Comprehensive BJC COVID-19 Diagnostic Guidelines
Updated: 8/31/2020

What's Changed?
August 31: Updates made throughout the document based on CDC recommendations to test all patients with COVID-compatible symptoms, and to test some asymptomatic patients
May 4: Updated symptom list as per CDC recommendations; modified symptom-based guidance
April 24: Updated pediatric guidelines from SLCH and WUSM Pediatric ID. Added clarification on testing for patients with high risk conditions in the ambulatory setting; added statement about repeat testing before surgical procedures during the same admission.
April 22: Updated Tier 3 testing criteria from "Fever **AND**" other symptoms to "Fever **OR**" other symptoms.

A wide range of symptoms have been reported among patients with COVID-19 including mild symptoms to very severe illness. Most patients have developed fever and/or symptoms of acute respiratory illness including cough or shortness of breath. Some patients have developed other, non-specific or less common symptoms (See table 1). Symptoms may occur 2-14 days after exposure to the virus.

The guidance below is based on recommendations from the Infectious Disease Society of America (IDSA)[1] and Missouri Department of Health & Senior Services (DHSS)[2], and the Centers for Disease Control and Prevention (CDC)[3]. These guidelines are subject to change based on local epidemiology and availability of supplies.

The guidelines below detail current testing recommendations for:

1. Inpatients and ED patients being admitted
2. Healthcare personnel
3. Ambulatory patients
4. Pediatric patients

Additional recommendations are provided for the management of individuals exposed to persons known to have COVID-19 and asymptomatic patients prior to surgical procedures.

In light of ongoing shortages of testing supplies and the dynamic nature of commercial testing, this document does not detail exactly which internal testing platform or commercial vendor will be utilized for an individual patient population. As allowed by supplies, BJC/WUSM employees, inpatients, pre-procedural patients and symptomatic persons with high risk comorbidities will be tested internally. Tests requested on other patient populations may be sent to commercial lab vendors.

Table 1: Symptoms Compatible with COVID-19

Respiratory symptoms alone	OR at least 2 of these symptoms
• Cough • Shortness of breath • Difficulty breathing	• Fever, subjective or documented ▪ New chills ▪ Repeated shaking with chills ▪ New muscle pain ▪ New Headache ▪ New sore throat ▪ New runny nose or nasal congestion ▪ New sudden loss of taste or smell ▪ Nausea or vomiting ▪ Diarrhea ▪ Fatigue

1: Inpatients and ED Patients Being Admitted (INPATIENT TESTING)

Patients with COVID-19 compatible symptoms

- Any patient (ED, inpatient, or ambulatory) with signs/symptoms compatible with COVID-19 (Table 1) should be tested. Clinicians should use their judgement to determine whether signs/symptoms are compatible with COVID-19. Most patients with COVID-19 develop fever and/or symptoms of acute respiratory illness (e.g. cough) but some infected patients may present with other symptoms as well.
- Patients presenting in extremis and unable to obtain history should also be tested.

Patients without COVID-19 compatible symptoms

Testing asymptomatic patients can be considered in situations where there is risk to the care team or where results might change care delivery.

These include:

- Patients undergoing surgery requiring intubation or other aerosol generating procedure. Comprehensive recommendations for patients undergoing surgery or other procedures may be found in the document "BJC Guidance: COVID Testing Pre-Procedure & Procedural PPE".
- Patients requiring urgent transplants within the next 24-hours (solid organ transplant, BMT), or starting CAR-T, and leukemia induction/consolidation or other high-intensity chemotherapy
- Patients who will be treated with other severely immunosuppressive medications
- In certain instances, testing patients likely to be admitted to a semi-private room can be considered
- Patients with altered mental status in whom a reliable history cannot be obtained may also be tested

Post-Acute Discharge

Some post-acute care facilities may require a negative test prior to transfer. Testing is permissible if the facility will not otherwise accept patients ready for discharge.

Repeat Testing

As a new test that lacks a true gold standard, it is difficult to fully know test performance. A negative test in a patient with symptoms or findings compatible with COVID-19 cannot definitively rule out disease. Infectious Diseases (where available) should be contacted to discuss repeat testing. Repeat testing can be considered in patients with high clinical suspicion of having COVID-19 (e.g. Areas of high prevalence or known exposure to individual with COVID-19). An algorithm for retesting and isolation precautions for inpatients can be found in the updated Interim Infection Prevention Guidance.

In the absence of new symptoms consistent with COVID-19, an inpatient with a negative test during the admission should not have repeat testing performed prior to subsequent surgeries or procedures.

A growing body of evidence indicates that persons with COVID-19 may have intermittent or persistently positive COVID-19 RNA tests for weeks in the absence of infectious virus. Most patients are no longer shedding infectious virus 11 days after symptom onset, and rarely up to 20 days in critically ill and severely immunocompromised patients. Therefore, repeat testing is not recommended for patients who previously had a positive COVID-19 PCR. An EPIC Best Practice Advisory will alert clinicians if a COVID-19 RNA test is ordered for a patient with a prior positive test result. Additionally, a "COVID-19 Recovered" flag will appear in Epic after the COVID-19 isolation flag discontinues.

2: Healthcare Personnel who are actively/currently working in BJC/WUSM health care facilities

- Any healthcare personnel with symptoms potentially consistent with COVID-19 should be tested.
- Testing for BJC and WU employees (as well as TRISL and BJC owned Bethesda facilities) may be arranged by contacting the employee COVID call center (314-362-5050 or 314-362-5056).
- Healthcare personnel with symptoms will be screened and evaluated for testing regardless of potential exposure source (ie. testing may occur even if not clearly occupationally acquired).
- Asymptomatic healthcare personnel with known high/moderate risk exposures may sometimes also be tested in the setting of public health / outbreak investigations directed by Occupational Health.

3: Ambulatory Patients (Adult)

Patients with COVID-19 compatible symptoms

Ambulatory patients with signs/symptoms compatible with COVID-19 (see Table 1) should be tested. Clinicians should use their judgement to determine whether signs/symptoms are compatible with COVID-19.

Additional Patient Populations

- **Patients in high risk groups** (oncology patients, transplant patients, those on immunosuppressive medications) may be tested in the ambulatory setting prior to treatment. Tip Sheets detailing the process for ordering these tests may be found on the BJC COVID-19 Resources web page.

- **Asymptomatic individuals with recent known or suspected exposure**. Individuals who have had unprotected close contact with a **confirmed or probable COVID-19** patient may be tested.
    - Close contacts are defined as someone who spent more than 15 minutes within 6 feet of an infected person, starting from 2 days before illness onset (or, for asymptomatic patients, 2 days prior to specimen collection).
    - A negative test does not mean the individual will not develop an infection from the close contact or contract an infection at a later time.
    - Asymptomatic persons who have had close contact with an individual known to be COVID-19 (+) or with someone currently undergoing testing for COVID-19 should be instructed to:
        - Self-quarantine at home for a full 14 days after exposure, regardless of any test results
        - Contact their healthcare provider for further evaluation if they develop symptoms

Serological Testing

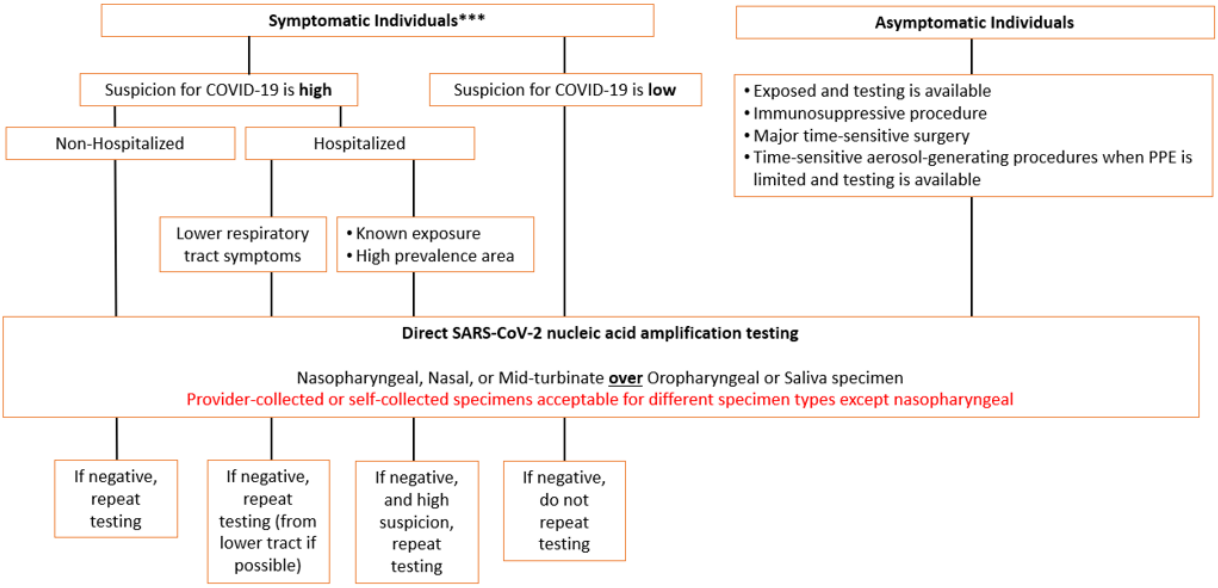
While antibody testing is available at BJC and WUSM, there is no clear clinical role for antibody testing at this time. It is not clear if antibody responses are protective or sustained. Serological tests should not be used for diagnosis of acute infections.

False positive results can occur due to past exposure to seasonal coronaviruses. Given the low prevalence of infection in the St. Louis region, the false positive rate of serological tests is expected to be substantial. False negative results can occur early in disease. Internal data from BJH testing suggests a sensitivity of <10% within 3 days of symptom onset, and <44% at <14 days. If active COVID-19 infection is suspected, PCR testing of nasopharyngeal, oropharyngeal or lower respiratory tract specimen should be ordered for COVID-19 diagnosis.

Additional information about serological testing can be found at the BJC COVID-19 Clinical Resources Testing website.

COVID-19 Decision Tree for Adult Patients

Figure 1. IDSA Algorithm for SARS-CoV-2 Nucleic Acid Testing



***Note:**

- Testing should be prioritized for symptomatic patients first.
- When resources are adequate, testing for selected asymptomatic individuals can also be considered.

Guidelines for Testing Pediatric Patients

Guidelines for Testing Pediatric Patients

Testing per this algorithm does not require Infectious Diseases approval. For discussion of situations not covered in this algorithm, please call Infectious Diseases on call. These recommendations are effective 4/17/20.

1. Patients in the ED or at an outside facility who will be admitted to St. Louis Children's Hospital (SLCH) or other inpatient facility:
    a. COVID-19 testing should be obtained for patients admitted to SLCH with respiratory symptoms of an unclear etiology or other compatible symptoms.
        i. COVID-19 compatible symptoms in pediatric patients include:
            1. Cough (50% of pediatric patients with COVID-19)
            2. Fever (40-50%)
            3. Sore throat (13-24%)
            4. Myalgias (13-23%)
            5. Shortness of breath (13-15%)
            6. Diarrhea (9-13%)
            7. Rhinorrhea and/or nasal congestion (7-31%)
            8. Vomiting (6-11%)
            9. Loss of taste or smell (6%)
            10. Chest pain (6%)
            11. Leukopenia, lymphopenia, abnormal chest x-ray findings (unknown)
    b. COVID-19 testing should be obtained in patients with a close contact (e.g., a household member) with confirmed COVID-19, or if a close contact has pending COVID-19 testing at the time of the patient's admission.
    c. COVID-19 testing should be obtained in patients who will be admitted to the Pediatric Behavioral Health Unit.
    d. COVID-19 testing should be obtained in any patient admitted from a group home or other group setting.
    e. COVID-19 testing should be obtained for most patients with a planned surgical procedure with intubation or a sedated procedure likely to involve intubation in the next 4 days (see details in the BJC system guidance regarding procedures for COVID-19 testing and PPE recommendations).
        i. For patients who are undergoing pre-operative or pre-procedural COVID-19 PCR testing, testing should ideally be performed within 4 days prior to their procedure, unless there are extenuating circumstances.
            1. Asymptomatic inpatients who have tested negative during that admission do not require repeat testing.
            2. Asymptomatic outpatients with negative screening (i.e., no close contacts with COVID-19) who have a negative COVID-19 PCR test obtained more than 4 days prior to the procedure should be discussed on a case-by-case basis with the attending

anesthesiologist and surgeon/proceduralist regarding whether repeat testing is indicated.

3. For asymptomatic patients with negative screening (i.e., no close contacts with COVID-19) who undergo multiple or regularly-scheduled sedated procedures with high risk for intubation (e.g., oncology patients undergoing weekly sedated lumbar punctures, hospitalized patients undergoing multiple operative interventions or sedated radiologic exams, etc) who have negative COVID-19 PCR testing and subsequently shelter-in-place at home or in the hospital should undergo repeat COVID-19 PCR testing once monthly (and not more frequently) for pre-procedural indications.
    a. In this scenario, for patients undergoing high-risk procedures for aerosol-generation (e.g., bronchoscopy, tracheotomy, other airway or oropharyngeal surgical procedures), pre-operative testing within 4 days prior to the procedure is recommended.
    b. In this scenario, patients with positive screening (i.e., compatible symptoms or known close contact with someone with COVID-19) are recommended to have COVID-19 testing within 4 days of their sedated procedure.

2. <u>Pediatric outpatients (includes patients who will be discharged from the ED):</u>

a. COVID-19 testing should be obtained for patients with one or more of the following symptoms compatible with COVID-19.
    i. Cough
    ii. Fever
    iii. Sore throat
    iv. Myalgias
    v. Shortness of breath
    vi. Diarrhea
    vii. Rhinorrhea and/or nasal congestion
    viii. Vomiting
    ix. Loss of taste or smell
    x. Chest pain
    xi. Leukopenia, lymphopenia, abnormal chest x-ray findings
b. COVID-19 testing should be obtained in patients instructed by their local health department to be tested.
c. Symptomatic patients who meet one of the following criteria will be tested at the WashU/IOH lab:
    i. Patients in high-risk groups (e.g., immunocompromised, hematology/oncology, infusion center, dialysis, immunology, CF, asthma, other subspecialty populations)
    ii. Patients with a household contact who is an active healthcare worker
    iii. Patients who live in a group setting or in homeless shelters

d. Asymptomatic patients instructed to be tested by the health department and symptomatic patients who do not meet one of the above additional criteria will be tested at a send out lab (e.g., Quest or Labcorp) with approximately a 3 day turnaround time.

Home Isolation Guidance

For Individuals with Confirmed or Suspected COVID-19:
The CDC has provided the following guidance for symptom-based strategy for discontinuation of isolation.

Individuals with symptoms consistent with COVID-19 and who were directed to care for themselves at home may discontinue isolation when released by their local health department; patients can call the health department for instructions if they have not heard from them. Usually the health department will approve release under the following conditions:

- You have been fever-free for at least 72 hours (without the use of fever reducing medicine such as Tylenol) **AND**
- Other symptoms have improved (for example, when cough or shortness of breath have improved) **AND**
- At least 10 days have passed since symptoms first appeared

For individuals who did not have symptoms but had a laboratory confirmed COVID-19 test, the CDC recommends the following time-based strategy for discontinuation of isolation:

- 10 days have passed since the date of their first positive COVID-19 diagnostic test, assuming they have not subsequently developed symptoms since their positive test.

References:

[1] IDSA Guidelines on the Diagnosis of COVID-19. https://www.idsociety.org/practice-guideline/covid-19-guideline-diagnostics/. Updated 5/6/20 (Accessed 6/17/20)

[2]MO DHSS. COVID-*19 PCR Testing Update from Missouri DHSS.* https://health.mo.gov/living/healthcondiseases/communicable/novel-coronavirus/pdf/mo-pcr-testing-update-providers.pdf. Updated 3/23/2020. (Accessed 3/24/2020)

[3]CDC. *Overview of Testing for SARS-CoV-2*. https://www.cdc.gov/coronavirus/2019-ncov/hcp/testing-overview.html. Updated 6/13/2020. (Accessed 6/16/2020)

Appendix: Specimen Collection Types

Acceptable specimen collection containers for respiratory pathogen testing:

Flexible Minitip ESwab (Blue cap)	Minitip ESwab (Green cap)	Flexible minitip swab with Universal Transport Media/UTM (Red cap)
Available Tests:	**Body Site**	
Respiratory Pathogen Panel (RPP, RVP, Biofire)	NP swab	
Influenza/RSV PCR	NP swab	
COVID-19 PCR	NP swab	

ESwab Transport System (Regular flocked swab)	
Available Test:	**Body Site**
COVID-19 PCR	Oropharyngeal (Throat) swab

Credit: Melanie Yarbrough, BJH Department of Laboratories