Genetics of osteoarthritis
Researchers are exploring how genetics affect the prevalence and progression of osteoarthritis. They are looking for genetic predictors of the disease. The researchers believe that understanding how gene variance is related to knee and hip arthritis could lead to new treatments both before and after surgery. The study is also looking at how genetics affect the success of hip or knee joint replacement.

“Genetics of osteoarthritis and joint replacement recovery: Key to precision rehabilitation.”
Principal investigator: Marcas Bamman; Birmingham VA Medical Center.

Genes related to tinnitus
Researchers are studying how genes relate to tinnitus. Tinnitus is ringing in the ears with no external source. It has been the number-one disability for Veterans for more than a decade, being reported in more than 30 percent of the population. The study aims to identify genes associated with tinnitus from different causes, such as noise, blast, traumatic brain injury, and age. Identifying these genes will direct research into ways to measure tinnitus and new drug treatments.

“Genome-wide association study of tinnitus in the Million Veteran Program with emphasis on traumatic brain injury.”
Principal investigator: Allen Ryan; VA San Diego Healthcare System.

Gulf War Illness risk factors
Researchers are studying how genes relate to Gulf War illness (GWI) in Gulf War-era Veterans. GWI is a chronic illness affecting many Veterans from that era. It can include fatigue, headaches, joint pain, indigestion, insomnia, dizziness, respiratory disorders, skin problems, and memory problems. The researchers are comparing men and women with GWI to those without the condition. They are also looking at how different genes and self-reported Gulf War environmental exposures relate to GWI rates. The findings could lead to better treatments to help these Veterans.

“Gulf War Illness (GWI) risk factors.”
Principal investigators: Drew Helmer, Dawn Provenzale; VA New Jersey Healthcare System; VA Cooperative Studies Epidemiology Center.

Posttraumatic stress disorder (PTSD) risk factors
Researchers are using MVP data to learn about the genes that may affect whether combat Veterans develop PTSD. The team hopes to gain new insight into the effects of PTSD on the brain so that new and improved treatments can be explored. This will be one of the largest genomic studies on PTSD ever done.

“Posttraumatic stress disorder (PTSD) risk factors.”
Principal investigators: Murray Stein, Joel Gelernter; VA San Diego Healthcare System; VA Connecticut Healthcare System.

Genetics of schizophrenia and bipolar illness
This research project is studying what genes make it more likely for people to have schizophrenia or bipolar disorder. It is also looking at the problems with thinking and day-to-day function that come with these conditions. Researchers are comparing participants with the two conditions to those who do not have the condition in the MVP database. The findings could help Veterans and others with serious mental illnesses.

“Functional disability in schizophrenia and bipolar illness.”
Principal investigator: Philip Harvey; Miami VA Healthcare System.

Genetic vulnerability to substance abuse
Researchers are studying genetic risk factors for chronic alcohol, tobacco, and opioid use. Past studies have suggested genes play a role in these unhealthy habits. The team hopes to use the findings to advance screening, diagnosis, and treatment of alcohol, tobacco, and opioid abuse.

“Genetic vulnerability to substance abuse.”
Principal investigator: Philip Harvey; Miami VA Healthcare System.
Heart disease risk factors
This research study is exploring the role of genetics in obesity, diabetes, and abnormal lipid levels as drivers of heart disease. The knowledge gained through this research may lead to new therapies that are safe, effective, and personalized. Heart disease is the No. 1 cause of death among Veterans. “Genetics of cardiovascular diseases in the Veterans population.”

How genes affect kidney disease
This study is focusing on how genes affect the risk and progression of kidney disease, a condition common in people with diabetes. It is examining differences in how people with diabetes respond to the drug metformin (the most common treatment for diabetes) and what role genes play in these differences. The project is also looking at people with high blood pressure, a major risk factor for kidney disease, to determine whether genes play a role. The work may help doctors personalize kidney disease treatment.

How genes affect macular degeneration
Past studies have shown that macular degeneration (an eye condition that causes vision loss) is related to specific genes. However, these studies have included mostly Caucasian volunteers. Our researchers are now looking at whether similar genes are carried by African Americans. This study will help to develop better treatments to slow or stop vision loss. “Genetic risk for macular degeneration in diverse Veteran populations.”

Genetic risk for suicide
This research study is exploring genetic variants that increase Veterans’ risk for suicidal behavior. Past studies have suggested that some people are at higher risk of suicide because of their genes. The researchers hope that this study will lead to improved approaches to suicide prevention by finding new ways to identify Veterans at high risk for suicide. On average, 20 Veterans die by suicide in the U.S. each day. “Genome-wide association study of suicidal behavior in the Million Veteran Program.”

Predicting breast cancer risk for women Veterans
Researchers are using MVP data to build a new screening strategy for breast cancer. The team is studying genetic and clinical markers to predict breast cancer risk. They will use the results to improve treatments and develop precision medicine—treatment customized to individual patients. “Predicting the breast cancer risk for women Veterans.”

How gene variation relates to diseases
This project is examining how differences in people’s genes affect gene expression (how the information in DNA is translated into actual physiological changes within the body). Studying changes in gene expression will help researchers understand the genetic risk factors of different diseases. The researchers are looking at numerous health conditions, such as PTSD, depression, diabetes, and heart disease. They will use the results to improve treatments and develop precision medicine—treatment customized to individual patients. “Large-scale transcriptome and epigenome association analysis across multiple traits.”

Genetics related to heart disease
Researchers are studying the genes that influence how obesity and lipid levels affect heart disease risk. Using MVP data, this study is looking at whether these genetic factors differ among African Americans and Hispanics. Most previous studies have looked mainly at Caucasians. The findings could help guide treatment and prevention efforts. “Cardiovascular disease risk factors, prevalent cardiovascular disease and genetics in the Million Veteran Program.”