

Genes determine risk level for diseases

Have you ever wondered why some people, like George Burns, can smoke their entire lives and never develop lung cancer, while a nonsmoker, like Dana Reeve, develops lung cancer? The key is in their genes, those small bits of genetic material that tell the body how to develop and function.

While we all have the same number of genes, the actual instructions vary slightly from one person to the next. These variations determine how susceptible we are to common conditions like diabetes or heart disease. Variations can increase the chance of developing cancer or life-threatening blood clots, but they also can be protective. For example, some people are resistant to malaria, HIV/AIDS and tuberculosis.

In a few instances, a single variation in a gene can significantly increase a person's risk for a disease. For example, women who have a variation in one specific gene have a 56 percent to 85 percent chance of developing breast cancer in their lifetimes. Variations like these, however, are present in only 5 percent to 10 percent of people with breast cancer. In most cases, diseases like breast cancer or colon cancer occur sporadically or they are caused by the combination of a number of genes and the environment. Even in cases where people inherit a specific gene variation, they may never develop the disease.

Even though scientists can test for a few of these variations, genetic testing is appropriate for only a small group of people. For now, collecting your family health history is the best way to find out about diseases you are



likely to develop. Be sure to find out which relatives had a disease and the age when they were first diagnosed. If you share this information with your doctor, you may learn if there are steps you can take to reduce your risk for disease or you may detect a problem earlier, when more treatment options are available.

To learn more about how knowing your family medical history can reduce your risk for disease, go to the Guilford Genomic Medicine Initiative's Web site at www.genomic-medicine.org. Under the Community Members section, there is information about the importance of family medical history and its use when determining your risk for certain diseases.

