Memorial Sloan Kettering Cancer Center

PATIENT & CAREGIVER EDUCATION

About Clonal Hematopoiesis (CH)

This information explains clonal hematopoiesis (KLOH-nul hee-MA-toh-poy-EE-sis). It explains the risk factors of CH, and what to do if you have CH. It also has information about MSK's Clonal Hematopoiesis Clinic.

About hematopoietic stem cells

A hematopoietic stem cell is a cell that makes blood cells. These stem cells are in your bone marrow, the soft tissue in the center of your bones. As stem cells mature, they become blood cells, such as red blood cells, white blood cells, and platelets.

What is CH?

CH is not cancer. It is a disorder that causes hematopoietic stem cells to make blood cells that all have the same mutation. A mutation is a genetic change.

The cells with the genetic mutation are different from the rest of your healthy blood cells. These mutations are not hereditary (passed on to you by your parents). If you have children, you cannot pass CH to them. They are not at a higher risk of getting CH.

Causes and risk factors of CH

There is not a single cause of CH. Risk factors that can raise your chances of developing CH include:

- Getting older.
- Being male.
- Being white.
- Smoking.
- Radiation therapy.
- Some types of chemotherapy.

It is possible to get CH even if you do not have any of these risk factors.

Risks of CH

People with CH have a higher risk of developing:

- **Blood cancer.** Most people with CH have a very low risk of developing blood cancer. Less than 1 out of every 100 people with CH get blood cancer each year. Types of blood cancer include myelodysplastic syndrome (MDS) and acute myeloid leukemia (AML).
- **Cardiovascular (heart) disease**, such as heart attack or stroke. People with CH are about twice as likely to get heart disease as people without CH. Heart disease screening guidelines are the same whether or not you have CH.
- **Other diseases**, such as:
  - Chronic liver disease.
  - Chronic kidney disease.
  - Chronic obstructive pulmonary disease (COPD).
  - Osteoporosis.
  - Blood clots.
  - Gout.

People with CH have a lower risk of developing Alzheimer's disease.

Symptoms of CH

There are no warning signs of developing CH. Most people with CH never have any symptoms.

How to diagnose and treat CH

At this time, routine testing for CH is not recommended. This is because there are currently no treatments for CH.

CH is diagnosed through a special blood test that sequences your DNA. This is known as next generation sequencing. Most people learn they have CH by chance from a blood test looking for other genetic mutations.

Talk with your healthcare provider about whether you should be tested for CH.

What to do if you have CH

Tell your healthcare provider if you've been diagnosed with CH. You can also make an appointment with MSK's CH clinic.

Your doctor will do tests to check for blood cancer. These tests may include blood tests, such as complete blood count (CBC) or genetic testing. Low blood counts, and certain types and sizes of genetic mutations can raise the risk of developing blood cancer. Genetic testing helps to monitor the type and size of mutation. Most people with CH have a very low risk of developing blood cancer.

If you have CH, following a healthy lifestyle can help lower your risk of heart disease. This includes keeping track of your blood pressure, cholesterol, and blood sugar, and controlling them if they are high. Talk with your primary healthcare provider or cardiologist (heart doctor) about how to do this.

If you smoke, try to quit. MSK's Tobacco Treatment Program can help. Read *Tobacco Treatment Program* (www.mskcc.org/experience/patient-support/tobacco-treatment) to learn more.

About MSK's CH clinic

MSK's CH clinic is a specialty clinic for people with CH. The CH clinical team is made up of the following members who specialize in treating CH:

- **Oncologists** (doctors who treat cancer).
- **Hematologists** (HEE-muh-TAH-loh-jists). These are doctors with special training in blood disorders.
- **A cardiologist**. This is a doctor with special training in the cardiovascular system (heart and blood vessels).
- **A nurse practitioner (NP)**.
- **A nurse**.

In the MSK CH clinic, your care team will create a monitoring program for you. This program is based on your risk of developing blood cancer. It will include blood tests and clinic visits. If you have low blood counts, you may need a bone marrow biopsy. Read *Bone Marrow Aspiration and Biopsy* (www.mskcc.org/pe/bone-marrow-aspiration-biopsy) to learn more.

If you do not already have a cardiologist, you can meet with the CH clinic cardiologist. You may also choose to join a research study to help us better understand CH.

If you're diagnosed with blood cancer while in the CH clinic, your care team will make a treatment plan. They will work with hematologists at MSK to make a plan that's best for you.

Talk with your MSK healthcare provider about whether a CH referral is right for you. If you are not an MSK patient, call 646-497-9154.

If you have questions or concerns, contact your healthcare provider. A member of your care team will answer Monday through Friday from 9 a.m. to 5 p.m. Outside those hours, you can leave a message or talk with another MSK provider. There is always a doctor or nurse on call. If you're not sure how to reach your healthcare provider, call 212-639-2000.

For more resources, visit www.mskcc.org/pe to search our virtual library.

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