# Evidence Search Service Results of your search request

## Covid-19 and multi-system inflammatory disease in children

**ID of request:** 23026  
**Date of request:** 1st May, 2020  
**Date of completion:** 1st May, 2020

If you would like to request any articles or any further help, please contact:  Kaye Bagshaw at [kaye.bagshaw@nhs.net](mailto:kaye.bagshaw@nhs.net)

Please acknowledge this work in any resulting paper or presentation as: Evidence search: Covid-19 and multi-system inflammatory disease in children. Kaye Bagshaw. ( 1st May, 2020). LONDON, UK: Newcomb Library Library and Information Service.

**Sources searched**  
CINAHL (3)  
EMBASE (1)  
KnowledgeShare (1)  
MEDLINE (16)

**Date range used** (5 years, 10 years): All   
**Limits used** (gender, article/study type, etc.): None   
**Search terms and notes** (full search strategy for database searches below):

Very little published as this is so recent. Have included articles linking myocarditis / kawasaki disease / txic shock with other previous coronavirus outbreaks.

For more information about the resources please go to: <http://www.homerton.nhs.uk/newcomb>.

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### [C. Search History](#SearchHistory)

## A. National and International Guidance

#### Paediatric Intensive Care Society

**Increased number of reported cases of novel presentation of multi-system inflammatory disease: A statement from the Paediatric Intensive Care Society** (2020)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=f35f83b63e7fe14ac055f8e30c87a3ba)

NHS England highlighted a small rise in the number of cases of critically ill children presenting with an unusual clinical picture. Many of these children tested positive for COVID-19, some had not. The alert indicated “the cases have in common overlapping features of toxic shock syndrome and atypical Kawasaki disease with blood parameters consistent with severe COVID-19 in children. Abdominal pain and gastrointestinal symptoms have been a common feature as has cardiac inflammation"

## B. Original Research

1. **Clinically suspected myocarditis in the course of coronavirus infection.**  
   Ozieranski Krzysztof European heart journal 2020;:No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=15a483d49601f6636ae6bcbec97856a6)

1. **COVID-19 and Kawasaki Disease: Novel Virus and Novel Case.**  
   Jones Veena G. Hospital pediatrics 2020;:No page numbers.

1. **COVID-19: consider cytokine storm syndromes and immunosuppression.**  
   Mehta Puja Lancet (London, England) 2020;395(10229):1033-1034.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=6908e6e4e6b7f7e60a2b8c965db794f4)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=d7da6c3b1801e4b381cf3cb8ffc86967)

1. **Fulminant myocarditis in the time of coronavirus.**  
   Cuomo Vittoria European heart journal 2020;:No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=7cf494dd03708baff50334cd58f82d59)

1. **Myocarditis revealing COVID-19 infection in a young patient.**  
   Paul Jean-François European heart journal cardiovascular Imaging 2020;:No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=5a881e305c51343676acc4f5c8785fa1)

1. **Terra incognita: clinically suspected myocarditis in a SARS-CoV-2 positive patient.**  
   Warchoł Izabela Polish archives of internal medicine 2020;:No page numbers.

1. **Four cases with Kawasaki disease and viral infection: aetiology or association.**  
   Giray Tuba Le infezioni in medicina 2016;24(4):340-344.

The aetiology of Kawasaki disease has not yet been precisely determined. It has been associated with a variety of bacterial and viral agents. Some viruses including human adenovirus, coronavirus, and parainfluenza virus type 3 have been isolated from patients with Kawasaki disease. Clinical presentation of patients with human coronavirus and adenovirus infections mimics Kawasaki disease. In addition, these viruses may also be detected in Kawasaki disease as a coinfection. In this report, we present four Kawasaki disease patients infected with adenovirus, coronavirus OC43/HKU1 and parainfluenza virus type 3.

1. **Possible involvement of infection with human coronavirus 229E, but not NL63, in Kawasaki disease**  
   Shirato K. Journal of Medical Virology 2014;86(12):2146-2153.

Although human coronavirus (HCoV)-NL63 was once considered a possible causative agent of Kawasaki disease based on RT-PCR analyses, subsequent studies could not confirm the result. In this study, this possibility was explored using serological tests. To evaluate the role of HCoV infection in patients with Kawasaki disease, immunofluorescence assays and virus neutralizing tests were performed. Paired serum samples were obtained from patients with Kawasaki disease who had not been treated with gamma-globulin. HCoV-NL63 and two antigenically different isolates of HCoV-229E (ATCC-VR740 and a new isolate, Sendai-H) were examined as controls. Immunofluorescence assays detected no difference in HCoV-NL63 antibody positivity between the patients with Kawasaki disease and controls, whereas the rate of HCoV-229E antibody positivity was higher in the patients with Kawasaki disease than that in controls. The neutralizing tests revealed no difference in seropositivity between the acute and recovery phases of patients with Kawasaki disease for the two HCoV-229Es. However, the Kawasaki disease specimens obtained from patients in recovery phase displayed significantly higher positivity for Sendai-H, but not for ATCC-VR740, as compared to the controls. The serological test supported no involvement of HCoV-NL63 but suggested the possible involvement of HCoV-229E in the development of Kawasaki disease. J. Med. Virol. 86:2146-2153, 2014.<br/>Copyright &#xa9; 2014 Wiley Periodicals, Inc.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=63507bf1bd3bc53902b8401f46aa47f9)

1. **Viral infections associated with Kawasaki disease.**  
   Chang Luan-Yin Journal of the Formosan Medical Association 2014;113(3):148-154.

Background/purpose: Kawasaki disease (KD) is a disease of unknown cause. To investigate the infectious etiology of Kawasaki disease, we initiated a prospective case-control study to investigate possible links between common viral infections and Kawasaki disease.Methods: We enrolled 226 children with KD and 226 age- and sex-matched healthy children from February 2004 to March 2010. Throat and nasopharyngeal swabs were taken for both viral isolation and polymerase chain reaction (PCR) for various viruses.Results: The mean age of the 226 KD cases was 2.07 years, and the male to female ratio was 1.43 (133 boys to 93 girls). Their mean fever duration was 7.5 days with a mean peak temperature of 39.7°C. In addition to the typical symptoms of fever, neck lymphadenopathy, lip fissure and/or strawberry tongue, skin rash, nonpurulent bulbar conjunctivitis, palm/sole erythema, and induration followed by periungual desquamation, these KD cases also exhibited cough (69%), rhinorrhea (58%), and diarrhea (45%). Cases of KD had a significantly higher positive rate of viral isolation in comparison with the control group (7.5% vs. 2.2%, p = 0.02). Compared with the control group, cases of KD were more likely to have overall positive rates of viral PCR (50.4% vs. 16.4%, p < 0.001) and for various viruses including enterovirus (16.8% vs. 4.4%, p < 0.001), adenovirus (8.0% vs. 1.8%, p = 0.007), human rhinovirus (26.5% vs. 9.7%, p < 0.001), and coronavirus (7.1% vs. 0.9%, p = 0.003).Conclusion: We found that some common respiratory viruses, such as adenoviruses, enteroviruses, rhinoviruses, and coronaviruses, were associated with KD cases.

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[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=ae40607645256c926cc1e8ea2838befd)

1. **Kawasaki disease lacks association with human coronavirus NL63 and human bocavirus.**  
   Lehmann Christian The Pediatric infectious disease journal 2009;28(6):553-554.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=d37cef779cc623bb90f3fe73b68ba530)

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[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=784f7ce39a858694ac4b62dbba82a691)

1. **Review of new and newly discovered respiratory tract viruses in children.**  
   Brodzinski Holly Pediatric emergency care 2009;25(5):352.

Respiratory tract viral infection continues to be among the most common reasons for emergency department visits and hospitalization of children, particularly infants younger than 1 year, in the United States. Throughout the years, clinicians have considered respiratory syncytial virus followed by influenza as the most common pathogens responsible. Over the past decade, new viruses have been discovered through both more specific testing and the finding of new agents causing infection. This includes human metapneumovirus, which leads to similar but often epidemiologically more severe clinical symptoms than respiratory syncytial virus. Other agents responsible for lower respiratory tract infection include Coronavirus (severe acute respiratory syndrome), Bocavirus, and others. This review serves to focus on some of the recent literature on these agents and the clinical impact they have on pediatric lung infection.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=f8507b7123f301a4da01918f5cf0de04)

1. **New developments in the search for the etiologic agent of Kawasaki disease.**  
   Rowley AH Current Opinion in Pediatrics 2007;19(1):71-74.

Purpose Of Review: The aim of this article is to review recent developments in the search for the etiologic agent of Kawasaki disease.Recent Findings: Two recently proposed theories of Kawasaki disease etiology, the toxic shock syndrome toxin-1 hypothesis and the coronavirus NL-63 hypothesis, have been studied extensively and have been disproven. Surprisingly, IgA plasma cells infiltrate inflamed tissues in acute Kawasaki disease, including the coronary artery, and are oligoclonal, or antigen-driven. Synthetic versions of predominant IgA antibodies in acute Kawasaki disease arterial tissue bind to an antigen present in acute Kawasaki disease ciliated bronchial epithelium and in a subset of macrophages in acute inflamed Kawasaki disease tissues. Light and electron microscopic studies of the antigen in acute Kawasaki disease ciliated bronchial epithelium indicate that the Kawasaki disease-associated antigen localizes to cytoplasmic inclusion bodies that are consistent with aggregates of viral protein and associated nucleic acid.Summary: The identification of cytoplasmic inclusion bodies in acute Kawasaki disease ciliated bronchial epithelium has provided direction for future Kawasaki disease etiology studies. Transmission electron microscopic examination of glutaraldehyde-fixed medium-sized bronchi from acute Kawasaki disease fatalities and analysis of the protein and nucleic acid components of the inclusions should provide important information about these inclusion bodies and speed the identification of the specific etiologic agent of Kawasaki disease.

1. **Blinded case-control study of the relationship between human coronavirus NL63 and Kawasaki syndrome.**  
   Dominguez Samuel R. The Journal of infectious diseases 2006;194(12):1697-1701.

We conducted a blinded, case-control, retrospective study in pediatric patients hospitalized at The Children's Hospital, Denver, Colorado, to determine whether human coronavirus (HCoV)-NL63 infection is associated with Kawasaki syndrome (KS). Over the course of a 7-month period, nasopharyngeal-wash samples from 2 (7.7%) of 26 consecutive children with KS and 4 (7.7%) of 52 matched control subjects tested positive for HCoV-NL63 by reverse transcription-polymerase chain reaction. These data suggest that, although HCoV-NL63 was circulating in children in our community during the time of the study, the prevalence of infection with HCoV-NL63 was not greater in patients with KS than in control subjects.

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[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=f11b7a379e383fcb1a2833e5851c0ea7)

1. **Finding the cause of Kawasaki disease: a pediatric infectious diseases research priority.**  
   Rowley AH Journal of Infectious Diseases 2006;194(12):1635-1637.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=50c916b9be7a2108d3f2177c7b6f5a88)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=d30915c0559313b4a217fac79ae7f828)

1. **Human coronavirus-NL63 infection is not associated with acute Kawasaki disease.**  
   Baker S. C Advances in experimental medicine and biology 2006;581:523-526.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=6e007626333193953ae16195f6ef3d74)

1. **Lack of association between infection with a novel human coronavirus (HCoV), HCoV-NH, and Kawasaki disease in Taiwan.**  
   Chang Luan-Yin The Journal of infectious diseases 2006;193(2):283-286.

We investigated whether infection with a novel human coronavirus (HCoV), called "New Haven coronavirus" (HCoV-NH)--which is similar to and likely represents the same species as another novel HCoV, HCoV-NL63--is associated with Kawasaki disease (KD) in Taiwan. Fifty-three patients with KD were enrolled in our study. Serum, peripheral-blood mononuclear cells, nasopharyngeal aspirates, throat swabs, and rectal swabs from these patients were assayed for HCoV-NL63 by real-time reverse-transcriptase (RT) polymerase chain reaction (PCR), and the throat swabs, nasopharyngeal aspirates, and rectal swabs were also assayed for HCoV-NH by RT-PCR. All PCR results were negative for both HCoV-NL63 and HCoV-NH; therefore, we did not find any association between HCoV-NH infection and KD in Taiwan.

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[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=0e1767d672d8cec791c03d30c49cb394)

1. **The widening scope of coronaviruses.**  
   Kahn Jeffrey S. Current opinion in pediatrics 2006;18(1):42-47.

PURPOSE OF REVIEWIn the past 2 years, at least three distinct human coronaviruses have been discovered, including the etiological agent associated with severe acquired respiratory syndrome (SARS). These recently discovered viruses, with the exception of the SARS associated coronavirus (SARS-CoV), are likely to be common respiratory viruses and may be responsible for a substantial proportion of respiratory tract disease.RECENT FINDINGSThe SARS-CoV first appeared in 2002 and spread rapidly around the globe. Although the worldwide spread of SARS-CoV may have been halted, the emergence of this new virus demonstrates the potential threat represented by species-to-species transmission of coronaviruses. NL63, initially isolated from a young child with lower respiratory tract disease, represents a group of newly described group I coronaviruses that have been identified worldwide, which are associated with both upper and lower respiratory tract disease, particularly in young children. The distribution of HKU1, a newly identified group II coronavirus, is not yet established. NL63 and HKU1 are related to the common human coronaviruses 229E and OC43, respectively.SUMMARYThe discovery of at least three new human coronaviruses represents significant advances in the investigation of human respiratory tract disease. Further studies are required to fully define the impact of these new pathogens.

1. **Association between a novel human coronavirus and Kawasaki disease.**  
   Esper Frank The Journal of infectious diseases 2005;191(4):499-502.

Kawasaki disease is a systemic vasculitis of childhood; its etiology is unknown. We identified evidence of a novel human coronavirus, designated "New Haven coronavirus" (HCoV-NH), in respiratory secretions from a 6-month-old infant with classic Kawasaki disease. To further investigate the possible association between HCoV-NH infection and Kawasaki disease, we conducted a case-control study. Specimens of respiratory secretions from 8 (72.7%) of 11 children with Kawasaki disease and from 1 (4.5%) of 22 control subjects (children without Kawasaki disease matched by age and the time the specimens were obtained) tested positive for HCoV-NH by reverse-transcriptase polymerase chain reaction (Mantel-Haenszel matched odds ratio, 16.0 [95% confidence interval, 3.4-74.4]; P=.0015). These data suggest that HCoV-NH infection is associated with Kawasaki disease.

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[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=1ec5f8c6cbabed39795e5dbac876953d)

1. **Human coronavirus NL63 is not detected in the respiratory tracts of children with acute Kawasaki disease.**  
   Shimizu Chisato The Journal of infectious diseases 2005;192(10):1767-1771.

Kawasaki disease (KD) is a self-limited, systemic vasculitis of children for which an infectious trigger is suspected. Recently, an association between KD and human coronavirus (HCoV)-New Haven (NH) was reported, on the basis of polymerase chain reaction (PCR) with primers that also amplified HCoV-NL63. We investigated the possible association between these HCoVs in the respiratory tract and KD by reverse-transcriptase (RT) PCR and viral culture in a geographically and ethnically diverse population. Only 1 (2%) of 48 patients with acute KD was positive by RT-PCR for HCoV-NL63/NH in a nasopharyngeal swab. These data do not support an association between these HCoVs and KD.

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[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=953ae3f75e6bf06982e2ef12f2cd1935)

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[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=2576dc28449eb24109ac140de7901d01)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=dd5003d087d68d45d355cedc5fb7af56)

1. **Lack of association between New Haven coronavirus and Kawasaki disease.**  
   Ebihara Takashi The Journal of infectious diseases 2005;192(2):351.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=29b956a9b579a70c8aeae0d81d0a3ba1)

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=d80e4b3c892e5f6f4b82e8b67032296a)

### Opening Internet Links

The links to internet sites in this document are 'live' and can be opened by holding down the CTRL key on your keyboard while clicking on the web address with your mouse

### Full text papers

Links are given to full text resources where available. For some of the papers, you will need an **NHS OpenAthens Account**. If you do not have an account you can [register online](https://openathens.nice.org.uk/).

You can then access the papers by simply entering your username and password. If you do not have easy access to the internet to gain access, please let us know and we can download the papers for you.

### Guidance on searching within online documents

Links are provided to the full text of each document. Relevant extracts have been copied and pasted into these results. Rather than browse through lengthy documents, you can search for specific words as follows:

**Portable Document Format / pdf / Adobe**  
Click on the Search button (illustrated with binoculars). This will open up a search window. Type in the term you need to find and links to all of the references to that term within the document will be displayed in the window. You can jump to each reference by clicking it.

**Word documents**  
Select Edit from the menu, the Find and type in your term in the search box which is presented. The search function will locate the first use of the term in the document. By pressing 'next' you will jump to further references.

## C. Search History

## Reviewer note 14/5/20:

## Consider using CORONAVIRUS/ and “CORNAVIRUS INFECTIONS”/ subject headings in Medline and CINAHL.

## Consider searching for the terms “MUCOCUTANEOUS LYMPH NODE SYNDROME" and ENDOTOXEMIA as truncated text terms.

## Consider a Pubmed search also as things are developing fast in this area, and grey literature sources for results like the letter and guidance below. Since this search was conducted several other key papers were published:

## South Thames Retrieval (whose [original report appeared in the Lancet online here](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31094-1/fulltext) on7/5/20) released [this letter to anaesthetic teams](https://static1.squarespace.com/static/5e6613a1dc75b87df82b78e1/t/5ebbf54739793d1dee31c923/1589376329479/Anaesthetic+COVID_19+ALERT+FINAL+WHG.pdf) on 13/5/20 following the RCPCH's ["Guidance: Paediatric multisystem inflammatory syndrome temporally associated with COVID-19"](https://www.rcpch.ac.uk/sites/default/files/2020-05/COVID-19-Paediatric-multisystem-%20inflammatory%20syndrome-20200501.pdf).

## Also on 13/5/20, this cohort study from Italy was published: <https://www.thelancet.com/action/showPdf?pii=S0140-6736(20)31103-X>

|  | **Source** | **Criteria** | **Results** |
| --- | --- | --- | --- |
| 1. | Medline | ("2019-nCoV" OR "SARS-CoV" OR "MERS-CoV").ti,ab | 5460 |
| 2. | Medline | (coronavirus OR "corona virus" OR SARS OR MERS OR covid-19).ti,ab | 24903 |
| 3. | Medline | ("Severe Acute Respiratory Syndrome" OR "Middle East Respiratory Syndrome").ti,ab | 6729 |
| 4. | Medline | (1 OR 2 OR 3) | 25622 |
| 5. | Medline | "MUCOCUTANEOUS LYMPH NODE SYNDROME"/ | 5923 |
| 6. | Medline | ("kawasaki disease" OR "kawasaki syndrome").ti,ab | 6463 |
| 7. | Medline | ENDOTOXEMIA/ | 4246 |
| 8. | Medline | ("toxic shock").ti,ab | 4491 |
| 9. | Medline | MYOCARDITIS/ | 14357 |
| 10. | Medline | (myocarditis).ti,ab | 14710 |
| 11. | Medline | ("cardiac inflammation").ti,ab | 698 |
| 12. | Medline | ("multiple organ" AND inflammation).ti,ab | 1348 |
| 13. | Medline | (5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12) | 37528 |
| 14. | Medline | (4 AND 13) | 96 |
| 15. | Medline | 14 [Human age groups Infant,newborn OR Infant OR Child,preschool OR Child OR Adolescent OR Young adult] | 21 |
| 16. | Medline | (COVID-19 consider cytokine storm syndromes).ti,ab | 1 |
| 17. | Medline | (COVID-19 AND Kawasaki disease).ti,ab | 1 |
| 18. | EMBASE | ("2019-nCoV" OR "SARS-CoV" OR "MERS-CoV").ti,ab | 5575 |
| 19. | EMBASE | (coronavirus OR "corona virus" OR SARS OR MERS OR covid-19).ti,ab | 25836 |
| 20. | EMBASE | ("Severe Acute Respiratory Syndrome" OR "Middle East Respiratory Syndrome").ti,ab | 7068 |
| 21. | EMBASE | CORONAVIRINAE/ | 2174 |
| 22. | EMBASE | (18 OR 19 OR 20 OR 21) | 26888 |
| 23. | EMBASE | ("kawasaki disease" OR "kawasaki syndrome").ti,ab | 9061 |
| 24. | EMBASE | ("toxic shock").ti,ab | 5312 |
| 25. | EMBASE | (myocarditis).ti,ab | 20125 |
| 26. | EMBASE | ("cardiac inflammation").ti,ab | 1132 |
| 27. | EMBASE | ("multiple organ" AND inflammation).ti,ab | 2079 |
| 28. | EMBASE | "MUCOCUTANEOUS LYMPH NODE SYNDROME"/ | 11318 |
| 29. | EMBASE | exp MYOCARDITIS/ | 25710 |
| 30. | EMBASE | "SEPTIC SHOCK"/ | 50397 |
| 31. | EMBASE | (23 OR 24 OR 25 OR 26 OR 27 OR 28 OR 29 OR 30) | 97040 |
| 32. | EMBASE | (22 AND 31) | 161 |
| 33. | EMBASE | 32 [Human age groups Infant to one year OR Child unspecified age OR Preschool Child 1 to 6 years OR School Child 7 to 12 years OR Adolescent 13 to 17 years] | 32 |
| 34. | CINAHL | ("2019-nCoV" OR "SARS-CoV" OR "MERS-CoV").ti,ab | 575 |
| 35. | CINAHL | (coronavirus OR "corona virus" OR SARS OR MERS OR covid-19).ti,ab | 5108 |
| 36. | CINAHL | ("Severe Acute Respiratory Syndrome" OR "Middle East Respiratory Syndrome").ti,ab | 1722 |
| 37. | CINAHL | exp "CORONAVIRUS INFECTIONS"/ | 3277 |
| 38. | CINAHL | (34 OR 35 OR 36 OR 37) | 6240 |
| 39. | CINAHL | ("kawasaki disease" OR "kawasaki syndrome").ti,ab | 1648 |
| 40. | CINAHL | ("toxic shock").ti,ab | 507 |
| 41. | CINAHL | (myocarditis).ti,ab | 2295 |
| 42. | CINAHL | ("cardiac inflammation").ti,ab | 98 |
| 43. | CINAHL | ("multiple organ" AND inflammation).ti,ab | 268 |
| 44. | CINAHL | "MUCOCUTANEOUS LYMPH NODE SYNDROME"/ | 1583 |
| 45. | CINAHL | exp "SHOCK, SEPTIC"/ | 5869 |
| 46. | CINAHL | (39 OR 40 OR 41 OR 42 OR 43 OR 44 OR 45) | 10518 |
| 47. | CINAHL | (38 AND 46) | 26 |

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