

Multisystem Inflammatory Syndrome in Children

A plain-English guide for you and your family

WHAT IS HAPPENING

MIS-C happens when a child's immune system gets confused a few weeks after having COVID-19 — even if the infection was mild or the child never knew they had it. Normally, after the virus is gone, the immune system should calm down and finish cleaning up. Instead, it stays revved up and starts attacking the child's own body — the blood vessels, heart, belly, skin, and more — all at the same time. This flood of inflammation makes kids very sick very fast: high fever that won't quit, belly pain, throwing up, red eyes, rash, and swollen hands or feet that look a lot like Kawasaki disease. The heart is especially at risk. The coronary arteries (the small pipes that feed oxygen to the heart muscle) can swell and weaken, and the heart muscle itself can get inflamed and struggle to pump. Blood pressure can drop dangerously low, putting the child into shock. The good news is that if caught early and treated with medicines that calm the immune system — IVIG (a mix of antibodies given through an IV) and steroids (strong anti-inflammation drugs) — most children recover fully. The key is recognizing the pattern: fever that lasts and lasts, plus problems in many body systems, after recent COVID. Doctors must move fast, because the window to stop heart damage is narrow.

What you might feel

- Fever lasting several days (usually 3 or more)
- Belly pain, throwing up, or diarrhea
- Rash, very red and cracked lips, and a bright red bumpy tongue (strawberry tongue)
- Red, bloodshot eyes without any gunk or yellow discharge
- Swollen, puffy hands or feet
- Swollen lymph nodes in the neck
- Fast heartbeat or chest pain
- Trouble breathing, very fast breathing, or shortness of breath
- Extreme tiredness, confusion, or difficulty waking up

Call the doctor right away if...

- Chest pain, trouble breathing, or very fast breathing — the heart muscle or lungs may be severely inflamed and struggling to work, risking heart failure or dangerous drops in oxygen.
- Confusion, extreme drowsiness, or difficulty waking the child — blood pressure may be dangerously low, starving the brain of oxygen and signaling possible shock.
- Severe belly pain that does not go away — inflammation may be causing dangerous swelling, fluid buildup in the abdomen, or even damage to organs like the pancreas or liver.
- Pale, cold, or blotchy skin with a weak, racing pulse — signs that blood pressure has dropped so low the body is going into shock and cannot deliver blood to vital organs.
- Little or no urine output for many hours — the kidneys are not getting enough blood flow and may be starting to fail (acute kidney injury).

What the care team will do

- Place child on continuous cardiac monitor and pulse oximeter, measure blood pressure every 1 to 2 hours
- Establish large-bore IV access and monitor strict intake and output every hour
- Assess for signs of shock: cold hands and feet, delayed capillary refill over 3 seconds, weak pulses, low urine output under 1 mL/kg/hour
- Monitor respiratory status including work of breathing, oxygen saturation, and lung sounds every 2 to 4 hours
- Draw and monitor cardiac biomarkers including troponin (heart enzyme), BNP (brain natriuretic peptide, heart stress hormone), and inflammatory markers like CRP (C-reactive protein) and ferritin as ordered
- Perform complete skin assessment and document rash location, eye redness, mouth changes, and swelling of hands or feet
- Assess neurological status including level of consciousness, pupil response, and behavior changes every 2 to 4 hours
- Administer aspirin with food or milk and monitor for bleeding signs including gums, stool, and bruising

Medicines you may be given — and why

Intravenous Immunoglobulin (IVIG)

IVIG is a liquid packed with healthy antibodies collected from thousands of blood donors. When we give it through an IV, those antibodies flood into the child's bloodstream and calm down the

runaway immune attack. They grab onto and block the harmful antibodies the child's own immune system is making, turn down the alarm signals that tell white blood cells to attack, and help reset the immune system so it stops attacking the body's own blood vessels and organs.

Methylprednisolone or Dexamethasone (corticosteroids)

Steroids are powerful medicines that dial down inflammation all over the body. They work by slipping into immune cells and turning off the genes that make inflammatory chemicals (cytokines like TNF-alpha, IL-1, and IL-6). Think of it like flipping the 'off' switch inside the cells that are making the firestorm. This helps stop the immune attack on the heart, blood vessels, gut, and other organs so they can start to heal.

Aspirin (low-dose or anti-inflammatory dose)

Aspirin has two jobs in MIS-C. First, it keeps platelets (the tiny blood cell fragments that form clots) from sticking together, which lowers the risk of dangerous clots forming in inflamed blood vessels, especially the coronary arteries (the vessels that feed the heart muscle). Second, at higher doses, aspirin blocks an enzyme called cyclooxygenase (COX) inside cells, which stops the cells from making prostaglandins (chemicals that cause pain, fever, and swelling). This helps calm inflammation and bring down fever.

Anakinra (IL-1 receptor antagonist)

Anakinra blocks interleukin-1 (IL-1), one of the most powerful alarm chemicals the immune system makes. IL-1 is like a megaphone telling the body to ramp up inflammation, fever, and tissue damage. Anakinra works by sitting on the receptors (the docking sites on cells) where IL-1 usually lands, so the real IL-1 cannot get through and deliver its inflammatory message. Think of it like plugging the lock so the alarm key cannot turn it. This helps calm the runaway inflammation in children with very severe MIS-C who are not improving enough with IVIG and steroids alone.

Infliximab or Tocilizumab (biologic cytokine blockers)

These are targeted biologic medicines used in severe or treatment-resistant MIS-C. Infliximab grabs onto TNF-alpha (tumor tissue death (necrosis) factor alpha), a powerful inflammatory alarm chemical, and stops it from landing on cells and turning on inflammation. Tocilizumab blocks the receptor for IL-6 (interleukin-6), another major inflammation driver that is often sky-high in MIS-C. By blocking these specific cytokines, the medicines shut down key pathways that drive the runaway immune attack, helping the body calm down when IVIG and steroids are not enough.

Where this information comes from

- CDC MIS-C case definition and clinical guidance

- American Academy of Pediatrics (AAP) MIS-C interim guidance
- WHO preliminary case definition for multisystem inflammatory syndrome in children
- American College of Rheumatology MIS-C clinical guidance

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