep or who are found to have sleep apnea on testing may benefit from talking to their doctors about sleep apnea. Additional information on sleep apnea can be found at myapnea.org, an sleep apnea patient-centered network. ❤️



Detection of Damaged Heart Muscle Using MRI

By Evrim Turkbey, MD, Johns Hopkins University

A heart attack (myocardial infarction) causes damage to the heart muscle (myocardium) from a sudden loss of blood supply. It is usually the result of a blockage or serious degree of narrowing in one or more of the heart blood vessels (coronary arteries). The damaged heart tissue is replaced by "scar" tissue that does not contract normally when the heart muscle pumps. Scar tissue can sometimes lead to heart failure or dangerous heart rhythms.

The most common symptoms of a heart attack are chest pain or tightness, nausea, sweating and shortness of breath. However, many people who have had a heart attack and have heart muscle scar do not have a history of experiencing any heart attack symptoms. These people are "asymptomatic." While the person may not have realized they had a heart attack, the asymptomatic heart muscle scars left behind may indicate the person is at risk for a future heart attack.

It is important to understand how many people have heart muscle scars and the risk factors for these scars for people who had no heart attack symptoms. A special cardiac magnetic resonance imaging (MRI) technique that is called "late gadolinium enhancement" can identify heart muscle scars with high sensitivity. MESA Exam 5 is the first US population-based study that used cardiac MRI to detect these scars.

Exam 6 is happening now! Your field center team looks forward to seeing you soon. If you've already come for your visit, Thank You!

Questions? Contact your MESA Field Center at:

Wake Forest:

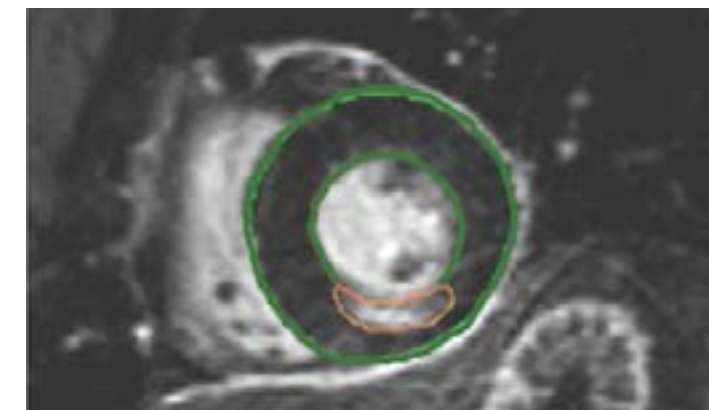
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This is a cross section of the heart obtained using cardiac MRI. The tissue between the green lines is the left heart muscle. The normal healthy muscle appears "black". The "white" area in the orange circle is a scar from an earlier heart attack.

At Exam 5, about 8 percent of participants had heart muscle scars, but about 80% of those participants reported no past symptoms of a heart attack. Older people and current smokers were more likely to have heart muscle scar and men were almost 6 times more likely to have a heart muscle scar compared to women. Hypertension (high blood pressure) and increased BMI (weight relative to height) were also associated with higher likelihood of having heart muscle scar. The likelihood of having myocardial scar is also increased with higher levels of calcium in the coronary arteries.

These results suggest that we shouldn't wait to experience heart attack symptoms before making heart healthy changes. In light of these results and other studies, it is recommended that everyone aim to achieve and maintain a normal weight, stop smoking, and control high blood pressure. ❤️

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Prep time: 20 minutes

Cook time: 45 minutes


Chicken Stew

Save leftovers for lunch the next day!

- 8 chicken pieces (breasts or legs)
- 1 C water
- 2 small garlic cloves, minced
- 1 small onion, chopped
- 1^{1/2} tsp salt
- 1/2 tsp ground black pepper
- 3 medium tomatoes, chopped
- 1 tsp parsley, chopped
- 1/4 C celery, finely chopped
- 2 medium potatoes, peeled and chopped
- 2 small carrots, chopped
- 2 bay leaves

- 1 Remove the skin and any extra fat from the chicken. In a large skillet, combine the chicken, water, garlic, onion, salt, black pepper, tomatoes, and parsley. Tightly cover and cook over low heat for 25 minutes.
- 2 Add celery, potatoes, carrots, and bay leaves, and continue to cook for 15 more minutes or until chicken and vegetables are tender. Remove bay leaves before serving.

This recipe is from the NHLBI's heart-healthy recipe book. For more delicious, heart-healthy recipes, visit: <https://healthyeating.nhlbi.nih.gov/>





Yield:
8 servings

Serving size:
1 piece of chicken and vegetables

C = cup
tsp = teaspoon

Each serving provides:

Calories	206	Calcium	32 mg
Total fat	6 g	Iron	2 mg
Saturated fat	2 g		
Cholesterol	75 mg		
Sodium	489 mg		

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