

Multisystem Inflammatory Syndrome in Children

兒童多系統炎症綜合症

English	繁體中文
<p>Early this year, as people across the world became aware of and took precautions against COVID-19, the serious—sometimes fatal—disease associated with the SARS-CoV-2 coronavirus, many took a small measure of comfort in believing that children infected with the disease were left relatively unharmed.</p> <p>But in late April, physicians in Europe and the United States began to report a small but growing number of cases of children afflicted with a new multisystem inflammatory syndrome that appears to be associated with COVID-19. Doctors began to report seeing very sick children, many of whom tested positive for COVID-19, with some combination of fever, red eyes, swollen hands and feet, rash, and gastrointestinal problems, all of which are symptoms related to inflammation.</p> <p>At first, doctors noted similarities between these symptoms and those associated with other inflammatory syndromes, such as Kawasaki disease and toxic shock syndrome. But as they began to see more of these children, they started to suspect they were seeing something different. The condition was first called PMIS (pediatric multisystem inflammatory syndrome) but is now officially known as multisystem inflammatory syndrome in children, or</p>	<p>今年年初，隨著世界各地民眾開始留意和預防新冠肺炎(COVID-19) - 一種與新冠病毒(SARS-CoV-2)有關的嚴重疾病 (有時會致命的) - 許多人都慶幸感染了新冠肺炎(COVID-19)的孩童，並不會受到什麼傷害。</p> <p>不過，在四月下旬，歐洲和美國的醫生開始發報少數但越來越多的兒童罹患新的多系統發炎綜合症的病例，該綜合症看來與新冠肺炎(COVID-19)有關。醫生初時報告看到病重的小童，其中許多人的新冠肺炎(COVID-19)檢測呈陽性，伴有發燒、紅眼、手腳腫脹、皮疹和胃腸道疾病等多種毛病，這些都是跟炎症有關的症狀。</p> <p>起初，醫生注意到這些症狀與其他發炎綜合徵 (如川崎病和中毒性休克綜合徵) 相似。但是隨著他們開始看到更多這些孩子，他們開始懷疑自己所看到的有別。該病最初被稱為小兒多系統發炎綜合症 (PMIS)，但現在正式被稱為兒童多系統發炎綜合症(MIS-C)。</p>

MIS-C.

Because MIS-C has only recently been identified, the medical community is still trying to understand what causes it, as well as why it appears to affect only children. And while there is mounting evidence that it is linked to COVID-19, the relationship between the two is not yet known. What is clear is that MIS-C is a serious health issue that requires prompt medical attention. Fortunately, it is also rare, and the vast majority of children affected by it survive.

“This new entity seen in children is a severe post-infectious manifestation of the virus,” says Marietta Vázquez, MD, a Yale Medicine pediatric infectious disease specialist. “It calls for us to be vigilant to its presentation without panic, as it remains rare.”

What is MIS-C?

MIS-C is a serious though rare condition in children in which the body’s own immune system overreacts to a stimulus, resulting in inflammation of multiple organ systems throughout the body. It can affect the heart, blood vessels, gastrointestinal organs, lungs and other respiratory organs, kidneys, skin, eyes, and nervous system, and it can lead to impaired organ function and even organ failure. In most cases, though, children experience inflammation in only a few of these organs.

MIS-C shows similarities to other known inflammatory disorders, including Kawasaki

因為兒童多系統發炎綜合症(MIS-C)直到最近才被發現，所以醫學界仍在努力瞭解其成因，以及為什麼它看來只影響兒童。儘管有越來越多的證據顯示它與新冠肺炎(COVID-19)有關，但兩者之間的關係尚未明朗。兒童多系統發炎綜合症(MIS-C)顯明是一個嚴重的健康問題，需要及時的醫療護理。幸運的是，它屬罕見的，而受它影響的絕大多數兒童都可以存活。

“在兒童中發現的這一新實體是嚴重的病毒感染後之表現。”耶魯大學醫學兒科傳染病專家 Marietta Vázquez 醫生說，“這要求我們對它的呈現保持警惕，但不用驚慌，因為它仍然屬罕見。”

什麼是兒童多系統發炎綜合症 (MIS-C) ?

兒童多系統發炎綜合症(MIS-C) 是一種嚴重但罕見的兒童疾病，會令人體自身的免疫系統對刺激過度反應，導致全身多個器官系統發炎。它會影響心臟、血管、胃腸、肺和其他呼吸器官、腎臟、皮膚、睛和神經系統，並可能導致器官功能受損或甚至器官衰竭。但是，在大多數情況下，炎症僅發生在兒童的少數器官。

兒童多系統發炎綜合症(MIS-C)與其他已知的炎症性疾病(包括川崎病和中毒性休克綜合症)相似。

- 川崎病是一種原因不明的炎症綜合症，主要影響兒童，特徵是血管炎。

disease and toxic shock syndrome.

- Kawasaki disease is an inflammatory syndrome of unknown cause that mostly affects children, and is characterized by vasculitis, or inflammation of the blood vessels. It can cause fever, rash, red eyes, swollen hands and feet, swollen lymph nodes in the neck, and dry and red lips and tongue.
- Toxic shock syndrome is an inflammatory condition caused by a bacterial infection that, like MIS-C, can result in low blood pressure, fever, and rash.

At this point, MIS-C has been diagnosed only in children and adolescents under 21, and most cases have occurred in Europe and the United States. It is not known why the syndrome affects people in this age group or why it has appeared in these regions. Nor have researchers uncovered information regarding risk factors or preventive measures for MIS-C.

What causes MIS-C?

The cause of MIS-C is not yet known, though it seems to be linked to COVID-19. Most children who have been treated for it have either tested positive for a current COVID-19 infection or have antibodies to it, meaning they've been exposed.

Clinicians and researchers are working to

它會引起發燒、皮疹、紅眼、手腳腫脹、頸部淋巴結腫大、嘴唇和舌頭乾燥變紅。

- 中毒性休克綜合症是由細菌感染引起的炎性疾病，就如兒童多系統發炎綜合症(MIS-C)一樣，可導致血壓低、發燒和皮疹。

目前，僅在 21 歲以下的兒童和青少年中診斷出兒童多系統發炎綜合症(MIS-C)，大多數病例發生在歐洲和美國。尚未清楚該綜合症為什麼會影響這個年齡群，與及它為什麼出現在這些地區。研究人員也未找出與兒童多系統發炎綜合症(MIS-C)有關之危險因素或預防措施的資訊。

兒童多系統發炎綜合症(MIS-C)是怎樣形成的？

儘管現在尚未清楚兒童多系統發炎綜合症(MIS-C)的成因，但看來跟新冠肺炎(COVID-19)有關。許多曾接受過新冠肺炎(COVID-19)治療的兒童，不論是最近被檢測出新冠肺炎(COVID-19)感染呈陽性抑或具有抗體，這意味著他們已受感染。

臨床醫生和研究人員正在努力追尋兒童多系統發炎綜合症(MIS-C)的確實成因，到底它是否與新冠肺炎(COVID-19) 有關聯，以及它為什麼看來僅影響兒童。

兒童多系統發炎綜合症(MIS-C)有何徵

determine the precise cause of MIS-C, whether it is connected to COVID-19, and why it appears to affect only children.

What are the symptoms of MIS-C?

In nearly all known cases, children with MIS-C have had a fever of 100.4°F or higher for at least 24 hours, and most also have low blood pressure. Other symptoms associated with MIS-C may include but are not limited to:

- Diarrhea, vomiting, or stomach pain
- Skin rash
- Myocarditis (inflammation of the heart)
- Conjunctivitis (red eyes)
- Swollen hands or feet
- Swollen lymph nodes in the neck
- Respiratory problems
- Red, cracked lips
- Swollen red tongue with bumps that resembles a strawberry (known as “strawberry tongue”)
- Fainting
- Confusion
- Cough
- Sore throat

How is MIS-C diagnosed?

There is no diagnostic test for MIS-C. Doctors instead diagnose the condition by assessing the child’s history, conducting a physical examination, and evaluating a series of lab tests.

The Centers for Disease Control and Prevention (CDC) has established the following set of criteria, all of which should

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在幾乎所有已知病例中，患上兒童多系統發炎綜合症(MIS-C)的兒童已發燒至少至 100.4°F 或更高達 24 小時，並且大多數的血壓也偏低。與兒童多系統發炎綜合症 (MIS-C)相關的其他徵狀可包括以下(但並不限於這些)：

- 腹瀉，嘔吐或胃痛
- 皮疹
- 心肌炎 (心臟發炎)
- 眼結膜炎 (紅眼睛)
- 手或腳腫脹
- 頸部淋巴結腫大
- 呼吸系統問題
- 嘴唇紅、裂
- 舌頭紅腫，類似於草莓狀 (被稱為“草莓舌”)
- 昏厥
- 精神混亂
- 咳嗽
- 咽喉痛

如何診斷兒童多系統發炎綜合症 (MIS-C)？

目前未有針對診斷兒童多系統發炎綜合症(MIS-C)的檢測。醫生通過評估孩子的病史，進行身體檢查並評估一系列的測驗來作診斷。

疾病控制與預防中心 (CDC) 建立了以下標準以診斷兒童多系統發炎綜合症 (MIS-C)，這應能符合診斷這疾病的需要：

- 患者年齡未超過 21 歲，並且發燒達 100.4°F (38°C) 至少持續 24 小時 (如果未有測量患者的體溫，則至少患者自己感到有發燒 24 小時)。

be met for a diagnosis of MIS-C:

- The patient is 21 years of age or younger and has had a fever of 100.4°F (38°C) for at least 24 hours (or if the patient's temperature has not been measured, he or she has felt feverish for at least 24 hours).
- Blood work shows indications of inflammation.
- The patient requires treatment at a hospital (often in the intensive care unit) due to severe illness that includes dysfunction of two or more organs, in particular of the heart, blood vessels, gastrointestinal organs, lungs and other respiratory organs, kidneys, skin, eyes, or nervous system.
- Absence of other diagnoses that explain inflammatory symptoms such as a bacterial infection
- A positive test for current or past infection by SARS-CoV-2, the virus that causes COVID-19, or failing a positive test, evidence of exposure to someone with the virus within four weeks of the onset of symptoms of MIS-C

In practice, this means that both symptoms and the possibility of exposure to COVID-19 will be taken into consideration. If the child has not undergone prior COVID-19 testing, the doctor will order a test.

The doctor will also order blood tests to check markers of inflammation and organ function, as well as for a possible bacterial infection. Because MIS-C can affect the

- 血液檢查顯示有炎症跡象。
- 患者因嚴重疾病而需要在醫院（通常在深切治療病房）進行治療，其中包括兩個或多個器官出現功能障礙，特別是心臟、血管、胃腸器官、肺和其他呼吸器官、腎臟、皮膚、眼睛或神經系統。
- 缺乏其他能夠解釋發炎症狀（例如細菌感染）的診斷
- 不論是新近或過去，曾經對導致新冠肺炎（COVID-19）的新型冠狀病毒（SARS-CoV-2）檢測呈現陽性。或在測試不顯示陽性的情況下- 兒童多系統發炎綜合症(MIS-C)徵狀發作後四週內有曾接觸被新型病毒感染的人的證據。

實際是會同時考慮徵狀和曾接觸新冠肺炎（COVID-19）的可能性。如果小孩之前未曾接受過新冠肺炎（COVID-19）檢測，醫生會安排進行測試。

醫生也會安排進行血液檢測，以檢查炎症和器官功能的指標，以及有可能的細菌感染。由於兒童多系統發炎綜合症(MIS-C)會影響心臟，因此醫生可能會推薦心電圖（有時稱為 ECG 或 EKG），這是一種測量心臟功能的無痛檢查。最後，如果有呼吸道徵狀，孩子可能需要進行胸部 X 射線或電腦斷層掃描，以便醫生檢查肺部是否有炎症或感染跡象。

heart, the doctor may recommend an electrocardiogram (sometimes called ECG or EKG), a painless test that measures heart function. Finally, if there are respiratory symptoms, the child may need a chest X-ray or CT scan so that the doctor can examine the lungs for signs of inflammation or infection.

How is MIS-C treated and what is the prognosis for children affected by it?

Many children with MIS-C will need to be cared for in the intensive care unit, where medical providers can treat and closely monitor their condition. Depending on the severity of the illness and the particular organs involved, the child may also need to be under the care of other specialists, such as a cardiologist, rheumatologist, infectious disease specialist, or critical care physician.

The hallmark of MIS-C is widespread inflammation across multiple organ systems. Left untreated, this inflammation can cause long-term organ damage. That's why it is critical that children with MIS-C receive prompt medical treatment.

Treatment typically includes supportive care, which means that the focus is on relieving symptoms and preventing complications while the patient recovers. This usually involves the delivery of intravenous fluids and medications including antibiotics, with the goal of reducing fever, keeping blood pressure up, and eliminating any underlying bacterial infections.

如何治療兒童多系統炎症綜合症 (MIS-C) ，而受其影響的兒童可以如何處理預後？

許多患有兒童多系統發炎綜合症(MIS-C)的兒童需要在深切治療部接受護理，那裡的醫護人員可以治療並密切監測他們的病情。根據病情的嚴重程度和涉及的個別器官，孩子可能還需要接受其他專家的照顧，例如心臟病專家、風濕病專家、傳染病專家或重症護理醫生。

兒童多系統發炎綜合症(MIS-C)的標誌是跨多個器官系統的廣泛發炎，如果不及時治療，這種炎症會導致器官長期損壞，因此，兒童多系統發炎綜合症(MIS-C)患兒必須及時就醫，此乃至關重要。

治療通常包括支持性護理，即是把重點放在舒緩症狀，並在患者康復期間預防併發症。這通常涉及靜脈輸液和服食藥物，包括抗生素，目的是減少發燒，保持血壓升高，並消除任何潛在的細菌感染。

有鑑於兒童多系統發炎綜合症(MIS-C)的症狀是由過度的人體自身免疫力反應所引起，醫生也可能會安排服用藥物來暫時抑制體內的免疫系統。免疫抑制使患者的身體有時間痊癒，有助於避免器官長期損

Given that the symptoms of MIS-C are caused by the body's own exaggerated immune response, doctors may also administer medications to temporarily suppress the body's immune system. Immune suppression gives the patient's body time to heal, helping to avert long-term organ damage.

Drugs commonly used to suppress immune response in children with MIS-C include steroids and certain biologic drugs that are typically used in people with autoimmune disorders and rheumatoid arthritis. Patients may also receive intravenous immunoglobulin, a medication containing antibodies (proteins that help fight off viral and other infections).

Though MIS-C is a serious condition that usually requires hospitalization, with prompt medical attention, the vast majority of children with it recover fully.

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患上兒童多系統發炎綜合症(MIS-C)的兒童常用的抑制免疫反應的藥物包括有類固醇和某些生物藥物，這些藥物一貫用於患上自身免疫性疾病和類風濕性關節炎的病人。患者還可以接受靜脈注射免疫球蛋白，這是一種含有抗體（有助於抵抗病毒和其他感染的蛋白質）的藥物。

儘管兒童多系統發炎綜合症(MIS-C)是一種嚴重的疾病，通常需要住院治療，但要是能及時就醫，絕大多數有此疾病的兒童都可以完全康復。

<https://www.yalemedicine.org/conditions/multisystem-inflammatory-syndrome-in-children-mis-c/>