Cold and Flu Prevention and Treatment Guide

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HPRB 5410W Technical Manual

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Introduction

Background and Overview

This technical manual will focus on areas regarding the cold and flu such as the causes, symptoms, testing, medical care (doctor visits), treatments and medications, and prevention methods associated with them. It will provide valuable information in preventing and treating the cold and flu. The cold and flu are both classified as respiratory illnesses however they are two different sicknesses.[1] The cold is not as intense as the flu as the flu can result in pneumonia, bacteria infections, and more.[1] They do share similar symptoms making the two hard to distinguish from each other but typically the severity of the symptoms helps to determine which illness is present.

Audience & Utilizing the Manual

Individuals aged 18 years or older are the primary audience for this technical manual. The reason for selecting this age is because this is the age where most individuals are able to make decisions about their health care on their own without any additional consent. Additionally, this technical manual does apply to children but the concepts mentioned throughout

the technical manual such as vaccinations, proper hygiene, administering medications, and more should be implemented by parents or legal guardians of the minor. The goal is to create the most efficient manual in helping to keep all individuals safe. The audience will walk away with knowledge of the illnesses, prevention techniques, and treatment methods by the time they are done reading the manual.

Cold and Flu Statistics

Flu Statistics

★38 million illnesses[2]

★18 million medical visits[2]

★405,000 hospitalizations[2]

★22,000 deaths[2]

Cold Statistics

★Most people recover in 7-10 days[3]

★Adults have an average of 2-3 colds a year[3]

★More than 200 viruses can cause a cold[3]

Evolution of the Flu

1918
Life expectancy in the United States falls by 12 years due to waves of influenza [4]

1919
3rd wave of pandemic flu occurs. Pandemic eases up however virus spreads for the next 38 years [4]

1930
Discover that flu is caused by a virus and not a bacterium [4]

1957
Second strain of the flu virus causes another pandemic [4]

1960
U.S. Public Health Services recommends annual flu vaccines [4]

1968
Third strain of the virus emerges to trigger another pandemic [4]

2005
Genome of the 1918 flu virus is fully sequenced [4]

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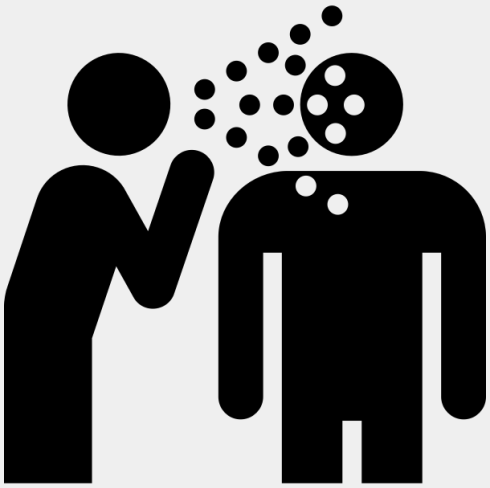
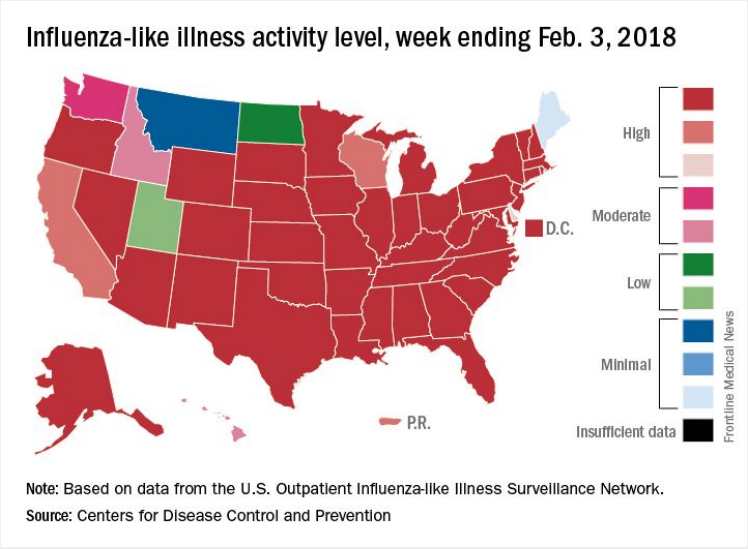
Chapter 1 - Causes

What Causes a Cold and Influenza? How Does It Spread?

A common cold is caused by a virus, most specifically, a rhinovirus. Nearly ½ of common colds are caused by a rhinovirus.[1] The virus enters the body through the eyes, mouth, and nose and targets the upper respiratory system causing symptoms related to a person's breathing.[1] A common cold is spread from person-to-person via droplets that are a result of coughing, sneezing, or talking. It can also be spread from droplets that are found on contaminated surfaces.



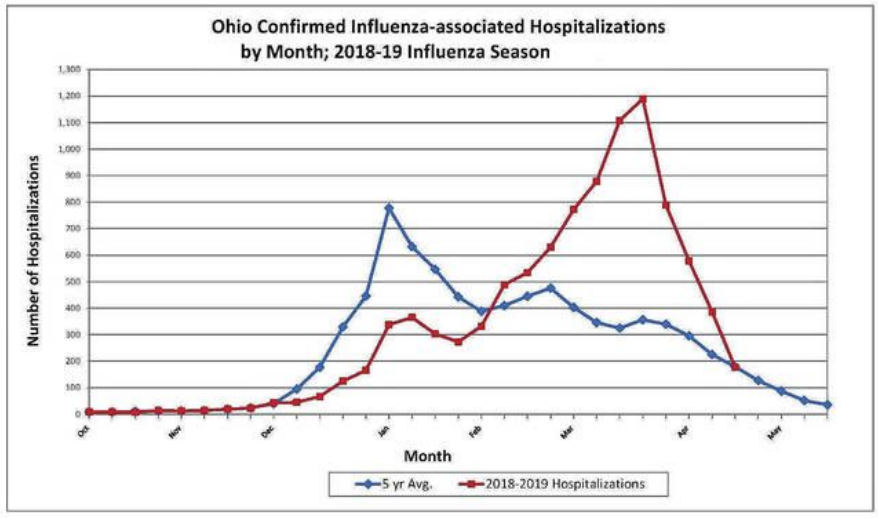


Influenza is caused by the influenza virus. Specifically, there are four types of influenza viruses: A, B, C, and D. Most commonly, strains A and B are the viruses that cause annual epidemics during the winter months. The influenza virus is radically complex as it adapts and modifies itself each year, obstacles in testing, vaccinations,

and treatment of the virus.[2] Influenza enters the body through droplets that are found as a result of coughing, sneezing, or talking. Influenza also spreads due to direct contact with a contaminated individual or surface, but this is not as common. The influenza virus is found to be more contagious than the virus of a common cold.[2] The map illustrates the epidemic potential of influenza in 2018. [3]

Is It Associated With A Certain Time of Year?

The common cold virus occurs when temperatures are rapidly changing. The rhinovirus thrives in environments with cooler temperatures, therefore it is common for common colds to be more prevalent around the months of September until April.[1] Furthermore, due to cooler temperatures, groups of people are more likely to interact in a closed environment (inside) which increases the ability for the virus to spread.[4]



Often, a rise or peak in the prevalence of influenza cases in the United States is referred to as “Flu Season.” Flu season varies from year to year according to CDC data, but most commonly, flu season in the United States experiences a rise in the prevalence of influenza cases from November until late spring, similar to the common cold.[2] The CDC provides weekly data to consistently update the progress of flu season.

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Chapter 2 - Symptoms

What are some of the common symptoms for common cold and influenza?

The symptoms of a common cold and influenza are closely similar but differ in their severity. Most often, the symptoms associated with influenza are severe, while the symptoms of a common cold are minor, mild, and at the worst, moderate. The table below consists of the common symptoms associated with a common cold and influenza.

Table 1. *Comparison of Symptoms.*

Cold[1]	Influenza[2]
Rare Mild Fever	High Fever (100℉-106℉)
Runny Nose	Chills
Congestion	Nausea
Mild Headaches	Severe Headaches
Mild Fatigue, Aches, and Tiredness	Severe Fatigue, Aches, and Tiredness
Sore Throat	Loss of Appetite
Cough	Severe Chest Discomfort

A common cold is mildly contagious for about **1-2 days**. A person can expect to recover from a common cold within 7-10 days, but in rare, extreme cases bronchitis or pneumonia may prolong severe symptoms. It is suggested that a person contact their doctor if symptoms persist for more than 14 days. Influenza is contagious **beginning 1**

day before symptoms occur until 5-7 days after symptoms first appear. A person can expect to recover from influenza ~3-7 days after symptoms first arise, but, often, fatigue and body aches can persist for >14 days.

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1. Centers for Disease Control and Prevention. Common colds: Protect yourself and others. Centers for Disease Control and Prevention. October 7, 2020. Accessed December 5, 2020. https://www.cdc.gov/features/rhinoviruses/index.html
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Chapter 3 - Testing

Detecting the Flu

There are numerous testing methods available to diagnose and detect the flu. One common testing method is **Rapid Influenza Diagnostic Tests (RIDTs)**. This testing method detects antigens of the virus that stimulate an immune response and is performed by a nasal or throat swab. It can produce results as soon as ten to fifteen minutes after testing.[3] However, this test is not always accurate. Rapid Influenza Diagnostic Tests are high in specificity, but lower in sensitivity.[1] This means that the test accurately detects those who do not have the virus, but may not always correctly identify those with the virus, meaning that a test with low sensitivity may yield more false negatives.

There are also **Rapid Molecular Assays.** This test is performed by a nasal swab and also produces quick results. Rapid Molecular Assays can provide results in fifteen to twenty minutes after testing. Unlike the RIDTs, Rapid Molecular Assays detect genetic material of the virus.[3] This test is high in sensitivity and

specificity, allowing it to be more accurate than the RIDTs.[1]

Testing for the influenza virus is not limited to RIDTs and Rapid Molecular Assays. There are also other tests that must be performed in special labs such as hospitals or state public health labs and can take several hours or days to receive results.[3]

When and Why Should You Get Tested?

Although testing is not required to make a clinical diagnosis for the influenza during flu season, it is highly recommended if one is exhibiting any flu-like symptoms to get tested.

- ➔ **Symptoms of the flu can be very similar to other illnesses. A flu test will rule out any other illness and help determine the right treatment plan.** The flu is a viral illness, not bacterial. Therefore, a course of antibiotics would not be beneficial treatment.[3] It is important to know if one if one is infected with the flu to avoid any unnecessary treatment.
- ➔ **Testing for the flu can allow for early detection and shorten the illness.** Symptoms of the flu set within 1-4 days after infection.[3] Infection can last for weeks. Early detection allows for immediate treatment and will reduce symptoms. If the flu is detected within 48 hours, illness can be shortened by at least one day.[3] Waiting to get tested will prolong treatment and recovery.
- ➔ **Getting tested for the flu can prevent any avoidable complications.** Leaving the flu untreated or undiagnosed can lead to severe

complications. This includes worsening of chronic health issues, pneumonia, organ failure, and even sepsis or death[3] . Anyone is at risk of developing an infection from the influenza virus and serious complications from the flu can arise at any age. However, individuals with chronic medical conditions, 65 years and older, pregnant women, and children under 5 years of age are at the highest risk and should take extra precaution.[3]

Risk of the Flu Test?

There are **no risks** associated with receiving a flu test. The tests are usually performed by a **swab test** or **nasal aspirate**.[3]

During a swab test, a sterile swab will be used to retrieve a sample from the throat or nose.[2]A nasal aspirate will require an injection of a saline solution into the nose and will be removed with gentle suction.[2]

While there is no risk associated with the tests, you may feel some discomfort while the tests are being performed. This could include a gagging sensation or a tickle when being swabbed. These effects are only temporary and should not continue after the test has been conducted.[2]

Where to Get the Flu Test?

Many places offer flu testing. These include:

- ☑ Local Health Department
- ☑ Urgent Care
- ☑ Your Primary Care Physician
- ☑ Local drug stores like CVS/Walgreens

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Chapter 4 - Medical Care

When to Seek Medical Attention?

During peak flu season, between December and February, thousands of people head to their nearest hospital emergency room as soon as they start experiencing symptoms when their illness does not warrant medical attention.

There are many disadvantages that arise from this[1]:

- ➔ Increases healthcare service wait times
  - ◆ Keeps physicians and nurses from attending to more severe patients
- ➔ Prompts hospitals to set up triage tents outside their facility to provide care for the patients
  - ◆ Causes unnecessary use of equipment that could be used in more effective manners.
- ➔ Turning people away
  - ◆ Causes frustration among the ill

- Creates a bad reputation for the hospital.

Although most cases of the cold or influenza can be treated with over the counter medication and rest, there are some instances that warrant medical attention, and consulting your doctor is necessary.

How to know when to seek medical attention? [1]

- If you are an adult experiencing the following symptoms, regardless if you fall into a high-risk category, you should go to the Emergency room:

Difficulty breathing or shortness of breath
Pain or pressure in the chest or abdomen
Sudden dizziness or frequent dizzy spells
Confusion
Severe or persistent vomiting
Flu-like symptoms that appear to be getting better and then return stronger than before

Warning Signs in Children[1]

For children or youth, it may be challenging to acknowledge warning signs of the flu especially if the child does not communicate their symptoms well. Children contract the common cold and influenza more commonly than adults as they are interacting with gems more frequently.

Source: 123RF.com

Pay attention to the following severe symptoms that your child may experience before taking them to the emergency room:

Stiff neck
Fast breathing or difficulty breathing
Extreme Irritability
Difficulty waking up or interacting
Severe headaches
Bluish skin or lips
Decreased appetite
Flu-like symptoms that get better and then return accompanied by a fever and cough

Warning Signs in Infants[1]

The most difficult age group to notice dangerous symptoms are infants especially if they are not walking or talking yet. Due to their weak immune system that is still building immunity to different diseases, they are highly susceptible to a severe form of the cold and the flu so it is important to watch out for the following symptoms:

Fever above 100.3 Fahrenheit for infants under 3 months old
Lack of tears when crying
Less wet diapers than usual
Inability to eat

Who Identifies as a High-Risk Patient for the Flu? [2]

The high-risk category includes individuals that are immunocompromised or already experience a chronic health condition that could increase the onset of the illness. These individuals should stay alert to any changes in their symptoms and seek medical attention quickly rather than putting it off. If the nearest emergency room is not available for a certain reason, contacting a doctor or going to an urgent care unit is recommended.

Source: Walgreens.com

References:

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Chapter 5 - Treatment and Medications

Over the Counter Medications

Over the counter medications are those that can be purchased without the need of a prescription from a healthcare professional. These medications can be found in pharmacies, grocery stores, gas stations, and more. Some of the most common over the counter medications for the cold and flu are Mucinex, Dayquil or Nyquill, Theraflu, Flonase, and more. Many over the counter medications require special consultation prior to taking them in the event that an individual has a history of liver disease, heart disease, pregnancy, diabetes, and more. Be sure to read the information on the medication prior to administering it to oneself or someone else.

Source: The-Scientist.com

Quick Facts - Over the Counter Medications

- Not all medications are recommended for children [1]
- Acetaminophen is the only pain reliever children should receive under the age of 6 [1]
- Ibuprofen or acetaminophen is acceptable to administer to anyone 6 years or older [1]
- Children under 4 years of age should only use cough medicine if advised by a doctor [1]
- Children over 4 years of age can take cough medicine with appropriate consultation [1]
- Medications should only be taken at the recommended doses and intervals [1]
- Medications should not be taken in the event that an individual is allergic to it [1]

Prescription Medications

Prescription medications are those that require a doctor or another healthcare professional to send in a request to the pharmacy that allows patients to obtain the medicine that they need. They are typically stronger in concentration than over the counter medications as well. The most common prescriptions to take for the cold or flu are Tamiflu, Relenza, Rapivab, and Xofluza. [2] These prescriptions are used to kill or prevent the growth of viruses. [2] Once again, it is crucial to only take these medications in the dosage and intervals that are recommended.

Quick Facts - Prescription Drugs

- On average, prescriptions are taken over the course of 5 to 7 days [2]
- Children are approved to take prescriptions for the cold and flu on a case by case basis [2]
- Oseltamivir is the safest prescription for children and pregnant women fighting the flu [2]
- Best to take prescription within 48 hours of onset [2]
- Antibiotics are NOT effective against cold or the flu [2]

Contraindications and Allergic Reaction Signs (Prescription & Over the Counter)

Stop taking the medication and seek medical attention if any of the following occur. Caution: these are only the major identifiers listed of an allergic reaction and there are many more ways that the human body can display an allergic reaction. Please be

aware and cautious when using medications.

- ✗ Skin reddening [3]
- ✗ Blisters [3]
- ✗ Rash [3]
- ✗ Anaphylaxis [3]
- ✗ Hypersensitivity to any component of the medication [3]

✗ Serious skin reactions such as epidermal necrolysis, Stevens-Johnson Syndrome, and erythema multiforme [3]

Other Ways to Feel Better While Fighting the Cold and Flu

☑ Get plenty of rest [1]

☑ Drink plenty of fluids [1]

Source: Time.com

☑ Utilize a clean humidifier or cool mist vaporizer [3]

☑ Use saline nasal spray or drops (use a rubber

suction bulb on children) [1]

Source:Fgb.com

- Breathe in steam from a bowl of hot water or shower [3]
- Suck on lozenges (do not give to children younger than 4 years of age) [3]
- Use Honey to Relieve Cough for Individuals Aged 1 or Older [3]

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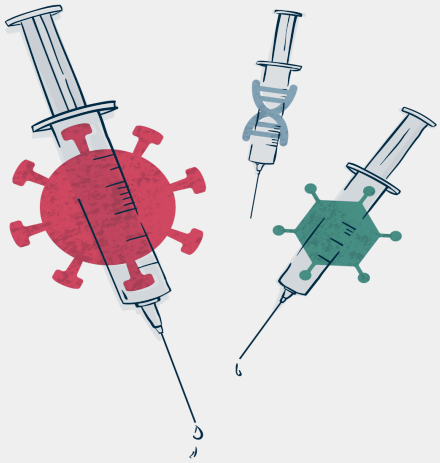
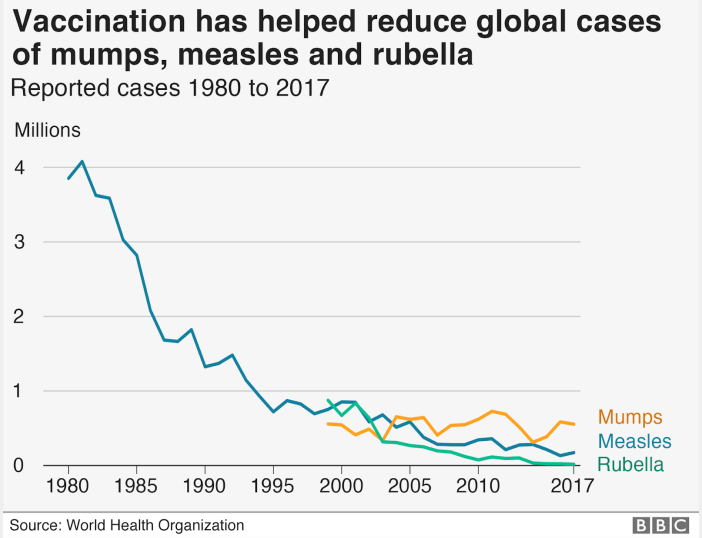
Chapter 6 - Prevention Strategies

Vaccinations



- Why Should People Get Vaccinated Against the Flu?
  - Influenza can be a potentially serious disease that can lead to hospitalization and sometimes even death. An annual seasonal flu vaccine is the best way to help protect against flu.[1]
- How do Flu Vaccines Work?
  - Antibodies stick to foreign invaders in your body and tell your immune system where to attack.[2] After you have the flu shot, it will take your body about 2 weeks to make these antibodies. The antibodies will circulate in your blood and provide protection against infection with the viruses that are used to make the vaccine.[2]

➢ The seasonal flu vaccine protects against the influenza viruses that research indicates will be most common during the upcoming season. Most flu vaccines in the United States protect against four different flu viruses, an influenza A (H1N1) virus, an influenza A (H3N2) virus, and two influenza B viruses.[2]



General Tips to Prevent the Flu and Colds

- Avoid Close Contact

  ☑ Stay distanced from those who are sick. Additionally, if you are sick, keep your distance from others to protect them from getting sick too.[3]

- Cover Your Mouth and Nose

  ☑ Cover your mouth and nose with a tissue when coughing or sneezing. It may prevent those around you from getting sick. Flu, colds, and other respiratory illnesses are spread by cough, sneezing, or unclean hands.[3]

- Clean Your Hands

- Washing your hands often will help protect you from germs. Soap and water is the best for cleaning your hands. If soap is unavailable, use an alcohol-based hand rub.[3]

❖ Avoid Touching Your Eyes, Nose, or Mouth

- Germs are often spread when a person touches something that is contaminated with germs and then touches his or her eyes, nose, or mouth.[3]

❖ Practice Other Good Health Habits

- Frequently disinfect household surfaces, especially when someone is ill. It is significant to get plenty of sleep, be physically active, manage your stress, drink plenty of fluids, and eat nutritious food to help prevent and fight against the flu.[3]

Tips to Prevent the Flu and Colds at Work

❖ Routinely Clean Surfaces

➢ Frequently touched objects and surfaces, including door knobs, desktop surfaces, keyboards, and phones, carry germs.[4]

❖ Participate in Healthy Habits

➢ Continue to wash your hands regularly and cover coughs and sneezes with tissues.[4]

❖ Ensure a Stocked Workplace

- ➢ Ensure your workplace has an adequate supply of tissues, soap, paper towels, alcohol-based hand rubs, and disposable wipes.[4]

❖ Contact Employer

- ➢ Find out about your employer's plans if an outbreak of flu or another illness occurs and whether flu vaccinations are offered on-site.[4]

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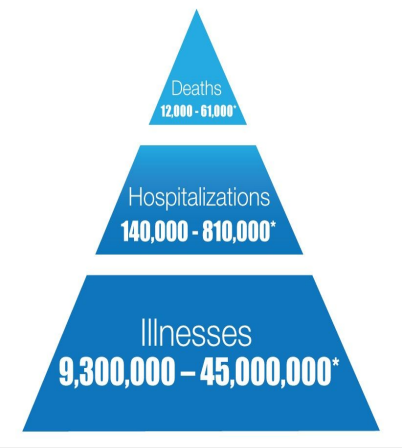
Chapter 7 - Future Research and Implications

The flu and common cold have been around for millennia, therefore, credible and reliable research has already been conducted. Scientists are very educated about the causes of the flu, the symptoms, and the treatments, however, there is always room for advancement.

A possible cure to the pesky common cold has always been urgent. There are two main reasons for the urgency:

	The common cold costs the United States economy approximately $40 billion a year due to being the most infectious illness[1]. ➔ This occurs when a massive amount of the population takes off work because of their symptoms, ultimately not contributing any money or time into the economy.
	The common cold takes the lives of thousands of children and adults who do not have the strong immunity needed to fight off the virus. ➔ The topic of the common cold has been so desensitized that even serious conditions for the illness are disregarded as “just the flu” or “I just have a cold”.

The urgency has always been there, however, the hope was missing.

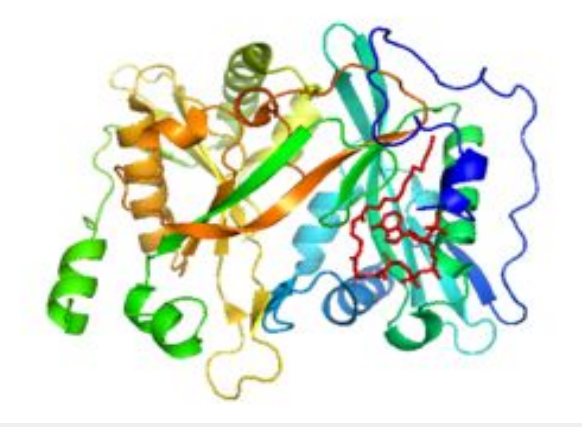
Possible Cure

There is a possible cure for the cold by Imperial College London as well as Sanford Medicine. The lead researcher of the Imperial College of London, Edward Tate, knows the dangerous implications that the cold can have on people who are immunocompromised or have respiratory problems such as asthma.

Source: Everydayhealth.com

Reasons why there isn't a cure for the common cold:

- ➔ There are over 160 subtypes of the rhinovirus which makes it difficult to pinpoint the exact type that needs to be attacked.
- ➔ Viruses are highly mutation prone and evolve rapidly thus hard to target with drugs.
- ➔ They build resistance and immunity against the medication or treatment coming back even stronger.



This "cure" targets a human enzyme called (N-myristoyltransferase) that all rhinoviruses need to survive. Inhibiting the enzyme will reduce the infection rate of the virus[2].

Although it's an innovative strategy for fighting the common cold, it has not yet

gone through all levels of testing and clinical trials. It is only in the early stages. Regardless, it is the closest researchers have been to putting an end on the cold once and for all.

FluSight by the CDC

The Centers for Disease Control and Prevention has started a new initiative to try and aid in decreasing the disadvantages that come with the flu season. They wanted to figure out a way to forecast the events of the flu season to better prepare the nation for the viral outbreak. They organized FluSight.

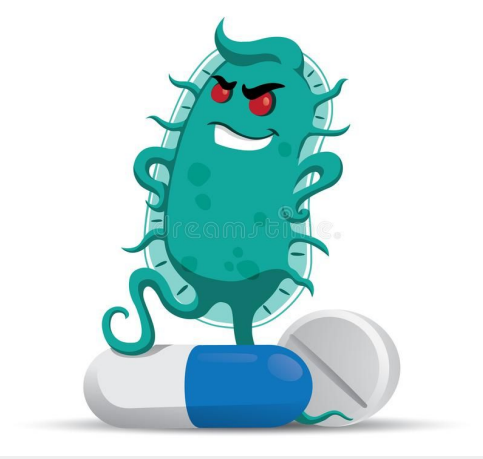
- ➔ FluSight by the CDC depicts[3]:
  - ◆ When and where flu increases will occur
  - ◆ How large the impact of the flu season will be
  - ◆ When flu season will peak aries from season to season

Source: CDC.gov

- ➔ Their goal is to create a reliable network of forecasters that can aid public health professionals combat the flu season more effectively[3].

Viral resistance

Influenza viruses are constantly changing, either from one season to the next or even within the same season. They build antiviral resistance to the medication and treatment that are used to attack them. When the



genetic makeup of the virus changes in the active site of the antiviral drug, there is reduced susceptibility to that drug.

➔ This means that the antiviral drug is ineffective in doing its job.

So, what happens exactly[4]?

➔ As the virus replicates, the strong ones survive and build resistance to the vaccine. Therefore, they become less susceptible to the antiviral drugs used to treat or prevent the flu.

➔ This can either happen spontaneously through a mutation or by adaptation and survival of the fittest.

However, there is promise. Research always predicts the next strand of the flu for the upcoming season and creates a treatment method that acknowledges the potential antiviral resistance that might happen. This involves several lab tests and can take a long time only to be inconclusive or completely misguided.

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4. Centers for Disease Control and Prevention. Influenza antiviral drug resistance. Centers for Disease Control and Prevention. September 3, 2020. Accessed December 16, 2020. https://www.cdc.gov/flu/treatment/antiviralresistance.htm

Conclusion

After reading this technical manual, we hope that the audience walks away with the proper knowledge needed to stay healthy and treat themselves or their loved ones in the event that an individual contracts the cold or flu. Both the cold and flu are spread by a virus that can be found on common surfaces, human skin, or droplets from sneezing, coughing, or talking. Both viruses occur annually as millions of people experience the flu and cold each year, but these viruses thrive between the winter months of November-April. It is important that you monitor your symptoms and specifically watch for a fever, congestion, or headaches. Know which symptoms to look out for before going to an urgent care center or the emergency room. If you or a loved one are exhibiting flu-like symptoms, it is important to get tested to rule out any other illness, determine the right treatment plan, and prevent the spread of the virus. While there are no risks associated with influenza testing, ask your healthcare provider about the different testing options available and how they are performed. It is important to discuss any medical testing with your healthcare provider to ensure that you have a full understanding of what is going on. There are multiple areas of interest covered in the manual including the background history of the illnesses, prevention and treatment techniques, testing techniques, future research, and more. Below is a list of additional resources to gain more information about the cold and flu. Please feel free to reach out to medical professionals as well if there are any concerns with one's health.

- https://www.cdc.gov/flu/prevent/actions-prevent-flu.htm
- https://www.fda.gov/consumers/consumer-updates/it-cold-or-flu-prevention-symptoms-treatments
- https://wellness.utk.edu/cold-flu-prevention/
- https://www.nia.nih.gov/health/all-about-flu-and-how-prevent-it
- https://studenthealth.studentaffairs.miami.edu/health-education/health-topics/cold-and-flu/index.html