

Respiratory Pathogen Testing

This information sheet accompanies [this respiratory pathogen testing flowchart](#) created by the Antimicrobial Stewardship teams at Tufts Medical Center, Lowell General Hospital and Melrose Wakefield Hospital.

It is very important that a nasopharyngeal swab is performed correctly, as sensitivity can be limited by inadequate sample collection.

Stewarding the Resource

Like any medical test, respiratory pathogen tests are a resource that should be utilized only when their results will impact management. Like many such resources, they are overused, particularly in the wake of the global pandemic where both healthcare professionals and the general public became accustomed to frequent testing.

Overuse of respiratory pathogen testing results in unnecessary costs to patients (outpatients) and to our hospitals (inpatients) and drives up healthcare costs in general. When performed in the setting of low levels of circulation in the community, the risk of a false positive increases, and with it the risk of inappropriate management.

Single and Multiplex Tests

Complicating respiratory virus testing is the fact that some tests are available as a single pathogen assay, others come bundled with 2-4 viruses in a single kit, and still others contain over 20 target pathogens in a single panel. Depending on the site in which you work, you may or may not be able to order tests for specific pathogens individually. When possible, limiting your order to the smallest possible number of tests is advised.

Approach to Adults Versus Children

In children less than 5 years of age, but especially those less than 2 years old, RSV testing can help to determine the need for hospital admission when a child is very sick. Because it has a somewhat predictable time course in this age group, RSV testing can help to determine whether a child who looks sick is likely to improve or worsen in the next 24 hours. On the other hand, even though RSV can cause severe disease in adults, especially those who are older, because there is no specific treatment available, testing is rarely indicated.

Importance of Local Epidemiology

Influenza and RSV are seasonal viruses. It is important to consider whether these viruses are circulating in the community prior to ordering tests for them. When prevalence of a pathogen is low, positive predictive value is low, and the likelihood that a positive test represents a false

positive increases. The Massachusetts Department of Public Health [maintains a dashboard](#), updated weekly on Thursdays, where you can follow the prevalence of seasonal viruses.

Considerations Specific to Testing for SARS CoV-2

Because the Centers for Disease Control and Prevention (CDC) [recommends isolation](#) for everyone with a diagnosis of COVID-19 (5 days at home then 5 days with a mask), testing is recommended for everyone with even mild symptoms. For those with [risk factors for progression to severe disease](#), it is especially important to test early in the course of illness (requesting a STAT result), because antiviral therapy such as Paxlovid is most effective when given as early as possible and should be given within the specified time frame (5 days for Paxlovid and Molnupiravir, 7 days for Remdesivir).

Considerations Specific to Testing for Influenza

The CDC recommends testing for influenza in limited circumstances. Testing should be conducted (and ordered STAT) for patients who qualify for treatment with an antiviral. This includes those with severe disease (i.e. those being hospitalized), and those with risk factors for progression to severe disease (e.g. age 65 and older, asthma, heart disease, stroke, diabetes, chronic kidney disease, pregnancy). See the [full list of risk factors](#) on the CDC web site. To be effective, treatment for influenza should be started within 72 hours of symptom onset and ideally sooner. In addition, there are epidemiologic indications for testing, such as for an outbreak investigation, before sending a patient back to a congregate setting, or when a high-risk close contact would be given post-exposure prophylaxis.

Considerations specific to testing using the Biofire® respiratory pathogen panel

The Biofire® respiratory pathogen panel is an expensive multiplex panel that includes 22 target pathogens listed below. Note that this test includes influenza and RSV. When performed by Labcorp, SARS Cov-2 is also included. When performed at Tufts Medical Center, SARS COV-2 is not included. At MelroseWakefield, the panel can only be ordered by an Infectious Disease physician. The panel is only indicated in patients who are critically ill and not improving at least 48 hours of admission, and for immunocompromised outpatients not improving after 48 hours of symptoms. This panel also includes atypical targets such as *Bordetella pertussis* and *Mycoplasma pneumoniae* which can aid in the diagnosis of atypical pneumonia.

VIRUSES:

- Adenovirus
- Coronavirus 229E
- Coronavirus HKU1
- Coronavirus NL63
- Coronavirus OC43
- **Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)**
- Human Metapneumovirus
- Human Rhinovirus/Enterovirus
- Influenza A virus
- Influenza A virus A/H1
- Influenza A virus A/H3
- Influenza A virus A/H1-2009
- Influenza B virus
- Parainfluenza virus 1
- Parainfluenza virus 2
- Parainfluenza virus 3
- Parainfluenza virus 4
- Respiratory syncytial virus

BACTERIA:

- *Bordetella parapertussis*
- *Bordetella pertussis*
- *Chlamydia pneumoniae*
- *Mycoplasma pneumoniae*