



Do Bugs Need Drugs?

A community program for wise use of antibiotics

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Tutorial Slide Show

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Antibiotics

- Most significant discovery of modern medicine
- Save millions of lives



Antibiotics are undoubtedly one of the most significant discoveries of modern medicine. In the 90 years since being discovered, antibiotics have saved millions of lives.

Unfortunately, within a short time of antibiotics being available, it was discovered that bacteria can rapidly adapt and change, making themselves resistant to antibiotics. As new classes of antibiotics were discovered, bacteria also became resistant to these drugs.

Now people are dying from infections caused by antibiotic resistant bacteria. Antibiotic resistance poses a great threat to modern medicine. Patients undergoing surgery, chemotherapy, transplants and therapy for burns all rely on antibiotics to treat the infections that can result from these procedures.

Antibiotic resistance

- Caused by overuse and misuse of antibiotics
- Limits effectiveness of antibiotics
- Patients with resistant infections cannot be treated



Resistant bacteria are often called superbugs. Many people working in healthcare institutions will be aware of two of these superbugs, methicillin resistant *Staphylococcus aureus* (MRSA) and vancomycin resistant enterococci (VRE).

In the community, there are also some superbugs. The ones we are most concerned about are penicillin resistant *Streptococcus pneumoniae* and community acquired MRSA.

Streptococcus pneumoniae is a significant cause of serious respiratory tract infections, accounting for the majority of deaths in patients with community acquired pneumonia. This bacterium can also cause meningitis and ear infections. In the last fifteen years this bacterium has become resistant to many different kinds of antibiotics. Every year in Canada, people die from infections caused by resistant *Streptococcus pneumoniae*.

More recently, resistance has spread *E. coli*. *E. coli* can cause urinary tract infections or other, more serious infections. In some cases there are no antibiotics that work.

Healthcare professionals are concerned that we may be facing a post-antibiotic era, when antibiotics may no longer be useful in the management of infections.

Antibiotics in the community

- 75% of antibiotics prescribed for respiratory tract infections
- 50% of antibiotic prescriptions are inappropriate
- Most respiratory tract infections are caused by viruses
- Antibiotics do not work against viruses



Of all the antibiotics used in the world, only half of them are used in humans. The other half are used in agriculture to treat and prevent infections in animals and plants. The agricultural use of antibiotics is a significant factor in the development of antibiotic resistance.

Overuse and misuse of antibiotics in humans are major contributors to the problem of antibiotic resistance. Eighty percent of the antibiotics prescribed for humans are used for infections treated in the community. The remaining 20% are for more serious infections treated in the hospital.

Most (75%) of the antibiotics used in the community are for respiratory tract infections. Respiratory tract infections include colds, sore throats, ear infections, sinusitis, croup, laryngitis, bronchitis, bronchiolitis, and pneumonia.

The majority of respiratory tract infections are due to viruses. Of the antibiotics used in the community to treat respiratory tract infections, at least 50% are inappropriate primarily because antibiotics are often prescribed for viral infections.

Antibiotics do not work against viruses.

Common misconceptions

- ✘ Antibiotics are effective against viruses
- ✘ Bronchitis (chest colds) need antibiotics
- ✘ No harm in using antibiotics when they are not needed



Many Canadians believe that antibiotics work against viruses. Surveys conducted by the National Information Program on Antibiotics (NIPA) indicate that as many as 53% of adults in Canada believe antibiotics work for viral infections.

In particular many patients believe that bronchitis (chest cold) is a bacterial infection. The productive cough associated with bronchitis is often misunderstood as indicating a bacterial infection and that antibiotics are needed. Bronchitis is almost always caused by a virus, unless you have another medical condition like emphysema or chronic obstructive pulmonary disease (COPD).

Although prescribers are ultimately responsible for appropriate prescribing of antibiotics, pressure from patients to receive antibiotics also contributes to the problem. Surveys indicate that many Canadian adults expect an antibiotic from their doctor when they or their children have symptoms of respiratory tract infections.

Last, many people do not realize that there are risks associated with antibiotic use and that there is harm in taking antibiotics when they are not needed. Any use of antibiotics increases the chance that your next infection will be resistant. Additionally when you take an antibiotic the normal balance of good bacteria in the digestive tract or on your skin is altered. These changes can leave you susceptible to other infections such as *C. difficile*.

Antibiotic resistance is a worldwide problem

- World Health Organization

2011 - Combat Drug Resistance. No action today, no cure tomorrow

- European Commission

2011 - Action Plan on Antimicrobial Resistance

- US Centers for Disease Control and Prevention

1999 - Get Smart about Antibiotics Program

- Public Health Agency of Canada

- National Collaborating Centre for Infectious Diseases

2010 - AntibioticAwareness.ca



Antibiotic resistance has been recognized by the World Health Organization (WHO) as a global health crisis. In addition, the significance of antibiotic resistance has been recognized by European Commission, the Centers for Disease Control and Prevention in the United States and the Public Health Agency of Canada / National Collaborating Centre for Infectious Diseases.

These organizations recognize the need for education for healthcare professionals and the public about the wise use of antibiotics and the consequences of antibiotic resistance. Additionally, campaigns to improve the agricultural use of antibiotics are also underway as this also contributes to antibiotic resistance globally.

Do Bugs Need Drugs?

- Community program for wise use of antibiotics
- Started in October 1998
- Programs for healthcare professionals, public, students and schools, childcare centres, workplace, older adults



The *Do Bugs Need Drugs?* program is designed to address the national mandate and to ultimately decrease antibiotic resistance in Canada.

Do Bugs Need Drugs? was originally piloted in Grande Prairie, Alberta from October 1998 through March 1999. Educational programs were provided for doctors, pharmacists, school aged children and the general public. The project was successful in decreasing antibiotic prescriptions for respiratory tract infections by 12% compared with the previous year. A post intervention survey indicated increased public awareness and knowledge especially among adults whose children were taught about antibiotic resistance in school.

Based on the success of this pilot study, the program has expanded to Alberta, British Columbia, and elsewhere in Canada and the United States.

The program focuses on education in the community. We currently offer educational presentations for healthcare professionals,; schools, teachers and students; preschools and daycares; the workplace; and older adults in group settings. Programs are supported by a television ad, website and print materials, some of which are available in translation.

Key messages

- 1. Wash your hands!** Handwashing is the best way to stop the spread of infections.
- 2. Not all bugs are created equal.** Antibiotics work against bacteria, but not against viruses.
- 3. Use antibiotics wisely** so that bacteria do not become resistant to antibiotics.



Three key messages are promoted :

1. Wash your hands! Handwashing is the best way to stop the spread of infections. Surveys in Grande Prairie indicated that fewer than 50% of doctors and even fewer pharmacists regularly counseled their patients about handwashing. Yet this is probably the most useful advice that can be given to patients to prevent further spread of infection.
2. Not all bugs are created equal. Bacteria and viruses are different. Both can cause respiratory tract infections, but antibiotics only work against bacteria. Antibiotics do not work against viruses. Viruses cause the majority of respiratory tract infections.
3. Use antibiotics wisely. Bacteria can become resistant to antibiotics. Antibiotic resistance is a problem that must be addressed so that antibiotics continue to work against bacterial infections. Decreasing antibiotic use has been shown to reverse resistance in bacteria.

Antibiotics are sometimes viewed as confirmation that a person is sick. Some people think antibiotics will help them, even for a viral infection. People often want antibiotics when they are not needed, and do not realize that the misuse of antibiotics leads to antibiotic resistance. Antibiotic resistant infections are serious and can be fatal.

Handwashing



Handwashing

- 80% of common infections can be spread by the hands
- Best way to stop the spread of respiratory tract infections



Handwashing is the most important step in preventing the spread of infections. In fact, up to 80% of infections can be spread by the hands. Handwashing is especially useful in preventing the spread of viral respiratory tract infections.

Good bacteria

- Do not cause infections
- Live on your skin and in your mouth and intestines
- Not easily removed by handwashing
- Protect against disease-causing bacteria and viruses



A single hand can harbor as many as 200 million organisms including bacteria, viruses and fungi. Most of the organisms on the skin are actually good bacteria, called resident flora. These bacteria protect us from infection by crowding out bad bacteria and viruses.

Germs

- Microscopic organisms that cause infections
- Usually survive less than 24 hours
- Easily removed by handwashing
- Include infection-causing bacteria, viruses, fungi



The bad germs can live on our skin for short periods of time and are called transient flora. They cause infections when they are introduced in the body, usually by touching mucous membranes such as the mouth, nose or eyes. These bad germs are easily removed by proper handwashing.

How dirty are things?

- University of Arizona study
- Tucson, Chicago, San Francisco, Tampa

Location	% Contamination (fecal bacteria)
Playground	44
Bus rails	35
Public restrooms	25
Pens (shared)	16
Vending machines	14
Public phones*	13

*Home phones more contaminated



A scientific study by researchers at the University of Arizona examined the amount of contamination on objects that were frequently touched by many people. Bacteria commonly found in fecal matter were present on 44% of playground equipment, 35% of bus rails and 25% of surfaces in public restrooms. Bacteria are everywhere and many can cause disease.

Reference:

Reynolds KA, Watt PM, Boone SA, Gerba CP. Occurrence of bacteria and biochemical markers on public surfaces. *Int J Environ Health Res.* 2005;15(3):225-34.

How easy is it to transfer germs?

- 10 million E. coli O157.H7 transferred to the hands
 - Patting contaminated ground beef
- 1,000 - 100,000 bacteria transferred to the hands
 - Touching a patient's shoulder
 - Measuring blood pressure



Other research has shown that bacteria are readily transferred to the hands. For example, up to 10 million bacteria that cause hamburger disease (E. coli O157.H7) can be transferred to the hands by patting contaminated ground beef.

In medical settings, 1,000 – 100,000 bacteria can be transferred to the hands of healthcare providers by touching a patient on the shoulder or when checking a patient's blood pressure.

References:

Wachtel MR, McEvoy JL, Luo Y, Williams-Campbell AM, Solomon MB. Cross-contamination of lettuce (*Lactuca sativa* L.) with *Escherichia coli* O157:H7 via contaminated ground beef. *J Food Prot.* 2003;66(7):1176-83.

Duckro AN, Blom DW, Lyle EA, Weinstein RA, Hayden MK. Transfer of vancomycin-resistant enterococci via health care worker hands. *Arch Int Med.* 2005;165(3):302-7.

Do people really wash?

American Society for Microbiology

Study year	Phone survey	Observational survey	
	Say they wash*	Women	Men
2000 8,000 people 5 cities	95%	75%	58%
2007 6,000 people 4 cities	92%	88%	66%

*After using a public washroom



Even when people say they are washing, the actual percentage of individuals who wash hands is lower.

In 2000, in a telephone survey of 8,000 people in 5 cities by the American Society for Microbiology, 95% of people said they always washed their hands after using a public washroom. However, follow-up observation in public washrooms in the same cities revealed that on 75% of women and 58% of men actually washed their hands. When this study was repeated in 2007, 92% of the 6,000+ people surveyed by phone claimed they always washed their hands. Handwashing behavior was somewhat improved with 88% of women and 66% of men observed to wash their hands.

In the fall of 2003, over 96% of people were actually observed to wash their hands in the washrooms of the Toronto airport. Interestingly this followed the SARS outbreak earlier in the year in the Toronto area.

Reference:

American Society for Microbiology [Homepage on the internet]. Washington DC. [posted 2007 September 17; cited 2012 February 6]. Hygiene habits stall: public handwashing down. Available from: <http://www.washup.org/documents/CleanHandsPressRelease.pdf>

Does handwashing work?

- Margaret Ryan, Health Naval Research Centre, San Diego
- Recruits ordered to wash hands at least 5 times / day
- 45% reduction in respiratory illness



- Margaret Lee, Canadian Journal of Infection, Toronto
- Nursing students washed hands at least 7 times / day
- Reduced number of infections / colds



Does handwashing prevent illness? A variety of studies show that handwashing is an effective means of preventing the spread of infections.

In a study in San Diego, naval recruits were ordered to wash their hand at least five times a day. This resulted in a 45% reduction in respiratory illnesses among the enlistees.

A similar study among nursing students in Toronto showed that washing the hands at least seven times a day was associated with a reduced rate of colds and gastrointestinal infections.

References:

Ryan MA, Christian RS, Wohlrabe J. Handwashing and respiratory illness among young adults in military training. *Am J Prev Med.* 2001;21(2):79-83.

Lee MB. Frequency of handwashing and protection of health . *Can J Infect Control.* 2000;19:89-91.

Karachi study - 2005

Squatter settlements divided into three groups

- No soap
- Plain soap
- Antimicrobial soap

Groups receiving soap

- 50% reduction in pneumonia
- 53% reduction in diarrhea
- 34% reduction in impetigo



No benefit in using antimicrobial soap



A large study conducted in Karachi, Pakistan published in 2005 clearly shows the benefits of handwashing in preventing infectious diseases. Squatter settlements in Karachi were either given no soap, plain soap, or antimicrobial soap, and rates of illness were measured before and after the study. For the settlements receiving soap, researchers noted a 50% reduction in cases of pneumonia, 53% reduction in diarrhea and 34% reduction in impetigo (a skin infection). Importantly, the reduction in rates of illness were the same for groups receiving either plain soap or antibacterial soap. This study clearly shows that there is no benefit in using antibacterial soap.

Reference:

Luby SP, Agboatwalla M, Feikin Dr, Painter J, Billhimer W, Altaf A, Hoekstra RM. Effect of handwashing on child health: a randomised controlled trial. *Lancet*. 2005;366(9481):225-33.

When to wash your hands

- Before eating or preparing food
- After using the toilet / helping a child use the toilet
- Before and after changing diapers
- After blowing nose / helping a child with a runny nose
- After play or handling shared objects
- Before flossing your teeth
- Before inserting / removing contact lenses



Because germs like bacteria and viruses are introduced into the body most often by the hands, it is important to develop good handwashing habits. Although it is hard for adults to change habits, it is much easier for children to do so. The key is to make handwashing a habit rather than a chore.

The mouth is the most common route of entry for most viruses and bacteria that cause respiratory tract infections. It is important to wash your hands before meals and food preparation. This includes washing hands before feeding children and before breastfeeding. For smokers, handwashing should be a regular habit as the fingers are continuously brought up to the mouth. (Of course smoking itself can contribute to respiratory tract infections!)

Because of the large amount of bacteria found around the perineal area (anus and genitals), handwashing is absolutely necessary after using the toilet or after helping a child use the toilet or before and after changing diapers. Bathroom surfaces, especially in public bathrooms, are often heavily contaminated with germs.

During a respiratory tract infection, nasal secretions are loaded with germs. Handwashing, after blowing the nose or after being with someone who is sick, helps to prevent the spread of infection.

Importantly, children should be encouraged to wash their hands after playing with toys that are shared with others. Hands should also be washed after playing with animals and pets.

Last, remember to wash your hands when inserting or removing contact lenses and before flossing your teeth. In fact, anytime that your hands might come in contact with your mucous membranes (the pink moist areas of your eyes, mouth, nose and other areas of the body), wash your hands first.

How to wash your hands

- Wet your hands
- Apply soap
- Rub hands together for 20 seconds
Sing Twinkle, Twinkle song



- Rinse for 10 seconds
- Dry with a clean disposable towel
- Use towel to turn off taps and open the door



Knowing how to wash hands is as important as knowing when to wash them.

Washing with water alone will not get rid of most bacteria and viruses. Soap is needed to get rid of the dirt and grease that actually trap these "bugs". It is important to create good friction as this will physically remove the germs. Special attention needs to be paid to fingertips and fingernails as these are often still contaminated after handwashing. In fact, up to 95% of germs are found under the nails!

Most people do not wash for long enough, which is another reason that hands are still contaminated after washing. Washing with soap should take about 20 seconds (The time it takes to sing Twinkle Twinkle Little Star!)

Use plain soap. Antibacterial soap is not needed and may actually make things worse by promoting antibiotic resistance.

Rinsing is equally important because this is how the germs are removed. Effective rinsing should take about ten seconds.

Drying the hands completely is essential to proper handwashing, as many germs thrive in moist environments. Drying with a clean disposable towel is best if possible.

Care must be taken when leaving public places to not re-contaminate hands by touching dirty surfaces. Use a disposable towel to turn off the taps and open the washroom door.

Use plain soap

- Does not have antibiotics
- Removes dirt and grease that attract bad germs
- Does not lead to antimicrobial resistance



Use plain soap. There is no need to use antibacterial soap products. Plain soap will remove the dirt and grease that attract bad bacteria and viruses. Plain soap does not promote antibiotic resistance in the bacteria that normally live on our hands or in our environment.

Do not use antibacterial soap

- Antibacterial soap is not recommended
- Antibacterial soap leads to antimicrobial resistance
- Antibacterial soap has negative effects on the environment
- No more effective in preventing infections than plain soap



Antibacterial soap is not recommended for several reasons. Antibiotics generally take a lot longer to work than the time it takes to wash your hands. By constantly exposing the bacteria to these antibacterial products, bacteria can become resistant. The resistance can then be transferred to other bacteria including the bad, disease-causing bacteria.

There is no need to use antibacterial products as plain soap and proper handwashing can remove the germs very effectively.

Hand drying

- Removes 42% more germs than washing alone
- Wet hands transmit germs more easily than dry hands
- Some hot air dryers encourage bacterial growth because hands are left warm and moist
- Use clean towels
- Avoid sharing towels



Drying hands with a towel removes 42% more germs than just washing alone. Care should be taken not to spread germs by sharing towels. Use of hot air dryers may actually promote the growth of bacteria on the hands because often the hands are left warm and moist.

Alcohol-based hand sanitizers

- Must be at least 60% alcohol to be effective
- Do not cause antibiotic resistance
- Can kill bacteria and viruses
- Not effective against some germs that cause diarrhea
- Should not replace soap and water
- Not needed in the home



bugs
drugs

Alcohol-based hand sanitizers are effective in killing many bacteria and viruses but need to be at least 60% alcohol to be effective. Alcohol is a denaturing agent and causes immediate and extensive structural damage so that the bacteria are unable to survive. This is in contrast to antibiotics which kill bacteria more slowly by interfering with biological processes. With alcohol-based products the bacteria are quickly obliterated and have no chance of developing a resistance mechanism.

The advantages of alcohol-based hand sanitizers are that they can be used when soap and water are not available, are quick to use and cause less skin drying.

There are, however, disadvantages. Alcohol will not work in the presence of dirt and grime and are not effective if the hands are visibly dirty. Because these products are broad spectrum some good bacteria are also killed. Importantly, alcohol based agents do not kill some of the germs that cause diarrhea. Because of this, these products should not replace regular washing with soap and water and are not needed in the home.

Not all bugs are created equal



Viruses and bacteria

- Both viruses and bacteria can cause respiratory tract infections
- Most respiratory tract infections are caused by viruses



bugs
drugs

Both bacteria and viruses can cause infections of the respiratory tract, however viruses cause the majority of these illnesses. Bacteria and viruses are very different types of microorganisms - in their structure, the way they cause infections and the ways they can be killed.

Viral infections

- Viral infections make you feel sick all over your body
- Easily spread from one person to another
- Colds and influenza and most sore throats, coughs and sinus infections are caused by viruses

Antibiotics DO NOT work against viruses



Viral infections make you feel sick all over your body. They can be easily spread from one person to another. All colds and influenza and most sore throats, coughs and sinus infections are caused by viruses.

Antibiotics interfere with the biological processes of bacteria to kill them or to inhibit their growth. Viruses are significantly different from bacteria. Viruses are much smaller, simpler organisms and are not affected by antibiotics. Because of this antibiotics do not work against viral infections.

Bacterial infections

- Less common than viral infections
- Do not spread as easily from one person to another
- Usually affect only one part of the body
- Strep throat is caused by bacteria
- Pneumonia is often caused by bacteria

Antibiotics DO work against bacteria



Bacterial infections are less common than viral infections and are less contagious.

It is important to remember that the most serious respiratory tract infection, pneumonia, is usually caused by bacteria. Pneumonia is a potentially life-threatening illness. The most important reason for making sure we use antibiotics wisely is to preserve the usefulness of antibiotics for this sometimes fatal illness.

The most common bacterium which causes pneumonia has developed resistance. Antibiotics that would have worked very well in the past are no longer effective.

Use antibiotics wisely



Antibiotic resistance

- Antibiotics kill most bacteria, but some are able to survive
- Surviving bacteria have “antibiotic resistance”
- Antibiotic resistant bacteria cannot be killed by that antibiotic



Using antibiotics when they are not needed can lead to antibiotic resistance. Bacteria are said to have “antibiotic resistance” when they can no longer be killed by the antibiotic.

For more about bacteria and antibiotic resistance see the slide set What is Antibiotic Resistance? at www.dobugsneeddrugs.org.

Consequences of taking antibiotics

- When you take antibiotics your good bacteria can become resistant
- Antibiotic resistance can be transferred from your good bacteria to other bacteria, including bad bacteria that cause disease
- People who have taken antibiotics in the past have a higher chance that their next infection will be resistant



Giving antibiotics to someone who has a viral infection can be harmful. This exposes the good bacteria which normally live in the body to antibiotics. When bacteria are exposed to antibiotics, they can develop defenses so that they can resist being killed by the antibiotic. Resistance is genetic and is passed to new bacteria when they divide and multiply. Importantly, resistance genes can be transferred to the more serious disease-causing bacteria.

Effects of antibiotic resistance

- Antibiotics will not work against bacteria with antibiotic resistance
- Antibiotic resistant infections are difficult and sometimes impossible to treat

Remember, it is the bacteria that are resistant
NOT YOU!



When bacteria develop resistance to many or all antibiotics, there is no treatment and infections with these “superbugs” can be fatal.

Antibiotic resistance is a difficult concept to understand because many people believe that their immune system is making them resistant to antibiotics.

In fact this is not the case at all. Antibiotic resistance has nothing to do with a person’s immune system. It is the bacteria that are resistant to antibiotics. This means that even very healthy people who have never taken antibiotics can become infected with antibiotic resistant bacteria from someone else!

This highlights why antibiotic resistance is a public health problem that everyone should be concerned about.

Wise use of antibiotics in respiratory tract infections



Fever

- Helps the body fight infection
- Occurs with most respiratory tract infections
- Occurs with both viral and bacterial infections



A fever is often a symptom that makes people worry and possibly makes them seek medical advice. A high fever is sometimes thought to indicate that the infection is bacterial. This is not the case.

A fever, is one of the measures that the body uses to fight infection. Fever occurs with most respiratory tract infections, both viral and bacterial.

Tip - When fever is reduced in people with viral infections, they usually feel better, People with bacterial infections, especially pneumonia, will usually still feel very sick, even when their temperature is lowered.

Cold / runny nose

- Colds are always caused by viruses
- Most colds are associated with a sore throat or a cough
- Fluid from the nose becomes yellow or green after 2-3 days
- This does not mean it is a bacterial infection



There are about 200 different viruses that cause colds. On average, children get 8-10 colds per year. Adults get fewer colds, mostly because they have built up immunity against some of the cold viruses to which they have been previously exposed.

Most colds are associated with a cough or a sore throat. When a person has classic cold symptoms these other symptoms are also due to the virus and do not represent a separate illness that requires an antibiotic.

Yellow/green discharge from the nose is one of the most common reasons why people think they need an antibiotic for a cold. This represents the normal progression of a cold - not a new bacterial infection. The change in color indicates that the immune system is fighting the virus by mobilizing its infection fighting cells.

The fever and sore throat that are part of a cold are usually gone in about a week but it may take two or three weeks for a runny nose or cough to go away. Many people do not realize how long it takes to fully recover from a cold.

The best therapy for colds is fluids, especially warm fluids, rest and acetaminophen for fever. Salt water nose drops are useful for babies and toddlers to relieve nasal congestion. These can be made at home or bought.

Influenza

- Influenza is caused by a virus
- Prevention of influenza
 - Annual influenza vaccination
 - Frequent handwashing
 - Respiratory etiquette
- Stay home from school or work if you are sick



Influenza (flu) is caused by a virus. The flu season usually starts in November/ December and ends in April/May.

Influenza is a disease that can make a person very sick with fever, chills, muscle/body aches, sore throat and cough. Often a person feels very sick for 4-5 days and it may take up to three weeks to feel completely better.

The best way to prevent influenza is to get a yearly influenza vaccination. The vaccine is about 70-90% effective in preventing disease. Because the influenza virus is always changing, it is necessary to get a vaccination every year.

Once a person has influenza, the best way to prevent the spread of the virus is to wash your hands frequently and avoid coughing or sneezing on others. It is also important in the first few days of illness to stay away from school or work to prevent spreading the virus to others. Adults spread the virus for 3-5 days after first feeling sick, while children can spread the virus for up to one week.

New antiviral drugs are available that have some activity against the influenza virus. These drugs must be taken within the first 48 hours of influenza symptoms to be effective. This is a problem because people may not know that they have influenza yet.

The best therapy for the flu is fluids, rest and acetaminophen for the fever, aches and pains.

Sore throat

- Most sore throats are due to viruses
- Occasionally a sore throat may be due to *Streptococcus* bacteria

The only way to diagnose Strep throat is with a throat swab



Most sore throats are symptoms of colds or influenza. These do not require a test and will not be helped by an antibiotic.

Sometimes a sore throat may be due to a bacterium called *Streptococcus pyogenes* (Group A Strep). This is referred to as strep throat. Although it may occur in adults, this infection mainly affects children between the ages of 5-10. Strep throat is more common in the fall and winter.

Unfortunately it is not possible to tell just by looking whether a sore throat is due to a virus or a bacterium. A throat swab must be taken. Results are usually available within 48 hours. If positive, penicillin will usually be prescribed for the strep throat. A negative result indicates that the infection is probably due to a virus. While waiting for the results, acetaminophen should be given for pain and fever. Antibiotics do not significantly decrease the symptoms of a strep throat but they do help prevent complications that occur in rare instances after having an infection with the *Streptococcus* bacterium.

A throat swab is only necessary for patients who have a sore throat and no other symptoms. Persons with cold symptoms and sore throat may test positive for the *Streptococcus* bacterium on a throat swab when in fact, their symptoms are due to a virus. This is because healthy people can carry the *Streptococcus* bacterium in their throat and have no symptoms. When these people have a cold, a swab may falsely indicate strep throat and antibiotics may be prescribed inappropriately.

Ear ache

- 70 - 80% of ear infections get better without antibiotics
- In children over 2 years of age - use acetaminophen or ibuprofen for 48-72 hours
- Handwashing is the best prevention for ear infections since most ear infections occur after a cold



Ear infections are one of the most common reasons why children receive antibiotics. Young children are more prone to ear infections because the Eustachian tube (a special tube that connects the ear to the throat) can easily become blocked during a cold. This blockage can lead to a bacterial infection in the ear.

Not all ear aches are due to bacteria. During a viral infection, fluid may build up in the ear causing pain. Red ears are frequently seen in children who are sick with a viral infection or who have been crying. This is not an indication to give antibiotics.

It is important to give children with ear aches adequate pain medication. Many pediatric associations recommend watchful waiting to see if your child responds with pain medication for 48 - 72 hr before giving an antibiotic, as many children will get better without an antibiotic.

One of the most common reasons for the misuse of antibiotics is to treat fluid behind the eardrum. Fluid behind the eardrum is very common after a cold or ear infection. In fact, 50% of children will still have fluid behind the eardrum one month after an ear infection. If the child's symptoms have improved, antibiotics do not need to be prescribed. Children with an ear infection should be examined after three months. All the fluid should be gone. If not, further treatment may be needed to prevent hearing problems.

Some children have frequent ear infections and might benefit from having small tubes put in the ears. Prolonged use of antibiotics as a preventive measure is not recommended because it can lead to antibiotic resistance.

Cough

- Most coughs in adults and children are caused by viral infections
- Cough is often prolonged with viral infections
- Sometimes a cough may indicate pneumonia



The vast majority of coughs in otherwise healthy children and adults are due to viruses. In individuals with chronic lung diseases, bronchitis may sometimes be due to bacterial infections. Many people put up with a cough for a few days but often seek medical advice if they start coughing up yellow/green sputum or if the cough is prolonged.

Like the yellow/green nasal discharge of a cold, the discolored sputum associated with a chest cold (bronchitis) is an indication that the body is fighting the infection. This does not mean the infection is caused by bacteria.

Pneumonia is a very serious illness that often is associated with a cough. People with pneumonia are usually much sicker and often have had their symptoms for a shorter time. If pneumonia is suspected, a chest x-ray should be done to confirm the diagnosis, and antibiotics are usually prescribed.

Recovery from a cough can take a long time because viral infections can cause a lot of damage to the lining of the airways, resulting in irritation and coughing. In fact, 45% of people still have a cough two weeks after the start of their symptoms, while 25% still have a cough at three weeks.

With viral infections like bronchitis, symptoms may be prolonged. However, recurrence of fever after the initial fever has gone away is a medical concern and medical advice should be sought.

Sinusitis

- Viral sinusitis is up to 200 times more common than bacterial sinusitis
- Yellow / green nasal discharge lasting more than 10 days may indicate bacterial sinusitis



The sinuses are air filled spaces around the nose and the eyes. Sinusitis occurs when fluid builds up in the sinuses. Both bacteria and viruses can cause sinusitis, but viral sinusitis is up to 200 times more common.

Sinusitis most often occurs after a cold, but most colds do not lead to sinusitis. The symptoms of sinusitis are more severe and more prolonged than a cold.

A yellow/green discharge within a few days of a cold is normal. If this discharge continues for more than ten days, this may be an indication of bacterial sinusitis.

Unfortunately, sinus x-rays are not helpful in diagnosing bacterial sinusitis. X-rays cannot differentiate between the fluid that accumulates with a viral infection or a bacterial infection.

Decongestants may be helpful in relieving symptoms but do not shorten the duration of the illness.

If cold symptoms reoccur and are associated with a clear discharge, this indicates another cold, not sinusitis.

With viral infections like sinusitis, symptoms may be prolonged. However, recurrence of fever after the initial fever has gone away is a medical concern and medical advice should be sought.

You can make a difference!

Promote and support three key messages:

- Wash your hands!
- Not all bugs are created equal
- Use antibiotics wisely



So, what can you do?

Teach by example. Handwashing is the most important way to stop the spread of infections. Antibacterial soap should not be used because it promotes antibiotic resistance. Plain soap is very effective in removing germs from the hands.

Help others to understand that bacteria and viruses are different and that antibiotics do not work against viral infections. Take the time to explain why antibiotics are not needed for many respiratory tract infections such as colds and influenza.

Antibiotic resistance is a global health issue. Anyone can become infected with a resistant bacterium. That is why it is important to promote the wise use of antibiotics to prevent the development of antibiotic resistance.