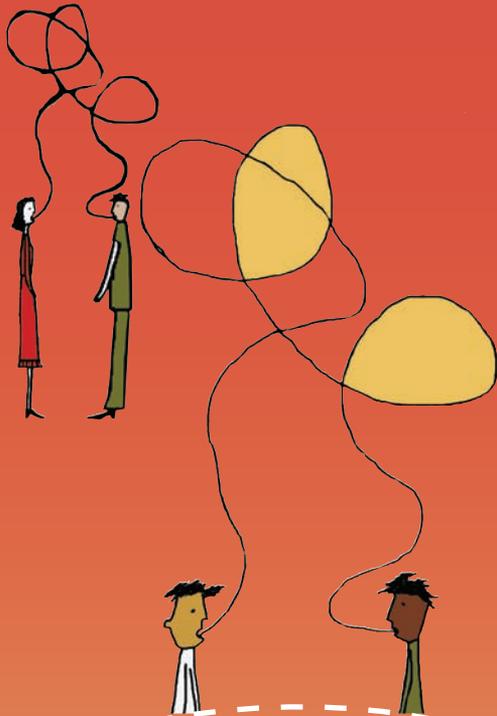


DOES IT RUN IN THE FAMILY?

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# A Guide for Understanding Genetics and Health



HMONG GENOMICS BOARD  
WEST SIDE COMMUNITY HEALTH SERVICES

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# Why is genetics important to my family and me?



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Genetics helps to explain:

- What makes you unique
- Why family members have traits in common
- Why some diseases like diabetes or cancer run in families
- How learning your family health history can help you stay healthy
- Why you should bring your family health history to your healthcare provider

Taking time to learn about health and diseases that run in your family is worth it! It will help you understand your own health and make healthy choices.

# What makes me unique?



Every person is unique in many ways. Part of what makes you unique is in your genes. **Genes are the instructions inside each of your cells.** These instructions influence how you look and how your body works. Since everyone has slightly different genes, everyone has a different set of instructions. **Genes are one reason why you are unique!**

1. Hand



2. Cell



# Tell me more about my genes

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- A person has two copies of each gene, one from the mother and one from the father.
- Genes carry instructions that tell your cells how to work and grow.
- Cells are the building blocks of the body. Every part of your body is made up of billions of cells working together.
- Genes are arranged in structures called chromosomes. Humans have 23 pairs of chromosomes. Copies of the chromosomes are found in each cell.
- Chromosomes are made up of DNA. DNA is the special code in which the instructions in your genes are written.

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3. Chromosomes



4. DNA





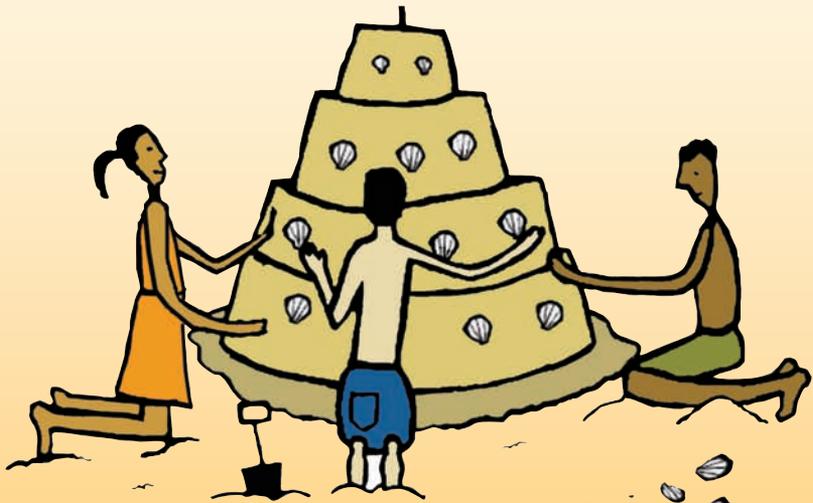
## Why do family members have things in common?

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Children inherit pairs of genes from their parents. A child gets one set of genes from the father and one set from the mother. These **genes can match up in many ways** to make different combinations. This is why many family members look a lot alike and others don't look like each other at all. Genes can determine similarities in appearance, but they may also lead to a risk in the family for developing certain health conditions.

**Families also share habits, diet, and environment.** These experiences might influence how healthy we are later on in life.

You share a lot with your family—including what can make you sick.



# Why do some diseases run in families?

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Some diseases are caused when there is a change in the instructions in a gene. This is called a mutation. **Every person has many mutations.** Sometimes these changes have no effect or are even slightly helpful. But sometimes they can cause disease.

Most common diseases are caused by a combination of mutations, lifestyle choices, and your environment. **Even people with similar genes may or may not develop an illness** if they make different choices or live in a different environment.

## **Common Disease: Diabetes**

Changes in your genes passed on by your parents may make you more likely to develop type 2 diabetes. If you are active and eat a healthy diet, you may be able to lower your risk.

Visit page 10 to learn about some



Thousands of diseases are caused by a specific change in the DNA of a single gene. **Many of these diseases are rare.** These conditions usually develop when an individual is born with a mutated gene.

**Single Gene Disorder:  
Alpha-thalassemia**

Alpha-thalassemia is caused by a mutation in a single gene passed from each parent.

Even if a rare disease runs in your family, don't forget to learn about more common conditions that affect your family's health.

diseases that run in families.

# How can knowing my family health history help me stay healthy?

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Family health history gives you an idea of which diseases run in your family. Health problems that develop at a younger age than usual can be a clue that your family has higher risk. Though you can't change your genes, you can change your behavior.

## **Knowing your family health history will help you:**

- Identify risks due to shared genes.
- Understand better what lifestyle and environmental factors you share with your family.
- Understand how healthy lifestyle choices can reduce your risk of developing a disease.
- Talk to your family about your health.
- Summarize your health information to give to your healthcare provider.

## **Remember**

1. Share your family health history with your healthcare provider.
2. Ask if screening is available for a disease in your family.

# Why should I take my family health history to my healthcare provider?

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Your healthcare provider (doctor, nurse, or physician's assistant) may use your family health history and current health to figure out your risk for developing a disease. Your provider can then help decide which screenings you get and which medicines you might take.

Based on your family health history, a healthcare provider may order a **genetic test** or refer you to a genetic counselor or geneticist. A specific test can show whether you are affected by or at risk for a disease and which mutations you might pass along to your children. Your healthcare provider can help you:

- Understand the results of your tests.
- Learn of any treatments for a disease found by the test.

All newborn babies born in the U.S. and many other countries are tested for certain genetic diseases that may make them sick if not treated. This is called **newborn screening**. If the screening test finds a problem, a healthcare provider or specialist will help you understand what can be done to help the baby.

# Diseases that run in the family

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In the rest of this booklet, we provide you with examples of some common diseases that affect our communities and families. For each disease, we include information under the following headings:

- What is the disease?
- Who is at risk?
- Hints for health



# Heart disease, Mob lub plawv

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Heart diseases are the main cause of death in America in both men and women. Two of the most common heart diseases are coronary artery disease (CAD) and high blood pressure (hypertension).

## **WHAT IS CORONARY ARTERY DISEASE (CAD)?**

- In CAD the arteries that supply blood to the heart muscle can get hard and narrow. The arteries narrow because of a buildup of plaque or cholesterol on the inner walls.
- CAD gets worse over time. As the heart gets less blood, less oxygen is delivered to the heart muscle. When the heart gets very little oxygen, you can develop chest pain or a heart attack.
- CAD is the most common cause of heart attacks among Americans, including Hmong Americans.

## **Who is at risk?**

- About 13 million Americans have CAD.
- A significant percent of Hmong people have CAD.
- Everyone has some risk for developing heart disease.
- CAD is caused by a combination of genetic background, lifestyle choices, and your environment.
- For some people, a healthier diet and increased activity can change cholesterol level and lower their risk.
- Some people can benefit from medication to lower their risk of having a heart attack.

## **Hints for health**

- Eat low fat and low salt meals.
- Get active and exercise regularly. Maintain a healthy weight. Obesity increases your risk.
- Take your medications to control high cholesterol, high blood pressure, and diabetes.
- If you smoke, talk with your healthcare provider about quitting.

For Hmong information, visit [spiral.tufts.edu/hmong.html](http://spiral.tufts.edu/hmong.html) and [www.healthyroadsmedia.org/hmong](http://www.healthyroadsmedia.org/hmong)

Also visit [www.nhlbi.nih.gov/health/dci](http://www.nhlbi.nih.gov/health/dci) and click on “Coronary Artery Disease” or call the American Heart Association at 800-AHA-USA-1 (800-242-8721).

# Heart disease continued

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## WHAT IS HIGH BLOOD PRESSURE - NTSHAV SIAB / NTSHAAB SAB?

- Blood pressure is a measure of how hard your heart is working to push the blood through your arteries.
- There are two numbers in a blood pressure reading. A normal reading is about 120/80 (read as “120 over 80”). The first number measures the force your heart uses to pump the blood. The second number measures the pressure between heartbeats.
- High blood pressure means that your heart is working too hard. Over time, high blood pressure can cause kidney failure, heart attacks, strokes, and other health problems.

## Who is at risk?

- Approximately one in three adults has high blood pressure. Many do not even know it because there are no clear symptoms.
- A significant percent of Hmong people have high blood pressure.
- A family history of high blood pressure increases your risk for developing it at a younger age.
- Greater risk comes with increasing age, being overweight, or having a family history of hypertension.

## Hints for health

- Decrease the amount of salt you eat.
- Maintain a healthy weight.
- Manage your stress.
- Get active and exercise regularly.
- Limit the alcohol you drink.
- Get screening regularly.

For Hmong information, visit [spiral.tufts.edu/hmong.html](http://spiral.tufts.edu/hmong.html) and [www.healthyroadsmedia.org/hmong](http://www.healthyroadsmedia.org/hmong)

Also visit [www.nhlbi.nih.gov/health/dci](http://www.nhlbi.nih.gov/health/dci) and click on “High Blood Pressure” or call the American Heart Association at 800-AHA-USA-1 (800-242-8721).

Heart disease symptoms may not appear until the damage is already done. Talk to your family about heart disease today.

# Chronic kidney disease, Mob lub raum

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## WHAT IS CHRONIC KIDNEY DISEASE?

Chronic kidney diseases impair the kidney's ability to make urine. Hmong people have high rates of kidney disease from diseases that are inherited: gout, kidney stones, diabetes, high blood pressure, and IgA nephropathy. Gout causes kidney damage by impairing urine filtration, as well as by creating kidney stones that block urine excretion.

## Who is at risk?

- Older people
- People with gout, kidney stones, diabetes, high blood pressure, or heart disease
- People with a family history of chronic kidney diseases, kidney stones, or gout

## Hints for health

- Eat a diet low in fat and protein, particularly beef and seafood.
- Limit alcohol
- Drink plenty of water every day and avoid dehydration.
- Maintain a healthy weight. Avoid obesity.
- Control blood pressure.
- Avoid medications that increase uric acid levels.
- Visit your doctor to have a urine test for protein and red blood cells.

For Hmong information: visit [spiral.tufts.edu/hmong](http://spiral.tufts.edu/hmong) and [www.hmonghealth.org](http://www.hmonghealth.org)

For general information on chronic kidney disease, visit [www.kidney.org](http://www.kidney.org)

The National Kidney Foundation provides a free, community-based health program called the Kidney Early Evaluation Program (KEEP). This includes tests for the early detection of chronic kidney disease.

# Diabetes (sugar disease)

## Ntshav qab zib / Ntshaav qaab zib

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Diabetes is a serious, chronic disease in which blood sugar levels are above normal. Unfortunately, many people learn about their diabetes after complications develop. According to the American Diabetes Association, one-third of those affected by type 2 diabetes are unaware that they have the disease.

Symptoms occur when the body fails to change sugar, starches, and other food into energy. This happens when the body cannot produce or properly use a hormone called insulin. Serious complications from diabetes can include blindness, kidney failure, and death. Diabetes can be detected early and treatment can prevent or delay these serious health problems. A combination of genetics and environmental factors such as diet and exercise plays an important role in developing the disease.

### **WHAT IS TYPE 1 DIABETES?**

- Type 1 diabetes usually develops in young children or young adults.
- People with type 1 diabetes stop producing their own insulin.

### **WHAT IS TYPE 2 DIABETES?**

- Type 2 diabetes usually develops in people over 30 years of age; though in recent years, more young people are developing it due to poor diet.
- Scientists are learning more about the specific genes involved in this type of diabetes.



### Who is at risk?

- Diabetes affects approximately one in 14 people in the United States.
- Between 14 percent and 30 percent of Hmong adults are developing diabetes.
- Five to 10 percent of Americans who are diagnosed with diabetes have type 1 diabetes.
- Type 2 diabetes usually develops in adults, but overweight teenagers can also develop it.
- Children or siblings of individuals with diabetes are more likely to develop it themselves.
- Obese people have a greater risk for type 2 diabetes.
- Women who had a baby that weighed more than 9 pounds or who had gestational diabetes while pregnant are at risk.

### Hints for health

- Eat more fruits and vegetables, less rice, sugar and fat.
- Get active and exercise regularly.
- Lose weight if necessary.

For Hmong information:

[spiral.tufts.edu/hmong.html](http://spiral.tufts.edu/hmong.html)

[www.hmonghealth.org](http://www.hmonghealth.org)

[www.ndep.nih.gov/diabetes/pubs/HmongTipsheet.pdf](http://www.ndep.nih.gov/diabetes/pubs/HmongTipsheet.pdf)

[www.ndep.nih.gov/diabetes/pubs/TCH\\_AsAm\\_flyer\\_Hmo.pdf](http://www.ndep.nih.gov/diabetes/pubs/TCH_AsAm_flyer_Hmo.pdf)

For more information, visit [www.ndep.nih.gov](http://www.ndep.nih.gov) or call 800-860-8747.

# Cancer

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There are many types of cancer. Cancer is caused by the growth and spread of abnormal cells. Though your risk of getting cancer increases as you get older, genetic and environmental factors also cause people to be at a higher risk for certain types of cancer.

## **WHAT IS BREAST CANCER - CANCER LUB MIS?**

- Breast cancer is a type of cancer that forms in the tissues of the breast, usually the ducts.
- Breast cancer is one of the most common cancers among women. Although it is rare, men can also get breast cancer.
- Most breast cancer is treatable if found early.

## **Who is at risk?**

- One out of eight American women will develop breast cancer in their lifetime.
- Hmong women have died of breast cancer.
- Breast cancer risk is higher among women whose close blood relatives have had this disease. Both your mother's and father's family history of breast cancer is important.

## **Hints for health**

- Women should do monthly breast self-exams.
- After age 40, women should get annual mammograms.
- Ask about genetic testing for high-risk families.
- Eat a healthy, balanced diet.
- Get active and exercise regularly.
- Limit the alcohol you drink.

For Hmong information, visit [www.cancer.org](http://www.cancer.org) and search for "Hmong".

Also visit [spiral.tufts.edu/hmong](http://spiral.tufts.edu/hmong) and [www.hmonghealth.org](http://www.hmonghealth.org)

For more information, visit [www.cancer.gov/cancertopics](http://www.cancer.gov/cancertopics) and click on "Breast Cancer" or call 800-4-CANCER (800-422-6237).

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## WHAT IS LUNG CANCER - CANCER LUB NTSWS?

- Lung cancer is the uncontrolled growth of abnormal cells in one or both of the lungs.

### Who is at risk?

- Lung cancer is the leading cause of cancer death for both men and women.
- More than 150,000 people in the United States died of lung cancer in 2005, including Hmong people.
- Nearly 87 percent of lung cancer cases in the United States are smoking-related.

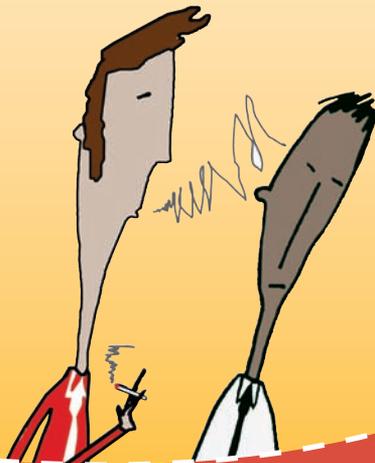
### Hints for health

- Do not smoke.
- Avoid secondhand smoke.
- Find out about testing for radon and asbestos in your home and at work.

For Hmong information, visit [www.cancer.org](http://www.cancer.org) and search for “Hmong”. Also visit [spiral.tufts.edu/hmong.html](http://spiral.tufts.edu/hmong.html) and [www.hmonghealth.org](http://www.hmonghealth.org) and search for “Lung Cancer”.

For more information, visit [www.cancer.gov/cancertopics](http://www.cancer.gov/cancertopics) and click on “Lung Cancer” or call 800-4-CANCER (800-422-6237).

Also visit NIH medlineplus tutorial:  
[www.nlm.nih.gov/medlineplus/tutorials/lungcancer/htm/index.htm](http://www.nlm.nih.gov/medlineplus/tutorials/lungcancer/htm/index.htm)



# Cancer continued

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## **WHAT IS LIVER CANCER - CANCER DAIM NPLOOJ SIAB / DAIM NPLOOJ SAB?**

Liver cancer occurs most commonly in people with chronic Hepatitis B infections. Children get the hepatitis B virus at birth from their mothers, while adolescents and adults can get the Hepatitis B virus from exposure to blood and sex with people who have the virus.

Over many decades, about 10 percent of people with chronic infections will get very sick. The virus slowly causes liver damage, including liver failure, and liver cancer.

### **Who is at risk?**

- 16 percent of Hmong have chronic Hepatitis B infections upon arrival in the US.
- All infants born to infected mothers are at risk, so they receive an extra vaccine at birth.
- Adults who have sex without a condom.

### **Hints for health**

- Ask your doctor if you have Hepatitis B or if you are immune to Hepatitis B.
- If you are not immune, get the vaccine.
- If you are a carrier, get a yearly checkup of blood work and an ultrasound.
- If you have a liver tumor, get a biopsy to make sure it is not cancer.

For Hmong information, visit [spiral.tufts.edu/hmong.html](http://spiral.tufts.edu/hmong.html)

Visit [www.hmonghealth.org](http://www.hmonghealth.org) and search for “Liver Cancer”.

Hmong information about vaccination: Visit [www.immunize.org](http://www.immunize.org)

Click on “Print Materials” and find Hmong language.

# Single gene mutation

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## WHAT IS THALASSEMIA?

People with alpha-thalassemia or beta-thalassemia have impaired hemoglobin (which is the molecule in red blood cells that carries oxygen). Thalassemia disorders are inherited from parents who have altered or mutated genes, with wide variation.

- Some people are not affected, but their children may be.
- Some people have small red blood cells and low hemoglobin, but they are not sick.
- Some people are weak and sick with hemolytic anemia.
- Rarely, unborn babies and newborn babies are seriously ill and may not live.

## Who is at risk?

- Thalassemias occur around the world.
- A high percent of Southeast Asians have alpha- or beta-thalassemia.
- A significant percent of Hmong people have thalassemia.

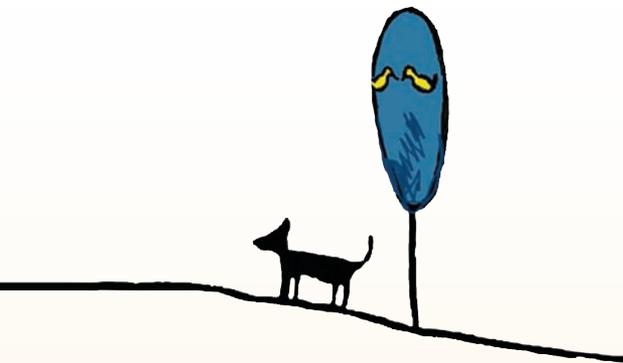
## Hints for health:

- Ask your doctor if you have thalassemia.
- Do not take iron tablets except for iron deficiency anemia.
- Get genetic counseling to understand the risk of transmitting thalassemia to your children.

For more information:

Visit [www.nchmd.org](http://www.nchmd.org) and search for “Alpha Thalassemia”

Visit [www5.doh.wa.gov](http://www5.doh.wa.gov) and search for “Alpha Thalassemia”



## Single gene mutation continued

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### WHAT IS DRUG METABOLISM?

Genes control the creation of enzymes that metabolize medicines. Gene mutations can influence drug metabolism. Unfortunately, doctors don't know if people have mutations or not. So, the initial medication dose may be too strong or too weak.

Research studies on genes called pharmacogenomics can now be conducted to determine if populations of people have mutations that could influence their metabolism of medicines. The results of these studies can help doctors prescribe medicines at appropriate doses.

For Hmong information, visit [spiral.tufts.edu/hmong](http://spiral.tufts.edu/hmong). Click on "Patient Information by Topic", and then select the drop down box for "Medicines".

For further information:

[www.ncbi.nlm.nih.gov/About/primer/pharm.html](http://www.ncbi.nlm.nih.gov/About/primer/pharm.html)

# Resources

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The “Does It Run In the Family?” toolkit includes two pieces that can help you summarize your health information for your provider—the family health portrait and healthcare provider card. You may also hear your healthcare provider call a *Family Health Portrait* a “pedigree.”

Each family and individual is unique and may have genetic diseases other than the major diseases listed here.

For more information visit:

**Disease InfoSearch**

[www.geneticalliance.org](http://www.geneticalliance.org)

**National Library of Medicine**

[www.nlm.nih.gov/services/genetics\\_resources.html](http://www.nlm.nih.gov/services/genetics_resources.html)



**West Side**  
Community Health Services

[WWW.WESTSIDECHS.ORG](http://WWW.WESTSIDECHS.ORG)

LaClinica, 153 Cesar Chavez St, St Paul MN 55107  
East Side Family Clinic, 860 Arcade St, St. Paul MN 55106  
McDonough Homes Clinic, 1544 Timberlake St, St. Paul MN 55117

WSCHS' mission is caring for the health of diverse communities. Our overall goal is to improve the health of disadvantaged populations. We meet that goal by building responsive programs, enhancing our capacity, nurturing community relationships, and serving as a voice for our communities.



**Genetic Alliance**

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