

**COLD
AGGLUTININ
DISEASE**

unraveled

A guide to living with
and understanding CAD



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Cold Agglutinin Disease (CAD) can be hard to understand, and resources and information can be hard to find. In this brochure, there's information about what CAD is, the science behind what causes it, and tools that may help you on your journey with this rare condition.



Henriette, Germany
Living with CAD

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“It’s very difficult to find any really good information because it’s so rare. Being your own advocate is definitely something that you learn that you have to do.”

– **Fred**, United States
Living with CAD



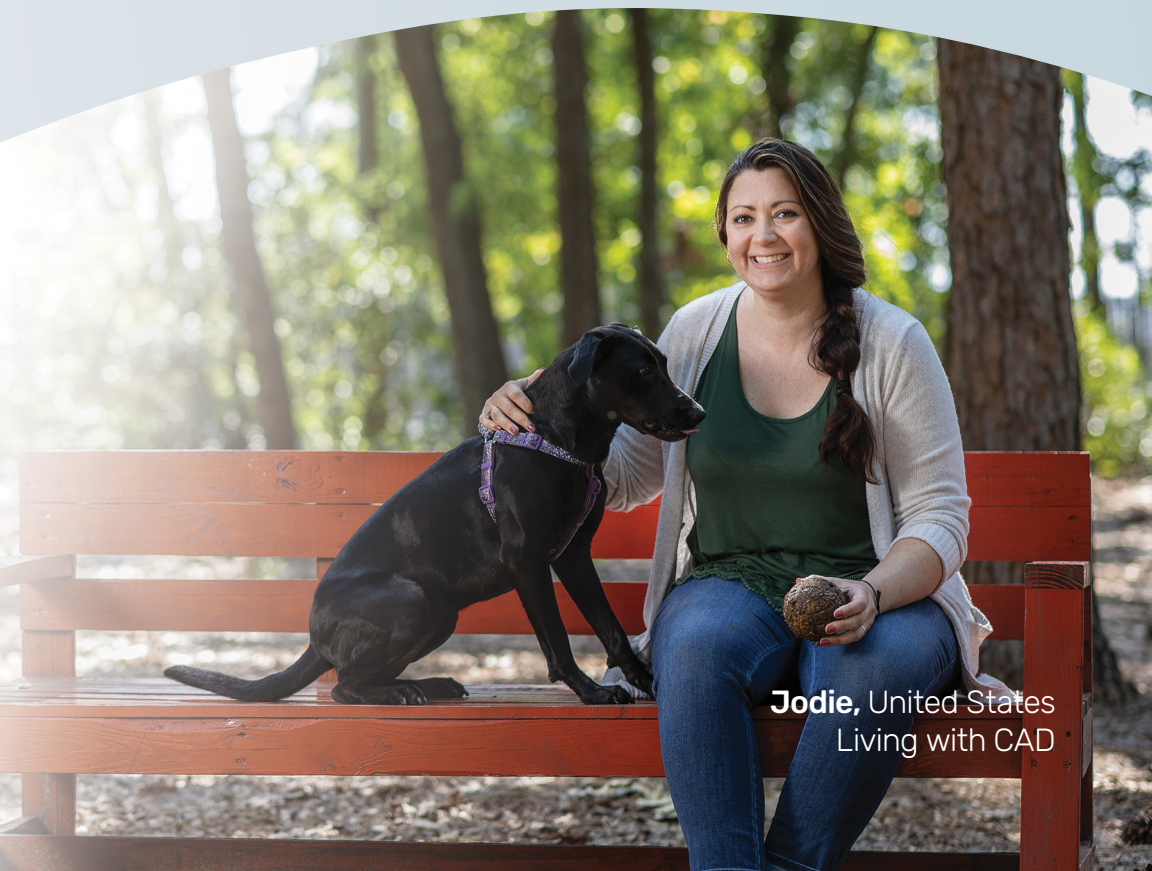
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What is CAD?

Cold Agglutinin Disease (CAD) is a rare, serious blood disorder that mistakenly attacks and destroys red blood cells, a process known as haemolysis.

CAD is a form of autoimmune anaemia (AIHA), a group of disorders characterised by a malfunction of the immune system that produces autoantibodies, which attack red blood cells as if they were substances foreign to the body.



Jodie, United States
Living with CAD

Symptoms of CAD

People living with CAD may experience symptoms such as:



Fatigue



Weakness



Shortness
of breath



Chest pain



Light-
headedness



Irregular
heartbeat



Bluish colour/
discomfort in
hands and feet



Jaundice



Dark Urine

The average age of onset of CAD is 60, but it has been seen in patients as young as 30.

These symptoms may worsen if you have a compromised or weakened immune system or an infection, or if you're exposed to cold temperatures. However, while cold weather can trigger symptoms, a common misconception about CAD is that it can be managed for all patients by avoiding cold temperatures. In reality, there may be more happening in your body, even if you're not exposed to the cold.

You should always talk with your physician about any symptoms you may be experiencing. They are your best reference for information about your disease and treatment.

How CAD Works in the Body

The immune system normally helps the body by destroying and eliminating foreign threats, such as bacteria.

In CAD, certain bone marrow cells can create antibodies, called cold agglutinins, that activate a part of the immune system known as the complement pathway that then attack healthy red blood cells. This activation is what causes the ongoing destruction of red blood cells (haemolysis).

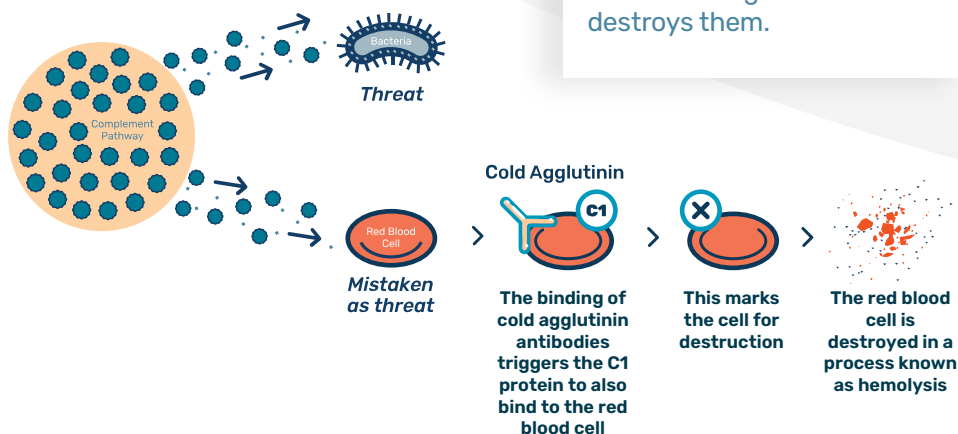
Even if you're not exposed to the cold, the ongoing haemolysis could lead to complications like anaemia, a lack of red blood cells or haemoglobin in the blood. Anaemia can cause symptoms such as severe fatigue, weakness, shortness of breath, light-headedness, palpitations, blood in the urine or dark urine, and jaundice.

Additionally, chronic haemolysis may deplete red blood cells so quickly that they cannot be replenished to a normal level, which can lead to the need for red blood cell transfusions.

Your immune system normally helps the body by attacking foreign threats.

But in CAD, a part of the immune system called the complement pathway mistakes healthy red blood cells for foreign threats and destroys them.

A closer look at the complement pathway



Diagnosing CAD

CAD is a rare disease that can be hard to understand—which can make receiving a diagnosis of CAD a challenge. But once your doctor suspects that CAD may be a possible diagnosis, they can conduct different tests to learn more.

Here are some terms that may be useful to know when that happens.



Haemoglobin: usually found inside of red blood cells, this protein helps to transport oxygen and carbon dioxide throughout the body



Reticulocytes: these are the young (immature) red blood cells that are produced to replace red blood cells that have been destroyed



Antibody titer: measures the concentration and strength of antibodies (such as cold agglutinins) in your blood



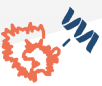
Mean corpuscular volume (or MCV): is a measure of the average size and volume of red blood cells in your blood



Lactate dehydrogenase (or LDH or LD): is an enzyme that is released when cells are destroyed



Bilirubin: a pigment that is released when haemoglobin is broken down



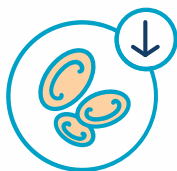
Haptoglobin: a protein in the blood whose job it is to find haemoglobin that has been released from destroyed red blood cells and flag it for recycling



Blood smear: evaluates the shape, size, colour, and arrangement of red blood cells as well as looks at your white blood cells and platelets

The Potential Risk of CAD

Since the haemolysis caused by CAD is chronic, it's important to pay close attention to your general wellbeing and to stay in regular contact with a doctor.



Anaemia occurs when you do not have enough red blood cells, leading to low haemoglobin, which is responsible for carrying oxygen throughout the body. If organs and tissues don't get enough oxygen, they can't function normally, causing severe fatigue and other symptoms.

In CAD, haemolysis of red blood cells leads to anaemia, which may cause fatigue, shortness of breath, and other symptoms. New findings show that CAD may be more serious than previously thought.

A 10-year review of the medical histories of 425 people with CAD showed they had a higher risk of stroke, heart attack, or blood clots (27% of patients with CAD vs 17% of patients without CAD experienced one of these events).

Research conducted on prior cases of patients with CAD suggests that the burden associated with CAD extends beyond anemia. In fact, some research has shown that patients with CAD were twice as likely to suffer from a type of blood clot or even die than those without CAD.

A separate 14-year review of patient records from 457 patients with CAD in the US showed that they had a higher risk of blood clots (x2) or death (x16) than those without CAD.

More studies are needed to evaluate this risk.

CAD and its symptoms can be daunting but there are medical professionals trained to help you treat and manage your disease. Be sure to talk to your doctor about CAD as they are the best reference for information about CAD and related conditions.



**“With CAD, you may look okay,
but nobody’s aware of what
really goes on in your body.”**

— Sharon, United States
Living with CAD

Tips for Everyday CAD Health

You may not know anyone else with CAD, but there are approximately 10,000 people with CAD between Europe and the United States. Together, we can find ways to help make everyday life feel a little more manageable.

It's important to talk first with a healthcare provider who understands CAD, such as a haematologist.

- To help remember all of your questions for your physician, you can write them down in your Doctor Discussion Guide before you have your appointment and bring them with to make the conversation easier.
- Note the severity of your symptoms with the Symptom Tracker, and keep a journal with any advice your doctor has given you.
- Be your own advocate. Educate yourself and take charge of managing your symptoms. Consider carrying your Blood Lab Card and Blood Test Tracker with you for any potential emergencies or doctor visits.

It's critical to pay close attention to how you feel to better manage their condition.

- Keep track of your mental health and emotional state, including how hopeful, anxious, uncertain, or even disconnected you feel.
- Consider talking to a therapist, counselor, or other mental health professional if needed.
- Reaching out to other patients with CAD or community organisations may be useful, if they are available. (Ask your doctor if you need assistance on where to find these resources.)

Tips for Everyday CAD Health

Ensure you take steps to manage your overall health, rather than solely focusing on your CAD symptoms.

- Maintain a healthy, well-balanced diet. Consider speaking with a doctor or nutritionist for guidance.
- Try to get a full 8 hours of sleep every night.
- Wash your hands and try to avoid contact with people who are sick.

Cold temperatures can trigger CAD symptoms, so be aware of your exposure to cold.

- Consider dressing in layers and be cautious around air conditioning.
- Keep an extra scarf, jumper, hat, and pair of gloves in your car.
- When handling ice-cold beverages or reaching for items in the freezer, consider wearing gloves and avoid direct contact when possible.



Jörg, Germany
Living with CAD

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Additional Resources and Support

To learn more about CAD, using the camera on your phone, scan this QR code or visit patient.understandcad.com.



Brad, Canada
Living with CAD

Tools and Resources

The following resources may prove useful for being your own advocate and keeping track of your CAD symptoms.

Remember to print these out, take notes, add questions, and bring them to your next doctor's appointment.



Impact of CAD Tracker

Cold agglutinin disease (CAD) and its symptoms are often easily misunderstood, even by those who suffer from CAD.

Answer these brief questions to help better understand the impact CAD has on your physical, mental, and social well-being.

Be sure to fill out the Impact of CAD Tracker and bring it to your next appointment with your healthcare provider



Physical Symptoms

	Not at all	Mild	Moderate	Severe
Fatigue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weakness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Light-headedness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chest pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Irregular heartbeat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shortness of breath	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A bluish colour or discomfort of the hands and feet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Use this space to describe other examples of ways your physical symptoms impact you.

CAD has a variety of possible physical symptoms, but people living with CAD may also have wide-ranging effects on their mental wellbeing and daily life. Take a moment and reflect on what life was like before you started feeling CAD symptoms. Now use that “pre-CAD” state as a baseline to answer the following questions...

 Be sure to fill out the Impact of CAD Tracker and bring it to your next appointment with your healthcare provider



Mental Wellbeing

	Not at all	Slightly	Moderately	Significantly
CAD impacts my memory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CAD impacts my concentration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CAD impacts my mood or emotions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Use this space to discuss the ways in which CAD impacts your mental wellbeing.



Daily Life

	Not at all	Slightly	Moderately	Significantly
Personal life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical wellbeing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CAD impacts my mood or emotions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Be sure to fill out the Impact of CAD Tracker and bring it to your next appointment with your healthcare provider



Daily life (continued)

Social life and leisure



Emotional wellbeing



Use this space to describe specific ways in which CAD has impacted your daily life.

Overall, what have been some of the most prominent ways in which CAD has impacted your life?

Remember: Your doctor should always be your first point of contact about any symptoms you may be experiencing. They are your best reference for information about your disease and treatment.

Doctor Discussion Guide



Be sure to fill out the Doctor Discussion Guide and bring it to your next appointment with your healthcare provider

This guide can help facilitate productive conversations with a doctor or healthcare team. This can help establish an ongoing care plan for managing Cold Agglutinin Disease.

Questions for your doctor:

I've read about haemolysis and the destruction of red blood cells caused by CAD. Can you explain what that means for me, what impact that has on me and what I should look out for?

What blood tests should I have done regularly to monitor my condition? And how often? What blood counts should we be monitoring?

Are there risks of Cold Agglutinin Disease that I should know about?

What are some ways I might manage my symptoms, like fatigue, weakness, and shortness of breath?



What should I be doing regularly to help my immune system and maintain my overall health?

Is it okay for me to exercise?

How often should I come in to see you?

What are my treatment options?

Follow-up appointments:

Date: _____

Date: _____

Date: _____




Blood Lab Card



Give this card to your lab technician or healthcare team when you are having blood drawn.

✂

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- I have Cold Agglutinin Disease (CAD), a rare form of autoimmune hemolytic anemia (AIHA)
- This means my blood sample can agglutinate and be unusable at temperatures lower than 37°C. Please keep my blood sample warm (37°C) until it is ready to be tested


PLEASE DO NOT REFRIGERATE THIS BLOOD.

For more information about CAD, visit
CADunraveled.com

sanofi

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✂

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Blood Test Tracker

This useful tracker will help you stay on top of your blood test results and any changes you feel in your body. Knowing what to monitor and what your levels are is important for both you and your doctor in managing CAD.



Monitor your blood test results

You can use this Blood Test Tracker to monitor your blood test results and spot trends in how you're feeling. Be sure to discuss the results of each test with your doctor to help you better understand what's going on in your body. Below are some tests that your doctor might order and not all may apply.



Be sure to fill out the Blood Test Tracker and bring it to your next appointment with your healthcare provider

Test date					
Haemoglobin					
Reticulocyte					
Bilirubin					
LDH					
Other					

Your doctor may wish to perform other laboratory tests as well. Talk to your doctor about what tests may be best for you.

Follow-up appointments for blood tests:

Date: _____

Date: _____

Date: _____

Date: _____

Glossary

AIHA – Acquired Autoimmune Haemolytic Anaemia, is a rare type of anaemia where your immune system attacks and destroys red blood cells.

Anaemia – A condition when you do not have enough red blood cells or when your red blood cells do not function properly.

Autoimmune – A disease where the immune system causes the body to attack and damage its own tissues.

Bilirubin – A substance found in bile that is produced when the liver breaks down red blood cells.

Cold agglutinins – Autoantibodies created by the immune system that mistake red blood cells as a threat and destroy them.

Complement pathway – A series of proteins circulating in the blood and tissue fluids. When it encounters molecular components of microorganisms, three pathways (classical, MB-lectin, and alternative) are activated to protect against bacteria.

Haemoglobin – A protein in red blood cells responsible for carrying oxygen.

Haemolysis – The destruction of red blood cells that releases haemoglobin into the bloodstream.

LDH – Lactate dehydrogenase, an enzyme found in the majority of cells in your body (blood, muscles, brain, kidneys, and pancreas) that turn sugar into energy.

Reticulocyte – Newly created, immature red blood cells.

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ABOUT SANOFI

At Sanofi, we're committed to helping support the health and lives of patients with CAD. We are proud to have the opportunity to apply our legacy of a patient-centered approach.



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