

*Respiratory Viral Panel
(RVP)*

SPOT ON
Genetic Testing



RVP (Respiratory Viral Panel)

- Respiratory viruses cause acute, local and systemic illness that range in severity. The detection and identification of specific viral nucleic acids from individuals exhibiting signs and symptoms of respiratory infection aids in the diagnosis of respiratory viral infection.
- This panel detects 25 common respiratory viruses: of **Influenza virus, Types A, H1N1(Swine), and B; Human Parainfluenza Viruses, types 1,2,3,& 4; Rhinoviruses A & B; Enterovirus, types A,B,C & D; Coronavirus HKU1, OC43, NL63, and 229E; Adenoviruses A, B,C & E; Human Metapneumovirus A & B; and Human Respiratory Syncytial Virus, types A & B.**

RSV (Respiratory Syncytial Virus)

- The most common cause of bronchiolitis, inflammation of the small airways in the lung, and pneumonia, infection of the lungs in children under one year of age in the U.S.
- Infection usually occurs within communities during the fall, winter and spring, with the infectious stage lasting from 3-8 days. Typically, it produces cold-like symptoms that tend to be mild in most of the population, however, it can be serious in immunocompromised adults and children, or in adults and children with underlying lung and heart disease (cdc.gov, 2018).

Human Parainfluenza Virus (HPIV)

- Parainfluenza viral infections cause both lower and upper respiratory tract disease in all age groups. It typically has an incubation time of 2-7 days and is spread by contact from an infected person through airborne means such as sneezing and coughing, or personal contact with an infected person or infected surface.
- There are four types of HPIV, types 1, 2, 3 & 4. Types 1 and 2 most often cause croup in young children, with Type 1 most prevalent in the fall of odd-numbered

years and Type 2 occurring each fall. Type 3 occurs in the spring and summer

months each year and is most commonly associated with bronchiolitis, bronchitis, and pneumonia. Type 4 does not typically exhibit established seasonal patterns and causes mild to severe respiratory illness (cdc.gov, 2017).

Influenza

- Influenza viral infections cause respiratory infections in all age groups predominately in fall and winter months, with the peak activity occurring between December –February each year.
- Infected persons are most contagious with the first 3-4 days after symptoms appear. The illness is mostly mild, but can be severe and even cause death in immunocompromised persons of all ages and in populations of young children and the elderly.
- Influenza A viruses are divided into subtypes based upon two proteins on the surface of the virus, hemagglutinin, or H protein, and neuraminidase, or N protein. There are 18 different hemagglutinin subtypes and 11 neuraminidase subtypes, classified as H1-H18, and N1-N11, respectively.
- Current subtypes, or strains of Influenza A include H1N1 and H3N2. Influenza B viruses do not have subtypes, but are classified according to two lineages, as either B/Yamagata, or B/Victoria strains (cdc.gov, 2018).

Adenovirus

- Adenoviruses are DNA viruses that cause acute respiratory infection, pneumonia, conjunctivitis, cystitis, and gastroenteritis in all ages groups among human populations, however, the population with the greatest susceptibility of acquiring these infections are in the age group between 2-6 years of age.
- Highly contagious and spread by contact by respiratory or ocular secretions, adenoviral infections usually are found in day-care centers, military bases and schools.

- There are 47 human adenovirus types that are classified, however, five types are studied and they are identified as A, B, C, D & E (Doerfler, 1996).

Human Metapneumovirus

- Human metapneumovirus was discovered in 2001 and is the causative agent of respiratory tract infections which contribute to morbidity and mortality worldwide, particularly children under the age of 5 years old. In adults, the yearly incidence in adults was determined to be 4-11%, mostly in late winter and early spring.
- Two genetic lineages are characterized in humans, and are denoted as A and B. HMPV infections typically occur throughout the year. The first infection typically occurs in children at 6 months of age, and may reoccur thereafter.
- Upper respiratory tract infections are characterized by a runny nose, cough, fever and otitis media. Lower respiratory tract infections are typified by bronchiolitis, pneumonia, croup, and can exacerbate asthma. Any type of pre-existing condition such as COPD, cancer, or lung disease can increase the severity of symptoms; for instance, many children and elderly adults are hospitalized due to these conditions.
- In addition, coinfection with other viruses, such as RSV, is likely to be observed (Schildgen, et al, 2011).

Rhinovirus

- Rhinovirus is most associated with common cold illnesses and occurs in all age groups around the world, with the highest incidence in early fall, from September – November and in spring, from March – May.
- It is the causative agent of both upper and lower respiratory tract illnesses, and similar to other viral infections, it produces more severe symptoms in children with pre-existing conditions such as asthma and cystic fibrosis, as well as adults with chronic bronchitis. It typically occurs in combination with bacterial

pathogens such as *Streptococcus pneumoniae* which can lead to superinfections (Turner, 2007).

- Most incidents of rhinovirus infection are characterized by symptoms which resolve in one week in healthy children and adults.

Enterovirus

- Enteroviruses are classified as RNA picornaviruses, pico meaning small. They include Coxsackieviruses, Echoviruses, Enteroviruses, and Polioviruses.
- Enterovirus infections usually occur in the United States in summer and fall and affect all age groups. The viral particles are shed in respiratory secretions, and stool, and as such are transmitted by direct contact.
- In addition, the virus may be found in the blood and CSF of infected individuals. Most infections are benign. However, neonatal infection can lead to sepsis, fever, lethargy, DIC, and multiple organ failure, resulting in death (Tesini, 2019).

Coronavirus

- Human coronaviruses cause mild to moderate upper respiratory infections in people of all ages around the world, however, they are typically prevalent in young children.
- In the United States, infection usually occurs in the fall and winter months. Symptoms typically include runny nose, headache, cough, sore throat and fever, lasting a short duration.
- There are four common coronaviruses: 229E, NL63, OC43, and HKU1. Recently, two new strains were discovered, SARS-Cov(Severe Acute Respiratory Syndrome), which occurred in China in 2004 and MERS-Cov(Middle Eastern Respiratory Syndrome) which occurs predominately in the Arabian peninsula.
- Transmission of human coronaviruses is by aerosol droplets and personal contact with an infected person or through infected surfaces. As in the case of other viral infections, persons with weakened immune systems, infants, and older adults with

preexisting conditions are more likely to exhibit pneumonia and/or bronchitis (cdc.gov, 2017)

Specimen Collection: Nasopharyngeal swab or aspirate in Viral Transport Media, ex. (Puritan). Transport on ice.

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