

Understanding CMT2C

An easy guide to the nerves, the gene and the symptoms. About 6 minutes to read · Last updated October 2026

At a glance

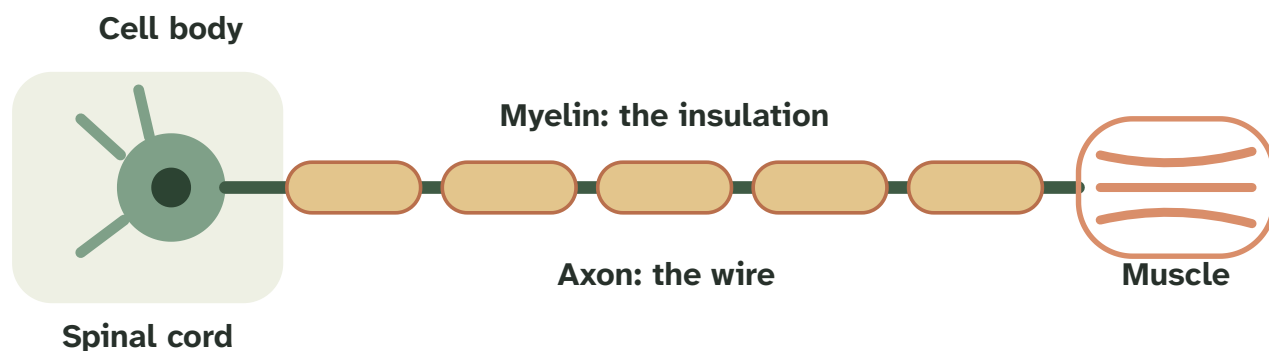
CMT2C is an inherited nerve condition caused by a change in one gene, *TRPV4*. It mainly weakens muscles, and unlike most types of CMT it often affects the voice, breathing and skeleton too [6]. There is no cure yet, but good care makes a real difference to safety and daily life [6].

The basics

Charcot-Marie-Tooth disease (CMT) is a group of inherited conditions that damage the peripheral nerves. These are the nerves outside the brain and spinal cord: they carry signals out to the muscles and bring sensations back to the spinal cord and brain [9]. About 1 in 2,500 people have some form of CMT [9]. CMT2C is a rare type of CMT [1].

A way to picture it

Think of the brain and spinal cord as a power station, and the peripheral nerves as long cables carrying power out to your feet, hands, voice box and breathing muscles. In CMT, those cables are damaged, so less power arrives where it is needed.



In type 1 CMT the insulation (myelin) is mainly affected. In type 2 CMT, which includes CMT2C, the wire itself (the axon) is damaged, so the signal reaching the muscle is weaker [9].

The genetic cause

CMT2C is caused by a change in a gene called *TRPV4* [10]. You can think of the change as a typo in the instructions for building one protein. Because it is genetic, a person is born with it, even if symptoms start much later. Symptoms can begin anywhere from birth to after age 80 [6].

The *TRPV4* gene makes a channel: a tiny gate on the surface of cells that lets calcium in [23]. In CMT2C the gate is too active, which is called a gain of function [6].



The orange dots stand for calcium. Too much calcium getting in appears to harm nerves over time. This explanation comes from laboratory and animal studies [6].

CMT2C is passed down in an autosomal dominant way. This means each child of a parent with CMT2C has a 1 in 2 chance of inheriting the change [6]. Severity varies a great deal, even within one family, and it cannot be predicted from the gene result [6].

Symptoms that set CMT2C apart

Most types of CMT mainly affect the feet and hands. CMT2C often also affects the muscles used for speaking and breathing, to a degree that varies a lot from person to person [6].

Breathing and the diaphragm

The diaphragm is the large muscle under the lungs that pulls air in. When the nerves that control it are affected, people can feel short of breath or find it hard to breathe lying flat, and sleep apnea can occur [6]. In the largest study, the TRPV4 registry, 55% of people reported shortness of breath [3]. Checking breathing regularly matters in this type of CMT [6].

Arms, legs and feet

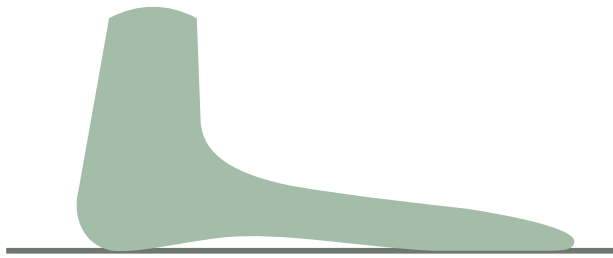
Weakness and wasting of the lower legs, foot drop (difficulty lifting the front of the foot) and high arches are common [6]. In CMT2C the weakness does not always start in the feet: it can affect the shoulders, hips and thighs too, and can be uneven between the two sides [6]. Foot shape changes were reported by 73% of registry participants [3].

The voice box

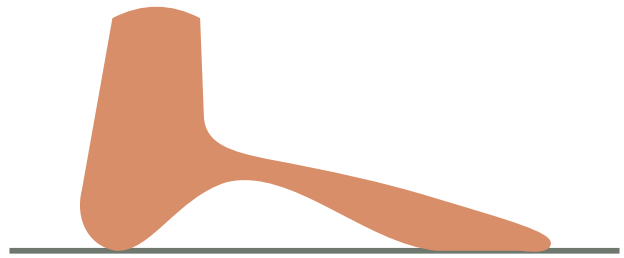
Weakness of the vocal folds is described as a hallmark of TRPV4-related disease [6]. It can cause a hoarse or quiet voice, or a high-pitched, noisy sound when breathing in, called stridor. In the registry, 45% reported hoarseness and 40% stridor [3].

Hearing, bladder and skeleton

Some people also have hearing loss, bladder problems or curvature of the spine (scoliosis) [6].



Typical arch



High arch (pes cavus)

Uneven weakness in the foot muscles can pull the bones into a higher arch over time, so less of the sole touches the ground [6].

Key takeaways

- ✓ **It is genetic.** CMT2C is caused by a change in the *TRPV4* gene and runs in families, though severity can differ a lot even between relatives [6].
- ✓ **It damages the nerve's wire.** CMT2C is an axonal neuropathy: the nerve fiber itself is affected, so the signal to the muscles is weaker [9].
- ✓ **It can affect the voice and breathing.** Unlike most types of CMT, it often involves the vocal folds and the diaphragm [6].
- ✓ **It affects the limbs.** It causes weakness in the legs, feet, hands and sometimes shoulders and hips, and can change the shape of the feet [6].
- ✓ **There is no cure yet, but care helps.** The standard of care is regular checks of breathing, voice and hearing, plus therapy, braces and breathing support when needed [6]. The first drug designed for CMT2C is in development (see [Trials and research](#)).

Sources for this guide

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- [23]** Nilius B, Voets T. “The puzzle of TRPV4 channelopathies.” *EMBO Reports* 2013;14(2):152-163. DOI 10.1038/embor.2012.219. [link.springer.com](https://www.nature.com/articles/embor.2012.219)

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