The Problem

It’s no secret that certain forms of disease tend to run in families. It is estimated that heart disease, cancer and diabetes account for 7 of every 10 deaths in the United States. Like rare genetic disorders, these common diseases run in families and can therefore be considered genetic diseases. This is one reason why, even in an era of high-tech genetic mapping and testing, a simple medical family tree is still an important tool. It can provide powerful insights into your own risk of various diseases and disorders. This piece of your legacy is extremely important to pass on to children, grandchildren, and future generations.

Know the Terms:

1. **Allele**: Different forms of the same gene. Different alleles produce variations in inherited characteristics such as eye color or blood type.
2. **Chromosome**: Compact unit containing protein and “coded” DNA.
3. **DNA**: Deoxyribonucleic Acid is the molecule found in the nucleus of a cell; contains the genetic instructions used to assemble body proteins; the instructional manual in the development and functioning of all known living organisms.
4. **Gene**: Genes are made of DNA and is the instruction manual for our body; the blueprint used to build proteins that make us function (physiology).
5. **Genome**: The complete set of genetic material of an organism.
6. **Heredity**: Inherited “traits”; the passing of traits from parents to child.
7. **Inheritance**: The passing of “genes” from parent to child.
8. **Proteins**: Molecules of a cell involved in all cell functions, i.e. the work-horse of a cell. Cells need thousands of different proteins to function.
9. **Traits**: Notable feature, characteristic, or quality in a person.

Genetics and Family: Basic Training

1. **Family Health History**:
   - Children, parents, and grandparents often share similar health problems.
   - If a particular disease runs in your family, you may have inherited factors that put you at risk.
   - These factors are passed down from parent to child by way of genes.
   - All humans have the same genes, but the information within each gene may differ slightly from person to person.
   - Family health history is information about diseases that run in your family, as well as the eating habits, activities, and environments that your family shares.
   - Knowing about the diseases that run in your family can help you make healthy choices.

2. **Family History and Disease Risk**:
   - Many things influence your overall health and likelihood of developing a disease. Family history, both genetics and learned behavior, can increase our susceptibility to illness.
   - **Chronic disease is thought to be caused by a combination of several factors**:
     - Genetics
     - Lifestyle
     - Environmental factors
   - **Areas of family history that put me at risk**:
     - Having one or more close relatives with a medical condition.
     - Having a relative diagnosed with a condition at an early age (typically before age 55).
     - Having a relative with a disease that is more rare in a certain gender (for example, a female with heart disease).
     - Having a combination of diseases that run in your family (for example, both diabetes and heart disease).
Common health problems that can run in a family include:

- Alzheimer's disease/dementia
- Arthritis
- Asthma
- Blood clots
- Cancer
- Depression
- Diabetes
- Heart disease
- High cholesterol
- High blood pressure
- Pregnancy losses and birth defects
- Stroke

Choices affect Risk:

- Even when your family medical history has put you at risk, the choices you make will largely determine your fate.
- With healthy living, you can reduce if not neutralize these genetic risk factors and add years to your life.

3. Genetic Diseases:

- Some diseases are clearly genetic, meaning the disease comes from a mutation, or harmful change, in a gene inherited from one or both parents.
  - Genes are instruction manuals for our bodies; the directions for building all the proteins that make our bodies function.
  - Examples of genetic diseases are
    - Huntington's disease,
    - Cystic fibrosis
    - Muscular dystrophy
    - Marfan syndrome

Talk'n Stats:

- Approximately 4 million babies are born each year.
- About 3 to 4% will be born with a genetic disease or major birth defect.
- Approximately 1% of all babies will be born with chromosomal abnormality, which can cause physical problems and mental retardation.
- More than 20% of infant deaths are caused by birth defects or genetic conditions (e.g. congenital heart defects, abnormalities of the nervous system, or chromosomal abnormalities).
- Approximately 10% of all adults and 30% of children in hospitals are there due to genetically related problems.
- It is estimated that 5% to 10% of all cancers are inherited, meaning an abnormal gene (that can lead to cancer) has been inherited.

Know Your Numbers:

1. What a Your Family Health History May Reveal:
   - You can use a family health history to see if you, your children, or your grandchildren might face an increased risk of developing serious health problems.
     - These health problems might be common ones, such as heart disease, cancer, or diabetes.
     - They could also be less common diseases that are passed from one generation to the next, such as hemophilia or sickle cell anemia.
     - Many diseases result from a combination of a person's genes, lifestyle, and environment.
     - People can't change the genes they inherit from their parents.
       - They can change things like diet, physical activity, and medical care to try to prevent diseases that run in the family.
       - By knowing your numbers, you can alter lifestyle choices accordingly to lower risk.
       - Remember, families not only pass on genes, but behavioral patterns (addictive tendencies, food and cooking patterns, stress management styles, etc.) as well.
A health care professional can use a family health history to help assess a person's risk of certain diseases. The professional might recommend actions to lower the chance of getting those diseases, such as:

- Medical tests or screenings
  - Screening tests (such as mammograms and colorectal cancer screening) can detect diseases like cancers at an early stage when they are most treatable.
  - Screening tests can also detect risk factors like high cholesterol and high blood pressure, which can be treated to reduce the chances of getting disease.
- Lifestyle changes
- Taking new medicines, or supplements for prevention.

2. **How You and Your Family May Benefit:**
   - Providing information that may help your children and grandchildren live longer, healthier lives.
   - Remember that mistakes are made by what we don't know, rather than what we do know.
     - When it comes to you health, and the well-being of your family, knowledge is power.

**Thoughts for Living: Creating Your Family Health History:**

1. **Talk to Your Blood Relatives:**
   - Step one in creating a family health history is to talk to your blood relatives.
   - The most helpful information comes from immediate family or first-degree relatives such as parents, grandparents, brothers and sisters.
   - Information from second-degree relatives such as nieces, nephews, half-brothers, half-sisters, aunts, uncles and close blood relatives can also be used.

2. **Questions to Ask:**
   - To start, make a list of relatives to contact. See if there are any existing family trees, charts, or baby books. Important questions to ask your blood relatives include:
     - What is your age or date of birth?
     - Do you have any chronic conditions, such as heart disease, diabetes, asthma, or high blood pressure?
     - Have you had any other serious illnesses, such as cancer or stroke? (If you know of a specific disease or illnesses in your family, ask about them, too.)
     - How old were you when you developed these illnesses?
     - Have you or your partner had any problems with pregnancies or childbirth?
     - What countries did our family come from? (Knowing this can help because some genetic diseases occur more often in certain population groups. Also, different diets and living environments can influence the risks of developing certain diseases.)
     - Has anyone in the family had birth defects, learning problems, or developmental disabilities, such as Down's syndrome?
     - What illnesses did our late parents or grandparents have?
     - How old were they when they died?
     - What caused their deaths?

3. **Adopted Family:**
   - Adoptive parents and adoption agencies may have some health information about birth parents, but many states have laws that protect this information.
   - A local health or social service agency may be able to help.
   - One alternative for adopted people is to start a brand-new family health history for the benefit of their biological children and grandchildren.

4. **Keep the History Up to Date:**
   - As children are born and family members develop illnesses, add that information.
   - Store it in a safe location.
   - It may take a little time and effort, but this lasting legacy can improve the health of your family for generations to come.