



**Supporting Family Testing:
The Test and Your Results**



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Introduction and purpose

Making the decision for you or a family member to be tested for Hereditary Angioedema (HAE) is not simple for some people. When you make the decision for yourself or a family member to be tested for HAE, you will experience many thoughts and feelings about the possibility of receiving confirmation that you have the condition. Before or after you have made the decision, you may wish to know more about the test itself, the process involved as well as understand what the diagnosis could mean and begin to discuss treatment options.

This booklet is designed to support you in advance of, during and after the test, helping you understand what will be involved in the process and to aid you in preparing for and understanding the results.

Before you continue reading, it is important to remember that having HAE identified is the first step to managing the condition and limiting the impact of any swelling attacks to help someone with HAE lead a fulfilling and active life.¹

You may be reading this booklet because a family member or blood relative has recently been diagnosed with HAE and you are considering being tested. Alternatively you may have been experiencing swelling attacks yourself and the doctor has suggested you are tested for HAE. Whichever reason, you may find that not all the content of this leaflet is directly relevant to you and your situation.

Because HAE is usually passed down from parent to child, family history is an important diagnostic tool for your doctor, alongside any symptoms.² However, the main way to establish if you have HAE is through a blood test.² Please note that this booklet does not address genetic testing which test is rarely necessary to confirm if you have HAE.³ If you have any questions that are not covered in this booklet please ask your doctor.

The test and what it looks for

If you decide to go ahead and get tested for HAE, you are likely to have already been in contact with a specialist doctor, possibly a hematologist, allergist, clinical immunologist or dermatologist who will conduct a blood test which can confirm your diagnosis.²

To confirm a diagnosis of HAE, the doctor will be reviewing the blood test laboratory results to check concentrations and activity of:

- The protein C1-esterase inhibitor (C1-esterase inhibitor (C1-INH) is a protein in the body.)²
- The complement factor C4 (a protein in the body's immune system)²

After the blood is taken, it will be sent for laboratory analysis. Your doctor should explain how long to expect to wait for your results. You should also ask your doctor about how you will get the results, whether by post or in person or perhaps via a telephone-call, so that you can prepare yourself.

There are three types of HAE, which are categorised depending on the levels and activity of the two factors observed in the test.²

- Type I: Around 85 percent of patients have Type I HAE, which is the most common form. Overall levels of C1-INH are low.²
- Type II: This is the second most common form of HAE, affecting around 15 percent of patients. C1-INH levels are normal or elevated but the C1-INH molecule does not function properly (low C1-INH activity).²
- HAE with normal C1-Inhibitor (previously referred to as Type III): This type of HAE is the rarest form, is the least understood and mostly affects women.² In some cases HAE with normal C1-Inhibitor has been linked to a mutation in Factor XII,² but in many the mutation is yet to be identified. C1-INH lab tests are normal but the patient will show the symptoms of HAE.²



Your doctor/ specialist can provide more information about the different types and what they mean for individuals.

Preparing for the results

Your doctor/ specialist should be able to tell you how long it will take for the results to be available. However soon this is, it may still feel far longer for you or the person who is waiting.

Receiving the results of any health test can be a confusing and stressful experience and you may not take in as much information as you would like or hope. You may find the following helpful as you prepare for your results:

- If it would make you feel more comfortable, try to take someone with you when you go to receive the results (if you receive them in person) – they can offer reassurance and support, as well as another person to listen to the doctor and absorb what is being said. If there is another family member who has HAE, it may be reassuring to also have them in the consultation if this is possible.
- It can help to write down any questions you have before the consultation and to check through your list during your time with the doctor so you know you have covered all your questions
- To help you remember the conversation you have with your doctor, it may help to write things down as you go along, or some people may find it helps to record the discussion on a small dictaphone or mobile telephone
- Consider making a follow up appointment at the end of your meeting – it can help to reassure you afterwards, knowing that you have another opportunity to have further questions from you and your family answered

Being tested for HAE is a big step for anyone and this leaflet should help you to prepare as much as you can. There will be things that can only be answered by your doctor so do not be afraid to ask questions before, during and after.

Receiving the results of any test can be stressful and trigger many emotions - you should make sure you have as much support and you can get and take the time that you need to digest information and ask questions.

Your local patient support group should be able to provide other information and support, details can be found on the HAEi website (www.HAEi.org).

Depending on the results of your test you may find the other booklet in this series, 'Talking to Your Family About HAE' provides useful support.

The results and what they mean

The results may show one of two things:

1. Results show no indicators of HAE

Some people who may have been told that they have been 'diagnosed' with HAE can then find out that their blood sample result comes back 'normal', showing no evidence of HAE.²

Although unusual, this can be hard news to receive if you have been experiencing symptoms and are looking for answers. It could be an indicator that the swelling attacks were not caused by HAE but another type of angioedema, or it could be as a result of HAE with normal C1-inhibitor (previously referred to as type III), where C1 and complement factor C4 levels in the blood will appear normal.²

If this does happen, you should discuss with your doctor how best to monitor your symptoms. Consider trying to have another blood test when you are in the middle of a swelling attack, if this is possible.²

Keep in close contact with your doctor, as failure to treat your symptoms can be serious.⁴ Your doctor will be able to



advise you on other suggestions and their plan for your treatment.

2. Results show that you have HAE type I or type II

When you make the decision for yourself or a family member to be tested for HAE, you or they may have had a variety of experiences with symptoms⁵ and some people are tested because HAE runs in their family and would like to know if they have it⁵ – see the leaflet, ‘Talking to Your Family About HAE’. If you have not experienced HAE symptoms, your doctor will probably advise you how to recognise symptoms, should they occur, and what to do if you feel a swelling attack coming on.⁵ Your doctor will also talk about how to manage HAE and this may also include discussions on whether to start treatment at this point.⁵

However, when the test was done, you or the family member may have already been experiencing symptoms and the test results confirm that you have one of the three types of HAE. This is now the time to discuss a management plan with your doctor.⁵

Living with HAE

Each patient is unique so it is important that patients with HAE and their doctor work together to find a management programme that is right for each individual and their own daily life.⁵

There is no doubt HAE swelling attacks may, for some patients, severely affect their lives, but with a proper understanding of the condition and the different treatment options, HAE patients and their families may be able to manage their symptoms and lead fulfilling and active lives.¹

Living with HAE often requires additional planning in certain situations. HAE doctors and also national or local patient groups provide information, advice and support for patients who wish to minimise the risks and burdens of their illness.⁵

In addition to the support provided by family and friends, connecting with other HAE patients may be valuable. It may be helpful to share experiences and feelings with people who know what it is like to live with HAE.

While there is currently no cure for HAE, there are medications available to either prevent or to help in the event of a swelling attack and to help reduce their frequency and severity.⁵

HAE treatment options focus on two main strategies:

- Stopping the swelling and providing rapid relief during attacks - also known as acute treatment⁶
- Reducing the frequency and severity of swelling attacks – also known as prophylactic or preventative treatment⁶

If you have been experiencing symptoms and the test confirms that you do have one of the three types of HAE, then your doctor may talk to you about which available treatments may be most appropriate to help you manage your HAE swelling attacks. For further information you may wish to contact a local patient group. Details can be found on the HAEi website (www.HAEi.org).

Talking to family about the results

If you have received a diagnosis of HAE, once you have had time to digest the information and talk to your doctor, you may want to talk to your family about your results. Some of the issues to discuss are complex so take your time before you have the conversation. Research shows that identifying HAE in patients can reduce the chances of a fatal swelling attack⁴, so it is important to consider that those in your family who are at risk of having HAE are made aware of the possibility of a test and how to go about it.⁴ The leaflet ‘Talking to Your Family About HAE’ addresses many of the issues associated with these discussions so please refer to that for more information and support.

What it means for you

Your family are likely to want to know how you will be affected by HAE, how you will manage it and what role they could or should play in helping to manage it. You may have had HAE symptoms for some time so they will be aware of how you and they can be affected by your HAE symptoms. The next steps of agreeing a treatment plan with your doctor and explaining this to your family members could provide reassurance that your HAE is being managed.⁵ They may also then feel better informed about how to support you.⁵

What it means for your family

As HAE is a hereditary condition, your diagnosis will have implications for other family members – children, siblings, parents and even cousins. The leaflet ‘Talking to Your Family About HAE’ addresses many of the issues associated with these discussions so please refer to that for more information and support.

If your child has been diagnosed with HAE you may want to explain some of the contents of this leaflet to them carefully in your own words, as well as considering other issues:

- When and how to explain the diagnosis to their siblings (and possibly some close friends)
- Informing the school / childcare and educating them about symptoms and actions. Your doctors should be able to support you with any logistical elements here.

Learning that you or a family member has been diagnosed with HAE can affect people in many ways and there are a number of implications to consider. However, a better understanding of the condition as well as careful management, and if necessary and possible, appropriate treatment, can mean that the impact is lessened and you or the family member are more confident about living with HAE.

There are many things for you and family members to consider after the diagnosis, including the option of testing for other members of your family.⁵ However, there is support and information available and the possibility of a variety of treatments that can make your HAE more manageable and offer you the chance of leading an active and fulfilling life.¹

In summary

- Research shows that identifying HAE in patients can reduce the chance of a laryngeal swelling attack being fatal.⁴
- A blood test can confirm diagnosis of HAE²
- With a proper understanding of the condition and the different treatment options, HAE patients and their families may be able to manage their symptoms and lead fulfilling and active lives¹
- While there is currently no cure for HAE, there are medications available to help in the event of a swelling attack and to help reduce their frequency and severity²
- If appropriate, your doctor will talk to you about which available treatments might be most appropriate to help you manage your HAE swelling attacks⁵
- Other members of your family may have HAE and not know it. It is important to consider making them aware of the possibility of a test and how to go about it⁵
- A better understanding of the condition, as well as careful management, and if necessary and possible, appropriate treatment, can mean that the impact is lessened and you or the family member are more confident about living with HAE^{1,5}

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Patient Story

And why she supports family testing for HAE

Michelle first remembers experiencing a swelling episode after she underwent a tooth extraction at around age 17. At the time she put the facial swelling down to an allergic reaction and, as the swelling subsided over time, didn't think much more about it. After going away to college she began experiencing frequent stomach aches which she thought were just a reaction to the stress of adjusting to a new environment. However, those stomach aches persisted, and over the years became increasingly painful and debilitating. Over time, Michelle and her family realized there was a hereditary component to what was happening as both her sister and father also experienced swelling attacks. As the locations of the attacks were all different, they didn't connect that they could all be part of the same condition. As the majority of Michelle's symptoms were abdominal or gastrointestinal, she stayed within the care of her GI doctor and over the next 20 years underwent unnecessary gall bladder and appendix removal surgeries, and many different tests for conditions such as celiac disease, diverticulitis, Irritable Bowel Syndrome (IBS), which always came back normal.

The breakthrough to finding a diagnosis came out-of-the-blue. While having lunch with a friend, Michelle's sister experienced a hand swelling. The friend happened to be a pediatrician, thought she recognized the swelling as HAE and suggested they find out more. Michelle made an appointment with her doctor and was the first in her family to be tested. She received a confirmed diagnosis of HAE at age 37.

"I was so relieved to finally get a diagnosis of HAE. Having that knowledge felt incredibly powerful. I could start to map out what would help me, and what wouldn't work and stop worrying that I would get these symptoms as a result of something I ate, or a particular journey I took."

Not long after she received her diagnosis, Michelle was looking into her family connections and learned that several members of her extended family also had HAE and had been diagnosed for many years. HAE had significantly impacted her cousin's family, but they hadn't tried to contact the wider family to talk with them about the potential for HAE to be in the family.

"I wish someone had been in touch to share our family's history with HAE. This clue would have given me something real to go and research. Instead, I spent 20 years having test after test and surgeries to be told nothing was wrong."

Michelle was the first member of her family to be tested and has also had her children (ages 10 and eight) tested. Although both of her children have HAE they are not showing any symptoms. Michelle feels a sense of relief knowing that she can work with their doctor on a management plan and explain immediately what is happening if they start having attacks. Michelle believes that you need to be proactive about your healthcare and when meeting new family members, she will always mention HAE and being tested. For Michelle, it is vital to share this knowledge amongst different branches of the family to help bring those living with undiagnosed HAE back out from wilderness.

"There is no reason not to go and get tested; not knowing and not having a management and treatment plan is so much worse than the passing small discomfort of a blood test. Knowledge is the key to control. Not to know is to live in fear and almost a prescription for a sheltered life."



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