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Editorial Open Access

Creating a Healthier Nation through Public Health Genetics

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Editorial

The US Surgeon General Family History Initiative is a powerful tool enabling individuals of the general population to engage in preventive health care as they proactively make well informed decisions regarding the quality of their overall well-being. Knowing which healthy as well as hazardous genes are present in their karyo types will empower individuals to transform their lives in order to decrease the onset of preventable illnesses and/or lessen the severity of disease manifestations. Reading through the website of the US Surgeon General Family History Initiative will reveal to the general population that both the manifestations of physical and behavioral disorders may demonstrate familial transmission as they afflict the well-being of biological relatives living during various generations.

The US Surgeon General Family History Initiative requests for the general population to record the family medical histories of their maternal and paternal biological relatives spanning at least 3 generations to accurately observe familial patterns of inheritance whether healthy or not. This undertaking may take several months to achieve since family members may reside in different regions of the country or globe, family members may have died and therefore other individuals must be interviewed in order to obtain accurate information, or loss of contact information delays the ability of reaching out to others. Certain individuals who are adopted or have loss permanent contact with family members may not be able to obtain the family medical histories of their biological relatives. Therefore, they will have to concentrate on data pertaining to their own past medical histories. Adopted children most certainly will have a completely different genetic makeup from their parents (unless adopted by a close relative) regardless of how close of a loving relationship in which they may have.

This undertaking will allow individuals to discover what diseases demonstrate familial transmission among biological relatives and how they should respond to them, for example: Familial transmission of heart disease is revealed when an individual records the family medical history of his biological relatives. Empowered with this knowledge, he can proactively protect his health by embracing a healthy lifestyle that involves a healthy diet, drinking plenty of non-carbonic and non-caffeinated fluids, obtaining adequate exercise, and reducing unhealthy behavioral habits such as cigarette smoking, excessive drinking of alcohol, and living a sedentary lifestyle. Individuals with karyotypes composed of similar healthy genes and hazardous traits may demonstrate significant discrepancies of disease manifestation due to the vast different environmental conditions in which they reside, for example: Two children with similar karyotypes both have the same gene potentially leading to the onset of asthma. The child residing in a healthy environment void of excessive air pollutants will have no and/or lesser breakouts of asthmatic attacks. The child residing in an industrialized heavily pollutant environment may experience numerous admissions to the emergency room department resulting from frequent asthmatic attacks. An individual moving from an industrialized environment with heavy air pollution to a community void of air pollution will experience less respiratory illnesses due to cleaner air. This phenomenon reveals that the environmental condition is a strong social determinant of health relating to the onset of diseases even when evaluating individuals with similar karyotypes.

The US Surgeon General Family History Initiative will enable patients to submit excellent documentation of their genetic imprint to their health care providers when seeking medical treatment. Often, patients do not realize that the information obtained from their family medical histories may be related to the signs and symptoms which have prompted them into seeking treatment from their health care providers, for example: A patient may go see his medical provider for a persistent cough which has lingered for over a month. Since a direct relationship exists between a persistent cough and lung carcinoma, the medical provider would like to examine the patient's past medical and family medical histories to see if he is a chronic cigarette smoker and/or lung cancer runs in his family, respectively. Another example involves a patient seeking medical attention for constant urination. His medical provider would like to know whether diabetes mellitus runs in his family since his constant urination may occur as a result of non-treatment for this disorder.

Thanks giving have been proclaimed as National Family History Day since during this gathering it is an excellent opportunity for biological relatives to obtain the family medical histories of one

another. This act alone enables everyone to work together in order to produce a health family. Relatives could be a source of encouragement for one another to become proactive in embracing healthy lifestyles. Furthermore, families may attend health-related seminars sponsored by establishments such as hospitals and health departments, and community and faith-based organizations on how to make well informed decisions to enhance the quality and longevity of their lives. The familial medical histories may also reveal how various diseases affected the health of the ancestors of the general population. As a result, individuals may seek genetic testing to learn if they have inherited the genes related to the manifestations of these very diseases, for example: A patient's family medical history revealed that her foremothers were afflicted with breast carcinoma. Through genetic testing, she may learn whether she inherited the BRCA gene which is related to an aggressive form of breast carcinoma. Based on the test results, this patient can work along with her physician in making informed decisions regarding choices for her life.

Students enrolled in the introductory biology course at Wayne County Community College District (WCCCD) in Wayne County, Michigan engage in a laboratory experiment pertaining to genetics and DNA. In this class assignment, they learn about the strong relationship between DNA and the transmission of genes in genotypes as well as the physical manifestations of traits in phenotypes. They learn about the importance of utilizing the US Surgeon General Family History Initiative in analyzing all aspects of inheritance including blood types, genders, genotypes, phenotypes, dominant and recessive traits, and healthy versus hazardous genes. WCCCD students may be able to encourage the usage of the US Surgeon General Family History Initiative to the general population in their future careers when caring for patients as well as the community in which they will serve. They will be able to help empower the general population in making well informed decisions in taking care of themselves and their loved ones.