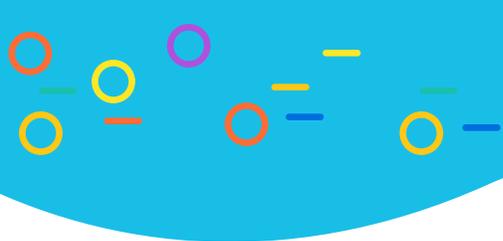




# DYNC1H1-related syndrome





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This guide is not meant to take the place of medical advice.

Please consult with your doctor about your genetic results and health care choices. The information in this guide was up to date at the time it was written in 2020. But new information may come to light with new research. You may find it helpful to share this guide with friends and family members or doctors and teachers of the person who has DYNC1H1-related syndrome.





## What is DYNC1H1-related syndrome?

DYNC1H1-related syndrome happens when there are changes to the DYNC1H1 gene. These changes can keep the gene from working as it should.

### Key role

The DYNC1H1 gene plays a key role in the basic function of the cell.

### Symptoms

Symptoms can vary widely. Because the DYNC1H1 gene is important in the development and function of brain cells, many people who have DYNC1H1-related syndrome have:

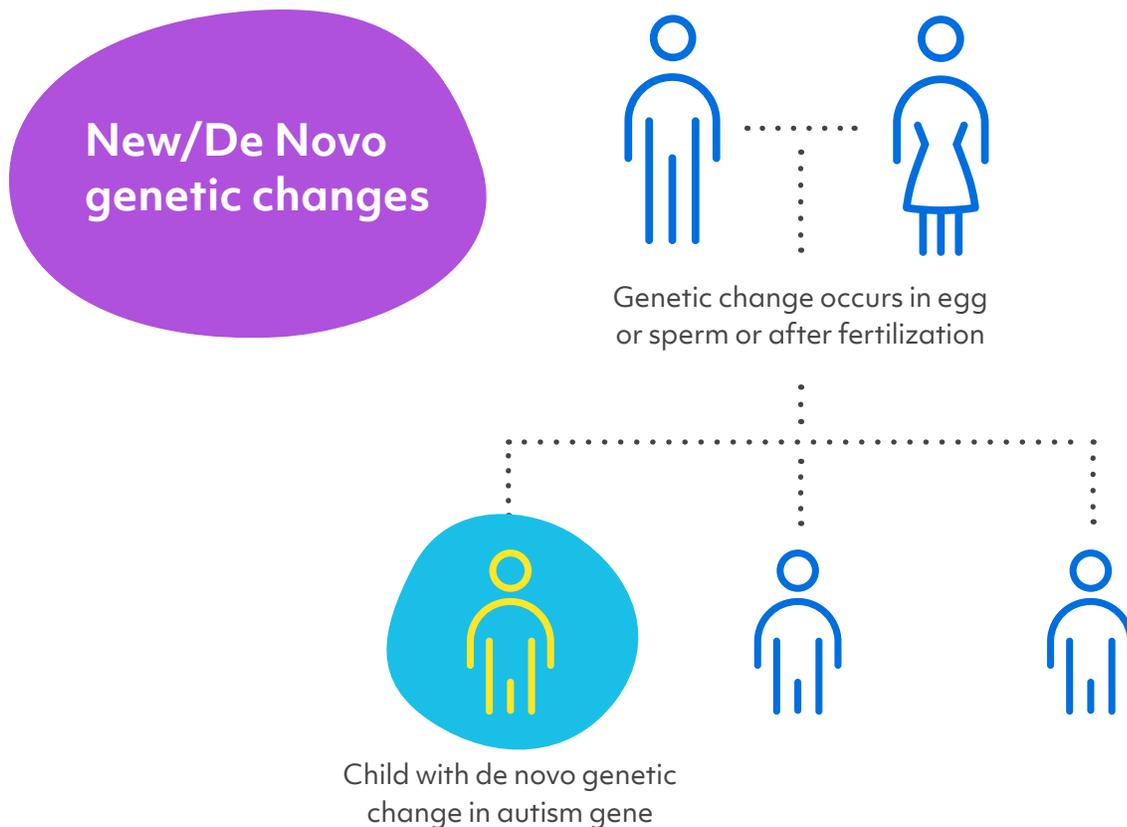
- Neuromuscular issues
- Intellectual disability

People who have DYNC1H1-related syndrome have different types of gene changes. This can affect which symptoms they have.

## What causes DYNC1H1-related syndrome?

Our genes contain the instructions, or code, that tell our cells how to grow, develop, and work. Every child gets two copies of the DYNC1H1 gene: one copy from their mother, from the egg, and one copy from their father, from the sperm. In most cases, parents pass on exact copies of the gene to their child. But the process of copying genes is not perfect. A change in the genetic code can lead to physical issues, developmental issues, or both.

Sometimes a random change happens in the sperm or egg. This change to the genetic code is called a 'de novo', or new, change. The child can be the first in the family to have the gene change.

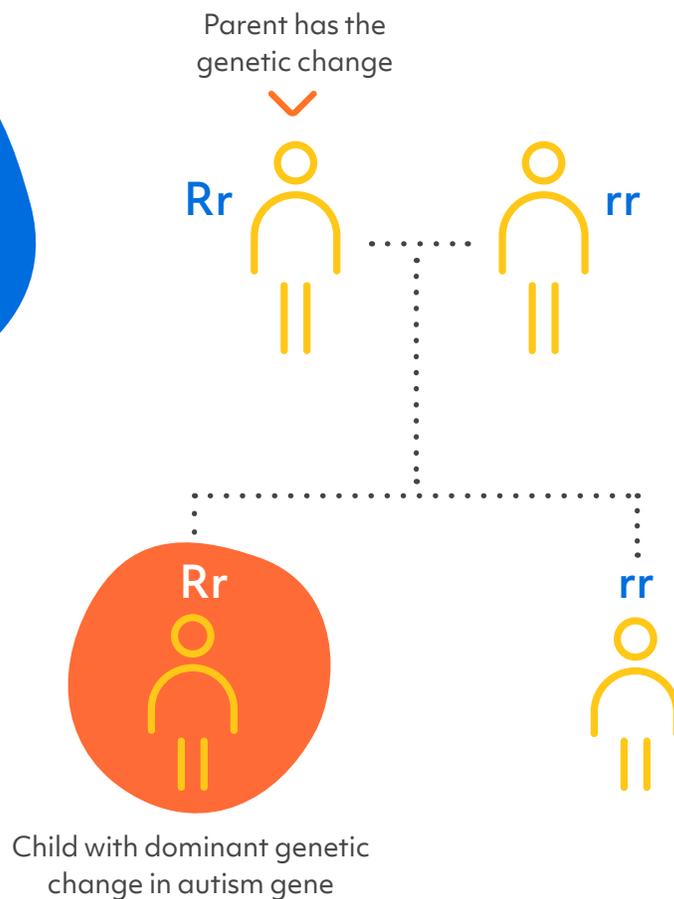


De novo changes can take place in any gene. We all have some de novo changes, most of which don't affect our health. But because DYNC1H1 plays a key role in development, de novo changes in this gene can have a meaningful effect.

Research shows that DYNC1H1-related syndrome is often the result of a de novo change in DYNC1H1. Many parents who have had their genes tested do not have the DYNC1H1 gene change found in their child who has the syndrome. In some cases, DYNC1H1-related syndrome happens because the gene change was passed down from a parent. This is called dominant inheritance.



**Dominant inheritance**  
Children have a 50% chance of inheriting the genetic change



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## Why does my child or I have a change in the DYNC1H1 gene?

No parent causes their child's DYNC1H1-related syndrome. We know this because no parent has any control over the gene changes that they do or do not pass on to their children. Please keep in mind that nothing a parent does before or during the pregnancy causes this to happen. The gene change takes place on its own and cannot be predicted or stopped.





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## What are the chances that other family members or future children will have DYNC1H1-related syndrome?

Each family is different. A geneticist or genetic counselor can give you advice on the chance that this will happen again in your family.

The risk of having another child who has DYNC1H1-related syndrome depends on the genes of both birth parents.

- If neither birth parent has the same gene change found in their child, the chance of having another child who has the syndrome is on average 1 percent. This 1 percent chance is higher than the chance of the general population. The increase in risk is due to the very unlikely chance that more of the mother's egg cells or the father's sperm cells carry the same change in the gene.
- If one birth parent has the same gene change found in their child, the chance of having another child who has the syndrome is 50 percent.

For a symptom-free sibling, a brother or sister, of someone who has DYNC1H1-related syndrome, the risk of having a child who has the syndrome depends on the symptom-free sibling's genes and their parents' genes.

- If neither parent has the same gene change found in their child who has the syndrome, the symptom-free sibling has a nearly 0 percent chance of having a child who has DYNC1H1-related syndrome.
- If one birth parent has the same gene change found in their child who has the syndrome, the symptom-free sibling has a small chance of also having the same gene change. If the symptom-free sibling has the same gene change as their sibling who has the syndrome, the symptom-free sibling's chance of having a child who has DYNC1H1-related syndrome is 50 percent.

For a person who has DYNC1H1-related syndrome, the risk of having a child who has the syndrome is about 50 percent.

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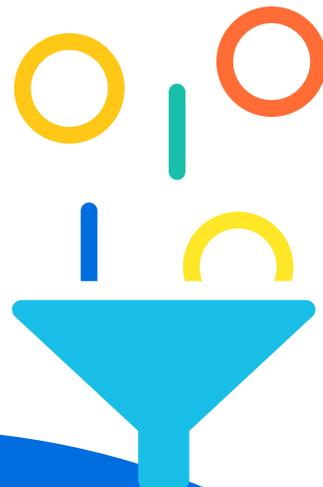
## How many people have DYNC1H1-related syndrome?

As of 2020, doctors had described about 200 people in the world with changes in the DYNC1H1 gene. The first case of DYNC1H1-related syndrome was described in 2011. Scientists expect to find more people who have the syndrome as access to genetic testing improves.

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## Do people who have DYNC1H1-related syndrome look different?

Appearance can vary. In a few cases, people who have DYNC1H1-related syndrome may look different.



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## How is DYNC1H1-related syndrome treated?

Scientists and doctors have only just begun to study DYNC1H1-related syndrome. At this point, there are no medicines designed to treat the syndrome. A genetic diagnosis can help people decide on the best way to track the condition and manage therapies. Doctors can refer people to specialists for:

- Physical exams and brain studies.
- Genetics consults.
- Development and behavior studies.
- Other issues, as needed.

A developmental pediatrician, neurologist, or psychologist can follow progress over time and can help:

- Suggest the right therapies. This can include physical, occupational, speech, or behavioral therapy.
- Guide individualized education plans (IEPs).

Specialists advise that therapies for DYNC1H1-related syndrome should begin as early as possible, ideally before a child begins school.

If seizures happen, consult a neurologist. There are many types of seizures, and not all types are easy to spot. To learn more, you can refer to resources such as the Epilepsy Foundation's website: [epilepsy.com/learn/types-seizures](https://www.epilepsy.com/learn/types-seizures).

DYNC1H1-related syndrome is very rare. Doctors and scientists have just recently begun to study it.

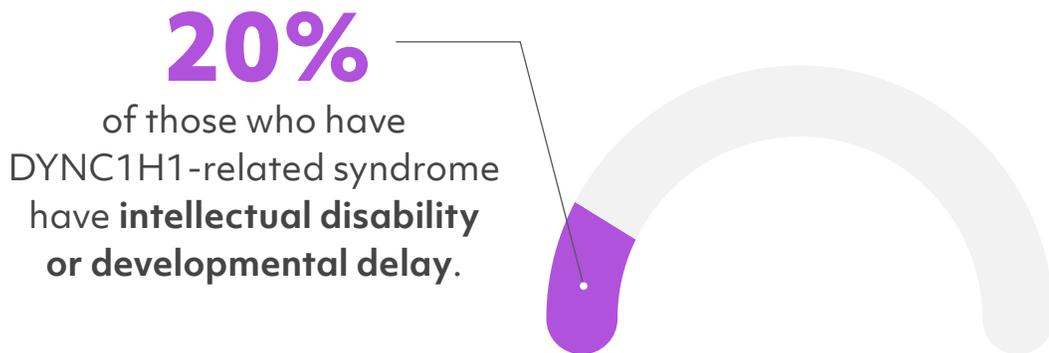
This section includes a summary of information from a review of major published articles that describe around 200 people who have DYNC1H1-related syndrome. It highlights how many people have different symptoms. To learn more about the review, see the [Sources and references](#) section of this guide.

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## Behavior and development concerns linked to DYNC1H1-related syndrome

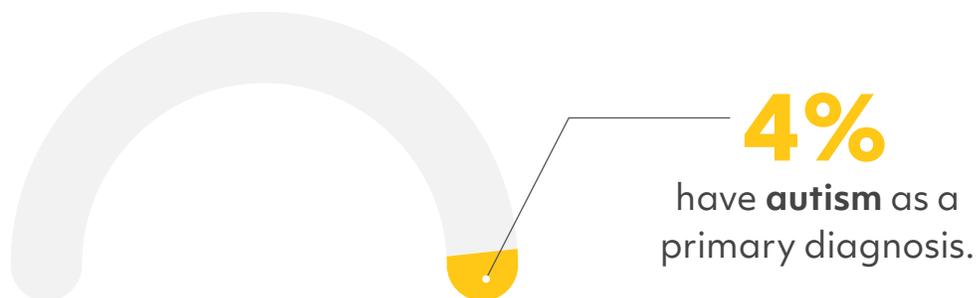
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### Learning



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### Behavior



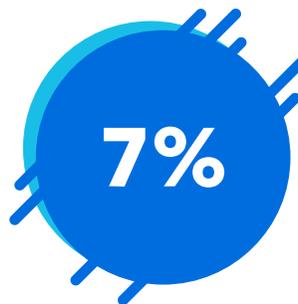
# Medical and physical concerns linked to DYNC1H1-related syndrome

## Muscle



More than 30 percent of those who have DYNC1H1-related syndrome have **spinal muscular atrophy**, a disorder in which the muscles used for movement are weak or waste away.

7 percent have muscle weakness or low muscle tone at birth or in infancy, known as **congenital myopathy**.



## Brain and nervous system

About **20 percent** have a disorder called **Charcot-Marie-Tooth axonal type 20**, which affects the nerves and can cause weakness and other symptoms.



About **5 percent** have **changes in the structure of the brain**.



**Where can I  
find support  
and resources?**

## **DYNC1H1 Gene Mutation Family Support Group**

[www.facebook.com/groups/860747154008596](https://www.facebook.com/groups/860747154008596)



**Simons Searchlight** is another research program sponsored and run by the Simons Foundation Autism Research Initiative, also known as SFARI. As part of the next step in your research journey, Simons Searchlight offers you the opportunity to partner with scientists and other families who have the same gene change. Simons Searchlight is a registry for more than 150 genetic changes that are associated with neurodevelopmental conditions, including autism spectrum disorder. Simons Searchlight makes it easier for researchers to access the information they need to advance research on a condition.

To register for Simons Searchlight, go to the Simons Searchlight website at [www.simonssearchlight.org](http://www.simonssearchlight.org) and click “**Join Us Today**”.

- **Learn more about Simons Searchlight**  
[www.simonssearchlight.org/frequently-asked-questions](http://www.simonssearchlight.org/frequently-asked-questions)
- **Simons Searchlight webpage with more information on DYNC1H1**  
[www.simonssearchlight.org/research/what-we-study/dync1h1](http://www.simonssearchlight.org/research/what-we-study/dync1h1)
- **Simons Searchlight DYNC1H1 Facebook community**  
[www.facebook.com/groups/799947033901412](https://www.facebook.com/groups/799947033901412)

## Sources and References

The content in this guide comes from a published review about DYNC1H1-related syndrome. Below you can find details about the review, as well as a link to a summary.

- Amabile S. *et al.* *American Journal of Medical Genetics Part A*, **182**, 2049-2057, (2020).  
DYNC1H1-related disorders: A description of four new unrelated patients and a comprehensive review of previously reported variants  
[pubmed.ncbi.nlm.nih.gov/32656949](https://pubmed.ncbi.nlm.nih.gov/32656949)



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