



# Coronavirus COVID-19

BC Centre for Disease Control | BC Ministry of Health



## Clinical Reference Group Recommendation: Pediatric Clinical Guidance for COVID-19

Updated: October 19, 2020

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### Updates:

- Management-
  - o Change to the section on the role of corticosteroids in the treatment of COVID-19
  - o Change to the section on Chloroquine/hydroxychloroquine
- 6 references added



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## Introduction

Knowledge is changing rapidly and therefore information below may be modified in response to new information.

This document addresses issues relating to pediatric patients and COVID-19 and is intended for health-care professionals. **This document does not specifically address newborns born to mothers with suspected or confirmed COVID-19 as this will be provided in a separate document.**

Lead Author: Dr. Ashley Roberts. Co-authors: Dr. Alison Lopez, Dr. Sarah Silverberg, Ethan Zhang, Jessica Li, Dr. Laura Sauvé

Versions 1 & 2 Reviewed by:

Pediatric infectious diseases, BC Children's Hospital (BCCH): Dr. Laura Sauvé, Dr. Alison Lopez, Dr. Soren Gantt, Dr. Manish Sadarangani, Dr. David Goldfarb, Dr. Hana Mijovic

Microbiology, BCCH: Dr. Peter Tilley

AMS/Pharmacy: Natasha Kwan, Vanessa Paquette and Roxane Carr

Version 3 reviewed by Clinical Research Group pediatric sub-committee

## Microbiology and Transmission

COVID-19 (SARS-CoV-2) virus is a betacoronavirus and is related to the viruses that cause Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS). The incubation period is a median of 3 to 5 days but ranges from 2 to 14 days.

The infection mainly spreads from respiratory droplets or prolonged close contact. Airborne spread is possible during aerosol-generating procedures.

The spread of COVID-19 through vertical transmission is being closely studied. Intrauterine transmission may occur, but is likely rare. Postnatal transmission from a caregiver is more likely to occur. Please refer to Perinatal Services BC-led [COVID-19 Newborn guidance](#) for more details on this topic.

Children do not appear to be a major source of SARS-CoV-2 transmission in households or schools, a finding which has been consistent globally. The majority of children with COVID-19 have a positive household contact. Children with COVID-19 have been found to have high viral loads despite milder symptoms, with prolonged shedding in nasal secretions (up to 22 days) and in fecal samples (up to over 30 days). Asymptomatic children have tested positive on nasopharyngeal and fecal specimens. Children appear to shed the virus for longer than adults, but the evidence for the infectivity of shed virus remains limited.

## Infection Prevention and Control (IPAC)

Please refer to the BC Centre For Disease Control's (BCCDC) COVID-19 care webpage for up-to-date recommendations: <http://www.bccdc.ca/health-professionals/clinical-resources/covid-19-care/infection-control>

Each health authority has site-specific IPAC guidelines. BC Children's Hospital-specific recommendations, policies and procedures are available at: <http://policyandorders.cw.bc.ca/>

In brief, droplet and contact precautions should be used for all suspected or confirmed cases of COVID-19 with the addition of Airborne precautions should be used for any aerosol generating medical procedures (AGMPs).

AGMPs include:

- Endotracheal tube insertion or removal
- Tracheotomy or tracheostomy care
- Bronchoscopy
- Nebulized therapy
- High-flow nasal cannulae therapy or CPAP therapy

A full list of current AGMPs is available at: <http://www.bccdc.ca/health-professionals/clinical-resources/covid-19-care/infection-control>

IPAC guidelines for donning and doffing PPE should be followed. See BCCDC link: <http://www.bccdc.ca/health-professionals/clinical-resources/covid-19-care/infection-control/personal-protective-equipment>

## Clinical Features and Diagnosis

### Clinical presentation

Pediatric studies, most of which look at children under 1 to 18 years of age, are consistently reporting that most children have mild disease or asymptomatic infection. It is not known why children are significantly less affected compared to adults. Symptomatic children typically present with low-grade fever and a dry cough. Less common symptoms include sore throat, headache, productive cough, anosmia, rhinorrhea, diarrhea and other gastrointestinal symptoms. Rarely, severe cases may progress to respiratory distress or failure after one week. Co-infection of COVID-19 with other pathogens, e.g. influenza, respiratory syncytial virus (RSV) and mycoplasma has been described.

Compared to adults, children report more gastrointestinal symptoms, including abdominal discomfort, nausea, vomiting, and diarrhea. These manifestations may be the sole presentation, without any accompanying respiratory symptoms.

Children with COVID-19 can present with skin changes, including acrocyanosis, pernio-like changes, and acral ischemia. Skin lesions may appear as acraly distributed red-purple papules or nodules and should prompt testing and referral to a pediatric dermatologist.

After a COVID-19 infection, children and adolescents very rarely present with Multisystem Inflammatory Syndrome in Children (MIS-C) – an acute multisystemic inflammatory disease which has overlapping features of toxic shock syndrome and Kawasaki disease. This syndrome is thought to be a post infectious entity related to COVID-19. Most of these cases have known exposures to a case of COVID-19 or have tested positive on COVID-19 serology.

Case definitions and the management of suspected MIS-C cases are discussed in a separate document, available at: [http://www.bccdc.ca/Health-Professionals-Site/Documents/COVID19\\_MIS-C\\_ClinicianGuidance.pdf](http://www.bccdc.ca/Health-Professionals-Site/Documents/COVID19_MIS-C_ClinicianGuidance.pdf)

### **Disease severity**

The current literature estimates that children have made up 5-10% of the infected population, and this number is likely to change (earlier in the pandemic only severely ill individuals were tested, starting in fall 2020, testing is more broadly available to children with mild symptoms). Approximately 1% of children with lab-confirmed COVID-19 have required hospitalization and a few children have required mechanical ventilation.

In a large sample of pediatric patients which reviewed over 2,000 children with confirmed or suspected COVID-19, 0.6% had critical illness. Patients under 1 year of age, preschool-aged children, and those who are immunocompromised or had pre-existing pulmonary conditions are at higher risk of severe disease although it is still rare. While higher rates of disease have been documented in adolescents and young adults compared to school-aged children, they do not appear to present as severely as young infants.

In the adult population, progression to Acute Respiratory Distress Syndrome often occurs late in the disease course at a median of 8 days after symptom onset. There have been very few critical pediatric cases described so it is unclear whether this is the same for pediatrics; however, there are cases of severe multi-system organ failure in pediatric patients with COVID-19 that occurred as part of acute illness rather than MIS-C.

### **Imaging**

Chest imaging should be done if clinically indicated but should not be used as a screening or diagnostic tool.

Chest imaging often shows consolidation, ground-glass opacities or bilateral infiltrates. Radiographic abnormalities have been reported in asymptomatic children.

### **Testing**

Microbiologic confirmation of COVID-19 is made by a positive Polymerase Chain Reaction (PCR) test for COVID-19 from a nasopharyngeal swab (preferable) or a lower respiratory tract sample (sputum or endotracheal secretions). In the outpatient setting, a saline gargle and swish test is available for children.

Stool PCR and serological testing is available in BC, but are restricted. Consultation with Microbiology must be done prior to ordering both tests. Stool testing is restricted to those with no alternative diagnosis and a high suspicion of COVID-19 disease.

Serologic testing is restricted to two clinical scenarios: i) patients with atypical clinical manifestations that may be due to COVID-19 infection, i.e. multisystem inflammatory syndrome in children (MIS-C) or other severe/unusual post-infectious inflammatory syndromes; and ii) to help diagnosed patients who are SARS-CoV-2 RNA negative, but present with a compatible syndrome, or who present later during their disease course.

For further details refer to: [http://www.bccdc.ca/health-professionals/clinical-resources/covid-19-care/covid-19-testing/antibody-testing-\(serology\)](http://www.bccdc.ca/health-professionals/clinical-resources/covid-19-care/covid-19-testing/antibody-testing-(serology))

**Who to test:**

Please refer to BCCDC's Pediatric Testing guidelines for up-to-date testing criteria and instructions: [http://www.bccdc.ca/Health-Professionals-Site/Documents/COVID19\\_PediatricTestingGuidelines.pdf](http://www.bccdc.ca/Health-Professionals-Site/Documents/COVID19_PediatricTestingGuidelines.pdf)

- Testing is recommended for all infants, children and youth with new symptoms compatible with COVID-19 or MIS-C.
- Nucleic acid amplification tests may be falsely negative. If there is strong clinical suspicion for COVID-19 in the setting of a negative test, consider repeat testing.

**Who not to test:**

- Asymptomatic individuals, unless recommended by public health in the context of an outbreak investigation.

## Management and Treatment

Therapeutic options for COVID-19 are actively being studied worldwide and are rapidly evolving. The majority of data available is from adult literature. Current literature suggests that most children will have mild disease and will recover at home 1 to 2 weeks after symptom onset with no medical intervention necessary.

Suspected or confirmed cases should self-isolate at home for at least 10 days after onset of their symptoms. Caregivers to children with COVID-19 can be counselled to provide similar supportive interventions to other viral infections, including regular provision of fluids and antipyretics if needed for comfort. After 10 days, if their temperature is normal and they feel better, they can return to their routine activities. Coughing may persist for several weeks, so a cough alone does not mean they need to continue to self-isolate for more than 10 days.

Children and adolescents who have recovered from the acute phase of COVID-19 should be monitored clinically for the development of any post-infectious complications. Primary care providers should counsel families to contact their office or seek medical attention if concerns arise. Providers should seek specialist advice from BC Children's Hospital if their patient develops features such as fever, mucocutaneous inflammation, gastrointestinal (GI) symptoms,

chilblains, or other systemic symptoms, in particular if symptoms occur within 4 to 6 weeks from the initial COVID-19 illness.

Hospitalization of a child with suspected or confirmed COVID-19 disease is indicated for those with moderate to critical disease. Definitions of clinical severity of COVID-19 in pediatric patients are outlined in the Canadian Paediatric Society's (CPS) practice point:  
<https://www.cps.ca/en/documents/position/the-acute-management-of-paediatric-coronavirus-disease-2019covid-19>

Management of MIS-C is addressed in a separate document, available at:  
[http://www.bccdc.ca/Health-Professionals-Site/Documents/COVID19\\_MIS-C\\_ClinicianGuidance.pdf](http://www.bccdc.ca/Health-Professionals-Site/Documents/COVID19_MIS-C_ClinicianGuidance.pdf)

## Supportive Care

**Recommendation: Supportive care is the only known effective therapy for COVID-19. Use conservative fluid management when there is no evidence of shock.**

Advanced organ support including hemodynamic support, mechanical ventilation and renal replacement may be necessary if severe respiratory deterioration is occurring, or if the child is showing signs of multisystem inflammatory condition possibly associated with COVID-19. In such instances, arrangements for transfer to a higher level of care and consultation with a Pediatric Intensive Care Unit (PICU) is required.

## Fever Management

**Recommendation: Acetaminophen and ibuprofen at routine doses can be safely administered for fever and symptom relief in children with suspected or confirmed COVID-19.**

Early in the outbreak, there were concerns that the use of nonsteroidal anti-inflammatory drugs (NSAIDs) may worsen the severity of COVID-19 infection; however, the evidence has not demonstrated a link:  
<https://www.ti.ubc.ca/2020/03/18/acetaminophen-vs-nsaids-during-covid-19-pandemic/>

There is no indication at this time to discontinue NSAIDs for those patients needing them for other diagnoses (i.e. juvenile idiopathic arthritis, etc.). Decisions should be made on a case-by-case basis in consultation with their doctor or sub-specialist and pediatric infectious diseases.

## Corticosteroids

**Recommendation: Dexamethasone may be beneficial in pediatric patients with COVID-19 respiratory disease who require mechanical ventilation, however, the safety and efficacy of dexamethasone or other corticosteroids for COVID-19 treatment in children has not been sufficiently evaluated. Decisions regarding the initiation of corticosteroids for the treatment of hospitalized children with COVID-19 should be made on a case by case basis in consultation with the Pediatric Intensive Care physician (PICU) on call at BC Children's Hospital through the Patient Transfer Network line.**

As mentioned previously, several epidemiologic studies suggest that acute disease manifestations are substantially less severe in children than in adults, although there are reports of children with COVID-19 requiring PICU-level care.

Patients with severe COVID-19 can develop a systemic inflammatory response that can lead to lung injury and multisystem organ dysfunction. It has been proposed that the potent anti-inflammatory effects of corticosteroids might prevent or mitigate these deleterious effects. Recent evidence has shown that corticosteroids may decrease mortality in critically ill adults with COVID-19. Decisions regarding the use of corticosteroids in the treatment of children with COVID-19 should be made on a case by case basis, in consultation with the pediatric intensive care service at BC Children's Hospital.

Patients who are regularly on corticosteroids for other indications (i.e. underlying adrenal insufficiency, rheumatologic disease, etc.) should be discussed on a case- by- case basis with Pediatric Infectious Diseases and the physicians involved in their care.

Children with asthma exacerbations and suspected/confirmed COVID-19 should receive inhaled or systemic corticosteroids according to current asthma guidelines.

Similarly, children with moderate to severe croup should be given corticosteroids as per current guidelines. Consider avoiding corticosteroids in cases of milder croup with no respiratory distress.

## **Antibiotics**

**Recommendation: Empiric antibiotics should be given for sepsis or other suspected bacterial co- infection based on clinical assessment of the patient.**

Antibiotics have no effect against the COVID-19 virus. Please collect relevant cultures (blood, urine etc.) before initiating antibiotics. Empiric antibiotics should be de-escalated on the basis of microbiology results and clinical judgment.

For sepsis, children should be empirically treated with an IV third generation cephalosporin +/- IV vancomycin, depending on MRSA risk factors. Empiric therapy for sepsis in children who are immunocompromised (e.g. febrile neutropenia) or have history of infections with drug resistant organisms should be discussed with infectious disease service at BC Children's Hospital.

For pneumonia, children should be treated with IV ampicillin or oral amoxicillin based on their clinical severity, as per community acquired pneumonia guidelines.

## **Intravenous Immune Globulin (IVIG)**

**Recommendation: IVIG is not recommended as a treatment of acute COVID-19.**

IVIG has been used in some pediatric cases of COVID-19 but there is no clear evidence of benefit in COVID-19 disease in children. IVIG is being investigated as a treatment of multisystem



inflammatory syndrome in children, temporally related to COVID-19. Although the features of MIS-C overlap with those of Kawasaki Disease, cases that meet criteria for Kawasaki Disease should receive IVIG as per current guidelines.

### **Antiviral medications**

**Recommendation: There are currently no approved therapies to treat COVID-19. Please contact Pediatric Infectious Diseases to discuss a specific case. As per the WHO guidelines, investigational anti-COVID-19 medications will only be used in approved, randomized controlled trials.**

The antivirals discussed below are not an exhaustive list of medications that have been studied against COVID-19. Please see the BC COVID-19 Therapeutics Committee's summary for more details on unproven therapies against COVID-19:

[http://www.bccdc.ca/Health-Professionals-Site/Documents/Guidelines\\_Unproven\\_Therapies\\_COVID-19.pdf](http://www.bccdc.ca/Health-Professionals-Site/Documents/Guidelines_Unproven_Therapies_COVID-19.pdf)

**Oseltamivir** is not recommended for COVID-19 as it is highly specific to the influenza virus. Empiric therapy for children with symptoms compatible with influenza is reasonable during influenza season.

**Lopinavir/ritonavir** has been shown to inhibit the protease activity of coronavirus but has been shown to have no benefit for patients with COVID-19.

**Remdesivir** is currently approved for adults hospitalized with COVID-19. For children, studies are underway to assess its safety.

**Chloroquine/hydroxychloroquine** has been evaluated in the treatment of adult outpatients and adult hospitalized patients with COVID-19. There is no evidence of benefit and chloroquine/hydroxychloroquine are thus not recommended as a treatment or post exposure prophylaxis for COVID-19. In four randomized controlled trials, there was no reduction in disease severity, hospitalization rate or mortality and no shortening of the course of illness observed.

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## About the Clinical Reference Group

The Clinical Reference Group (CRG) is made up of senior individuals from relevant healthcare areas (including critical care, epidemiology, infectious disease, microbiology, emergency medicine, public health, primary care and clinical specialties) acting as a collective resource for current COVID-19 knowledge. They provide clinical advice and guidance to support the overall work being done by the BC Centre for Disease Control, the Provincial Health Office, and the Ministry of Health. The CRG includes representation from the provincial health authorities and works with the other Ministry areas in order to provide cross-input on all COVID-19 content.

The Pediatric subcommittee of the CRG is made up of pediatricians from across the province and representation from Child Health BC.

Members include: Dr. Srinivas Murthy (co-chair), Dr. Laura Sauvé (co-chair), Dr. Ghada Al-Rawahi, Dr. Tom Blydt-Hansen, Dr. Catherine Briggs, Dr. Matthew Carwana, Dr. Tommy Gerschman, Dr. Esther Lee, Dr. Hana Mijovic, Dr. Ashley Roberts, Dr. Peter Skippen, Trish Thomson, Dr. Tom Warshawski.