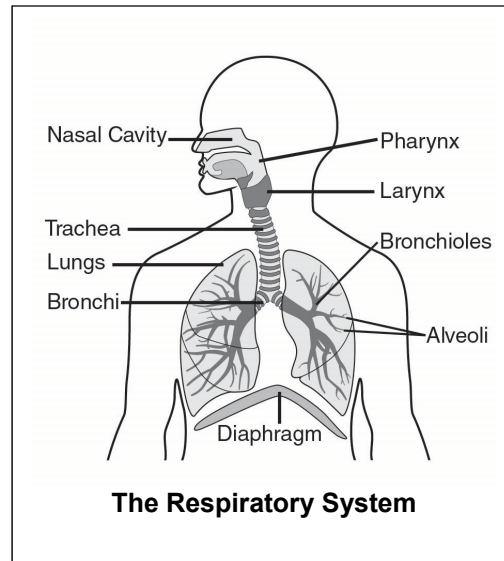


Cold, Flu, or Allergy?

Introduction:

A cold, the flu, and allergies all affect the respiratory system and have many similar symptoms. It can be difficult to tell whether someone has a cold, the flu, or allergies.



Mrs. Miller took her three daughters to see their doctor because they have respiratory system symptoms.

- Danielle Miller (13 years old) has been sniffing, coughing and sneezing for about a week.
- Kyla Miller (16 years old) has a bad cough and a runny nose. She also has a headache and a 100°F fever.
- Eva Miller (12 years old) has asthma so she usually has a cough. Today she notices that she is very tired and it is difficult for her to breathe. She has a 102°F fever.

Part 1: Rapid Influenza Tests

Mrs. Miller is worried that her daughters may have influenza (the flu). Do the Miller girls have influenza (the flu)? Often, a doctor can make a flu diagnosis simply based on the person's symptoms. However, the Miller family's doctor has asked you to conduct rapid influenza tests to determine if any of the three Miller girls have influenza.

1. The rapid influenza test begins by using a swab to take a sample of mucus from a patient's nose. You have three bags that each contain a cotton swab with a (pretend) mucus sample from either Danielle's, Kyla's or Eva's nose.
2. Place 2 drops of Rapid Flu Test Solution onto each of the circles on the **Rapid Flu Test Strip**. Then, close the lid of the Rapid Flu Test Solution tube to prevent spills.
3. Dip each cotton swab into the appropriate circle of the **Rapid Flu Test Strip**.
4. Record the results of the flu tests in the data table below.
 - If the swab turns pink, the patient has the flu.
 - If the swab remains white, the patient does not have the flu.

Name	Color of Swab	Interpretation (Flu or Not Flu)
Danielle		
Kyla		
Eva		

5. Discard the **Rapid Flu Test Strip** and the swabs. Save the dropper and tube of Rapid Flu Test Solution.
6. Which of the Miller girls have the flu? Explain how you can tell.

Part 2: Danielle's Case

Use the results of the Rapid Flu Tests and the **Allergy Facts** below to answer questions 1 through 6.

Allergy Facts

Normally, the immune system fights germs called pathogens. An allergy occurs when a person's immune system overreacts to an **allergen** that is harmless for most people. Allergens that cause allergic reactions include things as pollen, dust mites, mold spores, pet dander, some foods, insect stings, and some drugs.

During an allergic reaction the immune system releases an excess of chemicals called **histamines**. Histamines can cause symptoms such as a runny nose, sneezing, itching, rashes, swelling, ear congestion or asthma. Medicines that contain **antihistamines** as active ingredient can be used to treat allergies because antihistamines block the action of histamines.

1. Based on the results of the flu test, the doctor explained that Danielle's symptoms are most likely due to exposure to an allergen. What is an allergen?

2. Danielle's allergic reaction symptoms include sneezing, itchy cough, runny nose, and watery eyes. What chemical made in the body causes Danielle's symptoms?

3. The doctor suggested that Danielle treat her allergy with an over-the-counter allergy drug. What active ingredient should Danielle look for if she wants a drug that blocks the action of the chemical you selected for question 2?

4. When selecting a drug, it is best to select a drug that only treats the symptoms that you are experiencing. Look at the four drug labels provided. Which drug would you recommend for relieving Danielle's allergy symptoms? Explain your choice.

5. What side effects should Danielle be aware of before she takes this drug?

6. What drug interactions should Danielle be aware of before she takes this drug?

Side Effect

Any effect of a drug or dietary supplement that is in addition to its intended effect, especially an effect that is harmful or unpleasant.

Drug Interaction

A drug interaction occurs when a substance (another drug, food, or a dietary supplement) affects the activity of a drug when both are administered together. Drug facts labels may warn that the drug should not be taken with another drug or food.

Part 3: Kyla's Case

Use the results of the Rapid Flu Tests and the **Cold Facts** below to answer questions 1 through 9.

Cold Facts

The common **cold** is the most common contagious infectious disease in humans. A cold is caused by a rhinovirus, a type of virus that is usually less harmful than the influenza virus that causes the flu. The body's reaction to the cold virus causes cold symptoms such as sore throat, cough, mild fever, ear congestion, blocked nose, and runny nose. Colds are common because the human body cannot develop immunity to all of the different types of rhinoviruses that can cause the common cold.

Antibiotics are not effective in treating colds. They do not cure a cold or speed up recovery because they kill bacteria but do not kill the viruses that cause a cold. Doctors will not prescribe antibiotics for a common cold because they are concerned that overuse of antibiotics will promote the evolution of antibiotic resistant bacteria that are not killed by antibiotics. Colds are usually treated by using over-the-counter drugs, drinking fluids, and getting plenty of rest.

1. Based on the results of the flu test, the doctor explained that Kyla has a cold, not the flu. Kyla asks the doctor for a prescription for an antibiotic, but the doctor said she did not need one. Explain why he would not give her a prescription for an antibiotic.

2. For her cough, the doctor suggested that she could take an **antitussive**. Antitussives are cough suppressant drugs that block the cough reflex. Look at the four drug labels provided. Which drug(s) contain an antitussive to suppress Kyla's cough?

3. For her stuffy nose, Kyla could take a **decongestant**. Decongestants reduce the swelling of tissues in your nose, making breathing easier. Look at the four drug labels provided. Which drug(s) contain a decongestant to relieve Kyla's stuffy nose?

4. If Kyla's respiratory tract (lungs, trachea, and bronchi) is clogged with mucus, she could use an **expectorant**. Expectorants are drugs that thin the mucus and promote removal of mucus from the respiratory tract. Look at the four drug labels provided. Which drug(s) contain an expectorant to promote removal of mucus from Kyla's respiratory tract?

5. To relieve Kyla’s headache, she could take an **analgesic**. Analgesics are drugs that relieve pain. If you have a fever, you could take an **antipyretic**. Antipyretics are drugs used to reduce fevers. The common over-the-counter fever reducers (aspirin, ibuprophen, and acetaminophen) are also pain relievers. Look at the four drug labels provided. Which drugs contain an analgesic/antipyretic to relieve Kyla’s headache?

6. **To avoid potential overdoses, it is important to NOT take two drugs with the same ingredient.** This is especially true for acetaminophen, a common fever reducer and pain reliever found in a variety of cold medications. Taking too much acetaminophen increases the risk of liver damage. Select the one cold drug that you would recommend that Kyla purchase and use for treating her cold symptoms. Explain your selection.

7. List two **side effects** that Kyla should be aware of when she takes the drug you selected for question 6.

- _____
- _____

A **side effect** is any effect of a drug that is in addition to its intended effect, especially an effect that is harmful or unpleasant.

8. Would it be safe for Kyla to take both the drug you selected for question 6 and a pain reliever that contains acetaminophen for her headache? Explain why or why not.

Pharmacists are a good source of information for both prescription and over-the-counter drugs. Kyla isn’t sure she has chosen the best drug for her cold so she asks the pharmacist for advice. The pharmacist asks Kyla if she is already taking any prescription or other non-prescription drugs.

The pharmacist discovers that Kyla is taking a prescription antidepressant - a drug used to treat depression. He points out that some antidepressant drugs may result in dangerous **drug interactions** with ingredients in some cold drugs. The pharmacist also shows Kyla the warnings on the drug that she was considering buying. He recommends that Kyla talk with her doctor for advice on what drugs to take to treat her cold symptoms.

A **drug interaction** is a situation in which a substance (usually another drug) affects the activity of a drug when both are administered together. Drug interactions usually have a harmful effect.

9. Explain why it is important for Kyla to talk with a doctor before she takes medicine such as Multi-Symptom Cold + Flu Syrup.

Part 4: Eva's Case

Use the results of the Rapid Flu Tests and the **Flu Facts** below to answer questions 1-6 on the next page.

Flu Facts

The flu (also known as influenza) is a viral infection that attacks the respiratory system — the nose, throat and lungs. The flu viruses may cause respiratory system symptoms such as cough and runny nose that may also be associated with colds or allergies. People should suspect they have the flu if they also have a high temperature (101°F or above), cold sweats, shivers, aching joints, aching limbs, headaches, and extreme fatigue.

Because the flu is highly contagious, it is important that people who have the flu stay home and try to avoid contact with other people. The flu can be deadly, particularly for young children, people over 65 years old, and people with chronic diseases (long lasting diseases that can be treated but not cured) such as asthma, heart disease, immune system problems, kidney disease, and diabetes.

Because the flu is caused by a virus, antibiotics will not reduce flu symptoms or cure the flu. The flu is usually treated by using over-the-counter drugs, drinking fluids, and getting plenty of rest. Inhaling steam may also help ease the symptoms. However, it is important to not take over-the-counter drugs if a doctor has prescribed drugs, such as a pain reliever, fever reducer or a cough suppressant to treat flu symptoms. A dangerous overdose may result if the active ingredients in prescription drugs are the same as the active ingredients in over-the-counter drugs.

The flu can be prevented by getting an influenza (flu) vaccination each year. A yearly influenza vaccination is important because the flu virus mutates rapidly and this year's flu vaccine may not work to prevent the new flu viruses next year.

At the first sign of flu symptoms, it is wise to call the doctor to ask if you would benefit from prescription antiviral flu drugs, such as Tamiflu or Relenza. Antiviral drugs do not cure or prevent the flu, they just reduce the severity and duration of flu symptoms. To be most effective, these antiviral drugs need to be given within one to three days of first flu symptoms.

1. The doctor explained that Eva’s symptoms made him suspect that she has the flu. List two flu symptoms that are not usually associated with a cold or allergies.

- _____
- _____

2. The results of the rapid flu test show that Eva definitely has the flu. Explain two reasons why people who have flu symptoms should seek prompt medical advice from a doctor.

- _____
- _____

3. Eva has two chronic diseases—asthma and diabetes. Explain how a chronic disease is different from diseases such as the flu or a cold.

4. The doctor gave Eva a prescription for an antiviral drug (Tamiflu). This antiviral drug will not prevent or cure the flu. Why would Eva want to take the antiviral drug?

5. The doctor also gave Eva prescriptions for a pain and fever reducer (acetaminophen) and a cough suppressant (dextromethorphan). Which over-the-counter flu drug would you recommend that Eva use for treating her flu symptoms? Explain your selection.

6. Danielle and Kyla know that the flu is contagious. They do not want to “catch” the flu from Eva. Should they take some of Eva’s prescription antiviral drug? Explain why or why not.
