In the United States, respiratory virus season usually begins in October and lasts through April, although regional variation does occur. During these months, a number of different viruses are responsible for respiratory disease. The most important of these are influenza and respiratory syncytial virus (RSV), but others such as parainfluenza, rhinovirus, adenovirus and human metapneumovirus can also cause significant disease. In general, these viruses cause a clinical syndrome termed “influenza-like illness” due to overlapping clinical signs and symptoms (fever, cough, headache, sore throat, runny nose, fatigue, possibly muscle aches).

Clinical signs and symptoms of influenza-like illness vary by person, ranging from asymptomatic carriage to severe disease requiring hospitalization. These respiratory viruses are easily spread throughout the community and health care environment and contribute greatly to the morbidity and mortality of the population. As such, the laboratory plays a crucial role in facilitating an accurate diagnosis. In this regard, most laboratories rely upon so-called “rapid antigen tests” to diagnose the most common viruses – influenza and RSV. However, rapid antigen tests are unreliable (false negative test results can exceed 40 percent). False negative test results lead to adverse outcomes, including inappropriate use of antibacterial antibiotics, inability to institute proper infection control measures, and the spread of disease throughout health care facilities and the community.

Beaumont Laboratory uses a FDA-approved nucleic acid amplification test (NAAT) to simultaneously detect and differentiate influenza A, influenza B and RSV from nasopharyngeal swab specimens. NAATs provide the most accurate test results with a false negative rate of 3 percent or less.

**Clinical indicators: influenza and/or RSV infection**

| Symptoms: | Influenza-like illness (abrupt onset of fever, chills, headache, myalgia, sore throat, cough, fatigue). Other symptoms include bronchiolitis, tracheobronchitis, croup. |
| Incubation: | Range (1 to 5 days). Patients are infectious approximately one day before the onset of symptoms and for up to a week thereafter. Infants may shed virus for longer periods of time. |

**Adults**

- **Influenza infection:** primary cause of upper respiratory tract infection during respiratory virus season. The infection is usually self-limiting and resolves within a week.
- **RSV infection:** A common cause of upper and lower respiratory tract infection and a common cause of asthma and COPD exacerbation.

**Children**

- **Influenza infection:** primary cause of upper respiratory tract infection during respiratory virus season. Infection can be very dangerous for non-immunized children.
- **RSV infection:** primary cause of lower respiratory tract infection in children less than 2 years of age. Common cause of upper and lower respiratory tract infection in older children. A common cause of asthma exacerbation.

**Elderly and immunocompromised**

- **Influenza and RSV infection:** these patient populations are extremely vulnerable. Infections tend to be severe, requiring hospitalization due to complications such as pneumonia, polyneuritis, myositis, cardiomyopathy and encephalopathy. Reye’s syndrome may also occur after influenza infection.

Principle of the test

Beaumont Laboratory uses a highly sensitive, FDA-approved nucleic acid amplification test (NAAT) to simultaneously detect and differentiate influenza A, influenza B and respiratory syncytial virus (RSV) from nasopharyngeal swab specimens. Nucleic acid amplification is the optimal diagnostic testing modality for detection of these respiratory viruses. Rapid antigen testing is no longer recommended due to sub-optimal test sensitivity (i.e. a high false negative test result rate).

Beaumont Laboratory is committed to providing the most accurate diagnostic testing strategies for respiratory viruses. Use of NAAT will enhance detection of these respiratory viruses, which leads to optimal patient care, proper initiation of infection control measures and proper utilization of antiviral antibiotic therapy.

Specimen collection:

Nasopharyngeal (NP) swabs should be maintained in the nasopharynx for 30 seconds and gently rotated to obtain optimal diagnostic material.

NP swabs (rayon, Dacron, flocked) must be placed into viral transport medium (universal transport media [UTM], universal viral transport [UVT]) and refrigerated (2-8°C or 36-46°F).

Rejection criteria:
- Bloody specimens
- Samples in bacterial transport systems
- Specimens on dry swabs
- Specimens submitted on cotton or calcium alginate swabs, or on wooden shaft

Test Code: FLRSV

Specimen storage:

Transport specimen to the Clinical Microbiology Laboratory as soon as possible. Store refrigerated (2-8°C or 36-46°F).

DO NOT FREEZE SPECIMENS

<table>
<thead>
<tr>
<th></th>
<th>Detects</th>
<th>Sensitivity</th>
<th>Specificity</th>
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</thead>
<tbody>
<tr>
<td>Rapid Influenza and</td>
<td>Influenza A</td>
<td>&gt;97%</td>
<td>&gt;98%</td>
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<tr>
<td>RSV by PCR</td>
<td>Influenza B</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>RSV</td>
<td></td>
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<tr>
<td>Rapid Antigen Test</td>
<td>Influenza A/B</td>
<td>50-80%</td>
<td>&gt;98%</td>
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<tr>
<td></td>
<td>RSV</td>
<td>70-90%</td>
<td>&gt;98%</td>
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</table>

Beaumont Laboratory testing recommendations

Testing desired?  Yes

Focused or expanded pathogen detection desired?

Positive

1. No further action.
2. Molecular subtyping for influenza A not needed at this time.
3. Seasonal influenza A H3, seasonal influenza B and influenza A nH1N1 (2009) are sensitive to oseltamivir (Tamiflu) and zanamivir (Relenza).

Is another test needed to exclude other viral respiratory pathogens?

No

Rapid influenza and RSV by PCR

Negative

No further action

Expanded (routine only)

Focused (routine or STAT)

Order:

respiratory viral panel by PCR (NP specimens)
or
culture, virus (NP or non-NP specimens)

Special note:
1. Rapid antigen tests for influenza and RSV are highly discouraged due to sub-optimal diagnostic sensitivity.
2. The best first-line test for influenza and RSV detection is the rapid influenza and RSV by PCR test.

Effective: Jan. 2, 2013

- Sunday through Saturday, 24 hours a day
- Results available the same day
- Results available within 2 hours from receipt in the laboratory if ordered STAT

Treatment guidelines and additional information

Please refer to the following sources provided by the Centers for Disease Control and Prevention (CDC):
1. Influenza – http://www.cdc.gov/flu/
2. RSV – http://www.cdc.gov/rsv/

For more information or questions about Influenza, RSV and/or other respiratory virus, please contact Bobby Boyanton, M.D., Barbara Robinson-Dunn, Ph.D., D(ABMM), or a Client Service Agent at 800-551-0488.