

New Multiplex PCR Assay for Detection of Influenza A/B and RSV Viruses Being Performed at Wellspan Health System Laboratories

Effective October 9, 2017, the Wellspan Laboratories at Ephrata Community Hospital, Gettysburg Hospital, and Good Samaritan Hospital will be performing a multiplex Polymerase Chain Reaction (PCR) assay (Cepheid Xpert® Xpress FLU/RSV) for the rapid and reliable detection of influenza A, influenza B, and respiratory syncytial virus (RSV) directly from nasopharyngeal swab specimens. A Respiratory Virus Panel (17 viruses and 4 bacteria) is also available, and will be performed at York Hospital. This panel includes: adenovirus; *Bordetella pertussis* and *Bordetella parapertussis*; *Chlamydia pneumoniae*; coronavirus types 229E, HKU1, NL63, OC43; influenza A with seasonal H1, H3 and H1N1 2009; influenza B; metapneumovirus; *Mycoplasma pneumoniae*; parainfluenza types 1, 2, 3, 4; rhinovirus/enterovirus; and RSV. This confirmatory PCR test (sensitivity approaching 100%) will be performed 24 hours per day, seven days per week and will be replacing previously used, less sensitive rapid antigen enzyme immunoassay (EIA) methods (sensitivity 60-70%).

Background and Clinical Significance

Human respiratory infections may be caused by a wide variety of microbial pathogens including bacteria, fungi, viruses, and even some parasitic worms. Among the viruses, influenza virus and respiratory syncytial virus (RSV) are two common causes of pulmonary infection, causing disease in all patient age groups especially during the winter months. Early diagnosis of these infections is often necessary to insure the prompt administration of antiviral therapy and/or to institute appropriate infection control measures in hospitalized or nursing home patients to minimize the risk of disease transmission. The PCR test will be particularly useful with emergency department and hospitalized patients.

Influenza viruses are classified into types A, B, and C, of which the former two cause most human infections. Influenza A is the most common type of influenza infection in humans, and is generally responsible for seasonal flu epidemics and occasionally for pandemics. Influenza A viruses can also infect animals such as birds, pigs, and horses. Infections with influenza B virus are generally restricted to humans and are less frequent causes of epidemics. Symptoms commonly include fever, chills, headache, muscle aches, malaise, cough, and sinus congestion. Gastrointestinal symptoms (i.e., nausea, vomiting, or diarrhea) may also occur, primarily in children, but are less common in adults. Symptoms generally appear within two days of exposure to an infected person. Pneumonia may develop as a complication of influenza infection, causing increased morbidity and mortality in pediatric, elderly, and immunocompromised populations.

Respiratory syncytial virus (RSV), a member of the Paramyxoviridae family consisting of two subgroups (subgroups A and B), is also the cause of a contagious disease that afflicts primarily infants and the elderly who are immunocompromised, e.g., patients with chronic lung or heart disease or undergoing treatment for conditions that reduce the

strength of their immune system. The virus can live for hours on countertops and toys and causes both upper respiratory infections, such as tracheobronchitis, and lower respiratory infections manifesting as bronchiolitis and pneumonia. By the age of two, most children have already been infected with RSV, but because only weak immunity develops following infection, both children and adults can become reinfected. Symptoms usually appear four to six days after exposure to infection. The disease is typically self-limiting, lasting about one to two weeks in infants. In adults, the infection lasts about five days and presents with symptoms consistent with a cold, such as rhinorrhea, fatigue, headache, and fever. The RSV season overlaps with influenza season somewhat as infections begin to rise during the fall and continues through early spring.

During the viral respiratory season, it is often difficult to determine whether a pulmonary infection is caused by influenza or RSV since they may present with similar clinical symptoms.

Test: Influenza AB w RSV

Alternate Names: INFL RSV PCR, Influenza AB w RSV, RSV with influenza A and B by RT PCR

Includes: INF RSV PCR

Method: Multiplex Real-Time PCR

Specimen Requirement: Nasopharyngeal swab specimens collected on Dacron or flocked swabs in Universal Transport Medium (UTM)

Unacceptable Specimens: Any swab other than Dacron or flocked swabs and any transport medium other than UTM

Storage and Transport: Specimens should be transported at 2-8°C. Specimens placed in transport medium following collection can be stored for up to 24 hours at 2-30°C or up to seven days at 2-8°C prior to testing with the Cepheid Xpert® Xpress FLU/RSV

Schedule of Testing: Daily, 24 hours per day

CPT Code: 87631

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References

1. CDC Guidance for Clinicians on the Use of RT-PCR and Other Molecular Assays for Diagnosis of Influenza Virus Infections. <https://www.cdc.gov/flu/professionals/diagnosis/molecular-assays.htm> (accessed September 2017).