Coronavirus Disease 2019 (COVID-19)

Information for Pediatric Healthcare Providers

Updated Aug. 17, 2020 Print

Summary of Recent Changes

Revisions were made on August 14, 2020 to reflect new evidence about COVID-19 in children.

This guidance is intended to inform pediatric healthcare providers of up-to-date information about children with suspected or confirmed COVID-19 and about caring for children during the pandemic. Children are defined as age 1 month to 18 years for the purpose of this document.

For healthcare providers caring for neonates (≤28 days old) with suspected or confirmed COVID-19, including those born to a mother with suspected or confirmed COVID-19, please refer to CDC guidance for evaluating and managing neonates at risk for COVID-19.

Infections Among Children

Incidence of COVID-19 in Children

In the United States and globally, fewer cases of COVID-19 have been reported in children (age 0-17 years) compared with adults.[1,2] While children comprise 22% of the US population,[3] recent data show that 7.3% of all cases of COVID-19 in the United States reported to CDC were among children (as of August 3rd, 2020).[4] The number and rate of cases in children in the United States have been steadily increasing from March to July 2020. The true incidence of SARS-CoV-2 infection in children is not known due to lack of widespread testing and the prioritization of testing for adults and those with severe illness. Hospitalization rates in children are significantly lower than hospitalization rates in adults with COVID-19, suggesting that children may have less severe illness from COVID-19 compared to adults.[5,6] Visit CDC's Cases, Data, and Surveillance page for current CDC data.

Infections and Transmission Among Children

It is unclear whether children are as susceptible to infection by SARS-CoV-2 compared with adults and whether they can transmit the virus as effectively as adults. Recent evidence suggests that children likely have the same or higher viral loads in their nasopharynx compared with adults[7] and that children can spread the virus effectively in households and camp settings.[8,9]

Due to community mitigation measures and school closures, transmission of SARS-CoV-2 to and among children may have been reduced in the United States during the pandemic in the spring and early summer of 2020. This may explain the low incidence in children compared with adults. Comparing trends in pediatric infections before and after the return

to in-person school and other activities may provide additional understanding about infections in children.

Symptoms and Severity of COVID-19 in Children

Clinical Presentation

The incubation period of SARS-CoV-2 appears to be about the same for children as in adults, at 2-14 days with an average of 6 days.[10]

Signs or symptoms of COVID-19 in children include:

- Fever
- Fatigue
- Headache
- Myalgia
- Cough
- Nasal congestion or rhinorrhea
- New loss of taste or smell
- Sore throat
- Shortness of breath or difficulty breathing
- Abdominal pain
- Diarrhea
- Nausea or vomiting
- Poor appetite or poor feeding

Children infected with SARS-CoV-2 may have many of these non-specific symptoms, may only have a few (such as only upper respiratory symptoms or only gastrointestinal symptoms), or may be asymptomatic. The most common symptoms in children are cough and/or fever.[11-15] A recent systematic review estimated that 16% of children with SARS-CoV-2 infection are asymptomatic,[16] but evidence suggests that as many as 45% of pediatric infections are asymptomatic.[17] The signs and symptoms of COVID-19 in children are similar to other infections and noninfectious processes, including influenza, streptococcal pharyngitis, and allergic rhinitis. The lack of specificity of signs or symptoms and the significant proportion of asymptomatic infections make symptom-based screening for identification of SARS-CoV-2 in children particularly challenging.[17]

Severity of Illness in Children

While children infected with SARS-CoV-2 are less likely to develop severe illness compared with adults, children are still at risk of developing severe illness and complications from COVID-19. Recent COVID-19 hospitalization surveillance data shows that the rate of hospitalization among children is low (8.0 per 100,000 population) compared with that in adults (164.5 per 100,000 population), but hospitalization rates in children are increasing.[5] While children have lower rates of mechanical ventilation and death than adults, 1 in 3 children hospitalized with COVID-19 in the United States were admitted to the intensive care unit, which is the same in adults.[5]

Current evidence suggests that children with certain underlying medical conditions and infants (age <1 year) might be at increased risk for severe illness from SARS-CoV-2 infection.[10,11,14] Of the children who have developed severe illness from COVID-19, most have had underlying medical conditions.[5]

- There is limited evidence about which underlying medical conditions in children might increase the risk for severe illness. Current evidence suggests that children with medical complexity, with genetic, neurologic, metabolic conditions, or with congenital heart disease might be at increased risk for severe illness from COVID-19. Similar to adults, children with obesity, diabetes, asthma and chronic lung disease, sickle cell disease, or immunosuppression might also be at increased risk for severe illness from COVID-19.
- While healthcare providers should maintain a high index of suspicion for SARS-CoV-2 infection in these populations and monitor the progression of illness closely, it appears that most infants[18] and children with certain underlying conditions such as cancer[19] who are infected with SARS-CoV-2 do not usually develop severe illness.
- Hospitalization rates in the United States are higher among Hispanic/Latino children and black, non-Hispanic children and non-Hispanic black children compared with white children, which may be related to the higher rates of obesity and other underlying conditions among these populations.[5]

Similar to adults, children with severe COVID-19 may develop respiratory failure, myocarditis, shock, acute renal failure, coagulopathy, and multi-organ system failure. Some children with COVID-19 have developed other serious problems like intussusception or diabetic ketoacidosis.[10,14, 20,21] Children infected with SARS-CoV-2 are also at risk for developing multisystem inflammatory syndrome in children (MIS-C).[22] For the case definition, recommended evaluation, and current data on MIS-C cases in the United States, visit MIS-C Information for Healthcare Providers.

Testing and Recommendations for Isolation

Viral tests (nucleic acid or antigen) are recommended to diagnose acute infection with SARS-CoV-2. Testing strategies, including clinical criteria for considering testing and recommended specimen type, are the same for children and adults. CDC's guidance for the evaluation and management of neonates at risk for COVID-19 details specific testing considerations for newborns.

For more information on CDC's recommendations for isolation, which apply to children and adults, visit: discontinuing precautions and disposition of patients with COVID-19 in healthcare settings and discontinuation of home isolation for people not in healthcare settings.

Testing, Isolation, and Quarantine for School-Aged Children

As children return to school and other in-person activities, pediatric healthcare providers should be prepared to answer questions from families about testing and when it is safe to return to school or be with people outside the household. Review CDC's information for school administrators on symptom screening and return to school and testing for children in school as well as CDC's Community Mitigation framework.

School-aged children should be prioritized for viral testing if they have:

- Signs or symptoms of COVID-19 **and** have had
  - close contact (within 6 feet of someone for a total of 15 minutes or more) with a person with suspected or confirmed SARS-CoV-2 infection **or**
  - a potential exposure (which includes living in an area or traveling to an area with in the community as defined by the local public health department and described in CDC's Community Mitigation framework)
- a known recent exposure to SARS-CoV-2 regardless of symptoms.

Children with symptoms of an infectious disease should not attend school, but the length of time the child should stay home depends on the most likely etiology of illness (COVID-19 or not). Return to school policies for children with suspected or confirmed COVID-19 should be based on CDC's recommendation for discontinuation of home isolation. A

negative test or doctor's note should **not** be required for return to school upon completion of the 10 days of isolation with improvement of symptoms.

- If the child has symptoms of COVID-19 but has not had close contact or a potential exposure (which includes travel to or living in an area with substantial transmission), he or she should be evaluated for possible other disease processes and should be allowed to return to school according to existing school policies if they are determined to likely **not** have COVID-19. Examples of non-COVID return to school policies include resolution of fever without antipyretics for 24 hours for viral illnesses or after initiation of antibiotics for bacterial illnesses.
- If the child has symptoms of COVID-19 and lives in or has traveled to an area with substantial transmission, he or she should be tested for SARS-CoV-2 infection, if possible. If the test result is negative, the child should be allowed to return to school once their symptoms of illness have improved consistent with existing school policy. If testing cannot be obtained, the child should be considered a presumed case of COVID-19 and should isolate according to CDC's recommendations for discontinuation of home isolation.
- If the child has had a known exposure or close contact to someone with SARS-CoV-2, he or she should be tested for SARS-CoV-2 but must remain in quarantine for the 14-day incubation period even if results are negative, in accordance with CDC's Quarantine If You Might Be Sick.

Laboratory and Radiographic Findings of COVID-19

Typical laboratory findings in children with COVID-19 include mild abnormalities in white blood cell count (either increased or decreased lymphocyte counts), mildly elevated inflammatory markers (including procalcitonin), and mildly elevated liver enzymes.[23] Radiologic findings in children with COVID-19 include unilateral or bilateral infiltrates on chest radiograph or CT, ground-glass opacities on CT, and consolidation with surrounding Halo sign on CT.[23,24] CT should be used sparingly and only for hospitalized, symptomatic patients with specific clinical indications. For more information, see recommendations from the American College of Radiology .

Management of COVID-19 in Children

Pediatric healthcare providers should consider the child's clinical presentation, requirement for supportive care, underlying medical conditions, and the ability for caregivers to care for the child at home when deciding whether the child may need inpatient care for COVID-19. For more information, visit Guidance for home care of people not requiring hospitalization for Coronavirus Disease 2019 (COVID-19). Provide parents resources on emergency warning signs for COVID-19 and caring for someone at home.

Currently, there are no specific drugs approved by the U.S. Food and Drug Administration (FDA) for treatment of COVID-19. Treatment of COVID-19 remains largely supportive and includes prevention and management of complications. Remdesivir , which has shown benefits in clinical trials in adults, is currently available through Emergency Use Authorization or compassionate use programs for children. The safety and effectiveness of remdesivir for treatment of COVID-19 has not yet been evaluated in children. Additionally, the National Institutes of Health (NIH) suggests that dexamethasone may be beneficial in pediatric patients with COVID-19 respiratory disease who are on mechanical ventilation. For more information, review considerations for children in NIH's COVID-19 Treatment Guidelines.[25]

For information on evaluation and management of MIS-C, visit MIS-C Information for Healthcare Providers.

It is important to remember that children infected with SARS-CoV-2 can present with other serious conditions such as diabetic ketoacidosis or intussusception, and a broad differential must be maintained in evaluating ill children during the COVID-19 pandemic.[10,14,20,21,26-29] Standard evaluation and management of co-occurring conditions should be maintained

for a child infected with SARS-CoV-2, with additional infection control measures. Pediatric providers should have an appropriate suspicion for COVID-19, but also to continue to consider and test for other diagnoses, such as community acquired pneumonia and influenza (see CDC's Flu Information for Healthcare Professionals for more information).

CDC has specific guidance for inpatient obstetric healthcare settings and the evaluation and management of neonates at risk for COVID-19. Additionally, several other organizations have published guidelines related to the treatment and management of adult and pediatric patients with COVID-19:

- National Institutes of Health (NIH) Coronavirus Disease 2019 (COVID-19) Treatment Guidelines
- World Health Organization (WHO) Interim Guidance on Clinical Management of Severe Acute Respiratory Infection when Novel Coronavirus (nCoV) Infection is Suspected
- Surviving Sepsis Campaign International Guidelines for the Management of Septic Shock and Sepsis-Associated Organ Dysfunction in Children
- Infectious Diseases Society of America Guidelines on the Treatment and Management of Patients with COVID-19

Immunizations and Well-Child Care

Community mitigation measures such as shelter-in-place orders resulted in declines in outpatient pediatric visits and fewer vaccine doses administered during the early COVID-19 pandemic,[30] leaving children at risk for vaccine-preventable diseases. **Healthcare providers should work with families to keep children up to date with all recommended vaccinations, especially with influenza vaccinations for the 2020-2021 influenza season.** For more information on influenza, visit CDC's Influenza page. For more information on immunization services and vaccination recommendations during the pandemic, visit Vaccination Guidance.

Healthcare providers should identify children who have missed well-child visits and/or recommended vaccinations and contact them to schedule in-person appointments, with prioritization of infants, children age < 24 months and school-aged children. Developmental surveillance and early childhood screenings, including developmental and autism screening, should continue along with referrals for early intervention services and further evaluation if concerns are identified.

All newborns should be seen by a pediatric healthcare provider shortly after hospital discharge (three to five days of age). Ideally, newborn visits should be done in-person, even during the COVID-19 pandemic, to evaluate feeding and weight gain, check for dehydration and jaundice, ensure all components of newborn screening were completed with appropriate confirmatory testing and follow-up, and evaluate maternal well-being. All healthcare facilities should ensure infection prevention and control policies are in place to minimize chance of exposure to SARS-CoV-2 among providers, patients, and families. For specific recommendations by healthcare facility type and level of community transmission, review Infection Control Guidance for Healthcare Professionals. CDC has additional trainings and information about potential exposures in the workplace for healthcare providers.

Pediatric healthcare providers should incorporate education on everyday infection prevention measures, such as the importance of proper hand hygiene, social distancing, and wearing masks when in public, as well as information on stress and coping during the pandemic in their regular anticipatory guidance with children and their families. Pediatric healthcare providers should educate patients and families about infection prevention policies that exist in clinics, emergency departments, hospitals, and clinics. Remind people to seek emergency care immediately, if indicated, as delaying care may cause harm.

Primary care practices should continue to use infection prevention strategies including:

- Scheduling sick visits and well-child visits during different times of the day

- Reducing crowding in waiting rooms, by asking patients to remain outside (e.g., stay in their vehicles, if applicable) until they are called into the facility for their appointment, or setting up triage booths to screen patients safely
- Considering telemedicine for visits that do not involve vaccination or do not require an in-person physical exam. For more information, visit Using Telehealth Services

Additional Information

- MIS-C Information for Healthcare Providers
- Interim Clinical Guidance for Management of Patients with Confirmed COVID-19
- Considerations for Inpatient Obstetric Healthcare Settings
- Evaluation and Management Considerations for Neonates At Risk for COVID-19
- Guidance on Care for Breastfeeding Women
- Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed COVID-19 in Healthcare Settings
- Health Alert Network (HAN): Multisystem Inflammatory Syndrome in Children (MIS-C) Associated with Coronavirus Disease 2019 (COVID-19)
- Steps Healthcare Facilities Can Take to Prepare for COVID-19
- What Healthcare Personnel Should Know about Caring for Patients with Confirmed or Possible COVID-19 Infection
- National Institutes of Health: Coronavirus Disease 2019 (COVID-19) Treatment Guidelines

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