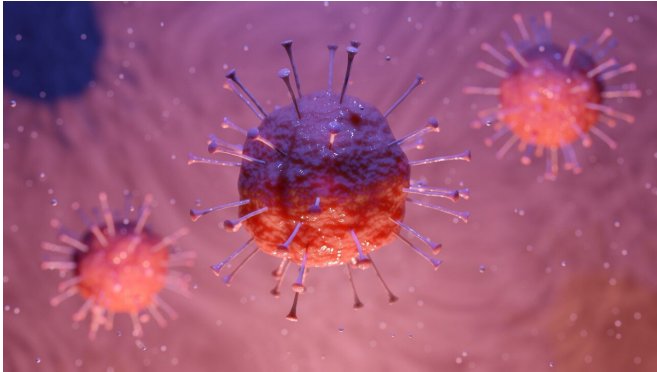


# Coronavirus and Kawasaki disease in children: it's an intriguing but unproven link

30 April 2020, by David Burgner



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Doctors in the United Kingdom and other European countries have recently reported [small but increasing numbers](#) of critically ill children with features of both Kawasaki disease and toxic shock syndrome. These are uncommon conditions affecting the blood vessels.

England's National Health Service (NHS) [issued an alert](#) to doctors as a result.

These children presented with fever, severe abdominal pain and/or a skin rash. Some also had inflammation of the coronary arteries which supply blood to the heart, and inflammation of the heart muscle itself.

Some, but not all, tested positive for SARS-CoV-2, the virus causing COVID-19.

But what is Kawasaki [disease](#), and how might these cases be related to COVID-19?

## Kawasaki disease

Kawasaki disease is an uncommon disease of childhood, typically occurring between six months

and five years. It occurs less frequently in [older children](#) and rarely in adults.

Initially described in Japan in 1967, it is most common in North East Asia but is seen worldwide. In Australia, on average, [one child is diagnosed with Kawasaki disease](#) every day.

Kawasaki disease is a vasculitis or inflammation of [blood vessels](#), resulting from excessive immune activation. We don't know what causes it and there's no diagnostic test. Diagnosis is based on the [clinical features](#), which include:

prolonged fever  
rash  
red eyes  
swollen or red hands and feet  
sores, red or swollen lips or tongue  
swollen lymph node in the neck.

The most serious complication of Kawasaki disease is damage to the coronary arteries, which in rare cases may be life-threatening. Timely treatment with a blood product containing purified immune proteins, called intravenous immunoglobulin (IVIG), [reduces the risk of this complication](#) from 25% to 5%.

Rarely, children with Kawasaki disease can present critically unwell with shock (low blood pressure) due to impaired heart muscle function—a serious condition called [Kawasaki shock syndrome](#).

Kawasaki shock [syndrome](#) can resemble severe infection or [toxic shock syndrome](#), a massive inflammatory response to toxins produced by certain bacteria. Toxic shock syndrome is also treated with IVIG, along with antibiotics.

While Kawasaki disease is generally an acute inflammatory disease and rarely recurs, patients who sustain more serious coronary artery damage may carry this with them through their lives. This may mean they have to take medications and are at higher risk of events like heart attacks.

## So what does Kawasaki disease have to do with COVID-19?

Recently [reported clusters](#) of children with an illness resembling Kawasaki shock syndrome have emerged from the UK and other European countries.

Some of these children diagnosed with Kawasaki disease [are testing positive for SARS-CoV-2](#), leading clinicians to consider a link between coronavirus and Kawasaki disease or Kawasaki shock syndrome.

Paediatricians have been looking for the cause of Kawasaki disease for more than 50 years. Many features of Kawasaki disease point to one or more infectious triggers; suggested causes have included common bacteria, viruses, fungi, and even carpet shampoo.

And this isn't the first time Kawasaki disease has been linked to a coronavirus. In 2005, researchers from Yale University [isolated a novel coronavirus](#) (New Haven coronavirus, HCoV-NH) from eight out of 11 children with Kawasaki disease. But these findings [couldn't be replicated](#) in other groups of children with Kawasaki disease.

However tempting it might be to conclude COVID-19 may trigger Kawasaki disease, we should be cautious. There are as yet few details on the cases and not all children had positive tests for SARS-CoV-2—nor all the features of Kawasaki shock syndrome. Many children are also older than is typical of Kawasaki disease.

Further, both Kawasaki disease and COVID-19 cause illness via excessive inflammation—particularly of blood vessels. And both diseases can progress to a state of overwhelming whole-body inflammation sometimes called a [cytokine storm](#). So it might be difficult to differentiate one disease from the other in their most severe forms.

Another possible explanation could be COVID-19 infection led to bacterial infection which then caused features similar to those of Kawasaki disease or toxic shock syndrome. (Bacterial

infections may occur if a viral infection impairs the body's defences against other infections.)

## Should we be worried?

SARS-CoV-2 clearly hasn't followed the textbook on how a respiratory virus "should" behave. Unlike other respiratory viruses (such as influenza) young children generally appear to have mild or no symptoms. Severe COVID-19 in children [does happen](#), but is extremely rare.

Similarly, Kawasaki disease is uncommon—and toxic shock syndrome and Kawasaki shock syndrome even rarer still.

We may see cases of Kawasaki disease or Kawasaki [shock](#) syndrome linked to COVID-19 in Australia, but probably only a few.

Parents should be reassured COVID-19 is generally very mild in [children](#). But it's important if your child has features of [serious illness](#) you should come to hospital immediately—pandemic or no pandemic.

Clinicians should be vigilant for cases of this possible new association. As more information emerges, we'll develop a clearer picture of whether and how SARS-CoV-2 might relate to Kawasaki disease. At present it remains an intriguing but unproven association.

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APA citation: Coronavirus and Kawasaki disease in children: it's an intriguing but unproven link (2020, April 30) retrieved 18 May 2021 from <https://medicalxpress.com/news/2020-04-coronavirus-kawasaki-disease-children-intriguing.html>

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