



# Multisystem inflammatory syndrome in children

Most children who get infected with the virus that causes COVID-19 have mild or no symptoms and some may also experience severe illness, especially if they have underlying medical conditions. A very small group of these kids go on to develop a serious set of symptoms—an extremely rare condition called multisystem inflammatory syndrome in children, or MIS-C. NIH-funded researchers are working to learn more about this condition, including how it differs from other diseases and COVID-related complications like long COVID and the best ways to diagnose and treat it.

## What is multisystem inflammatory syndrome?

Multisystem inflammatory syndrome (MIS) is a set of symptoms associated with an extreme immune response to COVID-19. It causes inflammation in multiple organs, including the heart, lungs, kidneys, brain, stomach, and intestines. It's a very rare condition—only 2 out of 100,000 children develop it—but it's serious and can be deadly.

## What are the symptoms?

Children with MIS-C usually experience their first symptoms a few weeks after getting COVID-19. The most common symptoms are inflammation in more than two organs and a high fever (more than 100.4 degrees Fahrenheit) for 24 hours or longer. Other symptoms can include:

- Diarrhea, vomiting, or stomach pain
- Skin rash
- Bloodshot (red) eyes
- Dizziness or lightheadedness, which are signs of low blood pressure

If a child has any of these symptoms, they need emergency medical care right away:

- Trouble breathing
- Pain or pressure in the chest that doesn't go away
- Confusion or unusual behavior
- Severe pain in the abdomen (stomach area)
- Inability to wake up or stay awake
- Discolored lips, skin, or nail beds (pale, blue, or gray depending on skin tone)

## Who can get it?

Although there have been cases in adults and teenagers, most people who get MIS-C are children between ages 1 and 15. Boys are slightly more likely to get MIS-C than girls, and it seems to disproportionately affect Black and Hispanic/Latino children.

Multisystem inflammatory syndrome in adults is called MIS-A. It also causes inflammation in different organs, but it's even less common than MIS-C.

## What's the best way to prevent MIS-C?

The best way to keep children safe from MIS-C is to protect them from getting infected with the virus that causes COVID-19. Getting vaccinated is the most effective way to prevent COVID-19 and MIS-C, and vaccines are currently available for children ages 6 months and older. Research shows that vaccines are safe for kids who have already had MIS-C, and everyone who is eligible should get vaccinated. Other steps you and your child can take are:

- Wearing masks in public
- Staying away from people who are sick
- Practicing social distancing
- Avoiding touching your eyes, nose, and mouth

## How is MIS-C being studied?

Researchers across NIH are collaborating on research to determine how the COVID-19 virus behaves in children and how it can lead to long-term conditions like long COVID and MIS-C.

### The CARING for Children with COVID Initiative.

The [Collaboration to Assess Risk and Identify Long-term Outcomes \(CARING\) for Children with COVID study](#) is led by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) and the National Heart, Lung, and Blood Institute (NHLBI), in collaboration with the National Institute of Allergy and Infectious Diseases (NIAID). Research studies at multiple sites across the country aim to answer important questions like:

- Which children are most likely to get COVID-19 and why?
- Why is there such a range of symptoms in kids who get COVID-19?
- Which children who get COVID-19 are most likely to develop conditions like MIS-C?
- What are the best ways to treat these conditions in children?

**The COVID MUSIC Study.** The [Long-term Outcomes after the Multisystem Inflammatory Syndrome In Children \(MUSIC\) study](#) is looking at how MIS-C affects children's health—both in the short term and over time. This study, which is happening through the NHLBI-funded [Pediatric Heart Network](#), is taking place at multiple hospitals and

medical centers across the country and has recruited more than 1,200 children and adolescents in little more than a year. The study has a specific focus on health disparities (when certain groups of people have worse health outcomes than others) and aims to:

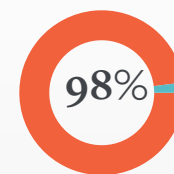
- Learn how MIS-C affects children's organs over the long term
- Improve treatment and care for people with MIS-C and other similar conditions
- Understand who gets MIS-C and why

**PreVAIL kIDs. Predicting Viral-associated Inflammatory Disease Severity in Children with Laboratory Diagnostics and Artificial Intelligence (PreVAIL kIDs)** is a study being led by NICHD as part of NIH's [Rapid Acceleration of Diagnostics \(RADx\)](#) initiative. Its goal is to develop innovative approaches to understanding the underlying factors that influence the spectrum of conditions that may occur in children infected with the COVID-19 virus. The study explores which factors in a child's genes, immune system, and environment can affect:

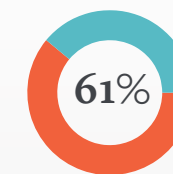
- Who gets COVID-19
- How severe their symptoms are
- Who goes on to develop severe COVID-19 and MIS-C

Visit [ClinicalTrials.gov](https://ClinicalTrials.gov) to find more [clinical research studies about MIS-C](#). ■

## MIS-C: By the numbers



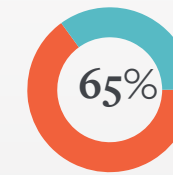
Out of all MIS-C patients, **98% tested positive for the COVID-19 virus.**



61% of MIS-C patients **are male.**



90% of MIS-C patients are between ages **1 and 15.**



Of all reported MIS-C cases, **65% have been in non-white children**, and children who are Black (non-Hispanic), and Hispanic/Latino are disproportionately affected.

SOURCE: Centers for Disease Control and Prevention

IMAGE: GETTY IMAGES