COVID-19 SIGNS AND SYMPTOMS, REINFECTION, VARIANTS AND VACCINES

All Changes Highlighted in Bronze

This document provides the NHTI college community current information on COVID-19 signs and symptoms, reinfection, variants and vaccinations.

COVID-19 caused by the virus SARS-CoV-2 continues to be studied to better understand how it is transmitted, its short and long term effects, how it evolves into new variants and the effectiveness of vaccinations. The body of scientific knowledge, medical treatment for, and the epidemiologic understanding of the virus changes rapidly and this guidance will update as new information becomes available.

What is Coronavirus (COVID-19)

COVID-19 is a contagious respiratory illness that is caused by infection with a new coronavirus called SARS-CoV-2.

How the Virus (SARS-CoV-2) that Causes COVID-19 Spreads

COVID-19 spreads when an infected person breathes out droplets and very small particles that contain the virus. These droplets and particles can be breathed in by other people or land on their eyes, noses, or mouth. In some circumstances, they may contaminate surfaces they touch.

People who are closer than six (6) feet and while not taking other mitigation measures (i.e. wearing a face mask) are at highest risk for developing COVID-19 infection. In general, the more closely a person interacts with others and the longer that interaction, the higher the risk of contracting COVID-19.

The NH Department of Health and Human Services defines close contact exposure as:

- When people are within six (6) feet a COVID-19 positive person for a cumulative time period of 10 minutes or greater during the infectious period. Infection period is up to sixteen (16) days.
- When a person is coughed or sneezed upon, or otherwise has direct physical contact with a COVID-19 positive person.

COVID-19 is spread in three main ways:

- Breathing in air (airborne transmission) when close to an infected person who is exhaling small droplets and aerosolized particles that contain the virus.
- Having these small droplets and aerosolized particles that contain virus land on the eyes, nose, or mouth, especially through splashes and sprays like a cough or sneeze.
- Touching eyes, nose, or mouth with hands that have the virus on them.

Airborne Transmission

Studies have shown that airborne transmission can occur in certain settings as a persons respiratory droplets can remain suspended in the air for periods of time, depending on the circumstances, after a person has been in the area.

COVID-19 risk of infection for airborne transmission is increased significantly in the following circumstances:
• Indoor spaces with inadequate ventilation or air handling where the concentration of exhaled respiratory fluids, especially very fine droplets and aerosol particles, can build-up in the air space.
• Increased exhalation of respiratory fluids if the infectious person is engaged in physical exertion or raises their voice (e.g., exercising, shouting, singing).
• Prolonged exposure to these conditions, typically more than ten (10) minutes.
• Rooms where aerosol generating procedures are occurring.

**Contaminated Surfaces**

COVID-19 can be transmitted by touching a surface or object that has the virus on it and then touching ones’ own mouth, nose, or eyes. This is considered a low risk way in which infection from COVID-19 can occur.

**COVID-19 and Animals**

COVID-19 can spread from **people to animals** in some situations. Pet cats and dogs can sometimes become infected after close contact with people with COVID-19. Based on current information, the risk of animals spreading COVID-19 to people is considered to be low. For information see [COVID-19 and Pets](#).

**COVID-19 Symptoms, MIS-C, MIS-A and COVID-19 Long Term Effects**

**Coronavirus (COVID-19)**

**Common Symptoms**

People with COVID-19 have had a wide range of symptoms reported from mild symptoms to severe illness. Symptoms may appear **2-14 days after exposure to the virus**. People with these symptoms may have COVID-19. Common symptoms include:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea
- New loss of taste or smell

**Emergency Symptoms**

The following are COVID-19 emergency symptoms. Seek emergency medical care immediately if you have any of the following symptoms:

- Trouble breathing
- Persistent pain or pressure in the chest
- Pale, gray, or blue colored skin, lips or nail beds, depending on skin tone.
- Inability to wake or stay awake
- New confusion

These are not a list of all possible COVID-19 symptoms. For more information see [COVID-19 symptoms](#).

**Long Term Effects of COVID-19**

Most people with COVID-19 get better within weeks of illness, however, some people experience post-COVID conditions. Post-COVID conditions are a wide range of new, returning, or ongoing health problems people can experience **more than four weeks** after first being infected with the virus that causes COVID-19.
Even people who did not have symptoms (asymptomatic) when they were infected can have post-COVID conditions. These conditions can have different types and combinations of health problems for different lengths of time.

**Long COVID**

Long COVID is a range of symptoms that can last weeks or months after first being infected with COVID-19 or can appear weeks after infection. Long COVID can happen to anyone who has had COVID-19, even if the illness was mild, or they had no symptoms. It is estimated that approximately 10 percent of persons who contract COVID-19 will develop long COVID.

People with long COVID report experiencing different combinations of the following symptoms:

- Tiredness or fatigue
- Difficulty thinking or concentrating (sometimes referred to as “brain fog”)
- Headache
- Loss of smell or taste
- Dizziness on standing
- Fast-beating or pounding heart (also known as heart palpitations)
- Difficulty breathing or shortness of breath
- Symptoms that get worse after physical or mental activities
- Depression or anxiety
- Fever
- Chest pain
- Cough
- Joint or muscle pain

**Multisystem Inflammatory Syndrome in Children (MIS-C)**

Multisystem inflammatory syndrome in children (MIS-C) impacts children from birth through to age twenty and is a condition where different body parts can become inflamed. It is rare, however, it has been linked to COVID-19. For a list of the signs and symptoms please click here.

**Multisystem Inflammatory Syndrome in Adults (MIS-A)**

Multisystem inflammatory syndrome in children (MIS-A) impacts adults and is a condition where different body parts can become inflamed. It is rare, however, it has been linked to COVID-19. For a list of the signs and symptoms please click here.

**Reinfection with COVID-19**

Current research supports that antibody immunity occurs for persons who have had COVID-19. Reinfection may occur 90 days after initial symptom onset or a positive test result. However, reinfection can occur sooner and must be evaluated by a healthcare professional in a clinical setting to determine if testing is needed if a person has any COVID-19 symptoms within the 90 days. Several of the identified Variants of Concern also pose an increased risk of reinfection from previous types/variants of COVID-19.

**COVID-19 Variants**

There are several emerging variants of the SARS-CoV-2 virus globally, including within the United States. These variants are being studied for their effects on transmissibility, effects on persons with prior infection, severity of illness, lethality, impact on treatments and current vaccinations.

The United States Department of Health and Human Services developed a classification process for “...the rapid characterization of emerging variants and actively monitors their potential impact on critical SARS-CoV-2 countermeasures, including vaccines, therapeutic, and diagnostics.”
The three classifications are: Variant of Interest (VOI), Variant of Concern (VOC) and Variant of High Consequence (VHC).

**Variant of Interest**
A variant of Interest has specific genetic markers that have been associated with changes to receptor binding, reduced neutralization by antibodies generated against previous infection or vaccination, reduced efficacy of treatments, potential diagnostic impact, or predicted increase in transmissibility or disease severity.

**Variant of Concern**
A variant of concern has evidence of an increase in transmissibility, more severe disease (increased hospitalizations or deaths), significant reduction in neutralization by antibodies generated during previous infection or vaccination, reduced effectiveness of treatments or vaccines, or diagnostic detection failures.

Possible attributes of a variant of concern:

**Variant of High Consequence**
A variant of high consequence has clear evidence that prevention measures or medical countermeasures (MCMs) have significantly reduced effectiveness relative to previously circulating variants. Possible attributes of a variant of high consequence:

**Variants Currently Circulating in The United States**
There are currently eight Variants of Interest and five Variants of Concern identified and circulating in the United States. There are no identified Variants of High Consequence Identified.

the Brazilian (P.1) and the California (B.1.427) have been identified in cases in New Hampshire.

**CDC Variants of Interest**
Due to the significant increased number of Variants of Interest circulating in the United States they will no longer be listed in this document. For information on the Variants of Interest and their specific attributes please see [Variants of Interest](#).

**CDC Variants of Concern**

**Alpha - United Kingdom (B.1.1.7)**
- Accounts for a majority of COVID-19 cases in the United States. Accounts for about 20% of cases in New Hampshire
- ~50% increased transmission
- Potential increased severity based on hospitalizations and case fatality rates
- No impact on susceptibility to EUA monoclonal antibody treatments
- Minimal impact for reduced antibody neutralization for prior COVID-19 infection/vaccination efficacy.

**Beta - South Africa (B.1.351)**
- ~50% increased transmission
- Significant decrease on current monoclonal antibody treatments
- Reduced antibody neutralization for prior COVID-19

**Epsilon - California (B.1.427)**
- ~20% increased transmissibility
- Modest decrease in effectiveness of some, but not all, Emergency Use Authorized therapeutics
• Reduced impact for reduced antibody neutralization for prior COVID-19

**Epsilon - California (B.1.429)**
• ~20% increased transmissibility
• Modest decrease in effectiveness of some, but not all, Emergency Use Authorized therapeutics
• Reduced impact for reduced antibody neutralization for prior COVID-19

**Gamma - Japan/Brazil (P.1)**
• Significant negative impact on current monoclonal antibody treatments
• Reduced effectiveness of antibody neutralization for prior COVID-19

Please see [COVID-19 variants](#) for more information.

## COVID-19 Vaccinations

There are three (3) COVID-19 vaccinations that have received Federal Drug Administration Emergency Use Authorization (EUA). All of these vaccines through clinical trials are considered both safe and effective.

All these vaccines are relatively new and there are multiple ongoing studies on potential for transmissibility and level of transmissibility of COVID-19 by vaccinated person, short and long term side effects, real world effectiveness against COVID-19, levels of effectiveness for particular groups of people (i.e. immunocompromised persons, older populations, persons who are taking certain immunosuppressant medications and/or have high risk factors, etc.) and variants, how long they remain effective to determine the need for/ timeline for booster doses and at preventing severe illness, hospitalizations and death.

The three EUA approved vaccines are:

**Pfizer-BioNTech**
• mRNA vaccine - Teach our cells how to make a protein—or even just a piece of a protein—that triggers an immune response inside our bodies.
• Two shots, 21 days apart
• Full immunity: More than 14 days after second shot
• Approved for persons 12 years of age and older
• Recent real world studies are showing an efficacy rate at preventing mild illness of approximately 90% – 94%. A recent real world study shows this efficacy is reduced to about 75% with the South African variant.
• Over 95% effective in preventing severe illness, hospitalizations and death across COVID-19 and all variants.

**Moderna**
• mRNA vaccine - Teach our cells how to make a protein—or even just a piece of a protein—that triggers an immune response inside our bodies.
• Two shots
• 28 days apart
• Full immunity: More than 14 days after second shot
• Approved for persons 18 years of age and older
• Recent real world studies are showing an efficacy rate at preventing mild illness of approximately 90% – 94%. South African Variant has shown to reduce effectiveness of current vaccine to approximately 75% (still highly effective) and a booster shot is undergoing clinical trials.
• Over 95% effective in preventing severe illness, hospitalizations and death across COVID-19 and all variants.
**Johnsons & Johnson/Janssen**

- **Viral Vector** - Use a modified version of a different virus (the vector) to deliver important instructions to our cells
- **One shot**
- **Full immunity** - More than 14 days after second shot
- **Approved for persons 18 years of age and older**
- **Recent studies are showing an efficacy rate at preventing moderate to severe illness of approximately 67% and 100% effective at preventing death.**

**COVID-19 Vaccine Breakthrough Cases**

No vaccine is 100% effective and “breakthrough” or infection after full vaccination are expected to occur. Breakthrough cases are being monitored at a state and federal level. There have been breakthrough cases where a persons tested positive after being fully vaccinated. Currently detected numbers are relatively low based on the numbers of persons who are currently vaccinated. **If you are fully vaccinated and develop COVID-19 symptoms or test positive for COVID-19 you are required to isolate to prevent potential for spread of COVID-19.** For more information on NHTI Reporting COVID-19 cases, contact and post-vaccine illness procedures see the NHTI websites [NHTI COVID-19 page](#).

**CDC Vaccine Information Link**

Please see the [CDC website vaccine page](https://www.cdc.gov/vaccines/) for COVID-19 vaccine information.

**New Hampshire Vaccine Information**

Please see the [New Hampshire Vaccine Webpage](https://www.health.nh.gov/) for information on eligibility and registration. New Hampshire residents 12 and older will be eligible to register for a COVID-19 vaccination.

**Campus Community Expectations and Other Information**

Everyone has a role to play in slowing the spread and protecting themselves, their family, and their community. COVID-19 is not limited to the NHTI campus and there is the expectation that employees and students practice public health measures while on and off campus.

For information on all NHTI COVID-19 policies please refer to the [NHTI website COVID-19 page](https://www.nhti.edu/coronavirus/). For additional information on how COVID-19 spreads, how to protect yourself and other information please see the [CDC website](https://www.cdc.gov/).

If you have additional questions contact the NHTI Campus Safety Department at [mailto:nhticampussafety@ccsnh.edu](mailto:nhticampussafety@ccsnh.edu)

All information in this document was obtained from the CDC and the New Hampshire Department of Health and Human Services websites.

*Updated: June 8, 2021*