

Genetics/Genomics

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Health care for all for all persons will increasingly include genetic and genomic information along the pathways of prevention, screening, diagnostics, prognostics, selection and monitoring of treatment effectiveness (The Consensus Panel on Genetics/Genomics Nursing Competencies, 2nd ed., 2009). Nurses are key to bridging the gap and moving this knowledge forward to help patients. This relevancy of genetics and genomics for nurses also applies to our own self care. The information we can obtain from ancestors is valuable in preparing our own personalized health plan. Genetic factors play a role in nine of ten leading causes of death in the United States, including heart disease, cancer, and diabetes. Human genome research is also leading to a better understanding of the interactions between genes and the environment and helping to find better ways to improve health and prevent disease (NHGRI, 2008C).

More and more tests to find DNA differences will become routine to detect, treat, and prevent disease. These advances while beneficial also raise a number of ethical, legal and social issues.

Questions to know before having a genetic test include who will have access to the information, how will it be used, who owns the genetic information stored in each individual's DNA and potential for discrimination. Discrimination from test information by health insurers and employers is protected by the Genetic Information Nondiscrimination Act (GINA) of 2008. The law is to ease concerns that might keep people from getting genetic tests that could benefit their health or from participating in research studies without fear. It sets a minimum standard that must be met in all states but the degree of protection does vary among the states.

Heart Disease, Diabetes, Schizophrenia, Certain Cancers

Examples of conditions caused by multiple genes or gene/environment interactions include heart disease, diabetes, schizophrenia, and certain types of cancer.

Key Points to Remember:

WHAT IS A GENE?

- A gene is the basic physical and functional unit of heredity made up DNA and acts as instructions to make proteins.
- The HGP (Human Genome Project) has estimated humans have between 20,000 and 25,000 genes.
- Most genes are the same in all people, but a very small number called alleles are slightly different and contribute to each person's unique physical features.

WHAT IS GENOMICS?

- The study of all genes in the human genome together, including their interactions with each other, the environment, and the influence of other psychological and cultural factors

WHAT IS GINA?

- GINA is the law that protects discrimination for genetic testing by health insurers & employers.

