

Mis C

MIS-C is the body's immune system misfiring weeks after COVID, causing fever, shock, and heart trouble in children—looks a lot like Kawasaki disease.

THE ONE-LINE TRUTH

A post-COVID immune storm in kids that attacks the blood vessels and heart, usually 2-6 weeks after the infection clears.

The chain — how it unfolds

1. SARS-CoV-2 infection triggers initial immune response. — why: The child catches COVID-19 (often mild or asymptomatic); the immune system learns the virus's spike protein and other pieces, then clears the infection over one to two weeks.
2. Two to six weeks later, the immune system misfires and launches a delayed hyperinflammatory attack. — why: In genetically susceptible children, antibodies and T cells that were made against the virus start cross-reacting with the child's own tissues (molecular mimicry) or the immune off-switch (regulatory T cells) fails, so cytokines keep flooding out even though the virus is long gone—triggering systemic inflammation.
3. Widespread endothelial injury and vasculitis (inflamed blood vessels throughout the body). — why: High cytokine levels—especially IL-6, IL-1, and TNF-alpha—damage the endothelium in vessels everywhere: heart, gut, skin, kidneys, brain; the lining swells, gaps open, and fluid leaks into surrounding tissues, causing swelling (edema) (swelling), rash, red eyes, and swollen hands and feet.
4. Myocarditis weakens the heart and coronary arteries develop aneurysms. — why: Immune cells infiltrate the myocardium, making it thick and stiff so it cannot pump well (reduced ejection fraction, sometimes below 50-55 percent); inflammation also hits the coronary arteries, weakening their walls so they balloon into aneurysms that can clot or burst, risking heart attack even in a young child.
5. Shock develops: distributive (leaky vessels, low resistance) plus cardiogenic (weak pump). — why: Leaky endothelium drops vascular resistance and lets fluid escape into tissues, while the inflamed heart cannot generate enough pressure; together, blood pressure falls, organs are starved of oxygen, lactic acid builds up, and the child shows cold extremities, confusion, fast breathing, and low urine output.

6. Gastrointestinal and mucocutaneous inflammation appears. — why: The gut lining is rich in blood vessels and immune cells, so it swells and becomes painful, causing severe belly pain, vomiting, and diarrhea that can mimic appendicitis; mucous membranes (lips, tongue, conjunctiva) turn red and crack, and a polymorphous rash (many shapes—macular, maculopapular) spreads over the trunk and limbs.
7. Impaired blood clotting (Coagulopathy) (abnormal clotting) and clot formation (thrombosis) risk rise. — why: Inflamed endothelium activates clotting factors and platelets stick to damaged vessel walls; D-dimer and fibrinogen climb, sometimes triggering clots in coronary aneurysms, deep veins, or even pulmonary arteries if inflammation is not controlled quickly.
8. Without immune suppression, the cascade progresses to multi-organ failure. — why: Untreated cytokine storm and shock damage kidneys (acute kidney injury), liver (elevated transaminases), lungs (acute respiratory distress syndrome), and brain (encephalopathy); mortality climbs if IVIG (intravenous immunoglobulin, which mops up rogue antibodies and cytokines) and corticosteroids (which directly shut down inflammation) are not given promptly to break the cycle.

Spot it — what you see, and why

- Fever lasting 24 hours or longer (100.4°F / 38°C or higher): The immune system (the body's defense army) stays fired up for days after the coronavirus infection, releasing waves of messenger proteins called cytokines (the body's alarm signals) that reset the brain's temperature thermostat higher and keep it there.
- Belly pain, diarrhea, or throwing up: Inflammation (swelling and irritation) spreads to the gut lining and the blood vessels feeding the intestines, making the belly cramp and the gut lose its normal rhythm so food and water move through too fast or trigger nausea.
- Red, bloodshot eyes without pus (conjunctivitis): Tiny blood vessels in the white part of the eye swell and leak as part of the body-wide inflammatory storm, making the eyes look pink or red—similar to what happens in Kawasaki disease—but no infection is actively growing there.
- Skin rash or bright red, cracked lips and tongue (strawberry tongue): Inflammation in the small blood vessels of the skin and mucous membranes (the moist inner lining of the mouth) causes a blotchy red rash and makes the tongue swell with red bumps that look like a strawberry's surface.
- Swollen hands and feet: Fluid leaks out of inflamed blood vessels in the hands and feet, pooling in the tissue under the skin and causing puffiness—like a sponge soaking up water—because the vessels are no longer sealing tightly.

- Fast heart rate (tachycardia) or chest pain: The heart muscle (myocardium) or the sac around it (pericardium) becomes inflamed, making the heart work harder and beat faster to keep up; chest pain comes from the inflamed tissue rubbing or from the heart struggling to pump against swollen, leaky vessels.

Red flags — act now

- Chest pain, trouble breathing, or lips/face turning blue—the heart or lungs may be failing.
- Blood pressure dropping (shock): cold hands and feet, confusion, very fast heart rate, or not peeing—the body is not getting enough blood flow.
- Severe belly pain that will not go away—inflammation may be damaging the intestines or other organs.
- New confusion, seizure, or extreme sleepiness—the brain is not getting enough oxygen or is being affected by the inflammation.
- Swelling or bulging of a blood vessel in the heart (coronary artery aneurysm)—a dangerous complication that can lead to a heart attack even in a child.

Treat it — in this order

1. Intravenous immunoglobulin (IVIG) 2 g/kg as a single dose over 8–12 hours → IVIG floods the bloodstream with pooled antibodies from thousands of donors, which blocks the overactive immune cells (B cells and macrophages) from releasing more inflammatory signals (cytokines) — this calms the immune storm attacking the heart, blood vessels, and other organs
2. Methylprednisolone 1–2 mg/kg/day IV (or equivalent corticosteroid) → Steroids turn down the genes inside immune cells that make inflammatory proteins (cytokines like IL-6 and TNF-alpha) — this stops the immune system from dumping more fuel on the fire and reduces swelling in the heart, blood vessels, and gut
3. Aspirin: high-dose (30–50 mg/kg/day in 4 divided doses) during acute phase if Kawasaki-like features, then low-dose (3–5 mg/kg/day once daily) once fever resolves → Aspirin blocks an enzyme (COX-1) that makes platelets sticky — this prevents clots from forming inside inflamed coronary arteries where blood flow is turbulent and vessel walls are damaged
4. Echocardiogram at diagnosis, 1–2 weeks, and 4–6 weeks (cardiology-guided schedule) → Repeated echo imaging shows whether coronary arteries are dilating into aneurysms (z-score ≥ 2.5) and whether heart muscle function (ejection fraction) is recovering — this guides how long to continue aspirin, whether to add anticoagulation, and whether the child can return to normal activity

5. IV fluids (cautious boluses, 10–20 mL/kg) and inotropes (epinephrine, milrinone) if shock or low blood pressure develops → Fluid boluses expand the blood volume so there is more liquid to push through the circulation; inotropes make the heart muscle squeeze harder and blood vessels relax — this keeps oxygen-rich blood flowing to the brain, kidneys, and other vital organs while the immune storm is still raging

Your top priorities at the bedside

1. Check blood pressure, heart rate, capillary refill (how fast skin color returns after pressing a fingernail), and urine output every 1 to 2 hours — why: MIS-C causes vasodilation (blood vessels open too wide) and capillary leak (fluid leaving blood vessels into tissues), dropping blood pressure fast into shock, so early catching means we start fluid boluses and pressors before organs fail
2. Place the child on continuous cardiac monitoring (heart monitor showing rhythm on screen) and watch for arrhythmias (abnormal heart beats) or ST-segment changes on the ECG (electrical tracing of heart) — why: Myocarditis from MIS-C inflammation damages heart muscle cells and electrical pathways, causing dangerous rhythms like ventricular a fast heart rate (tachycardia) (fast rhythm from bottom heart chambers) or heart blocks that can stop the heart
3. Measure strict intake and output, weighing every diaper or using a urometer (urine measuring chamber), and report urine less than 1 milliliter per kilogram per hour — why: Kidneys need good blood flow to make urine, so dropping urine output is the earliest sign that shock is starting or that we gave too much fluid and the heart cannot pump it, both needing immediate treatment changes