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Genetic Testing

Dear Reader:

The following document was created from the MTAS website (mtas.tennessee.edu). This website is maintained daily by MTAS staff and seeks to represent the most current information regarding issues relative to Tennessee municipal government.

We hope this information will be useful to you; reference to it will assist you with many of the questions that will arise in your tenure with municipal government. However, the *Tennessee Code Annotated* and other relevant laws or regulations should always be consulted before any action is taken based upon the contents of this document.

Please feel free to contact us if you have questions or comments regarding this information or any other MTAS website material.

Sincerely,

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Genetic tests typically look at an individual's DNA/RNA. Genetic tests look for changes in a person's genes or changes in the level of structure of key proteins coded by specific genes. Some types of genetic testing may be: gene tests, chromosomal tests, or biochemical tests.

Genetic tests can include, but may not be limited to:

- **Gene tests** look for signs of a disease or disorder in DNA or RNA taken from a person's bodily fluids or tissues. The tests can look for changes in gene patterns or altered chemical bases, excess copies, activity level of genes, inactive genes, or missing genes.
- **Chromosomal tests** apply to the large DNA containing structures in the nucleus of the cell. Humans are supposed to have 23 pairs of chromosomes; 22 pairs of autosomes, and one pair of sex cell chromosomes. Chromosomal tests look at features of an individual's chromosomes including structure, number, and arrangement. The tests may look for a chromosome missing, expanded, or being switched to a different chromosomal location. Karyotype's and fluorescent in situ hybridization (FISH) analysis may be types of tests used for chromosomal purposes.
- **Biochemical tests** generally look at the amounts or activities of key proteins. These types of tests are commonly used in newborn screenings. The diagnosis of Phenylketonuria (PKU) is made by using a biochemical test.

Examples of Tests Covered by GINA:

- BRCA1/BRCA2 or HNPCC mutilations for hereditary cancers
- Carrier screening for disorders such as cystic fibrosis and fragile X syndrome
- Newborn screenings for genetic conditions
- Classifications of genetic properties of tumors to help determine therapy

Genetic testing is generally used to:

- Diagnose a person who may have symptoms of a disease or illness.
- Determine if an individual is a carrier of a genetic disease. Some carriers will not get the disease, but may be able to pass the gene to children. Conversely, some carriers may get the disease but may not be able to pass the gene to children.
- Diagnose unborn fetuses with genetic conditions before birth.
- Screen newborns for genetic diseases or conditions.
- Indicate if a person is pre-disposed to or inherited disposition prior to a disease starting.
- Assist health care providers with determining the best course of treatment.

While genetic testing can be a stressor, it often provides a measure of relief because individuals no longer have to live with the uncertainty that comes with not knowing if they are gene positive. Additionally, it may allow for a longer, healthier life span due to experimental medical treatments, and healthy living behaviors that may lead a person to taking steps to lower his or her chance of developing a disease.

Predictive testing can show which individuals have a higher chance of developing a disease or condition before symptoms appear. This is commonly being used for breast cancer and diabetes. Predictive testing does not conclusively provide answers, but simply looks at genetic risk factors that make one more likely to inherit a disease.