



Coronavirus Disease 2019 (COVID-19)



Screening K-12 Students for Symptoms of COVID-19: Limitations and Considerations

Updated Nov. 5, 2020

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Summary of Changes

Revisions made on November 3, 2020

- Added a flowchart and scenarios to provide clarity for what to do when a student has symptoms of COVID-19
- Incorporates updated guidance for schools and when to quarantine

This document provides guidance for administrators, staff, and nurses in K-12 schools on COVID-19 symptom screening for schools opening for in-person learning. The guidance detailed here relates only to **students in K-12** school settings and is unique for two reasons:

1. Children and adolescents with COVID-19 might experience different symptoms and varying symptom severity compared to adults. See [“Information for Pediatric Healthcare Providers”](#) for more information.
2. K-12 schools provide essential educational, developmental, and support services to students and families. Therefore, excluding students from school has different consequences from excluding individuals from other settings. This makes the considerations for symptom screening in students in K-12 schools different from those for other settings or populations.

For guidance related to screening of teachers and staff, please refer to CDC’s [Interim Guidance for Businesses and Employers Responding to Coronavirus Disease 2019](#) and the readiness checklist [Prevent Transmission Among Employees](#) of CDC’s [Resuming Business Toolkit](#).

We learn more about COVID-19 every day, and as more information becomes available, CDC will continue to update and share information. As our knowledge and understanding of COVID-19 evolves, this guidance may change. **Based on the best available evidence at this time,**

- **CDC does not currently recommend schools conduct symptom screening for all students in grades K-12 on a routine (e.g., daily) basis.**
- **Parents, caregivers, or guardians (“caregivers”) should be strongly encouraged to monitor their children for symptoms of infectious illness every day through home-based symptom screening.**
- **Students who are sick should not attend school in-person.**

People with COVID-19 have a wide range of reported symptoms – from mild symptoms to severe illness. Symptoms may appear **2-14 days after exposure** to the virus that causes COVID-19.

Symptoms can include

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

This list does not include all possible [COVID-19 symptoms](#). Children and adolescents with the virus that causes COVID-19 may experience any, all, or none of these symptoms.

Limitations of COVID-19 symptom screening in schools

When implemented, symptom screening is intended to identify people who have possible symptoms of COVID-19. Those people are then kept from entering a setting to reduce the risk of spreading the virus that causes COVID-19. Screenings can be conducted in many ways and may range from assessing for only one symptom of COVID-19 (e.g., daily temperature checks to assess for fever) to assessing for multiple or all known COVID-19 symptoms. There is no single approach to COVID-19 symptom screening that is right for all populations or settings, **and there are limitations and challenges to using symptom screening in general, as well as using it as part of a school reopening strategy.**

COVID-19 symptom screening limitations in children and adolescents

- **The effectiveness of COVID-19 symptom screening in schools is not well**

known. A recent study found that symptom screening that evaluated for all known COVID-19 symptoms and was conducted by health professionals in a hospital setting failed to identify nearly half (45%) of all pediatric patients infected with the virus that causes COVID-19, and 40% of those with COVID-19 symptoms did not have the virus that causes it.^[1] This means schools still need to implement other mitigation strategies to reduce the spread of the virus that causes COVID-19 (such as those described in [Operating Schools during COVID-19](#)) even if symptom screening is used.

- **Symptom screening will fail to identify some students who have the virus that causes COVID-19.** Symptom screening cannot identify people with the virus that causes COVID-19 who are asymptomatic (do not have symptoms) or pre-symptomatic (have not developed signs or symptoms yet but will later). Others might have symptoms that are so mild that they might not notice them. Children infected with the virus that causes COVID-19 are more likely than adults to be asymptomatic or to have only mild symptoms.^{[2], [3], [4]} The exact percentage of children infected with the virus that causes COVID-19 who are asymptomatic is still unknown, but recent large studies have suggested that around 16% of infected children do not develop symptoms.^[5] This means that even if schools attempt to screen for all known COVID-19 symptoms, asymptomatic and pre-symptomatic students with the virus will not be identified and could potentially pass it to others.
- **Symptom screening will identify only that a person might be sick, not that the person necessarily has COVID-19. There is no symptom or set of symptoms that occurs only in children diagnosed with COVID-19.**^{[6], [7], [8], [9]}
 - Many symptoms of COVID-19 are also symptoms of common illnesses like cold and flu. For example, fever and cough are the most common symptoms reported in children with COVID-19 and are present with many infections. The overlap between symptoms of COVID-19 and other common infectious illnesses means that some people with COVID-19 symptoms could have something else. This could be true even more often in young children because they typically have multiple viral illnesses each year.
 - Students with chronic conditions like asthma or allergies might have symptoms such as cough or nasal congestion without having an infectious illness. Children with other chronic illnesses such as those that affect the stomach or intestines (e.g., Crohn’s disease or irritable bowel syndrome) might also experience symptoms like nausea, vomiting, or diarrhea that can be confused with symptoms of COVID-19. For many students with chronic medical conditions, symptoms might reoccur frequently throughout the year.
 - Because many COVID-19 symptoms are present in other illnesses, symptom screenings have the potential to exclude students from school repeatedly even though they do not have COVID-19 or another contagious illness, particularly when those screenings evaluate for multiple or all known COVID-19 symptoms.

Table. Many symptoms of COVID-19 are also present in common illnesses

Symptoms of COVID-19	Strep Throat	Common Cold	Flu	Asthma	Seasonal Allergies
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Fever or chills	X		X		
Cough		X	X	X	X
Sore throat	X	X	X		X
Shortness of breath or difficulty breathing				X	
Fatigue		X	X	X	X
Nausea or Vomiting	X		X		
Diarrhea	X		X		
Congestion or Runny Nose		X	X		X
Muscle or body aches	X	X	X		

Note: The table above does not include all COVID-19 symptoms

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Unique challenges of school-based symptom screening

Schools face specific challenges not necessarily present in other settings when implementing symptom screening. This is because schools have a unique role not only in the lives of students and their families, but also in the broader community.

- **Symptom screening might require close contact or frequent interaction between screeners (school personnel or volunteers) and multiple students.** This could increase the risk of COVID-19 exposure to screeners or be logistically challenging for schools in which dedicated space is not available. In schools without a nurse on staff, a person who is not a healthcare professional might be asked to assess students' symptoms and make difficult determinations about which students should be excluded from school.
- **Symptom screening has the potential to exclude certain students repeatedly, such as those with chronic medical conditions, from school even though they do not have COVID-19 or any contagious illness.** This is particularly true when symptom screening is conducted by people who do not have the training or background to understand students' health status, potentially leading to false positive screenings by identifying chronic symptoms as symptoms of COVID-19. This in turn might worsen disparities for students who already miss school frequently because of chronic medical conditions.

Excluding students from school for longer than what is typically called for in existing school policies—without considering the student's usual health and

without assessing the likelihood the student was exposed to the virus that causes COVID-19—risks repeated, long-term, and unnecessary student absence and possible unintended harm.

- **Symptom screening is not intended to diagnose someone with COVID-19.**

When a student develops symptoms that suggest COVID-19, school officials must not only determine whether to exclude that student from school, but they must also identify policies regarding when it is safe to allow the student to return. Most illnesses do not require the same precautions or length of isolation that COVID-19 does.

Because of these limitations and challenges, CDC does not currently recommend routine (such as daily) school-based COVID-19 symptom screening of all students. However, students should not attend school when they are sick.

Schools can minimize some of the limitations and challenges of symptom screening and help reduce the spread of the virus that causes COVID-19 by

- Encouraging families to check their students' health and keep students home when they are sick
- Emphasizing home symptom screening or being aware of symptoms that suggest infectious illness generally rather than comprehensive screening for all known symptoms of COVID-19
- Basing decisions for safe return to school on the likelihood that the student's symptoms are from COVID-19

A home-based strategy

Schools can review existing sick student policies and consider enhancing them by asking families to participate in home-based screening. This approach relies on students and their caregivers to identify when the student might have symptoms of infectious illness and take action (such as staying home). Some of the advantages of this approach include

- Using caregiver knowledge of their children's health to identify when they might have symptoms of infectious illness
- Encouraging caregiver participation in decision-making and discussion around their children's health
- Identifying students who might have infectious illness **before** they arrive at school, limiting contact between potentially sick students and others during transit and after school arrival
- Avoiding repeated interactions during the screening process between school personnel or volunteers and students who may have COVID-19.

Decision-making about when and for how long a student should stay home

For schools and families to make informed decisions about when a student should stay home and when it's safe for the student to return to in-person school, two questions need to be considered

1. What are the student's symptoms? and
2. In what context did those symptoms occur?

Section 1: Symptoms of infectious illness

Symptom screening should not try to identify every known symptom of COVID-19. No single symptom indicates someone has COVID-19, and many COVID-19 symptoms can occur when a person does not have COVID-19 or any infectious illness. Instead, use symptom screening to determine if a student currently has an infectious illness that they might pass on to others.

The presence of any of the symptoms below generally suggests a student has an infectious illness and should not attend school, regardless of whether the illness is COVID-19. **For students with chronic conditions, a positive screening should represent a change from their typical health status.**

- [Temperature](#)  of 100.4 degrees Fahrenheit or higher
- Sore throat
- Cough (for students with chronic cough due to allergies or asthma, a change in their cough from baseline)
- Difficulty breathing (for students with asthma, a change from their baseline breathing)
- Diarrhea or vomiting
- New onset of severe headache, especially with a fever

Students should not attend school in-person if they or their caregiver identifies new development of any of the symptoms above.

Section 2: Context of symptoms: Risk of exposure to the virus that causes COVID-19

These questions can help schools assess the risk that a student has been exposed to COVID-19. This information will help determine when a student's symptoms are more likely to be from COVID-19. Having symptoms of infectious illness alone should not be treated as a COVID-19 diagnosis. The most appropriate length of school exclusion should be based on the likelihood that the student's symptom(s) represent COVID-19 instead of another infection.

Schools and parents should be more cautious about keeping students with symptoms consistent with COVID-19 home if there is a higher likelihood that a student's symptoms are caused by COVID-19. Students are more likely to have COVID-19 if

- A. The student had [close contact](#) (within 6 feet for a total of 15 minutes or more) with a

person with [laboratory-confirmed or probable](#) COVID-19

- B. the response to the above is “no,” but the student attends school in an area where there is [moderate risk of transmission](#) or higher according to CDC’s [Indicators and thresholds](#) for risk of introduction and transmission of COVID-19 in schools

In situation A, the student has had known recent exposure to the virus that causes COVID-19, and there is a higher probability that their symptoms are from COVID-19. Students who have not had known close contact should be assessed for situation B. In situation B, the chances that a student has been exposed to the virus without knowing it are increased but not certain. **Schools should work with local health officials to identify the risk of transmission in the school based on CDC’s [Indicators and thresholds for risk of introduction and transmission of COVID-19 in schools](#) and update parents with this information regularly.** Students who meet either of these criteria should be referred to their healthcare provider and/or local public health officials for further evaluation and possible testing. However, contacting public health officials is particularly important for students who meet criteria A because of their known exposure (close contact) with someone with COVID-19.

Home-based symptom screening template

Schools can use the template below to share with caregivers and aid in daily reporting.

Caregivers: Please complete this short check of your student each morning before they leave for school.

Symptoms

If your child has any of the following symptoms, they might have an illness they can spread to others. Check your child for these symptoms before they go to school:

Note: For students with chronic conditions, check a symptom only if it has changed from usual or baseline health.

- ☐ **Temperature**  100.4 degrees Fahrenheit or higher
- ☐ Sore throat
- ☐ Cough (for students with chronic cough due to allergies or asthma, a change in their cough from baseline)
- ☐ Difficulty breathing (for students with asthma, a change from their baseline breathing)
- ☐ Diarrhea or vomiting
- ☐ New onset of severe headache, especially with a fever

→ If your child does NOT have any of the symptoms above, send them to school as usual.

→ If your child has any of the symptoms above,

- **Keep them home from school**
- **Consider whether your child needs to see a healthcare provider and possible COVID-19 testing.** CDC has a Coronavirus Self Checker available in its website, which may help you make decisions about seeking medical care for possible COVID-19 (<https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/coronavirus-self-checker.html>)
- **Contact your child's school** [INSERT YOUR SCHOOL REPORTING INSTRUCTIONS] **and report that your child is sick. The school may ask some additional questions to help determine when it is safe for your child to return to school.**

Template for school assessment of student's risk of exposure to virus that causes COVID-19

Schools: When a caregiver reports that a student is sick with any symptoms in the "Home-based symptom screening template," ask the caregiver question A

A. To the best of your knowledge, has your child had close contact (within 6 feet for a total of 15 minutes or more) with someone with COVID-19?

☐ Yes

☐ No

→ **If NO, continue to question B. Otherwise, skip question B and continue to instructions below.**

Complete question B based on the school's risk of COVID-19 transmission according to CDC's Indicators for Dynamic School Decision-Making

(<https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/indicators.html#thresholds>)

B. Does the community where the school is located have moderate risk of COVID-19 transmission or higher?

☐ Yes

☐ No

→ **If YES to A**

- **Encourage the caregiver to consult with the student's healthcare provider.** CDC has a Coronavirus Self Checker available on its website, which may help caregivers make decisions about seeking medical care for possible COVID-19 (<https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/coronavirus-self-checker.html>)
- **Refer the student's family to local public health officials for potential testing and evaluation as a possible close contact**

→ **If YES to B**

- **Encourage the caregiver to consider whether their child needs to see their healthcare provider.** CDC has a Coronavirus Self Checker available on its website, which may help caregivers make decisions about seeking medical care for possible COVID-19 (<https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/coronavirus-self-checker.html>)
- **Refer the student's family to local public health officials or their healthcare provider for potential testing**

Scenarios for returning to in-person school

Schools should base decisions about when it is safe for students who develop symptoms (in other words, those with a “yes” response in Section 1) to be around others and return to in-person school on the responses provided to Section 2 and COVID-19 viral test results, when available. Caregivers of symptomatic students should be encouraged to consult their children’s healthcare provider to determine when COVID-19 testing is appropriate.

Students in the following scenarios include those with a **YES response to any part of Section 1:**

Scenario 1: Symptomatic student with no increased risk of exposure to the virus that causes COVID-19 (in other words, **NO to both parts of Section 2**)

- This student should stay home until his or her symptoms have improved according to existing school policies, typically, at least 24 hours after they no longer has a fever (temperature of 100.4 or higher) or signs of a fever (chills, feeling very warm, flushed appearance, or sweating) without the use of fever-reducing medicine (e.g., acetaminophen or ibuprofen).

Scenario 2: Symptomatic student who has had close contact (within 6 feet for a total of 15 minutes or more) with a person infected with COVID-19 (in other words, **YES to Section 2A**).

- If the student receives a **positive** COVID-19 test result they should not attend school and should isolate until:
 - At least 10 days since symptoms first appeared AND
 - 24 hours with no fever without fever reducing medication AND
 - Other symptoms of COVID-19 are improving (see [Isolate If You Are Sick](#) for more information)
- If the student receives a **negative** COVID-19 test result or are not tested they must still complete the full 14-day quarantine from the last contact with an infected person before returning to school because they can still develop COVID-19 for up to 14 days after being exposed. (See [When to Quarantine](#) for more information.)

Scenario 3: Symptomatic student with no known close contact with an infected person BUT attends a school with moderate risk of transmission or higher (in other words, **NO to Section 2A but YES to Section 2B**)

- If the student receives a **positive** COVID-19 test result or if they are not tested, they should not attend school and should isolate until
 - At least 10 days since symptoms first appeared AND
 - 24 hours with no fever without fever reducing medication AND
 - Other symptoms of COVID-19 are improving (see [Isolate If You Are Sick](#) for more information)
- If the student receives a **negative** test result, the symptoms are most likely from

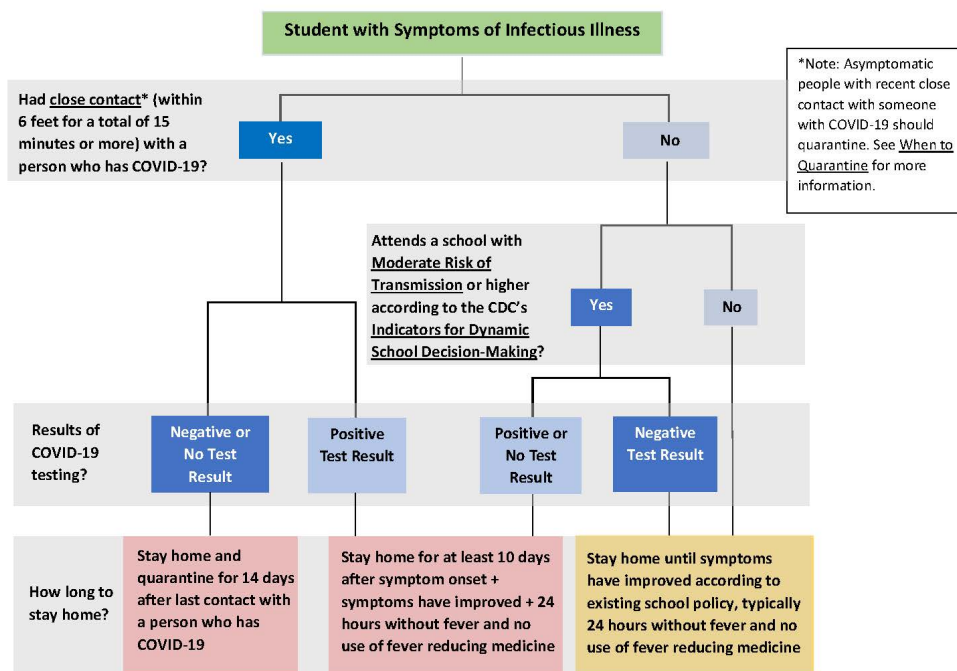
another infection. Because this student DOES NOT have a known close contact, they may return to school once symptoms have improved according to existing school policies such as those described in Scenario 1.

For each of these scenarios, after the appropriate isolation or quarantine period is complete, schools should not require a COVID-19 viral test result or doctor’s note for school return.

NOTE: The scenarios above describe return to school policies for students who have symptoms of possible infectious illness (i.e., YES response(s) in Section 1).

Asymptomatic individuals who have had close contact with someone with COVID-19 should also quarantine for 14 days from the last contact with an infected person. See [When to Quarantine](#) for more information.

If the individual later develops symptoms, they will need to isolate for at least 10 days from the start of their symptoms and meet the additional criteria described in CDC’s [Isolate If You Are Sick](#) guidance. As a result, some individuals may have a total quarantine plus isolation duration longer than 14 days.



Download the full-sized image [JPG - 143KB]

This flowchart explains when students who have symptoms of COVID-19 can return to school, based on whether the student had close contact with someone with COVID-19, whether the student attends school with moderate risk of transmission or higher, and the student's testing results.

If a student has symptoms and tests positive for the virus that causes COVID-19, the student must isolate for 10 days. If a student has symptoms and had close contact (within 6 feet for a total of 15 minutes or more) with someone who has COVID-19 and tests negative or was unable to be tested, the student must quarantine for 14 days. If a student has symptoms but has not had a close contact, then the risk of transmission in the school and community matters. If there was no close contact and no moderate or higher risk of transmission, then the student should stay home until symptoms improve, per non-COVID school policies. If there was no close contact but there is moderate or higher risk of transmission and no testing was obtained, the student should isolate for 10 days.

Students Who Become Sick at School

Some students might develop symptoms of infectious illness while at school. Schools that identify symptomatic students during the school day should follow the steps of CDC's "[Student Becomes Sick](#)" on what to do next. This includes notifying the student's caregiver and recommending an evaluation by a healthcare provider and testing or initiating [school-based testing](#), if available. Schools should work with students and their caregivers to base school exclusion and return decisions on the same criteria detailed for home-based screening above.

School Isolation Protocols

Additionally, when students develop symptoms of infectious illness, schools should take action to isolate them from other students and staff.

- Students with any of the symptoms in Section 1 should follow their school's current illness management policy to minimize transmission to others and allow for these symptoms to resolve (at least 24 hours without fever reducing medications or according to existing school illness policy).
- Students who develop any of the symptoms in Section 1 while at school should be placed in an isolation area (ideally with a restroom) separate from staff and other students:
 - School nursing staff who interact with a student who becomes ill while at school should use [Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 \(COVID-19\) Pandemic](#) when caring for sick people.
 - Students who are sick and not already wearing a mask should be provided one to wear unless the student has a contraindication to doing so. (See [Considerations for Wearing Masks](#) for more information.)

- Students who are sick should go home or to a healthcare facility depending on how severe their symptoms are, and follow [CDC guidance on for caring for yourself and others](#) who are sick.
 - If a student has also answered YES to either question in Section 2 and the school needs to call an ambulance or bring a student to the hospital, the school should first alert the healthcare staff that the student might have been exposed to someone with COVID-19.
- After the student leaves an isolation area, school staff should follow CDC's [Considerations for Cleaning and Disinfecting Your Facility](#).
 - **Note:** In developing plans for placing students with symptoms in an isolation area, schools should take care to ensure that students are isolated in a non-threatening manner, within the line of sight of adults, and for the shortest possible period. If more than one individual at a school becomes sick at the same time, ideally each person should be isolated separately to avoid unnecessary exposures in case one or more of those who are sick do not have COVID-19.

Additional resources regarding actions to take for students who become sick while at school are available at:

[What to Do If a Student Becomes Sick at School or Reports a New COVID-19 Diagnosis Flowchart](#)

Considerations If Schools Elect to Conduct Symptom Screening

Although CDC does not currently recommend that schools conduct symptom screening, for schools that choose to implement screening on-site, CDC offers the following:

- Consider the scientific evidence previously outlined and weigh the risks and benefits to students, staff, and the larger community.
- Consider how school policies regarding symptom screening can balance the resources required and feasibility of implementation and the risk of transmission in schools.
- Consider ways to reduce the likelihood of excluding students who do not have COVID-19 from essential instructional and critical developmental experiences.

Before conducting screenings or sharing personally identifiable information on students concerning COVID-19 with public health authorities or other officials, consider federal, state, and local requirements, including provisions in the Family Educational Rights and Privacy Act (FERPA). Some of the factors schools may weigh include:

Feasibility

- If symptom screening is implemented by the school, are there enough staff who are sufficiently trained in screening procedures as well as in putting on and taking off personal protective equipment (PPE)?

- How will results of screening be verified?
- Is proper equipment (e.g., thermometers, PPE) available in sufficient quantities?
- How will proper cleaning and disinfection of the screening area and equipment be ensured?
- Will processes be in place to ensure screeners and students maintain safe distance during screening?
- What protections will be included for staff who are at increased risk of severe COVID-19?
- What testing strategies will be implemented by the school so that students with positive symptom screenings can be further evaluated? (See [Considerations for Testing in K-12 Schools](#).)

Harm mitigation

- What strategies are needed to reduce the harms to students and their families when students are excluded from school, such as students who rely on school meals or impact on parental ability to work, when screening falsely identifies their chronic symptoms as symptoms of COVID-19?
- How will students with chronic conditions or special health care needs be accommodated to minimize the risk of symptom screening falsely identifying chronic symptoms as symptoms of COVID-19?
- How will stigma be reduced for students who screen positive for having symptoms of COVID-19, regardless of whether they have COVID-19?
- What is the emotional impact of daily screening on young children and how can fear of new mitigation protocols, such as adults wearing PPE, be reduced?
- How will ill students be afforded the opportunity to make up any missed classwork without penalty to reduce mental or physical anxieties about missed academic opportunities when screening falsely identifies their chronic symptoms as symptoms of COVID-19?

Level of community transmission in the area where the school is located

- If there is minimal COVID-19 transmission in the community, symptom screening will be more likely to identify people with symptoms who have something other than COVID-19. Symptom screening in this scenario will be more likely to identify other illnesses or conditions, not COVID-19, including certain chronic symptoms, some of which may not require staying home.
- When there is more community transmission, the likelihood that individuals with symptoms actually have COVID-19 is higher. Therefore, symptom screening may be more helpful when COVID-19 transmission in the community is high.

Recommendations of local public health authorities

- Regardless of factors above, schools should ensure that their policies follow the recommendations of local public health officials and are consistent with Federal, state, and local laws, including FERPA.
- Schools that choose to conduct symptoms screening should contact their local health

departments with questions regarding practices and implementation.

- Additionally, schools should continue to monitor compliance with the immunizations required for in-person school attendance.

Note: Symptom screening is intended to reduce transmission from a potentially infected person to others. It is not designed to assess the severity of illness in the person with infection, the person's risk of developing serious illness, or the person's need to seek medical care. CDC has a COVID-19 self-checker to help caregivers of children with symptoms of COVID-19 assess whether they should contact their child's healthcare provider available at [Coronavirus Self-Checker](#).

References

- [1] Poline J, Gaschignard J, Leblanc C, Madhi F, Foucaud E, Nattes E, Faye A, Bonacorsi S, Mariani P, Varon E, Smati-Lafarge M. "Systematic SARS-CoV-2 screening at hospital admission in children: a French prospective multicenter study." *Clinical Infectious Diseases* (2020).
- [2] Davies, N.G., Klepac, P., Liu, Y. *et al.* Age-dependent effects in the transmission and control of COVID-19 epidemics. *Nat Med* (2020). <https://doi.org/10.1038/s41591-020-0962-9> 
- [3] Assaker, Rita, Anne-Emmanuelle Colas, Florence Julien-Marsollier, Béatrice Bruneau, Lucile Marsac, Bruno Greff, Nathalie Tri, Charlotte Fait, Christopher Brasher, and Souhayl Dahmani. "Presenting symptoms of COVID-19 in children: a meta-analysis of published studies." *BJA: British Journal of Anaesthesia* (2020).
<https://www.sciencedirect.com/science/article/pii/S0007091220304086?via%3Dihub> 
- [4] Dong, Yuanyuan, Xi Mo, Yabin Hu, Xin Qi, Fan Jiang, Zhongyi Jiang, and Shilu Tong. "Epidemiology of COVID-19 among children in China." *Pediatrics* 145, no. 6 (2020).
<https://pediatrics.aappublications.org/content/145/6/e20200702> 
- [5] Assaker, Rita, et al. "Presenting symptoms of COVID-19 in children: a meta-analysis of published studies." *BJA: British Journal of Anaesthesia* (2020).
- [6] Clemency, Brian M., Renoj Varughese, Danielle K. Scheafer, Brian Ludwig, Jacob V. Welch, Robert F. McCormack, Changxing Ma, Nan Nan, Theresa Giambra, and Thomas Raab. "Symptom Criteria for COVID-19 Testing of Health Care Workers." *Academic Emergency Medicine* 27, no. 6 (2020): 469-474.
- [7] Roland, Lauren T., Jose G. Gurrola, Patricia A. Loftus, Steven W. Cheung, and Jolie L. Chang. "Smell and taste symptom-based predictive model for COVID-19 diagnosis." In *International Forum of Allergy & Rhinology*. 2020.
- [8] Stokes EK, Zambrano LD, Anderson KN, et al. Coronavirus Disease 2019 Case Surveillance — United States, January 22–May 30, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:759–765. DOI: <http://dx.doi.org/10.15585/mmwr.mm6924e2external> .

[9]Assaker, Rita, et al. "Presenting symptoms of COVID-19 in children: a meta-analysis of published studies." *BJA: British Journal of Anaesthesia* (2020).

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