The Children’s Minnesota COVID-19 patient and healthcare worker testing guidelines were developed to provide a cohesive organizational approach with defined priorities for COVID-19 testing. These guidelines apply to patients and staff within Children’s Minnesota and Children’s Health Network patients.

1. Patients
   Diagnostic testing for COVID-19 is recommended for:
   a. Symptomatic patients
   b. Asymptomatic patients about to undergo a surgical procedure or aerosol generating procedure
   c. Patients with a known exposure to a confirmed COVID-19-positive case
   d. Patients in certain risk categories, such as:
      i. those admitted to or living in congregate living settings
      ii. medical specialty patients such as hem/onc patients
      iii. newborns of mothers with confirmed COVID-19
   e. Admissions outlined below

2. Healthcare Workers
   Diagnostic testing for COVID-19 is determined by Employee Health Services and performed using a nasal swab and either in-house 24-hour test or 48-hour in-house PCR testing.

### Test Type for Patients

<table>
<thead>
<tr>
<th>Definition</th>
<th>Respiratory symptoms</th>
<th>Non-respiratory symptoms or asymptomatic</th>
<th>Urgent/emergent procedures and other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External Clinic</strong></td>
<td>BinaxNOW* + Influenza A/B and RSV, if applicable</td>
<td>Agena</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Hospital-based Clinic</strong></td>
<td>Cepheid (including SARS-CoV-2, influenza A/B with or without RSV)</td>
<td>Agena or DiaSorin</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>ED Discharge to Home</strong></td>
<td>Cepheid (including SARS-CoV-2, influenza A/B with or without RSV)</td>
<td>Agena</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Admitted Patient</strong></td>
<td>Cepheid (including SARS-CoV-2, influenza A/B with or without RSV)</td>
<td>DiaSorin</td>
<td>Cepheid (including SARS-CoV-2 only)</td>
</tr>
</tbody>
</table>


**Turnaround Time and Accepted Specimens by Test Type**

<table>
<thead>
<tr>
<th></th>
<th>BinaxNOW*</th>
<th>Cepheid</th>
<th>DiaSorin</th>
<th>Agena</th>
<th>Mayo</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAT</td>
<td>BinaxNOW*</td>
<td>Cepheid</td>
<td>DiaSorin</td>
<td>Agena</td>
<td>Mayo</td>
</tr>
<tr>
<td>Accepted specimen types**</td>
<td>Rapid in-house antigen test, 15 mins</td>
<td>Rapid in-house PCR test, 1H</td>
<td>In-house PCR test, up to 24H</td>
<td>In-house PCR test, 48–96H</td>
<td>Send out PCR test, 48–120H</td>
</tr>
<tr>
<td>Anterior Nares Swab</td>
<td>Nasopharyngeal (NP) Swab Anterior Nares Swab</td>
<td>Nasopharyngeal (NP) Swab Anterior Nares Swab</td>
<td>Nasopharyngeal (NP) Swab Anterior Nares Swab</td>
<td>Nasopharyngeal (NP) Swab Anterior Nares Swab</td>
<td>Oropharyngeal (OP) swab*** Sputum</td>
</tr>
</tbody>
</table>

* BinaxNOW antigen tests are available at Children’s Minnesota external clinics. It is reflexed to an in-house PCR test if negative.

** NP swabs are preferred due to increased testing sensitivity.

*** Reserve OP collections only for cases when an NP or Anterior Nare collection is not possible

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**Accepted Tests at Children’s Minnesota**

<table>
<thead>
<tr>
<th></th>
<th>PCR</th>
<th>Antigen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Nasal Swab</td>
<td>Accepted</td>
<td>Accepted</td>
</tr>
<tr>
<td>NP Swab</td>
<td>Accepted</td>
<td>Accepted</td>
</tr>
<tr>
<td>OP Swab</td>
<td>Accepted</td>
<td>Accepted</td>
</tr>
<tr>
<td>Saliva</td>
<td>Accepted</td>
<td>Not accepted^</td>
</tr>
<tr>
<td>Bronch</td>
<td>Accepted</td>
<td>Accepted</td>
</tr>
<tr>
<td>Lower Respiratory Sample</td>
<td>Accepted</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

^Negative antigen tests and negative saliva PCR tests will not populate the banner bar or clinical highlights when entered in the External Infectious Disease Results Powerform.

**Notes:**
- Consider COVID-19 retesting in patients who have previously tested negative and have developed new or worsening symptoms of illness.
- Patients undergoing continuous or multiple AGPs should be tested for COVID-19 prior to initiation of the first AGP. Periodic testing or retesting prior to additional AGPs is not required, unless the patient develops new symptoms of illness, has a significant clinical change, or has a significant change to their exposure risk. For a full list of aerosol-generating procedures and related information, refer to Aerosol-Generating Procedures.
- Newborns admitted to a neonatal unit should undergo COVID-19 testing according to the neonatal testing algorithm. Infants admitted to neonatal units directly from birth do not require COVID-19 testing for AGPs,
unless infant’s mother is a confirmed COVID-19 case. Newborns discharged with mother after delivery should undergo one diagnostic test for COVID-19 when mother’s COVID-19 test is resulted as positive or at the first newborn well-child clinic visit, whichever is later.

- Exposure is defined as being within 6 feet for more than 15 minutes to persons with confirmed COVID-19.

Frequently asked questions

1. **Q: For patients who come for frequent infusions or therapies, must they be tested every time before each treatment?**

   A: This gets difficult and is a clinical judgement of the provider as there is no clear science yet. It is recommended that these patients have a baseline COVID-19 antibody test to see if they have had asymptomatic infection in the past. If positive, they would not need nasal swab PCR testing at each infusion. If the baseline antibody test is negative, it is advised to have a nasal swab in the 24 hours prior to the planned encounter, or on the day of the procedure if testing in advance is not feasible. Understanding exposure risks between therapies will be an important part of the decision to retest.

2. **Q: How are antibody tests to be used?**

   A: Children’s Minnesota has an in-house IgG antibody test for SARS-CoV-2 the virus that causes COVID-19. This test should not be done before day 14 after symptom onset as it may be too early to detect the immune response to the infection. The blood test is especially useful in patients to diagnose severe post-viral multisystem inflammatory syndrome in children (MIS-C) associated with COVID-19 when the PCR test is negative and the serology is positive. Duration of antibodies and their level of protectiveness is still not well-understood.

3. **Q: If someone tests positive who is completely asymptomatic, do they need to do anything special?**

   A: Yes, they should be considered potentially infectious for 10 days from the day of the test and limit social interaction especially with people at high risk for severe disease such as the elderly or those with chronic conditions.

4. **Q: What are the hours of the Swab Centers?**

   A: The Minneapolis Swab Center located as a drive through site on P3 in the Green Ramp is open Monday – Friday 0730-1600 and Saturday 0800-1200. The St. Paul Swab Center is on the lower level in the Red Ramp off Thompson at Smith. Their hours are Monday -- Friday 0730-1600.

5. **Q: How does an employee make an appointment for testing at the Swab Center?**

   A: Employees are referred for testing after an assessment by calling the Employee Health Services line. One of the Nurse Practitioners will make a plan appropriate for you. Their number is 952-992-5372.

6. **Q: If an exposed patient’s COVID-19 test is negative, do they still need to quarantine for 14 days?**
A: Yes, all patients who are exposed to a person with confirmed COVID-19 should follow a 14-day quarantine period after the last date of exposure even if the result is negative. Infection could develop at any time during the quarantine period.

7. Q: Parents are under the impression we have lots of ability to test anyone whenever they want it, is that true?
   A: Unfortunately, this is a misperception. Across the U.S., Minnesota and at Children's Minnesota our test supply is limited and we must balance our limited use of in-house one hour turn-around time for urgent inpatient needs. However, we will work with each family to get the right testing.

8. Q: What do we do if a parent or patient refuses a COVID-19 test?
   A: This should be managed on a case-by-case basis and well-documented in the chart. Try to explain the rationale for testing, that it is clinically important to know if the patient has an asymptomatic infection that might complicate their care, to know what type of room to admit them to and for our staff to know what PPE to wear. It is not mandatory to test and we cannot force a test on a patient, but explaining the reason is important. If they refuse, we treat the patient as if they are positive for COVID-19 and move them to the appropriate unit/room.

Surgery specific frequently asked questions

9. Q: When can testing be done before surgery?
   A: For patients not admitted to the hospital, testing is recommended within 96 hours before surgery. After testing, families will be instructed to limit their social interactions to their own household given the short 2 day incubation period of COVID-19 after exposure. Pre-op history and physical visits and testing for COVID-19 can be done in primary care at the same visit as long as the visit is within the 96 hour time window prior to surgery. The Swab Center is available for testing pre-procedure as well.

10. Q: For patients not admitted to the hospital, can we accept a COVID-19 test done 96 or more hours before surgery?
    A: Since the incubation period (time from exposure to symptoms) is as short as 2 days with COVID-19, the clinician should ask the family if they have limited their contact with their own household and if so, may use that test. If not, they can either retest or treat the patient as a positive in which case the procedure could possibly be canceled.

11. Q: How long is a negative test good for after a patient has a negative on admission?
    A: Admitted patients who tested negative for COVID on admission do not need to be retested within that admission unless the patient develops new symptoms consistent with COVID-19 or worsening conditions such as unexplained increase in seizures, etc.

12. Q: Can CHN clinics send their swabs to Children’s Minnesota lab for pre-op testing or if the child is symptomatic and needs a test for diagnosis?
    A: Yes, we are able to test patients who are from Children’s Minnesota and clinics in the Children’s Health Network. The details of this process are currently being worked out.
13. Q: If a test is ordered and the result is not back yet, should the surgery proceed without the test?
   A: No. Clinicians must wait for the test result to return prior to starting the procedure unless it is an emergency.

14. Q: What happens if a pre-procedure test is positive?
   A: The proceduralist who ordered the test must decide how to proceed. If the procedure is not urgent or emergent, it will be rescheduled with a minimum interval of 21 days until the procedure; if no new symptoms develop, repeat testing is not necessary at that time of rescheduling.

15. Q: Why do patients undergoing cardiac surgery have a two test strategy—4 days before in their pre-surgery cardiology visit and again the day of surgery?
   A: Doing heart surgery on a child with a new COVID-19 infection could be life-threatening. Inflammation of the heart occurs in children with COVID-19 and recovery from surgery and COVID-19 would be extremely difficult. Canceling heart surgery if they are positive 4 days in advance prevents the wasting of expensive materials such as heart valves and setting up equipment and supplies that would not be able to be used.

Testing and precautions frequently asked questions

16. Q: What is the time and symptom based strategy for duration of isolation precautions?
   A: CDC recommends that for most persons with COVID-19 illness, isolation and precautions can generally be discontinued 10 days after symptom onset and resolution of fever for at least 24 hours, without the use of fever-reducing medications and with improvement of other symptoms. A limited number of persons with severe illness may warrant extended duration of isolation and precautions for up to 20 days after symptom onset. Please consult with infectious disease. For persons who never develop symptoms, isolation and other precautions can be discontinued 10 days after the date of first positive COVID test.

17. Q: When would a test-based strategy be used to determine duration of isolation precautions?
   A: CDC recommends that for persons who are severely immunocompromised, a test based strategy could be considered, in consultation with infectious disease. For all others, the time and symptom based strategy described above is recommended.

18. Q: If a patient who has had COVID-19 is being discharged to a behavioral health facility and the receiving facility requires a negative COVID-19 test, what test should be used?
   A: Test for clearance is run in-house using the Agena platform. Do not do serial tests on behavior health patients using the rapid in-house test. Order an Agena test every 72-96 hours (wait for result prior to ordering another test) until a negative result is obtained. Follow the powerplan when selecting a test.

19. Q: When should the Respiratory Pathogen Panel 2.1 (RP 2.1) be used?
   A: The RP 2.1 should be used for inpatients who are immunocompromised and/or are in critical condition. This test is costly for the patient and should be used sparingly.

20. Q: Can I order both a rapid SARS-CoV-2 test and the RP 2.1 on the same patient?
A: At present, rapid SARS-CoV-2 test orders will be canceled on samples with both a rapid SARS-CoV-2 test and the RP 2.1 ordered during the hours that panel testing is performed.

21. Q: Are there PCR-like tests that are accepted at Children’s Minnesota?
A: Yes. There are different types of modified PCR tests that Children’s Minnesota would accept. One example is Transcription Mediated Amplification (TMA), a molecular technology that utilizes a unique method to amplify SARS-CoV-2 RNA in a sample.

22. Q: How do I identify if an antigen test was used when a patient has a result from an external facility?
A: After examining the test result from an external facility, if you are unable to identify the test type, asking the family may help. Antigen testing is usually rapid (30 minutes or less).

References:

Reviewer: Berg, Garton, Kalaskar, Sznewajs, Johnson, Laramie
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